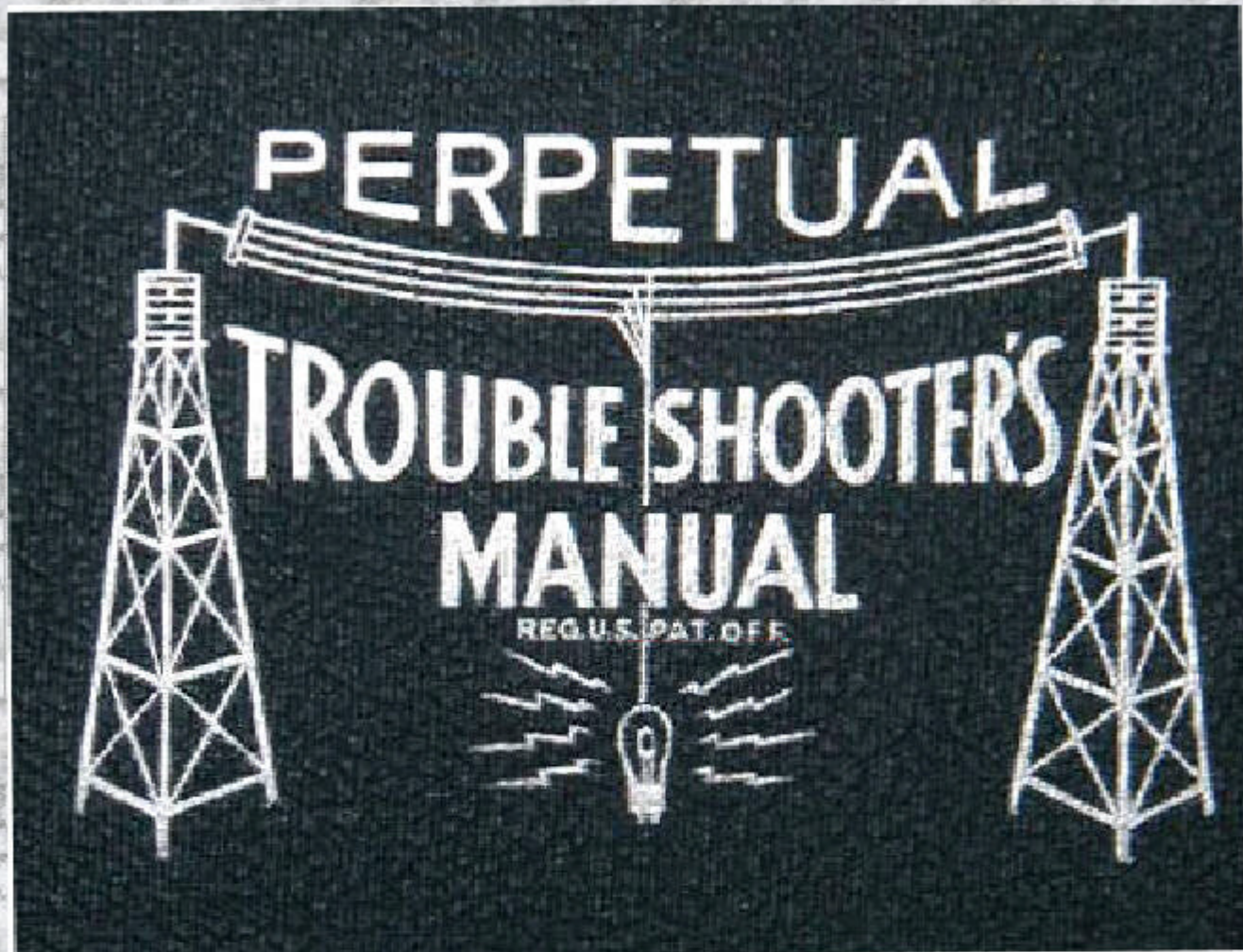


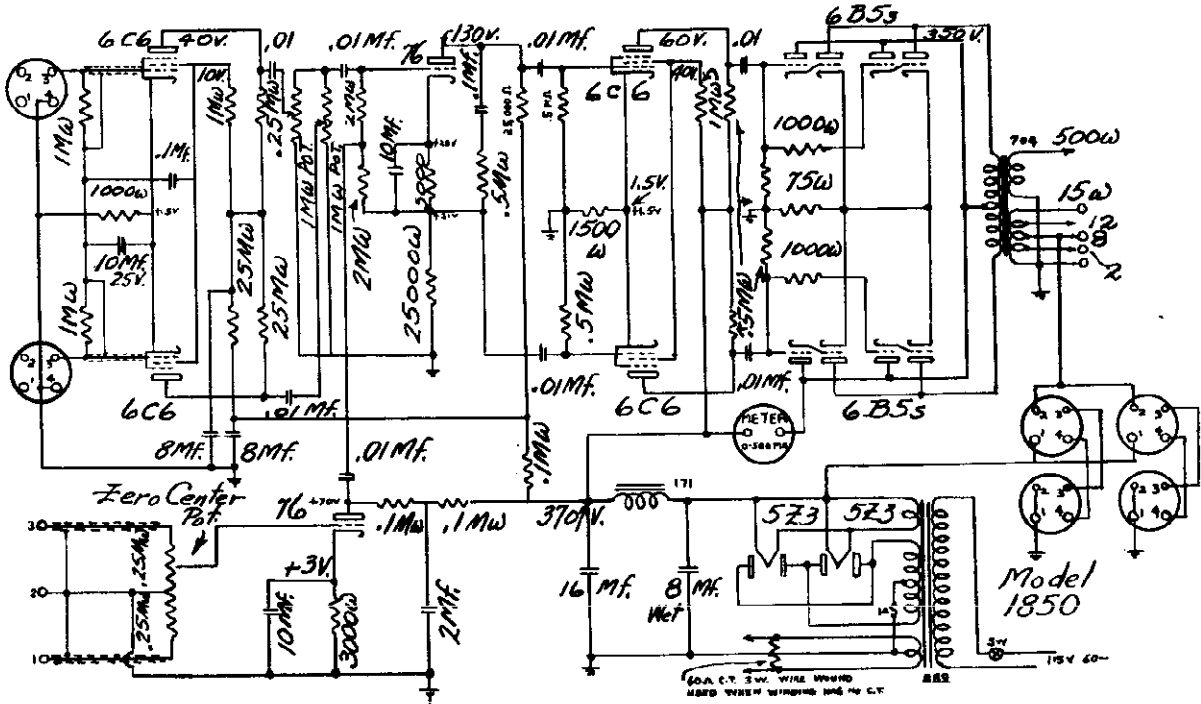
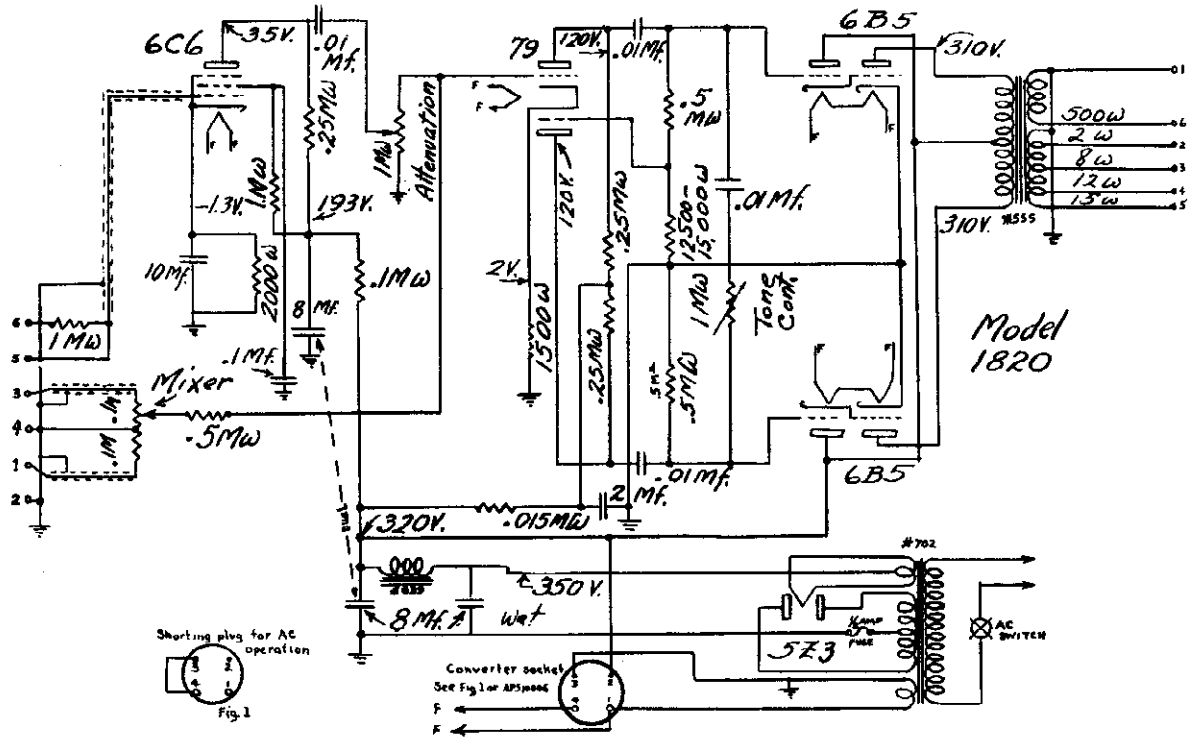
RIDER'S **VOLUME - VIII**



**COVERING OCTOBER 1936
THROUGH
OCTOBER 1937**

ACRATEST PRODUCTS

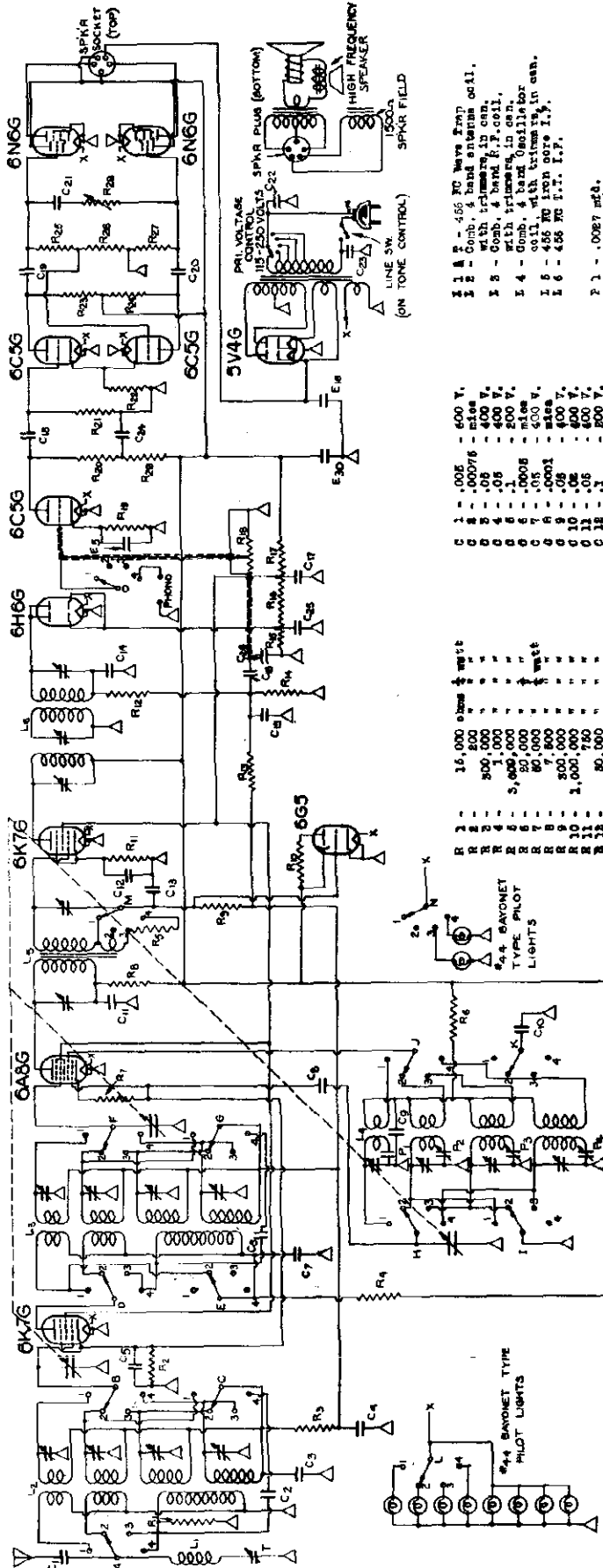
MODEL 1820
MODEL 1850
Schematics
Voltage



AIR KING PRODUCTS CORP.

MODEL 11F
Schematic, Alignment

MODEL 11F
4 BAND ALL-WAVE SUPERHETERODYNE



ALIGNMENT FREQUENCIES

I.F. - 456 KC (Selectivity switch in "Selectivity Position")

- Trimmers**
- BAND 1 - 16 MC or 19. M
 - BAND 2 - 5 MC or 60 M
 - BAND 3 - 1500 KC or 200 M
 - BAND 4 - 300 KC or 1000 M
- Padder**
- 2 MC or 150 M
 - 600 KC or 500 M
 - 150 KC or 2000 M
 - 150 KC or 2000 M

WAVE BAND SWITCH POSITIONS

1. Foreign Short Wave
2. Police, Aircraft, Amateur
3. Medium Wave
4. Long Wave

SELECTIVITY SWITCH POSITIONS

1. Selective
2. Medium Fidelity
3. High Fidelity
4. Phonograph

1	.005	400 V.
2	.00075	400 V.
3	.05	400 V.
4	.05	400 V.
5	.1	200 V.
6	.0005	400 V.
7	.05	400 V.
8	.001	400 V.
9	.05	400 V.
10	.05	400 V.
11	.1	200 V.
12	.1	200 V.
13	.0001	400 V.
14	.0001	400 V.
15	.05	400 V.
16	.05	400 V.
17	.05	400 V.
18	.05	400 V.
19	.05	400 V.
20	.05	400 V.
21	.05	400 V.
22	.05	400 V.
23	.1	200 V.
24	.1	200 V.
25	.0001	400 V.
26	.0001	400 V.

NOTE: - WAVE BAND SWITCH SHOWS IN BAND & POSITION, (POSITIVE, AIRCRAFT, AMATEUR)

SELECTIVITY SWITCH SHOWN IN FIRST (SELECTIVE) POSITION.

MODELS 21, 22, 522
81 Series
Schematic, Layout
Data

AIR KING PRODUCTS CORP.

INSTRUCTIONS FOR INSTALLATION AND OPERATION

Model Nos. 21-22-522 and 81 Series

This receiver employs a chassis of latest design. The frequency range covered is 540-1750 kilocycles.

TUBES (Model 21 series)
6D6, 6C6, 38, 76
(Model 81 & 22 and 522 series)
6D6, 6C6, 38, 76, K90F

ANTENNA The antenna built into the set will perform to give best results in most localities. However, in communities located more than 100 miles away from a broadcasting station, an outside antenna of 50 to 75 feet may be necessary for better performance. This antenna should be attached to the end of the built in antenna hank.

VOLUME CONTROL AND ON/OFF SWITCH This control is located on the lower right side of the receiver. To place set in operation, turn this knob to the right. This automatically turns the receiver on. To decrease volume to desired level, turn this control to the left. To turn set off, rotate the control to the extreme left until click is heard.

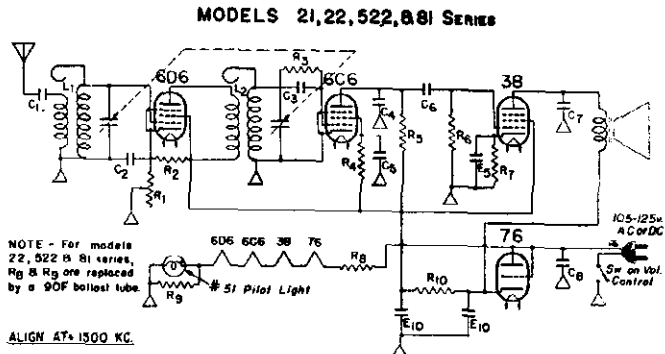
SELECTOR KNOB The selector knob is located on the upper right hand side of the receiver. It is used to tune in desired stations. The scale is calibrated in kilocycles.

INSTALLATION a. Unhank the line cord and stretch it out to its full length before connecting to the 105-125 volts, 50-60 cycles AC or DC power lines. Under this condition, the cord will feel warm. THIS IS NORMAL. Operating with the cord hanked or rolled up may cause it to heat excessively and damage set. DO NOT CUT THIS CORD TO SHORTEN OR LENGTHEN IT.

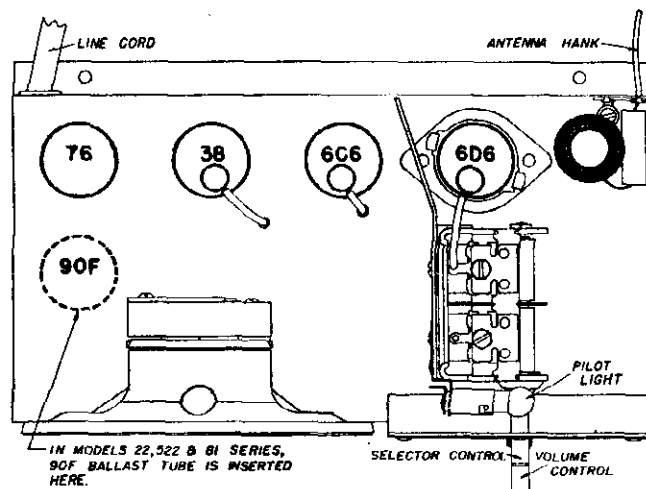
b. When using DC current, allow the receiver to warm up for 60 seconds. IF AFTER THAT TIME RECEIVER DOES NOT FUNCTION, REVERSE THE PLUG IN THE ELECTRIC OUTLET.

c. CAUTION — Do Not Connect Ground Wire to Chassis.

L1 - Antenna Coil
L2 - RF Coil

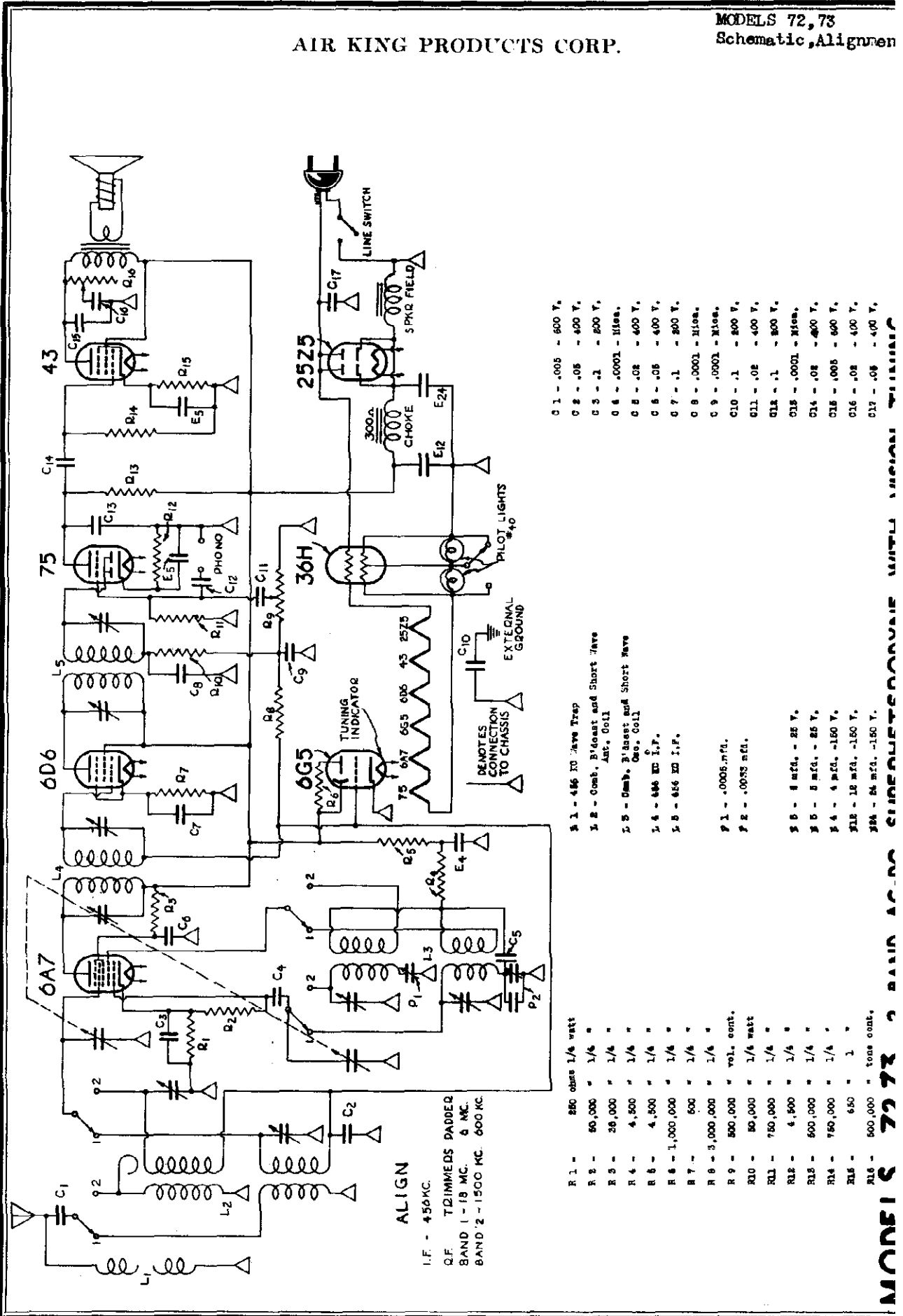


TUBE SOCKET LOCATIONS



E5	- - -	5	MF	-	25 VOLT
E10	- - -	10	MF	-	150 VOLT
C1	- - -	.005	MF	-	400 VOLT
C2	- - -	.02	MF	-	400 VOLT
C3	- - -	.005	MF	-	400 VOLT
C4	- - -	.0001	MF	-	mica
C5	- - -	.02	MF	-	400 VOLT
C6	- - -	.02	MF	-	400 VOLT
C7	- - -	.005	MF	-	400 VOLT
C8	- - -	.05	MF	-	400 VOLT
R1	-	25,000 ohm	VOL. CONTROL		
R2	-	35,000 ohm	1/4	Watt	
R3	-	3,000,000 ohm	1/4	Watt	
R4	-	6,000,000 ohm	1/4	Watt	
R5	-	1,000,000 ohm	1/4	Watt	
R6	-	750,000 ohm	1/4	Watt	
R7	-	1,000 ohm	1/4	Watt	
R8	-	290 ohm	in line cord		
R9	-	31 ohm	3	Watt	
R10	-	2700 ohm	1/4	Watt	

AIR KING PRODUCTS CORP.



ALIGN

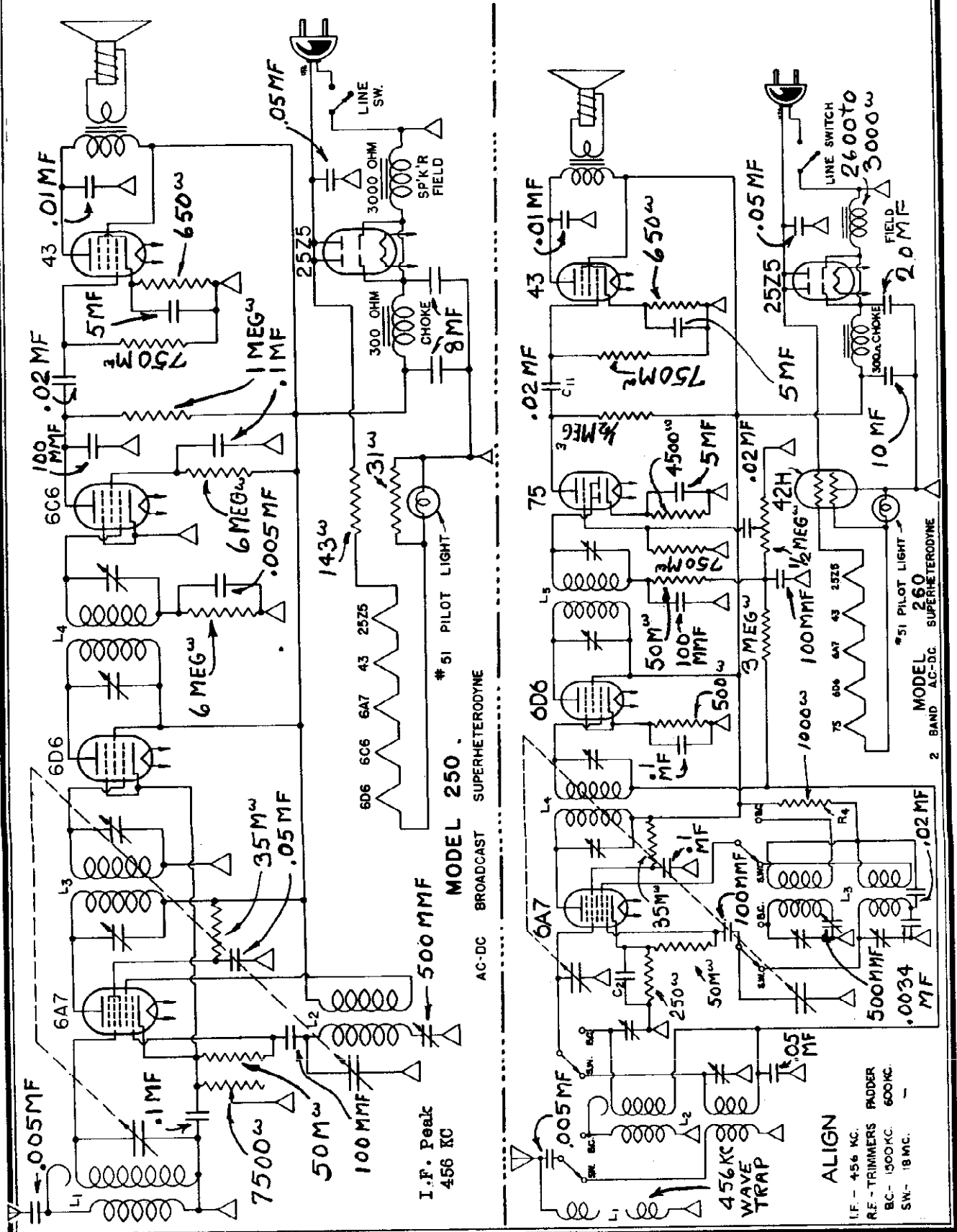
I.F. - 450 KC.
Q.F. TRIMMEDS PADDED
BAND 1 - 18 MC. 6 MC.
BAND 2 - 1500 KC. 600 KC.

- R 1 - 250 ohms 1/4 watt
- R 2 - 50,000 " 1/4 "
- R 3 - 20,000 " 1/4 "
- R 4 - 4,500 " 1/4 "
- R 5 - 4,500 " 1/4 "
- R 6 - 1,000,000 " 1/4 "
- R 7 - 500 " 1/4 "
- R 8 - 3,000,000 " 1/4 "
- R 9 - 500,000 " vol. cont.
- R 10 - 50,000 " 1/4 watt
- R 11 - 750,000 " 1/4 "
- R 12 - 4,500 " 1/4 "
- R 13 - 500,000 " 1/4 "
- R 14 - 750,000 " 1/4 "
- R 15 - 650 " 1 "
- R 16 - 500,000 " tone cont.
- C 1 - .005 - 500 V.
- C 2 - .05 - 400 V.
- C 3 - .1 - 500 V.
- C 4 - .0001 - 150v.
- C 5 - .02 - 400 V.
- C 6 - .05 - 400 V.
- C 7 - .1 - 500 V.
- C 8 - .0001 - 150v.
- C 9 - .0001 - 150v.
- C 10 - .1 - 500 V.
- C 11 - .02 - 400 V.
- C 12 - .1 - 500 V.
- C 13 - .0001 - 150v.
- C 14 - .02 - 400 V.
- C 15 - .005 - 600 V.
- C 16 - .02 - 400 V.
- C 17 - .05 - 400 V.
- P 1 - .0005 mfd.
- P 2 - .0025 mfd.
- P 3 - 5 mfd. - 25 V.
- P 4 - 5 mfd. - 25 V.
- P 5 - 4 mfd. - 150 V.
- P 6 - 12 mfd. - 150 V.
- P 7 - 24 mfd. - 150 V.
- P 8 - 456 KD Wave Trap
- P 9 - Comb. B'domat and Short Wave Ant. Coil
- P 10 - Comb. B'domat and Short Wave Cap. Coil
- P 11 - 456 KD I.F.
- P 12 - 456 KD I.F.

MODELS 72, 73 AIR KING PRODUCTS CORP. SCHAUMBURG, ILL.

MODEL 250
 MODEL 260
 Schematics

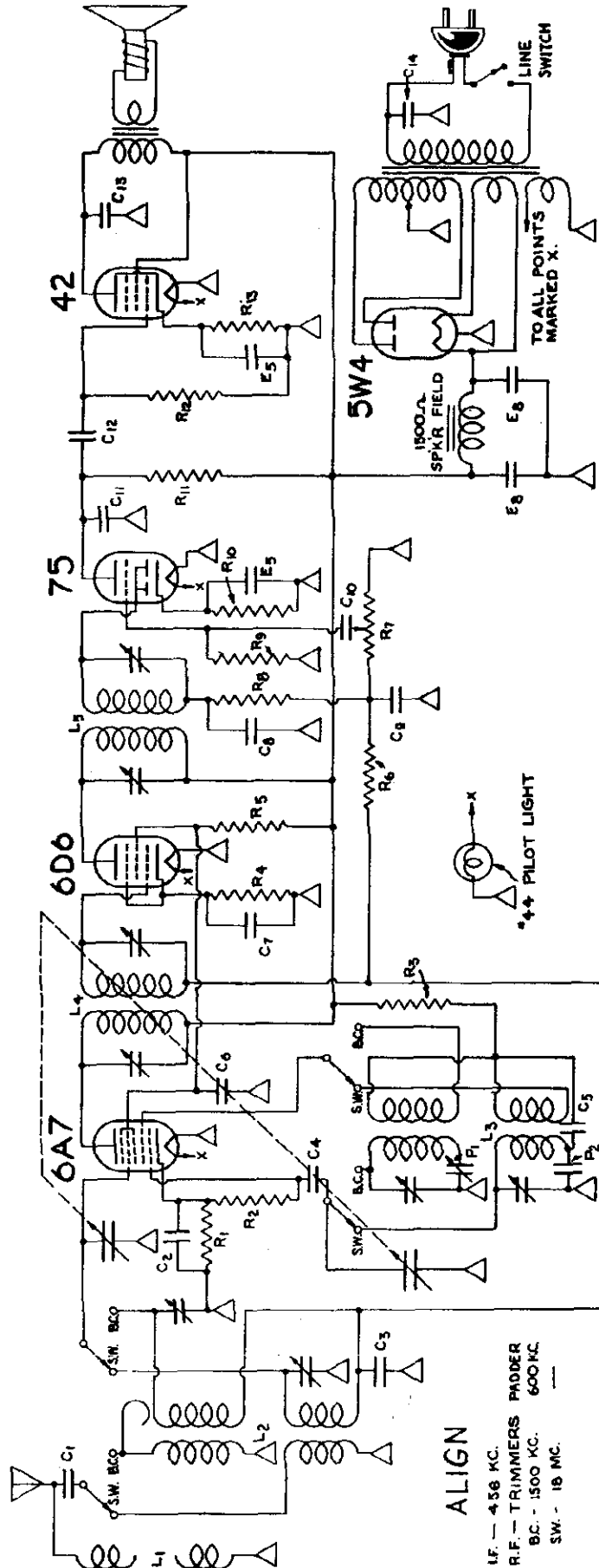
AIR KING PRODUCTS CORP.



AIR KING PRODUCTS CORP.

MODEL 261
 MODELS 730, 731
 Schematics, Alignment

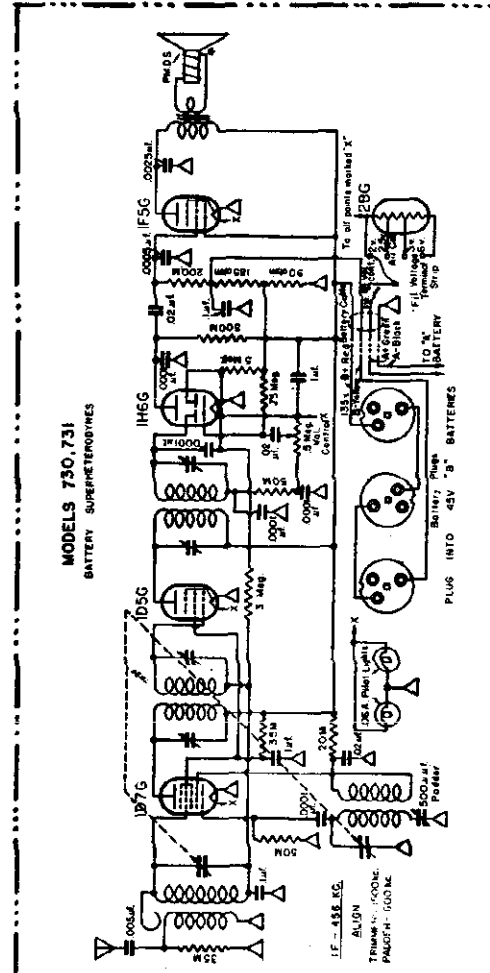
MODEL 261
 2 BAND AC. SUPERHETERODYNE



ALIGN

IF - 456 KC.
 R.F. - TRIMMERS PADDER
 BC - 1500 KC. 600 KC.
 SW - 18 MC.

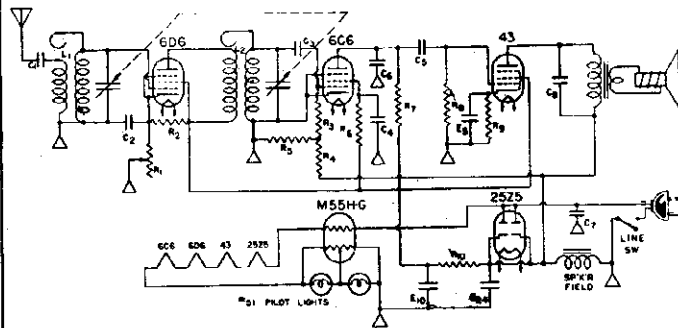
R 1 -	250 ohm 1/2 watt	I 1 -	456 TO wave trap	C 1 -	.005 - 600 V.
R 2 -	20,000 " 1/2 "	I 2 -	2 band Antenna coil	C 2 -	.1 - 200 V.
R 3 -	20,000 " 1/2 "	I 3 -	2 band Oscillator coil	C 3 -	.05 - 400 V.
R 4 -	500 " 1/2 "	I 4 -	456 TO Input I.P.	C 4 -	.0001 - misc
R 5 -	20,000 " 1/2 "	I 5 -	456 TO Output I.P.	C 5 -	.02 - 400 V.
R 6 -	5,000,000 " 1/2 "	P 1 -	500 Ohm f.	C 6 -	.1 - 200 V.
R 7 -	500,000 " Vol. Cont.	P 2 -	.0004 mfd.	C 7 -	.1 - 200 V.
R 8 -	50,000 " 1/2 watt	R 5 -	5 mfd. - 35 V.	C 8 -	.0001 - misc
R 9 -	750,000 " 1/2 "	R 6 -	.0004 mfd.	C 9 -	.0001 - misc
R 10 -	2,000 " 1/2 "	R 7 -	5 mfd. - 35 V.	C 10 -	.02 - 400 V.
R 11 -	500,000 " 1/2 "	R 8 -	5 mfd. - 35 V.	C 11 -	.0001 - misc
R 12 -	750,000 " 1/2 "	R 9 -	5 mfd. - 250 V.	C 12 -	.02 - 400 V.
R 13 -	400 " 1/2 "	R 10 -	5 mfd. - 250 V.	C 13 -	.008 - 600 V.
		R 11 -	5 mfd. - 250 V.	C 14 -	.05 - 200 V.



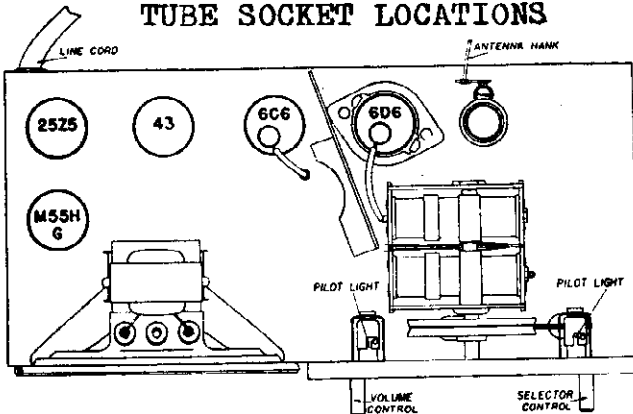
MODEL 700
MODEL 705

AIR KING PRODUCTS CORP.

Schematics
Socket



TUBE SOCKET LOCATIONS

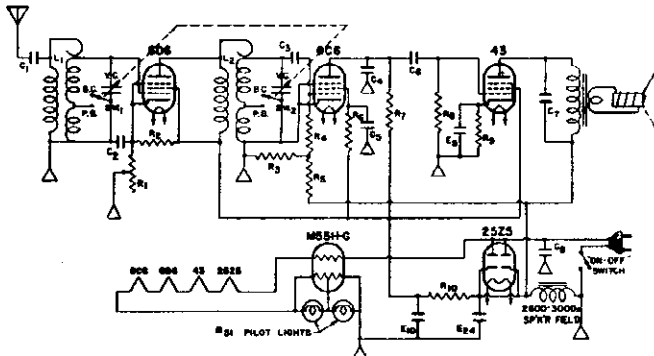


The frequency range covered is 540-1750 kilocycles.

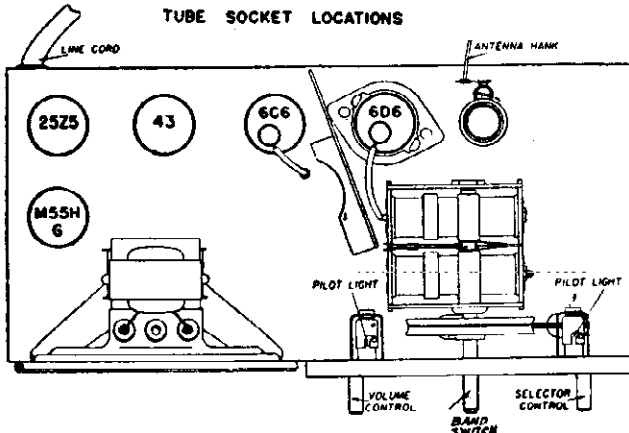
MODEL No. 700

- R1 - 25,000 ohm Vol. Cont.
- R2 - 35,000 " 1/4 Watt
- R3 - 6,000,000 " " "
- R4 - 1,000,000 " " "
- R5 - 2,700 " " "
- R6 - 6,000,000 " " "
- R7 - 1,000,000 " " "
- R8 - 500,000 " " "
- R9 - 650 " 1/2 " "
- R10 - 4,500 " " "
- C1 - .005 MF, 400 Volt DC
- C2 - .02 MF, 200 " "
- C3 - .005 MF, 400 " "
- C4 - .02 MF, 200 " "
- C5 - .02 MF, 200 " "
- C6 - .00025 MF, Mica
- C7 - 1 MF, 400 Volt DC
- C8 - .005 MF, 400 " "
- E5 - 5 MF, 25 VOLT Elec.
- E10 - 10 MF, 150 VOLT ELEC.
- E24 - 24 MF, 150 VOLT ELEC.
- L1 - Antenna Coil
- L2 - R.F. COIL

MODEL No. 705



TUBE SOCKET LOCATIONS



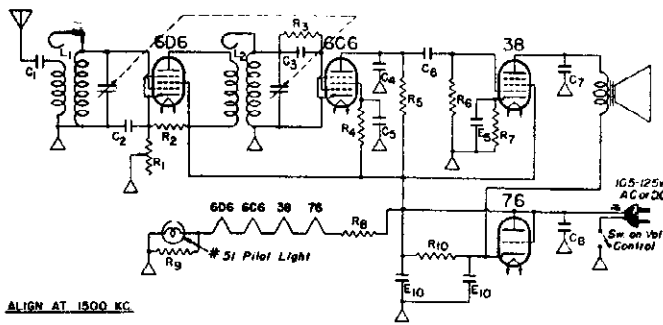
The frequency ranges covered are 540-1750,
and 1725-4000 kilo-cycles.

- R1 - 25,000 Ohm Vol. Cont.
- R2 - 35,000 " 1/4 Watt
- R3 - 27,000 " " "
- R4 - 6,000,000 " " "
- R5 - 1,000,000 " " "
- R6 - 6,000,000 " " "
- R7 - 1,000,000 " " "
- R8 - 500,000 " " "
- R9 - 650 " 1/2 " "
- R10 - 4,500 " " "
- C1 - .005 MF, 400 Volt DC
- C2 - .02 MF, 200 " "
- C3 - .005 MF, 400 Volt DC
- C4 - .00025 MF - Mica
- C5 - .02 MF, 200 Volt DC
- C6 - .02 MF, 200 " "
- C7 - .005 MF, 400 " "
- C8 - .1 MF, 400 " "
- E5 - 5 MF, 150 Volt Elec.
- E10 - 10 MF, 150 " "
- E24 - 24 MF, 150 " "
- L1 - Combination Ant. Coil
- L2 - Combination RF Coil
- VC - 410 MMF Max. Variable
- SW1, SW2 - 2 Pole, 2 position
common rotor band switch

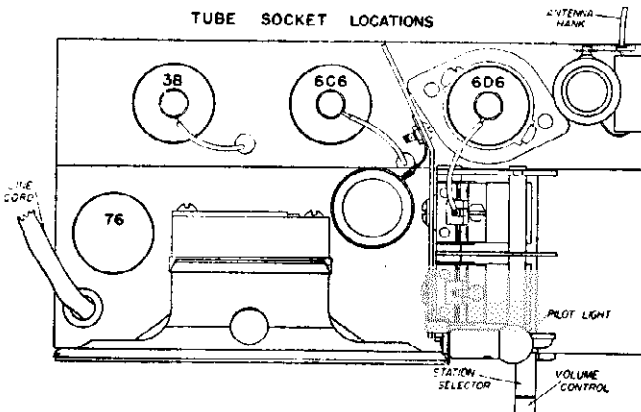
AIR KING PRODUCTS CORP.

MODELS 710, 715
 MODELS 1000, 2000
 Schematics, Socke

MODELS 1000 and 2000



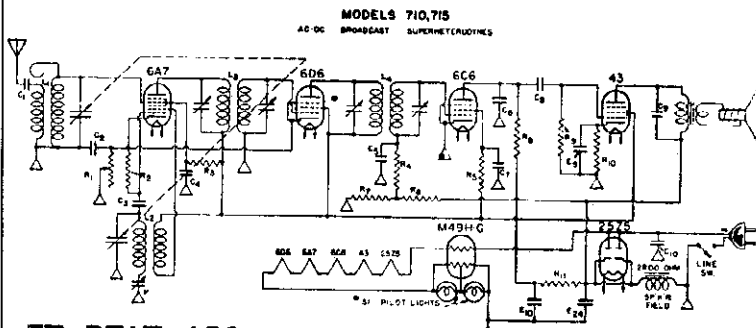
ALIGN AT 1500 KC



The frequency range is 540-1750 kilocycles.

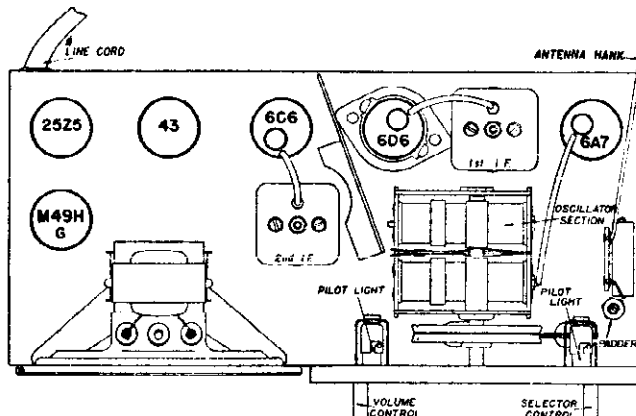
- R1 - 25,000 Ohm Vol. Cont
- R2 - 35,000 " 1/4 Watt
- R3 - 3,000,000 " " "
- R4 - 6,000,000 " " "
- R5 - 1,000,000 " " "
- R6 - 750,000 " " "
- R7 - 1,000 " " "
- R8 - 290 Ohm in line cord
- R9 - 31 Ohm 3 Watt
- R10 - 2,700 Ohm 1/4 Watt
- C1 - .005 MF, 400 Volt DC
- C2 - .02 " , 400 " "
- C3 - .005 " , 400 " "
- C4 - .0001 " , Mica
- C5 - .02 " , 400 Volt DC
- C6 - .02 " , 400 Volt DC
- C7 - .005 " , " " "
- C8 - .05 " , " " "
- E5 - 5 Mf , 25 Volt Elec.
- E10 - 10 Mf , 150 " "
- L1 - Antenna Coil
- L2 - RF Coil

MODELS 710 and 715



IF PEAK 456 KC

TUBE SOCKET LOCATIONS

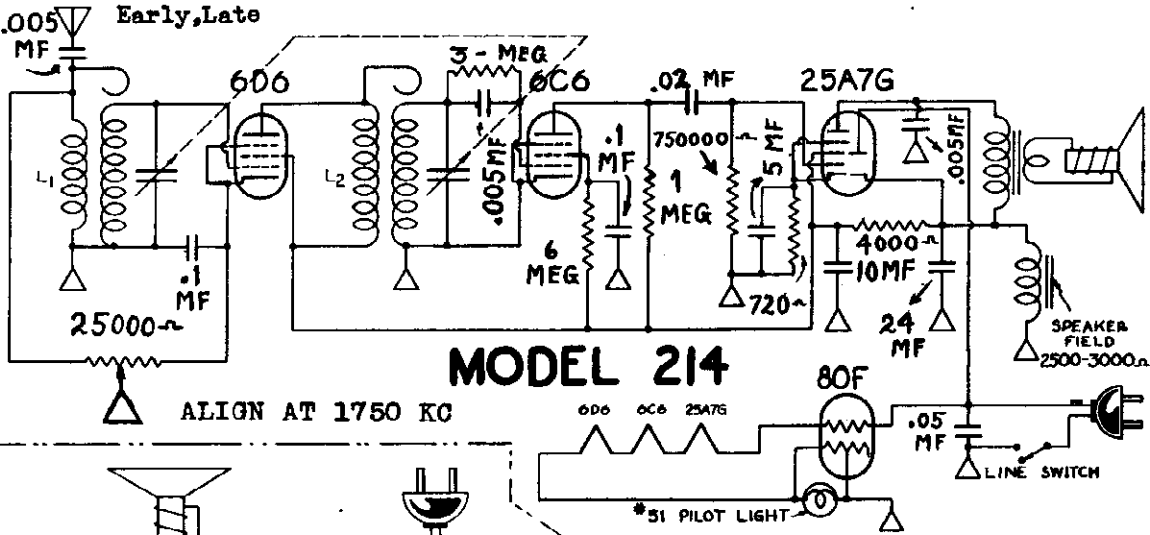


The frequency range covered is 540-1750 kilocycles.

- R1 - 7,500 Ohm Vol. Cont
- R2 - 50,000 " 1/4 Watt
- R3 - 35,000 " " "
- R4 - 6,000,000 " " "
- R5 - 6,000,000 " " "
- R7 - 2,700 " " "
- R8 - 1,000,000 " " "
- R9 - 500,000 " " "
- R10 - 650 " 1/2 "
- R11 - 4,500 " " "
- C1 - .005 MF, 400 Volt DC
- C2 - .1 MF, 200 " "
- C3 - .0001 " , MICA
- C4 - .02 " , 400 Volt DC
- C5 - .005 " , 400 " "
- C6 - .00025 MF, Mica
- C7 - .02 MF, 400 Volt DC
- C8 - .02 " , 400 " "
- C9 - .005 " , 400 " "
- C10 - .1 " , 200 " "
- L1 - Ant. Coil ; L2 - Osc. Coil
- L3 - input IF ; L4 - Output IF
- E5 - 5 MF, 25 Volt Electro.
- E10 - 10 MF, 150 Volt "
- E24 - 24 MF, 150 " "

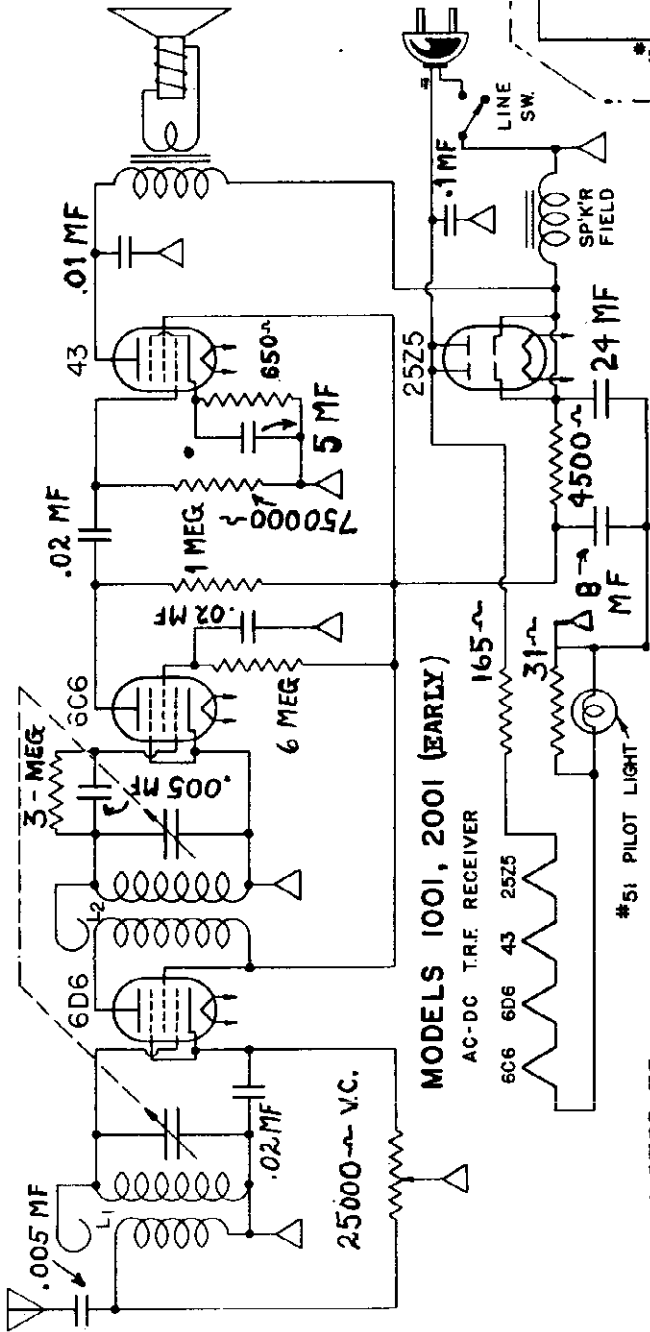
MODEL 214
 MODELS 1001, 2001

AIR KING PRODUCTS CORP.



MODEL 214

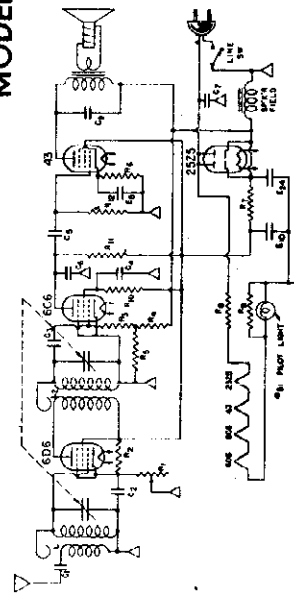
ALIGN AT 1750 KC



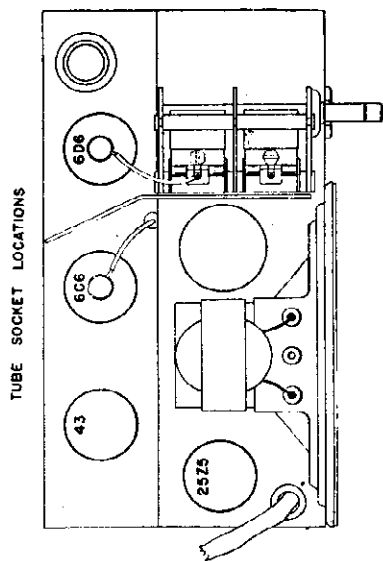
MODELS 1001, 2001 (EARLY)
 AC-DC T.R.F. RECEIVER

ALIGN AT 1750 KC

MODEL No. 1001, 2001
 (REVISED)



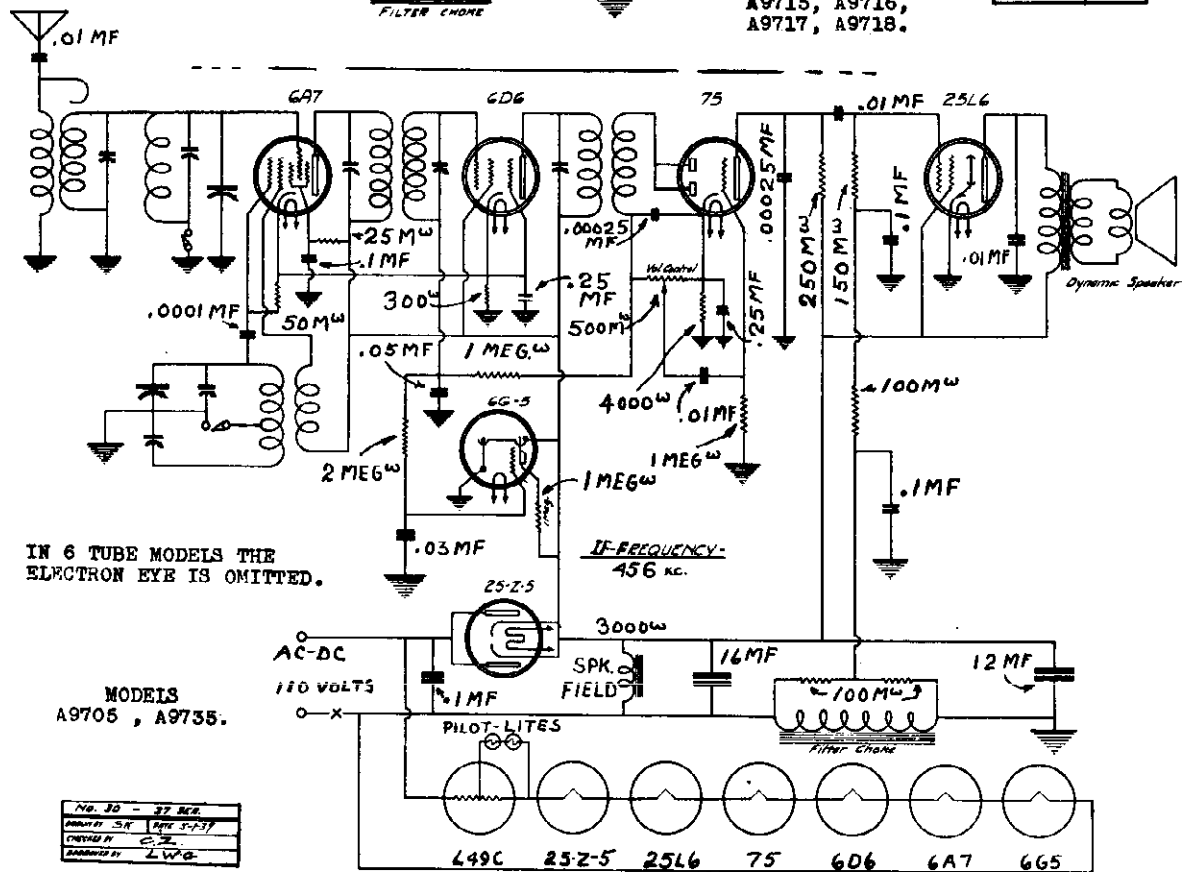
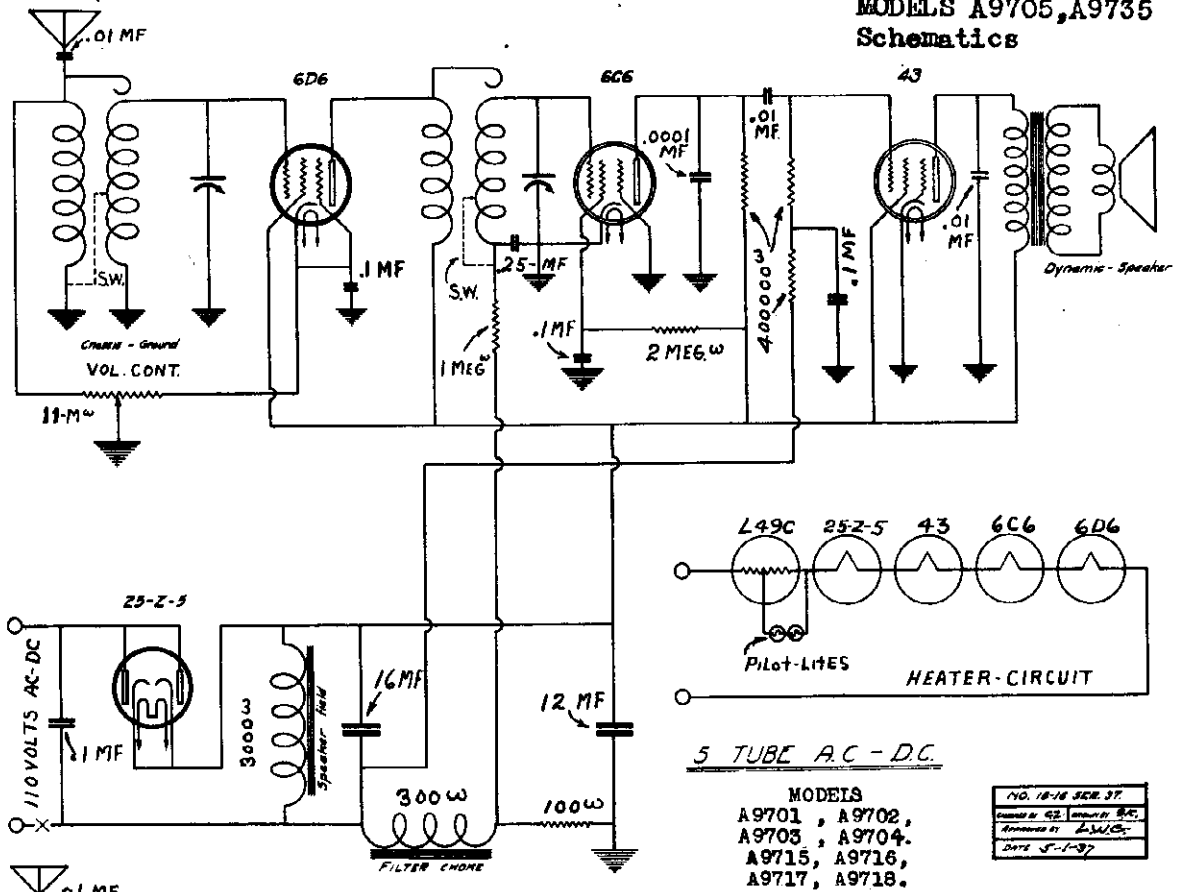
- R1 - 25000 OHM - CENTRAL
- R2 - 25000
- R3 - 100K
- R4 - 100K
- R5 - 100K
- R6 - 100K
- R7 - 100K
- R8 - 100K
- R9 - 100K
- R10 - 100K
- R11 - 100K
- R12 - 100K
- R13 - 100K
- R14 - 100K
- R15 - 100K
- R16 - 100K
- R17 - 100K
- R18 - 100K
- R19 - 100K
- R20 - 100K
- R21 - 100K
- R22 - 100K
- R23 - 100K
- R24 - 100K
- R25 - 100K
- R26 - 100K
- R27 - 100K
- R28 - 100K
- R29 - 100K
- R30 - 100K
- R31 - 100K
- R32 - 100K
- R33 - 100K
- R34 - 100K
- R35 - 100K
- R36 - 100K
- R37 - 100K
- R38 - 100K
- R39 - 100K
- R40 - 100K
- R41 - 100K
- R42 - 100K
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- R46 - 100K
- R47 - 100K
- R48 - 100K
- R49 - 100K
- R50 - 100K
- R51 - 100K
- R52 - 100K
- R53 - 100K
- R54 - 100K
- R55 - 100K
- R56 - 100K
- R57 - 100K
- R58 - 100K
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- R65 - 100K
- R66 - 100K
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- R68 - 100K
- R69 - 100K
- R70 - 100K
- R71 - 100K
- R72 - 100K
- R73 - 100K
- R74 - 100K
- R75 - 100K
- R76 - 100K
- R77 - 100K
- R78 - 100K
- R79 - 100K
- R80 - 100K
- R81 - 100K
- R82 - 100K
- R83 - 100K
- R84 - 100K
- R85 - 100K
- R86 - 100K
- R87 - 100K
- R88 - 100K
- R89 - 100K
- R90 - 100K
- R91 - 100K
- R92 - 100K
- R93 - 100K
- R94 - 100K
- R95 - 100K
- R96 - 100K
- R97 - 100K
- R98 - 100K
- R99 - 100K
- R100 - 100K



ALIGN AT 1750 KC

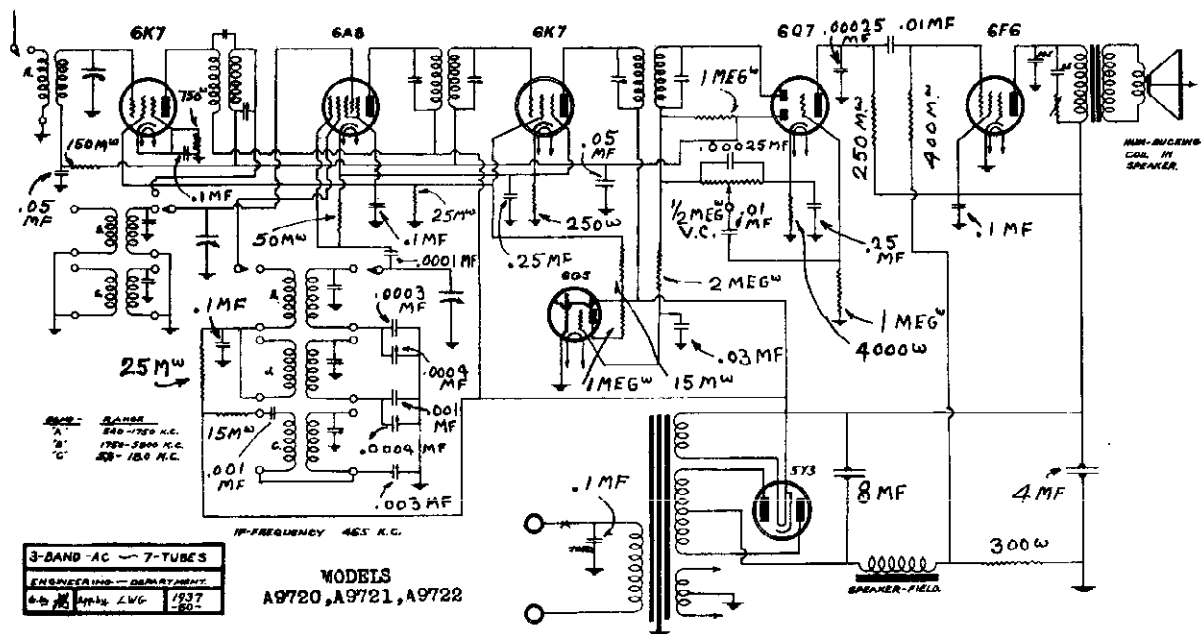
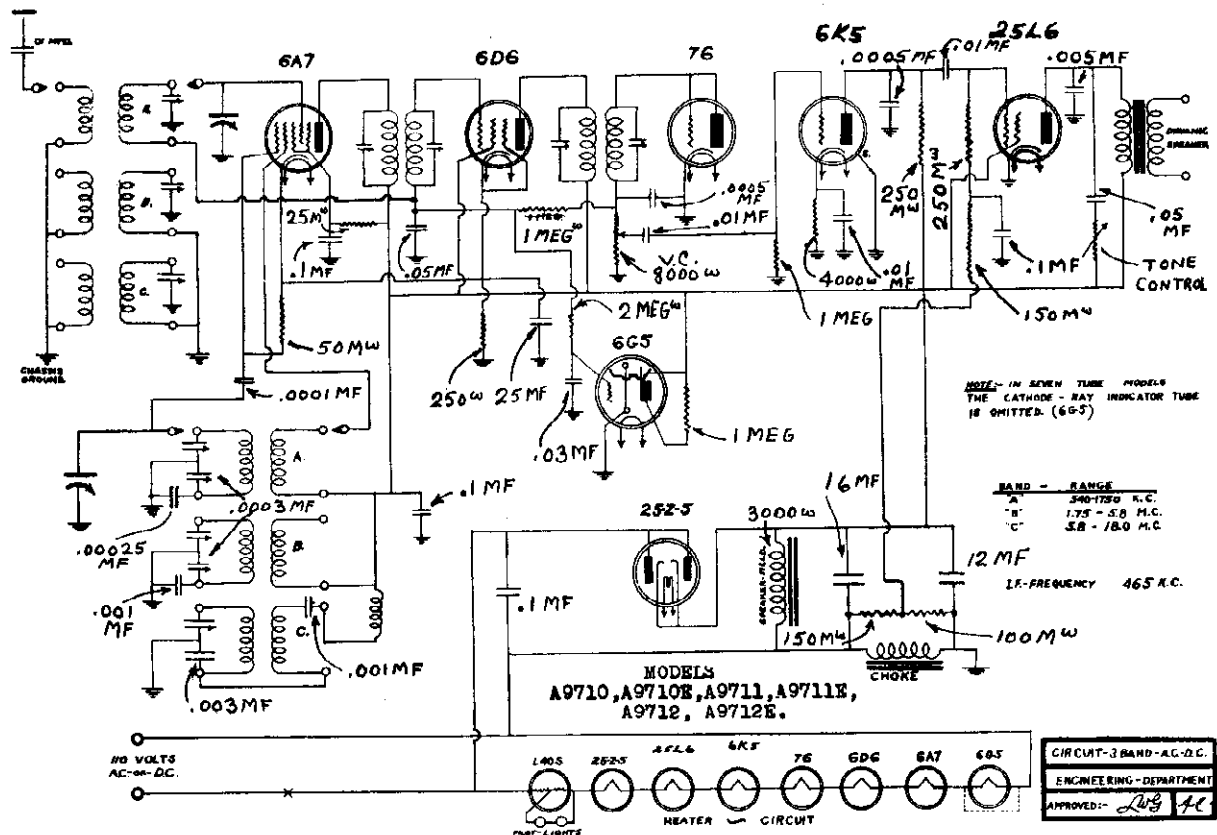
ALLIED RADIO CORP.

MODELS A9701, A9702, A9703
 A9704, A9715, A9716
 A9717, A9718
 MODELS A9705, A9735
 Schematics



MODELS A9710, A9711, A9711E
 A9712, A9712E
 MODELS A9720, A9721, A9722
 Schematics

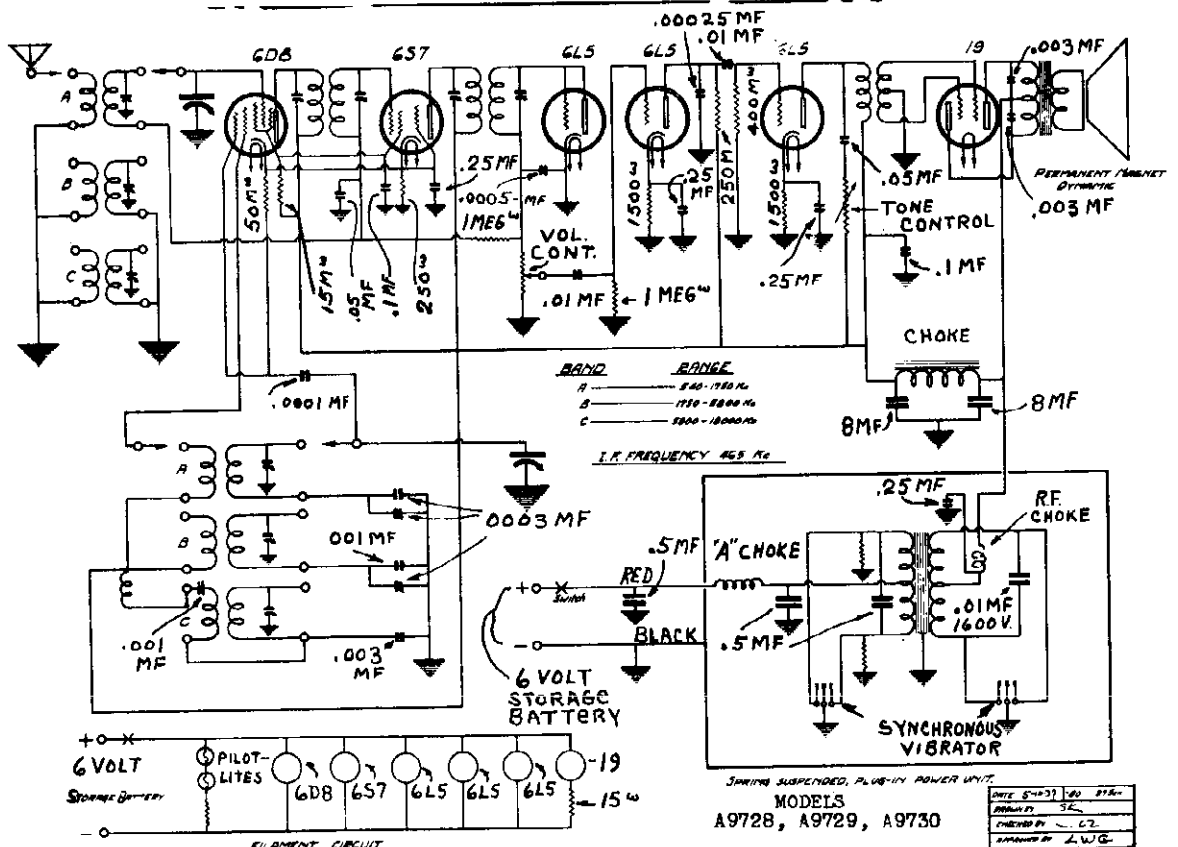
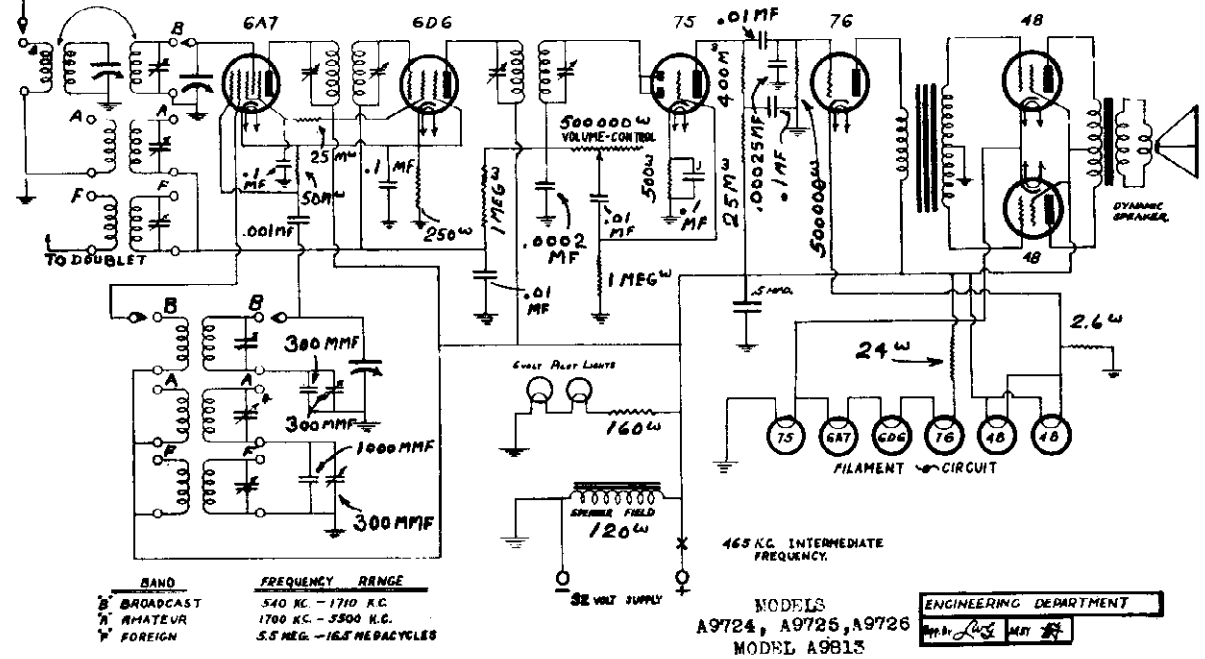
ALLIED RADIO CORP.



ALLIED RADIO CORP.

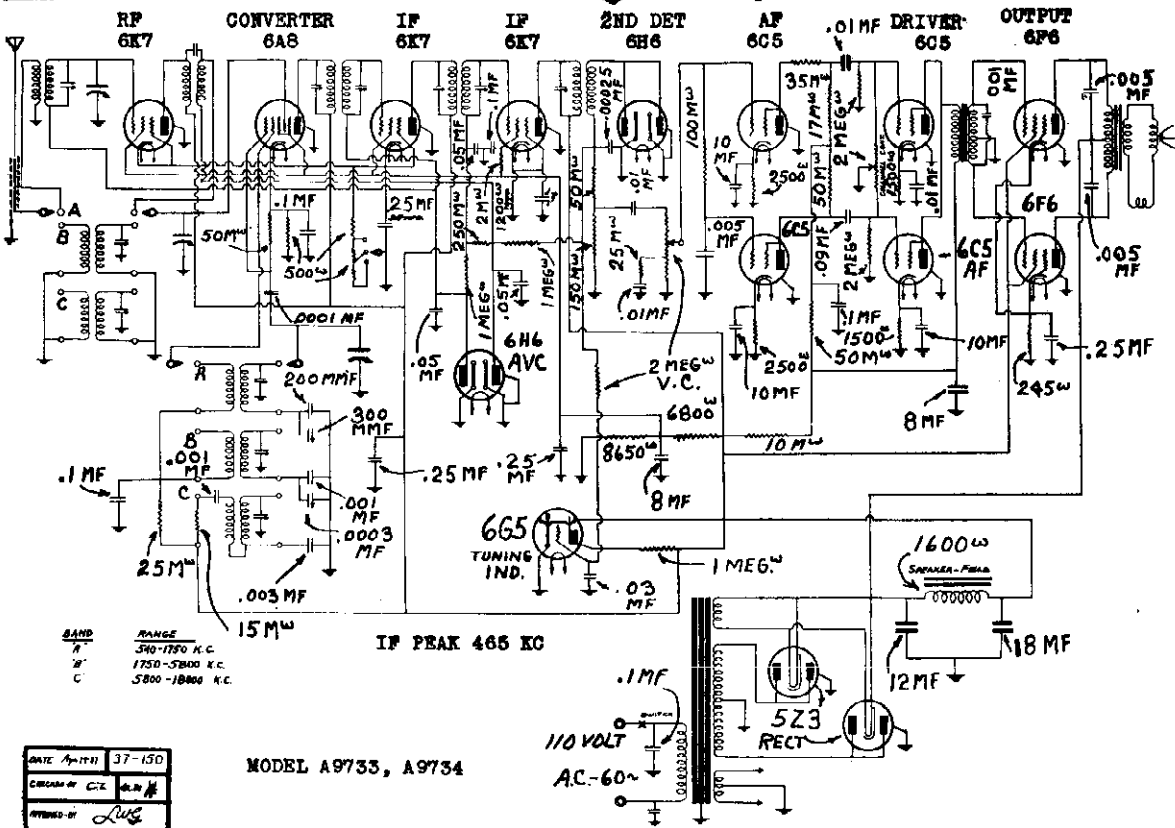
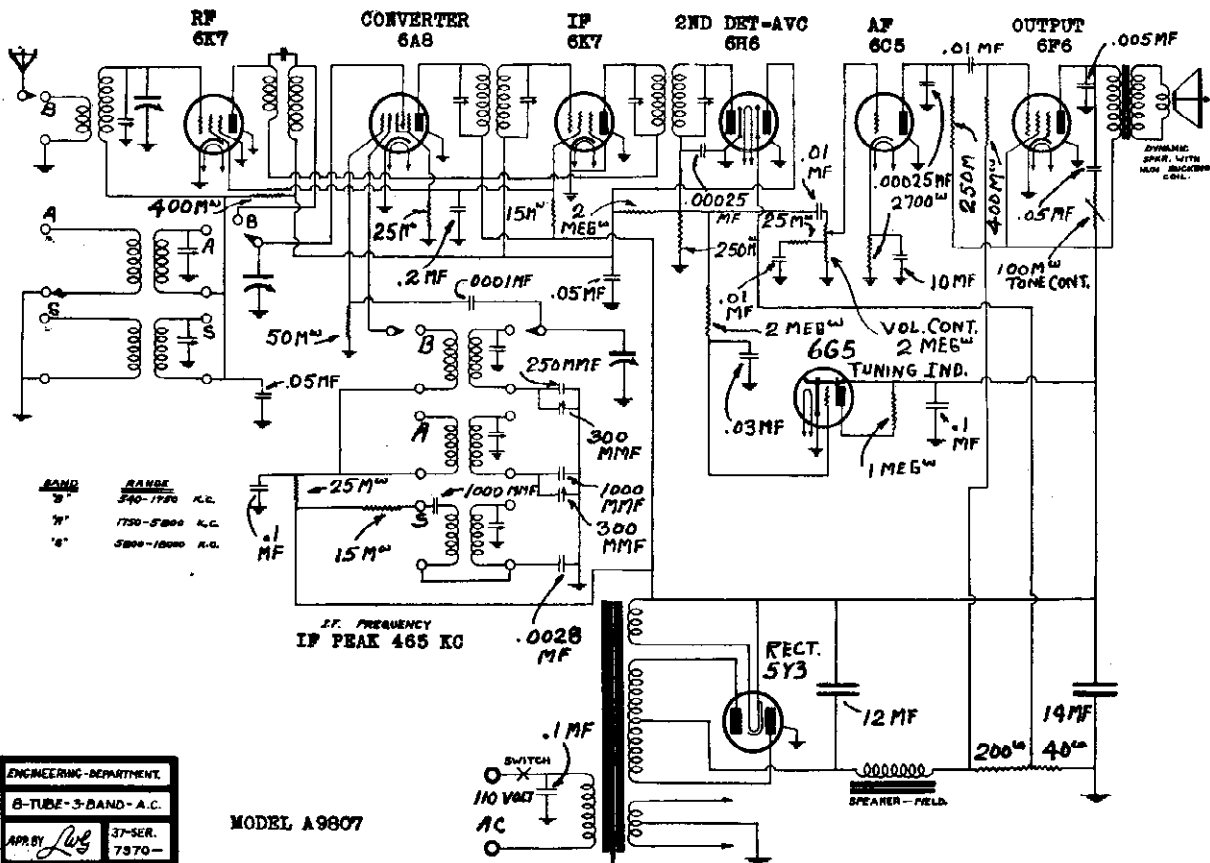
MODELS A9724, A9725,
A9726, A9813
MODELS A9728, A9729, A97
Schematics

ALL-WAVE THREE BAND
6 • TUBE • 32 • VOLT • SUPERHET



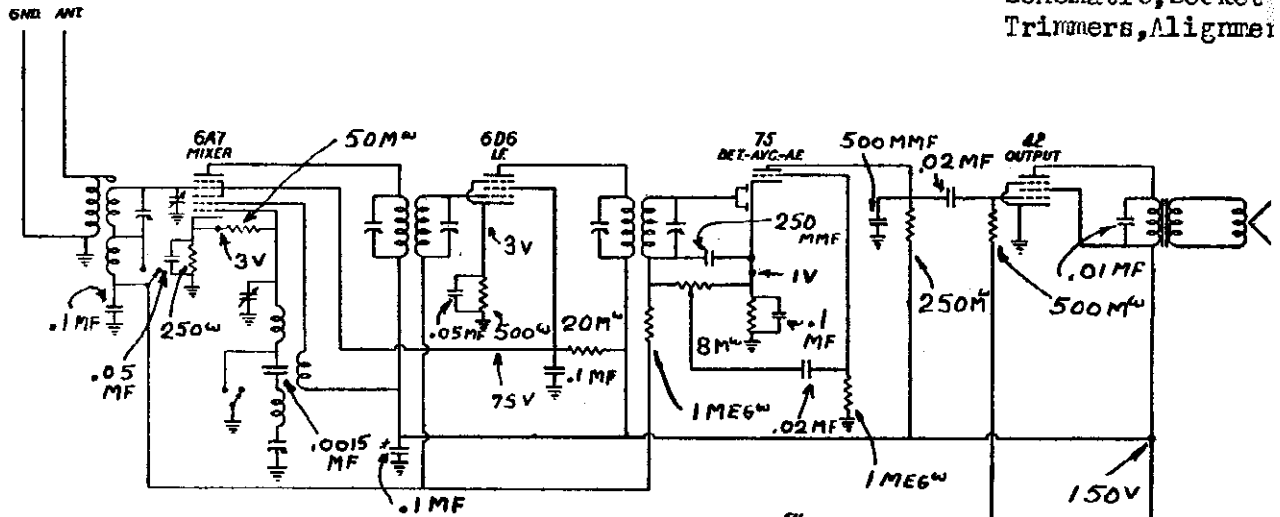
MODELS A9733, A9734
MODEL A9807
Schematics

ALLIED RADIO CORP.

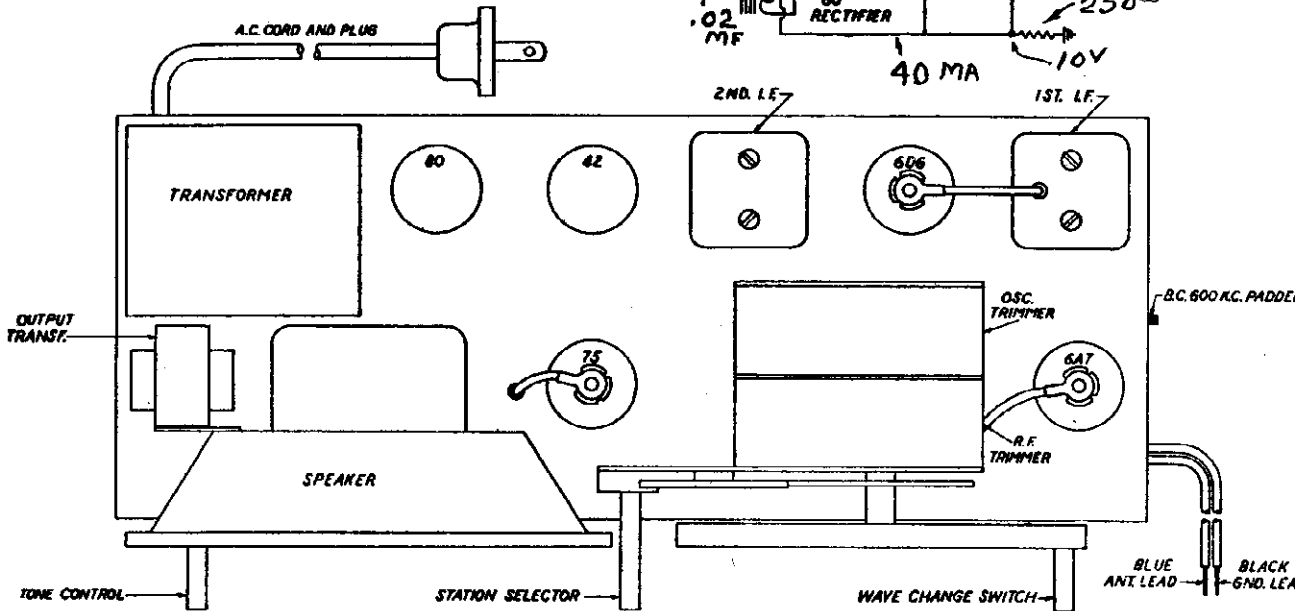


ALLIED RADIO CORP.

MODELS A9775, A98
Chassis B1
Schematic, Socket
Trimmers, Alignment



**SCHEMATIC DIAGRAM
B1 CHASSIS**
5 TUBE A.C. 2 BAND [80-540 TO 1720 K.C.
S.W.-2000 TO 7000 K.C.
I.F. = 455 K.C.
SWITCH SHOWN IN B.C. POSITION
ALL VOLTAGES SHOWN TO GROUND



ALIGNMENT

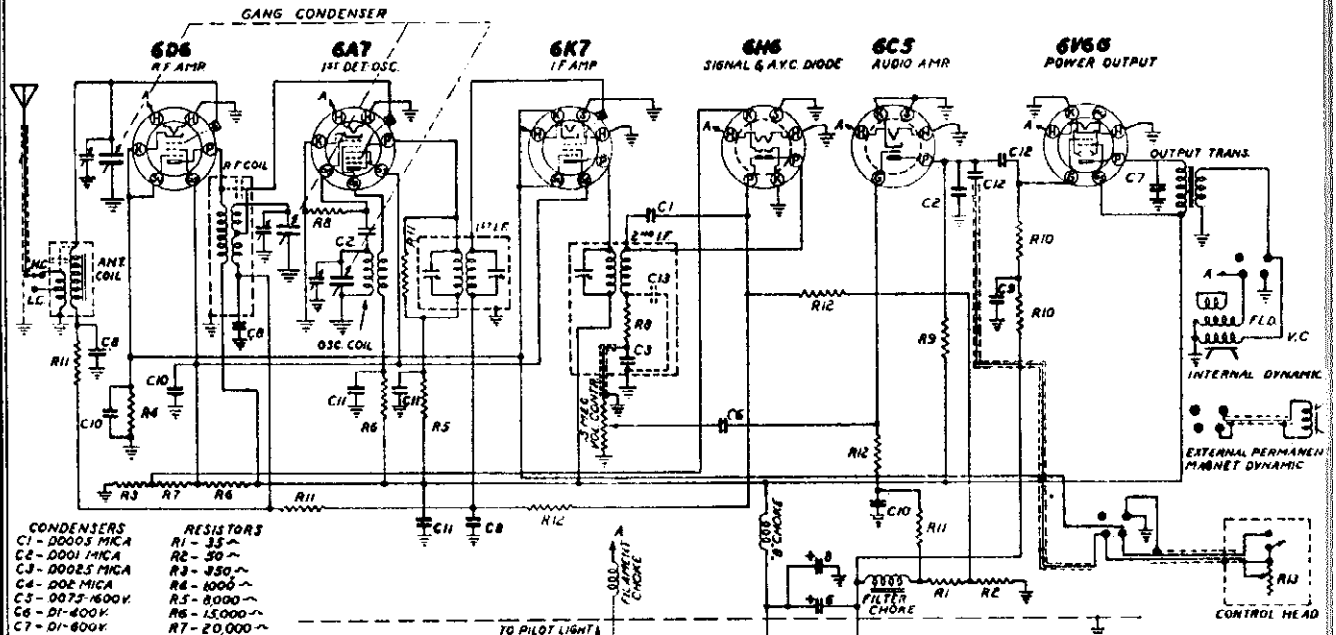
INTERMEDIATE FREQUENCY - Connect the Signal Generator to grid of 6A7 tube through a .05 MFD condenser. Ground Generator to Ground of chassis. Set Generator at 456 KC and adjust trimmers on IF transformers for Max. Peak.

BROADCAST BAND - Connect the Generator to the antenna of receiver through a 1000MFD condenser. Ground Generator to ground of chassis. Range switch in Broadcast position. Set Generator to 1400 KC and adjust Oscillator and RF trimmers to maximum peak. Dial of receiver set on 1400 KC. Pad the Broadcast band at 600 KC, rocking gang condenser during the adjustment.

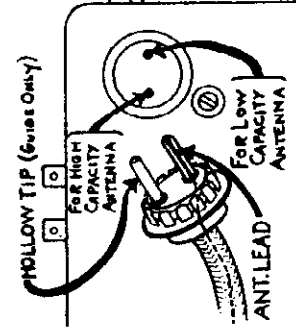
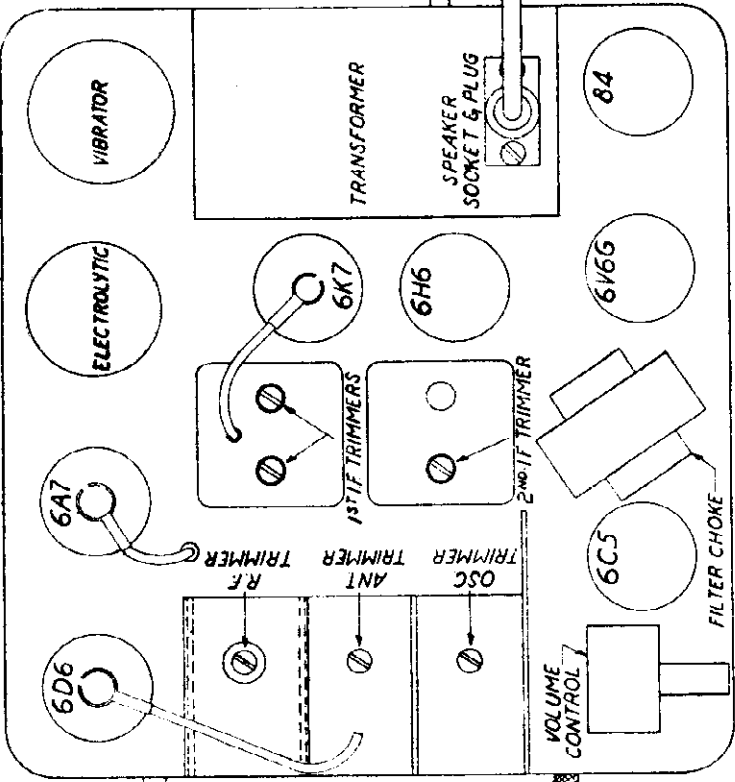
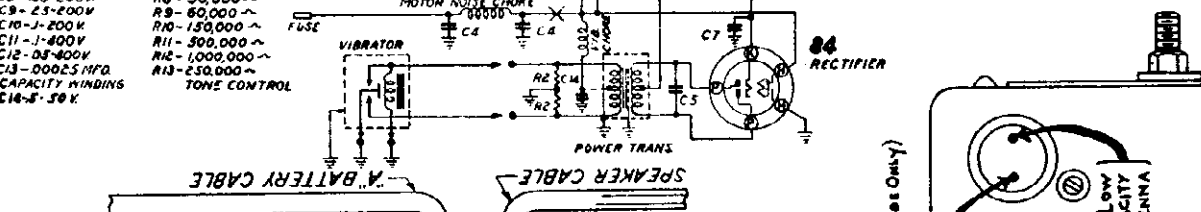
SHORT WAVE BAND - Set Receiver and Generator to 6000 KC. Range switch in SW position. Adjust SW antenna trimmer for maximum peak. No padding adjustment is required on this band.

ALLIED RADIO CORP.

MODELS A9782, A9783
Chassis B7
Schematic, Socket
Trimmers, Alignment



- | | |
|-------------------|-------------------|
| CONDENSERS | RESISTORS |
| C1 - 00005 MICA | R1 - 35 Ω |
| C2 - 0001 MICA | R2 - 50 Ω |
| C3 - 00025 MICA | R3 - 350 Ω |
| C4 - 002 MICA | R4 - 1000 Ω |
| C5 - 0075-500V | R5 - 8100 Ω |
| C6 - 01-500V | R6 - 15,000 Ω |
| C7 - 01-500V | R7 - 20,000 Ω |
| C8 - 05-200V | R8 - 50,000 Ω |
| C9 - 25-200V | R9 - 60,000 Ω |
| C10 - 200V | R10 - 150,000 Ω |
| C11 - 1-400V | R11 - 500,000 Ω |
| C12 - 05-500V | R12 - 1,000,000 Ω |
| C13 - 00025 MFD | R13 - 250,000 Ω |
- CAPACITY WINDINGS
C14 - 50 K



ALIGNMENT

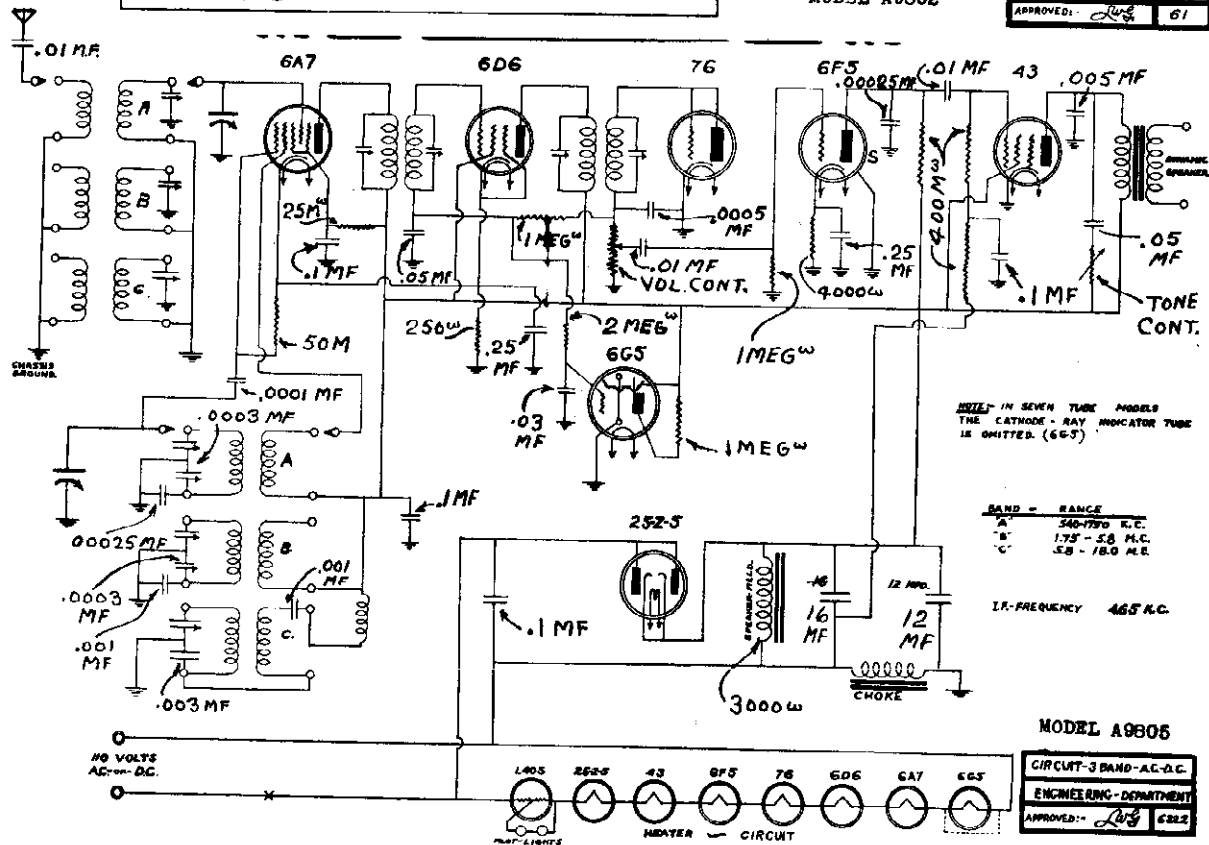
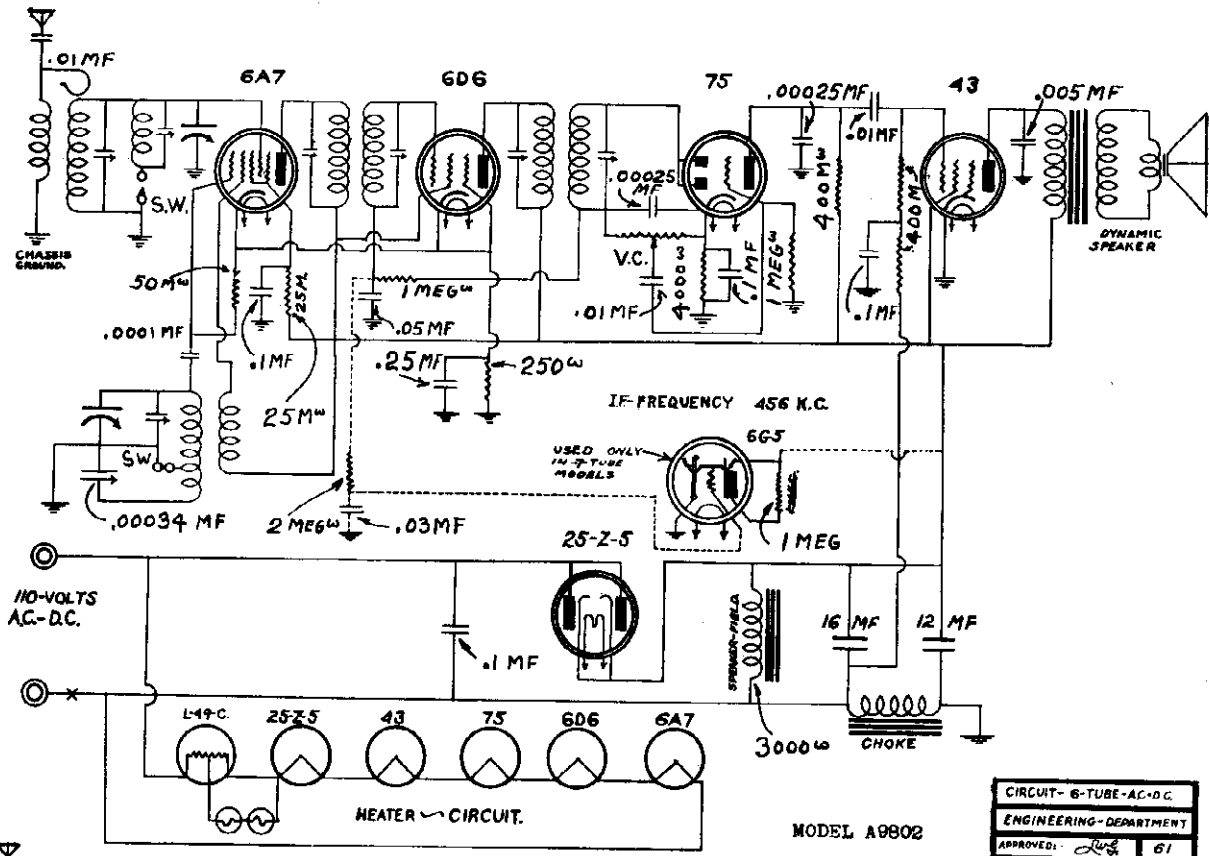
I.F. ALIGNMENT. Adjust the test oscillator to 175 K.C. and connect the output directly to the grid of the first detector tube (6A7), without the use of any series condenser or resistor; the omission of series condenser and resistor to block out the AVC action. The ground on the test oscillator can be connected to the chassis ground. Align the trimmers of the first and second I.F. transformers to peak or maximum reading on the output meter.

OSCILLATOR ALIGNMENT. Adjust the test oscillator to 1400 K.C. and connect the output to the antenna through a .0001 mfd. mica condenser to give the equivalent of a low capacity type average auto antenna. Set the dial pointer to 1400 K.C. and adjust the oscillator trimmer to peak. (Front section of gang condenser.)

R.F. ALIGNMENT. The next step is to adjust the center and rear trimmers of the gang condenser to peak. The center section of the gang condenser tunes the antenna amplifier stage (6D6 tube), and the rear condenser section tunes the detector grid coil of the 6A7 tube.

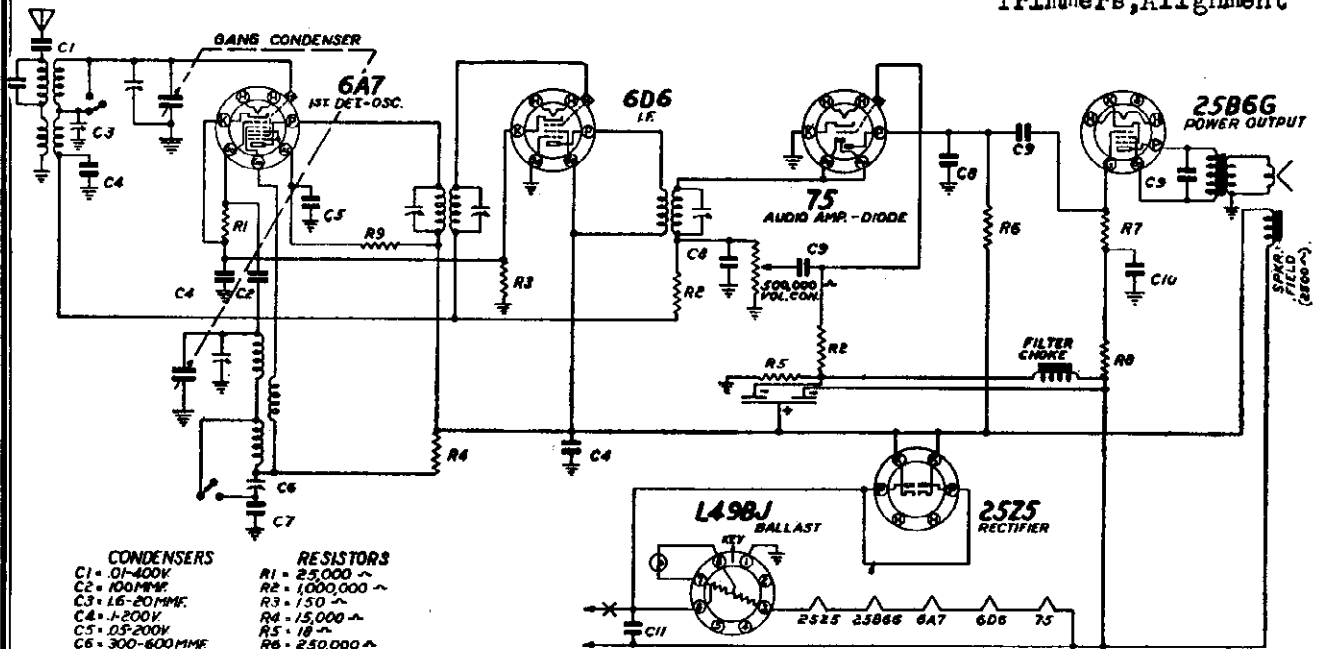
MODEL A9802
MODEL A9806
Schematics

ALLIED RADIO CORP.



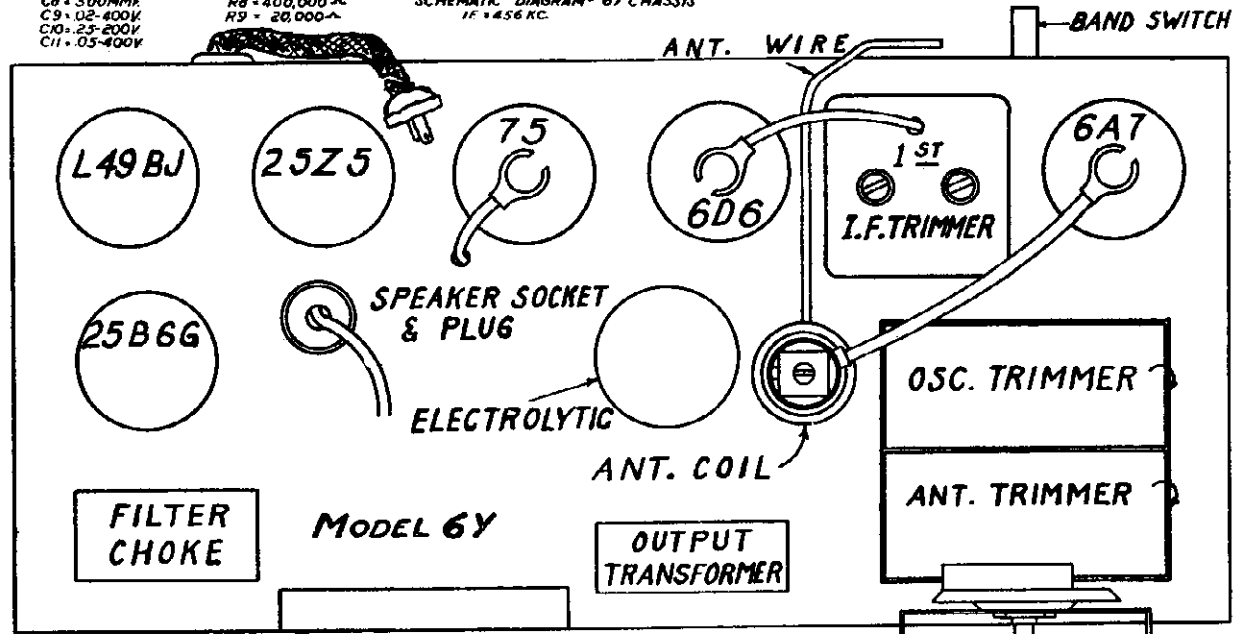
ALLIED RADIO CORP.

MODELS A10502, A10503
 Chassis 6Y
 Schematic, Socket
 Trimmers, Alignment



- | CONDENSERS | RESISTORS |
|-----------------|-------------------------|
| C1 - 01-400K | R1 - 25,000 Ω |
| C2 - 100MMF | R2 - 1,000,000 Ω |
| C3 - 16-20MMF | R3 - 150 Ω |
| C4 - J-200V | R4 - 15,000 Ω |
| C5 - .05-200V | R5 - 18 Ω |
| C6 - 300-400MMF | R6 - 250,000 Ω |
| C7 - 1500MMF | R7 - 100,000 Ω |
| C8 - 500MMF | R8 - 400,000 Ω |
| C9 - 02-400V | R9 - 20,000 Ω |
| C10 - 25-200V | |
| C11 - .05-400V | |

SCHEMATIC DIAGRAM - 6Y CHASSIS
 IF 1456 KC.



2ND I.F. TRIMMERS BROADCAST PADDING CONDENSER ON & OFF SWITCH & VOLUME CONTROL (UPPER) TUNING KNOB (LOWER)

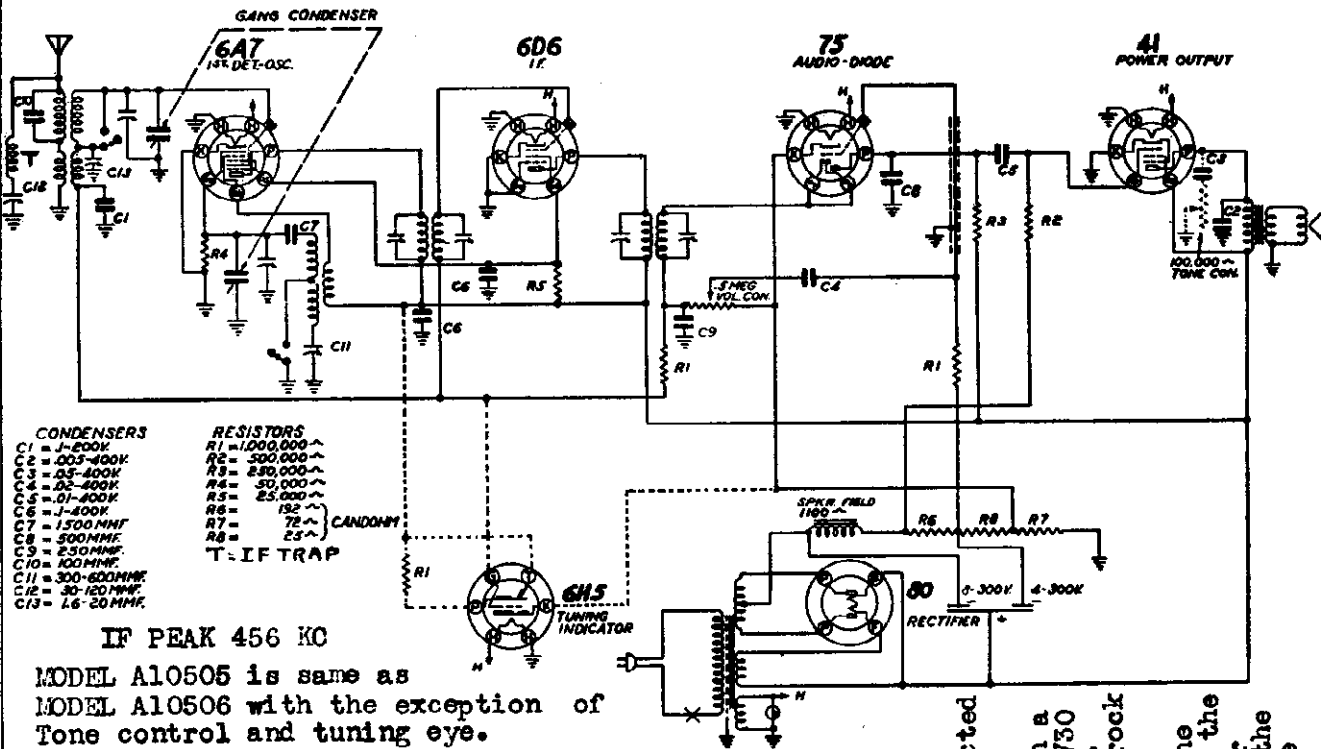
IF ALIGNMENT - Wave switch on B.C. position. Generator connected to grid of 6A7 through a .05 IFD condenser. Align four trimmers.

BROADCAST - Connect generator to antenna lead through a 100 MFD condenser. Gang condenser at minimum. Generator set at 1730 KC and adjust oscillator trimmer to peak. Set generator at 1400 KC, adjust Antenna trimmer to peak. Generator and receiver set at 600 KC, rock gang condenser while padding oscillator to maximum peak.

SHORT WAVE - Generator set to 6000 KC, while rotating gang condenser from the high frequency end of dial until the generator signal is heard, adjust the S.W. antenna trimmer for maximum peak. Be sure to align this trimmer on the first signal heard while rotating gang condenser from high frequency end. Repeat adjustments for maximum performance of the receiver.

MODEL A10505, Chassis 5X
 MODEL A10506, Chassis 6W
 Schematic, Socket
 Trimmers, Alignment

ALLIED RADIO CORP.

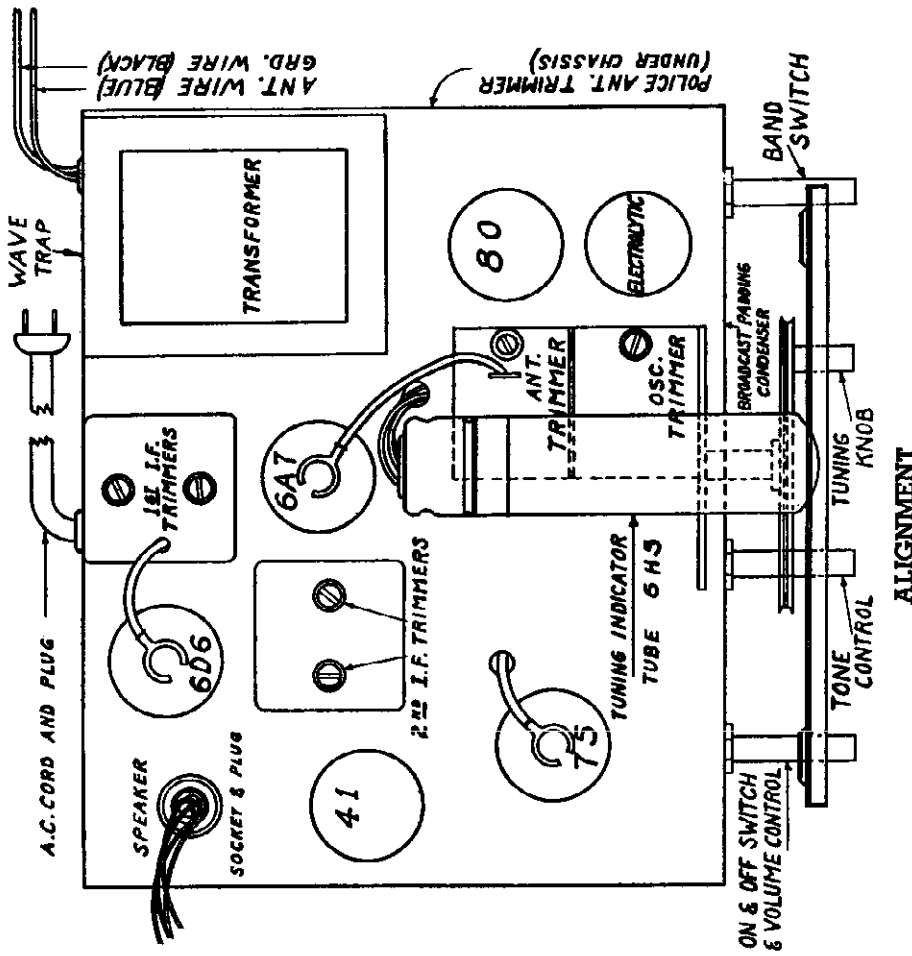


- CONDENSERS**
 C1 = J-200K
 C2 = 003-400K
 C3 = 003-400K
 C4 = 003-400K
 C5 = 01-400K
 C6 = J-400K
 C7 = 1500MHF
 C8 = 500MHF
 C9 = 250MHF
 C10 = 100MHF
 C11 = 300-600MHF
 C12 = 30-120MHF
 C13 = 16-20MHF

- RESISTORS**
 R1 = 1000,000
 R2 = 500,000
 R3 = 200,000
 R4 = 50,000
 R5 = 25,000
 R6 = 152
 R7 = 72
 R8 = 25
 CANDOMY
 T: IF TRAP

IF PEAK 456 KC

MODEL A10505 is same as
 MODEL A10506 with the exception of
 Tone control and tuning eye.



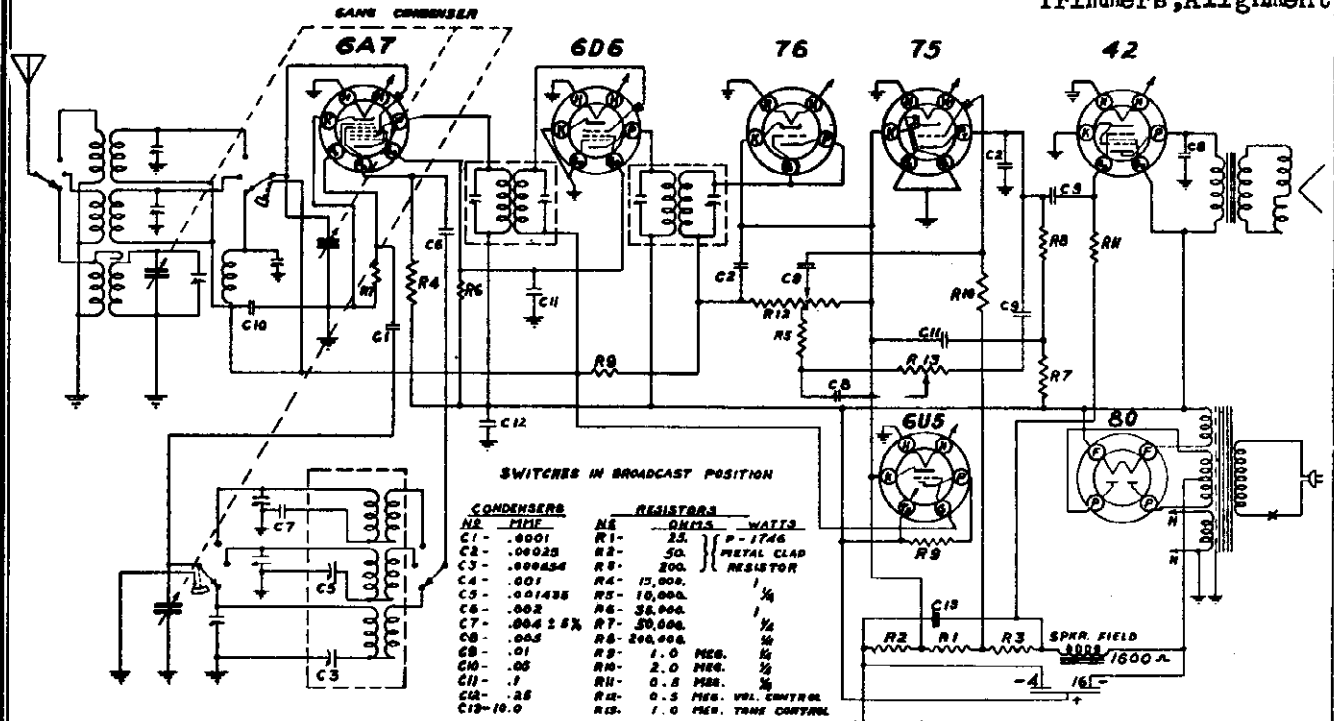
IF ALIGNMENT - Wave switch on B.C. position. Generator connected to grid of 6A7 through a .05 MFD Cond. Align four trimmers.

BROADCAST - Connect generator to the Ant. lead (blue) through a 200 MFD cond. Gang condenser at minimum, generator set at 1730 KC. adj. OSC. trimmer to peak. Set generator to 1400 KC, adj. ANT. trimmer to peak. Generator and receiver set to 600 KC, rock gang condenser while padding oscillator to maximum peak.

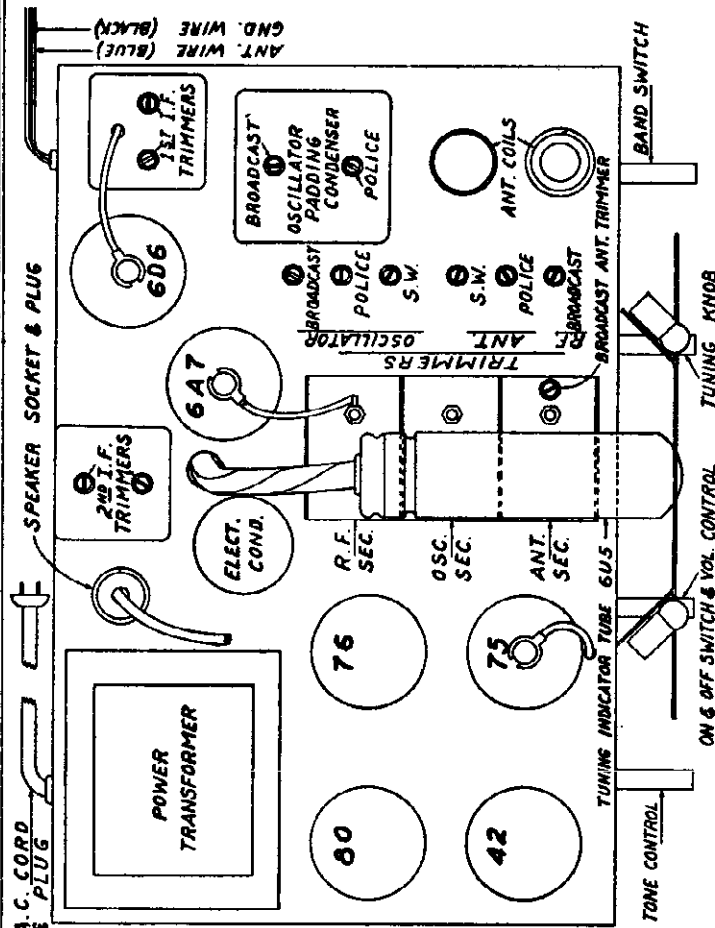
SHORT WAVE - Generator adjusted to 6000 KC, while rotating the gang condenser from the high frequency end of the dial until the generator signal is heard, adjust the S.W. ANT. trimmer (under the chassis) for maximum peak. Be sure to align this trimmer (under the first signal heard while rotating the gang condenser from the high frequency end of the dial. REPEAT ADJUSTMENTS.

ALLIED RADIO CORP.

MODEL A10507
Chassis 7M
Schematic, Socket
Trimmers, Alignment



IF PEAK 456 KC



ALIGNMENT DATA

IF ALIGNMENT - Wave Switch on BC position. Generator connected to grid of 6A7 through .05 MFD Cond. Align 4 Trimmers to Peak.

BROADCAST - Connect Generator to Ant. lead (BLUE) through 100 MFD condenser. Variable condenser to minimum, Generator at 1730 KC, adj. Osc. Trimmer to PEAK. Set Generator to 1400 KC, adj. ANT. Trimmer to PEAK. Generator and Receiver set to 600 KC, rock variable cond., PAD Osc. to maximum PEAK.

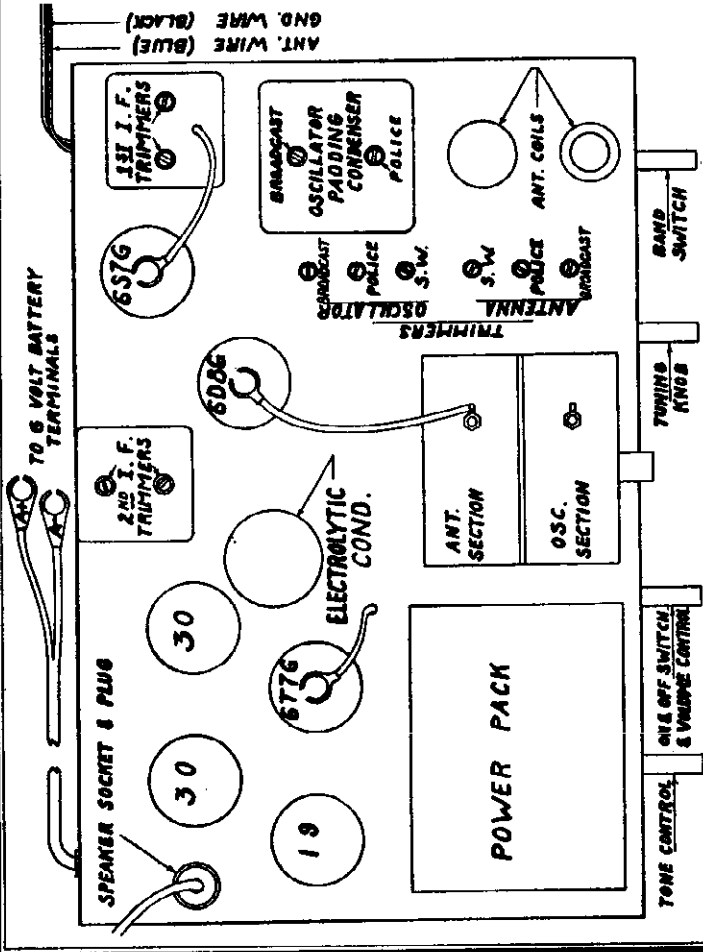
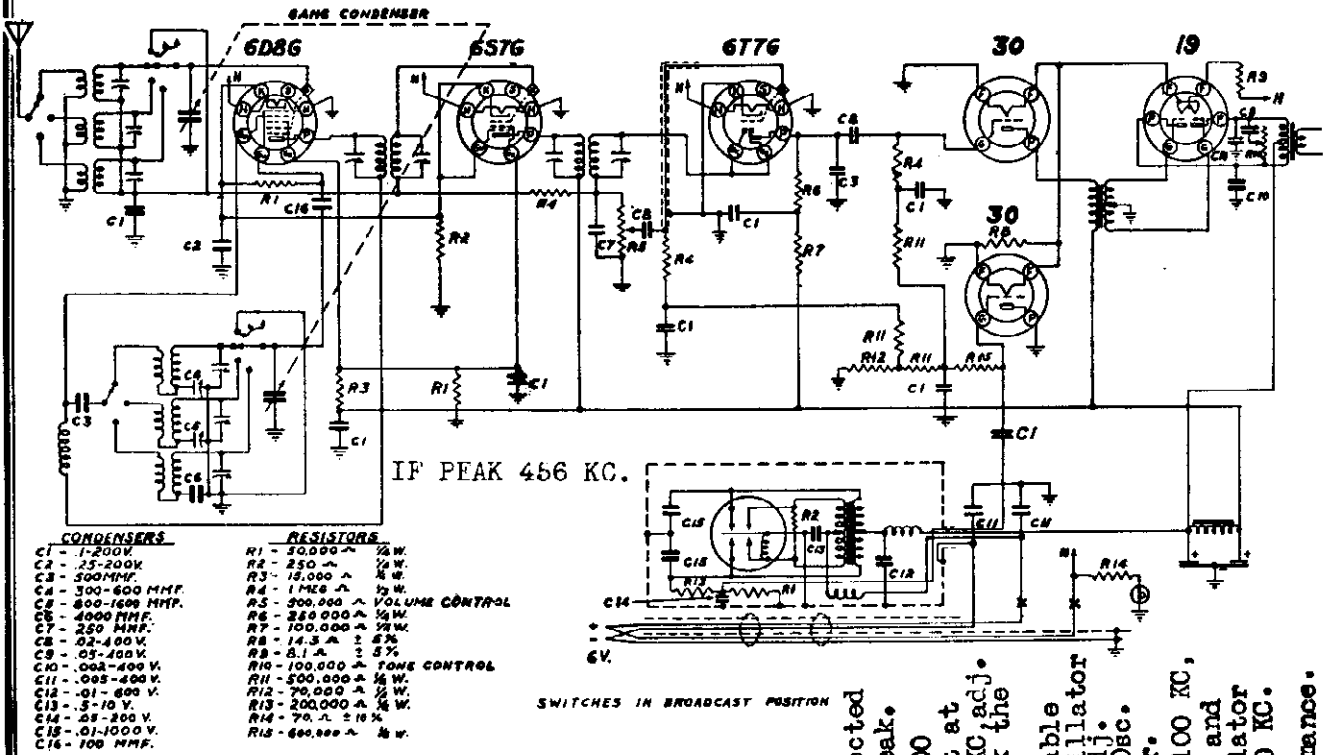
POLICE - Replace 200 MFD Cond. with 400 ohm resistor, Variable Condenser at minimum, Generator at 5600 KC, adj. Police Osc. Trimmer to receive signal, then set Generator at 4000 KC, Adj. Police Trimmer to PEAK. Set Generator at 1800 KC, PAD Osc. with Police Padding Trimmer to peak. Rock Variable condenser.

SHORT WAVES - Variable condenser at minimum, Generator at 18100 KC, Adj. Osc. Short wave Trimmer to PEAK. Generator to 16000 KC and adjust S.W. Ant. Trimmer to PEAK. No padding of Oscillator is provided in this range. Sensitivity should be checked at 6000 KC.

All adjustments should be repeated for maximum performance.

MODEL A10508
Chassis 6P
Schematic, Socket
Trimmers, Alignment

ALLIED RADIO CORP.



ALIGNMENT DATA

IF ALIGNMENT - Wave switch on B.C. position. Generator connected to grid of 6D8G through .05 MFD Cond. Align 4 trimmers to peak.

BROADCAST - Connect Generator to Ant. lead (BLUE) through 200 MMFD condenser. Variable condenser to minimum, Generator set at 1730 KC, adj. Osc. trimmer to PEAK. Set Generator to 1400 KC, adj. ANT. trimmer to PEAK. Generator and receiver to 600 KC, rock the variable cond., PAD Oscillator to maximum PEAK.

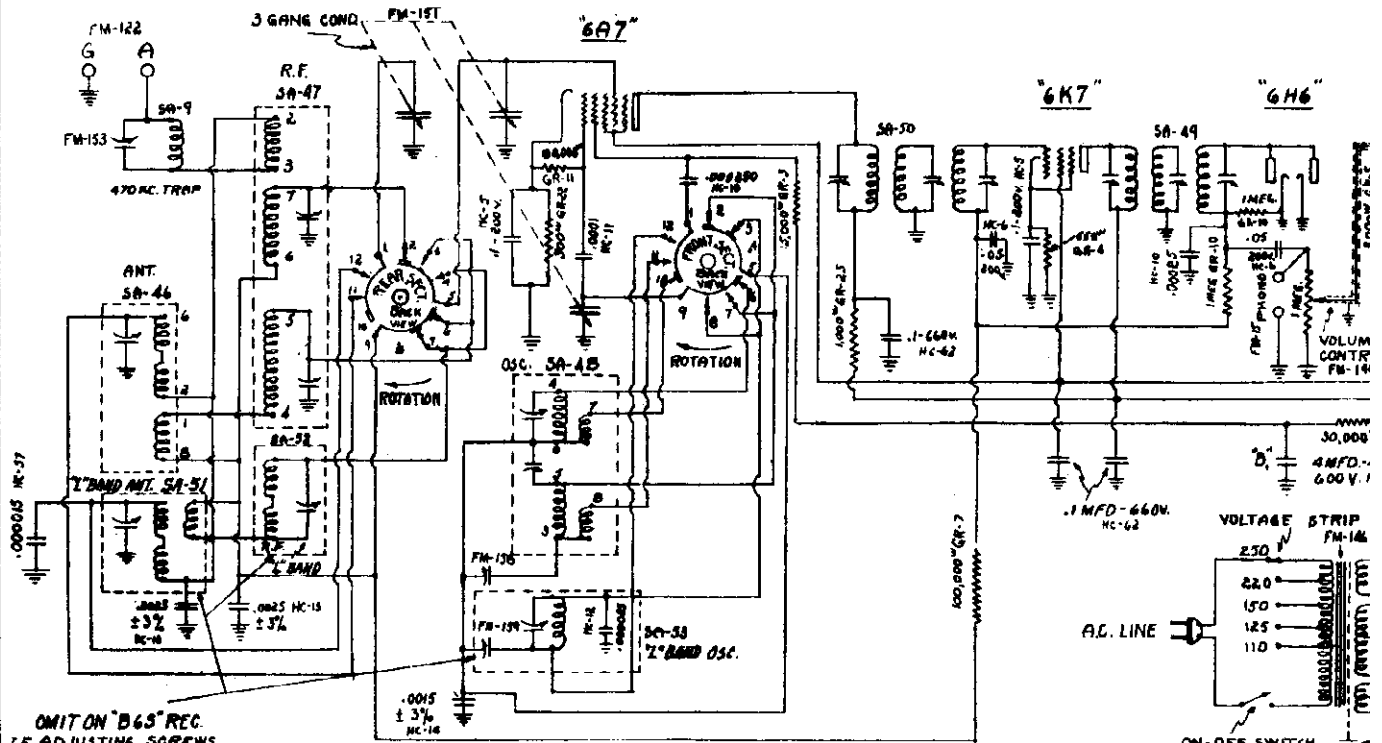
POLICE - Replace 200 MMFD cond. with 400 ohm resistor, variable condenser at minimum, Generator at 5600 KC adj. Police Oscillator trimmer to receive signal. Then set Generator at 4000 KC, adj. Police Ant. trimmer to peak. Set Generator at 1800 KC, pad Osc. with Police Padding trimmer to peak. Rock variable condenser.

SHORT WAVE - Variable condenser at minimum, Generator at 18100 KC, adj. Osc. Short Wave Trimmer to peak. Generator to 16000 KC and adjust ANT. Short Wave trimmer to peak. No padding of Oscillator is provided in this range. Sensitivity to be checked at 6000 KC.

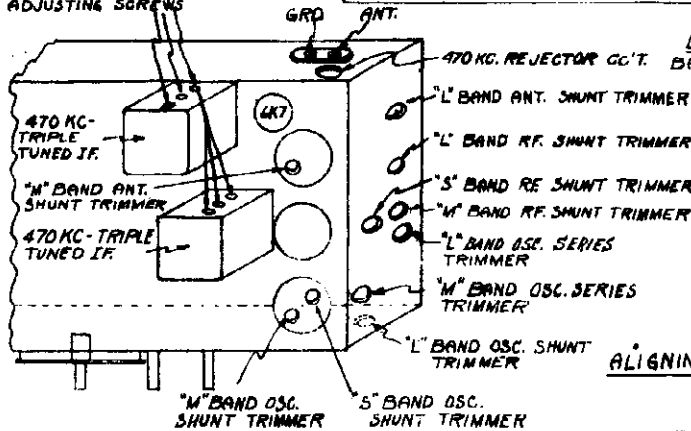
All adjustments should be repeated to obtain maximum performance.

MODEL 55 Amplifier
Schematic

ANDREA F



OMIT ON 'B' REC.
IF ADJUSTING SCREWS



BAND SELECTOR SWITCH SHOWN IN SHORT WAVE POSITION
BAND SELECTOR SWITCH DRAWN EXACTLY MECHANICALLY AND ELECTRICAL AS VIEWED FROM BOTTOM OF CHASSIS

ALIGNING FREQ.	
IF. SYSTEM - 470 KC.	
BAND "L"	335 ± 150 KC.
BAND "M"	1400 ± 600 KC.
BAND "S"	17000 KC.

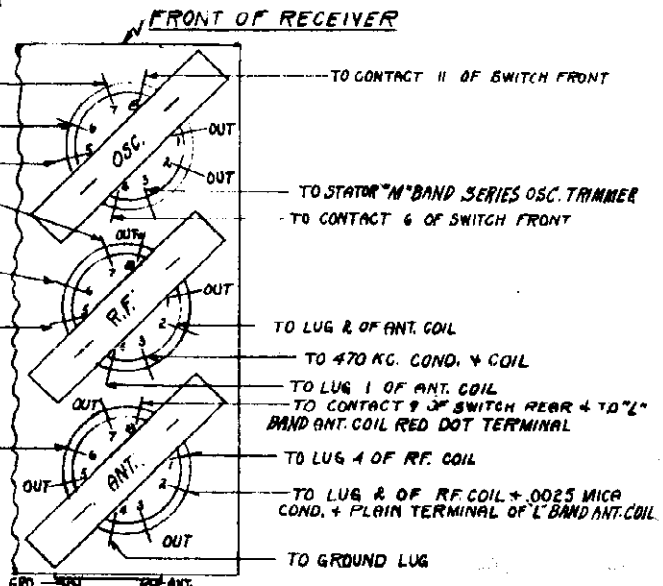
NOTE:
"A" + "A" IN SAME CAN HC-2
"B" + "B" IN SAME CAN HC-39
"C" + "C" IN SAME CAN HC-58

ALIGNING CONDENSER LOCATIONS

MODELS
1B6 and 2B6
RECEIVERS

- TO CONTACT 10 OF SWITCH FRONT
- TO CONTACT 5 OF SWITCH FRONT + .0015 MICA COND.
- TO CONTACT 7 OF SWITCH FRONT
- TO CONTACT 2 OF SWITCH REAR
- TO "L" BAND ANT. COIL RED DOT
- TO CONTACT 6 OF SWITCH REAR
- TO CONTACT 11 OF SWITCH REAR

POSITION OF COILS
IN THE RECEIVER

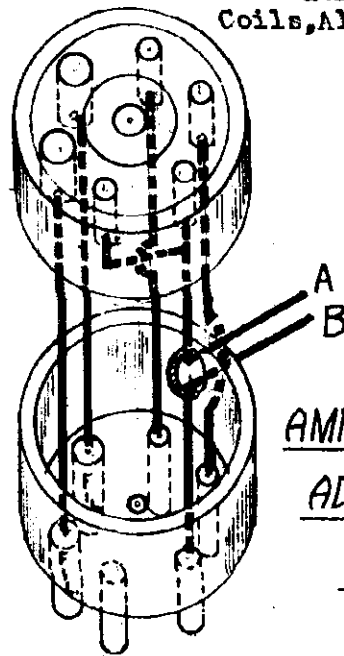
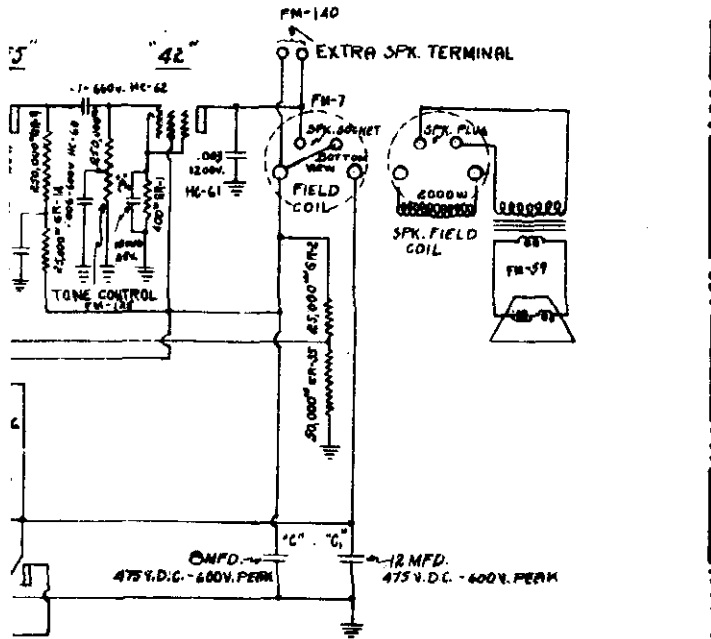


WIRING DIAGRAM

1B6 + 2B6 REC	12-24-35
J.R.	

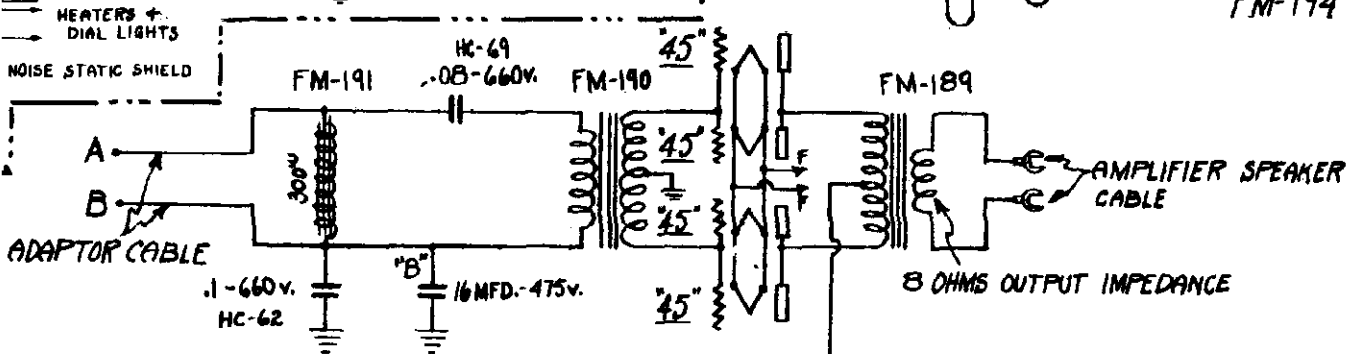
DIO CORP.

MODELS 1B6,3B6
Chassis B6L
MODELS 2B6,4B6
Chassis B6S
Schematic, Trimmers
Coils, Alignment



AMPLIFIER
ADAPTOR
SOCKET

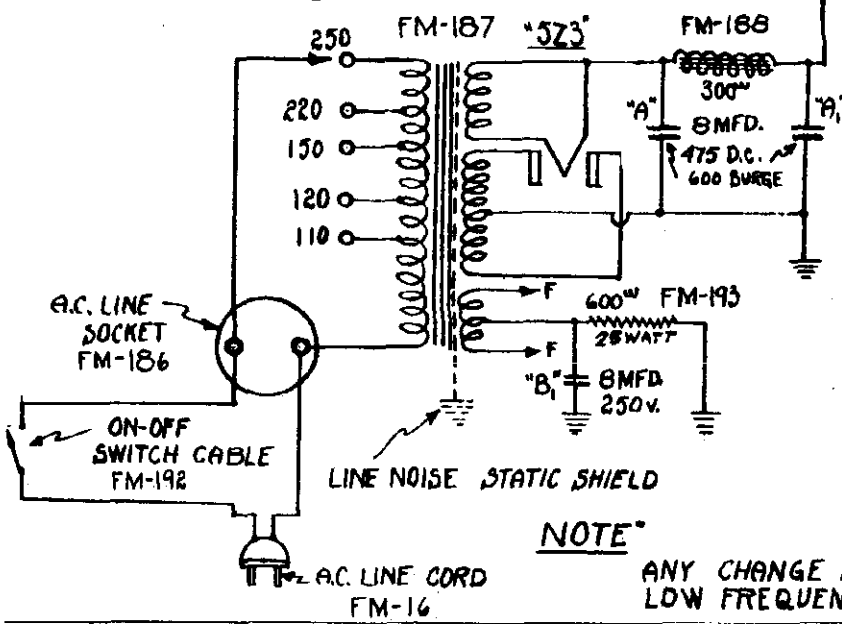
FM-194



AMPLIFIER GROUND TERMINAL
FM-193

NOTE:-

"A" + "A" IN SAME CAN HC-71
"B" + "B" IN SAME CAN HC-70



NOTE

ANY CHANGE IN VALUE OF HC-69 WILL SHIFT
LOW FREQUENCY RESPONSE OF AMPLIFIER

MODEL 55-POWER AMPLIFIER	
<i>HQ/H</i>	4-29-36
	J.R.

MODELS 1D7, 3D7, 5D7, 7D7
Chassis D7L
MODELS 2D7, 4D7, 6D7, 8D7
Chassis D7S
Alignment, Notes

ANDREA RADIO CORP.

otherwise proceed with step 3 and 4.

Set the signal generator to 17,000 K.C. and the receiver dial pointer to 17 M.C. (17,000 K.C.). Adjust oscillator shunt trimmer slowly between maximum and minimum. A signal will be heard at two settings of this trimmer; one near the minimum capacity (plates open) of the trimmer, the other nearer to maximum capacity (plates closed). The trimmer should be left adjusted to the signal heard near its minimum (open plates). The adjustment nearer maximum is the image frequency setting, as can be determined from previous explanation on page 8-5.

3. Align R.F. shunt trimmer for maximum output deflection. During this adjustment, be certain to rotate the station selector knob back and forth slowly for each small R.F. shunt trimmer change. During this adjustment, be certain to rotate the station selector knob back and forth slowly for each small antenna shunt trimmer change until maximum output is obtained. Retrim R.F. shunt trimmer for small change. Check to see that alignment has not been made on the image. (See notes).

Set test generator to 6000 K.C., retune receiver until signal is heard. Adjust oscillator series trimmer slowly while rotating the gang condenser around the signal for each small adjustment of the series trimmer until further adjustment of the series trimmer decreases the output signal.

Never touch the ANT., R.F. and OSC. shunt trimmer during this adjustment. Reset test generator to 17,000 K.C.; tune receiver until correct signal is heard. Retune antenna and R.F. shunt trimmer for final critical setting. During this final adjustment, never touch the oscillator shunt trimmers. Individual coils can be checked very simply as follows:

Apply the test generator signal through a .1 mfd. coil to the 6AG3 grid, and carry out the procedure outlined above. This will tell you if the oscillator shunt trimmer only is correctly adjusted or the right signal setting has been used on the test generator. In this case, ONLY, the image and fundamental will have the sure intensity.

When you are sure the oscillator circuit is correct, place the signal on the grid of the 6K7S R.F. tube, and repeat the procedure on the R.F. coil. In this case when correctly aligned, the image will be lower in volume than the fundamental.

Replace the .1 mfd. condenser in the test generator lead with a 400 ohm resistor and repeat procedure on antenna.

This method now assures you of correct individual alignment on each coil. Then proceed to touch up each coil except the oscillator as outlined.

LONG WAVE BAND "L" ALIGNMENT (This band is included in the D7L chassis only)

1. Set signal generator for 175 K.C. and connect generator high potential lead in series with .1 mfd. condenser to grid of 6AG3 tube.
2. Set receiver dial to 175 K.C. (1714 meters).
3. Adjust L.W. series oscillator trimmer until the loudest signal is heard. This point is required because of the wide frequency range the L.W. series oscillator trimmer has on the oscillator frequency. Due to this wide change in frequency it is possible that several different adjustment points in the L.W. series oscillator trimmer will produce output signals, but only one of these is correct (the loudest).
4. Set the generator and receiver dial to 400 K.C. (750 meters) and adjust L.W. oscillator shunt trimmer until the signal is heard.
5. After readjusting the L.W. oscillator shunt trimmer it is very important that the generator and dial be set for 175 K.C. (1714 meters) and the L.W. series oscillator trimmer readjusted as given in paragraph 3. Set the generator and receiver dials back to 400 K.C. (750 meters) with the oscillator shunt trimmer until the signal is heard.
6. Remove generator and connect to antenna of receiver. .00025 mfd. condenser and connect to 400 K.C. (750 meters).
7. Set generator and receiver dial to 400 K.C. (750 meters).
8. Adjust antenna and R.F. shunt trimmer for maximum output deflection.
9. Change generator and dial to 175 K.C. (1714 meters). Adjust L.W. series oscillator trimmer for maximum deflection. (Be certain to rotate gang condenser for each adjustment of the series trimmer).
10. Repeat adjustments set forth in paragraph 8 or receiver will not be aligned correctly because of effect given in paragraph 3.
11. After carrying out 10 be sure to repeat 8.
12. Both 8 and 9 must be repeated until it is noticed that the trimmers no longer improve alignment. The receiver is then correctly aligned.

When aligning the "S" band at 17,000 K.C., any adjustment of the antenna shunt and R.F. shunt trimmer will affect the oscillator tuning. This must be compensated for during the alignment, but rotating the gang condenser slowly back and forth about the signal for each shunt trimmer adjustment, until maximum deflection on the output meter is obtained. If the gang condenser is not rotated, false alignment and poor receiver sensitivity will result.

When receiver is incorporated in a 1.0 volt bias cell in the grid circuit of the 75 tube (see circuit diagram), THIS CELL MUST NEVER BE SHORTED OR TESTED BY MEANS OF A LOW RESISTANCE 2000 OHM PER VOLT VOLTMETER. THE ONLY ACCURATE WAY TO MEASURE ITS POTENTIAL IS BY MEANS OF A VACUUM TUBE VOLTMETER. These cells can be expected to render at least three years service without replacement. If further data is required, write the manufacturer.

FUNDAMENTAL & IMAGE FREQUENCY NOTES

A simple method of checking to determine if the receiver and generator are tuned for correct alignment is as follows:

Set the signal generator to 17,000 K.C. Tune the receiver from 15,000 K.C. to 18,000 K.C. Two signals should be heard 940 K.C. apart on the receiver, namely, one lower in frequency than 17,000 K.C., the other higher. The correct point for alignment is the higher frequency on the receiver dial. The lower is the image. As a check, the receiver should be left tuned to the higher frequency. Increase the generator frequency which was set for 17,000 K.C. slowly to approximately 18,000 K.C. A signal should be heard near 18,000 K.C. If the first setting was correct for alignment, no signal would indicate that the original setting was on the image frequency. If this occurs, make certain that you start from the beginning to be sure of your results, make after the correct setting has been found, and the alignment has been carried out, it will be noted that the image or lower frequency responses on the receiver dial will always sound weaker than the true signal if the tuned circuits have been correctly adjusted.

470 K.C. I.F. ADJUSTMENT

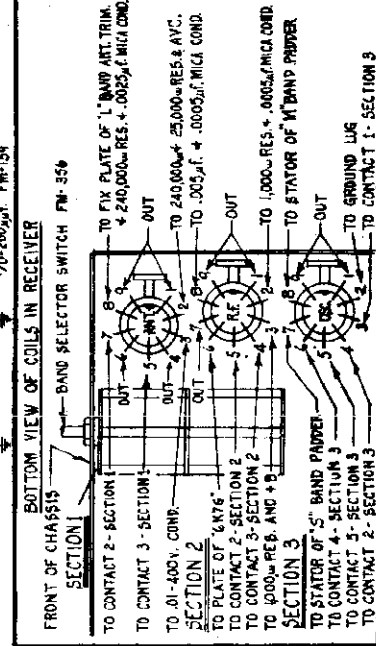
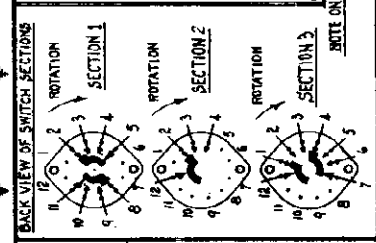
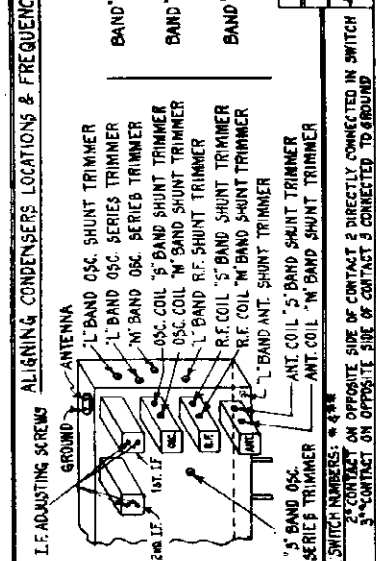
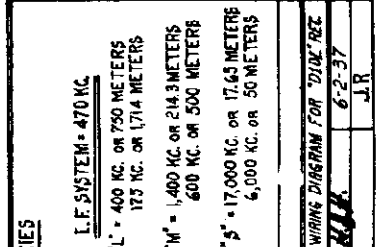
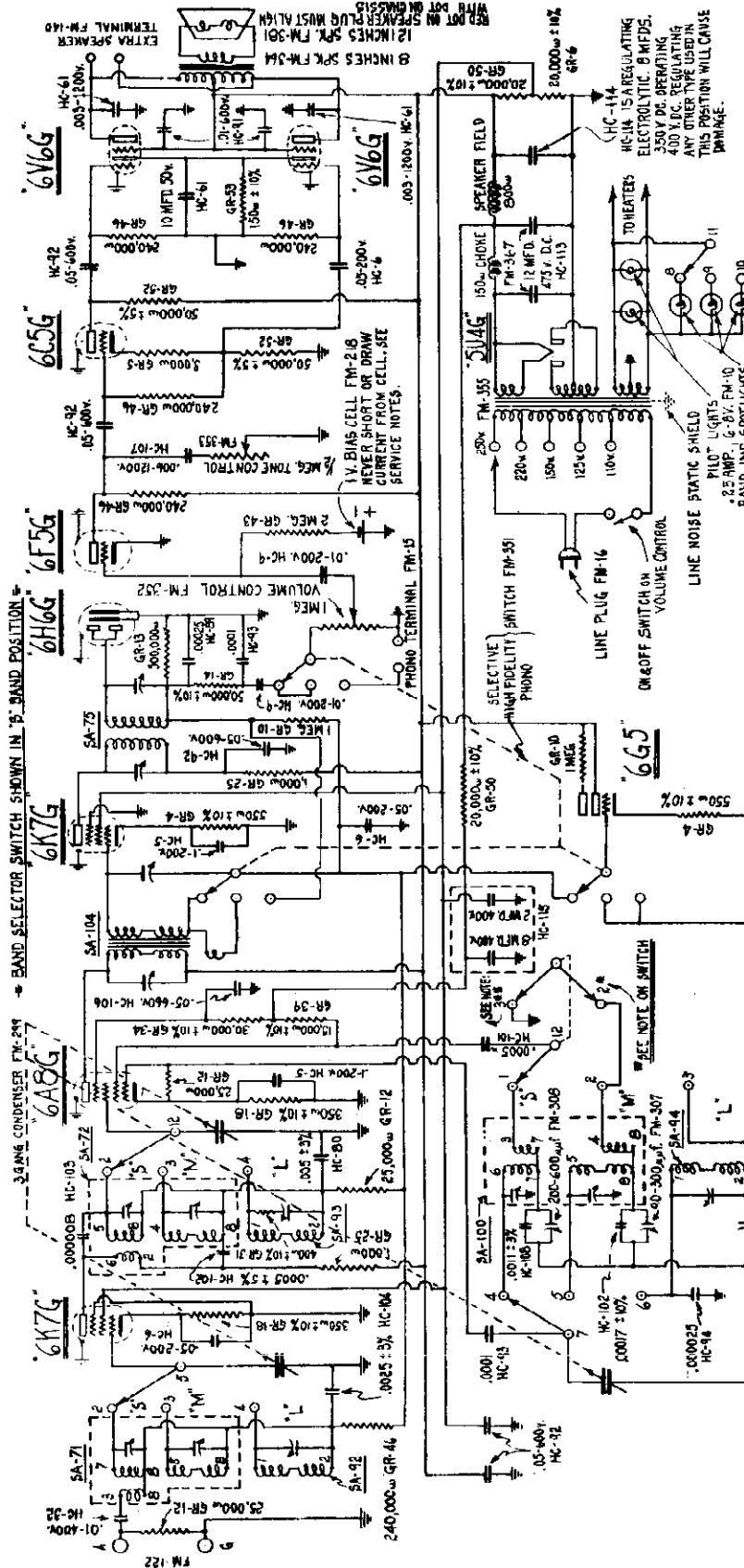
1. Connect high potential output lead from test generator in series with a .1 mfd. condenser to the grid of the 6AG3 with selector switch in "M" band position and dial at 1000 K.C. NEVER REMOVE CONTROL GRID CAP FROM TUBE.
2. Connect output voltmeter (copper oxide rectifier type) across voice coil of speaker.
3. Set generator to supply a modulated 470 K.C. signal. Adjust generator output attenuator until a small output reading is obtained on the output voltmeter.
4. Adjust both trimmers on top of the first and second I.F. transformers for maximum output.
5. Retrim slightly the first I.F. trimmer.

MEDIUM BAND "M" ALIGNMENT

1. Set test generator for 1400 K.C. Connect high potential lead of test generator in series with a .1 mfd. condenser to grid of 6AG3 tube. Tune receiver to 1400 K.C. (214.3 meters) on the tuning scale. If signal is not heard, leave scale pointer set to 1400 K.C. (214.3 meters), and adjust oscillator coil shunt trimmer slowly and carefully until signal is heard. The oscillator coil of the receiver and dial are now set correctly, assuming the test generator calibration is correct.
2. Remove test generator hot lead from 6AG3 grid. Replace .1 mfd. condenser with 250 mfd. (.00025 mfd.) and connect to antenna terminal of receiver "A", all other settings to remain the same.
3. Adjust "R.F." coil shunt trimmer and then "ANT" coil shunt trimmer for maximum output deflection.
4. Retune test generator to 600 K.C. (500 meters) and tune receiver to 600 K.C. (500 meters) until signal is heard.
5. Adjust oscillator coil series trimmer slowly while rotating the gang condenser slowly about the signal for each small adjustment of the series trimmer, until further adjustment of the series trimmer does not increase the output signal. During this adjustment, never touch the ANT., R.F. or OSC. shunt trimmers.
6. Reset test generator and receiver to 1400 K.C. Tune in signal on receiver. Adjust ANT. and R.F. shunt trimmers slightly for maximum output; never the OSC. shunt trimmer.

SHORT WAVE "S" BAND ALIGNMENT

1. Turn wave band selector switch to extreme right "S" band. Replace 250 mfd. (.00025 mfd.) condenser with 400 ohm resistor.
2. The following adjustment is necessary if the dial calibration is badly off;

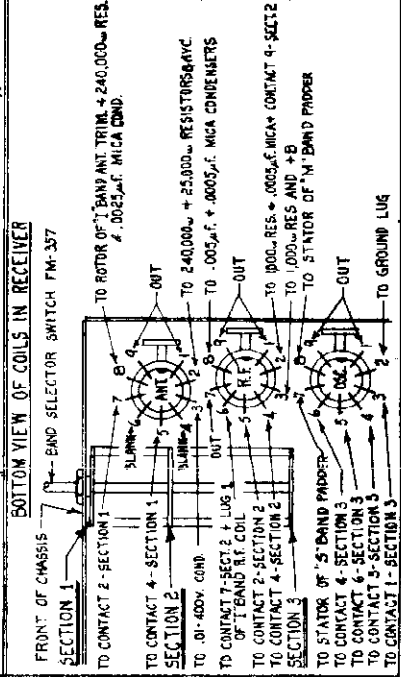
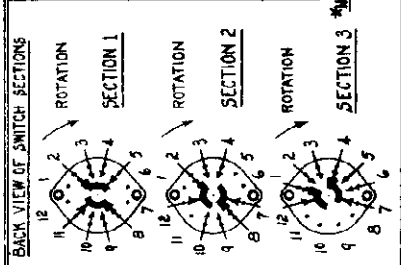
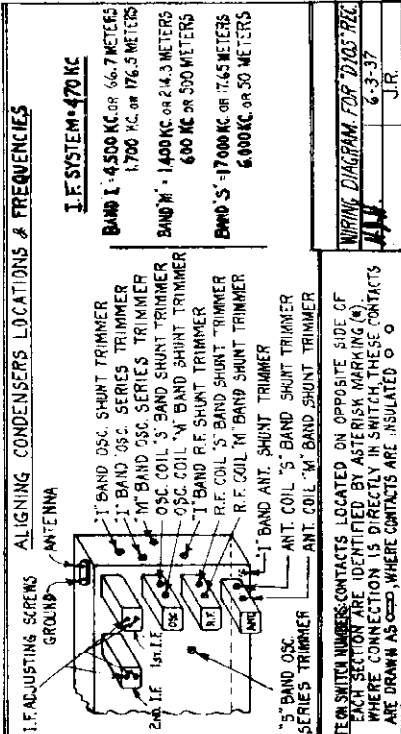
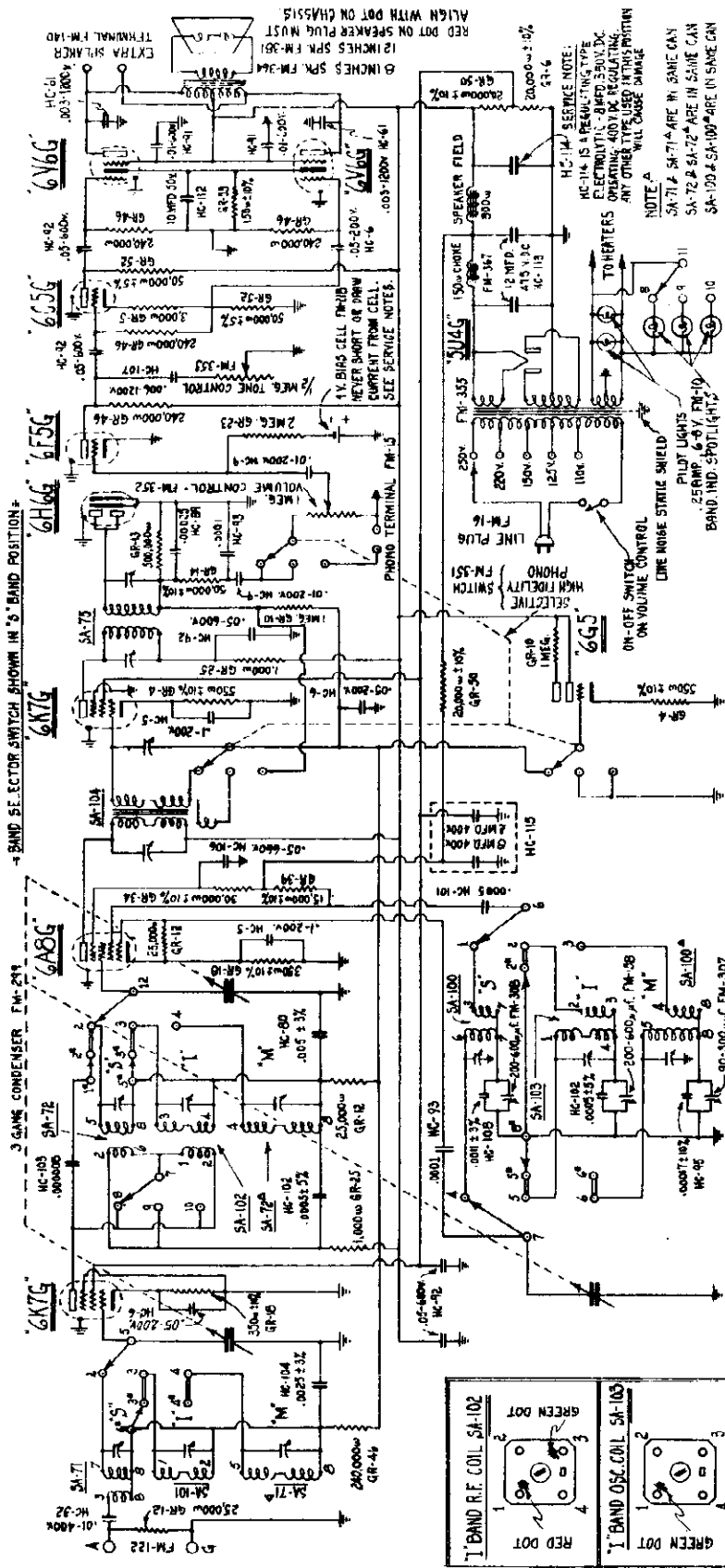


MODELS 2D10, 4D10, 6D10, 8D10, 10D10

Chassis D10S

ANDREA RADIO CORP.

Schematic, Trimmers, Coils, Data



WIRING DIAGRAM FOR D10S REC
6-3-37
J.R.

WRITE OR SWITCH NUMBERS LOCATED ON OPPOSITE SIDE OF EACH SECTION ARE IDENTIFIED BY ASTERISK MARKING (*). WHERE CONNECTION IS DIRECTLY IN SWITCH, THESE CONTACTS ARE DRAWN AS WHERE CONTACTS ARE INSULATED

**MODELS 1D10, 3D10, 5D10,
7D10, 9D10
Chassis D10L**

ANDREA RADIO CORP.

**MODELS 2D10, 4D10, 6D10
8D10, 10D10
Chassis D10S
Alignment**

Just oscillator series trimmer slowly while rotating the gang condenser around the signal for each small adjustment of the series trimmer until no further adjustment of the series trimmer increases the output signal.
NEVER TOUCH THE ANT., R.F. AND OSC. SHUNT TRIMMER DURING THIS ADJUSTMENT.
Reset test generator to 17,000 K.C.; tune receiver until correct signal is heard. Remove antenna and R.F. shunt trimmer for final critical setting. During this final adjustment, never touch the oscillator shunt trimmers.

THE "S" BAND IS NOW ALIGNED.

Should the operator be inexperienced on "S" band alignment, the individual coils can be checked very simply as follows:
Apply the test generator signal through a .1 mfd. coil to the 6AG5 grid, and carry out the procedure outlined above. This will tell you if the oscillator shunt trimmer only is correctly adjusted or the right signal setting has been used on the test generator. In this case, ONLY, the image and fundamental will have the same intensity.
When you are sure the oscillator circuit is correct, place the signal on the grid of the 6AV6 R.F. tube, and repeat the procedure on the R.F. coil. In this case when correctly aligned, the image will be lower in volume than the fundamental.
Replace the .1 mfd. condenser in the test generator lead with a 400 ohm resistor and connect to antenna terminal "A", and repeat procedure on antenna. This method now assures you of correct individual alignment on each coil.
Then proceed to touch up each coil except the oscillator as outlined in 3 and 4.

LONG WAVE BAND "L" ALIGNMENT

- THIS BAND IS INCLUDED IN THE D10L CHASSIS ONLY.**
TURN THE WAVE BAND SELECTOR SWITCH TO THE "L" POSITION.
1. Set signal generator for 175 K.C. and connect generator high potential lead in series with .1 mfd. condenser to grid of 6AG5 tube.
2. Set receiver dial to 175 K.C. (1714 meters).
3. Adjust L.W. series oscillator trimmer until the loudest signal is heard. This point is required because of the wide frequency range the L.W. series oscillator trimmer has on the oscillator frequency. Due to this wide change in frequency it is possible that several different adjustment points in the L.W. oscillator series trimmer will produce output signals, but only one of these is correct (the loudest).
4. Set the generator and receiver dial to 400 K.C. (750 meters) and adjust L.W. oscillator shunt trimmer until the signal is heard.
5. After readjusting the L.W. oscillator shunt trimmer it is very important that the generator and the set dial be set for 175 K.C. (1714 meters) and the L.W. series oscillator shunt trimmer set to 400 K.C. (750 meters) as in paragraph 3. Set the generator dial to 400 K.C. (750 meters) and adjust L.W. oscillator shunt trimmer until the signal is heard.
6. Remove generator lead from grid of 6AG5. Replace .1 mfd. condenser with .00025 mfd. condenser and connect to antenna of receiver.
7. Set generator and receiver dial to 400 K.C. (750 meters).
8. Adjust antenna and R.F. shunt trimmer for maximum output deflection.
9. Change generator and dial to 175 K.C. (1714 meters). Adjust L.W. series oscillator trimmer for maximum deflection. (BE CERTAIN TO ROTATE GANG CONDENSER FOR EACH ADJUSTMENT OF THE SERIES TRIMMER).
10. Repeat adjustments set forth in paragraph 8 or receiver will not be aligned correctly because of effect given in paragraph 3.
11. After carrying out 10 be sure to repeat it.
12. Both 8 and 9 must be repeated until it is noticed that the trimmers no longer improve alignment.
INTERMEDIATE WAVE BAND "I" ALIGNMENT

THIS BAND IS INCLUDED IN THE D10S CHASSIS ONLY.

- TURN THE WAVE BAND SELECTOR SWITCH TO THE "I" BAND POSITION.**
1. In series with the generator high potential output lead connect a .00025 mfd. (.250 mf.) condenser and connect to antenna "A" terminal of the chassis.
2. Tune generator and receiver to 4500 K.C. - 4.5 megacycles.
3. If signal is not heard leave scale pointer set to 4.5 megacycles and adjust oscillator "I" band shunt trimmer slowly and carefully until the signal is heard. The oscillator coil and dial are now correctly aligned and require no further adjustment.
4. Adjust R.F. coil shunt trimmer and then the ANT. for maximum output deflection.
5. Reset generator and receiver to 1700 K.C. (1.7 megacycles). Pick up signal with receiver on either side of 1.7 megacycles.
6. Adjust "I" band oscillator series trimmer only while turning the gang condenser. Being careful not to touch antenna and forth about the signal for each small adjustment of the series trimmer.
Continue this until no further adjustment of the series trimmer produces an increase in the output deflection.
Return generator and receiver to 4500 K.C. (4.5 megacycles). Tune in signal on receiver. Readjust ANT. and R.F. shunt trimmers slightly for any small change.

FUNDAMENTAL & IMAGE FREQUENCY NOTES

A simple method of checking to determine if the receiver and generator are tuned for correct alignment is as follows:
Set the signal generator to 17,000 K.C. Tune the receiver from 15,000 slowly up to 18,000 K.C. Two signals should be heard 940 K.C. apart on the receiver, namely one lower in frequency than 17,000 K.C. the other higher. The correct point for alignment is the higher frequency on the receiver dial, whichever is the image. As a check, the receiver should be left tuned to the higher frequency on the generator frequency which was set for 17,000 K.C. slowly and carefully to 18,000 K.C. A signal should be heard near 18,000 K.C. if the original setting was on the image frequency. If a signal would indicate that the original setting was on the image frequency, the signal would indicate certain that you start from the beginning to be sure of your results, make after the correct setting has been found, and the alignment has been carried out, it will be noted that the image or lower frequency response on the receiver dial will always sound weaker than the true signal if the tuned circuits have been correctly adjusted.
470 K.C. I.F. ADJUSTMENT

- CAUTION:** The I.F. system must always be aligned with the SELECTIVE-EL-FI-PRONO in the SELECTIVE POSITION or insensitivity or poor selectivity will result.
1. Connect high potential output lead from test generator in series with a .1 mfd. condenser to the grid of the 6AG5 with selector switch in "M" band position and dial to 1000 K.C. NEVER REMOVE CONTROL GRID CAP FROM TUBE.
2. Connect output voltmeter (copper oxide rectifier type) across voice coil of speaker.
3. Set generator to supply a modulated 470 K.C. signal. Adjust generator output until a small output reading is obtained on the output voltmeter.
4. Adjust both knobs of the first and second I.F. transformers for maximum output (SEE CHECK THE SWITCH IS ON THE SELECTIVE POSITION).
5. Retain slightly the first I.F. adjustment.

MEDIUM BAND "M" ALIGNMENT

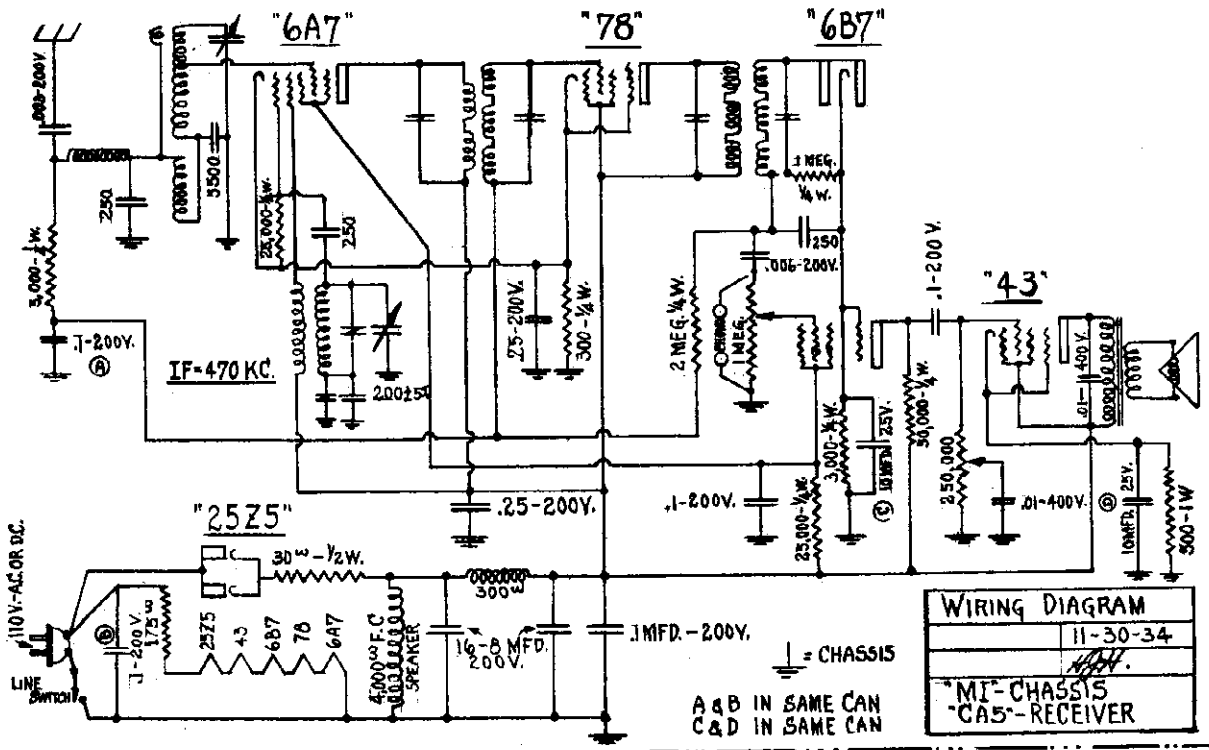
TURN THE WAVE BAND SELECTOR SWITCH TO THE "M" POSITION.
Set test generator for 1400 K.C. Connect high potential lead of test generator in series with a .1 mfd. condenser to grid of 6AG5 tube. Tune receiver to 1400 K.C. (214.3 meters) on the tuning scale. If signal is not heard, leave scale pointer set to 1400 K.C. (214.3 meters), and adjust oscillator coil shunt trimmer slowly and carefully until signal is heard.
The oscillator coil of the receiver and dial are now set correctly, assuming the test generator calibration is correct.
Remove test generator but lead from 6AG5 grid. Replace .1 mfd. condenser with 250 mf. (.00025 mfd.) and connect to antenna terminal of receiver "A", all other settings to remain the same.
Adjust R.F. coil shunt trimmer and then "ANT" coil shunt trimmer for maximum output deflection.
Remove test generator but lead from 6AG5 grid. Replace .1 mfd. condenser with 500 mf. (.00050 mfd.) and tune receiver to 600 K.C.
Adjust oscillator coil shunt trimmer slowly while rotating the gang condenser slowly about the signal for each small adjustment of the series trimmer until further adjustment of the series trimmer does not increase the output signal. During this adjustment, never touch the ANT., R.F. or Osc. shunt trimmers.
Reset test generator and receiver to 1400 K.C. Tune in signal on receiver. Adjust ANT. and R.F. shunt trimmers slightly for maximum output. NEVER THE OSC. SHUNT TRIMMER.

SHORT WAVE "S" BAND ALIGNMENT

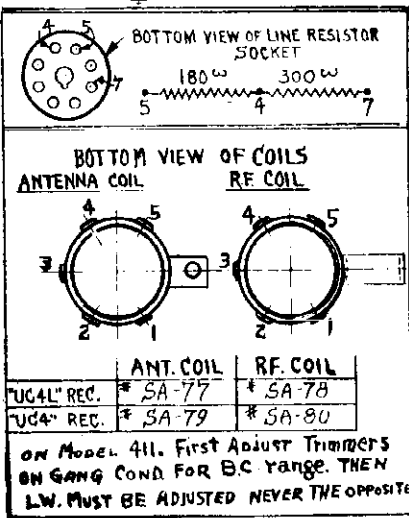
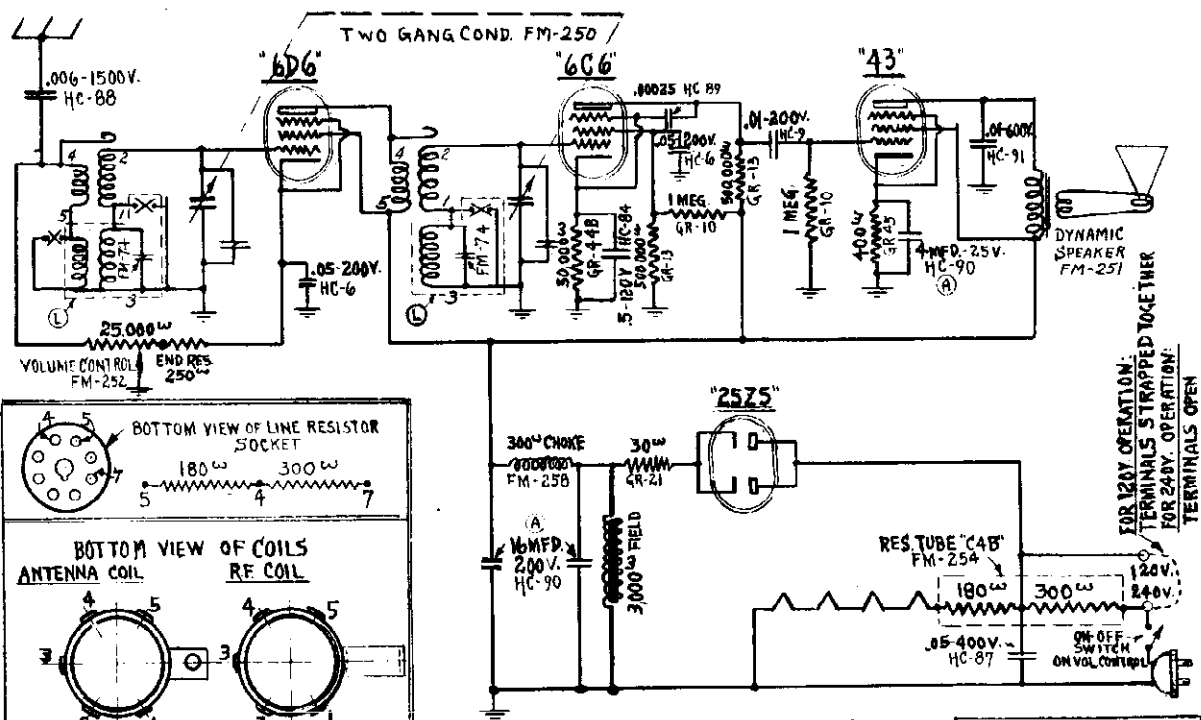
1. Turn wave band selector switch to extreme right "S" band. Replace 250 mf. (.00025 mfd.) condenser with 400 ohm resistor.
2. Off setting adjustment is necessary only if the dial calibration is badly off other than paragraph 4.
3. Set the signal generator to 17,000 K.C. and the receiver dial pointer to 17 M.C. (17,000 K.C.). Adjust oscillator shunt trimmer slowly between maximum and minimum. A signal will be heard at two settings of this trimmer; one near the minimum capacity (plates open) of the trimmer, the other nearer to maximum capacity (plates closed). The trimmer should be left adjusted to the signal heard near its minimum (open plates). The adjustment nearer maximum is the image frequency setting, as can be determined from previous explanation on image frequency.
4. Align R.F. shunt trimmer for maximum output deflection. During this adjustment, be certain to rotate the station selector knob back and forth slowly for each small R.F. shunt trimmer change.
5. Align antenna shunt trimmer for maximum output deflection. During this adjustment, be certain to rotate the station knob back and forth slowly for each small antenna shunt trimmer change until maximum output is obtained on the image. (See notes). Check to see that alignment has not been made on the image. (See notes).
Set test generator to 6000 K.C., return receiver until signal is heard. Ad-

MODEL CA5, Chassis MI
 MODEL 410, Chassis UC4
 MODEL 411, Chassis UC4L
 Schematics

ANDREA RADIO CORP.



WIRING DIAGRAM
 II-30-34
 "MI" CHASSIS
 "CA5" RECEIVER



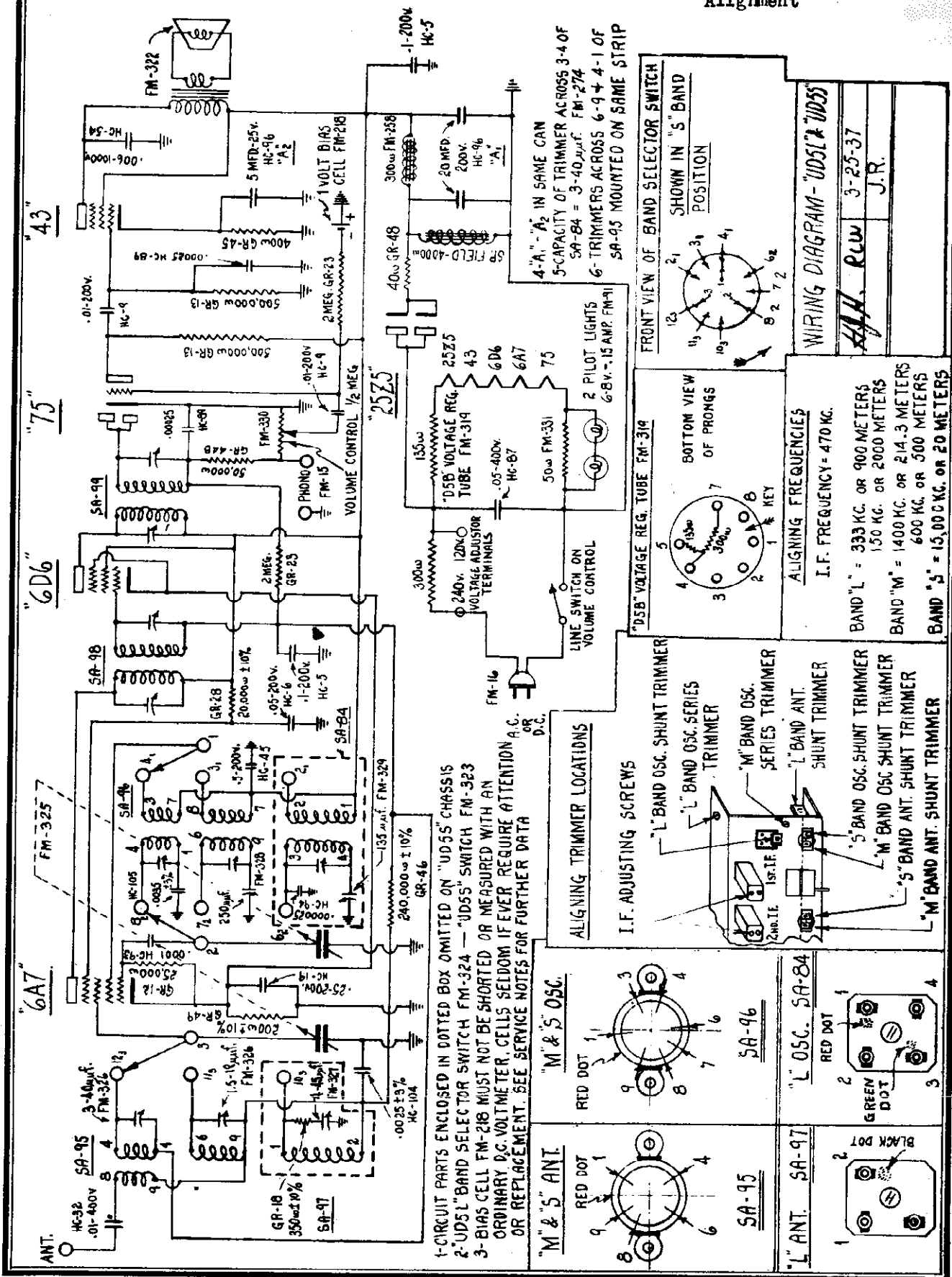
NOTE: (1) ON "UC4L" CHASSIS ONLY - BAND SELECTOR SWITCH FM-253
 (2) IN SAME CONTAINER
 B.C. ALIGNMENT AT 1400 KC. - TRIMMERS ON GANG
 "LW. " " AT 325 KC. " ON COILS ONLY
 NOTE. ALIGNMENT ON LW. BY ADJUSTING TRIMMER ON ANT COIL + ROCKING GANG

WIRING DIAGRAM
 MODEL 410 - CHASSIS UC4
 MODEL 411 - CHASSIS UC4L
 12-N-36

FOR 12BY OPERATION: TERMINALS 1 & 2 STRAPPED TOGETHER
 FOR 24BY OPERATION: TERMINALS OPEN

ANDREA RADIO CORP.

MODEL 520, Chassis UD55
 MODEL 521, Chassis UD5L
 Schematic, Trimmers, Coils
 Alignment



"43"

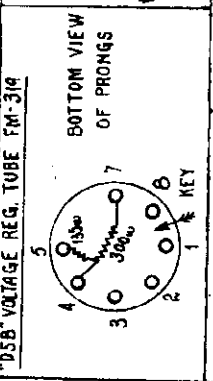
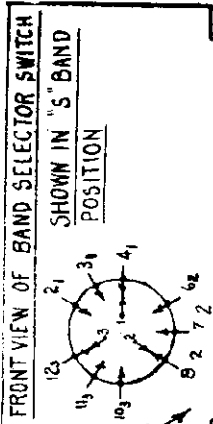
"75"

"6D6"

"6A7"

ANT.

- 1-CIRCUIT PARTS ENCLOSED IN DOTTED BOX OMITTED ON "UD55" CHASSIS
- 2-"UD5L" BAND SELECTOR SWITCH FM-324 - "UD55" SWITCH FM-323
- 3-BIAS CELL FM-218 MUST NOT BE SHORTED OR MEASURED WITH AN ORDINARY D.C. VOLT-METER, CELLS SELDOM IF EVER REQUIRE ATTENTION A.C. OR REPLACEMENT. SEE SERVICE NOTES FOR FURTHER DATA
- 4-"A1", "A2" IN SAME CAN
- 5-CAPACITY OF TRIMMER ACROSS 3-4 OF SA-84 = 3-40 μf. FM-274
- 6-TRIMMERS ACROSS 6-9 + 4-1 OF SA-95 MOUNTED ON SAME STRIP



WIRING DIAGRAM - "UD5L" & "UD55"

A.A. R.W. 3-25-37
 J.R.

ALIGNING FREQUENCIES

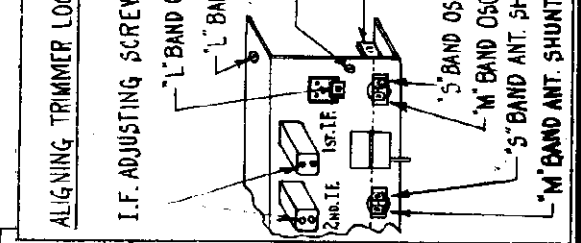
I.F. FREQUENCY = 470 KC.

BAND "L" = 333 KC. OR 900 METERS
 150 KC. OR 2000 METERS

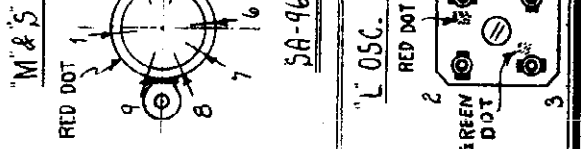
BAND "M" = 1400 KC. OR 214.3 METERS
 600 KC. OR 500 METERS

BAND "S" = 15,000 KC. OR 20 METERS

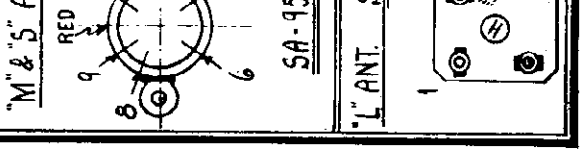
ALIGNING TRIMMER LOCATIONS



"M" & "S" OSC.



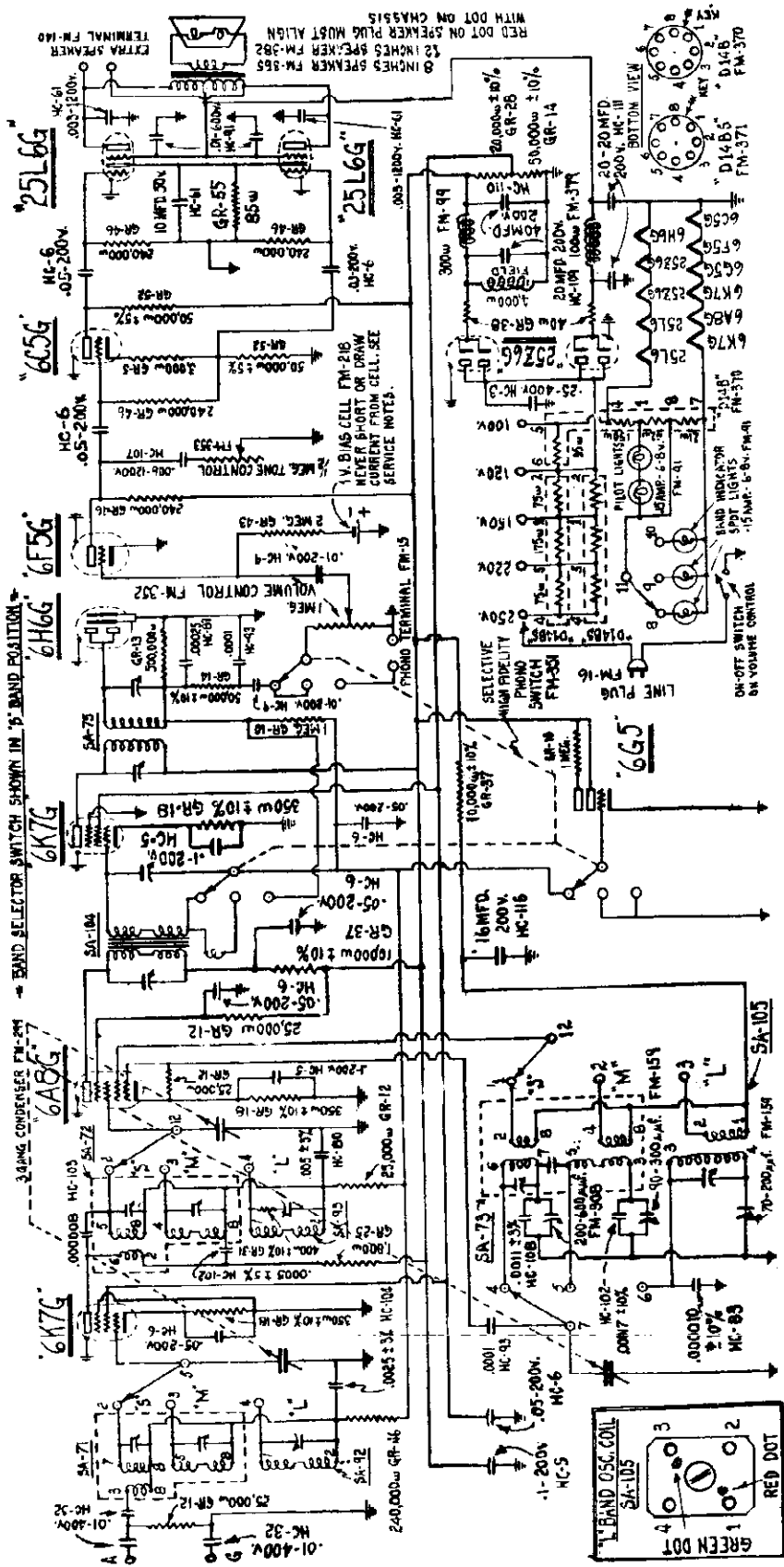
"L" ANT. SA-97



SA-95



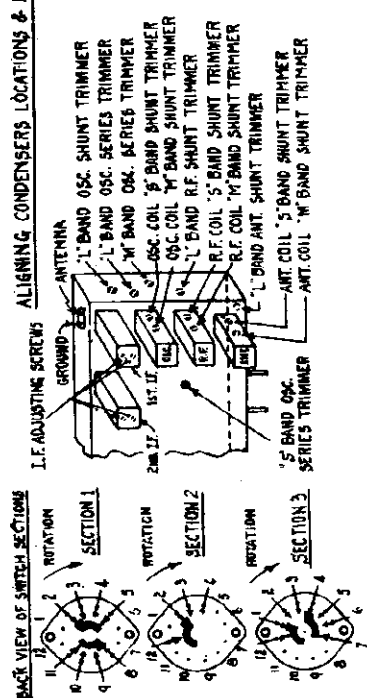
MODELS 1401, 1403, 1405, 1407, 1409 Chassis UD14L ANDREA RADIO CORP. Schematic, Trimmers, Coils Alignment



ALIGNING CONDENSERS LOCATIONS & FREQUENCIES

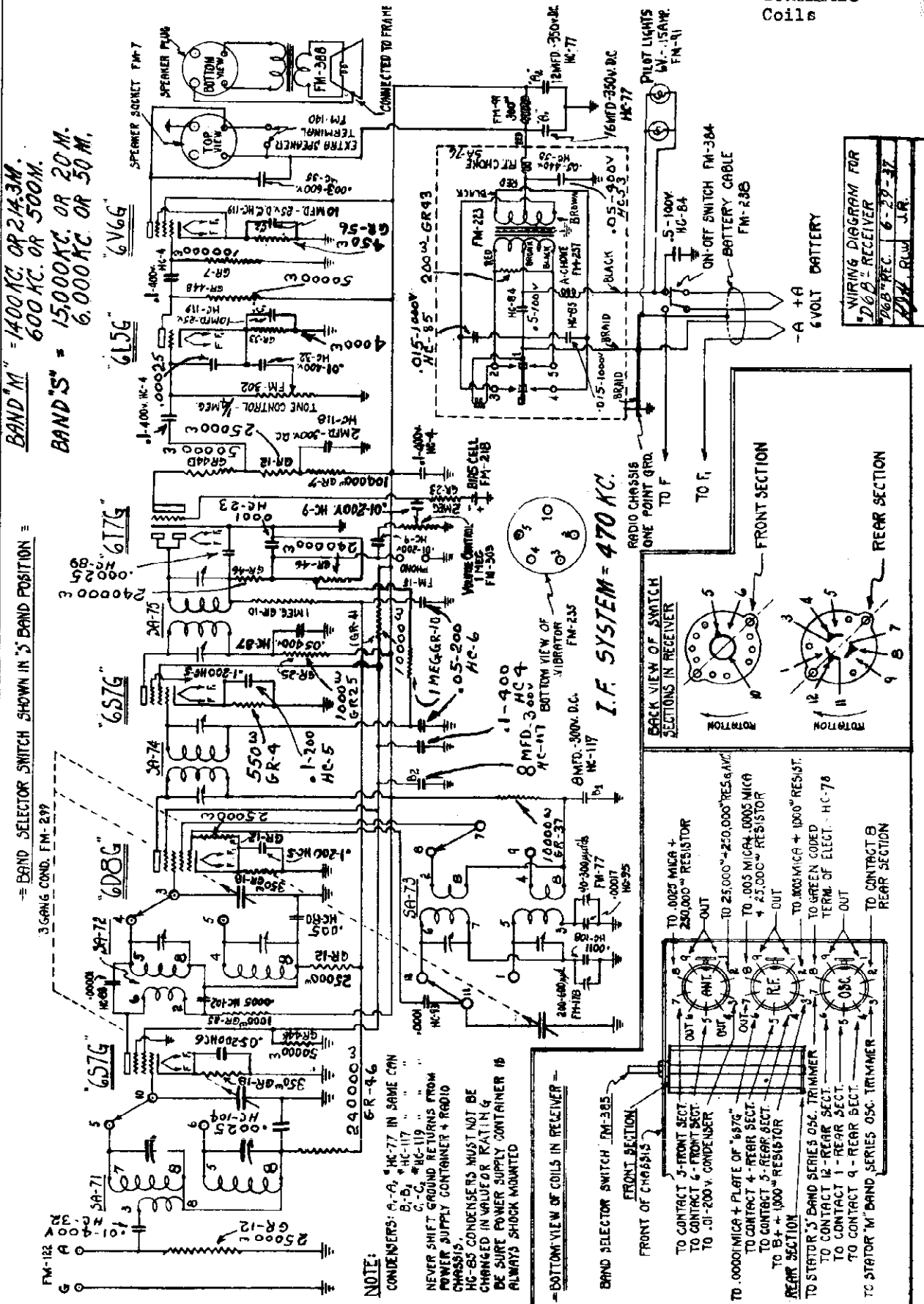
I.F. SYSTEM	470 KC
BAND 'L'	400 KC OR 750 METERS 175 KC OR 1714 METERS
BAND 'M'	1,400 KC OR 214.3 METERS 600 KC OR 500 METERS
BAND 'S'	15,000 KC OR 20 METERS 6,000 KC OR 50 METERS

WIRING DIAGRAM FOR COILS REC
REV. 8-27-37
J.R.



ANDREA RADIO CORP.

MODELS 616, 617,
Chassis D6B
Schematic
Coils



MODELS 616, 617, 618

Chassis D6B

ANDREA RADIO CORP.

Alignment, Trimmers

of the series trimmer, until further adjustment of the series trimmer does not increase the output signal. During this adjustment, never touch the ANT., R.F. or OSC. shunt trimmers.

Reset test generator and receiver to 1400 K.C. Tune in signal on receiver. Adjust Antenna and R.F. shunt trimmers slightly for maximum output - NEVER THE OSC. SHUNT TRIMMER.

SHORT WAVE "S" BAND ALIGNMENT

1. Turn wave band selector switch to extreme right "S" band. Replace 250 mfd. (.00025 mfd.) condenser with 400 ohm resistor.
2. The following adjustment is necessary only if the dial calibration is badly off, otherwise proceed with steps 3 and 4.

Set the signal generator to 15,000 K.C. and the receiver dial pointer to 15 K.C. (15,000 K.C.). Adjust oscillator shunt trimmer slowly between maximum and minimum. A signal will be heard at two settings of this trimmer, one near the minimum capacity (plates open) of the trimmer, the other nearer to maximum capacity (plates closed). The trimmer should be left adjusted to the signal heard near its minimum (open plates). The adjustment nearer maximum is the image frequency setting, as can be determined from previous explanation on Image Frequency.

3. Align R.F. shunt trimmer for maximum output deflection. During this adjustment, be certain to rotate the station selector knob back and forth slowly for each small R.F. shunt trimmer change.
4. Align antenna shunt trimmer for maximum output deflection. During this adjustment, be certain to rotate the station knob back and forth slowly for each small antenna shunt trimmer change until maximum output is obtained. Retrim R.F. shunt trimmer for any small change. Check to see that alignment has not been made on the image. (See notes)

Set test generator to 6000 K.C. Return receiver until signal is heard. Adjust oscillator series trimmer slowly while rotating the gang condenser around the signal for each small adjustment of the series trimmer until no further adjustment of the series trimmer increases the output signal.

NEVER TOUCH THE ANT., R.F. OR OSC. SHUNT TRIMMERS DURING THIS ADJUSTMENT.

Reset test generator to 15,000 K.C. Tune receiver until correct signal is heard. Return antenna and R.F. shunt trimmer for final critical setting. During this final adjustment, never touch the oscillator shunt trimmer.

THE "S" BAND IS NOW ALIGNED.

Should the operator be inexperienced on "S" band alignment, the individual coils can be checked very simply as follows:

Apply the test generator signal through a .1 mfd. coil to the 6D8G grid, and carry out the procedure outlined above. This will tell you if the oscillator shunt trimmer only is correctly adjusted, or the right signal setting has been used on the test generator. In this case ONLY the image and fundamental will have the same intensity.

When you are sure the oscillator circuit is correct, place the signal on the grid of the 6S70 R.F. tube, and repeat the procedure on the R.F. coil. In this case when correct alignment has been made, the image will be lower in volume than the fundamental.

Replace the .1 mfd. condenser in the test generator lead with a 400 ohm resistor and connect to antenna terminal "A", and repeat procedure on antenna.

This method now assures you of correct individual alignment on each coil. Then proceed to touch up each coil except the oscillator, as outlined in 3 and 4.

FUNDAMENTAL & IMAGE FREQUENCY NOTES

A simple method of checking to determine if the receiver and generator are tuned for correct alignment is as follows:

Set the signal generator to 15000 K.C. Tune the receiver from 15000 slowly up to 16000 K.C. Two signals should be heard 940 K.C. apart on the receiver, namely, one lower in frequency than 15000 K.C. and the other higher. The correct point for alignment is the higher frequency on the receiver dial, the lower is the image. As a check, the receiver should be left tuned to the higher frequency. Increase the generator frequency which was set for 15000 K.C. slowly to approximately 16000 K.C. A signal should be heard near 16000 K.C. if the first setting on the generator was correct for alignment. No signal would indicate that the original setting was on the image frequency. If this occurs, make certain that you start from the beginning to be sure of your results.

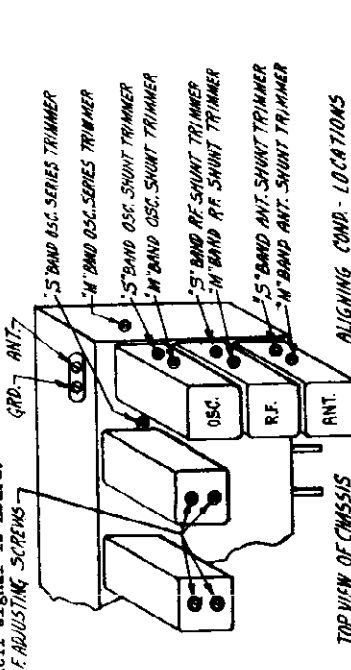
After the correct setting has been found, and the alignment has been carried out, it will be noted that the image or lower frequency response on the receiver dial will always sound weaker than the true signal, if the tuned circuits have been correctly adjusted.

470 K.C. I.F. ADJUSTMENT

1. Connect high potential output lead from test generator in series with a .1 mfd. condenser to the grid of the 6D8G tube.
2. Connect output voltmeter (copper oxide rectifier type) across voice coil of speaker.
3. Set generator to supply a modulated 470 K.C. signal. Adjust generator output attenuator until a small output reading is obtained on the output voltmeter.
4. Adjust both trimmers on top of the first and second I.F. transformers (see diagram) for maximum output.
5. Retrim slightly the first I.F. trimmer.

MEDIUM BAND "M" ALIGNMENT

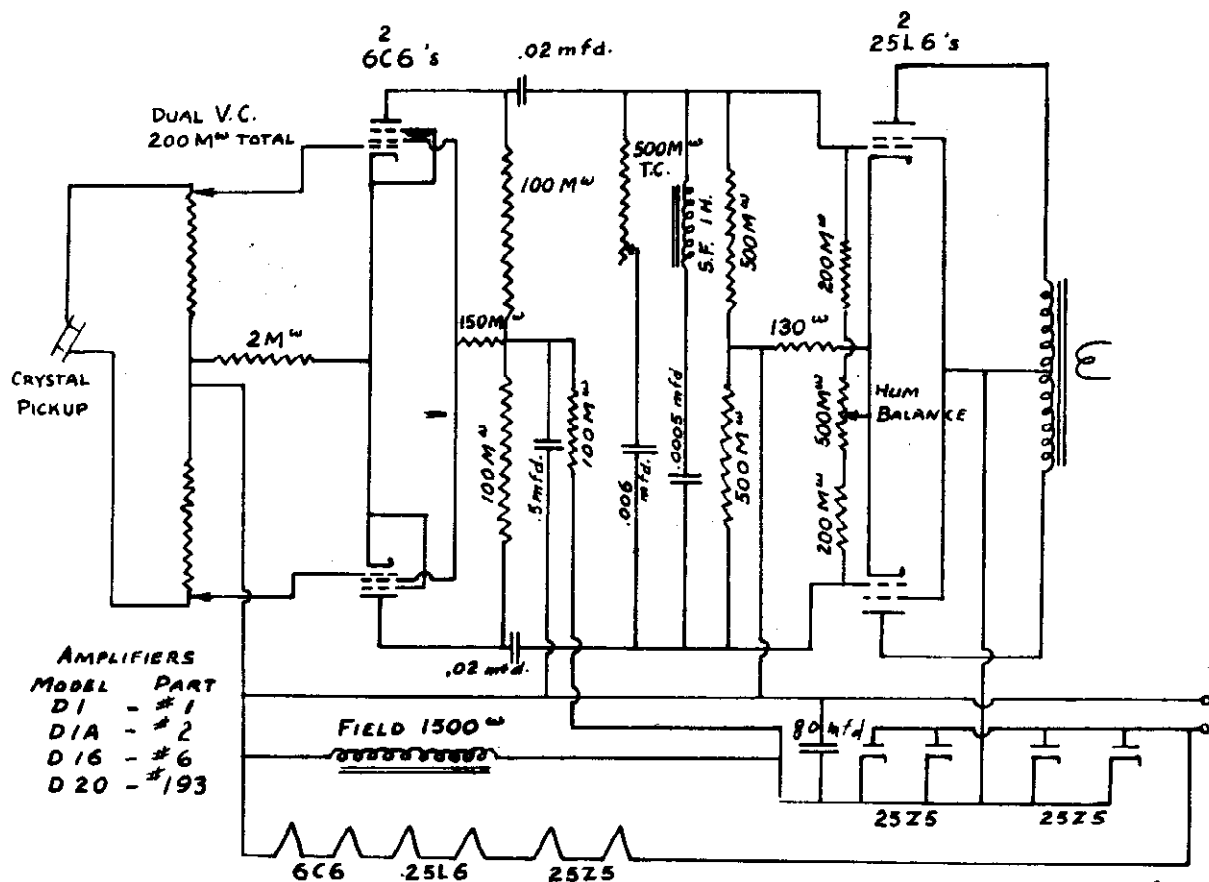
TURN THE WAVE BAND SELECTOR SWITCH TO THE "M" POSITION.
Set test generator for 1400 K.C. Connect high potential lead of test generator in series with a .1 mfd. condenser to grid of 6D8G tube. Tune receiver to 1400 K.C. (214.3 meters) on the tuning scale. If signal is not heard, leave scale pointer set to 1400 K.C. (214.3 meters), and adjust oscillator coil shunt trimmer slowly and carefully until signal is heard.



TOP VIEW OF CHASSIS

The oscillator coil of the receiver and dial are now set correctly, assuming the test generator calibration is correct. Remove test generator hot lead from 6D8G grid. Replace .1 mfd. condenser with 250 mfd. (.00025 mfd.) and connect to antenna terminal of receiver "A", all other settings to remain the same. Adjust R.F. coil shunt trimmer and then "ANT." coil shunt trimmer for maximum deflection. Return test generator to 600 K.C. (500 meters), and tune receiver to 600 K.C. (500 meters) until signal is heard. Adjust oscillator coil series trimmer slowly while rotating the gang condenser slowly about the signal for each small adjustment

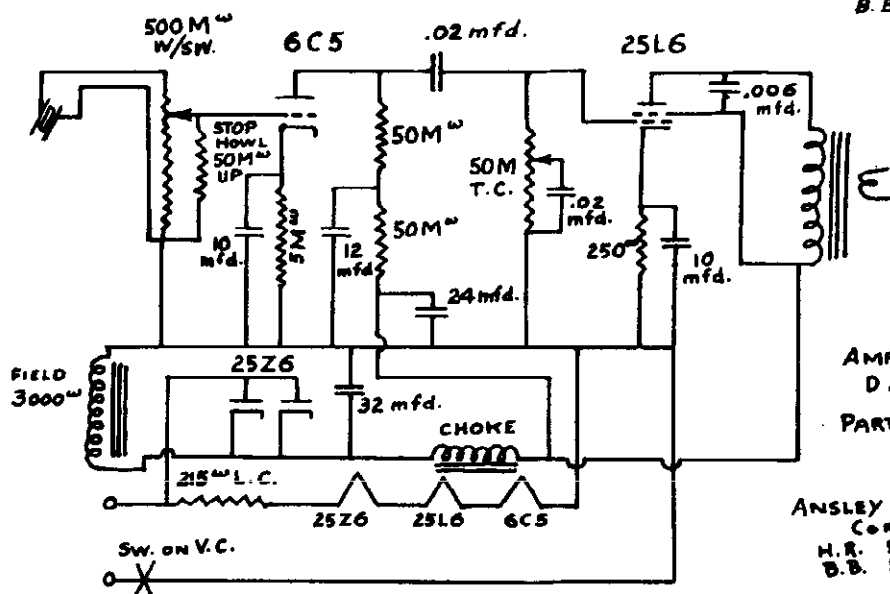
ANSLEY RADIO LABORATORIES



AMPLIFIERS

MODEL	PART
D1	- #1
DIA	- #2
D16	- #6
D20	- #193

ANSLEY RADIO CORP.
N. Y. C.
H. R. 9-18-37
B. B. 9-21-37



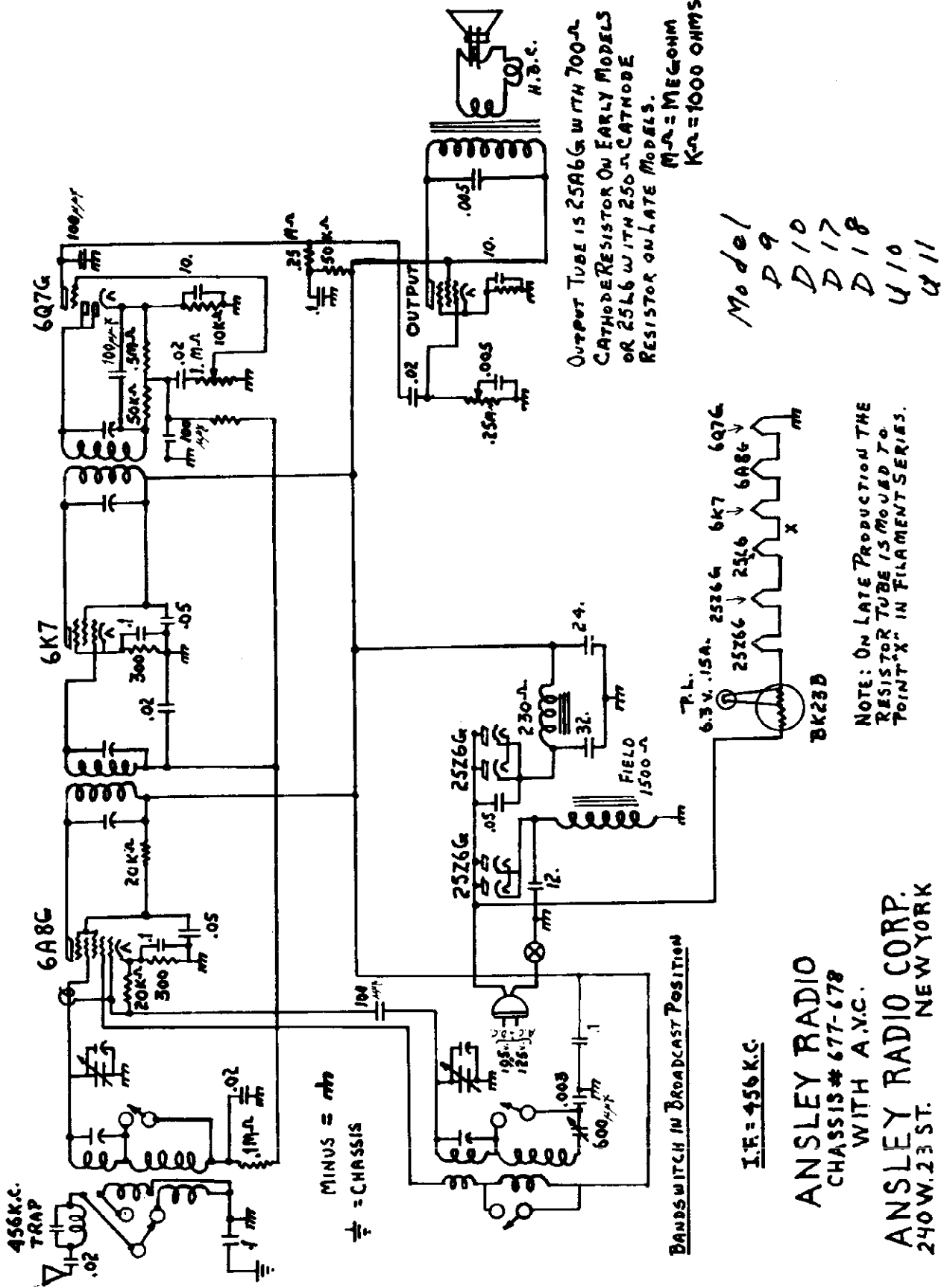
AMPLIFIER
D 26
PART # 211

ANSLEY RADIO
CORP.
H. R. 9-20-37
B. B. 9-21-37

MODELS D9, D10, D17, D18
U10, U11

ANSLEY RADIO LABORATORIES

Schematic



OUTPUT TUBE IS 25A6G WITH 700Ω
CATHODE RESISTOR ON EARLY MODELS
OR 25L6 WITH 250Ω CATHODE
RESISTOR ON LATE MODELS.
MΩ = MEGOHM
KΩ = 1000 OHMS

Model
D 9
D 10
D 17
D 18
U 10
U 11

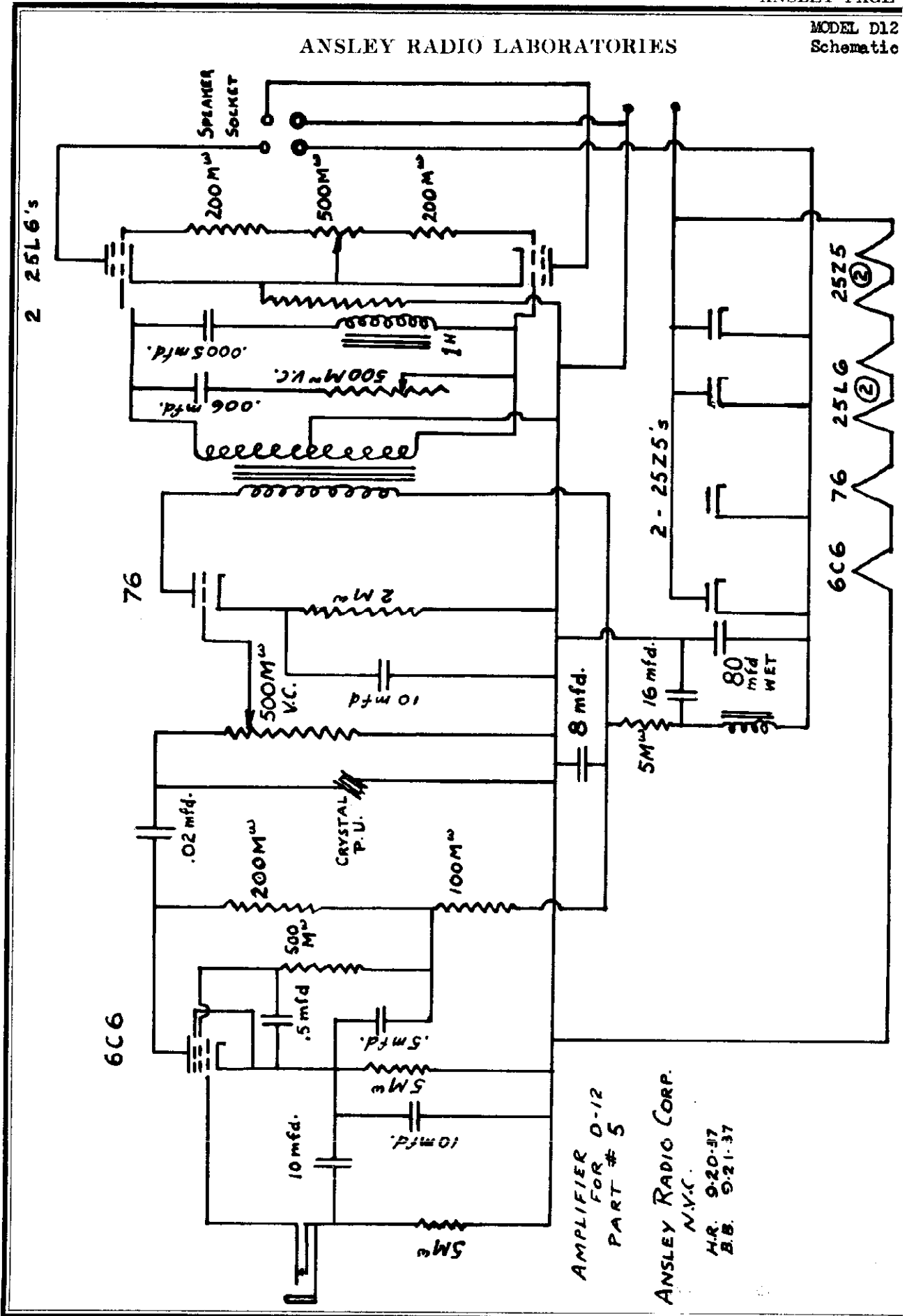
NOTE: ON LATE PRODUCTION THE
RESISTOR TUBE IS MOVED TO
POINT "X" IN FILAMENT SERIES.

BANDSWITCH IN BROADCAST POSITION

I.F. = 456 K.C.

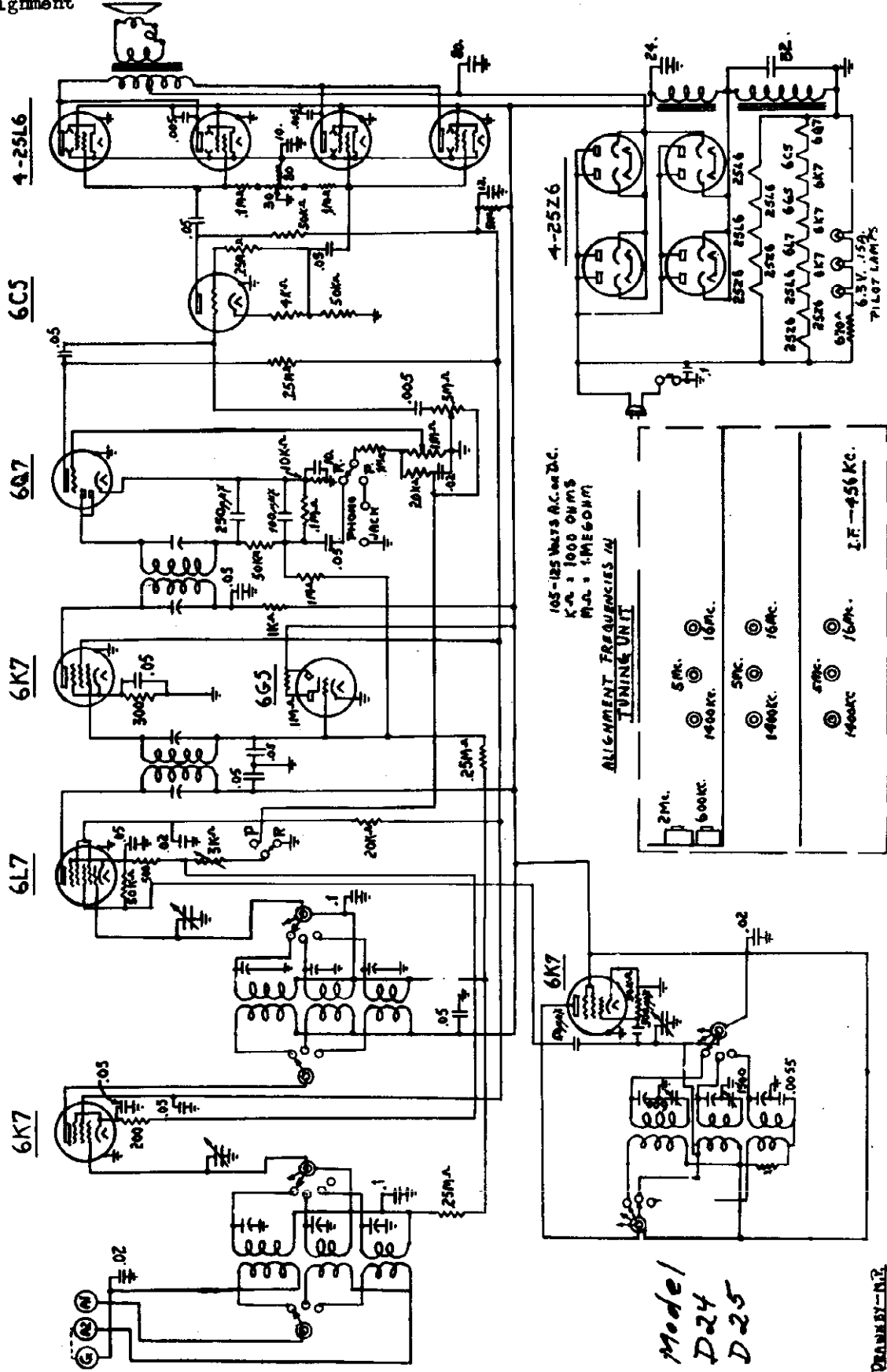
ANSLEY RADIO
CHASSIS # 677-678
WITH A.Y.C.
ANSLEY RADIO CORP.
240W.23 ST. NEW YORK

ANSLEY RADIO LABORATORIES



MODELS D24, D25
 Chassis 7152
 Schematic, Trimmers
 Alignment

ANSLEY RADIO LABORATORIES



105-125 WATTS A.C. or D.C.
 K.A. = 1000 OHMS
 M.O. = 1 MEGOHM

ALIGNMENT FREQUENCIES IN
 TUNING UNIT

2Mc	5Mc	10Mc	15Mc	16Mc
1600Kc	1400Kc	1400Kc	1400Kc	1400Kc
				I.F. - 456 Kc.

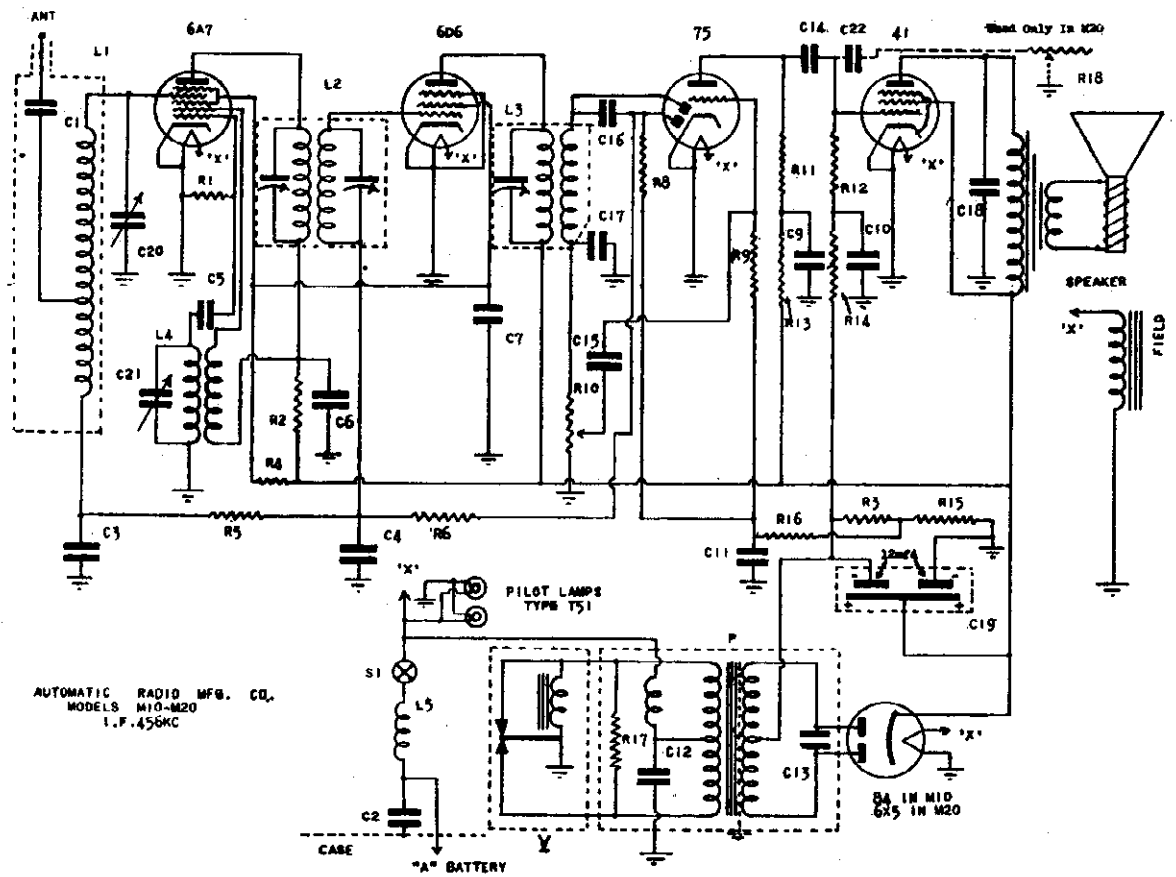
ANSLEY RADIO CORP.
 NEW YORK
 MODEL 7152 CHASSIS

Model
 D24
 D25

DRANBY-N.Y.
 CHAS. CO. BY - B.B.
 9/57

AUTOMATIC RADIO MFG. CO., INC.

MODELS M10, M20
Schematic, Parts
Alignment



AUTOMATIC RADIO MFG. CO.
MODELS M10-M20
I.F. 456KC

ALIGNMENT PROCEDURE

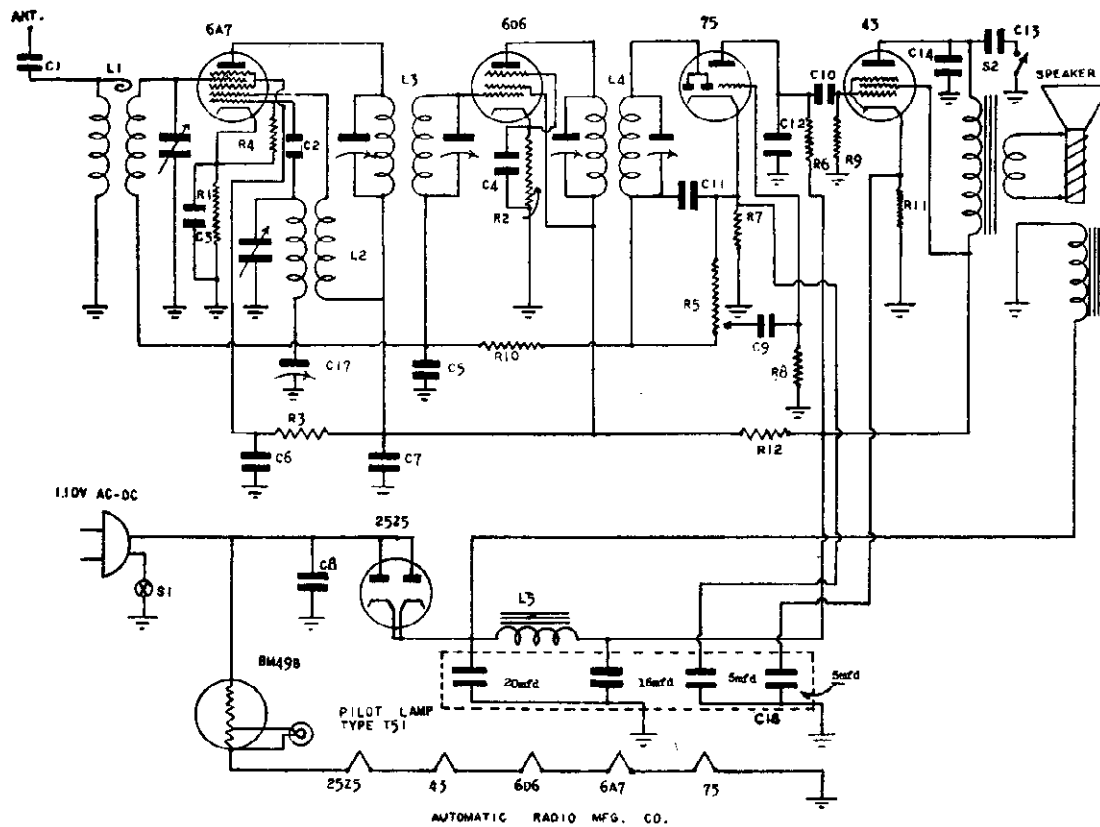
I. F. Alignment. Connect a signal generator set at 456 kc to the 6A7 grid. Connect an output meter across the secondary terminals of the speaker output transformer. With the weakest signal from the generator necessary to obtain .5 volt deflection on the output meter, peak the two trimmers on the first I. F. transformer and the single trimmer on the second I. F. transformer. This second I. F. transformer is located on the under side of the chassis.

R. F. Alignment. Insert a 200mmfd condenser in series with the antenna lead of the receiver and the signal generator. Set the receiver dial to 1400kc and the signal generator to the same frequency. Again with the weakest signal necessary to obtain .5 volt deflection of the output meter, adjust the terminals on both sections of the variable condenser. It is the utmost importance in making these various adjustments that the signal level be attenuated as far as possible in order to overcome the AVC action which would otherwise introduce serious errors and prevent obtaining optimum results.

SCHEMATIC LOCATION	DESCRIPTION	SCHEMATIC LOCATION	DESCRIPTION
L1	Antenna Coil	C19	Electrolytic Condenser Block
L2, L4	Composite I.F. Trans. and Osc.	C20, C21	2 sect. Tuning Condenser
L3	2nd I.F. Transformer	C22	Fixed Condenser .002mfd-600v
L5	"A" R.F. Choke	R1	Resistor 50,000 ohms-1/4 Watt
P	Speaker	R2	" 250 ohms-1/4 Watt
V	Power Transformer	R3	" 250 ohms-1/2 Watt
S1	Vibrator	R4	" 25,000 ohms-1/4 Watt
C1, C2	Line Switch (On Vol. Control)	R5	" 250,000 ohms-1/4 Watt
C3, C4	Mica Condenser .0005mfd	R6, R8, R9	" 1 megohm-1/4 Watt
C5, C16	Fixed " .05mfd-200v	R10	Volume Control-1/2 megohm
C6, C7, C9, C10, C11	Fixed " 100mmfd	R11, R12	Resistor 1/2 megohm-1/4 Watt
C12	Fixed " .1mfd-200v	R13, R14	" 1/4 megohm-1/4 Watt
C13	Fixed " .5mfd-200v	R15	" 30 ohms-1/4 Watt
C14, C15	Fixed " .007mfd-1200v	R16	" 100,000 ohms-1/4 Watt
C17	Fixed " .01mfd-400v	R17	" 150 ohms-1/4 Watt
C18	Fixed " 200mmfd	R18	Tone Control-1/2 megohm
	Fixed " .005mfd-600v		

MODEL B30, Series I
Schematic, Parts
Alignment

AUTOMATIC RADIO MFG. CO., INC.



MODEL B-30
SERIES I

AUTOMATIC RADIO MFG. CO.

I. F. 456kc

ALIGNMENT PROCEDURE

I. F. Alignment. Connect a signal generator set at 456kc to the 6A7 input and connect an output meter to the speaker output. Using a weak signal tune the two I. F. condensers on the first I. F. coil and the two I. F. condensers on the output I. F. coil for maximum response.

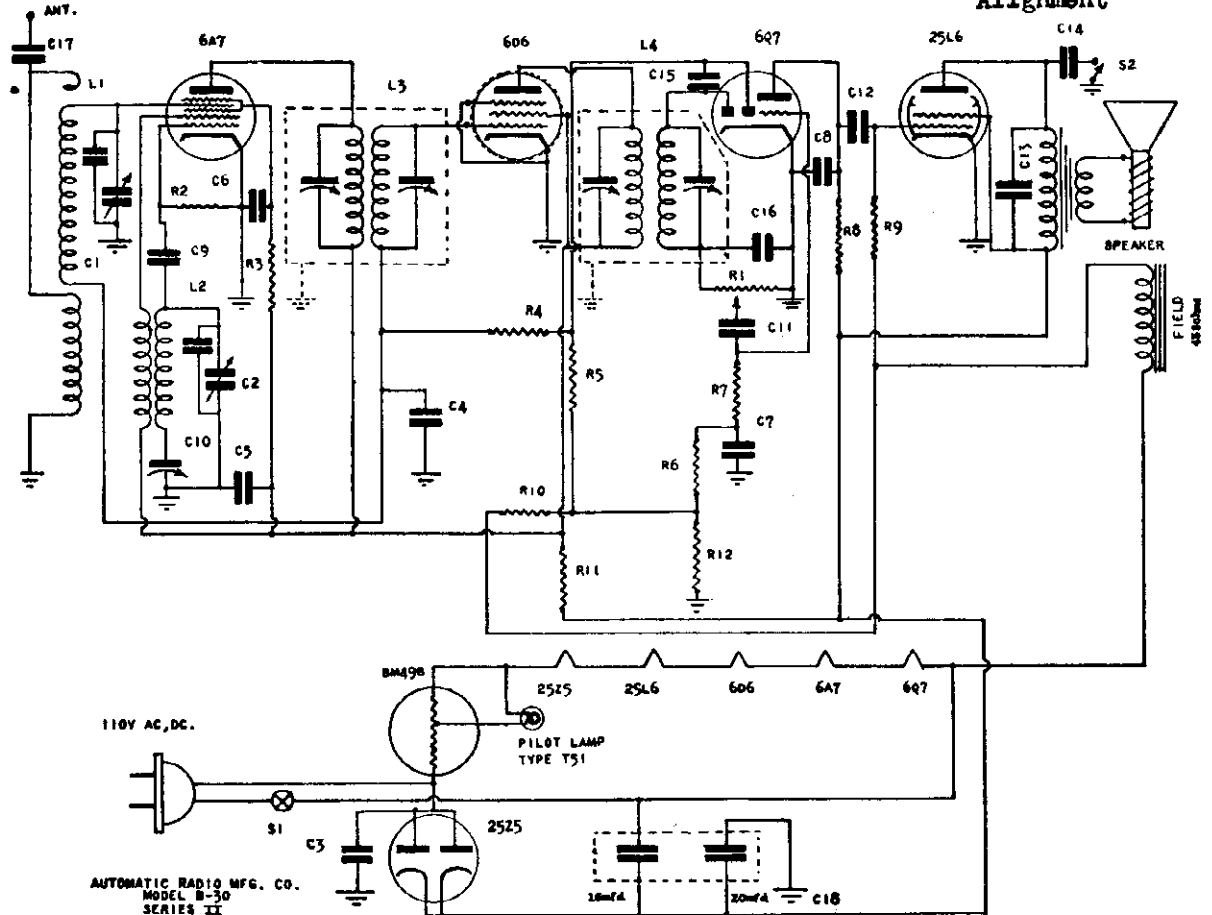
R. F. Alignment. Connect the signal generator set at 1400kc to the antenna lead using a dummy antenna of 200mmf. Tune the set by means of the dial to 1400kc position. Adjust oscillator trimmer for this frequency. Pad at 600kc. Recheck 1400 kc and trim antenna stage for maximum response. Repeating the alignment may result in improved sensitivity.

SCHEMATIC LOCATION	DESCRIPTION	PART NO.	LIST PRICE
L1	Antenna Coil	BA110	\$.50
L2	Oscillator Coil	BO110	.40
L3	1st IF Coil	LC110	.80
L4	2nd IF Coil	LC112	.80
L5	Filter Choke—300w	C1588	.80
—	Speaker	SD1	3.50
C1	Fixed Condenser—.002mfd—600v	—	.20
C2	Mica " —.0001mfd	—	.20
C3, C4, C5, C6, C7, C8	Fixed " —.1mfd—200v	—	.20
C9, C10	Fixed " —.01mfd—400v	—	.20
C11, C12	Mica " —.0002mfd	—	.20
C13	Fixed " —.02mfd—600v	—	.25
C14	Fixed " —.006mfd—600v	—	.20
C17	Variable Padder—200—600mfd	—	.40
C18	Electrolytic Condenser Block	CE15	1.60
S1	Line Switch (On Volume Control)	—	—
S2	Tone Control Switch	SI2	.40
R1, R2	Resistor—250 ohms—1/4 watt	—	.20
R3	Resistor—25,000 ohms—1/4 watt	—	.15
R4	Resistor—50,000 ohms—1/4 watt	—	.15
R5	Volume Control—500,000 ohms	RV18	.80
R6	Resistor—500,000 ohms—1/4 watt	—	.15
R7	Resistor—5,000 ohms—1/4 watt	—	.15
R8, R9, R10	Resistor—1 megohm—1/4 watt	—	.15
R11	Resistor—750 ohms 1/2 watt	—	.20
R12	Resistor—30 ohms—1/4 watt	—	.20

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

AUTOMATIC RADIO MFG. CO., INC.

MODEL B30, Series II
Schematic, Parts
Alignment



AUTOMATIC RADIO MFG. CO.
MODEL B-30
SERIES II
IF 456KC

ALIGNMENT PROCEDURE

I. F. Alignment. Connect a signal generator set at 456kc to the 6A7 input and connect an output meter to the speaker output. Using a weak signal tune the two I. F. condensers on the first I. F. coil and the two I. F. condensers on the output I. F. coil for maximum response.

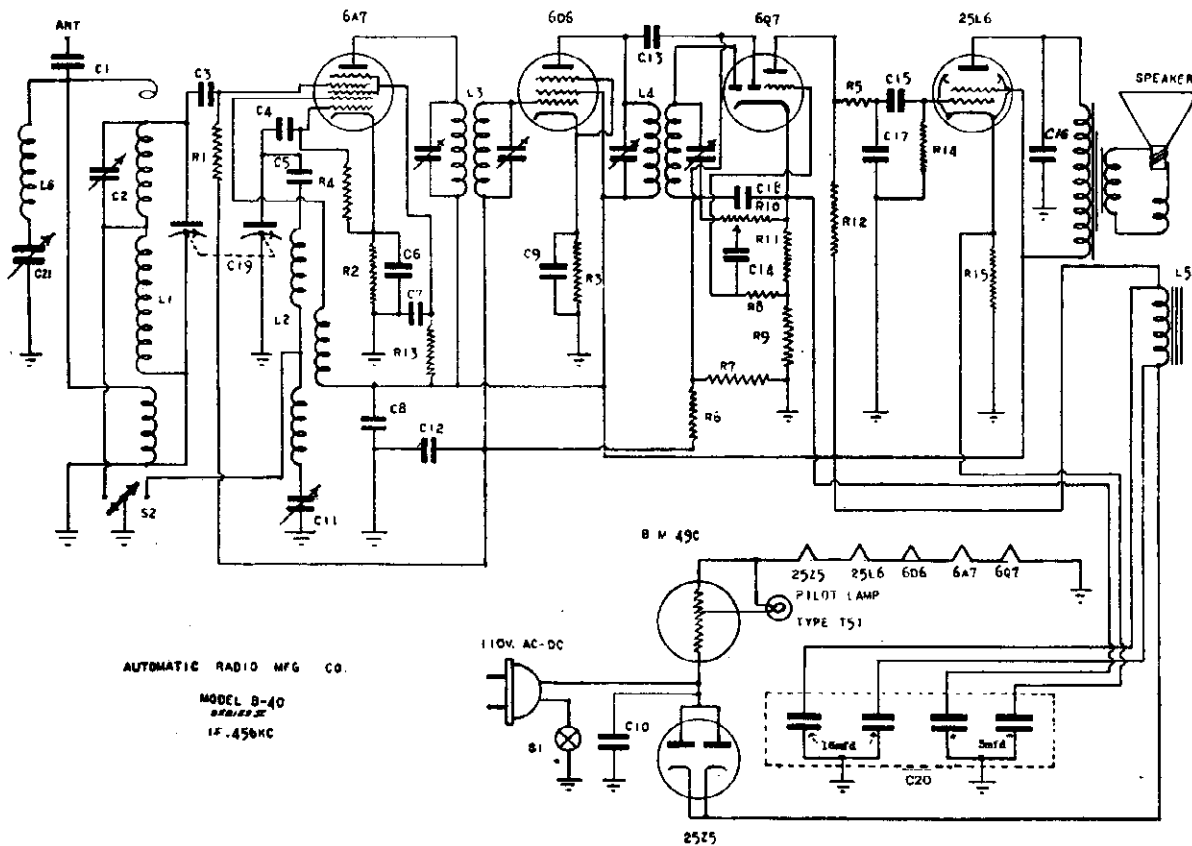
R. F. Alignment. Connect the signal generator set at 1400kc to the antenna lead using a dummy antenna of 200mmf. Tune the set by means of the dial to 1400kc position. Adjust oscillator trimmer for this frequency. Pad at 600kc. Recheck 1400kc and trim antenna stage for maximum response. Repeating the alignment may result in improved sensitivity.

SCHEMATIC LOCATION	DESCRIPTION	PART NO.	LIST PRICE
L1	Antenna Coil	BA110	\$0.50
L2	Oscillator Coil	BO110	.40
L3	1st I.F. Coil	LC110	.80
L4	2nd I.F. Coil	LC112	.80
—	Speaker	SD23	3.50
C1, C2	Tuning Condenser	CV25	1.80
C3, C4, C5, C6, C7	Fixed " .1mfd—200v	—	.20
C8, C9, C16	Mica " 200mmfd	—	.20
C15	Mica " 100mmfd	—	.20
C10	Variable Padder 550mmfd	—	.40
C11, C12, C13	Fixed Condenser .01mfd—200v	—	.20
C14	Fixed " .02mfd—600v	—	.20
C17	Fixed " .002mfd—600v	—	.25
C18	Electrolytic Condenser Block	CE20	1.40
S1	Line Switch (On Vol. Control)	—	—
S2	Tone Control Switch	S12	.40
R1	Volume Control 1/4 megohm	RV18	.80
R2	Resistors 50,000 ohms—1/4 Watt	—	.15
R3	" 25,000 ohms—1/4 Watt	—	.20
R4, R5	" 2 megohms—1/4 Watt	—	.15
R6, R7	" 1 megohm—1/4 Watt	—	.15
R8,	" 1/4 megohm—1/4 Watt	—	.15
R9	" 1/2 megohm—1/4 Watt	—	.15
R10	" 100 ohms—1/2 Watt	—	.20
R11	" 30 ohms—1/4 Watt	—	.20
R12	" 25 ohms—1/4 Watt	—	.20

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODEL B40, Series II
Schematic, Parts
Alignment

AUTOMATIC RADIO MFG. CO., INC.



AUTOMATIC RADIO MFG. CO.
MODEL B-40
SERIES II
IF .45Mc

SCHEMATIC LOCATION

SCHEMATIC LOCATION	DESCRIPTION	LIST PRICE
L1	Antenna Coil	\$0.80
L2	Oscillator Coil	.75
L3	1st I. F. Transformer	.80
L4	2nd I.F. Transformer	.80
L5	Speaker Field—450 ohms	—
L6	Wave Trap	.50
S1	Line Switch (On Volume Control)	—
S2	Band Switch	.40
C1	Fixed Condenser .002mfd—600v	.20
C2, C13, C21	Trimmer Condensers 3-30mmfd	.20
C3, C12	Fixed Condensers .005mfd—600v	.20
C4	Mica " 100mmfd	.20
C5	Mica " 1900mmfd	.25
C6, C7, C8, C9, Fixed	" .1mfd—200v	.20
C11	Variable Padder Condensers 550mmfd	.40
C14, C15, C16	Fixed Condensers .01mfd—400v	.20

SCHEMATIC LOCATION

SCHEMATIC LOCATION	DESCRIPTION	LIST PRICE
C17, C18	Mica " 200mmfd	.20
C19	Tuning Condenser	1.80
C20	Electrolytic Condenser Block	1.40
R1	Resistors 1 megohm—1/4 Watt	.15
R2, R3	" 250 ohms—1/4 Watt	.20
R4, R5	" 50,000 ohms—1/4 Watt	.15
R6, R7, R8	" 2 megohms—1/4 Watt	.20
R9	" 35,000 ohms—1/4 Watt	.20
R10	Volume Control 250,000 ohms	.80
R11	Resistors 7500 ohms—1/4 Watt	.20
R12	" 250,000 ohms—1/4 Watt	.15
R13	" 25,000 ohms—1/4 Watt	.20
R14	" 500,000 ohms—1/4 Watt	.15
R15	" 150 ohms—1/2 Watt	.25
	Speaker	3.75

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

ALIGNMENT PROCEDURE

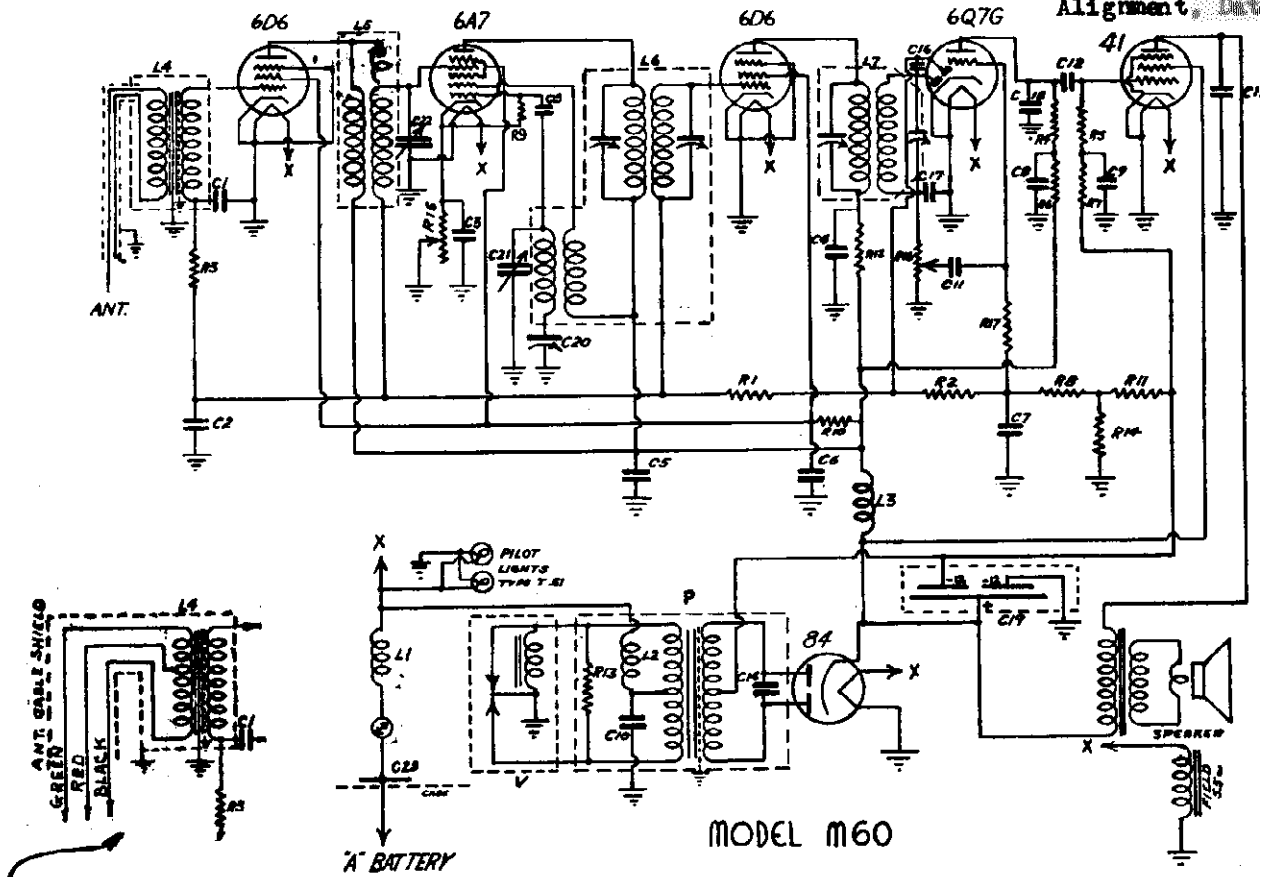
I. F. Alignment. Connect a signal generator set at 456kc to the 6A7 grid. Connect an output meter across the secondary terminals of the speaker output transformer. With the weakest signal from the generator necessary to obtain a .5 volt deflection on the output meter, peak the trimmers on both I. F. Transformers.

R. F. Alignment. Insert a 200mmfd condenser in series with the antenna lead of the receiver and the signal generator. Switch the receiver to the broadcast band and set the dial to 1400kc. Set the signal generator at the same frequency. With the weakest signal necessary to obtain .5 volt deflection on the output meter, adjust the trimmers on the variable condenser. Set the receiver to 600kc and with a signal of the same frequency adjust the oscillator padder condenser. Repeat the above procedure until certain that optimum adjustment has been secured. Now rotate the band switch to the short wave position. With the signal generator feeding a 6.0mc signal into the set, adjust the trimmer condenser on the antenna coil while "rocking" the variable condenser with the dial indicating a setting of approximately 6.0mc. It is imperative that all of the above adjustments be made with the signal level attenuated as far as possible in order to overcome the AVC action which would otherwise introduce serious errors and prevent obtaining best results.

Wave Trap Alignment. With a signal of a fairly high order and a frequency of 456kc being fed into the antenna input, adjust the trimmer on the trap coil to minimum response.

AUTOMATIC RADIO MFG. CO., INC.

Schematic, Part Alignment, Det



MODEL M60

REVISED ANTENNA CIRCUIT FOR MODEL M-60

For high capacity antenna (above 300 MMF), such as built in roof antenna or large running board antenna GREEN lead should be connected to antenna, RED lead connected to antenna cable shielding, and BLACK lead taped (not used).

For medium capacity antennas (150 to 300 MMF), such as rear vertical rod or overhead strip, RED lead is connected to antenna, BLACK lead should be grounded to cable shield, and GREEN wire taped (not used).

For low capacity antenna (below 150 MMF) such as a hinge mounted vertical rod or a cowl rod, the GREEN lead should be connected to the antenna, the BLACK lead should be grounded to the cable shield and the RED lead should be taped, and pushed back into the cable.

Schematic Location	Description	Part No.	List Price
L1	"A" R.F. Choke	RF100	\$0.20
L2	"A" R.F. Choke	RF101	.20
L3	"B" R.F. Choke	RF102	.40
L4	Antenna Coil	BA200	.80
L5	Interstage Coil	BR200	.75
L6	Composite I.F. Trans. an Osc.	LC200	.90
L7	2nd I.F. Transformer	L200	.80
P	Power Transformer	P300	1.80
V	Vibrator	V100	2.40
	Speaker	SD16	3.50
C1, C2	Fixed Condenser .05 mfd-200 volt		.20
C3, C4, C5, C6, C7, C8, C9	.1 mfd-200 volt		.20
C10	.5 mfd-150 volt		.30
C11, C12	.01 mfd-400 volt		.20
C13	.006 mfd-600 volt		.20
C14	.007 mfd-1200 volt		.30
C15, C16	Mica Condenser 100 mmfd		.20
C17, C18	200 mmfd		.20
C19	Electrolytic Condenser Block	CE12	1.20
C20	Variable Padder Condenser 500 mmfd		.40
C21, C22	2 Sect. Tuning Condenser	CV21	1.80
C23	Spark Plate 250 mmfd		.20
R1, R2, R17	Resistor 1 megohm 1/4 watt		.10
R3, R4, R5	1/2 megohm 1/4 watt		.10
R6, R7	1/4 megohm 1/4 watt		.10
R8	100,000 ohms 1/4 watt		.10
R9	50,000 ohms 1/4 watt		.10
R10	25,000 ohms 1/2 watt		.20
R11	250 ohms 1/2 watt		.20
R12	250 ohms 1/4 watt		.20
R13	150 ohms 1/4 watt		.20
R14	85 ohms 1/4 watt		.20
R15	Sensitivity Control 3,000 ohms	RV20	.20
R16	Volume Control 500,000 ohms	RV19	.20

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

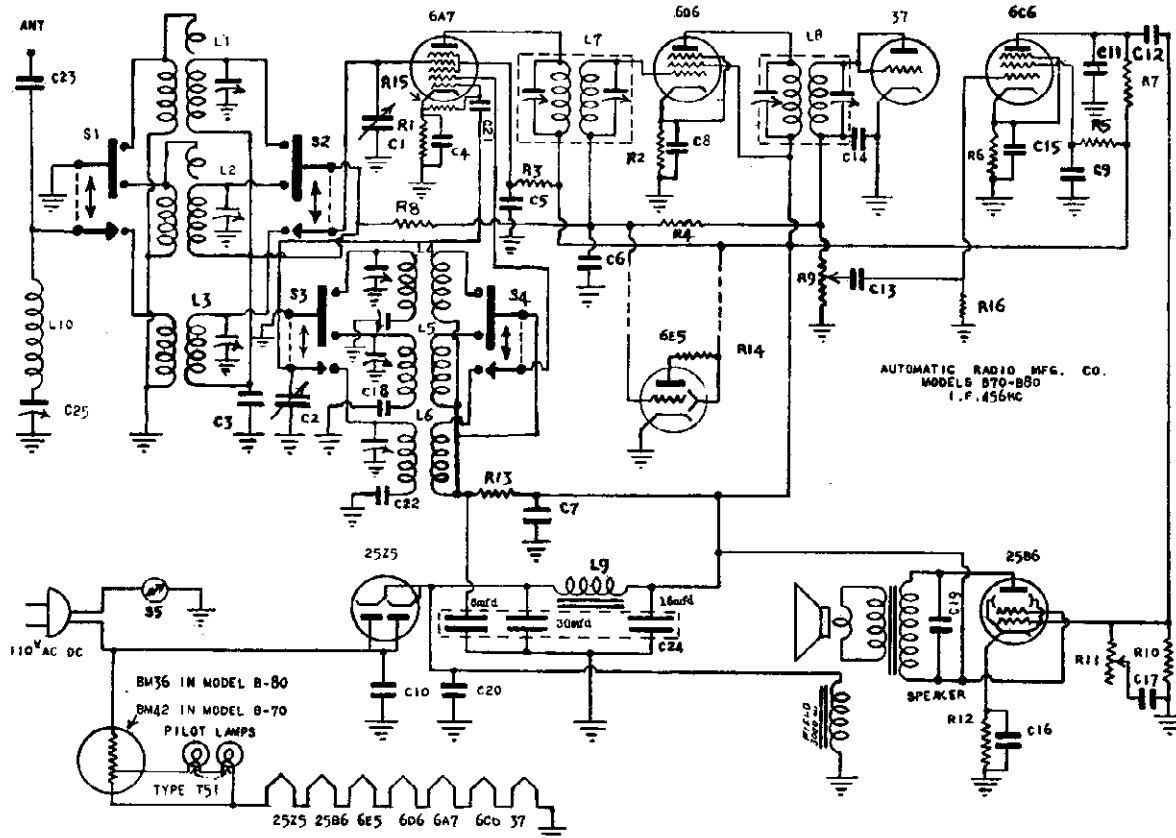
ALIGNMENT PROCEDURE

I. F. Alignment. Connect a signal generator set at 456kc to the 6A7 input and connect an output meter to the speaker output. Using a weak signal tune the two I. F. condensers on the composite coil and the two I. F. condensers on the output I. F. coil for maximum response.

Connect the signal generator set at 1400kc to the antenna lead using a dummy antenna of 200 mmf. Tune the set by means of the dial to 1400kc position. Adjust oscillator trimmer for this frequency. Pad at 600kc, Recheck 1400kc and trim antenna stage for maximum response. Repeating the alignment may result in improved sensitivity.

MODELS B70, B80
Schematic, Parts
Alignment

AUTOMATIC RADIO MFG. CO., INC.



AUTOMATIC RADIO MFG. CO.
MODELS B70-B80
I. F. 456kc

ALIGNMENT PROCEDURE

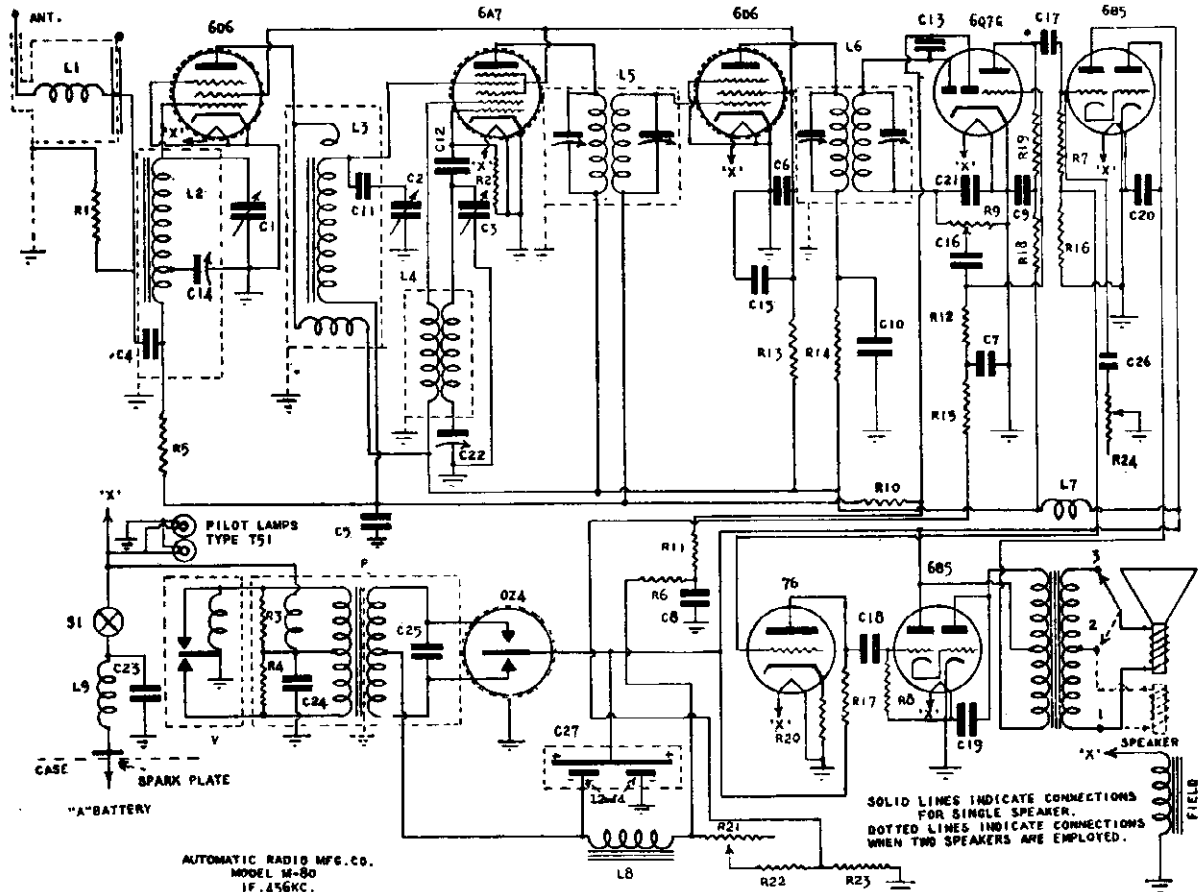
I. F. Alignment. Connect a signal generator set at 456kc to the 6A7 input and connect an output meter to the speaker output. Using a weak signal tune the two I. F. condensers on the composite coil and the two I. F. condensers on the output I. F. coil for maximum response.

R. F. Alignment. Connect the signal generator set at 1400kc to the antenna lead using a dummy antenna of 200mmf. Tune the set by means of the dial to 1400kc position. Adjust oscillator trimmer for this frequency. Pad at 600kc. Recheck 1400kc and trim antenna stage for maximum response. Repeating the alignment may result in improved sensitivity. Introduce a 456kc signal into the antenna lead and adjust Trap Condenser (C25) for minimum response.

SCHEMATIC LOCATION	DESCRIPTION	SCHEMATIC LOCATION	DESCRIPTION
L1	Antenna Coil Band A	C18	Mica " 1400mmfd
L2	" " " B	C19, C20	Fixed " .006mfd-600v
L3	" " " C	C21	Mica " 100mmfd
L4	Oscillator Coil Band A	C22	Fixed " 4500mmfd-200v
L5	" " " B	C23	Fixed " .002mfd-600v
L6	" " " C	C24	Electrolytic Condenser Block
L7	1st I.F. Coil	C25	Trimmer Condenser 3-30mmfd
L8	2nd I.F. Coil	R1, R2	Resistors 250 ohms-1/4 Watt
L9	Filter Choke	R3	" 25,000 ohms-1/4 Watt
L10	Antenna Wave Trap	R4	" 2 megohms-1/4 Watt
	Speaker	R5, R14	" 1 megohm-1/4 Watt
S1, S2, S3, S4	Band Switch	R6	" 2,500 ohms-1/4 Watt
S5	Line Switch (On Vol. Control)	R7, R8	" 250,000 ohms-1/4 Watt
C1, C2	Tuning Condenser	R9	Volume Control 250,000 ohms
C3, C4, C5, C6,		R10	Resistors 500,000 ohms-1/4 Watt
C7, C8, C9, C10	Fixed " .1mfd-200v	R11	Tone Control 500,000 ohms
C11, C14	Mica " 200mmfd	R12	Resistors 300 ohms-1 Watt
C12, C13	Fixed " .02mfd-600v	R13	" 7,500 ohms-1/4 Watt
C15, C16	Fixed " 5mfd-35v	R15	" 50,000 ohms-1/4 Watt
C17	Fixed " .0015mfd-600v	R16	" 2 megohms-1/4 Watt

AUTOMATIC RADIO MFG. CO., INC.

MODEL M80
Schematic, Part
Alignment



ALIGNMENT PROCEDURE

I. F. Alignment. Connect a signal generator set at 456 kc to the 6A7 grid. Connect an output meter across the secondary terminals of the speaker output transformer. With the weakest signal from the generator necessary to obtain .5 volt deflection on the output meter, peak the trimmers on both I. F. transformers.

R. F. Alignment. Insert a 200mmfd condenser in series with the antenna lead of the receiver and the signal generator. Set the receiver dial to 1400kc and the signal generator to the same frequency. Again with the weakest signal necessary to obtain 1 volt deflection of the output meter, adjust the trimmers on the oscillator, antenna and interstage sections of the variable condenser. Tune the receiver to 600kc and set the signal generator to this frequency. Adjust the padder condenser for maximum signal response to minimum signal input. Repeat the high frequency alignment.

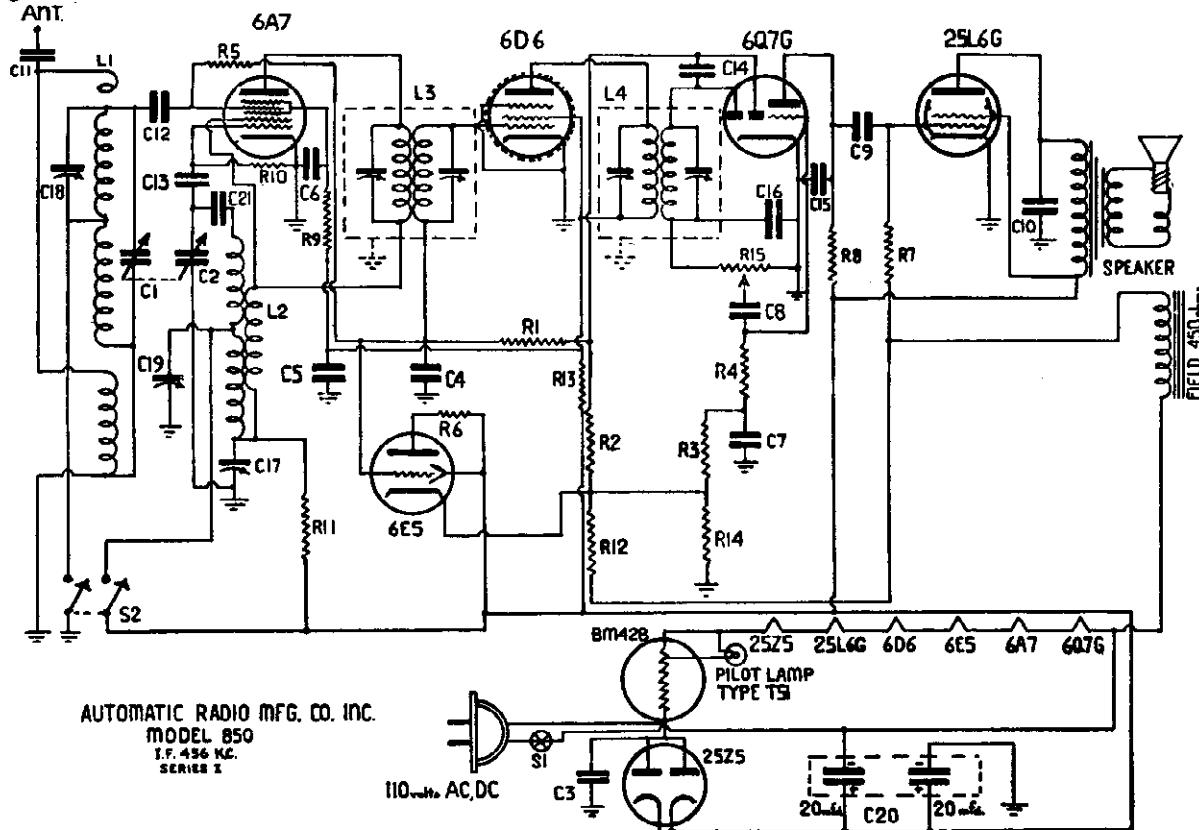
It is of the utmost importance in making these various adjustments that the signal level be attenuated as far as possible in order to overcome the AVC action which would otherwise introduce serious errors and prevent obtaining optimum results.

SCHEMATIC LOCATION	DESCRIPTION	SCHEMATIC LOCATION	DESCRIPTION
L1	Antenna Noise Filter	C15	Electrolytic " 8mfd—175v
L2	Antenna Coil	C16, C17, C18, C26	Fixed " .02mfd—200v
L3	Interstage Coil	C19, C20	Fixed " .006mfd—600v
L4	Oscillator Coil	C23, C24	Fixed " .5mfd—200v
L5	1st I.F. Coil	C25	Fixed " .008mfd—1200v
L6	2nd I.F. Coil	C27	Electrolytic Condenser Block
L7	"B" R.F. Choke	R1, R2	Resistors 50,000 ohms—1/3 Watt
L8	Filter Choke—100 ohms	R3, R4	" 50 ohms—1/3 Watt
L9	"A" R.F. Choke	R5, R6, R7, R8	" 1/2 megohm—1/3 Watt
S1	Speaker	R10, R11, R12	" 1 megohm—1/3 Watt
P	Line Switch (On Vol. Control)	R13	" 10,000 ohms—1/2 Watt
V	Power Transformer	R14	" 250 ohms—1/3 Watt
C1, C2, C3	Vibrator	R15, R16, R17, R18	" 100,000 ohms—1/3 Watt
C4	Tuning Condenser	R19	" 1/4 megohm—1/3 Watt
C5, C6, C7, C8, C9, C10	Fixed "	R20	" 5,000 ohms—1/3 Watt
C11	Fixed " .01mfd—200v	R22	" 17 ohms—1 Watt
C12, C13	Fixed " .1mfd—200v	R23	" 13 ohms—1 Watt
C14	Padder " 1477mfd	R9	Volume Control—1/2 megohm
C22	Padder " 1300mfd	R21	Sensitivity Control—115 ohms
C21	Padder " 300mfd	R24	Tone Control—50,000 ohms
	Mica " 100mmfd		
	Mica " 200mmfd		

MODEL 850

Schematic, Parts Alignment

AUTOMATIC RADIO MFG. CO., INC.



AUTOMATIC RADIO MFG. CO. INC.
MODEL 850
I.F. 456 KC.
SERIES 2

ALIGNMENT PROCEDURE

I. F. Alignment. The intermediate frequency to which this set should be adjusted is 456 K.C. To align the intermediate frequency transformers properly, a signal generator emitting a signal of 456 K.C. should be coupled to the signal control grid of the 6A7 tube through a 200 mmfd condenser. An output meter should be connected across the voice coil of the speaker. The four trimmers mounted internally in the top of the two I. F. cans should be adjusted to resonance. The output of the signal generator should be attenuated so as to provide the weakest possible signal necessary to produce a .5 volt deflection on the output meter.

R. F. Alignment. Adjust the signal generator to 17.4 MC. Feed this signal into the antenna lead of the receiver through a 400 ohm resistor. Rotate the band switch on the receiver to the Short Wave position and set the tuning dial to 17.4 on the Short Wave Scale. Adjust the trimmer on the rear section for maximum signal output. Rotate the Band Switch to the broadcast position. Replace the 400 ohm resistor in the Oscillator lead with a 200 mmfd condenser. Set the signal generator to 1560 K.C. and tune the receiver to the same frequency. Adjust the small trimmer condenser which is located near the Oscillator coil underneath the Chassis, to maximum signal response. Attenuate the output of the signal generator to the extent necessary for maintaining a deflection of .5 volts on the output meter and adjust the trimmer mounted on the front section of the variable condenser to resonance. Set the signal generator and the receiver at 600 K.C. and adjust the padder condenser for optimum response. Repeat the last two adjustments to insure accuracy of alignment. Rotate the Band Switch to the Short Wave position and with the signal generator and receiver tuned to 15 MC, adjust the small trimmer condenser which is located near the Short Wave Antenna coil. This last operation should be made with the 400 ohm resistor in the antenna circuit.

It is imperative that all adjustments be made with the minimum signal necessary to obtain the designated deflection on the output meter. This will obviate any difficulty arising from the A.V.C. action of the receiver, and will permit adjustment to absolute resonance.

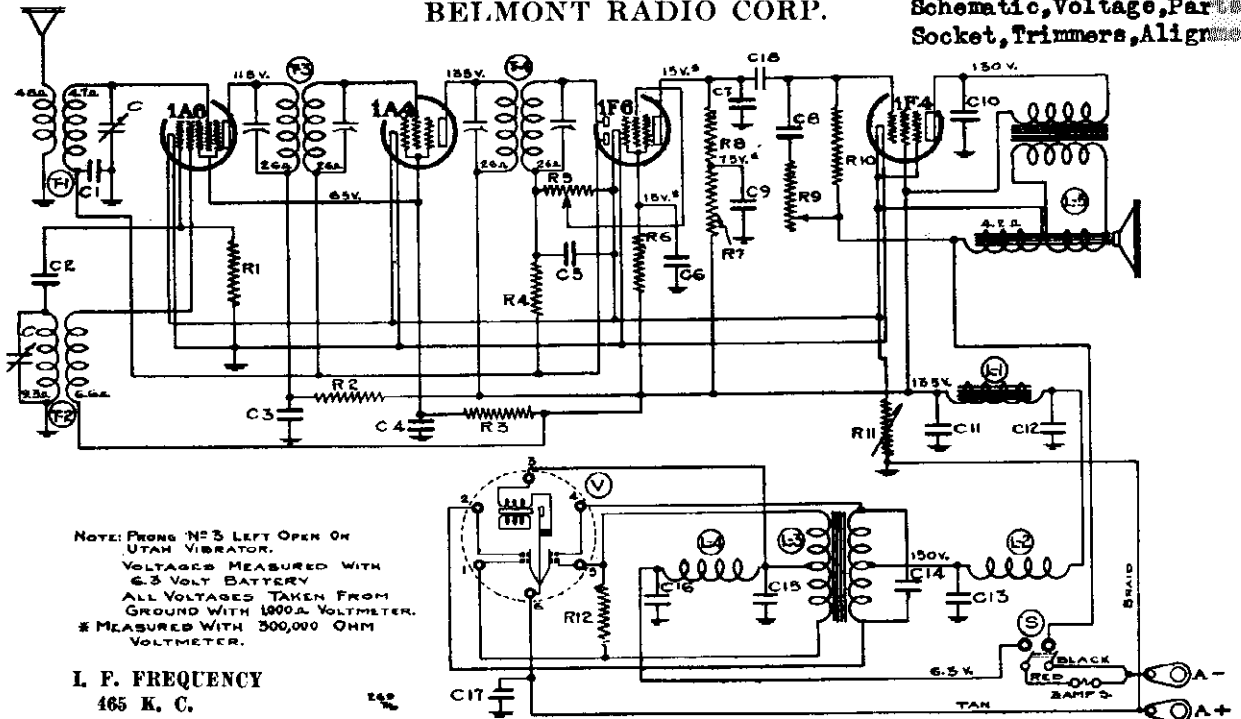
SCHEMATIC LOCATION

DESCRIPTION

L1	Antenna Coil	C17	Padder "	550mmfd
L2	Oscillator Coil	C18, C19	Trimmer "	3-30mmfd
L3	1st I F Transformer	C20	Electrolytic Condenser	
L4	2nd I F Transformer	R1, R2	Resistors	2 megohms—1/4 Watt
	Speaker	R3, R4, R5, R6	"	1 megohm—1/4 Watt
S1	Line Switch (On Vol. Control)	R7	"	1/2 megohm—1/4 Watt
S2	Band Selector Switch	R8	"	1/4 megohm—1/4 Watt
C1, C2	2 Sect. Variable Condenser	R9	"	25,000 ohms—1/4 Watt
C3, C4, C5, C6, C7	Fixed Condensers	R10	"	50,000 ohms—1/4 Watt
C8, C9, C10	Fixed "	R11	"	5,000 ohms—1/4 Watt
C11	Fixed "	R12	"	100 ohms—1 Watt
C12	Fixed "	R13	"	30 ohms—1/4 Watt
C13, 14	Mica "	R14	"	25 ohms—1/4 Watt
C15, C16	Mica "	R15	Volume Control	1/4 megohm
C21	Mica "			

BELMONT RADIO CORP.

MODEL 415, Series A
Schematic, Voltage, Parts
Socket, Trimmers, Alignment



No.	Part No.	Description
C1	100-10	.05 x 200 Volts CONDENSERS
C2	129-12	.00025 Mica
C3	100-33	.1 x 200 Volts
C4	100-33	.1 x 200 Volts
C5	129-12	.00025 Mica
C6	100-33	.1 x 200 Volts
C7	129-5	.0001 Mica
C8	100-25	.002 x 600 Volts
C9	100-9	.05 x 200 Volts
C10	100-7	.005 x 600 Volts
C11	119-28	5 mfd. x 200 Working Voltage
C12	119-28	5 mfd. x 200 Working Voltage
C13	100-33	.1 x 200 Volts
C14	100-34	.005 x 1300 Volts
C15	100-40	.5 mfd. x 200 Working Voltage

C16	100-40	.5 mfd. x 200 Working Voltage
C17	100-35	.5 x 200 Volts
C18	100-11	.01 x 400 Volts

NOTE: C11 & C12 in one unit—No. 119-28

RESISTORS		
R1	130-94	50M Ohm—1/3 Watt
R2	130-17	10M Ohm—1/3 Watt
R3	130-123	15M Ohm—1/2 Watt
R4	130-121	3.2 mekohm—1/3 Watt
R5	101-56	1 meg ohm—Volume Control
R6	130-19	1 meg ohm—1/3 Watt
R7	130-20	100M Ohm—1/3 Watt
R8	130-11	250M Ohm—1/3 Watt
R9	101-59	1 meg ohm—Tone Control
R10	130-37	750M Ohm—1/3 Watt
R11	101-44	4.75 Ohm—Filament Rheostat
R12	130-124	200 Ohm—1/2 Watt

MISCELLANEOUS PARTS		
C	102-38	One Section of Two Gang
T1	111-66	Antenna Coil
T2	110-45	Oscillator Coil
T3	108-84	Input I.F.—465 Kc.
T4	108-85	Output I.F.—465 Kc.
L1	105-30	Filter Choke
L2	123-3	R.F. Choke Coil
L3	104-62	Power Transformer
L4	105-19	"A" Choke
L5	114-50	6" Spkr. (Field Res. 4.2 Ohms)
S	101-56	On Volume Control
V	126-4	Vibrator Unit

NOTE: R11, Part No. 101-44 Variable Filament Rheostat is adjusted at the factory to keep the filament voltage of the tubes at 2 volts.

TUBES:

The tube complement of this chassis consists of the following tubes:

The type and function of each tube is as follows:

- 1—Type 1A6 Pentagrid Mixer, First Detector-oscillator.
- 1—Type 1A4 Super Control R. F. Tetrode I. F. Amplifier (465 K.C.)
- 1—Type 1F6 Duplex Diode Pentode, Second Detector, A.V.C. and First Audio.
- 1—Type 1F4 Pentode Output Amplifier.

ALIGNING I.F. TRANSFORMERS: (465 K. C.):

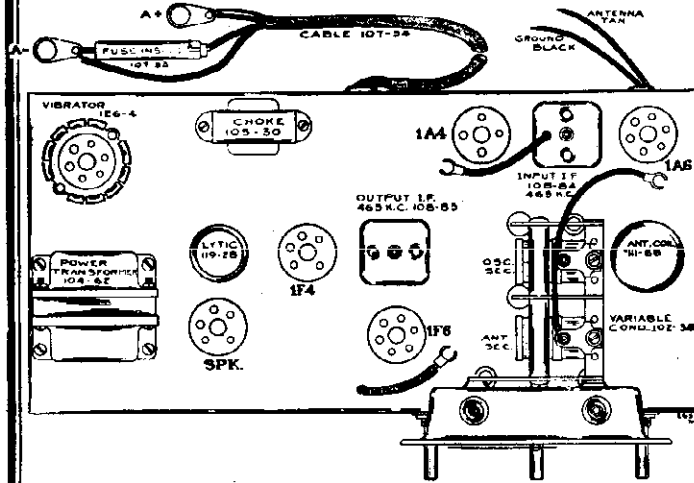
- Part No. 108-85 Output I.F. Transformer.
- Part No. 108-84 Input I.F. Transformer.

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view)

1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
 - (a) Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 1A4 tube, and adjust the output I.F. transformer (No. 108-85) to resonance.
 - (b) Move oscillator output clip from grid of 1A4 to grid cap of 1A6 and adjust input I.F. transformer (No. 108-84) to resonance.
 - (c) With oscillator still connected to 1A6, readjust output I.F. transformer (108-85) if necessary.

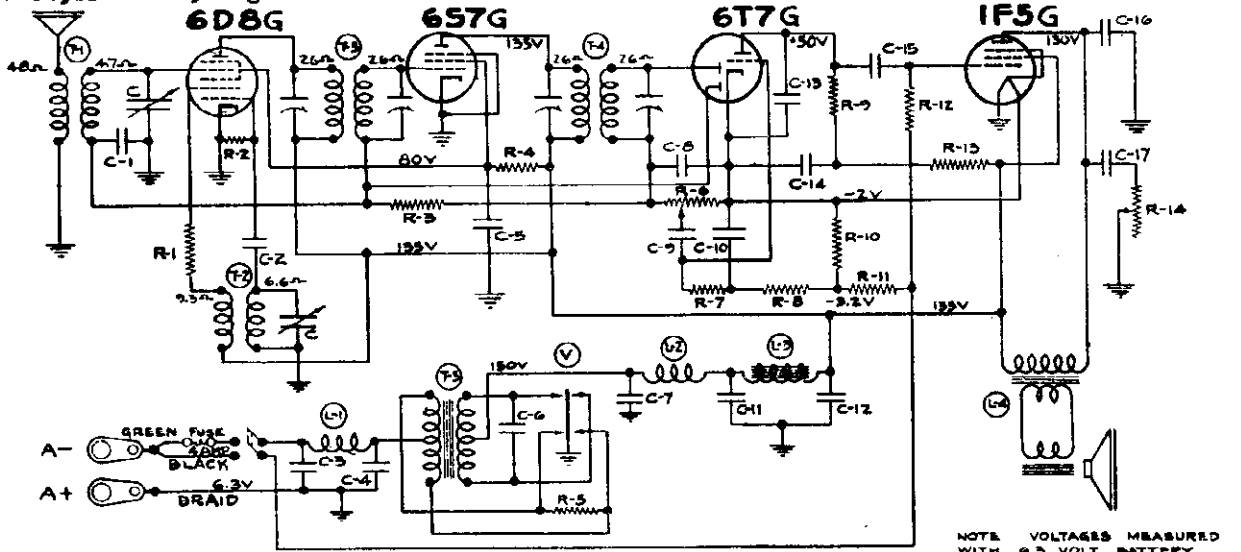
R.F. ALIGNMENT: (535-1720 K.C.)

1. With gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 200 mfd. condenser to tan antenna and black ground leads and make the following adjustments:
 - (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer (rear of gang condenser).
 - (b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance (front section of gang condenser).
 - (c) Check sensitivity at 600 and 1000 kilocycles.



MODEL 415, Series B
Schematic, Voltage
Socket, Trimmers, Alignment

BELMONT RADIO CORP.

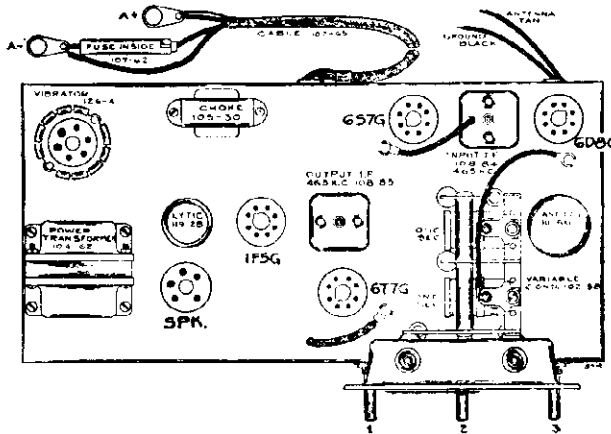


IF PEAK 465 KC

NOTE: VOLTAGES MEASURED WITH 9.5 VOLT BATTERY. ALL VOLTAGES TAKEN FROM GROUND WITH 1000Ω PER VOLT METER. * MEASURED WITH 0-300V SCALE.

No.	Part No.	DESCRIPTION	CONDENSERS
R1	130-23	2M-1/3	C1 100-9 .05-200 v.
R2	130-76	30M-1/3	C2 129-39 .00005-Mica
R3	130-121	3.2 meg-1/3	C3 100-40 .5-200 v.
R4	130-123	15M-1/2	C4 100-40 .5-200 v.
R5	130-84	200-1/3	C5 100-33 .1-200 v.
R6	101-56	1 meg-Volame Control	C6 100-34 .005-1200 v.
R7	130-19	1 meg-1/3	C7 103-33 .1-200 v.
R8	130-19	1 meg-1/3	C8 129-5 .0001-Mica
R9	130-100	150M-1/3	C9 100-11 .01-400 v.
R10	106-36	10 Ohm Muter	C10 100-11 .01-400 v.
R11	106-36	25 Ohm Muter	C11 119-28 5. Electrolytic-200 wv.
R12	130-19	1 meg-1/3	C12 119-28 5. Electrolytic-200 wv.
R13	130-20	100M-1/3	C13 129-12 .00025-Mica
R14	101-72	300M-Tone control	C14 100-33 .1-200 v.
			C15 100-11 .01-400 v.
			C16 100-37 .003-600 v.
			C17 100-11 .01-400 v.

- PARTS**
- T1 111-66 Antenna Coil
 - T2 110-45 Oscillator Coil
 - T3 108-84 Input I. F. Coil
 - T4 108-85 Output I. F. Coil
 - T5 104-62 Power Transformer
 - L1 105-19 "A" Choke
 - L2 123-1 RF "B" Choke
 - L3 105-30 Filter Choke
 - L4 114-63 Speaker (P. M. Dynamic)
 - V 126-4 Vibrator
 - C Variable Condenser



The type and function of each tube is as follows:

- 1—Type 6D8G Pentagrid Mixer, First Detector-oscillator.
- 1—Type 6S7G Remote Cut-off Pentode I. F. Amplifier (465 K.C.)
- 1—Type 6T7G Duplex Diode Triode, Second Detector, A.V.C. and First Audio.
- 1—Type 1F5G Pentode Output Amplifier.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and screen terminals of the type 1F5G output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

ALIGNING I.F. TRANSFORMERS: (465 K. C.):

- Part No. 108-85 Output I.F. Transformer.
- Part No. 108-84 Input I.F. Transformer.

These I.F. Transformers have two adjustments, both of which are accessible from the top of chassis (see fig. 1, top view page 2).

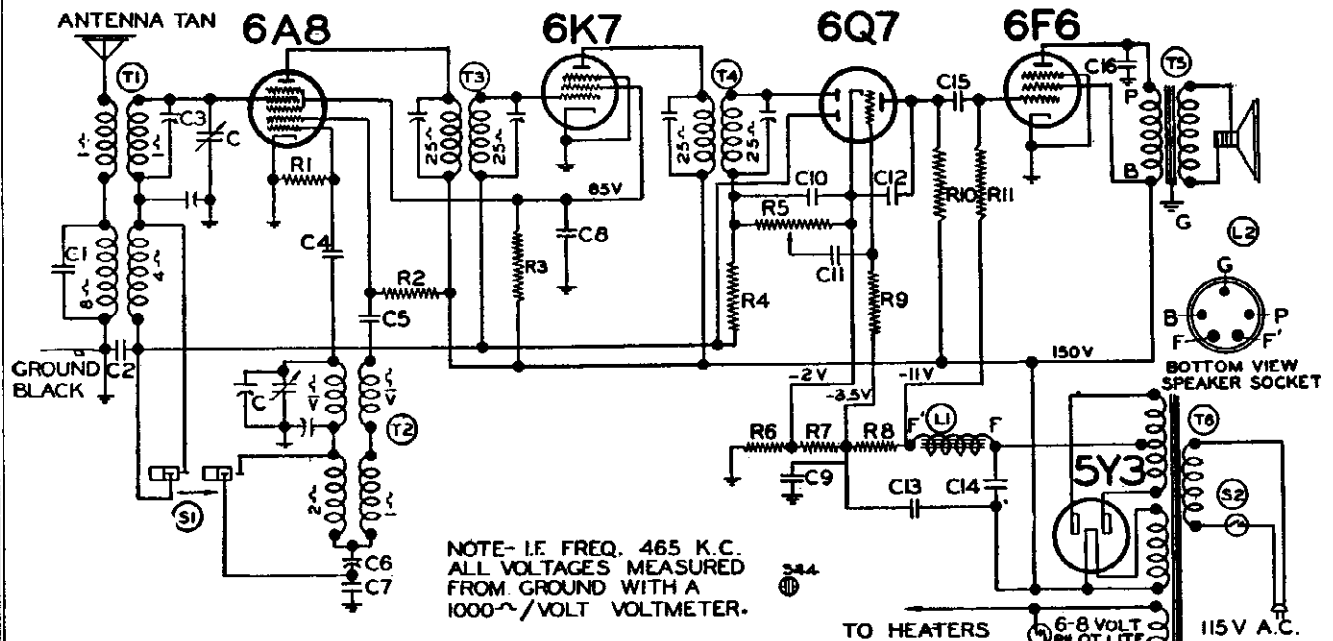
- With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments.
 - Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 6S7G tube, and adjust the output I.F. transformer (No. 108-85) to resonance.
 - Move oscillator output clip from grid of 6S7G to grid cap of 6D8G and adjust input I.F. transformer (No. 108-84) to resonance.
 - With oscillator still connected to 6D8G readjust output I.F. transformer (108-85) if necessary.

R. F. ALIGNMENT: (535-1720 K.C.)

- With gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 200 mmf. condenser to tan antenna and black ground leads and make the following adjustments:
 - With external oscillator set at 1720 kilocycles, adjust oscillator trimmer (rear of gang condenser).
 - Re-set external oscillator to 1400 kilocycles, rotate condenser, pick-up oscillator signal and adjust antenna trimmer to resonance (front section of gang condenser).
 - Check sensitivity at 600 and 1000 kilocycles.

BELMONT RADIO CORP.

MODEL 588, Series A
Schematic, Voltage
Socket, Trimmers, Parts



NOTE- I.F. FREQ. 465 K.C.
ALL VOLTAGES MEASURED
FROM GROUND WITH A
1000~ VOLT VOLTMETER.

No. Part No. Description

CONDENSERS

C1	129-12	.0025 - Mica 20%
C2	100-22	.05 x 200 25%
C3	124-39	Adjustable Condenser 2-20 mmf.
C4	129-5	.0001 - Mica 20%
C5	100-37	.003 x 600 v. 10%
C6	124-38	Series Pad - 600 mmf.
C7	129-74	.0015 Mica 2 1/2 %
C8	100-1	.1 x 400 v. 50% - 10%
C9	100-20	.1 x 200 v. 25%
C10	129-5	.0001 Mica 20%
C11	100-11	.01 x 400 v. 25%
C12	129-2	.0005 Mica 20%
C13	119-38	5 mfd. 200 w. v. Black
C14	119-38	5 mfd. 250 w. v. Brown
C15	100-11	.01 x 400 v. 25%
C16	100-19	.006 x 600 v. 25%

C13 and C14 - in one unit. 535 to 1720 K.C. (Kilocycles)

RESISTORS

R1	130-12	50M ohm - 1/3 w. 20%
R2	130-17	10M ohm - 1/3 w. 20%
R3	130-149	15M ohm - 1/3 w. 20%
R4	130-4	3 megohm - 1/3 w. 20%
R5	101-71	1 megohm - Volume control
R6	106-35	65 ohm - Muter
R7	106-35	45 ohm - Muter
R8	106-35	220 ohm - Muter
R9	130-4	3 megohm - 1/3 w. 20%
R10	130-9	200M ohm - 1/3 w. 20%
R11	130-3	500M ohm - 1/3 w. 20%

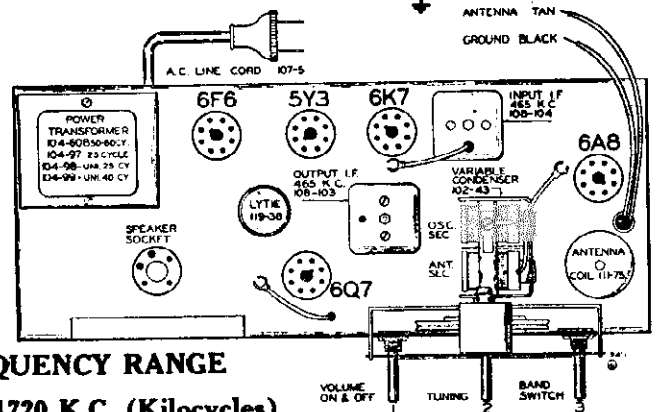
R6, R7 and R8 in one unit

PARTS

T1	111-75	Antenna coil complete
T2	110-60	Oscillator coil complete
T3	108-104	Input I.F. Assembly complete
T4	108-103	Output I.F. Assembly complete
T5		Output Transformer
T6	104-60B	Power Transformer
L1		2000 ohm - speaker field
L2	114-61	Dynamic speaker
S1	125-27	Wave change switch
S2		Switch on Volume Control

FREQUENCY RANGE

2000 to 7000 K.C. (Kilocycles) Vol. Control On-Off Switch Tuning Band Control Switch



The tube complement of this chassis consists of the following octal base glass tubes which are interchangeable with metal tubes:

- 1—Type 6A8G Pentagrid mixer, first detector-oscillator.
- 1—Type 6K7G Remote cut-off pentode I.F. amplifier (465 K.C.)
- 1—Type 6Q7G duplex diode triode second detector, A.V.C. and audio.
- 1—Type 6F6G—pentode output amplifier.
- 1—Type 5Y3G or 5W4—high vacuum rectifier.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 25, 40 and 60 cycles and with primary taps for 108, 127, 150, 225, and 260 volts, (see instructions) and also sometimes equipped with 25 cycle transformers with 105-115 volt or 220 volt primaries, not universals.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 115 volts on the primary of the power transformer.

MODEL 588, Series A
Trimmers, Alignment

BELMONT RADIO CORP.

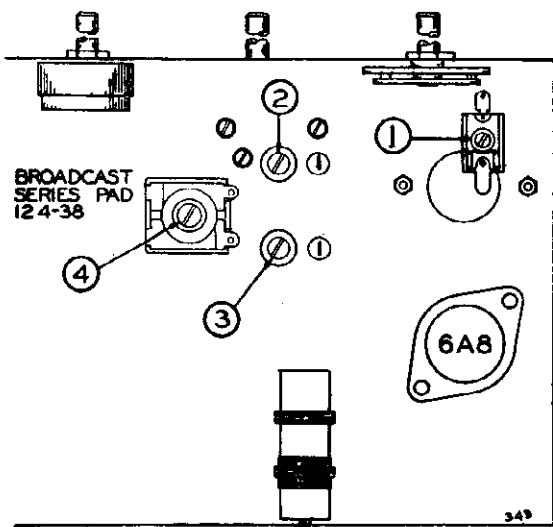


FIG. 3.—BOTTOM VIEW SHOWING TRIMMERS

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between the plate and screen terminals of the type 6F6G output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-103 Output I.F. Transformer

Part No. 108-104 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser in its minimum capacity position, plates entirely out of mesh, make the following adjustments:

(a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6K7G tube, and adjust the output I.F. transformer (No. 108-103) to resonance.

(b) With "Dummy 1" still connected, move oscillator output clip from grid of 6K7G to grid cap of 6A8G and adjust input I.F. transformer (No. 108-104) to resonance.

SHORT WAVE BAND ALIGNMENT:

2000 to 7000 Kilocycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 6 megacycles and connected in series with "Dummy 3" to the antenna and ground leads, make the following adjustments:

(a) Move dial pointer to 6 megacycles and adjust short wave oscillator trimmer to resonance.

This adjustment is the trimmer mounted on the top of rear section of the variable gang condenser (see Fig. 1, top view).

(b) Adjust short wave antenna trimmer (Adjustment Number 1), to resonance (see Fig. 3, bottom view).

BROADCAST BAND ALIGNMENT:

535 to 1720 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to antenna and ground leads make following adjustments:

(a) Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance. (Adjustment number 3, see bottom view of chassis, Fig. 3).

(b) Re-set external oscillator to 1400 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (adjustment number 2), to resonance.

(c) Re-set external oscillator to 600 K.C., and adjust broadcast series pad (adjustment number 4), to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3).

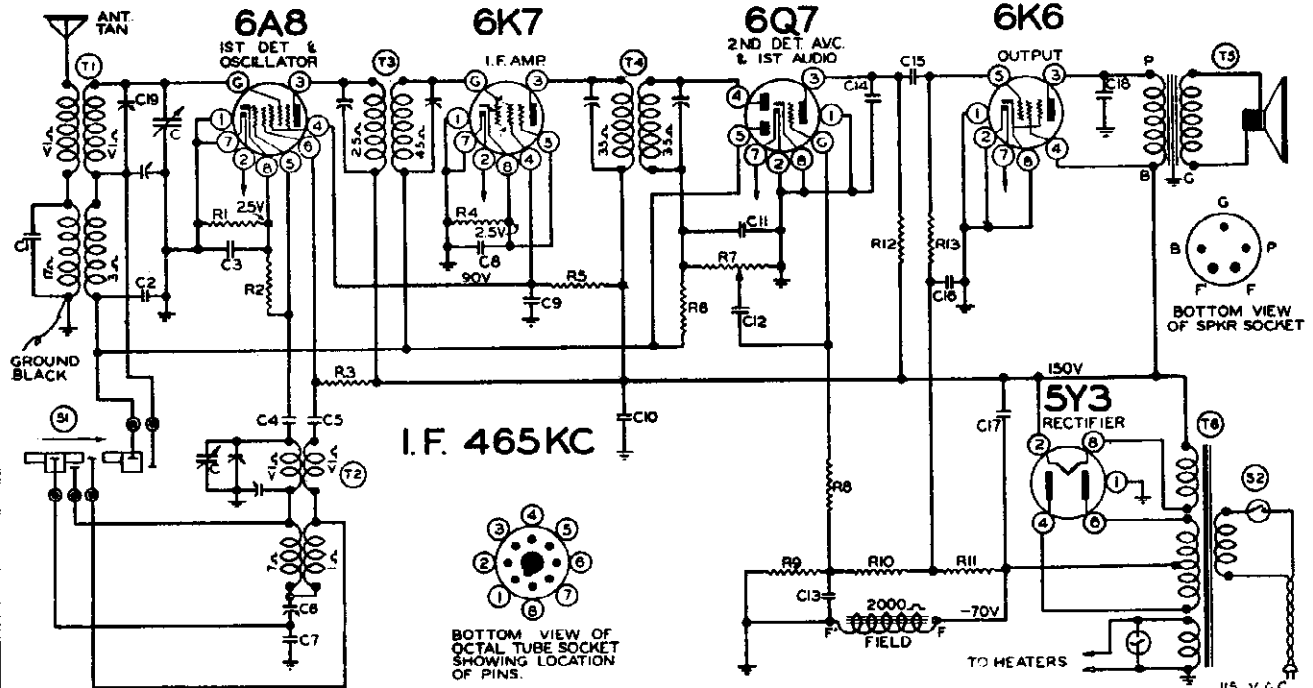
(d) Repeat adjustments "a" and "b" until sensitivity is at its maximum.

(e) Check for tracking and sensitivity at 1400, 1000, and 600 kilocycles. Under no circumstances bend plates of variable condenser sections to correct tracking.

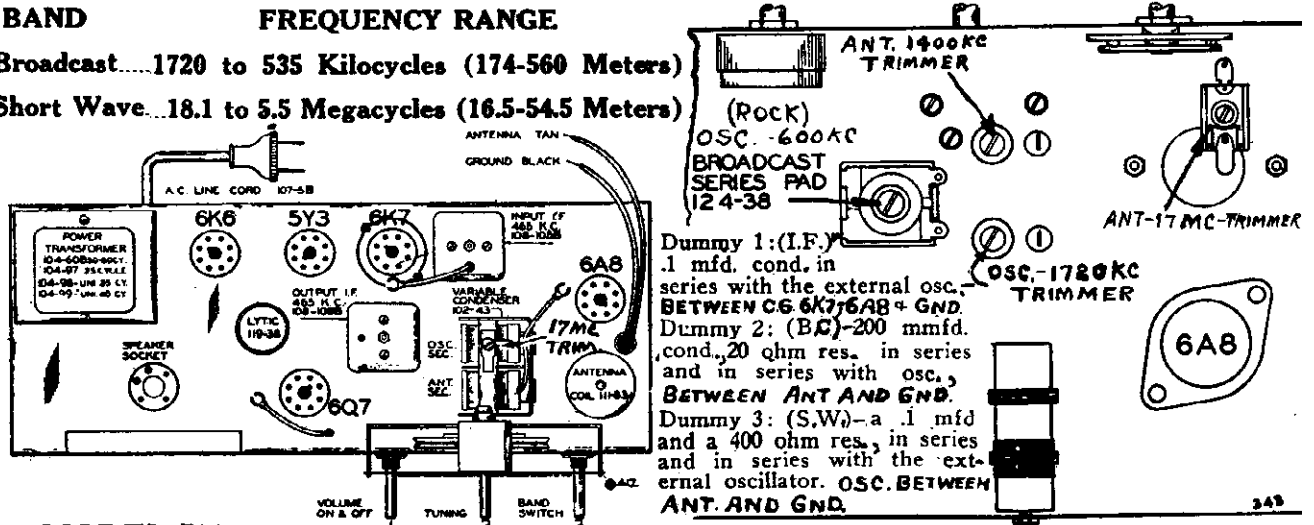
BELMONT RADIO CORP.

MODEL 589
Schematic, Socket
Trimmers, Alignment
Parts, Voltage

CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION



BAND **FREQUENCY RANGE**
Broadcast.....1720 to 535 Kilocycles (174-560 Meters)
Short Wave...18.1 to 5.5 Megacycles (16.5-54.5 Meters)



MODEL 589
SERIES "A"

Vol. Control On-Off Switch Tuning Band Control Switch

FIG. 3.—BOTTOM VIEW SHOWING TRIMMERS

FIG. 1—TOP VIEW

RESISTORS		CONDENSERS	
R	Value	C	Value
R1	130-83 300 ohm - 1/3 w. 10%	C1	102-43 2 gang variable Condenser
R2	130-12 50M ohm - 1/3 w. 20%	C2	129-5 .0001 Mica
R3	130-17 10M ohm - 1/3 w. 20%	C3	100-22 .05 x 200 v. - 25%
R4	130-93 450 ohm - 1/3 w. 10%	C4	100-20 .1 x 200 v. - 25%
R5	130-49 15M ohm - 1/3 w. 20%	C5	129-39 .00005 - 20% - Mica
R6	130-4 3 megohm - 1/3 w. 20%	C6	100-25 .002 x 600 v. - 20%
R7	101-71 1 megohm Volume control	C7	124-38 600 mmf. Series Pad. Adj.
R8	130-4 3 megohm - 1/3 w. 20%	C8	129-54 .003 - 2 1/4% Mica
R9	130-176 20M ohm - 1/3 w. 10%	C9	100-20 .1 x 200 v. - 25%
R10	130-80 150M ohm - 1/3 w. 10%	C10	100-1 .1 x 400 v. - 50 - 10%
R11	130-46 800M ohm - 1/3 w. 10%	C11	119-38 5.0 mfd. - 250 w. v. 'Lytic
R12	130-9 200M ohm - 1/3 w. 20%	C12	129-5 .0001 - 20% Mica
R13	130-3 500M ohm - 1/3 w. 20%	C13	100-11 .01 x 400 v. - 25%
		C14	100-20 .1 x 200 v. - 25%
			129-2 .0005 - 20% Mica

C	Value	Notes
C15	100-26	.02 x 400 v. - 25%
C16	100-20	.1 x 200 v. - 25%
C17	119-38	5.0 mfd. - 250 w.v. 'Lytic
C18	100-37	.003 x 600 v. - 10%
C19	124-39B	2 - 25 mmf. Adj. Cond.

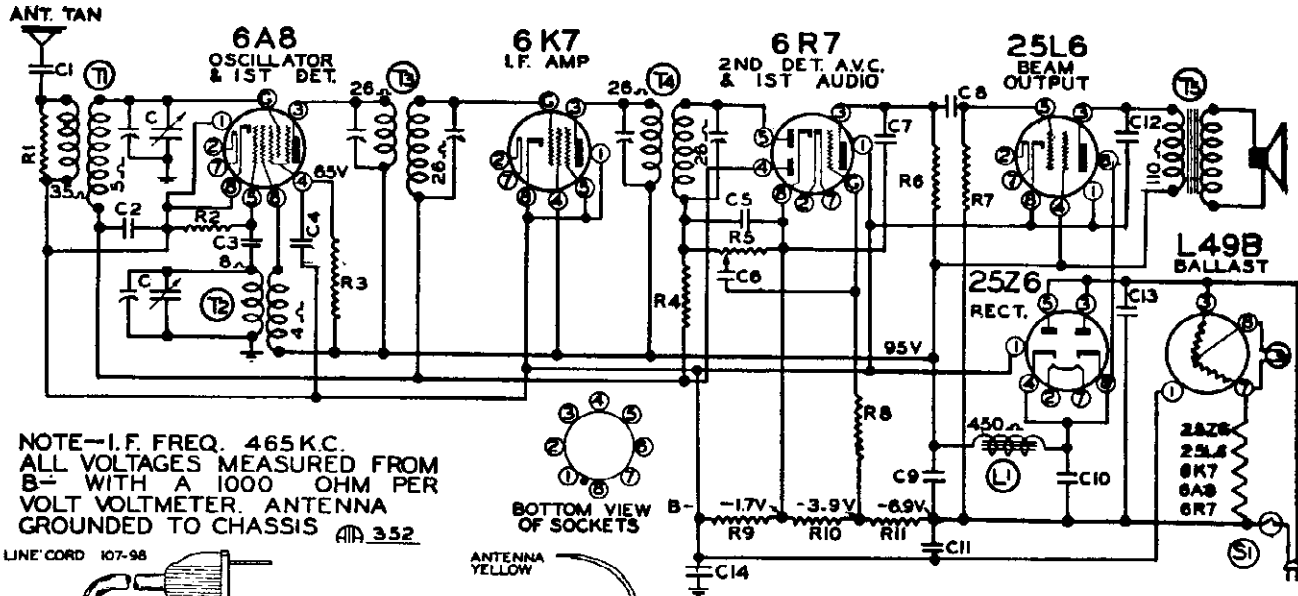
PARTS

T	Value	Notes
T1	111-83	Ant. Coil
T2	110-66	Osc. Coil
T3	108-105B	Input I.F. - 465 kc.
T4	108-106P	Output I.F. - 465 kc.
T5	114-61	6" Dynamic speaker
T6	104-60B	Power Transformer
S1	125-37	Wave Band Switch
S2		On-off switch on volume control

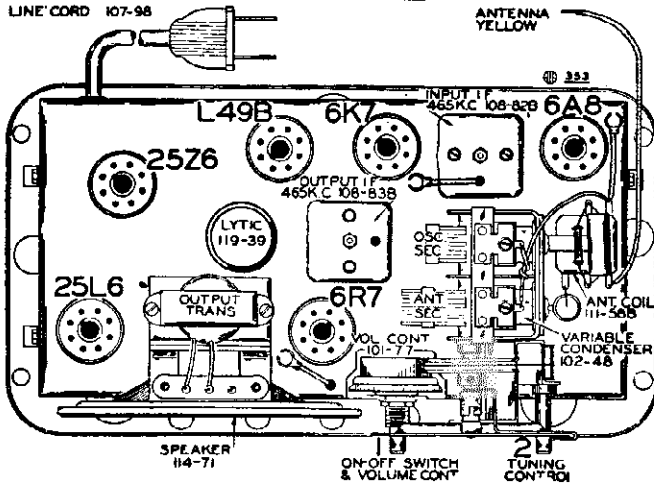
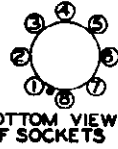
MODEL 602
Schematic, Socket

BELMONT RADIO CORP.

Voltage, Trimmers
Alignment, Parts



NOTE--I.F. FREQ. 465 K.C.
ALL VOLTAGES MEASURED FROM
B- WITH A 1000 OHM PER
VOLT VOLTMETER. ANTENNA
GROUNDED TO CHASSIS Φ 352



- (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer to resonance. This adjustment is on the top of rear section of variable gang condenser. (See Fig. 1).
- (b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance. (Top of front section of gang condenser).
- (c) Check sensitivity at 600 and 1000 kilocycles.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on diagram are measured with 119 volt A.C. or D.C. line.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

- Part No. 108-83B Output I.F. Transformer
 - Part No. 108-82B Input I.F. Transformer
- These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see Fig. 1).

1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
 - (a) Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 6K7G tube, and adjust the output I.F. transformer (No. 108-83B) to resonance.
 - (b) Move oscillator output clip from grid of 6K7G to grid of 6A8G and adjust input I.F. transformer (No. 108-82B) to resonance.
 - (c) With oscillator still connected to 6A8G, readjust output I.F. transformer (108-83B) if necessary.

R.F. ALIGNMENT: (535-1720 K.C.)

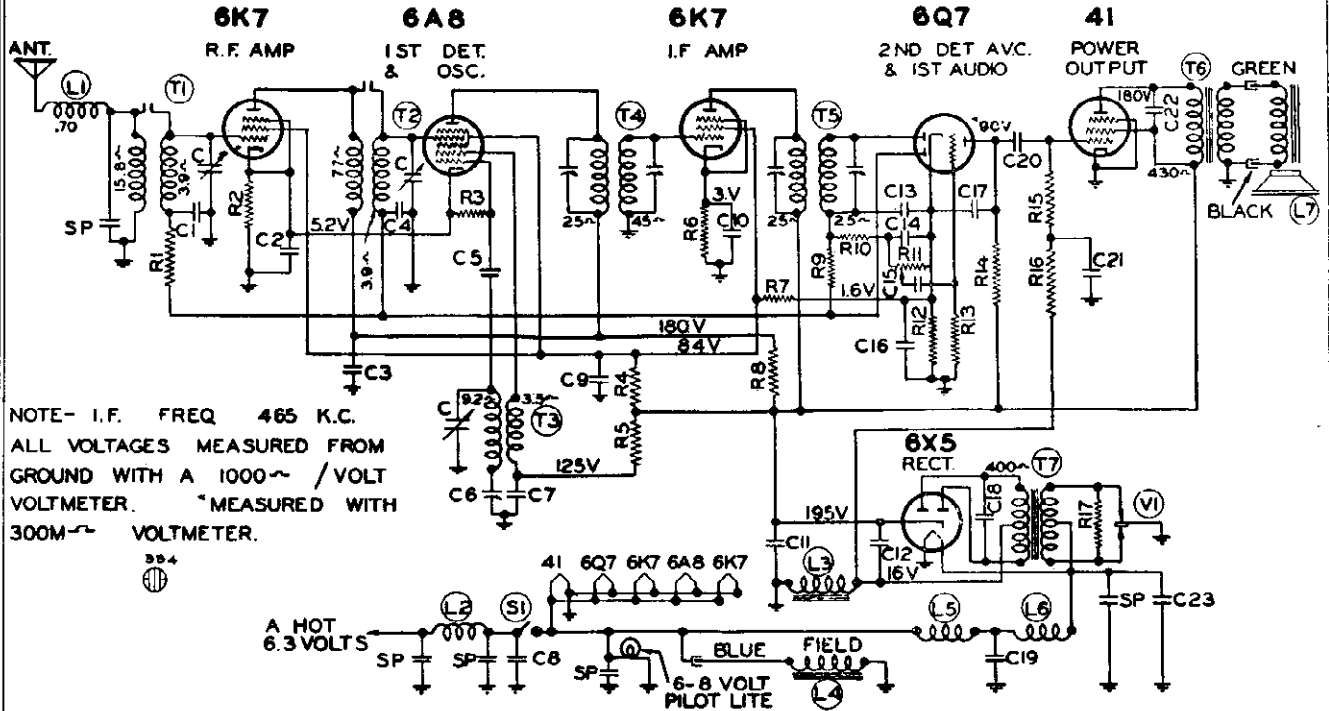
1. With gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 200 mmf. condenser to the antenna lead and chassis ground and make the following adjustments:

RESISTORS		CONDENSERS	
No.	Part No.	Description	
R1	130-17	10M ohm - 1/3 w.	20%
R2	130-12	50M ohm - 1/3 w.	20%
R3	130-149	15M ohm - 1/3 w.	20%
R4	130-4	3 meg ohm - 1/3 w.	20%
R5	101-77	Volume Control (1 Meg)	
R6	130-12	50M ohm - 1/3 w.	20%
R7	130-20	100M ohm - 1/3 w.	20%
R8	130-19	1 megohm - 1/3 w.	20%
R9	106-38	30 ohm	
R10	106-38	40 ohm	
R11	106-38	55 ohm	
R9, R10, and R11 in one unit			
C	102-48	2 gang variable	
C1	100-25	.002 x 600	25%
C2	100-9	.05 x 200	25%
C3	129-12	.00025 Mica	20%
C4	100-22	.05 x 200	25%
C5	129-5	.0001 Mica	20%
C6	100-11	.01 x 400	25%
C7	129-2	.0005 Mica	20%
C8	100-22	.05 x 200	25%
C9	119-39	20 mfd. lytic - 100 w.v.	
C10	119-39	15 mfd. lytic - 100 w.v.	
C11	100-20	.1 x 200	25%
C12	100-13	.05 x 400	25%
C13	100-39	.1 x 400	20%
C14	100-53	.25x400	20%

PARTS	
T1	111-58B
T2	110-46
T3	108-82B
T4	108-83B
T5	114-71
L1	450 ohm speaker field
S1	Switch on Volume Control

BELMONT RADIO CORP.

MODEL 661
Schematic, Voltage
Socket, Trimmers, Parts



NOTE- I.F. FREQ 465 K.C.
ALL VOLTAGES MEASURED FROM
GROUND WITH A 1000~ /VOLT
VOLTMETER. *MEASURED WITH
300M~ VOLTMETER.

No. Part No. Description

CONDENSERS

C	102-26	3 Gang Variable Condenser
C1	100-63	.05 x 200v. 50 - 10%
C2	100-63	.1 x 200v. 50 - 10%
C3	100-13	.05 x 400v. 25%
C4	100-22	.05 x 200v. 25%
C5	129-12	.00025 Mica - 20%
C6	124-37	Series Pad
C7	100-20	.1 x 200 v. 25%
C8	100-31	.5 x 120 v. 10 50%
C9	100-62	.25 x 200 v. 50 - 10%
C10	100-20	.1 x 200 v. 25%
C11	119-37	8 mfd. lytic 300 wv.
C12	119-37	4 mfd. lytic 300 wv.
C13	129-5	.0001 Mica 20%
C14	129-5	.0001 Mica 20%
C15	100-11	.01 x 400 v. 25%
C16	100-11	.01 x 400 v. 25%
C17	129-5	.0001 Mica 20%
C18	100-58	.005 x 1200 v. 20 - 10%
C19	100-31	.5 x 120 v. - 10 50%
C20	100-11	.01 x 400 v. 25%
C21	100-62	.25 x 200 v. 50 - 10%
C22	100-54	.006 x 600 v. 25%
C23	100-31	.5 x 120 v. - 10 50%
SP		Spark Plate

RESISTORS

R1	130-20	100M - 1/3 w. - 20%
R2	130-54	500 ohm - 1/3 w. - 20%
R3	130-12A	50M ohm - 1/3 w. insulated 20%
R4	130-165	15M ohm - 1 w. - 20%
R5	130-131A	20M ohm - 1/2 w. -insulated -10%
R6	130-24	400 ohm - 1/3 w. - 20%
R7	130-139A	40M ohm - 1/3 w. Insulated -20%
R8	130-31A	1500 ohm - 1/3 w. insulated -20%
R9	130-19	1 megohm - 1/3 w. - 20%
R10	130-52	50M ohm - 1/3 w. - 20%
R11	101-41	500M ohm - Volume Control
R12	130-153	700 ohm - 1/3 w. - 20%
R13	130-19	1 megohm - 1/3 w. - 20%
R14	130-11A	250M - 1/3 w. Insulated - 20%
R15	130-5A	300M ohm - 1/3 w. insulated -20%
R16	130-11A	250M ohm - 1/3 w. insulated -20%
R17	130-84	200 ohm - 1/3 w. insulated - 20%

PARTS

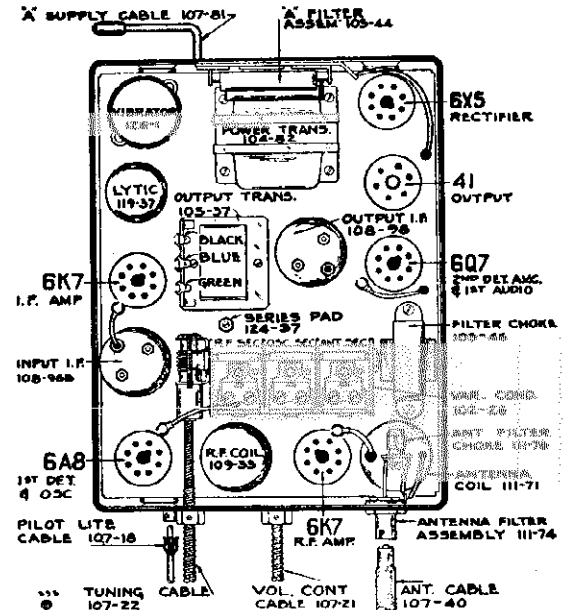
T1	111-71	Antenna Coil Complete
T2	109-35	R.F. Coil Complete
T3	110-57	Oscillator Coil Complete
T4	108-96B	Input I.F. Complete
T5	108-98	Output I. F. Complete
T6	105-37	Output Transformer
T7	104-82	Power Transformer
L1	111-76	Antenna Filter Choke
L2	105-26	"A" Choke
L3	105-46	"B" Filter Choke, 335 ohm
L4		Speaker Field, 4 ohm
L5	105-24	"A" Choke
L6	105-19	"A" Choke
L7	114-59	Dynamic Speaker
S1		Switch on Volume Control
V1	126-1	Vibrator

C1, C2 in same block
C11 and C12 in same block
C9 and C21 in same block

CONNECTIONS TO BATTERY

The battery cable, number 107-82, (red wire with fuse receptacle at one end and terminal lug at other end) must be connected to battery terminal of ammeter. At the same time connect ammeter capacitor, number 148-3, to battery terminal of ammeter, other end of condenser to any convenient grounded screw on back of instrument panel. Make certain that insulating sleeve is slipped over fuse when fuse is placed in receptacle, before connecting to short battery cable from receiver.

When connected properly, the discharge due to current drawn by the receiver should not indicate on the ammeter. This is important, since if improperly connected, as shown by the deflection of ammeter, additional motor interference may be encountered.



MODEL 661

**Alignment, Assembly
Wiring Data**

BELMONT RADIO CORP.

SERVICE NOTES

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

In order to prevent signal from acting upon A.V.C. and affecting accuracy of voltage measurements, aerial and ground leads should be short circuited while making measurements.

All voltages are to be measured with 6.3 volts input to receiver. Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

DESCRIPTION

Model No. 661 is a six-tube superheterodyne receiver having a tuning range of 530 K.C. to 1550 K.C., operates from a 6.0 volt storage battery and uses the automotive type 6.3 volt tubes. The "B" supply is obtained from a vibrator with a tube rectifier.

The I.F. frequency used is 465 K.C., the R.F. end of the receiver consisting of a high gain iron core antenna coil which gives high signal to noise ratio and an R.F. stage especially designed to give high image rejection and high I.F. attenuation. The I.F. transformers are designed to give high gain and selectivity and yet to have a broad nose for ease of tuning and hi-fidelity response. They are of the air core type and wound with solid wire to give minimum drift and variation of gain due to climatic changes.

This receiver has been carefully designed to facilitate servicing, the top and bottom covers are both removable and are fastened in place by spring clips, self tapping screws and trimount buttons.

DUMMY ANTENNAS

The dummy antennas referred to in the following instructions are:

"I.F. Dummy" —A .5 mfd. condenser connected in series with the test oscillator output lead.

"Broadcast Dummy"—A 175 mmfd. condenser connected in series with the output lead of the test oscillator.

RESONANCE INDICATOR

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and screen terminals of the type 41 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

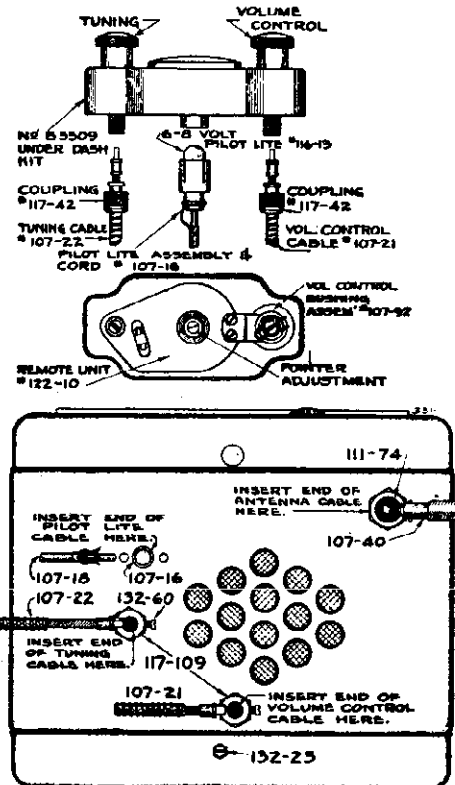
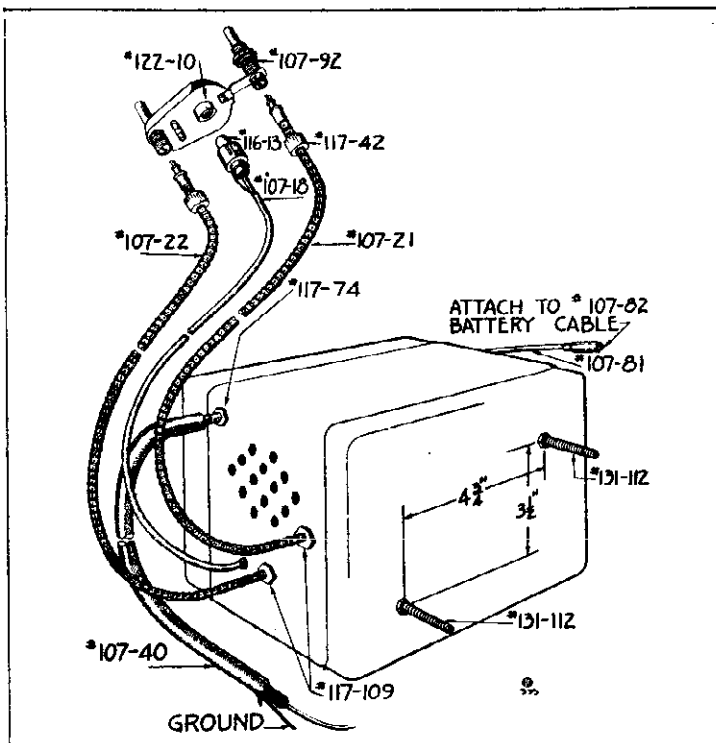
I.F. ALIGNMENT: (465 K.C.)

1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 465 K.C. in series with I.F. dummy antenna, to grid of 6K7 I.F. tube.
2. Adjust trimmer condensers of output I.F. transformer No. 108-98 to resonance with oscillator.
3. Move test oscillator connection to grid of 6A8 tube and adjust trimmer condensers of input I.F. transformer No. 108-96B to resonance with oscillator. See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.

BROADCAST ALIGNMENT

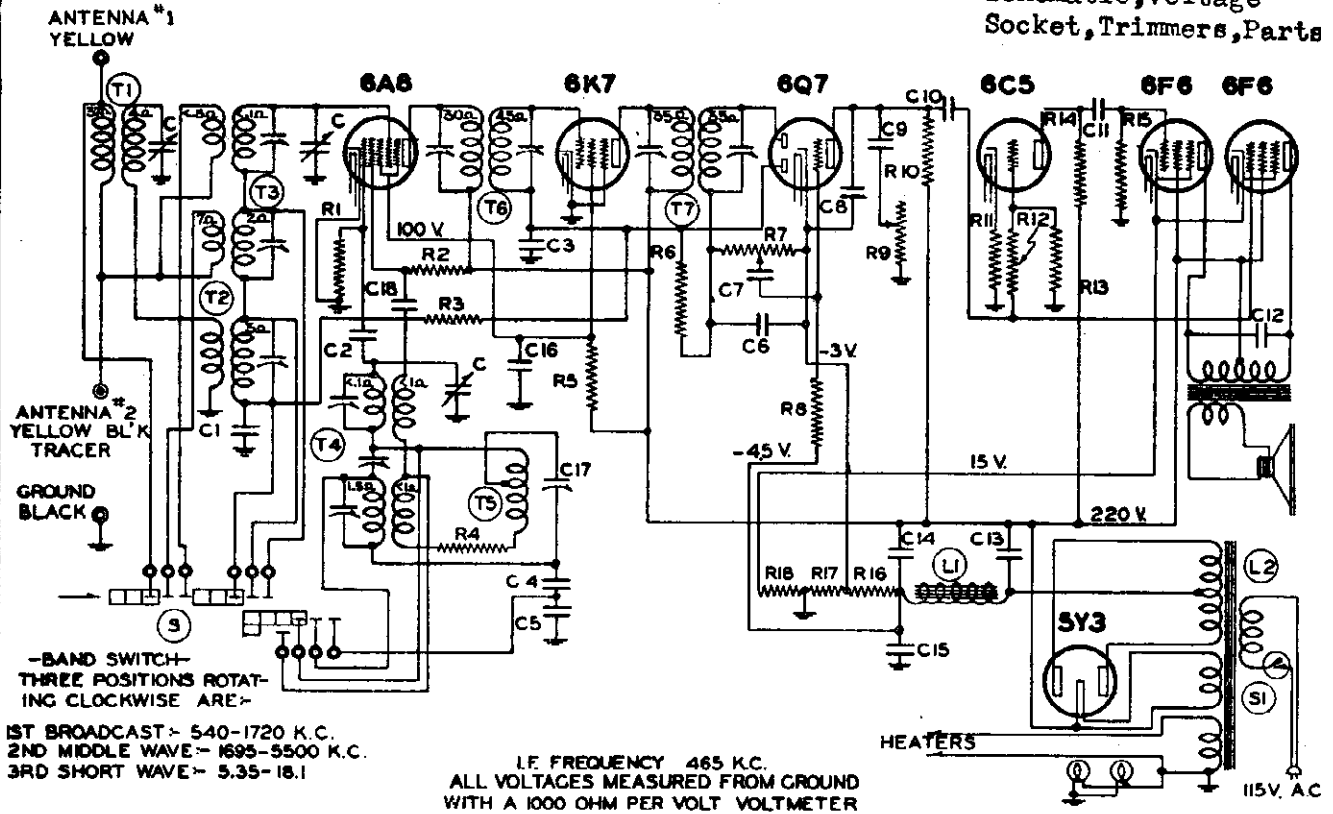
1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. in series with broadcast dummy to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance. (This adjustment is on the middle section of the three-gang condenser—see top view, Fig. 2).
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust R.F. and antenna trimmers to resonance (see top view, Fig. 2).
4. Re-set test oscillator to 600 K.C. and rotate variable condenser to 600 K.C. Adjust series pad, rocking gang condenser to and fro, at the same time adjusting series pad for maximum gain. This adjustment is accessible from the top of chassis—see top view.
5. Go back and check 1400 K.C. If adjustment is made here, check 600 K.C. again.
6. Check for sensitivity at 1000 K.C. by setting test oscillator to this frequency and picking up the signal by rotating variable condenser. Under no circumstances bend plates of variable condenser sections to correct tracking.

WIRING CONNECTIONS AND ASSEMBLY



BELMONT RADIO CORP.

MODEL 740
Schematic, Voltage
Socket, Trimmers, Parts



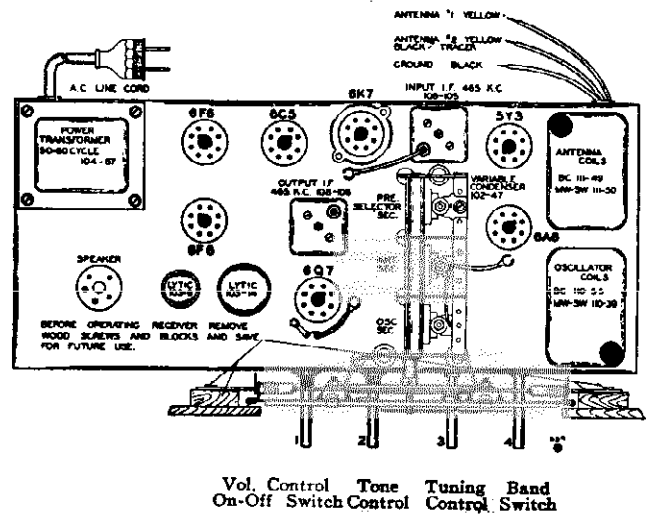
PARTS

No.	Part No.	Description
RESISTORS		
R1	130-12	50M ohms - 1/3 w.
R2	130-48	15M ohms - 1/3 w.
R3	130-103	100M ohms - 1/3 w.
R4	130-27	50 ohms - 1/3 w.
R5	130-96	25M ohms - 1/2 w.
R6	130-4	3 megohm - 1/3 w.
R7	101-74	1 megohm - Volume Control
R8	130-4	3 megohm - 1/3 w.
R9	101-75	300M ohms - Tone Control
R10	130-100	150M ohms - 1/3 w.
R11	130-22	5M ohms - 1/3 w.
R12	130-163	400M ohms - 1/3 w.
R13	130-103	100M ohms - 1/3 w.
R14	130-12	50M ohms - 1/3 w.
R15	130-100	150M ohms - 1/3 w.
R16	106-37	20 ohms - Muter
R17	106-37	42 ohms - Muter
R18	106-37	250 ohms - Muter
NOTE: R16, R17 and R18 in one unit, No. 106-37		
C	102-47	One section of three gang condenser
T1	111-51	B.C. Pre-Selector
T2	111-49	B.C. Antenna Coil Assembly
T3	111-50	MW - SW Antenna Coil Assembly
T4	110-39	MW - SW Oscillator Coil Assembly
T5	110-55	B.C. Oscillator Coil Assembly
T6	108-105	Input I.F. - 465 kc.
T7	108-106	Output I.F. - 465 kc.
L1	114-66	6" Speaker (Field Resistance 900 ohms)
L2	104-87	Power Transformer (60 cycle) 115 volts
S	125-17	Band Switch
S1	101-74	On-off Switch on volume control.

- 1—Type 6A8G—Pentagrid mixer, first detector and oscillator.
- 1—Type 6K7 Remote cut-off pentode I.F. amplifier (465 K.C.)
- 1—Type 6Q7G duplex diode triode second detector, A.V.C. and audio.
- 1—Type 6C5 Inverter stage.
- 2—Type 6F6G—pentode push-pull output amplifier.
- 1—Type 5Y3G high vacuum rectifier.

CONDENSERS

C1	100-22	.05 x 200 v.
C2	129-39	.00005 Mica
C3	100-22	.05 x 200 v.
C4	129-55	.0034 Mica
C5	129-54	.003 Mica
C6	129-5	.0001 Mica
C7	100-11	.01 x 400 v.
C8	129-2	.0005 Mica
C9	100-57	.006 x 600 v.
C10	100-26	.02 x 400 v.
C11	100-26	.02 x 400 v.
C12	100-12	.003 x 600 v.
C13	103-6	8 mfd. x 350 v.
C14	103-14	16 mfd. x 250 v.
C15	100-20	.1 x 200 v.
C16	100-39	.1 x 400 v.
C17	124-35	Adjustable Padder - Working Capacity 740 mmf.
C18	100-12	.003 x 600 v.



MODEL 740

Alignment, Trimmers

BELMONT RADIO CORP.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 115 volts on the primary of the power transformer.

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagrams.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between the plate and cathode terminals of the 5 prong speaker socket. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-106 Output I.F. Transformer

Part No. 108-105 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

- With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
 - Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6K7 tube, and adjust the output I.F. transformer (No. 108-106) to resonance.
 - With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap of 6A8G and adjust input I.F. transformer (No. 108-105) to resonance.

BROADCAST BAND ALIGNMENT:

540 to 1720 Kilocycles

- With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to tan antenna lead and black ground lead, make following adjustments:
 - Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance (adjustment number 1; see bottom view of coil assembly, Fig. 3.)
 - Re-set external oscillator to 1550 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (Adjustment number 4) to resonance; also adjust preselector trimmer which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 1, for location of this adjustment.)

- Re-set external oscillator to 600 K.C., and adjust broadcast series pad to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3.)
- Repeat adjustments "a" and "b" until sensitivity is at its maximum.
- Check for tracking and sensitivity at 1000 kilocycles. Under no circumstances bend plates of variable condenser sections to correct tracking.

SHORT WAVE BAND ALIGNMENT:

5.35 to 18.1 Megacycles

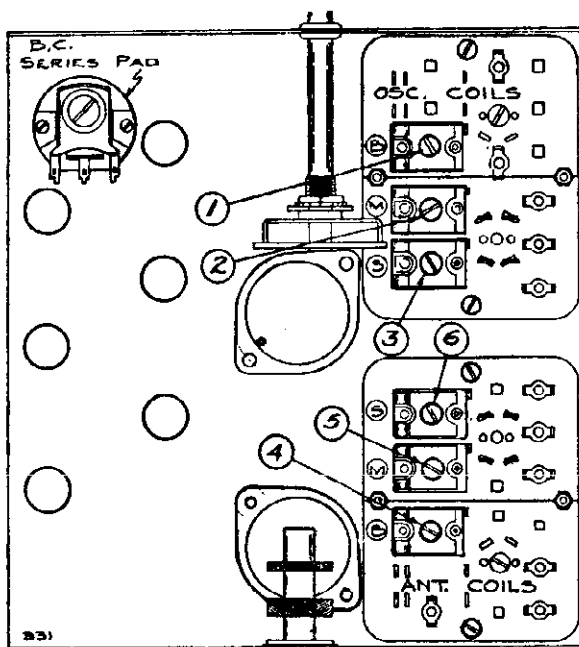
- With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
 - Move dial pointer to 17 megacycles and adjust short wave oscillator (Adjustment number 3) and short wave antenna (Adjustment number 6) to resonance.
 - Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check sensitivity.
 - Re-set external oscillator and check set at 18.1 megacycles and 5.3 megacycles for band coverage.

NOTE: It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental. An example of this is an image of a fundamental 18.3 megacycle signal appears near 17.4 megacycles.

MIDDLE WAVE BAND ALIGNMENT:

1690 to 5500 Kilocycles

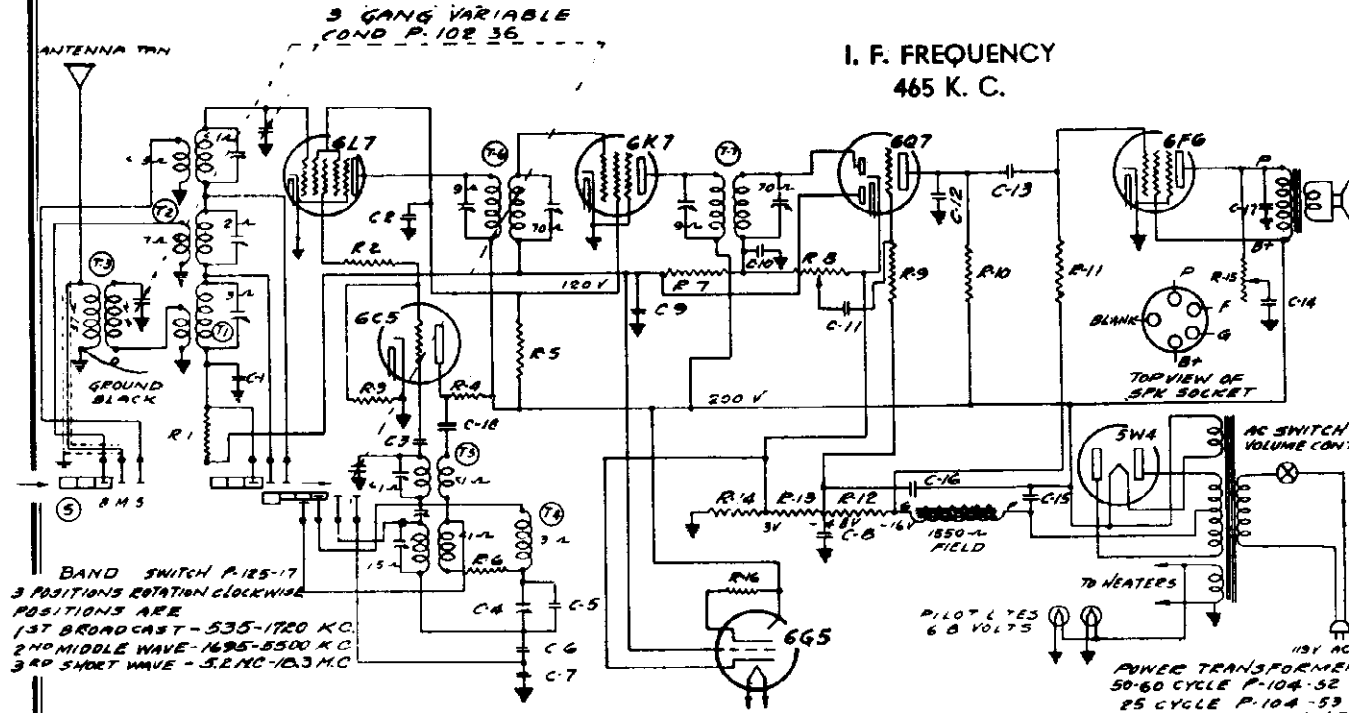
- With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5000 kilocycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
 - Move dial pointer to 5000 kilocycles and adjust middle wave oscillator (Adjustment number 2) and middle wave antenna (Adjustment number 5) to resonance.
 - Re-set external oscillator to 1800 kilocycles and pick up signal by rotating variable condenser and check sensitivity.
 - Re-set external oscillator and check set at 5400 kilocycles and 1700 kilocycles for band coverage.
 - Recheck broadcast band alignment.



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-BOTTOM VIEW SHOWING TRIMMERS

BELMONT RADIO CORP.

MODEL 787, Series A
Schematic, Voltage
Socket, Trimmers, Part



BAND SWITCH P-125-17
3 POSITIONS ROTATION CLOCKWISE
POSITIONS ARE
1ST BROADCAST - 535-1720 K.C.
2ND MIDDLE WAVE - 1625-5500 K.C.
3RD SHORT WAVE - 5.2 MC-18.3 MC

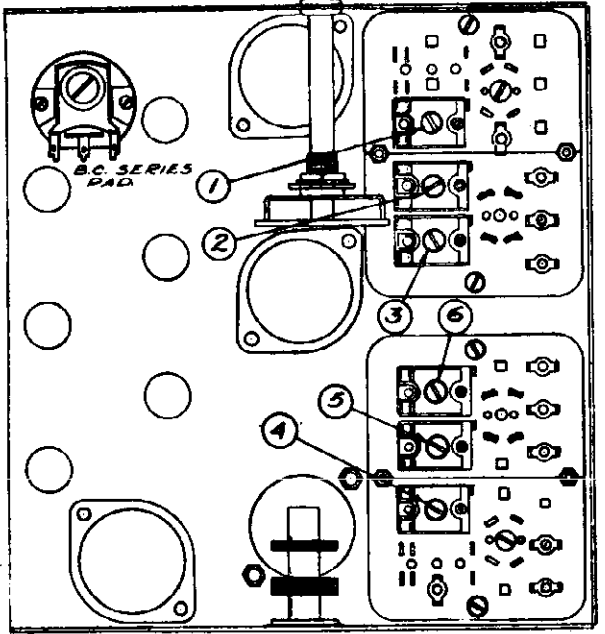
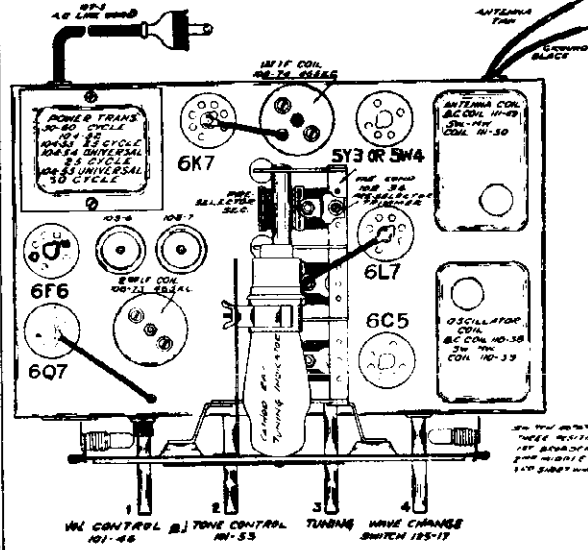
RESISTORS			
No.	Part No.	Description	
R1	130-20	100M Ohm - 1/2 Watt - 20% - 50 Volt Carbon	
R2	130-105	150 Ohm - 1/2 Watt - 20% - 10 Volt Carbon	
R3	130-12	50M Ohm - 1/2 Watt - 20% - 10 Volt Carbon	
R4	130-104	93M Ohm - 1 Watt - 20% - 100 Volt Carbon	
R5	130-34	19M Ohm - 1 Watt - 20% - 100 Volt Carbon	
R6	130-27	50 Ohm - 1/2 Watt - 20% - 3 Volt Carbon	
R7	130-19	1 Meg Ohm - 1/2 Watt - 20% - 100 Volt Carbon	
R8	101-46	1 Meg Ohm - Volume Control	
R9	130-4	3 Meg Ohm - 1/2 Watt - 20% - 100 Volt Carbon	
R10	130-103	100M Ohm - 1/2 Watt - 20% - 50 Volt Carbon	
R11	130-102	500M Ohm - 1/2 Watt - 10% - 50 Volt Carbon	
R12	220	220 Ohm	
R13	106-26	32 Ohm	
R14	52	52 Ohm	
R15	101-53	50M Ohm - Tone Control	
R16	130-110	1 Meg Ohm - 1/10 Watt - 10% - 100 Volt Carbon	

CONDENSERS			
No.	Part No.	Description	
C1	100-22	.05x200 Volt - 25%	
C2	100-1	.1x400 Volt - 4.50% - 10%	
C3	129-39	.00005 Mica (MT-O) - 20%	
C4	124-28	Series Pad (80-225)	

C5	120-65	.00055 Mica (MT-O) - 5%
C6	120-75	.0034 Mica (MW-W) - 2 1/2%
C7	120-54	.003 Mica (MW-W) - 2 1/2%
C8	100-20	.1x200 Volt - 25%
C9	100-22	.05x200 Volt - 25%
C10	120-12	.00025 Mica (MT-O) - 20%
C11	100-11	.01x400 Volt - 25%
C12	120-2	.0005 Mica (MT-O) - 20%
C13	100-11	.01x400 Volt - 25%
C14	100-27	.025x600 Volt - 25%
C15	103-6	8 Mfd. x 350 Volt Electrolytic
C16	103-7	8 Mfd. x 300 Volt Electrolytic
C17	100-25	.002x600 Volt - 20%
C18	100-37	.003x600 Volt - 10%

PARTS			
No.	Part No.	Description	
T1	111-49	Broadcast Antenna Coil	
T2	111-50	S.W.-M.W. Antenna Coil	
T3	111-51	B.C.-Pre-Selector Coil Assem.	
T4	110-38	B.C. Oscillator Coil	
T5	110-39	S.W.-M.W. Oscillator Coil	
T6	108-71	Input I.F. - 465 K.C.	
T7	108-73	Output I.F. - 465 K.C.	
S	125-17	Wave Change Switch	

TUNING RANGE—
Standard Broadcast Band
535-1720 Kilocycles.
Middle Wave Band
1625-5500 Kilocycles.
Short Wave Band
5.2-18.3 Megacycles.



BOTTOM VIEW (Showing Trimmers)

MODEL 787, Series A
MODEL 879, Series A
Alignment

BELMONT RADIO CORP.

MODEL 787 - Series A

DESCRIPTION:

Model 787 is a seven tube A.C. all wave superheterodyne receiver. It has a tuning range of 535 K.C. to 1625 megacycles in three bands, and is characterized by its exceptional selectivity and high fidelity.

A separate oscillator, effective automatic volume control, broad nose sharp skirt selectivity and new 0725 oval model.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 25, 40 and 60 cycles and with primary taps for 108, 127, 150, 225, and 250 volts.

1. With volume control full on (the extreme right of the rotation), the band changing switch in the broadcast position (extreme left of the rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

- (a) Connect external oscillator set at 465 kilocycles in series with "Dummy 1", to the control grid cap of the type 6X7 tube, located between the two I.F. transformers, and adjust the output I.F. transformer 108-65 to resonance.

With "Dummy 1" still connected, move oscillator output tap to approximately 1400 kilocycle, make the following adjustments:

- (b) With "Dummy 1" still connected, move oscillator output tap to approximately 1400 kilocycle, make the following adjustments: (a) Repeat adjustments "a" and "b" until sensitivity is at its maximum, and adjust I.F. transformer 108-65 to resonance. (See bottom view of chassis, Fig. 3.) (b) Re-set external oscillator to 1560 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (adjustment number 5) until maximum output is obtained, then adjustment is located which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 1, for location of this adjustment.) 600 K.C. and adjust broadcast series pad to resonance by rotating condenser to approximately 600 K.C., reading if necessary, by 10 and 15 until by adjusting series pad maximum output is obtained, then adjustment is located which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 3.) (c) Repeat adjustments "a" and "b" until sensitivity is at its maximum, and adjust I.F. transformer 108-65 to resonance. (See bottom view of chassis, Fig. 3.) (d) Re-set external oscillator to 1625 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (adjustment number 5) until maximum output is obtained, then adjustment is located which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 1, for location of this adjustment.) 600 K.C. and adjust broadcast series pad to resonance by rotating condenser to approximately 600 K.C., reading if necessary, by 10 and 15 until by adjusting series pad maximum output is obtained, then adjustment is located which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 3.) (e) Repeat adjustments "a" and "b" until sensitivity is at its maximum, and adjust I.F. transformer 108-65 to resonance. (See bottom view of chassis, Fig. 3.)

SERVICE NOTES:

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open bypass condensers, short each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, statoring, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser; open bypass condensers frequently cause oscillation and distorted tone.

DUMMY ANTENNAS: The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS; (465 K.C.): Part No. 108-22 Output I.F. Transformer. These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

MODEL 879 - Series A

DESCRIPTION

The tube complement of this chassis is as follows: 1-Type 6B7 Pentode cut-off pentode R.F. amplifier 1-Type 6B7 pentode first detector 1-Type 6C5 Oscillator 1-Type 6X7 Diode triode pentode I.F. amplifier (465 KC.) 1-Type 6Q7 Duplex diode triode second detector, A.V.C. and universal.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 25, 40 and 60 cycles and with primary taps for 108, 127, 150, 225, and 250 volts.

1. With volume control full on (the extreme right of the rotation), the band changing switch in the broadcast position (extreme left of the rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

- (a) Connect external oscillator set at 465 kilocycles in series with "Dummy 1", to the control grid cap of the type 6X7 tube, located between the two I.F. transformers, and adjust the output I.F. transformer 108-65 to resonance.

With "Dummy 1" still connected, move oscillator output tap to approximately 1400 kilocycle, make the following adjustments:

- (b) With "Dummy 1" still connected, move oscillator output tap to approximately 1400 kilocycle, make the following adjustments: (a) Repeat adjustments "a" and "b" until sensitivity is at its maximum, and adjust I.F. transformer 108-65 to resonance. (See bottom view of chassis, Fig. 3.) (b) Re-set external oscillator to 1560 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (adjustment number 5) until maximum output is obtained, then adjustment is located which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 1, for location of this adjustment.) 600 K.C. and adjust broadcast series pad to resonance by rotating condenser to approximately 600 K.C., reading if necessary, by 10 and 15 until by adjusting series pad maximum output is obtained, then adjustment is located which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 3.) (c) Repeat adjustments "a" and "b" until sensitivity is at its maximum, and adjust I.F. transformer 108-65 to resonance. (See bottom view of chassis, Fig. 3.)

SERVICE NOTES:

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open bypass condensers, short each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, statoring, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser; open bypass condensers frequently cause oscillation and distorted tone.

DUMMY ANTENNAS: The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Intermediate and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS; (465 K.C.): Part No. 108-22 Output I.F. Transformer. These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on (the extreme right of the rotation), the band changing switch in the broadcast position (extreme left of the rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

- (a) Connect external oscillator set at 465 kilocycles in series with "Dummy 1", to the control grid cap of the type 6X7 tube, located between the two I.F. transformers, and adjust the output I.F. transformer 108-65 to resonance.

With "Dummy 1" still connected, move oscillator output tap to approximately 1400 kilocycle, make the following adjustments:

- (b) With "Dummy 1" still connected, move oscillator output tap to approximately 1400 kilocycle, make the following adjustments: (a) Repeat adjustments "a" and "b" until sensitivity is at its maximum, and adjust I.F. transformer 108-65 to resonance. (See bottom view of chassis, Fig. 3.) (b) Re-set external oscillator to 1560 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (adjustment number 5) until maximum output is obtained, then adjustment is located which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 1, for location of this adjustment.) 600 K.C. and adjust broadcast series pad to resonance by rotating condenser to approximately 600 K.C., reading if necessary, by 10 and 15 until by adjusting series pad maximum output is obtained, then adjustment is located which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 3.) (c) Repeat adjustments "a" and "b" until sensitivity is at its maximum, and adjust I.F. transformer 108-65 to resonance. (See bottom view of chassis, Fig. 3.)

SERVICE NOTES:

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open bypass condensers, short each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, statoring, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser; open bypass condensers frequently cause oscillation and distorted tone.

DUMMY ANTENNAS: The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

MODEL 879 - Series A

ALIGNING I.F. TRANSFORMERS (465 K.C.) Part No. 108-22 Output I.F. Transformer. These I.F. transformers have two adjustments, both of which are accessible from the underside of chassis (see bottom view, Fig. 1).

1. With volume control full on (the extreme right of the rotation), the band changing switch in the broadcast position (extreme left of the rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

- (a) Connect external oscillator set at 465 kilocycles in series with "Dummy 1", to the control grid cap of the type 6X7 tube, located between the two I.F. transformers, and adjust the output I.F. transformer 108-65 to resonance.

With "Dummy 1" still connected, move oscillator output tap to approximately 1400 kilocycle, make the following adjustments:

- (b) With "Dummy 1" still connected, move oscillator output tap to approximately 1400 kilocycle, make the following adjustments: (a) Repeat adjustments "a" and "b" until sensitivity is at its maximum, and adjust I.F. transformer 108-65 to resonance. (See bottom view of chassis, Fig. 3.) (b) Re-set external oscillator to 1560 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (adjustment number 5) until maximum output is obtained, then adjustment is located which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 1, for location of this adjustment.) 600 K.C. and adjust broadcast series pad to resonance by rotating condenser to approximately 600 K.C., reading if necessary, by 10 and 15 until by adjusting series pad maximum output is obtained, then adjustment is located which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 3.) (c) Repeat adjustments "a" and "b" until sensitivity is at its maximum, and adjust I.F. transformer 108-65 to resonance. (See bottom view of chassis, Fig. 3.)

SERVICE NOTES:

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open bypass condensers, short each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, statoring, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser; open bypass condensers frequently cause oscillation and distorted tone.

DUMMY ANTENNAS: The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Intermediate and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS; (465 K.C.): Part No. 108-22 Output I.F. Transformer. These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on (the extreme right of the rotation), the band changing switch in the broadcast position (extreme left of the rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

- (a) Connect external oscillator set at 465 kilocycles in series with "Dummy 1", to the control grid cap of the type 6X7 tube, located between the two I.F. transformers, and adjust the output I.F. transformer 108-65 to resonance.

With "Dummy 1" still connected, move oscillator output tap to approximately 1400 kilocycle, make the following adjustments:

- (b) With "Dummy 1" still connected, move oscillator output tap to approximately 1400 kilocycle, make the following adjustments: (a) Repeat adjustments "a" and "b" until sensitivity is at its maximum, and adjust I.F. transformer 108-65 to resonance. (See bottom view of chassis, Fig. 3.) (b) Re-set external oscillator to 1560 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (adjustment number 5) until maximum output is obtained, then adjustment is located which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 1, for location of this adjustment.) 600 K.C. and adjust broadcast series pad to resonance by rotating condenser to approximately 600 K.C., reading if necessary, by 10 and 15 until by adjusting series pad maximum output is obtained, then adjustment is located which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 3.) (c) Repeat adjustments "a" and "b" until sensitivity is at its maximum, and adjust I.F. transformer 108-65 to resonance. (See bottom view of chassis, Fig. 3.)

SERVICE NOTES:

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open bypass condensers, short each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, statoring, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser; open bypass condensers frequently cause oscillation and distorted tone.

DUMMY ANTENNAS: The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

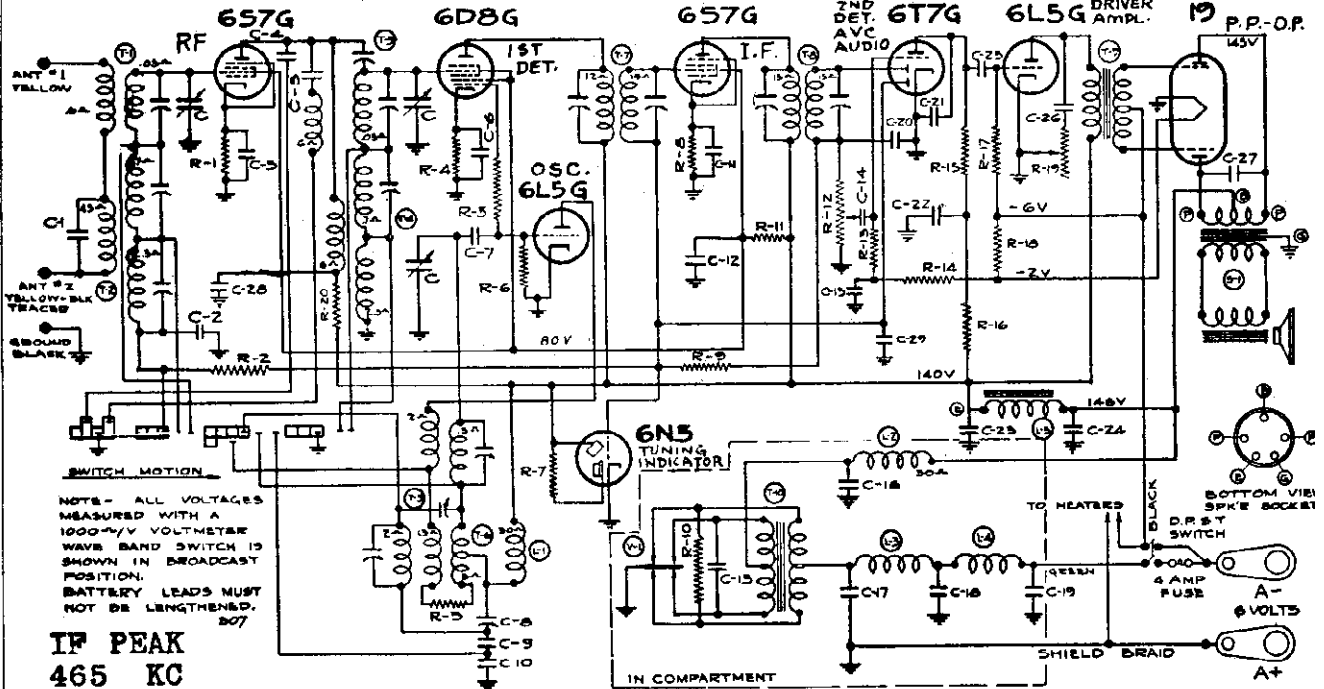
Dummy 2: (Broadcast)—Consists of a 200 mfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Intermediate and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

Voltage, Parts

BELMONT RADIO CORP.

MODEL 804
Schematic, Socket



IF PEAK
465 KC

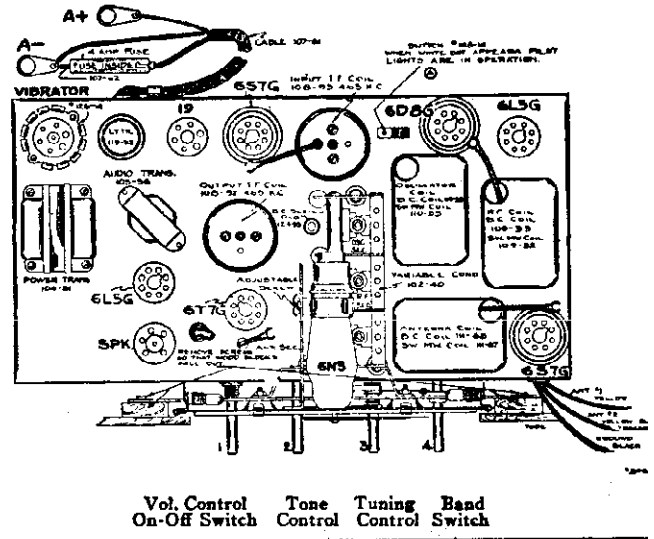
No.	Part No.	Description
CONDENSERS		
C	102-40	Variable Condenser
C1	129-5	.0001 Mica—MO—O—20%
C2	100-9	.05 x 200 v.—25%
C3	100-9	.05 x 200 v.—25%
C4	129-72	.0004 Mica—MT—W—5%
C5	129-38	.00005 Mica—MO—O—10%
C6	100-9	.05 x 200 v.—25%
C7	129-38	.00005 Mica—MO—O—10%
C8	124-35	J.S. Series Pad
C9	129-70	.004 Mica MW—J—2 1/2 %
C10	129-71	.002—Mica MW—W—2 1/2 %
C11	100-20	.1 x 200v.—25%
C12	100-20	.1 x 200v.—25%
C13	100-34	.005 x 1200 v.—10%
C14	100-11	.01 x 400 v.—25%
C15	100-11	.01 x 400 v.—25%
C16	100-14	.1 x 200 v.—25%
C17	100-56	.5 x 200 v.—50%—10%
C18	100-56	.5 x 200 v.—50%—10%
C19	100-25	.002 x 600 v.—25%
C20	129-5	.0001 Mica MO—O—20%
C21	129-2	.0005 Mica MT—O—20%
C22	100-20	.1 x 200 v.—25%
C23	119-32	4. mfd. 200 w. v. Lytic
C24	119-32	8. mfd. 200 w. v. Lytic
C25	100-11	.01 x 400 v.—25%
C26	100-26	.02 x 400 v.—25%
C27	100-25	.002 x 600 v.—25%
C28	100-50	.25 x 200 v.—20%
C29	100-22	.05 x 200 v.—25%

No.	Part No.	Description
RESISTORS		
R1	130-140	1200 ohm 1/3 w.—20%
R2	130-20	100M 1/3 w.—20%
R3	130-27	50 1/3 w.—20%
R4	130-54	500 ohm 1/3 w.—20%
R5	130-27	50 1/3 w.—20%
R6	130-2	75 M 1/3 w.—20%
R7		1/2 meg (in m. c. socket)
R8	130-140	1200 ohm 1/3 w.—20%
R9	130-38	2 meg 1/3 w.—20%
R10	130-84	200 ohm 1/3 w.—20%
R11	130-157	12M 1/2 w.—10%
R12	101-66	500M Volume Control
R13	130-19	1 meg 1/3 w.—20%
R14	130-19	1 meg 1/3 w.—20%
R15	130-20	100M 1/3 w.—20%

R16	130-20	100M	1/3 w.—20%
R17	130-4	3 meg	1/3 w.—20%
R18	130-158	16 ohm	1 w.—Insulated
R19	101-67	100M	Tone Control
R20	130-85	3 M	1/3 w.—20%

PARTS

T1	111-67	S.W. M.W. Ant. Coil
T2	111-68	B.C. Antenna Coil
T3	109-32	S.W. M. W. R.F. Coil
T4	109-33	B.C. R.F. Coil
T5	110-53	S.W. M.W. Osc. Coil
T6	110-55	B.C. Osc. Coil
T7	108-93	Input I.F. Coil
T8	108-92	Output I.F. Coil
T9	105-36	Audio Input Transformer
T10	104-81	Power Transformer
S1	114	P.M. Dynamic Spkr. 8"
L-1	123-3	Osc. "B" Choke
L-2	123-3	R.F. "B" Choke
L-3	105-19	"A" Choke
L-4	105-19	"A" Choke
L-5	105-30	"B" Filter Choke
V-1	126-4	Vibrator



MODEL 804

Alignment, Trimmers

BELMONT RADIO CORP.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

In order to prevent signal from acting upon A.V.C. and affecting accuracy of voltage measurements, aerial and ground leads should be short circuited while making measurements.

All voltages are to be measured with 6.3 volts input to receiver. Resistances of coils and transformer windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the two plate terminals of the type 19 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-92 Output I.F. Transformer
Part No. 108-93 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

- Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6S7G tube, and adjust the output I.F. transformer (No. 108-92) to resonance.
- With "Dummy 1" still connected, move oscillator output clip from grid of 6S7G to grid cap to 6D8G and adjust input I.F. transformer (No. 108-93) to resonance.

SHORT WAVE BAND ALIGNMENT:

5.35 to 18.1 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 18 megacycles and connected in series with "Dummy 3" to the antenna and ground posts, make the following adjustments:

- Move dial pointer to 18 megacycles and adjust short wave oscillator trimmer (adjustment number 1) to resonance.
- Re-set external oscillator to 17 megacycles and pick up signal by rotating variable condenser and adjust short wave R.F. trimmer (adjustment number 8), and short wave antenna trimmer (adjustment number 9), to resonance.
- Re-set external oscillator and check set at 18.1 megacycles and 6 megacycles for band coverage and sensitivity.

NOTE: It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental on the receiver dial. As an example of this a fundamental 18.3 megacycle signal can be tuned in not only at 18.3 on the dial but also at approximately 17.4 megacycles.

MIDDLE WAVE BAND ALIGNMENT:

1690 to 5500 Kilocycles

1. With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5.5 megacycles and connected in series with "Dummy 3" to the antenna and ground posts make the following adjustments:

- Move dial pointer to 5.5 megacycles and adjust middle wave oscillator trimmer (adjustment number 2) to resonance.
- Re-set external oscillator to 5 megacycles and pick up signal by rotating variable condenser and adjust middle wave R.F. trimmer (adjustment number 10), and middle wave antenna trimmer (adjustment number 5), to resonance.
- Re-set external oscillator and check sensitivity at 1700 kilocycles.

BROADCAST BAND ALIGNMENT:

540 to 1720 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to antenna and ground posts, make following adjustments:

- Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance. (Adjustment number 4; see bottom view of coil assembly, Fig. 3)
- Re-set external oscillator to 1400 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast R.F. trimmer (adjustment number 6) and broadcast antenna trimmer (adjustment number 7), to resonance.
- Re-set external oscillator to 600 K.C., and adjust broadcast series pad (adjustment number 3), to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3).
- Repeat adjustments "a" and "b" until sensitivity is at its maximum.
- Check for tracking and sensitivity at 1400, 1000, and 600 kilocycles. Under no circumstances bend plates of variable condenser sections to correct tracking.

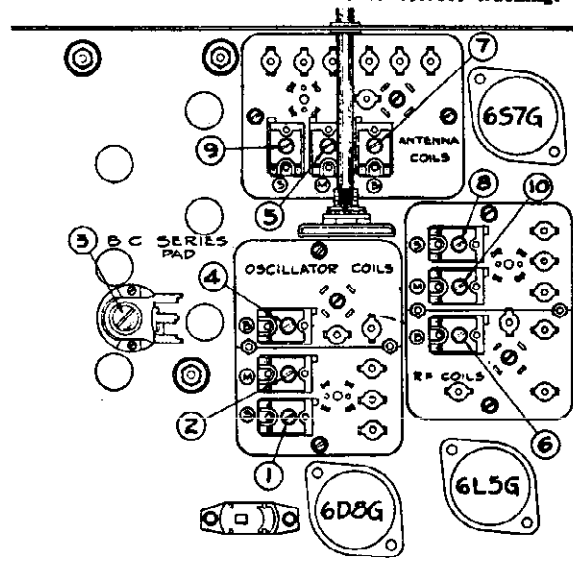
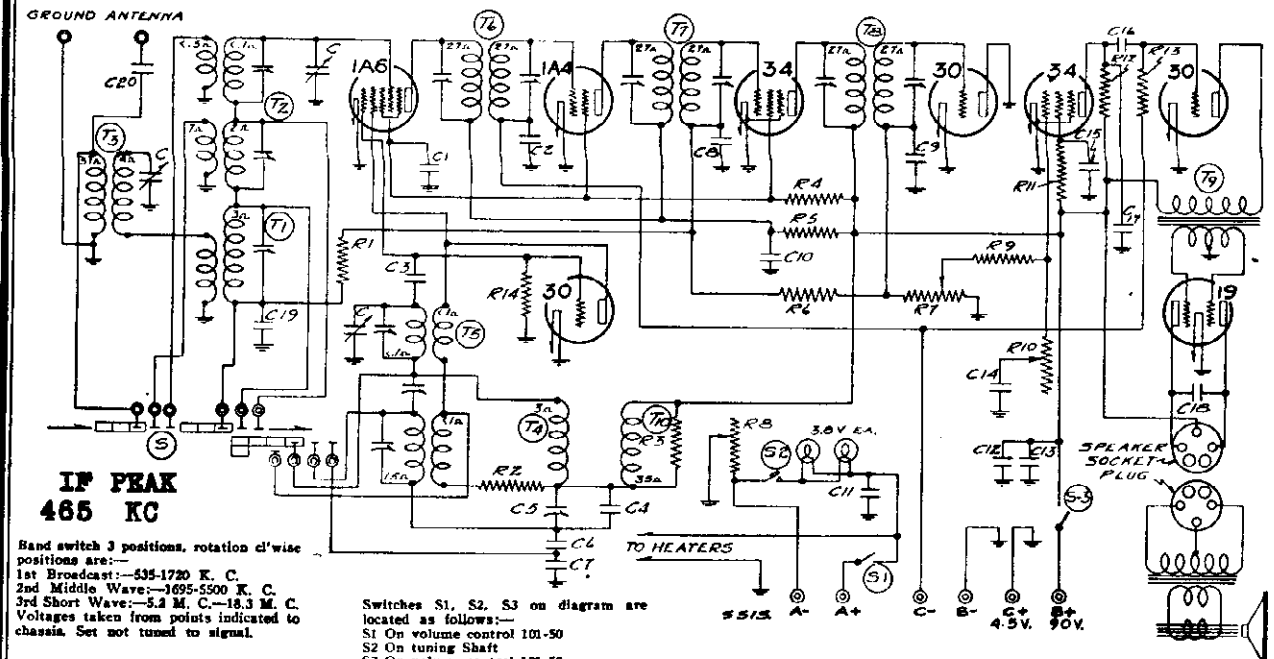


FIG. 3.—BOTTOM VIEW SHOWING TRIMMERS

BELMONT RADIO CORP.

MODEL 8
Schematic, Socket
Trimmers, Parts



**IF PEAK
465 KC**

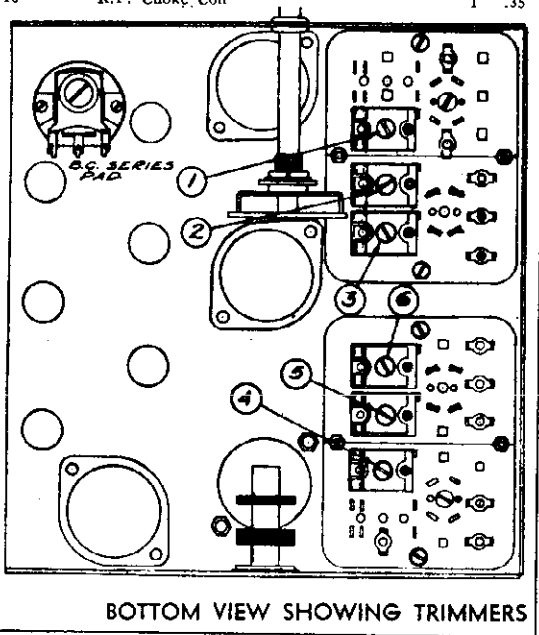
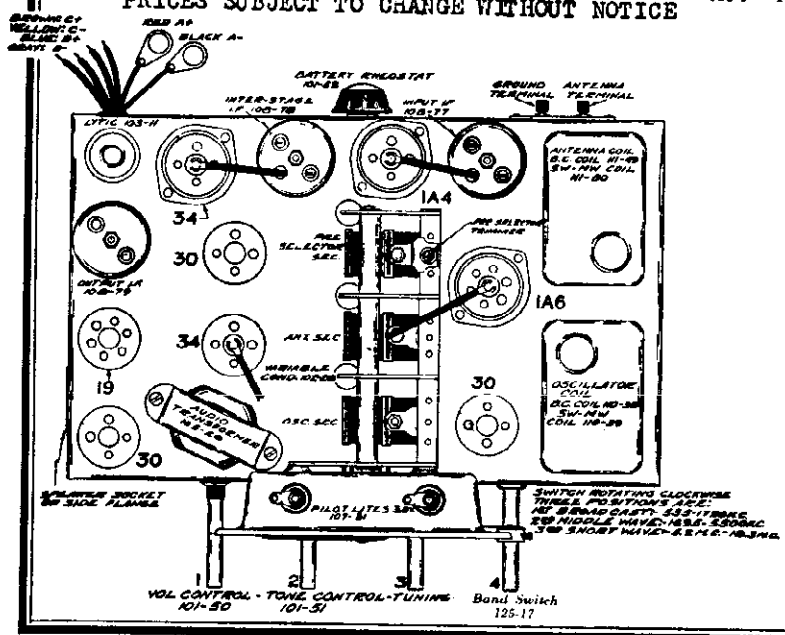
Band switch 3 positions, rotation clockwise positions are:—
1st Broadcast—535-1720 K. C.
2nd Middle Wave—1695-5500 K. C.
3rd Short Wave—5.2 M. C.—18.3 M. C.
Voltages taken from points indicated by chassis. Set not tuned to signal.

Switches S1, S2, S3 on diagram are located as follows:—
S1 On volume control 101-50
S2 On tuning shaft
S3 On volume control 101-50

LIST OF REPAIR PARTS (Serial No. 6K 411500 and up)
Use Only Genuine Factory Replacement Parts

Part No.	Circuit Diagram Reference	Description	No. Used in Set	List Price Each	Part No.	Description	No. Used in Set	List Price Each	
CONDENSERS									
100-5B	C11	1.0 x 120 Volt Tubular with Bracket	1	.50	125-17	S	Band Switch	1	.85
100-6	C1	.25 x 200 Volt Tubular less Bracket	1	.35	128-51		Wood Knob with Spring	3	.15
100-6B	C13	.25 x 200 Volt Tubular with Bracket	1	.35	128-52		"Tuning" Knob with Set Screw—Wood	1	.15
100-11	C14, C16, C20	.01 x 400 Volt Tubular	3	.25	131-12		Bakelite Knob with Arrow	1	.15
100-20	C10	.1 x 200 Volt Tubular	1	.25	RESISTORS				
100-22	C2, C8, C15, C19	.05 x 200 Volt Tubular	4	.25	130-11	R12	250M Ohm—1/2 Watt—20%—50 Volt Carbon	1	.20
100-25	C18	.002 x 600 Volt Tubular	1	.25	130-12	R3, R9, R14	50M Ohm—1/2 Watt—20%—20 Volt Carbon	3	.20
103-11	C12	8 Mfd. x 200 Volt Electrolytic	1	.75	130-19	R6, R11, R13	1 Meg Ohm—1/2 Watt—20%—100 Volt Car.	3	.20
129-5	C17	.0001 Mica—Type MT—20%	1	.25	146-20	R1	100M Ohm—1/2 Watt—20%—50 Volt Carbon	1	.20
129-12	C9	.00025 Mica—Type MT—20%	1	.25	130-27	R2	50 Ohm—1/2 Watt—20%—3 Volt Carbon	1	.20
129-50	C3	.00004 Mica—Type MT—30%	1	.25	130-31	R5	1500 Ohm—1/2 Watt—20%—10 Volt Carbon	1	.20
129-54	C7	.003 Mica—Type MW—2 1/4%	1	.35	130-109	R4	7500 Ohm—1/2 Watt—20%—50 Volt Carbon	1	.20
129-55	C6	.0034 Mica—Type MW—2 1/4%	1	.35	COILS				
129-65	C4	.00055 Mica—Type MT—5%	1	.25	108-77	T6	Input I.F. complete with Can	1	1.25
MISCELLANEOUS									
101-50	R7	Volume Control and Switch (250 M ohm)	1	1.25	108-78	T7	Interstage I.F. complete with Can	1	1.25
101-51	R10	Tone Control (300 M ohm)	1	.70	108-79	T8	Output I.F. complete with Can	1	1.25
101-52	R8	Filament Rheostat (2 ohm)	1	.50	110-38	T4	Broadcast Oscillator Coil Complete	1	.50
102-28	C	Three Gang Variable Condenser	1	4.00	110-39	T5	Mid-Wave & Short Wave Oscillator Coil Com.	1	1.50
105-28	T9	Audio Input Transformer	1	1.75	111-49	T1	Broadcast Antenna Coil Assembly Complete	1	.75
					111-50	T2	Mid-Wave & Short Wave Antenna Coil Assem. Complete	1	1.50
					123-3	T10	Broadcast Preselector Coil R.F. Choke, Coil	1	.75

PRICES SUBJECT TO CHANGE WITHOUT NOTICE



BOTTOM VIEW SHOWING TRIMMERS

MODEL 822
Alignment

BELMONT RADIO CORP.

BATTERIES REQUIRED:

The following batteries are required:

- 2—45 Volt "B" Batteries.
- 1—4½ Volt "C" Battery.
- 1—8 Volt Dry "A" Battery or 2 Volt Storage Battery.

TUBES:

The tube complement of this chassis is as follows:

- 1—Type 1A6 Pentagrid Mixer, First Detector.
- 1—Type 1A4 Tetrode First I.F. Amplifier (465 K.C.)
- 1—Type 34 Remote Cut-Off Pentode, 2nd I.F. Amplifier (465 K.C.)
- 1—Type 30 Oscillator.
- 1—Type 30 Second Detector and A. V. C.
- 1—Type 34 A.F. Amplifier.
- 1—Type 30 Driver Amplifier.
- 1—Type 19 Class "B" Push-Pull Output Amplifier.

SERVICE NOTES:

Voltagages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltagages as indicated on diagram, are measured with a new set of batteries.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

The approximate current consumption is as follows:

"A"—660 ma., "B"—18 to 24 ma.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the two plate terminals of the type 19 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

DUMMY ANTENNAS

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

- Part No. 108-79 Output I.F. Transformer
- Part No. 108-78 Interstage I.F. Transformer
- Part No. 108-77 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

- (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 34 tube, and adjust the output I.F. transformer (No. 108-79) to resonance.

- (b) With "Dummy 1" still connected, move oscillator output clip from grid of 34 to grid cap to 1A4 and adjust interstage I.F. transformer (No. 108-78) to resonance.

- (c) Move oscillator to grid cap of 1A6 and adjust input I.F. transformer (No. 108-77).

BROADCAST BAND ALIGNMENT:

535 to 1720 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to antenna and ground posts, make following adjustments:

- (a) Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance. (Adjustment number 1; see bottom view of coil assembly, Fig. 3)

- (b) Re-set external oscillator to 1550 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (adjustment number 4) to resonance; also adjust preselector trimmer which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 1, for location of this adjustment).

- (c) Re-set external oscillator to 600 K.C., and adjust broadcast series pad to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3).

- (d) Repeat adjustments "a" and "b" until sensitivity is at its maximum.

- (e) Check for tracking and sensitivity at 1000 kilocycles. Under no circumstances bend plates of variable condenser sections to correct tracking.

SHORT WAVE BAND ALIGNMENT:

5.2 to 18.3 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the antenna and ground posts, make the following adjustments:

- (a) Move dial pointer to 17 megacycles and adjust short wave oscillator (adjustment number 3) and short wave antenna (adjustment number 6) to resonance.

- (b) Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check sensitivity.

- (c) Re-set external oscillator and check set at 18.1 megacycles and 5.3 megacycles for band coverage.

NOTE: It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental on the receiver dial. As an example of this a fundamental 18.3 megacycle signal can be tuned in not only at 18.3 on the dial but also at approximately 17.4 megacycles.

MIDDLE WAVE BAND ALIGNMENT:

1695 to 5500 Kilocycles

1. With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5000 kilocycles and connected in series with "Dummy 3" to the antenna and ground posts make the following adjustments:

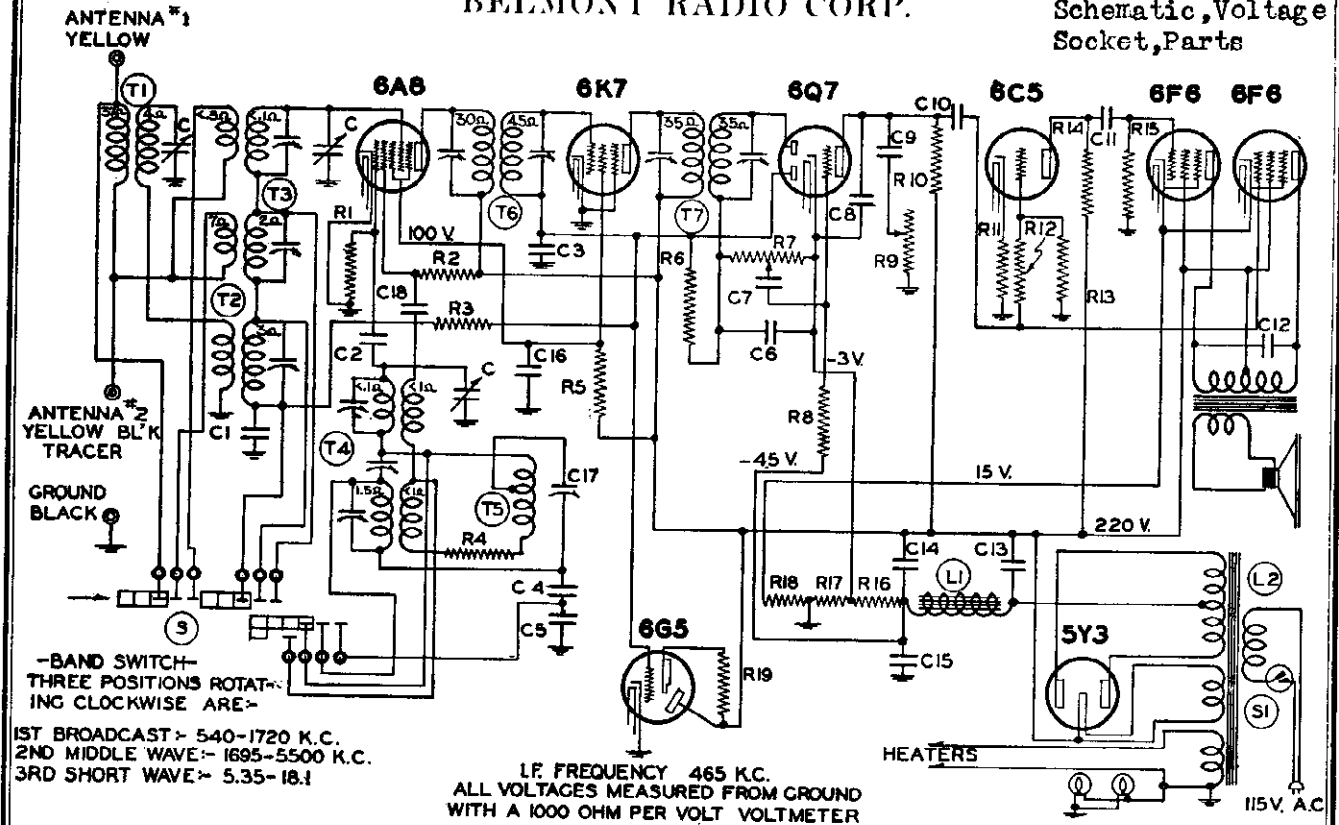
- (a) Move dial pointer to 5000 kilocycles and adjust middle wave oscillator (adjustment number 2) and middle wave antenna (adjustment number 5) to resonance.

- (b) Re-set external oscillator to 1800 kilocycles and pick up signal by rotating variable condenser and check sensitivity.

- (c) Re-set external oscillator and check set at 5400 kilocycles and 1700 kilocycles for band coverage.

BELMONT RADIO CORP.

MODEL 840
Schematic, Voltage
Socket, Parts



1ST BROADCAST - 540-1720 K.C.
2ND MIDDLE WAVE - 1695-5500 K.C.
3RD SHORT WAVE - 5.35-18.1

I.F. FREQUENCY 465 K.C.
ALL VOLTAGES MEASURED FROM GROUND
WITH A 1000 OHM PER VOLT VOLTMETER

No. Part No. Description

RESISTORS

R1	130-12	50M ohms - 1/3 w.
R2	130-48	15M ohms - 1/3 w.
R3	130-103	100M ohms - 1/3 w.
R4	130-27	50 ohms - 1/3 w.
R5	130-96	25M ohms - 1/2 w.
R6	130-4	3 megohm - 1/3 w.
R7	101-74	1 megohm - Volume Control
R8	130-4	3 megohm - 1/3 w.
R9	101-75	300M ohms - Tone Control
R10	130-100	150M ohms - 1/3 w.
R11	130-22	5M ohms - 1/3 w.
R12	130-163	400M ohms - 1/3 w.
R13	130-103	100M ohms - 1/3 w.
R14	130-12	50M ohms - 1/3 w.
R15	130-100	150M ohms - 1/3 w.
R16	106-37	20 ohms - Muter
R17	106-37	42 ohms - Muter
R18	106-37	250 ohms - Muter
R19	130-110	1 megohm - 1/10 w.

NOTE: R16, R17 and R18 in one unit, No. 106-37

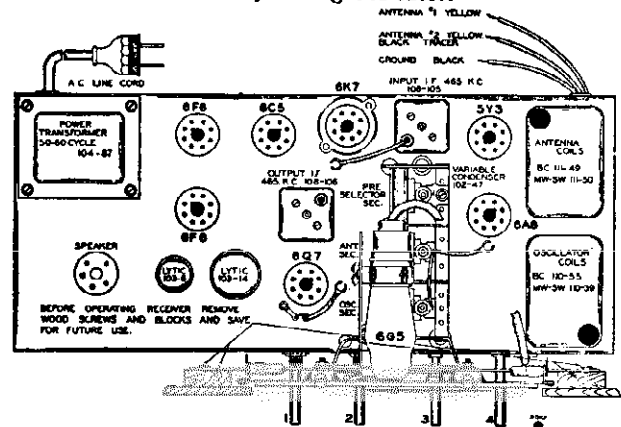
CONDENSERS

C1	100-22	.05 x 200 v.
C2	129-39	.00005 Mica
C3	100-22	.05 x 200 v.
C4	129-55	.0034 Mica
C5	129-54	.003 Mica
C6	129-5	.0001 Mica
C7	100-11	.01 x 400 v.
C8	129-2	.0005 Mica
C9	100-57	.006 x 600 v.
C10	100-26	.02 x 400 v.
C11	100-26	.02 x 400 v.
C12	100-12	.003 x 600 v.
C13	103-6	8 mfd. x 350 v.
C14	103-14	16 mfd. x 250 v.
C15	100-20	.1 x 200 v.
C16	100-39	.1 x 400 v.
C17	124-35	Adjustable Padder - Working Capacity 740 mmf.
C18	100-12	.003 x 600 v.

PARTS

C	102-47	One section of three gang condenser
T1	111-51	B.C. Pre-Selector
T2	111-49	B.C. Antenna Coil Assembly
T3	111-50	MW - SW Antenna Coil Assembly
T4	110-39	MW - SW Oscillator Coil Assembly
T5	110-55	B.C. Oscillator Coil Assembly
T6	108-105	Input I.F. - 465 kc.
T7	108-106	Output I.F. - 465 kc.
L1	114-68	8" Speaker (Field Resistance 900 ohms)
L2	104-87	Power Transformer (60 cycle) 115 volts
S	125-17	Band Switch
S1	101-74	On-off Switch on volume control.

- 1-Type 6A8G—Pentagrid mixer, first detector and oscillator.
- 1-Type 6K7 Remote cut-off pentode I.F. amplifier (465 K.C.)
- 1-Type 6Q7G duplex diode triode second detector, A.V.C. and audio.
- 1-Type 6C5 Inverter stage.
- 2-Type 6F6G—pentode push-pull output amplifier.
- 1-Type 5Y3G high vacuum rectifier.
- 1-Type 6G5 Cathode ray tuning indicator.



Vol. Control Tone Tuning Band
On-Off Switch Control Control Switch

MODEL 840

Alignment, Trimmers

BELMONT RADIO CORP.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 115 volts on the primary of the power transformer.

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagrams.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between the plate and cathode terminals of the 5 prong speaker socket. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-106 Output I.F. Transformer
Part No. 108-105 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

- (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6K7 tube, and adjust the output I.F. transformer (No. 108-106) to resonance.
- (b) With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap of 6A8G and adjust input I.F. transformer (No. 108-105) to resonance.

BROADCAST BAND ALIGNMENT:

540 to 1720 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to tan antenna lead and black ground lead, make following adjustments:

- (a) Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance (adjustment number 1; see bottom view of coil assembly, Fig. 3.)
- (b) Re-set external oscillator to 1550 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (Adjustment number 4) to resonance; also adjust preselector trimmer which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 1, for location of this adjustment.)

- (c) Re-set external oscillator to 600 K.C., and adjust broadcast series pad to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3.)
- (d) Repeat adjustments "a" and "b" until sensitivity is at its maximum.
- (e) Check for tracking and sensitivity at 1000 kilocycles. Under no circumstances bend plates of variable condenser sections to correct tracking.

SHORT WAVE BAND ALIGNMENT:

5.35 to 18.1 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
 - (a) Move dial pointer to 17 megacycles and adjust short wave oscillator (Adjustment number 3) and short wave antenna (Adjustment number 6) to resonance.
 - (b) Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check sensitivity.
 - (c) Re-set external oscillator and check set at 18.1 megacycles and 5.3 megacycles for band coverage.

NOTE: It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental. An example of this is an image of a fundamental 18.3 megacycle signal appears near 17.4 megacycles.

MIDDLE WAVE BAND ALIGNMENT:

1690 to 5500 Kilocycles

1. With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5000 kilocycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
 - (a) Move dial pointer to 5000 kilocycles and adjust middle wave oscillator (Adjustment number 2) and middle wave antenna (Adjustment number 5) to resonance.
 - (b) Re-set external oscillator to 1800 kilocycles and pick up signal by rotating variable condenser and check sensitivity.
 - (c) Re-set external oscillator and check set at 5400 kilocycles and 1700 kilocycles for band coverage.
 - (d) Recheck broadcast band alignment.

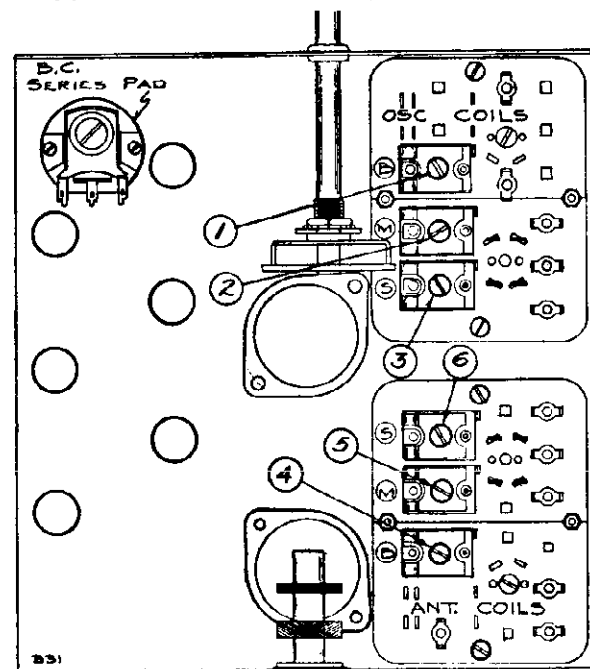
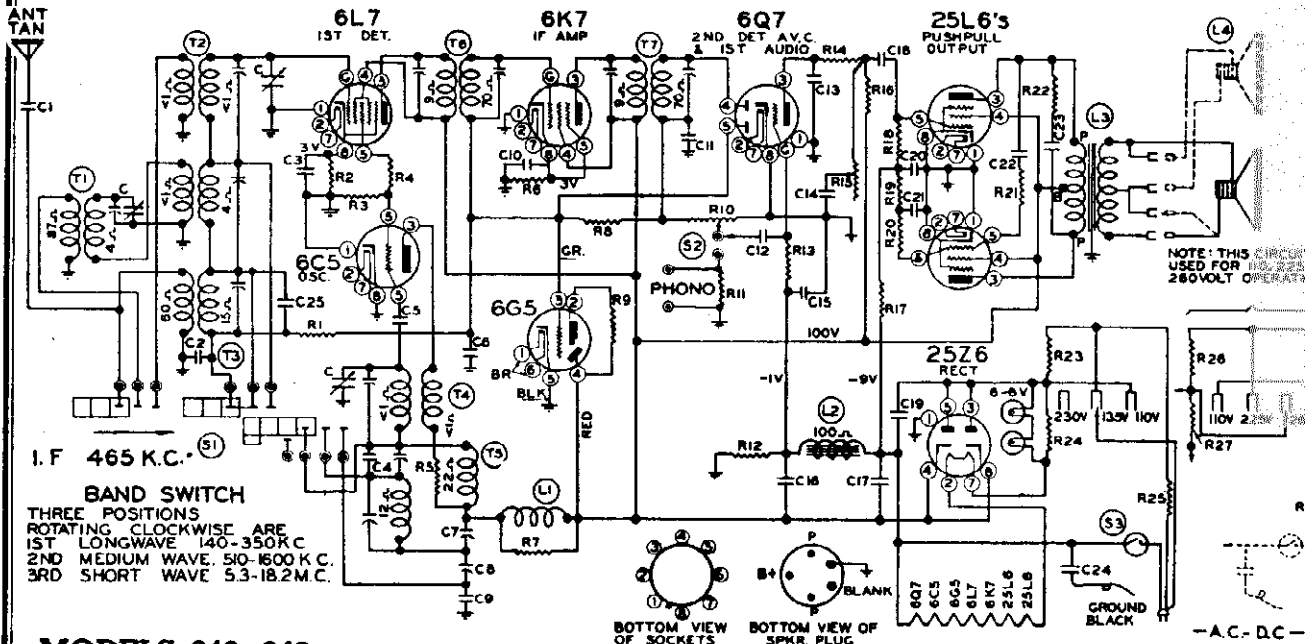


FIG. 3.—BOTTOM VIEW SHOWING TRIMMERS

BELMONT RADIO CORP.

MODELS 848, 849
Schematic, Volt
Socket, Parts



MODELS 848, 849

CONDENSERS

C	102-47	3 gang variable condenser	
C1	100-11	.01 x 400	25%
C2	100-22	.05 x 200	25%
C3	100-22	.05 x 200	25%
C4	129-67	.00004 Mica	10%
C5	129-39	.00005 Mica	20%
C6	100-26	.02 x 400	25%
C7	124-31	Adj. Cond.—300 mmf. W.C.	
C8	124-32	Adj. Cond.—565 mmf. W.C.	
C9	129-54	.003 Mica	2 1/2%
C10	100-9	.05 x 200	25%
C11	129-21	.0002 Mica	20%
C12	100-9	.05 x 200	25%
C13	129-2	.0005 Mica	20%
C14	100-19	.006 x 600	25%
C15	100-6	.25 x 200	20%
C16	119-30	26 mfd.—100 w.v.	
C17	119-30	26 mfd.—100 w.v.	
C18	100-11	.01 x 400	25%
C19	100-39	.1 x 400	20%
C20	100-43	.25 x 200	25%
C21	100-20	.1 x 200	25%
C22	100-19	.006 x 600	25%
C23	100-19	.006 x 600	25%
C24	100-36	.01 x 1400	10%
C25	129-3	.00002 Mica	20%

C16 and C17 in same unit

RESISTORS

R1	130-20	100M ohm—1/3 w. 20%
R2	130-54	500 ohm—1/3 w. 20%
R3	130-12	50M ohm—1/3 w. 20%
R4	130-60	100 ohm—1/3 w. 20%
R5	130-27	50 ohm—1/3 w. 20%
R6	130-54	500 ohm—1/3 w. 20%
R7	130-12	50M ohm—1/3 w. 20%
R8	130-4	3 megohm—1/3 w. 20%
R9		250M—1/10 w. in Tuning indicator socket
R10	101-46	Volume Control (1 meg. ohm)
R11	130-20	100M ohm—1/3 w. 20%
R12	130-169	12 ohm—Wire wound
R13	130-19	1 megohm—1/3 w. 20%
R14	130-66	75M ohm—1/3 w. 10%
R15	101-51	Tone Control (300M ohm)
R16	130-100	150M—1/3 w. 20%
R17	130-102	500M ohm—1/3 w. 10%

R18	130-11	250M ohm—1/3 w. 20%
R19	130-11	250M ohm—1/3 w. 20%
R20	130-7	40M ohm—1/3 w. 10%
R21	130-102	500M ohm—1/3 w. 10%
R22	130-22	5M ohm—1/3 w. 20%
R23	106-41	65 ohm
R24	106-41	40 ohm
R25	107-48	250 ohm line cord
R26	106-30	100 ohm
R27	106-30	40 ohm
R26 and R27	in one unit (110-225-260 volt operation)	
R23 and R24	in one unit (110-135-230 volt operation)	

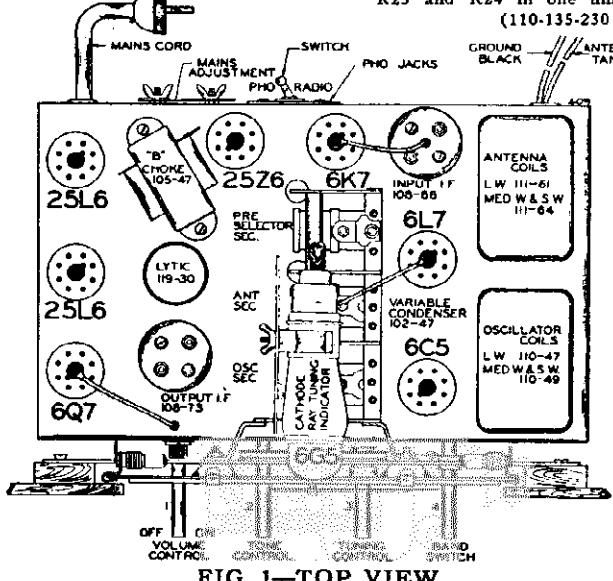


FIG. 1—TOP VIEW

T1	111-62	Pre-selector Coil Complete
T2	111-64	S.W. M.W. Antenna Coil Complete
T3	111-61	L.W. Antenna Coil Complete
T4	110-49	S.W. M.W. Oscillator Coil Complete
T5	110-47	L.W. Oscillator Coil Complete
T6	108-88	Input I.F. Coil Complete
T7	108-73	Output I.F. Coil Complete
L1	123-3	R.F. "B" Choke
L2	105-47	100 ohm Filter Choke
L3	114-83	8" P.M. Speaker
S1	125-17	Band Switch
S2	125-22	Phono Switch
S3		On-Off Switch on Volume Control
L4	114-84	Extension Speaker—6 ohm voice coil 8" P.M.

FREQUENCY RANGE

Long Wave.....350 to 140 K.C. (Kilocycles) 860-2150 Meters
 Medium Wave.....1600 to 510 K.C. (Kilocycles) 187- 588 Meters
 Short Wave.....18.2 to 5.3 M.C. (Megacycles) 16.5-56.5 Meters

BAND

MODELS 848, 849

Alignment, Trimmers

BELMONT RADIO CORP.

across the primary of the speaker input transformer or by means of an adapter between the plate and cathode terminals of the 5 prong speaker socket. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

CAUTION: No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet. To remove the knobs, pull them off and to take the chassis out of the cabinet, remove the four bolts by which it is fastened.

ALIGNING I.F. TRANSFORMERS:
 (465 K.C.) (645.1 Meters)
 Part No. 108-73 Output I. F. Transformer.
 Part No. 108-88 Input I. F. Transformer.

- These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).
1. With volume control full on (the extreme right of its rotation), the band changing switch in the medium wave position, (center of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
 - (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1," to the control grid cap of the type 6K7 tube, and adjust the output I.F. transformer (No. 108-73) to resonance.
 - (b) With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap to 6L7 and adjust input I.F. transformer (No. 108-88) to resonance.
 - (c) With oscillator still connected to 6L7, readjust output I.F. transformer (108-73) if necessary.

ALIGNMENT PROCEDURE:
 The following adjustments to be made after the I.F.'s have been aligned as explained above.

- SHORT WAVE BAND ALIGNMENT:**
 16.5 Meters (18.2 Mc.) to 56.5 Meters (5.3 Mc.)
1. With band changing switch in the short wave position, extreme right of its rotation, and with the gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
 - (a) Set external oscillator to 16.5 meters (18.2 Mc.) and adjust short wave oscillator trimmer (adjustment number 3, see Fig. 3) to resonance.
 - (b) Re-set external oscillator to 17.6 meters (17.0 Mc.) and pick up signal by rotating gang condenser. Adjust short wave antenna trimmer (adjustment number 6) to resonance.
 - (c) Re-set external oscillator to 50 meters (6.0 Mc.) and check for sensitivity.

MEDIUM BAND ALIGNMENT:
 588 Meters (510 K.C.) to 187 Meters (1600 K.C.)

1. With band changing switch in the medium wave position, center of its rotation, and with gang condenser in its minimum capacity position, plates entirely out-of mesh, and

LONG WAVE BAND ALIGNMENT:
 860 Meters (350 K.C.) to 2150 Meters (140 K.C.)

1. With band changing switch in the long wave position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator, connected in series with "Dummy 2," to tan antenna lead and black ground lead, make following adjustments:
 - (a) Set external oscillator to 860 meters (350 K.C.), and adjust long wave oscillator trimmer to resonance (adjustment number 1; see bottom view of coil assembly, Fig. 3).
 - (b) Re-set external oscillator to 925 meters (325 K.C.), rotate variable gang condenser and pick up signal. Adjust long wave antenna trimmer (Adjustment number 4) to resonance.
 - (c) Re-set external oscillator to 2000 meters (150 K.C.), and adjust long wave series pad to resonance by rotating condenser to approximately 2000 meters, rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3).
 - (d) Repeat adjustments "a" and "b" until sensitivity is at its maximum.

IMPORTANT: This band must be completely rechecked after the medium wave band has been rechecked.

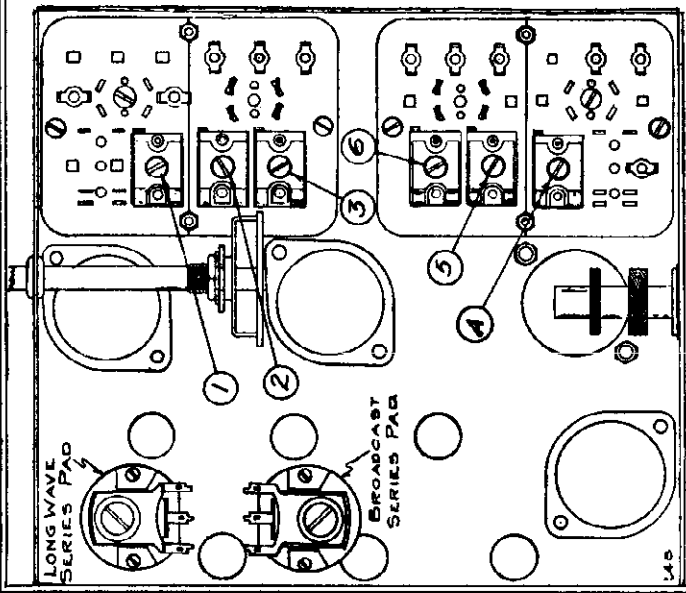


FIG. 3--BOTTOM VIEW (Showing Trimmers)
 Dummy Antennas:

The following dummy antennas are used in aligning the receiver, and are referred to in the following alignment instructions as "Dummy 1," "Dummy 2," and "Dummy 3."

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Medium and long wave) — Consists of a 200 mfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

TEST FREQUENCIES USED:

Kilocycles	Meters
465	645.1
150	2000
350	850
325	925
600	500
1400	214
1600	187
6000	50.0
17000	17.6
18200	16.5

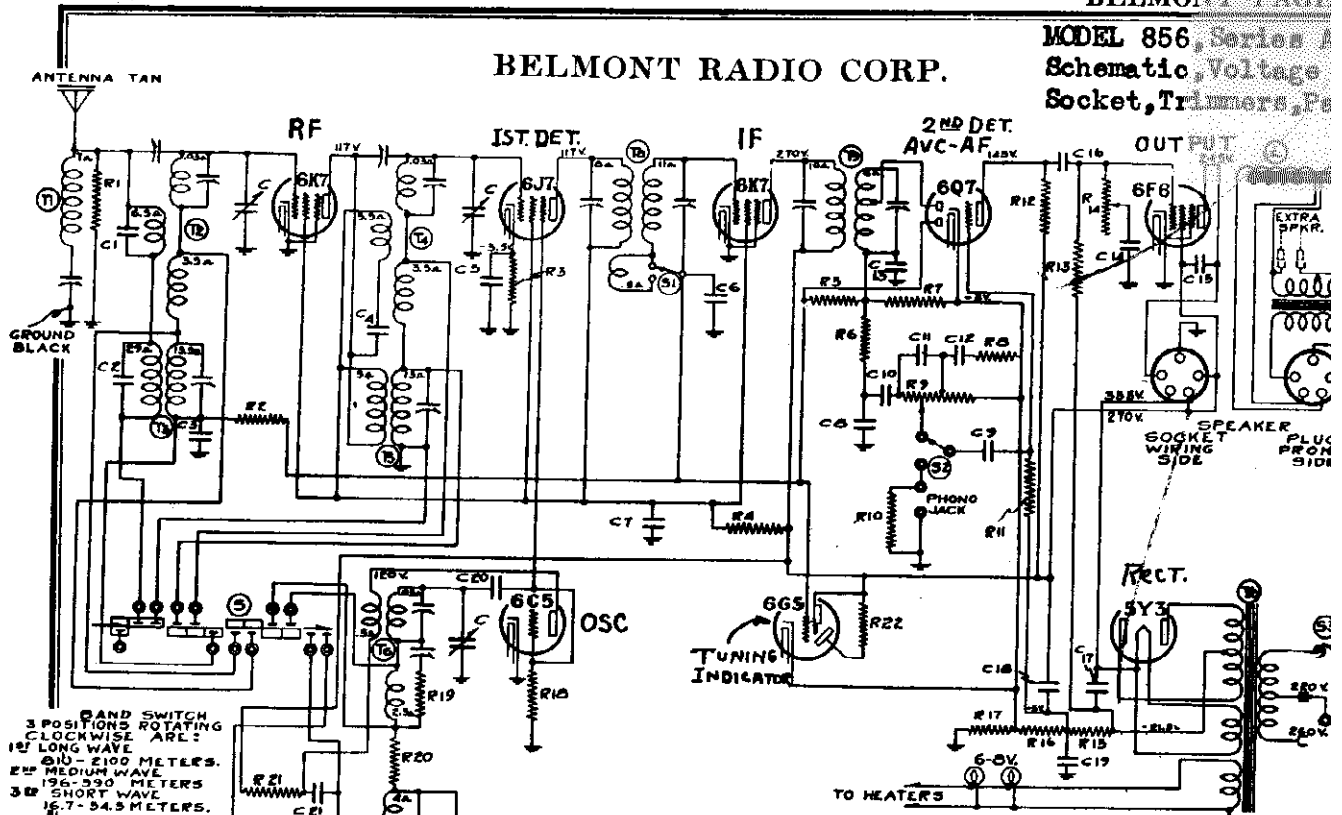
Resonance Indicator:
 Use as a resonance indicator an output meter connected

- with external oscillator connected in series with "Dummy 2" to tan antenna lead and black ground lead, make following adjustments:
- (a) Set external oscillator to 187 meters (1600 K.C.) and adjust medium wave oscillator trimmer to resonance (adjustment number 2; see bottom view of coil assembly, Fig. 3).
 - (b) Re-set external oscillator to 214 meters (1400 K.C.), rotate variable gang condenser and pick-up signal. Adjust medium wave antenna trimmer (Adjustment number 5) to resonance; also adjust preselector trimmer which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 1, for location of this adjustment.)
 - (c) Re-set external oscillator to 500 meters (600 K.C.), and adjust medium wave series pad to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3).
 - (d) Repeat adjustments "a" and "b" until sensitivity is at its maximum.
 - (e) Check for tracking and sensitivity at 300 meters (1000 K.C.) Under no circumstances bend plates of variable condenser sections to correct tracking.
- IMPORTANT:** This band must be completely rechecked after the long wave band has been adjusted.
- LONG WAVE BAND ALIGNMENT:**
 860 Meters (350 K.C.) to 2150 Meters (140 K.C.)
1. With band changing switch in the long wave position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator, connected in series with "Dummy 2," to tan antenna lead and black ground lead, make following adjustments:
 - (a) Set external oscillator to 860 meters (350 K.C.), and adjust long wave oscillator trimmer to resonance (adjustment number 1; see bottom view of coil assembly, Fig. 3).
 - (b) Re-set external oscillator to 925 meters (325 K.C.), rotate variable gang condenser and pick up signal. Adjust long wave antenna trimmer (Adjustment number 4) to resonance.
 - (c) Re-set external oscillator to 2000 meters (150 K.C.), and adjust long wave series pad to resonance by rotating condenser to approximately 2000 meters, rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3).
 - (d) Repeat adjustments "a" and "b" until sensitivity is at its maximum.

IMPORTANT: This band must be completely rechecked after the medium wave band has been rechecked.

BELMONT RADIO CORP.

MODEL 856, Series A
Schematic, Voltage
Socket, Trimmers, Pa



3 POSITIONS ROTATING
CLOCKWISE ARE:
1st LONG WAVE
12-210 METERS.
2nd MEDIUM WAVE
136-930 METERS
3rd SHORT WAVE
16.7-54.5 METERS.

IF=465 KC.

INDICATED VOLTAGES ARE MEASURED
TO GROUND. SET NOT TUNED TO
STRONG SIGNAL.

RESISTORS

No.	Part No.	Description
R1	130-36	10M Ohm 1/3 Watt-20% - 70 Volt Carbon
R2	130-20	100M Ohm 1/3 Watt-20% - 50 Volt Carbon
R3	130-43	2500 Ohm 1/3 Watt-20% - 20 Volt Carbon
R4	130-88	10M Ohm 2 Watt-20% - Wire Wound
R5	130-3	500M Ohm 1/3 Watt-20% - 100 Volt Carbon
R6	130-20	100M Ohm 1/3 Watt-20% - 50 Volt Carbon
R7	130-11	250M Ohm 1/3 Watt-20% - 50 Volt Carbon
R8	130-22	5M Ohm 1/3 Watt-20% - 10 Volt Carbon
R9	101-47	1 Meg Ohm - Volume Control
R10	130-12	50M Ohm 1/3 Watt-20% - 20 Volt Carbon
R11	130-38	2 Meg Ohm 1/3 Watt-20% - 100 Volt Carbon
R12	130-20	100M Ohm 1/3 Watt-20% - 50 Volt Carbon
R13	130-3	500M Ohm 1/3 Watt-20% - 100 Volt Carbon
R14	101-38	100M Ohm - Tone Control
R15	106-27	220 Ohm - Muter Strip
R16	106-27	28 Ohm - Muter Strip
R17	106-27	33 Ohm - Muter Strip
R18	130-12	50M Ohm 1/3 Watt-20% - 20 Volt Carbon
R19	130-60	100 Ohm 1/3 Watt-20% - 10 Volt Carbon
R20	130-27	50 Ohm 1/3 Watt-20% - 3 Volt Carbon
R21	130-25	10M Ohm 1/3 Watt-20% - 150 Volt Carbon
R22	130-110	1 Meg Ohm 1/10 Watt-10% - 100 Volt Carbon

CONDENSERS

No.	Part No.	Description
C1	129-41	.0024 Mica-MW-W-10%
C2	129-1	.001 Mica-MT-4-20%
C3	100-9	.05 x 200 Volt-25%
C4	129-42	.0086 Mica-MW-W-5%
C5	100-14	.1 x 200 Volt-20%
C6	100-9	.05 x 200 Volt-25%
C7	100-41	.25 x 400 Volt-20%
C8	129-60	.00015 Mica-MT-0-20%
C9	100-11	.01 x 400 Volt-25%
C10	100-9	.05 x 200 Volt-25%
C11	129-2	.0005 Mica-MT-4-20%
C12	100-9	.05 x 200 Volt-25%
C13	129-5	.0001 Mica-MT-0-20%
C14	100-26	.02 x 400 Volt-25%
C15	100-32	.0005 x 1000 Volt-20%
C16	100-11	.01 x 400 Volt-25%
C17	103-8	14 mfd. x 400 Volt Electrolytic
C18	103-8	8 mfd. x 350 Volt Electrolytic
C19	100-42	.25 x 200 Volt-25%
C20	129-68	.00003 Mica-MT-0-20%
C21	100-13	.03 x 400 Volt-25%
C22	129-40	.0001 Mica-MT-0-10%

MISCELLANEOUS PARTS

No.	Part No.	Description
C	109-23	One Section of Three Gang Condenser
T1	104-50	Wave Trap Coil and Trimmer
T2	111-38A	M.W. and S.W. Antenna Coil
T3	111-37	L.W. Antenna Coil
T4	109-25A	M.W. and S.W. R.F. Coil
T5	109-22	L.W. R.F. Coil
T6	110-31	M.W. and S.W. Oscillator Coil
T7	110-30	L.W. Oscillator Coil
T8	108-64	Input I.F. 465 Kc.
T9	108-63	Output I.F. 465 Kc.
T10	104-63	Power Transformer 50 Cycle
I	114-46	8 In. Speaker (Field Resistance 1250 Ohm)
S	125-21	Band Switch
S1	101-38	High Fidelity Switch on Tone Control
S2	125-22	Phono-Radio Switch
S3	101-47	On and Off Switch on Volume Control

NOTE: R15, R16 and R17 are in one unit-No. 106-27

C23 129-37 .0019 Mica-MW-W-2 1/2 %
C24 129-37 .0005 Mica-MT-0-5 %
C25 124-33 Adjustable Condenser 200 mmf. Work. Cap.
C26 124-33 Adjustable Condenser 340 mmf. Work. Cap.
NOTE: C25 and C26 are in one unit-No. 124-33

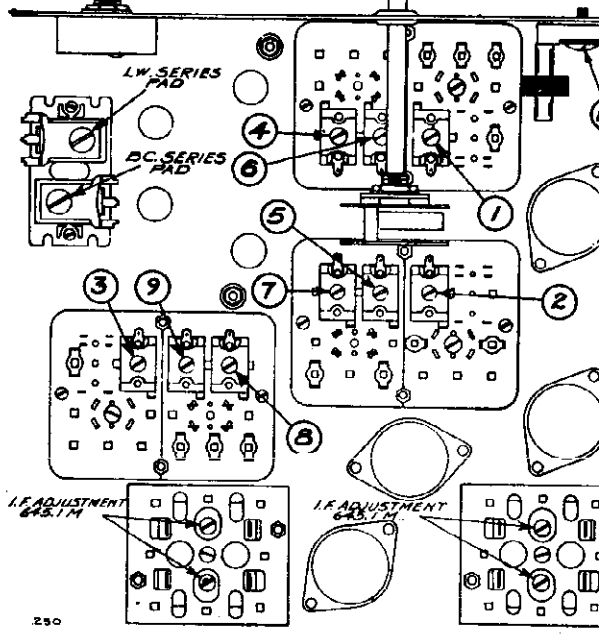
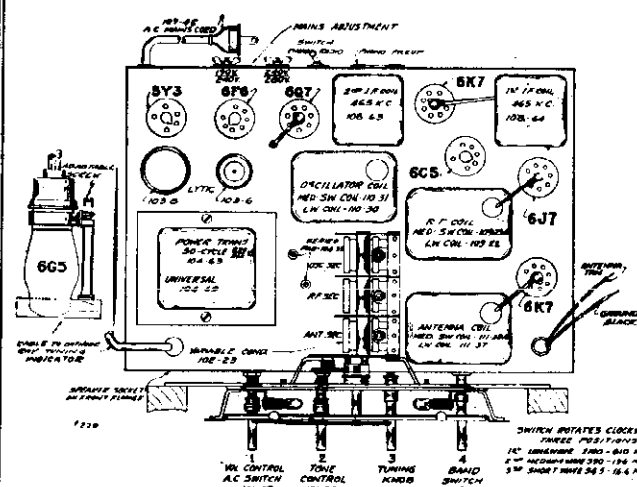


FIG. 2-BOTTOM VIEW (Showing Trimmer)

MODEL 856, Series A
Alignment**BELMONT RADIO CORP.****POWER SUPPLY:**

This receiver is normally supplied with a transformer for operation on 50 cycles (may be higher in frequency, not lower) and with a primary designed for operation on 190-280 volts.

Mains transformer is provided with two taps, one for voltages 190-240 volts another for voltages 240-280 volts. These taps are accessible upon removing plate fastened with two wing nuts to back of chassis.

ALIGNING INSTRUCTIONS**Dummy Antennas**

The following dummy antennas are used in aligning the receiver, and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast and long wave)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

TEST FREQUENCIES USED

	Kilocycles	Meters
I. F.	465	645.1
Long Wave	150	2000
	370	810
	350	857
Broadcast	550	545
	1300	230
	1530	196
Short Wave	6000	50.0
	17000	17.6
	18100	16.6

ALIGNING I.F. TRANSFORMERS
(465 K.C.) (645.1 Meters)

Part No. 108-63 Output I.F. Transformer.
Part No. 108-64 Input I.F. Transformer.

These I.F. transformers have two adjustments, both of which are accessible from the underside of chassis (see bottom view).

- With volume control full on (the extreme right of its rotation), the band changing switch in the medium wave position (center of its rotation), the tone control on "Hi" part of the sharp position (as much right rotation as possible without operating the Hi Fidelity switch), and with the variable condenser set to approximately 230 meters (1300 K.C.), make the following adjustments:
 - Connect external oscillator set at 645.1 meters (465 K.C.), in series with "Dummy 1," to the control grid cap of the type 6K7 tube, located between the two I.F. transformers, and adjust the output I.F. transformer (108-63) to resonance.
 - With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap to 6J7 and adjust input I.F. transformer (108-64) to resonance.
 - With oscillator still connected to 6J7, readjust output I.F. transformer if necessary.

ALIGNMENT PROCEDURE

The following adjustments to be made after the I.F.'s have been aligned as explained above.

SHORT WAVE BAND ALIGNMENT:
16.6 Meters (18.1 Mc.) to 54.5 Meters (5.5 Mc.)

- With band changing switch in the short wave position, extreme right of its rotation, and with the gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
 - Set external oscillator to 16.6 meters (18.1 Mc.) and adjust short wave oscillator trimmer (adjustment number 8, see Fig. 2) to resonance.
 - Re-set external oscillator to 17.6 meters (17.0 Mc.) and pick up signal by rotating gang condenser. Adjust short wave R.F. trimmer (adjustment number 7) and short wave antenna trimmer (adjustment number 6) to resonance.

- Re-set external oscillator to 50 meters (6.0 Mc.) and check for sensitivity.

NOTE: It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental. An example of this is an image of a fundamental 18.3 megacycle signal appears near 17.4 megacycles.

MEDIUM OR BROADCAST BAND ALIGNMENT:
590 Meters (508 K.C.) to 196 Meters (1530 K.C.)

- With band changing switch in the medium wave position, center of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to tan antenna lead and black ground lead, make following adjustments:
 - Set external oscillator to 196 meters (1530 K.C.) and adjust medium wave oscillator trimmer to resonance (adjustment number 9; see bottom view of coil assembly, Fig. 2.)
 - Re-set external oscillator to 230 meters (1300 K.C.), rotate variable gang condenser and pick up signal. Adjust medium wave R.F. trimmer (adjustment number 5) and medium wave antenna trimmer (adjustment number 4) to resonance.
 - Re-set external oscillator to 545 meters (550 K.C.) and adjust medium wave series pad to resonance by rotating condenser to approximately 550 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 2.)
 - Repeat adjustments "a" and "b" until sensitivity is at its maximum.
 - Check for tracking and sensitivity at 300 meters (1000 K.C.) Under no circumstances bend plates of variable condenser sections to correct tracking.

IMPORTANT: This band must be completely rechecked after the long wave band has been adjusted.

LONG WAVE BAND ALIGNMENT:
810 Meters (370 K.C.) to 2100 Meters (143 K.C.)

- With band changing switch in the long wave position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to tan antenna lead and black ground lead, make following adjustments:
 - Set external oscillator to 810 meters (370 K.C.), and adjust long wave oscillator trimmer to resonance (adjustment number 3; see bottom view of coil assembly, Fig. 2.)
 - Re-set external oscillator to 857 meters (350 K.C.), rotate variable gang condenser and pick up signal. Adjust long wave R.F. trimmer (adjustment number 2) and long wave antenna trimmer (adjustment number 1) to resonance.
 - Re-set external oscillator to 2000 meters (150 K.C.), and adjust long wave series pad to resonance by rotating condenser to approximately 2000 meters, rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 2.)
 - Repeat adjustments "a" and "b" until sensitivity is at its maximum.

IMPORTANT: This band must be completely rechecked after the medium wave band has been rechecked.

WAVE TRAP ADJUSTMENT:

The circuit diagram of this receiver shows a wave trap part number 108-50 (T1) in the antenna circuit.

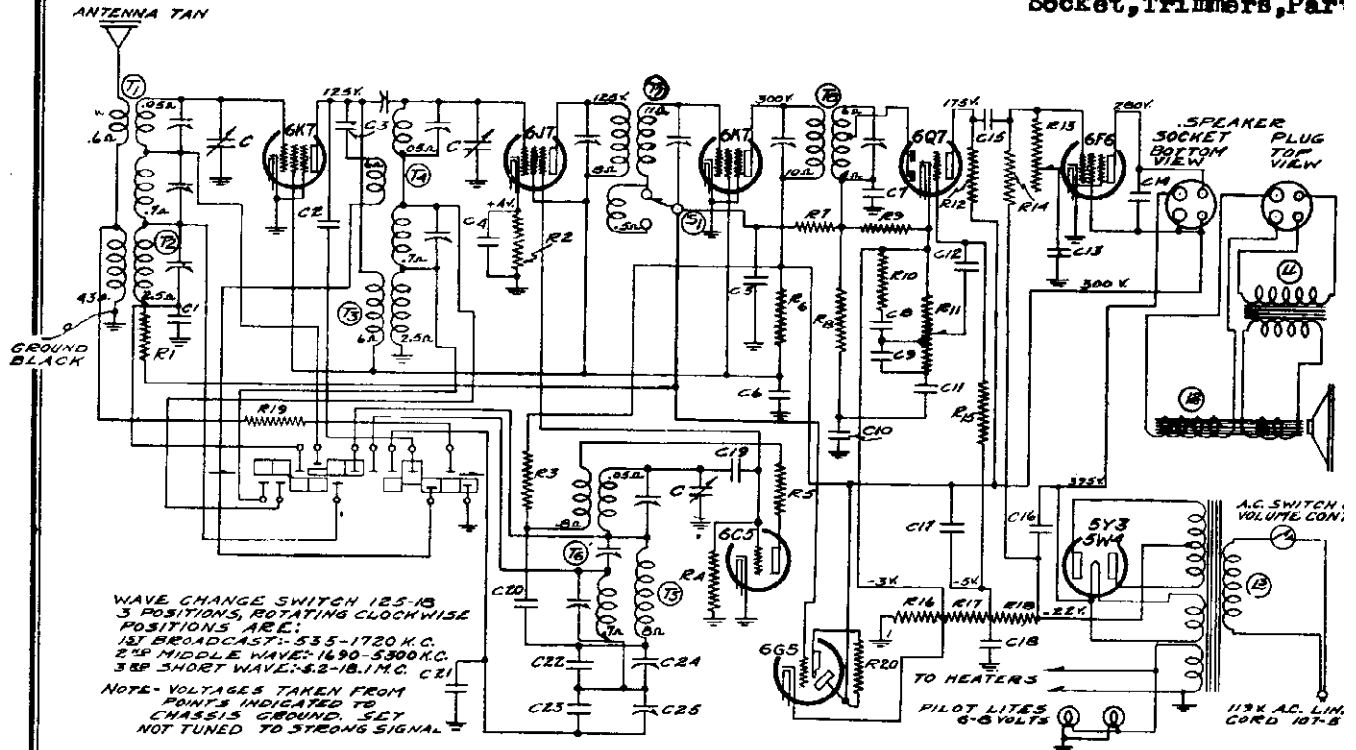
The purpose of this part is to trap out interfering frequencies close to the intermediate frequency (645.1 meters, 465 K.C.) used for the I.F. stage.

To properly adjust the trimmer for the wave trap (adjustment number 10, Fig. 2, page 2), proceed as follows:

- With band changing switch in the medium wave position, center of its rotation and the dial pointer set at 545 meters, and with external oscillator connected in series with "Dummy 2" to tan antenna lead and black ground lead, make the following adjustment:
 - Set external oscillator to 645.1 meters (465 K.C.) and adjust wave trap trimmer (adjustment number 10) for minimum response.

BELMONT RADIO CORP.

MODEL 878, Series A
Schematic, Voltage
Socket, Trimmers, Parts



WAVE CHANGE SWITCH 125-13
3 POSITIONS, ROTATING CLOCKWISE
POSITIONS ARE:
125 BROADCAST: 535-1720 K.C.
13-18 MIDDLE WAVE: 1490-5300 K.C.
18-19 SHORT WAVE: 6.2-18.1 MC. C21
NOTE: VOLTAGES TAKEN FROM
POINTS INDICATED TO
CHASSIS GROUND. SET
NOT TUNED TO STRONG SIGNAL

The tube complement of this chassis is as follows:

- 1—Type 6K7 Remote cut-off pentode R.F. amplifier
- 1—Type 6J7—pentode first detector.
- 1—Type 6C5 Oscillator
- 1—Type 6K7 Remote cut-off pentode I.F. amplifier (465 K.C.)
- 1—Type 6Q7 duplex diode pentode second detector, A.V.C. audio.
- 1—Type 6F6—pentode output amplifier.
- 1—Type 5Y3 or 5W4—high vacuum rectifier.
- 1—Type 6G5 Cathode Ray Tuning Indicator.

No.	Part No.	Description
R1	130-20	100M Ohms—1/3 W.—20%—50 V.—Car.
R2	130-43	2500 Ohms—1/3 W.—20%—20 V.—Car.
R3	130-77	10M Ohms 1 W.—20%—100V.—Car.
R4	130-12	50M Ohms—1/3 W.—20%—20 V.—Car.
R5	130-60	100 Ohms—1/3 W.—20%—10 V.—Car.
R6	130-88	10M Ohms—2 W.—20%—Wire Wound
R7	130-3	500M Ohms—1/3 W.—20%—100 V.—Car.
R8	130-20	100M Ohms—1/3 W.—20%—50 V.—Car.
R9	130-11	250M Ohms—1/3 W.—20%—50 V.—Car.
R10	130-22	5000 Ohms—1/3 W.—20%—10 V.—Car.
R11	101-47	1 meg Ohm—Vol. Con. with AC Switch
R12	130-20	100M Ohms—1/3 W.—20%—50 V.—Car.
R13	101-38	100M Ohms—Tone Con with Fid. Switch.
R14	130-3	500M Ohms—1/3 W.—20%—100 V.—Car.
R15	130-38	2 meg Ohm—1/3W.—20%—100 V.—Car.
R16	106-27	38 Ohms—10% Muter Resistor
R17	106-27	28 Ohms—10% Muter Resistor
R18	106-27	220 Ohms—10% Muter Resistor
R19	130-27	50 Ohms—1/3 Watt—20% Car.
Note: R16, R17, R18 in one unit—part No. 106-27		
R20	130-110	1 Megohm—1/10 W.—10%—100V.—Car.

CONDENSERS	
C	102-35 One sec. of 3 gang var. condenser
C1	100-9 .05—200 Volt—25%
C2	129-59 .0003 Mica—MT—0—5%
C3	129-39 .00005 Mica—MT—0—20%
C4	100-9 .05—200 Volt—25%
C5	100-9 .05—200 Volt—25%
C6	100-41 .25—400 Volt—20%
C7	129-5 .0001 Mica—MT—0—20%
C8	100-9 .05 200 Volt 25%
C9	129-2 .0005 Mica—MT—0—20%
C10	129-69 .00015 Mica—MT—0—20%
C11	100-9 .05—200 Volt—25%
C12	100-11 .01—400 Volt—25%
C13	100-26 .02—400 Volt—25%
C14	100-32 .0005—1000 Volt—20%
C15	100-11 .01—400 Volt—25%
C16	103-8 14 mid.—400 Volt Electrolytic
C17	103-6 8 mid.—350 Volt Electrolytic
C18	100-46 .25—200 Volt—20%
C19	129-31 .000025 Mica—MT—0—15%
C20	100-13 .05—400 Volt—25%
C21	129-54 .003 Mica—MW—W—2 1/2%

I. F. FREQUENCY
465 K. C.

- C22 129-57 .0005 Mica—MT—0—5%
 - C23 129-66 .0021 Mica—MW—W—2 1/2%
 - C24 124-18 Padder, 300 mmf. working capacity
 - C25 124-18 Padder, 300 mmf. working capacity
 - Note: C24, C25 in one unit—Part No. 124-18
- PARTS
- T1 111-54 M.W. and S.W. Antenna Coil Asse
 - T2 111-55 Broadcast Antenna Coil Assem.
 - T3 109-30 Broadcast R.F. Coil Assem.
 - T4 109-29 M.W. and S.W. R.F. Coil Assem.
 - T5 110-43 Broadcast Osc Coil Assem.
 - T6 110-42 M.W. and S.W. Osc. Coil Assem.
 - T7 108-64 Input I.F. Coil—465 Kc.
 - T8 108-63 Output I.F. Coil—465 Kc.
 - L1 Output Transformer (on speaker)
 - L2 114-36 8" Speaker (Field Resist. 1250 Ohm)
 - L3 104-27 Power Transformer (50-60 Cycle)
 - S 125-18 Band Switch
 - S1 101-38 Fidelity Switch on Tone Control

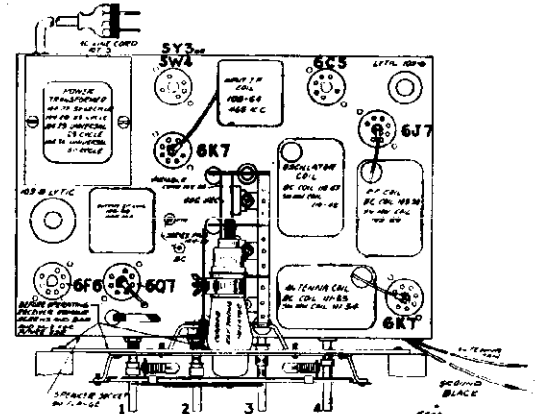
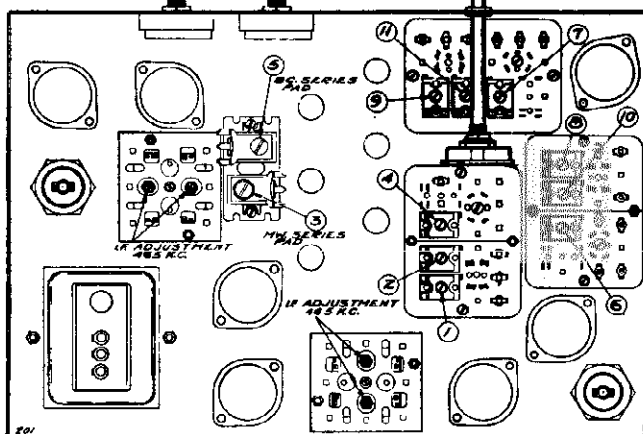
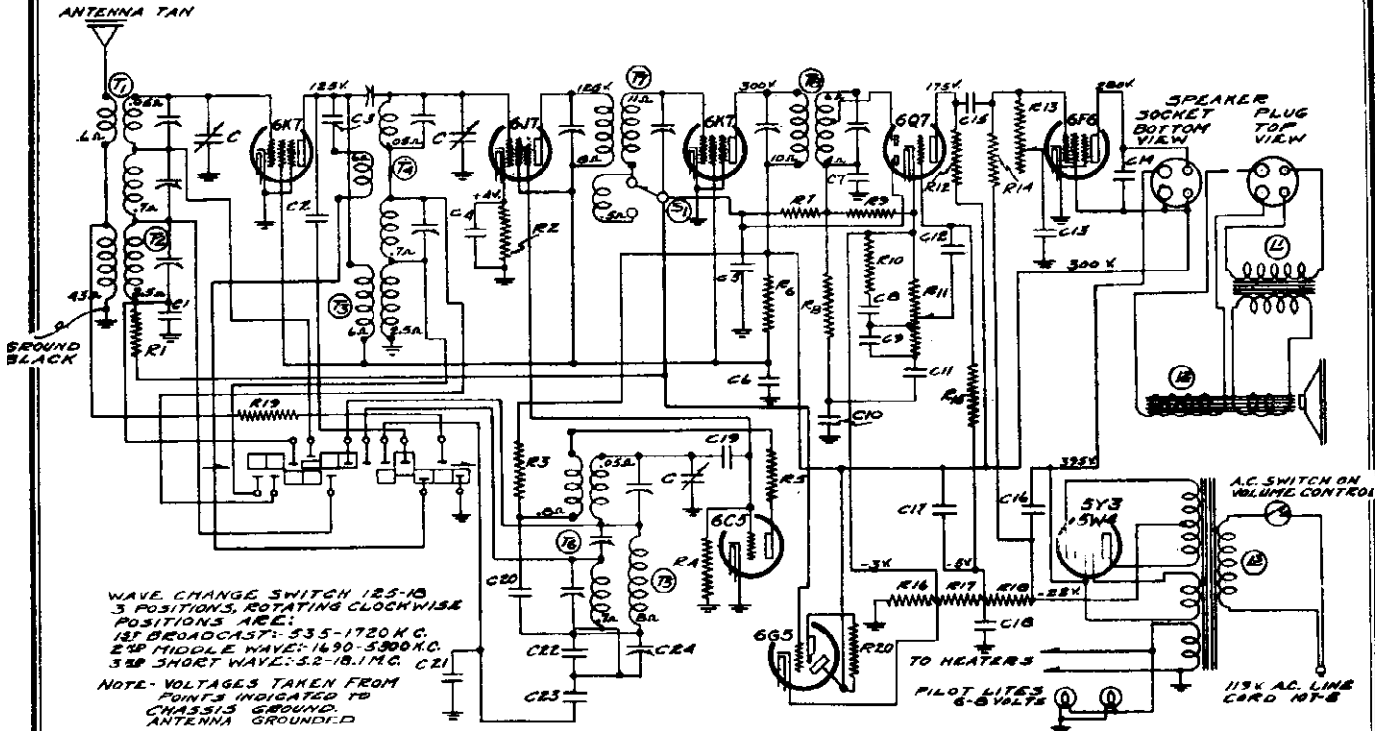


FIG. 1—BOTTOM VIEW SHOWING TRIMMERS

MODEL 878, Series B

BELMONT RADIO CORP.

Schematic, Voltage Socket, Trimmers, Parts



The tube complement of this chassis is as follows:

- 1—Type 6K7 Remote cut-off pentode R.F. amplifier
- 1—Type 6J7—pentode first detector.
- 1—Type 6C5 Oscillator
- 1—Type 6K7 Remote cut-off pentode I.F. amplifier (465 K.C.)

- 1—Type 6Q7 duplex diode pentode second detector, A.V.C. audio.
- 1—Type 6F6—pentode output amplifier.
- 1—Type 5Y3 or 5W4—high vacuum rectifier.
- 1—Type 6G5 Cathode Ray Tuning Indicator.

Part No.	Description
RESISTORS	
R1 130-20	100M Ohms—1/3 W.—20%—50 V.—Car.
R2 130-43	2500 Ohms—1/3 W.—20%—20 V.—Car.
R3 130-77	10M Ohms—1 W.—20%—100V.—Car.
R4 130-12	50M Ohms—1/3 W.—20%—20 V.—Car.
R5 130-60	100 Ohms—1/3 W.—20%—10 V.—Car.
R6 130-88	10M Ohms—2 W.—20%—Wire Wound
R7 130-38	2 meg Ohms—1/3 W.—20%—100 V.—Car.
R8 130-20	100M Ohms—1/3 W.—20%—50 V.—Car.
R9 130-11	250M Ohms—1/3 W.—20%—50 V.—Car.
R10 130-22	5000 Ohms 1/3 W.—20%—10 V.—Car.
R11 101-47	1 meg Ohm—Vol. Con. with AC Switch
R12 130-20	100M Ohms—1/3 W.—20%—50 V.—Car.
R13 101-38	100M Ohms—Tone Con with Fid. Switch.
R14 130-3	500M Ohms—1/3 W.—20%—100 V.—Car.
R15 130-38	2 meg Ohm—1/3 W.—20%—100 V.—Car.
R16 106-27	38 Ohms—10% Muter Resistor
R17 106-27	28 Ohms—10% Muter Resistor
R18 106-27	220 Ohms—10% Muter Resistor
R19 130-27	50 Ohms—1/3 Watt—20% Car.
Note: R16, R17, R18 in one unit—part No. 106-27	
R20 130-110	1 Megohm—1/10 W.—10%—100V.—Car.

CONDENSERS	
C 102-35	One sec. of 3 gang var. condenser
C1 100-9	.05—200 Volt—25%
C2 129-59	.0003 Mica—MT—0—5%
C3 129-39	.00005 Mica—MT—0—20%
C4 100-9	.05—200 Volt—25%
C5 100-9	.05—200 Volt—25%
C6 100-41	.25—400 Volt—20%
C7 129-5	.0001 Mica—MT—0—20%
C8 100-9	.05—200 Volt—25%
C9 129-2	.0005 Mica—MT—0—20%
C10 129-60	.00015 Mica—MT—0—20%
C11 100-22	.05—200 Volt—25%
C12 100-11	.01—400 Volt—25%
C13 100-26	.02—400 Volt—25%
C14 100-32	.0005—1000 Volt—20%
C15 100-11	.01—400 Volt—25%
C16 103-8	14 mfd.—400 Volt Electrolytic
C17 103-6	8 mfd.—350 Volt Electrolytic
C18 100-46	.25—200 Volt—20%
C19 129-31	.000025 Mica—MT—0—15%
C20 100-13	.05—400 Volt—25%
C21 129-69	.0023 Mica—MW—W—2 1/2%

**I. F. FREQUENCY
465 K. C.**

- C22 129-57 .0005 Mica—MT—0—5%
 - C23 129-55 .0034 Mica—MW—W—2 1/2%
 - C24 124-34 Padder, working capacity, 200 mmf.
- PARTS**
- T1 111-54 M.W. and S.W. Antenna Coil Assem.
 - T2 111-55 Broadcast Antenna Coil Assem.
 - T3 109-30 Broadcast R.F. Coil Assem.
 - T4 109-29 M.W. and S.W. R.F. Coil Assem.
 - T5 110-43 Broadcast Osc Coil Assem.
 - T6 110-42 M.W. and S.W. Osc. Coil Assem.
 - T7 108-64 Input I.F. Coil—465 Kc.
 - T8 108-63 Output I.F. Coil—465 Kc.
 - L1 Output Transformer (no speaker)
 - L2 114-36 8" Speaker (Field Resist. 1250 Ohms)
 - L3 104-27 Power Transformer (50-60 Cycle)
 - S 125-18 Band Switch
 - S1 101-38 Fidelity Switch on Tone Control

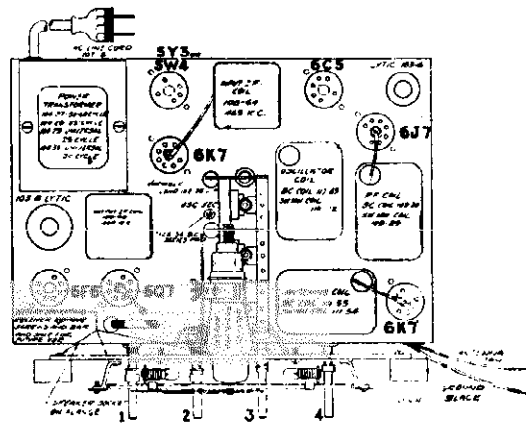
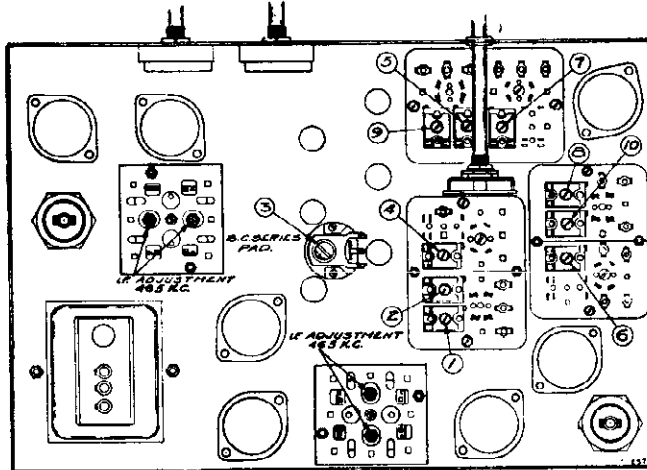


FIG. 1—BOTTOM VIEW SHOWING TRIMMERS

BELMONT RADIO CORP.

MODEL 878, Series A and
Alignment

SERVICE NOTES

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 119 volts on the primary of the power transformer.

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagrams.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.

ALIGNING INSTRUCTIONS

Dummy Antennas

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Intermediate and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

Resonance Indicator:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between the plate and screen terminals of the type 6F6 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

CAUTION:

No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet. To remove the knobs, pull them off and to take the chassis out of the cabinet, remove the four bolts by which it is fastened.

ALIGNING I.F. TRANSFORMERS (465 K.C.)

Part No. 108-63 Output I.F. Transformer
Part No. 108-64 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the underside of chassis (see bottom view, Fig. 1).

1. With volume control full on, (the extreme right of its rotation), the wave changing switch in the broadcast position, (extreme left of its rotation), the tone control on "Hi" part of the sharp position (as much right rotation as possible without operating the Hi Fidelity switch), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

- Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6K7 tube, located between the two I.F. transformers, and adjust the output I.F. transformer 108-63 to resonance.
- With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap to 6J7 and adjust input I.F. transformer (108-64) to resonance.
- With oscillator still connected to 6J7, re-adjust output I.F. transformer if necessary.

ALIGNMENT PROCEDURE

The following adjustments to be made after the I.F.'s have been aligned as explained above.

BROADCAST BAND ALIGNMENT:

1. With band changing switch in the broadcast position, extreme left of its rotation, and with external oscillator set at 600 kilocycles and connected in series with "Dummy 2" to the tan antenna and black ground lead, make the following adjustments:

FOR SERIES "A"

- Adjust broadcast series pad (adjustment number 5) to resonance with oscillator. Keep set in tune with oscillator by slowly rocking to and fro the variable condenser until maximum output is obtained. Note: This adjustment is accessible from the top of the chassis and is located between the variable condenser and the 108-63 output I.F. transformer. See top view, Fig. 3.

FOR SERIES "B"

- Adjust broadcast series pad (adjustment number 3) to resonance with oscillator. Keep set in tune with oscillator by slowly rocking to and fro the variable condenser until maximum output is obtained. Note: This adjustment is accessible from the top of the chassis and is located between the variable condenser and the 108-63 output I.F. transformer. See top view, Fig. 3.
- Re-set external oscillator to 1400 K.C., move dial pointer to 1400 K.C. and adjust oscillator (adjustment number 4), R.F. (adjustment number 6) and antenna (adjustment number 7) to resonance. See bottom view for location of these adjustments, Fig. 1.
- Repeat adjustments "a" and "b" until sensitivity is at its maximum.

NOTE: IT IS EXTREMELY NECESSARY IN MAKING ALL OF THESE ADJUSTMENTS THAT THE FUNDAMENTAL OSCILLATOR SIGNAL BE TUNED IN AND NOT THE IMAGE FREQUENCY WHICH WILL FALL BELOW THE FUNDAMENTAL.

SHORT WAVE BAND ALIGNMENT:

- With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
 - Move dial pointer to 17 megacycles and adjust short wave oscillator (adjustment number 1), short wave R.F. (adjustment number 8) and short wave antenna (adjustment number 9) to resonance.
 - Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check for sensitivity.

MIDDLE WAVE BAND ALIGNMENT:

FOR SERIES "A"

- With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 1800 K.C. and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
 - Rotate variable condenser to approximately 1800 K.C., tune in oscillator signal and adjust M.W. series pad (adjustment number 3) (see top view) to resonance. Slowly rock condenser to and fro while making this adjustment to be sure maximum output is obtained.
 - Set external oscillator at 5 M.C., rotate condenser, pick up signal and adjust intermediate wave R.F. (adjustment number 10), intermediate wave antenna (adjustment number 11) and intermediate wave oscillator (adjustment number 2) to resonance.

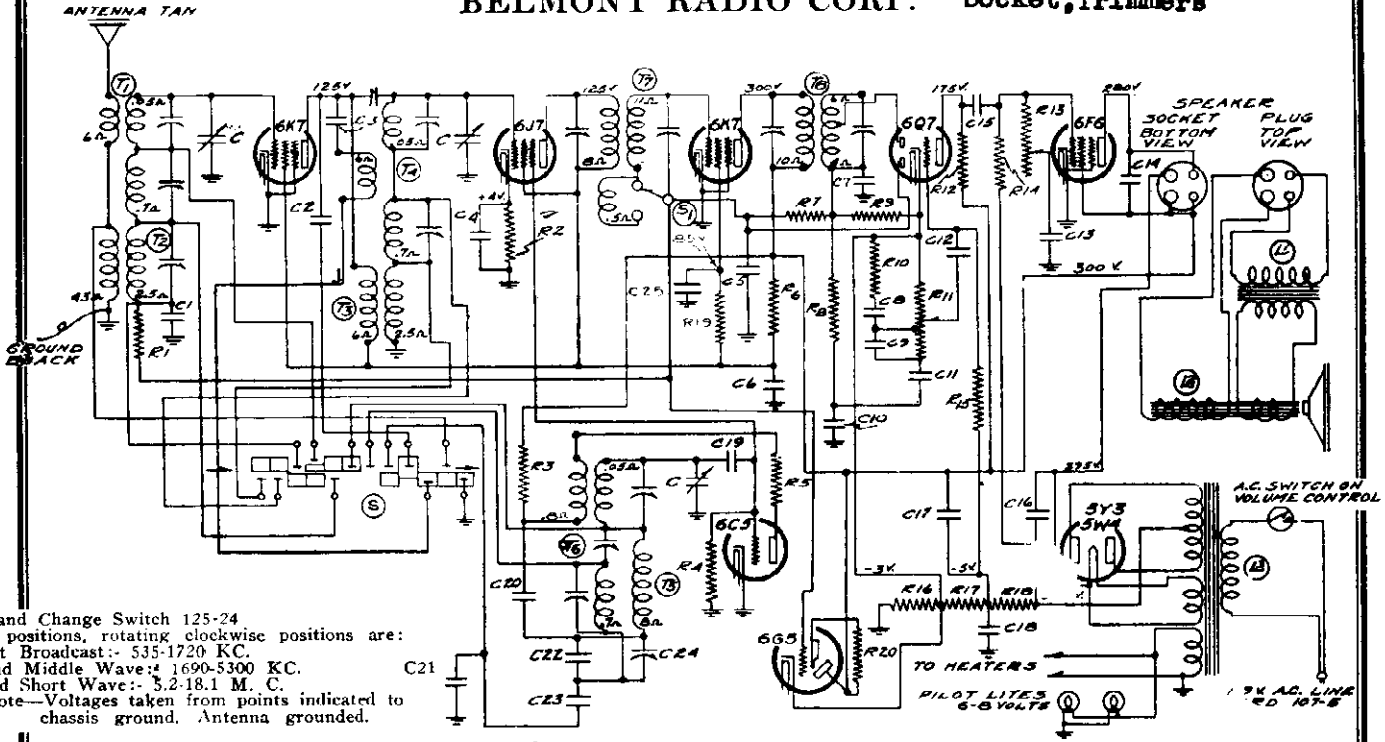
FOR SERIES "B"

- With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5 M.C. and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
 - Rotate condenser, pick up signal and adjust middle wave R.F. (adjustment number 10), middle wave antenna (adjustment number 5) and middle wave oscillator (adjustment number 2) to resonance.
- NOTE—** Re-check broadcast alignment and if it is found necessary to re-adjust either R.F. or antenna trimmers, repeat the 17 M.C. short wave and 5 M.C. middle wave adjustments.

MODEL 879, Series A

BELMONT RADIO CORP.

Schematic, Voltage, Parts
Socket, Trimmers



Band Change Switch 125-24
3 positions, rotating clockwise positions are:
1st Broadcast: 535-1720 KC.
2nd Middle Wave: 1690-5300 KC.
3rd Short Wave: 5.2-18.1 M. C.
Note—Voltages taken from points indicated to chassis ground. Antenna grounded.

FOR ALIGNMENT, SEE INDEX

Part No.	Description
R1	130-20 100M Ohms—1/3 W.—20%—50 V.—Car.
R2	130-43 2560 Ohms 1/3 W. 20%—20 V.—Car.
R3	130-77 10M Ohms—1 W.—20%—100V.—Car.
R4	130-12 50M Ohms—1/3 W.—20%—20 V.—Car.
R5	130-60 100 Ohms—1/3 W.—20%—10 V. Car.
R6	130-88 10M Ohms—2 W.—20%—Wire Wound
R7	130-38 2 meg Ohms—1/3 W.—20%—100 V.—Car.
R8	130-20 100M Ohms—1/3 W.—20%—50 V.—Car.
R9	130-11 250M Ohms—1/3 W.—20%—50 V.—Car.
R10	130-22 500M Ohms—1/3 W.—20%—10 V.—Car.
R11	101-60 1 meg Ohm—Vol. Con. with AC Switch
R12	130-20 100M Ohms—1/3 W.—20%—50 V.—Car.
R13	101-61 100M Ohms Tone Con. with Fid. Switch
R14	130-3 500M Ohms—1/3 W.—20%—100 V.—Car.
R15	130-38 2 meg Ohm—1/3W.—20%—100 V.—Car.
R16	106-27 38 Ohms—10% Muter Resistor
R17	106-27 28 Ohms—10% Muter Resistor
R18	106-27 220 Ohms—10% Muter Resistor
R19	130-76 30M Ohms—1/2 W.—20%—10V.—Carbon
Note: R16, R17, R18 in one unit—part No. 106-27	
R20	130-110 1 Megohm—1/10 W.—10%—100V.—Car.

Part No.	Description
C	102-37 One sec. of 3 gang var. condenser
C1	100-9 .05—200 Volt—25%
C2	129-59 .0003 Mica—MT—0—5%
C3	129-39 .00005 Mica—MT—0—20%
C4	100-9 .05—200 Volt—25%
C5	100-9 .05—200 Volt—25%
C6	100-41 .25—400 Volt—20%
C7	129-5 .0001 Mica—MT—0—20%
C8	100-9 .05—200 Volt—25%
C9	129-2 .0005 Mica—MT—0—20%
C10	129-60 .00015 Mica—MT—0—20%
C11	100-22 .05—200 Volt—25%
C12	100-11 .01—400 Volt—25%
C13	100-26 .02—400 Volt—25%
C14	100-32 .0005—1000 Volt—20%
C15	100-11 .01—400 Volt—25%
C16	103-8 14 mfd.—400 Volt Electrolytic
C17	103-6 8 mfd.—350 Volt Electrolytic
C18	100-46 .25—200 Volt—25%
C19	129-31 .000025 Mica—MT—0—15%
C20	100-13 .05—400 Volt—25%
C21	129-69 .0023 Mica—MW—W—2 1/2%
C22	129-57 .0005 Mica—MT—0—5%
C23	129-55 .0034 Mica—MW—W—2 1/2%
C24	124-34 Padder, working capacity, 200 mm.
C25	100-11 .01 x 400 Volt—25%

PARTS

T1	111-54 M.W. and S.W. Antenna Coil Assem.
T2	111-55 Broadcast Antenna Coil Assem.
T3	109-30 Broadcast R.F. Coil Assem.
T4	109-29 M.W. and S.W. R.F. Coil Assem.
T5	110-43 Broadcast Osc Coil Assem.
T6	110-42 M.W. and S.W. Osc. Coil Assem.
T7	108-64 Input I.F. Coil—465 Kc.
T8	108-63 Output I.F. Coil—465 Kc.
L1	Output Transformer (on speaker)
L2	114-36 8" Speaker (Field Resist. 1250 Ohms)
L3	104-27 Power Transformer (50-60 Cycle)
S	125-24 Band Switch
S1	101-61 Fidelity Switch on Tone Control

TUNING RANGE—
Standard Broadcast Band
535-1720 Kilocycles.

Middle Wave Band
1690-5300 Kilocycles
Short Wave Band
5.2-18.1 Megacycles.

I. F. FREQUENCY
465 K. C.

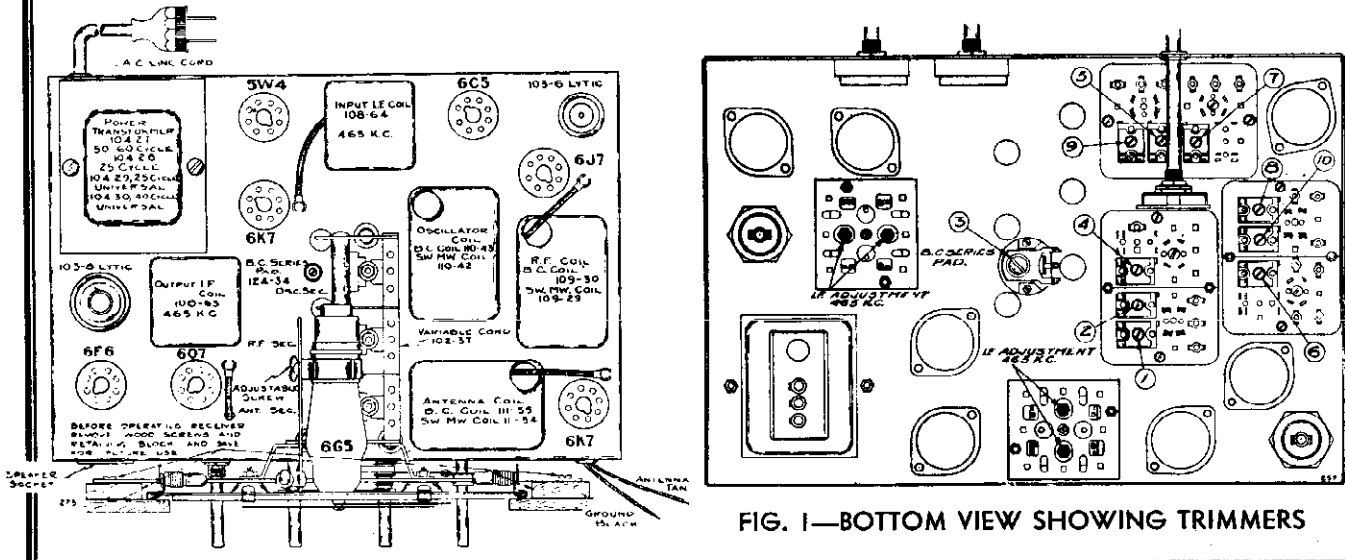
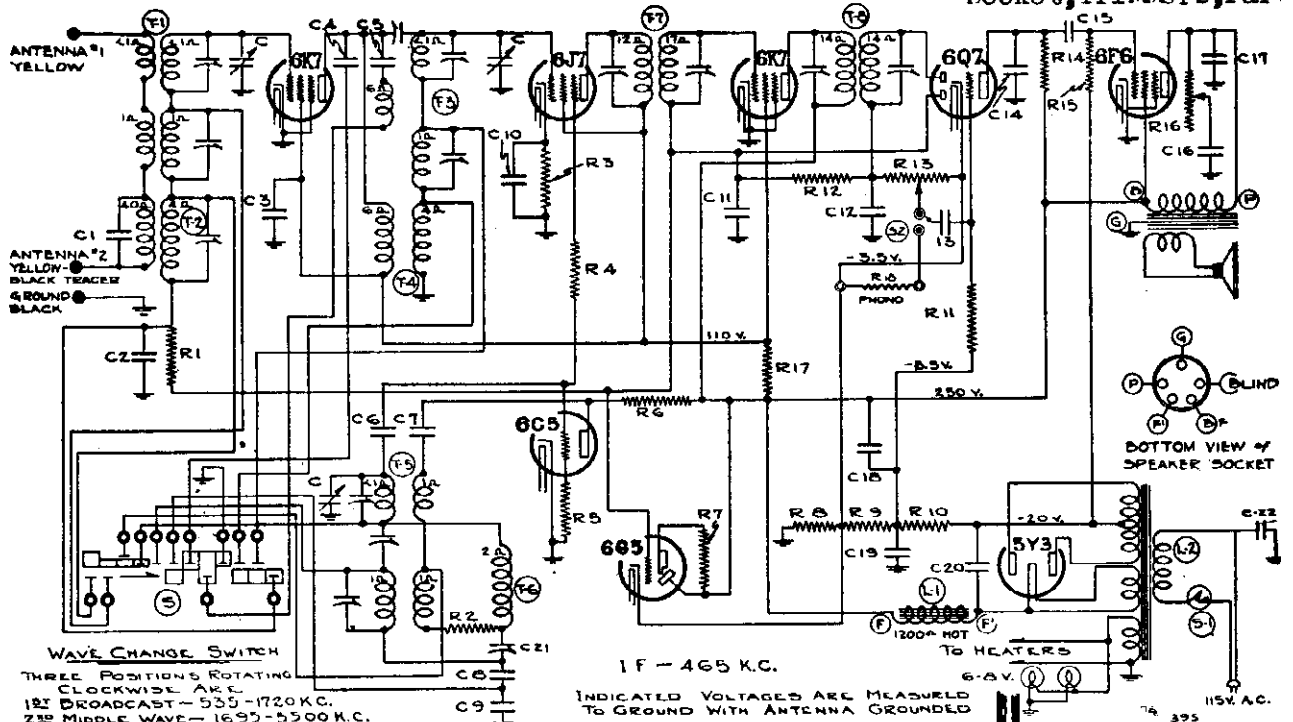


FIG. 1—BOTTOM VIEW SHOWING TRIMMERS

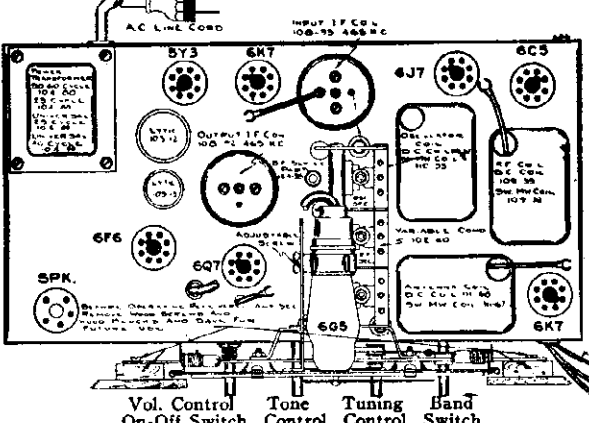
BELMONT RADIO CORP.

MODEL 890, Series A
Schematic, Voltage
Socket, Trimmers, Part



WAVE CHANGE SWITCH
THREE POSITIONS ROTATING
CLOCKWISE ARE:
1. BROADCAST - 535-1720 K.C.
2. MIDDLE WAVE - 1695-5500 K.C.
3. SHORT WAVE - 5.35-18.1 M.C.

BAND	FREQUENCY RANGE
Broadcast	535 to 1720 K.C. (Kilocycles)
Middle Wave	1695 to 5500 K.C. (Kilocycles)
Short Wave	5.35 to 18.1 M.C. (Megacycles)



RESISTORS

FIG. 1—TOP VIEW	FIG. 1—TOP VIEW	FIG. 1—TOP VIEW
R1 130-103	100M ohm—1/3 w.—10%	C2 100-9 .05x200 v.—25%
R2 130-105	150 ohm—1/3 w.—20%	C3 100-53 .25x400 v.—25%
R3 130-159	2500 ohm—1/3 w.—10%	C4 129-59 .0003 Mica—5%
R4 130-60	150 ohm — 1/3 w. 20%	C5 129-38 .00005 Mica—10%
R5 130-52	50M ohm—1/3 w.—20%	C6 129-67 .00004 Mica—10%
R6 130-77	10M ohm—1 w.—20%	C7 100-25 .002x600 v.—25%
R7 130-110	1 megohm—1/10 w.—10%	C8 129-70 .004 Mica—2 1/2 %
R8 106-33	55 ohm—Muter	C9 129-71 .002 Mica—2 1/2 %
R9 106-33	30 ohm—Muter	C10 100-20 .1x200 v.—25%
R10 106-33	240 ohm—Muter	C11 100-26 .02x400 v.—25%
R11 130-4	3 megohm—1/3 w.—20%	C12 129-40 .0001 Mica—10%
R12 130-38	2 megohm—1/3 w.—20%	C13 100-11 .01x400 v.—25%
R13 101-65	500M ohm—Volume Control	C14 129-2 .0005 Mica—20%
R14 130-103	100M ohm—1/3 w.—10%	C15 100-11 .01x400 v.—25%
R15 130-102	500M ohm—1/3 w.—10%	C16 100-27 .025x600 v.—25%
R16 101-53	50M ohm—Tone Control	C17 100-25 .002x600 v.—25%
R17 130-160	10M ohm—2 w.—Wire Wound	C18 103-13 8.0x400 v.—Lytic
R18 130-103	100M ohm—1/3 w.—10%	S 125-25 Band Switch
C1 129-40	.0001 Mica 10%	S1 101-65 On-off switch on Volume Control
		S2 125-22 Phono Switch

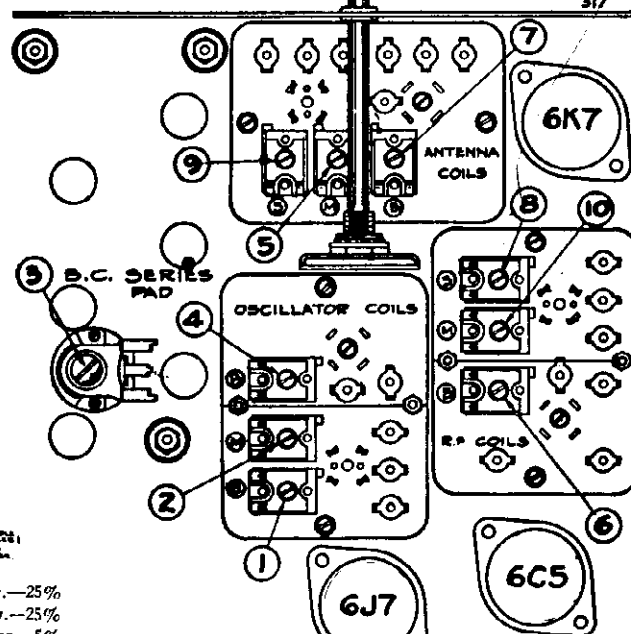


FIG. 3—BOTTOM VIEW SHOWING TRIMMERS.

C	102-40	Section of three gang condenser
T1	111-67	MW-SW Antenna Coil Assembly
T2	111-68	Broadcast Antenna Coil Assembly
T3	109-32	MW-SW R. F. Coil Assembly
T4	109-33	B. C. R. F. Coil Assembly
T5	110-53	M. W.-S. W. Oscillator Coil Assembl
T6	110-52	B. C. Osc. Coil Assembly
T7	108-93	Input I. F. Coil 465 kc.
T8	108-92	Output I. F. Coil 465 kc.
L1	114-57	Speaker 8"
L1	114-65	Speaker 10"—field Resistance—1200 oh
L2	104-80	Power Transformer—50-60 cycles
S	125-25	Band Switch
S1	101-65	On-off switch on Volume Control
S2	125-22	Phono Switch

MODEL 890, Series A
Alignment
BELMONT RADIO CORP.
RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between the plate and screen terminals of the type 6F6 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-92 Output I.F. Transformer
 Part No. 108-93 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

- Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6K7 tube, and adjust the output I.F. transformer (No. 108-92) to resonance.
- With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap of 6J7 and adjust input I.F. transformer (No. 108-93) to resonance.

BROADCAST BAND ALIGNMENT:
535 to 1720 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to antenna and ground leads make following adjustments:

- Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance. (Adjustment number 4; see bottom view of coil assembly, Fig. 3)
- Re-set external oscillator to 1400 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast R.F. trimmer (adjustment number 6) and broadcast antenna trimmer (adjustment number 7), to resonance.
- Re-set external oscillator to 600 K.C., and adjust broadcast series pad (adjustment number 3), to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3).
- Repeat adjustments "a" and "b" until sensitivity is at its maximum.
- Check for tracking and sensitivity at 1400, 1000, and 600 kilocycles. Under no circumstances bend plates of variable condenser sections to correct tracking.

SHORT WAVE BAND ALIGNMENT:
5.35 to 18.1 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the antenna and ground leads, make the following adjustments:

- Move dial pointer to 17 megacycles and adjust short

wave oscillator trimmer (adjustment number 1) to resonance.

- Adjust short wave R.F. trimmer (adjustment number 8), and short wave antenna trimmer (adjustment number 9), to resonance.
- Re-set external oscillator and check set at 18.1 megacycles and 6 megacycles for band coverage and sensitivity.

NOTE: It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental on the receiver dial. As an example of this a fundamental 17 megacycle signal can be tuned in not only at 17 on the dial but also at approximately 16.1 megacycles.

MIDDLE WAVE BAND ALIGNMENT:
1695 to 5500 Kilocycles

1. With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5 megacycles and connected in series with "Dummy 3" to the antenna and ground leads make the following adjustments:

- Move dial pointer to 5 megacycles and adjust middle wave oscillator trimmer (adjustment number 2) to resonance.
- Adjust middle wave R.F. trimmer (adjustment number 10), and middle wave antenna trimmer (adjustment number 5), to resonance.
- Re-set external oscillator and check sensitivity at 1800 kilocycles.
- Recheck broadcast band alignment.

ANTENNA AND GROUND LEADS:

You will notice three wires coming out of the back of the chassis, — the yellow wire and the yellow with black tracer wire are used for doublet antenna connections. The black wire is the ground connection.

For conventional types of antennas connect the yellow wire to the antenna lead and the yellow with black tracer and the black wire together to the ground lead.

When a doublet antenna is used connect the yellow wire and the yellow with black tracer wire to the doublet antenna and the solid black wire to the ground lead. (See Fig. 1—Top View, page 2).

ANTENNA:

For the best results an outside antenna approximately 75-100 feet long including the lead-in should be used. It should be erected as high as possible and as far from surrounding objects as practical. Both the antenna and lead-in should be placed at right angles to street car lines and incoming power lines and as far from any electrical apparatus which may be in the vicinity (such as elevator motors) as practical.

An inside antenna is not recommended, although it occasionally may serve as a temporary installation especially near powerful broadcasting stations. This type of antenna, however, will not be satisfactory in buildings of steel construction.

Reception on the short wave band can be sometimes improved by means of an approved doublet antenna.

DESCRIPTION:

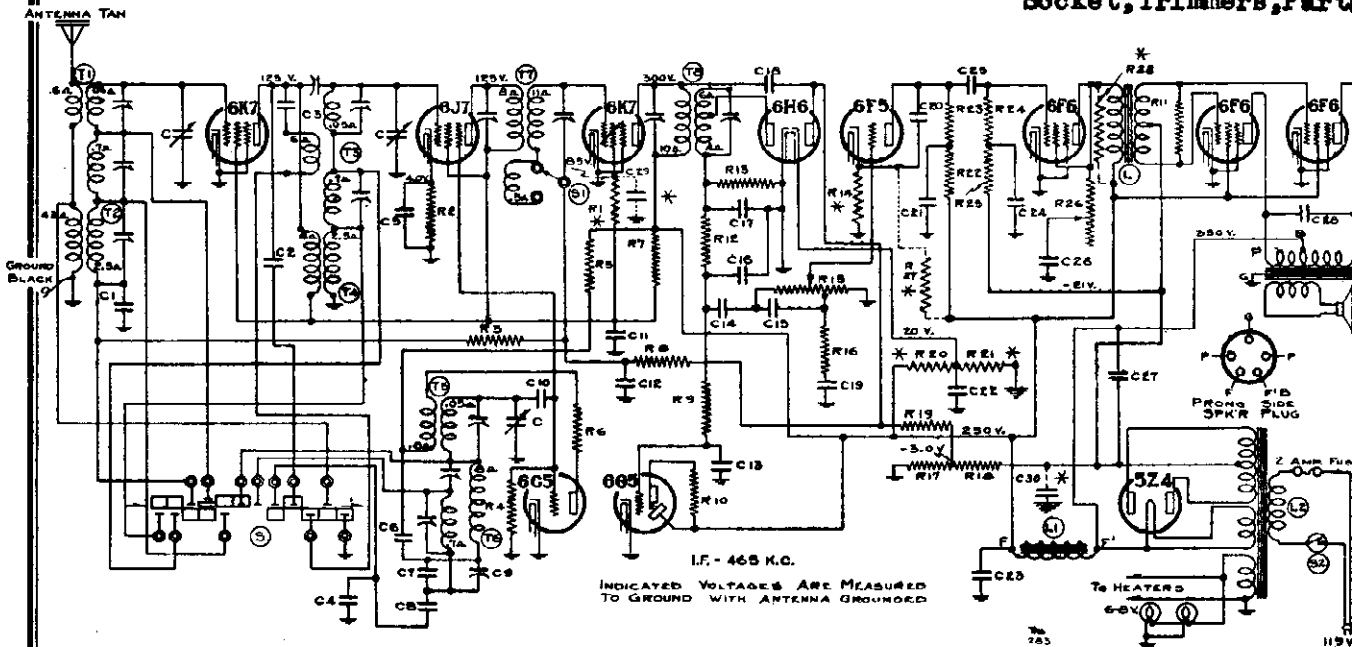
The tube complement of this chassis consists of the following metal and octal base glass tubes which are interchangeable with metal tubes:

- 1—Type 6K7 Remote cut-off pentode R.F. amplifier.
- 1—Type 6J7—pentode first detector.
- 1—Type 6C5 Oscillator.
- 1—Type 6K7 Remote cut-off pentode I.F. amplifier (465 K.C.)
- 1—Type 6Q7G duplex diode triode second detector, A.V.C. and audio.
- 1—Type 6F6G—pentode output amplifier.
- 1—Type 5Y3G or 5W4—high vacuum rectifier.
- 1—Type 6G5 Cathode ray tuning indicator.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 25, 40 and 60 cycles and with primary taps for 110, 130, and 230 volts.

BELMONT RADIO CORP.

MODELS 1170, 1172
Schematic, Voltage
Socket, Trimmers, Part



BAND CHANGE SWITCH
THREE POSITIONS, ROTATING
CLOCKWISE ARE:
1st BROADCAST: 535-1720 K.C.
2nd MIDDLE WAVE: 1690-5300 K.C.
3rd SHORT WAVE: 5.2-18.1 M.C.

TUNING RANGE—
Standard Broadcast Band
535-1720 Kilocycles.

Middle Wave Band
1690-5300 Kilocycles
Short Wave Band
5.2-18.1 Megacycles.

No. No.	Description
RESISTORS	
*R1 130-76	30M Ohm—1/4 Watt—20%—Carbon
R2 130-129	2500 Ohm—1/4 Watt—10%—Carbon
R3 130-20	100M Ohm—1/4 Watt—20%—Carbon
R4 130-12	50M Ohm—1/4 Watt—20%—Carbon
R5 130-77	10M Ohm—1 Watt—20%—Carbon
R6 130-60	100 Ohm—1/4 Watt—20%—Carbon
R7 130-88	10M Ohm—2 Watt—20%—Wire Wound
R8 130-4	1 meg Ohm—1/4 Watt—20%—Carbon
R9 130-4	3 meg Ohm—1/4 Watt—20%—Carbon
R10 130-110	1 meg Ohm—1/10 Watt—10%—Carbon
R11 130-21	20M Ohm—1/4 Watt—20%—Carbon
R12 130-20	100M Ohm—1/4 Watt—20%—Carbon
R13 130-20	100M Ohm—1/4 Watt—20%—Carbon
*R14 130-70	500 Ohm—1/4 Watt—10%—Carbon
R15 101-47	1 meg Ohm—Volume Control
R16 130-22	5M Ohm—1/4 Watt—20%—Carbon
R17 106-31	30 Ohm—Muter
R18 106-31	175 Ohm—Muter
R19 130-3	500M Ohm—1/4 Watt—20%—Carbon
*R20 130-130	100M Ohm—1/4 Watt—10%—Carbon
*R21 130-82	10M Ohm—1/4 Watt—10%—Carbon
R22 130-20	100M Ohm—1/4 Watt—20%—Carbon
R23 130-20	100M Ohm—1/4 Watt—20%—Carbon
R24 130-45	250M Ohm—1/4 Watt—20%—Carbon
R25 130-45	250M Ohm—1/4 Watt—20%—Carbon
R26 101-40	5000 Ohm Tone Control
*R27 130-130	100M Ohm—1/4 Watt—10%—Carbon
*R28 130-131	20M Ohm—1/4 Watt—10%—Carbon

NOTE: R17 and R18 in one Unit—No. 106-31.

No. No.	Description
CONDENSERS	
C1 100-9	.05 x 200 Volt—25%
C2 129-59	.0003 Mica—5%—MT-0
C3 129-39	.00005 Mica—20%—MT-0
C4 129-69	.0023 Mica—2 1/4%—MT-0
C5 100-9	.05 x 200 Volt—25%
C6 100-13	.05 x 400 Volt—25%
C7 129-57	.0005 Mica—5%—MT-0
C8 129-55	.0034 Mica—2 1/4%—MT-0
C9 124-34	200 mmf. Working cap. adjustable Pad
C10 129-31	.000025 Mica—15%—MT-0
C11 100-41	.25 x 400 Volt—20%
C12 100-9	.05 x 200 Volt—25%
C13 100-11	.01 x 400 Volt—25%
C14 100-22	.05 x 200 Volt—25%
C15 129-12	.00025 Mica—20%—MT-0
C16 129-60	.00015 Mica—20%—MT-0
C17 129-60	.00015 Mica—20%—MT-0
C18 129-3	.00002 Mica—20%—MT-0
C19 100-9	.05 x 200 Volt—25%
C20 129-5	.0001 Mica—20%—MT-0
C21 100-20	.1 x 200 Volt—25%
C22 100-19	.666' x 600 Volt—25%
C23 103-8	14 mfd.—400 Volt—Electrolytic
C24 100-20	.1 x 200 Volt—25%
C25 100-13	.05 x 400 Volt—25%
C26 100-45	.1 x 600 Volt—25%
C27 103-10	30 mfd. x 450 Volt—Electrolytic
C28 100-32	.0005 x 1000 Volts—20%
*C29 100-11	.01 x 400 Volts—25%
*C30 100-20	.1 x 200 Volt—25%

No. No.	Description
PARTS	
C	102-35 One section of three gang condenser
T1	111-54 MW and SW Antenna Coil Assem.
T2	111-55 Broadcast Antenna Coil Assem.
T3	109-29 MW and SW R.F. Coil Assem.
T4	109-30 Broadcast R.F. Coil
T5	110-42 MW and SW Osc. Coil Assem.
T6	110-43 Broadcast Osc. Coil Assem.
T7	108-64 Input I.F. Coil—465 Kc.
T8	108-63 Output I.F. Coil—465 Kc.
L	105-33 Audio Transformer
L1	114-47C Speaker (Field Resist. 1225 Ohm) Ho
L2	104-72 Power Transformer (50-60 Cycle)
S	125-18 Band Switch
S1	101-40 Fidelity Switch on Tone Control
S2	101-47 On-Off Switch on Volume Control

NOTE: Resistors and Condensers which are pre fixed with an asterisk (*) on the circuit diagram and parts list were added or the values changed during production to meet certain conditions. Resistors R1, R27, R28, and Condensers C29, C30 were added to correct certain variances of tube characteristics. Resistors R14, R20, R21 the values were changed. In some chassis the values of these resistors are as follows:
R14—2500 Ohm—1/4 Watt
R20—200M Ohm—1/4 Watt
R21—20M Ohm—1/4 Watt
Present values of these resistors are:
R14—500 Ohm—1/4 Watt
R20—100M Ohm—1/4 Watt
R21—10M Ohm—1/4 Watt

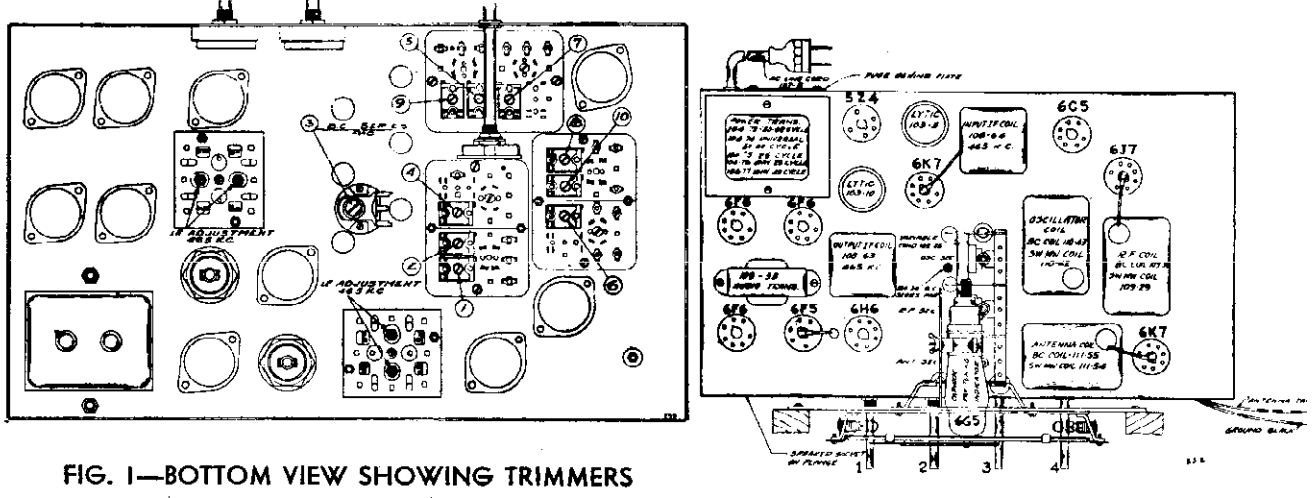


FIG. 1—BOTTOM VIEW SHOWING TRIMMERS

MODELS 1170, 1172**Alignment****BELMONT RADIO CORP.****DESCRIPTION**

The tube complement of this chassis is as follows:

- 1—Type 6K7 Remote cut-off pentode R.F. amplifier
- 1—Type 6J7 Pentode first detector
- 1—Type 6C5 Oscillator
- 1—Type 6K7 Remote cut-off pentode I.F. amplifier (465 K.C.)
- 1—Type 6H6 Duplex diode second detector and A.V.C.
- 1—Type 6F5 First audio amplifier
- 1—Type 6F6 Triode driver stage
- 2—Type 6F6 Class AB Output pentodes in push-pull
- 1—Type 5Z4 High vacuum rectifier
- 1—Type 6G5 Cathode Ray Tuning Indicator.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 25, 40 and 60 cycles and with primary taps for 108, 127, 150, 225, and 260 volts, (see instructions) and also sometimes equipped with 25 cycle transformers with 105-115 volt or 220 volt primaries, not universals.

SERVICE NOTES

NOTE: DeLuxe Model 1172 differs only from the Model 1170 in that dual speakers and a de luxe console cabinet are used. Both chassis are identical and the circuit diagram, the alignment procedure and the parts list contained in this manual apply to both models.

Attention is called to the circuit diagram contained in this manual. Several minor changes were made during production of these models to correct certain conditions. These changes are shown on the circuit diagram in dotted lines and explained in detail. Some of the chassis were equipped with 5Z3 rectifier tubes in place of the 5Z4 and do not have a fuse assembly in the power line.

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 115 volts on the primary of the power transformer.

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagrams.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.

This chassis is protected against damage from faulty tubes or abnormal line conditions by a fuse in the primary circuit.

If when set is turned on pilot lights do not light, look for a blown fuse.

This fuse is made accessible for replacement by removing fuse cover located on back flange of chassis, replace only with a 2 ampere fuse. If replacement fuse blows out, check tubes, (particularly 5Z4 rectifier) circuit, repair or replace defective tubes or parts.

NEVER ATTEMPT TO REPLACE FUSE WITHOUT FIRST DISCONNECTING POWER.

NEVER REPLACE WITH FUSE OTHER THAN 2 AMPERE RATING.

ALIGNING INSTRUCTIONS**Dummy Antennas**

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

- Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.
- Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.
- Dummy 3: (Intermediate and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

Resonance Indicator:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between the plate and cathode terminals of the 5 prong speaker socket. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

ALIGNING I.F. TRANSFORMERS (465 K.C.)

Part No. 108-63 Output I.F. Transformer

Part No. 108-64 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the underside of chassis (see bottom view Fig. 1).

1. With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), the tone control on "Hi" part of the sharp position (as much right rotation as possible without operating the Hi Fidelity switch), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
 - (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6K7 tube, located between the two I.F. transformers, and adjust the output I.F. transformer 108-63 to resonance.
 - (b) With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap to 6J7 and adjust input I.F. transformer (108-64) to resonance.
 - (c) With oscillator still connected to 6J7, re-adjust output I.F. transformer if necessary.

ALIGNMENT PROCEDURE

The following adjustments to be made after the I.F.'s have been aligned as explained above.

BROADCAST BAND ALIGNMENT:

1. With band changing switch in the broadcast position, extreme left of its rotation, and with external oscillator set at 600 kilocycles and connected in series with "Dummy 2" to the tan antenna and black ground lead, make the following adjustments:
 - (a) Adjust broadcast series pad (adjustment number 3) to resonance with oscillator. Keep set in tune with oscillator by slowly rocking to and fro the variable condenser until maximum output is obtained. Note: This adjustment is accessible from the top of the chassis and is located between the variable condenser and the 108-63 output I.F. transformer. See top view, Fig. 3.
 - (b) Re-set external oscillator to 1400 K.C., move dial pointer to 1400 K.C. and adjust oscillator (adjustment number 4), R.F. (adjustment number 6) and antenna (adjustment number 7) to resonance. See bottom view for location of these adjustments, Fig. 1.
 - (c) Repeat adjustments "a" and "b" until sensitivity is at its maximum.

NOTE: IT IS EXTREMELY NECESSARY IN MAKING ALL OF THESE ADJUSTMENTS THAT THE FUNDAMENTAL OSCILLATOR SIGNAL BE TUNED IN AND NOT THE IMAGE FREQUENCY WHICH WILL FALL BELOW THE FUNDAMENTAL.

SHORT WAVE BAND ALIGNMENT:

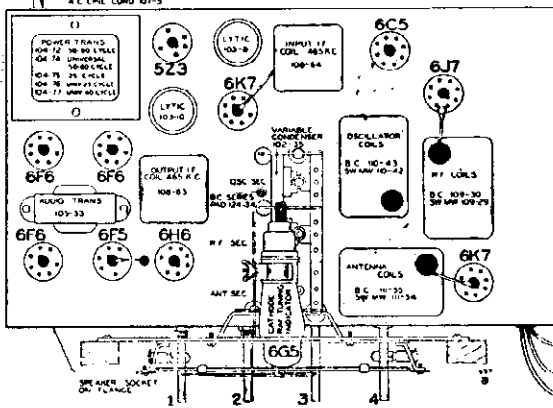
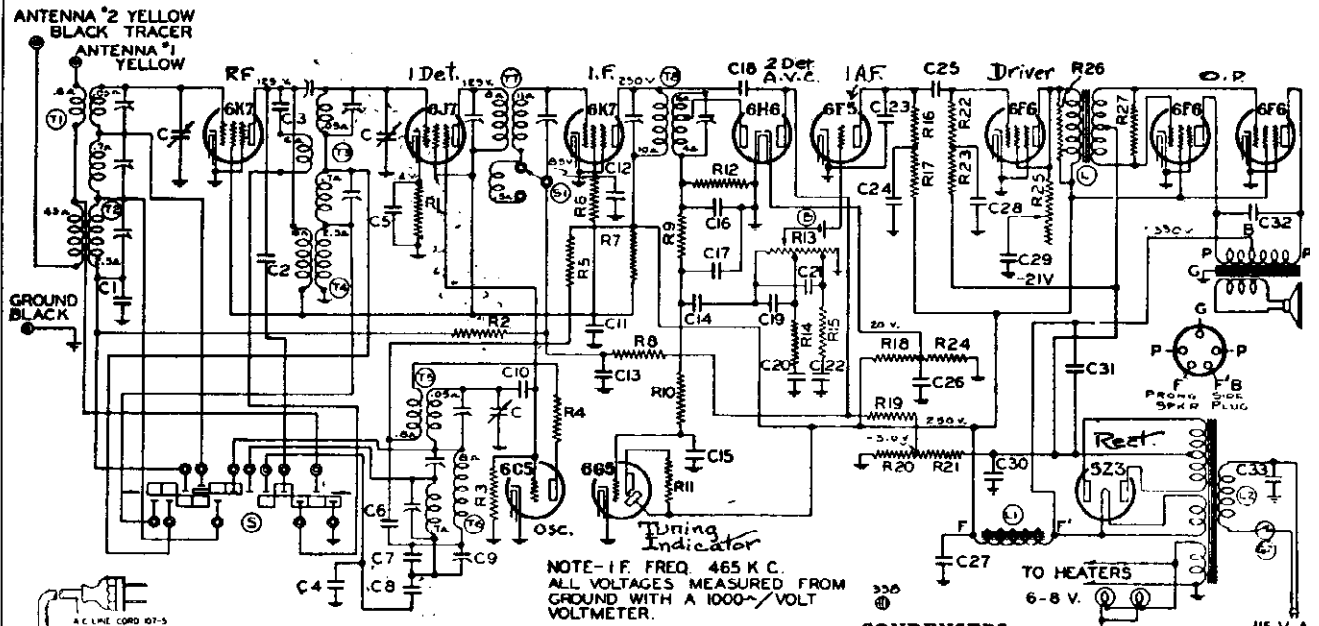
1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
 - (a) Move dial pointer to 17 megacycles and adjust short wave oscillator (adjustment number 1), short wave R.F. (adjustment number 8) and short wave antenna (adjustment number 9) to resonance.
 - (b) Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check for sensitivity.

MIDDLE WAVE BAND ALIGNMENT:

1. With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5 M.C. and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
 - (a) Rotate condenser, pick up signal and adjust middle wave R.F. (adjustment number 10), middle wave antenna (adjustment number 5) and middle wave oscillator (adjustment number 2) to resonance.
 - (b) Re-check broadcast alignment and if it is found necessary to re-adjust either R.F. or antenna trimmers, repeat the 17 M.C. short wave and 5 M.C. middle wave adjustments.

BELMONT RADIO CORP.

MODEL 1170B
Schematic, Voltage
Socket, Trimmers, Part



Vol. Control On-Off Switch
Tone Control
Tuning Control
Band Control Switch
High Fidelity Sw.

No. Part No. Description

RESISTORS

R1	130-129	2500 Ohm—1/3 Watt—10%—Carbon
R2	130-20	100M Ohm—1/3 Watt—20%—Carbon
R3	130-12	50M Ohm—1/3 Watt—20%—Carbon
R4	130-60	100 Ohm—1/3 Watt—20%—Carbon
R5	130-77	10M Ohm—1 Watt—20%—Carbon
R6	130-76	30M Ohm—1/3 Watt—20%—Carbon
R7	130-88	10M Ohm—2 Watt—20%—Wire Wound
R8	130-19	1 Megohm—1/3 Watt—20%—Carbon
R9	130-20	100M Ohm—1/3 Watt—20%—Carbon
R10	130-4	3 Megohm—1/3 Watt—20%—Carbon
R11	130-110	1 Megohm—1/10 Watt—10%—Carbon
R12	130-20	100M Ohm—1/3 Watt—20%—Carbon
R13	101-36	1 Megohm—Volume Control
R14	130-22	5M Ohm—1/3 Watt—20%—Carbon
R15	130-85	3M Ohm—1/3 Watt—20%—Carbon
R16	130-20	100M Ohm—1/3 Watt—20%—Carbon
R17	130-20	100M Ohm—1/3 Watt—20%—Carbon
R18	130-130	100M Ohm—1/2 Watt—10%—Carbon
R19	130-3	500M Ohm—1/3 Watt—20%—Carbon
R20	106-31	30 Ohm—Muter
R21	106-31	175 Ohm—Muter
R22	130-45	250M Ohm—1/3 Watt—20%—Carbon
R23	130-45	250M Ohm—1/3 Watt—20%—Carbon
R24	130-82	10M Ohm—1/3 Watt—10%—Carbon
R25	101-40	5000 Ohm—Tone Control
R26	130-131	20M Ohm—1/2 Watt—10%—Carbon
R27	130-21	20M Ohm—1/3 Watt—20%—Carbon

CONDENSERS

C1	100-9	.05x200 Volt—25%
C2	129-59	.0003 Mica—5%—MT-O
C3	129-39	.00005 Mica—20%—MT-O
C4	129-69	.0023 Mica—2 1/2%—MT-O
C5	100-9	.05x200 Volt—25%
C6	100-13	.05x400 Volt—25%
C7	129-57	.0005 Mica—5%—MT-O
C8	129-55	.0034 Mica—2 1/2%—MT-O
C9	124-34	200 Mmf. Working Cap.
C10	129-31	.00025 Mica—15%—MT-O
C11	100-41	.25x400 Volt—20%
C12	100-11	.01x400 Volt—25%
C13	100-9	.05x200 Volt—25%
C14	100-22	.05x200 Volt—25%
C15	100-11	.01x400 Volt—25%
C16	129-60	.00015 Mica—20%—MT-O
C17	129-60	.00015 Mica—20%—MT-O
C18	129-3	.00002 Mica—20%—MT-O
C19	129-2	.0005 Mica—20%—MT-O
C20	100-22	.05x200 Volt—25%
C21	129-60	.00015 Mica—20%—MT-O
C22	100-22	.05x200 Volt—25%
C23	129.5	.0001 Mica—20%—MT-O
C24	100-20	.1x200 Volt—25%
C25	100-13	.05x400 Volt—25%
C26	100-19	.006x600 Volt—25%
C27	103-8	14 Mfd.—400 Volt—Electrolytic
C28	100-20	.1x200 Volt—25%
C29	100-45	.1x600 Volt—25%
C30	100-20	.1x200 Volt—25%
C31	103-10	30 Mfd. — 450 Volt — Electrolytic
C32	100-32	.0005x1000 Volt—20%
C33	100-61	.02x600 Volt—Bakelite Micamold

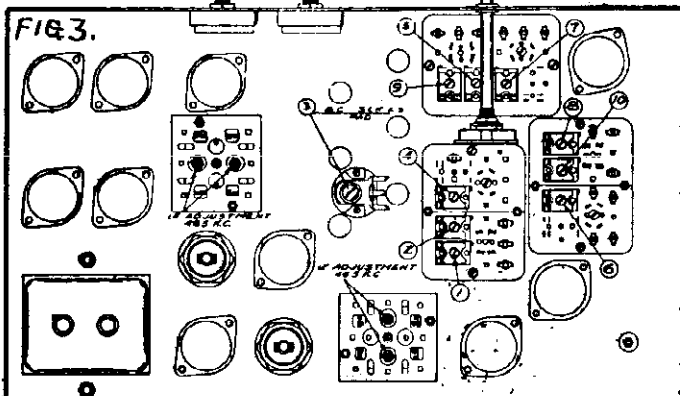
Adjustable Pad.

FREQUENCY RANGE

535 to 1720 K.C. (Kilocycles)
1690 to 5300 K.C. (Kilocycles)
5.3 to 18.1 M.C. (Megacycles)

DIAL SCALE

Outer Scale.....
Center Scale.....
Inner Scale.....



MODEL 1170E
Alignment

BELMONT RADIO CORP.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 25, 40 and 60 cycles and with primary taps for 108, 127, 150, 225, and 260 volts, (see instructions) and also sometimes equipped with 25 cycle transformers with 105-115 volt or 220 volt primaries, not universals.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a voltmeter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 115 volts on the primary of the power transformer.

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagrams.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between the plate and cathode terminals of the 5 prong speaker socket. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of the multi-range meter should be used.

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1," "Dummy 2," and "Dummy 3."

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS (465 K.C.)

Part No. 108-63 Output I.F. Transformer
Part No. 108-64 Input I. F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the underside of chassis (see bottom view Fig. 3).

1. With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), the tone control on "Hi" part of the sharp position (as much right rotation as possible without operating the Hi Fidelity switch), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

- (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1," to the control grid cap of the

type 6K7 tube, located between the two I.F. transformers, and adjust the output I.F. transformer 108-63 to resonance.

- (b) With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap to 6J7 and adjust input I.F. transformer (108-64) to resonance.
- (c) With oscillator still connected to 6J7, re-adjust output I.F. transformer if necessary.

BROADCAST BAND ALIGNMENT:

535 to 1720 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with external oscillator set at 600 kilocycles and connected in series with "Dummy 2" to the tan antenna and black ground lead, make the following adjustments:
 - (a) Adjust broadcast series pad (adjustment number 3) to resonance with oscillator. Keep set in tune with oscillator by slowly rocking to and fro the variable condenser until maximum output is obtained. Note: This adjustment is accessible from the top of the chassis and is located between the variable condenser and the 108-63 output I.F. transformer. See top view, Fig. 1.
 - (b) Re-set external oscillator to 1400 K.C., move dial pointer to 1400 K.C. and adjust oscillator (adjustment number 4), R.F. (adjustment number 6) and antenna (adjustment number 7) to resonance. See bottom view for location of these adjustments, Fig. 3.
 - (c) Repeat adjustments "a" and "b" until sensitivity is at its maximum.
 - (d) Check for tracking and sensitivity at 1000 kilocycles. Under no circumstances bend plates of variable condenser to correct tracking.

SHORT WAVE BAND ALIGNMENT:

5.3 to 18.1 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
 - (a) Move dial pointer to 17 megacycles and adjust short wave oscillator (adjustment number 1), short wave R.F. (adjustment number 8) and short wave antenna (adjustment number 9) to resonance.
 - (b) Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check for sensitivity.

NOTE: It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental on the receiver dial. As an example of this a fundamental 18.3 megacycle can be tuned in not only at 18.3 on the dial, but also at approximately 17.4 megacycles.

MIDDLE WAVE BAND ALIGNMENT:

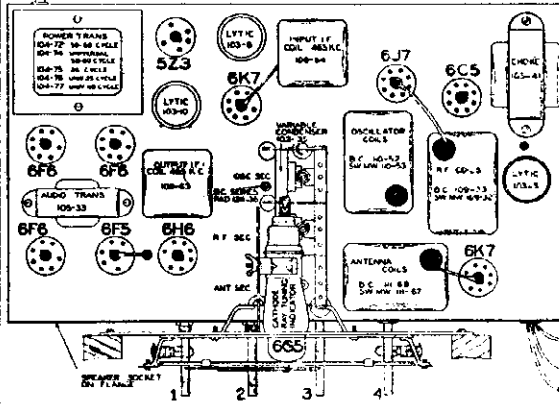
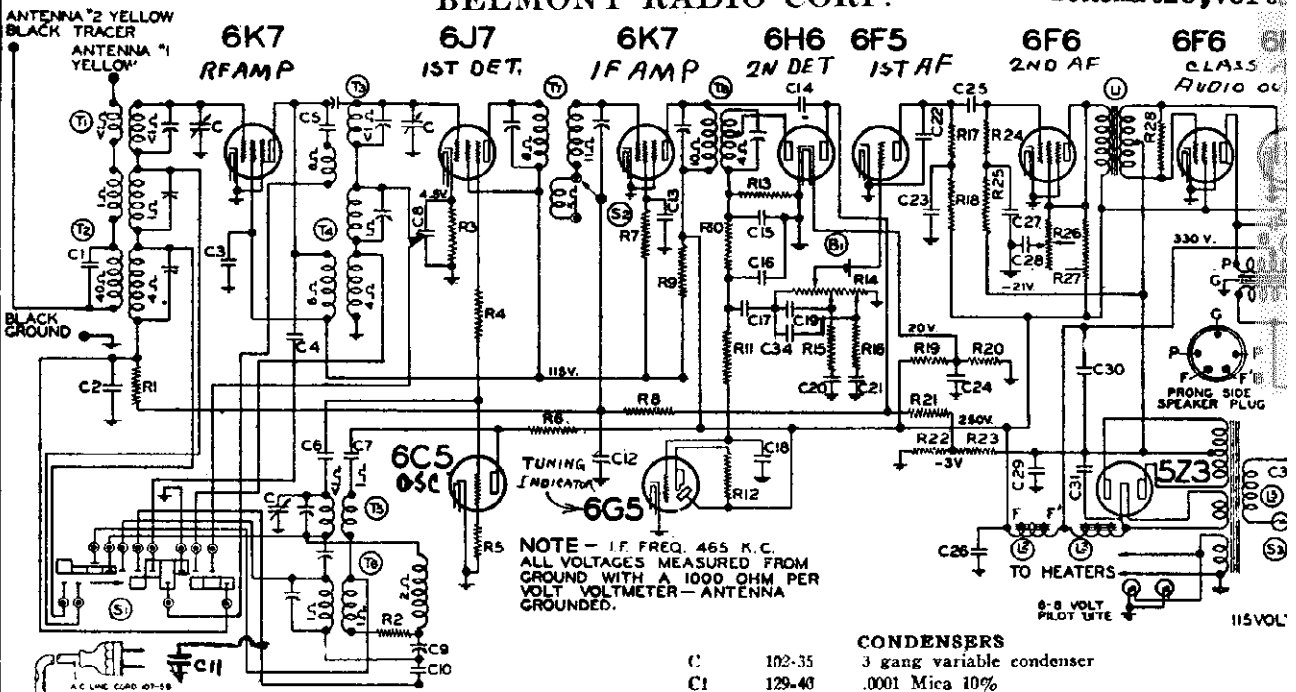
1690 to 5300 Kilocycles

1. With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5 M.C. and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
 - (a) Rotate condenser, pick up signal and adjust middle wave R.F. (adjustment number 10), middle wave antenna (adjustment number 5) and middle wave oscillator (adjustment number 2) to resonance.
 - (b) Re-check broadcast alignment and if it is found necessary to re-adjust either R.F. or antenna trimmers, repeat the 17 M.C. short wave and 5 M.C. middle wave adjustments.

Socket, Trimmers, Parts

BELMONT RADIO CORP.

MODEL 1174
Schematic, Volt



Vol. Control On-Off Switch
Tone Control
Tuning Band Control Switch
and High Fidelity Sw.

RESISTORS

R1	130-20	100M - 1/3 w. - 20%
R2	130-166	150 ohm - 1/3 w. - 10%
R3	130-129	2500 ohm - 1/3 w. - 10%
R4	130-60	100 ohm - 1/3 w. - 20%
R5	130-12	50M ohm - 1/3 w. - 20%
R6	130-133	15 M ohm - 1/2 w. - 20%
R7	130-76	30M ohm - 1/3 w. - 20%
R8	130-19	1 megohm - 1/3 w. - 20%
R9	130-88	10M ohm - 2 w. - 20% - wire wound
R10	130-20	100 M ohm - 1/3 w. - 20%
R11	130-4	3 megohm 1/3 w. - 20%
R12	130-110	1 megohm - 1/10 w. - 20%
R13	130-20	100M ohm - 1/3 w. - 20%
R14	101-36	1 megohm - Volume Control
R15	130-22	5M ohm - 1/3 w. - 20%
R16	130-85	3M ohm - 1/3 w. - 20%
R17	130-20	100M ohm - 1/3 w. - 20%
R18	130-20	100M ohm - 1/3 w. - 20%
R19	130-130	100M ohm - 1/2 w. - 10%
R20	130-82	10M - 1/3 w. - 10%
R21	130-3	500M ohm - 1/3 w. - 20%
R22	106-31	27 ohms
R23	105-31	175 ohms
R24	130-45	250M ohm - 1/3 w. - 20%
R25	130-45	250M ohm - 1/3 w. - 20%
R26	101-40	Tone Control
R27	130-131	20M ohm - 1/2 w. - 10%
R28	130-21	20M ohm - 1/3 w. - 20%

R22 and R23 in one unit

CONDENSERS

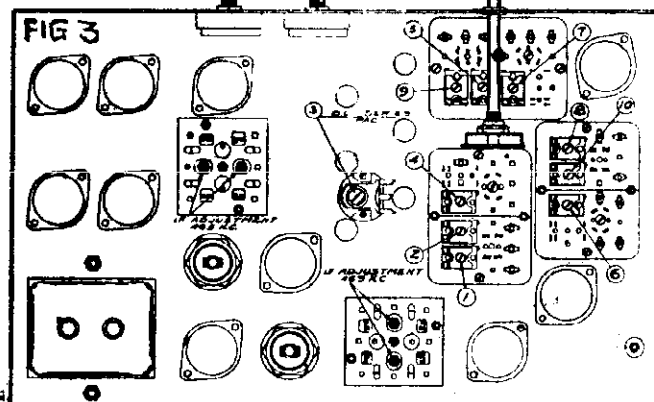
C	102-35	3 gang variable condenser
C1	129-40	.0001 Mica 10%
C2	100-9	.06 x 200 v. 25%
C3	100-53	.25 x 400 v. 20%
C4	129-59	.0003 Mica 5%
C5	129-38	.00005 Mica 10%
C6	129-38	.00005 Mica 10%
C7	100-25	.002 x 600 v. 25%
C8	100-20	.1 x 200 v. 25%
C9	124-35	.00074 Series Pad.
C10	129-70	.004 Mica 2 1/2 %
C11	129-71	.002 Mica 2 1/2 %
C12	100-9	.05 x 200 25%
C13	100-11	.01 x 400 25%
C14	129-3	.00002 Mica 20%
C15	129-60	.00015 Mica 20%
C16	129-60	.00015 Mica 20%
C17	100-22	.05 x 200 25%
C18	100-11	.01 x 400 25%
C19	129-2	.0005 Mica 20%
C20	100-22	.05 x 200 25%
C21	100-22	.05 x 200 25%
C22	129-40	.0001 Mica 10%
C23	100-20	.1 x 200 25%
C24	100-19	.006 x 600 v. 25%
C25	100-13	.05 x 400 25%
C26	103-8	14. mfd. x 400 w. v. lytic
C27	100-20	.1 x 200 25%
C28	100-45	.1 x 600 v. 25%
C29	100-20	.1 x 200 v. 25%
C30	103-10	30 mfd. x 450 w. v. lytic
C31	103-5	8 mfd. lytic 475 w. v.
C32	100-32	.0005 x 1000 v. 20%
C33	100-61	.02 x 600 v. Bakelite 20%
C34	129-60	.00015 Mica 20%

FREQUENCY RANGE

535 to 1720 K.C. (Kilocycles)
1695 to 5500 K.C. (Kilocycles)
5.35 to 18.1 M.C. (Megacycles)

DIAL SCALE

Cream Colored
Buff Colored
Green Colored



MODEL 1174

Alignment

BELMONT RADIO CORP.

Service Data for Service Men

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 25, 40 and 60 cycles and with primary taps for 108, 127, 150, 225, and 260 volts, (see instructions) and also sometimes equipped with 25 cycle transformers with 105-115 volt or 220 volt primaries, not universals.

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a voltmeter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 115 volts on the primary of the power transformer.

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagrams.

ALIGNING INSTRUCTIONS:

CAUTION:

No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet. To remove the knobs, pull them off and to take the chassis out of the cabinet, remove the four bolts by which it is fastened.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adaptor between the plate and cathode terminals of the 5 prong speaker socket. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of the multi-range meter should be used.

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1," "Dummy 2," and "Dummy 3."

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a .1 mfd condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS (465 K.C.)

Part No. 108-63 Output I.F. Transformer
Part No. 108-64 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the underside of chassis (see bottom view Fig. 3).

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.

1. With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), the tone control on "Hi" part of the sharp position (as much right rotation as possible without operating the Hi Fidelity switch), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

- Connect external oscillator set at 465 kilocycles, in series with "Dummy 1," to the control grid cap of the type 6K7 tube, located between the two I.F. transformers, and adjust the output I.F. transformer 108-63 to resonance.
- With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap to 6J7 and adjust input I.F. transformer (108-64) to resonance.
- With oscillator still connected to 6J7, re-adjust output I.F. transformer if necessary.

SHORT WAVE BAND ALIGNMENT:

5.35 to 18.1 Megacycles

- With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the antenna and ground leads, make the following adjustments:
 - Move dial pointer to 17 megacycles and adjust short wave oscillator trimmer (adjustment number 1) to resonance.
 - Adjust short wave R.F. trimmer (adjustment number 8), and short wave antenna trimmer (adjustment number 9), to resonance.
 - Re-set external oscillator and check set at 18.1 megacycles and 6 megacycles for band coverage and sensitivity.

NOTE: It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental on the receiver dial. As an example of this a fundamental 17 megacycle signal can be tuned in not only at 17 on the dial but also at approximately 16.1 megacycles.

MIDDLE WAVE BAND ALIGNMENT:

1695 to 5500 Kilocycles

- With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5 megacycles and connected in series with "Dummy 3" to the antenna and ground leads make the following adjustments:
 - Move dial pointer to 5 megacycles and adjust middle wave oscillator trimmer (adjustment number 2) to resonance.
 - Adjust middle wave R.F. trimmer (adjustment number 10), and middle wave antenna trimmer (adjustment number 5), to resonance.
 - Re-set external oscillator and check sensitivity at 1800 kilocycles.

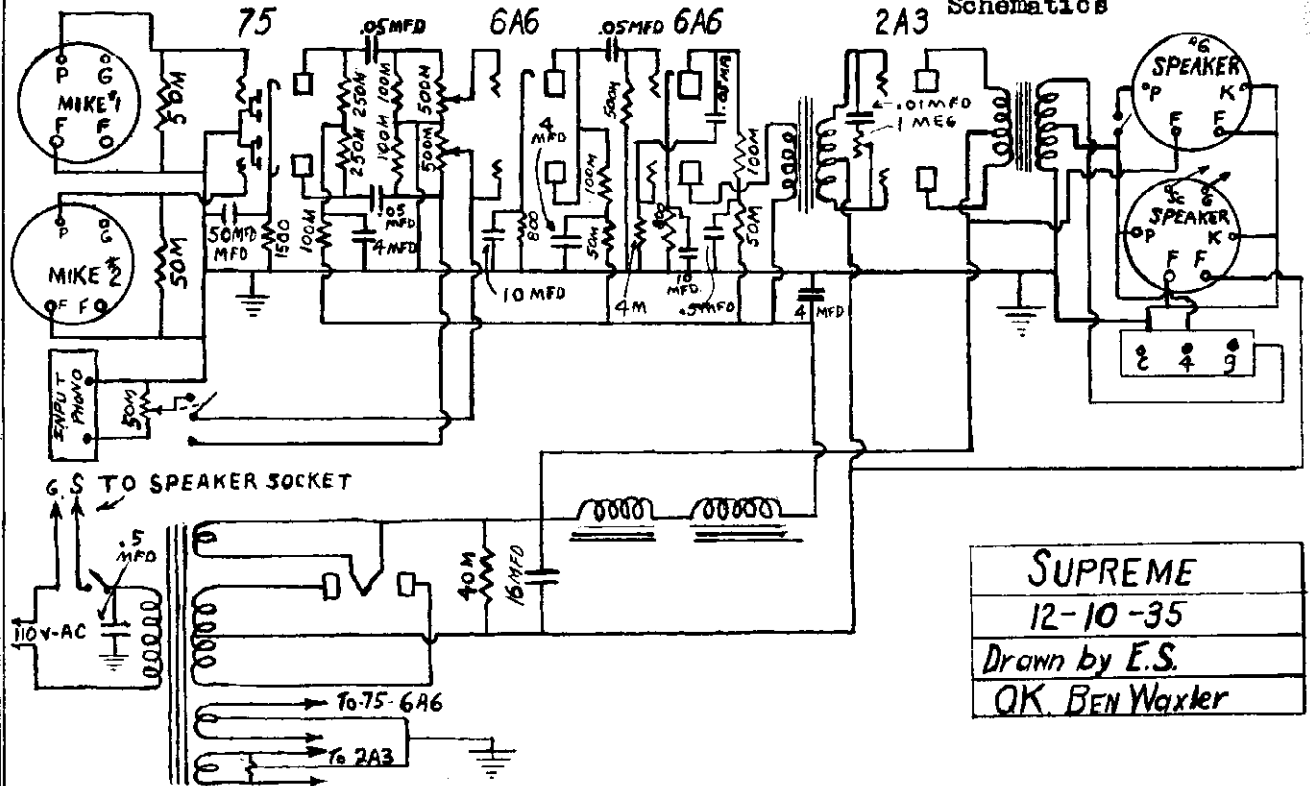
BROADCAST BAND ALIGNMENT:

535 to 1720 Kilocycles

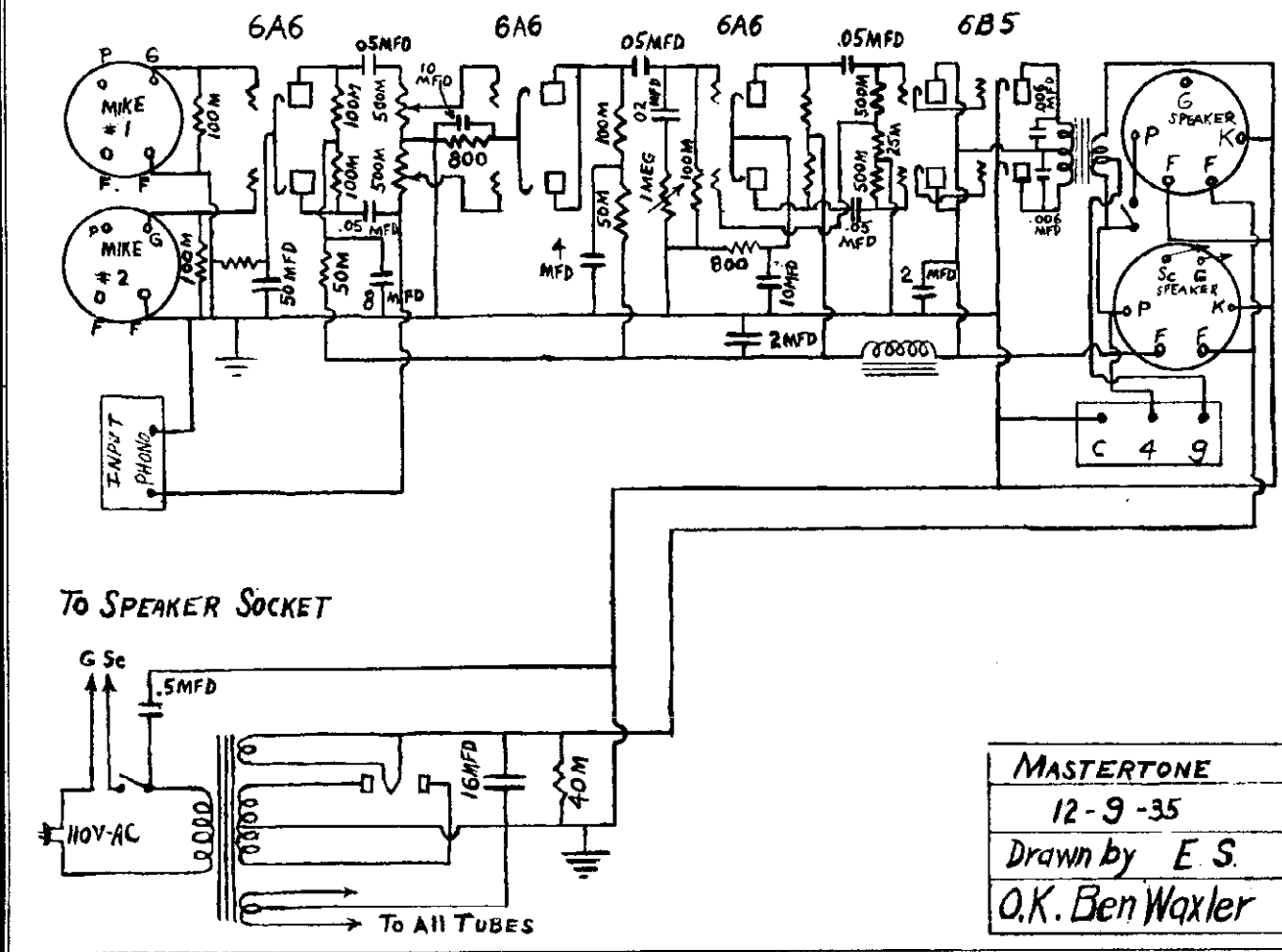
- With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to antenna and ground leads make following adjustments:
 - Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance. (Adjustment number 4; see bottom view of coil assembly, Fig. 3)
 - Re-set external oscillator to 1400 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast R.F. trimmer (adjustment number 6) and broadcast antenna trimmer (adjustment number 7), to resonance
 - Re-set external oscillator to 600 K.C., and adjust broadcast series pad (adjustment number 3) to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3).
 - Repeat adjustments "a" and "b" until sensitivity is at its maximum.
 - Check for tracking and sensitivity at 1400, 1000, and 600 kilocycles. Under no circumstances bend plates of variable condenser sections to correct tracking.
 - Recheck short wave and middle wave band alignment

DAVID BOGEN CO., INC.

MODEL Supreme Amplifier
MODEL Mastertone "
Schematics



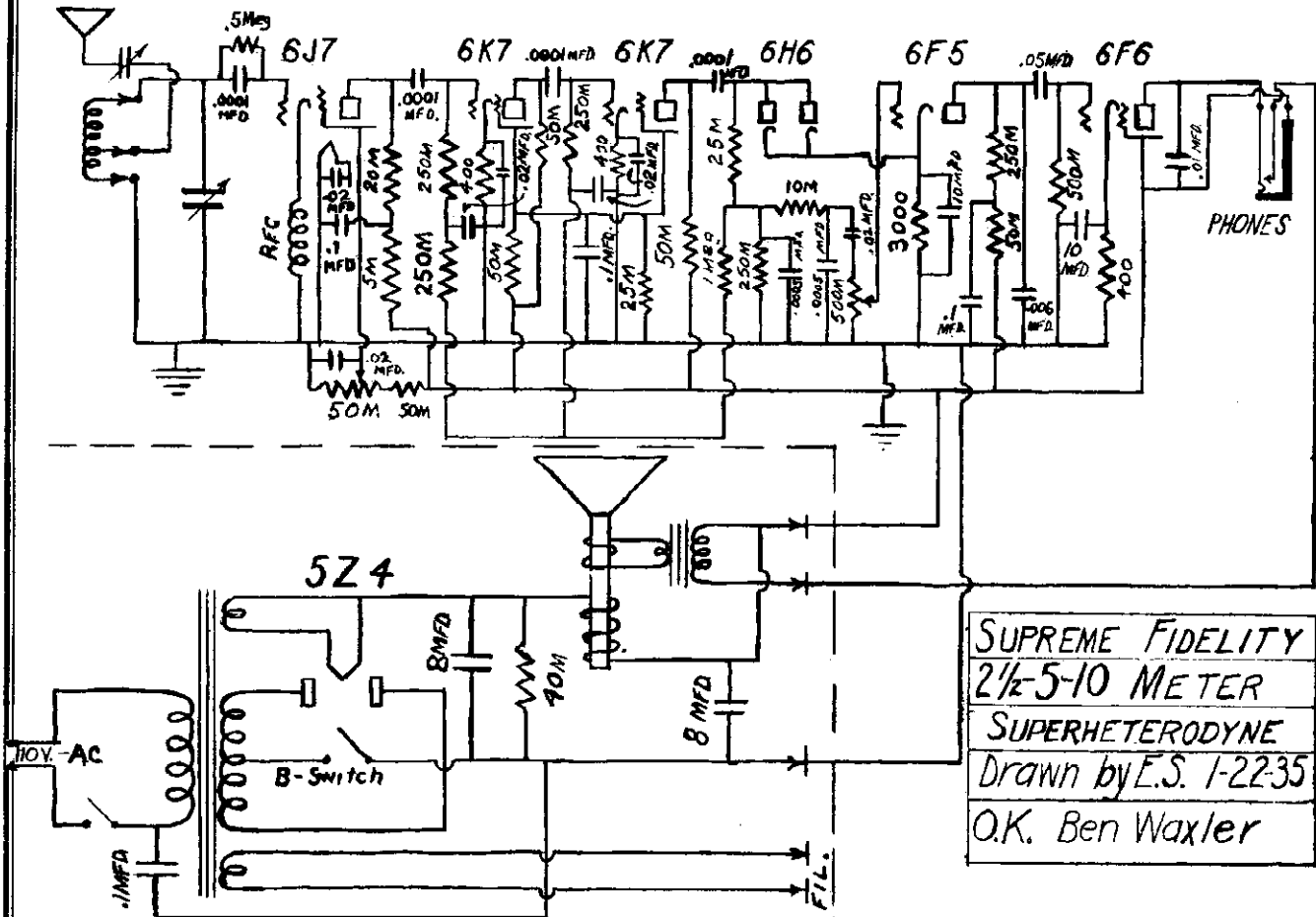
SUPREME
12-10-35
Drawn by E.S.
OK BEN Waxler



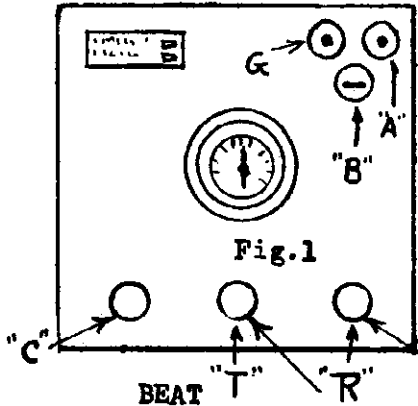
MASTERTONE
12-9-35
Drawn by E.S.
O.K. Ben Waxler

MODEL 2-5-10 Meter Super.
Schematic, Data

DAVID BOGEN CO., INC.



SUPREME FIDELITY
2 1/2-5-10 METER
SUPERHETERODYNE
Drawn by E.S. 1-22-35
O.K. Ben Waxler



Distorted-no signal

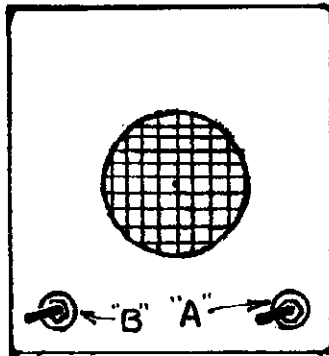


Fig. 2

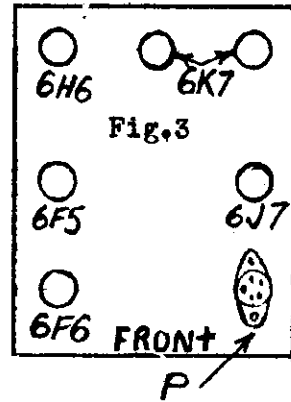
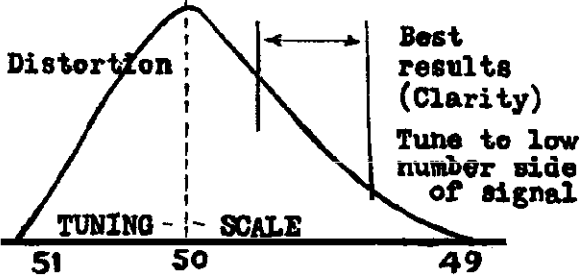


Fig. 3



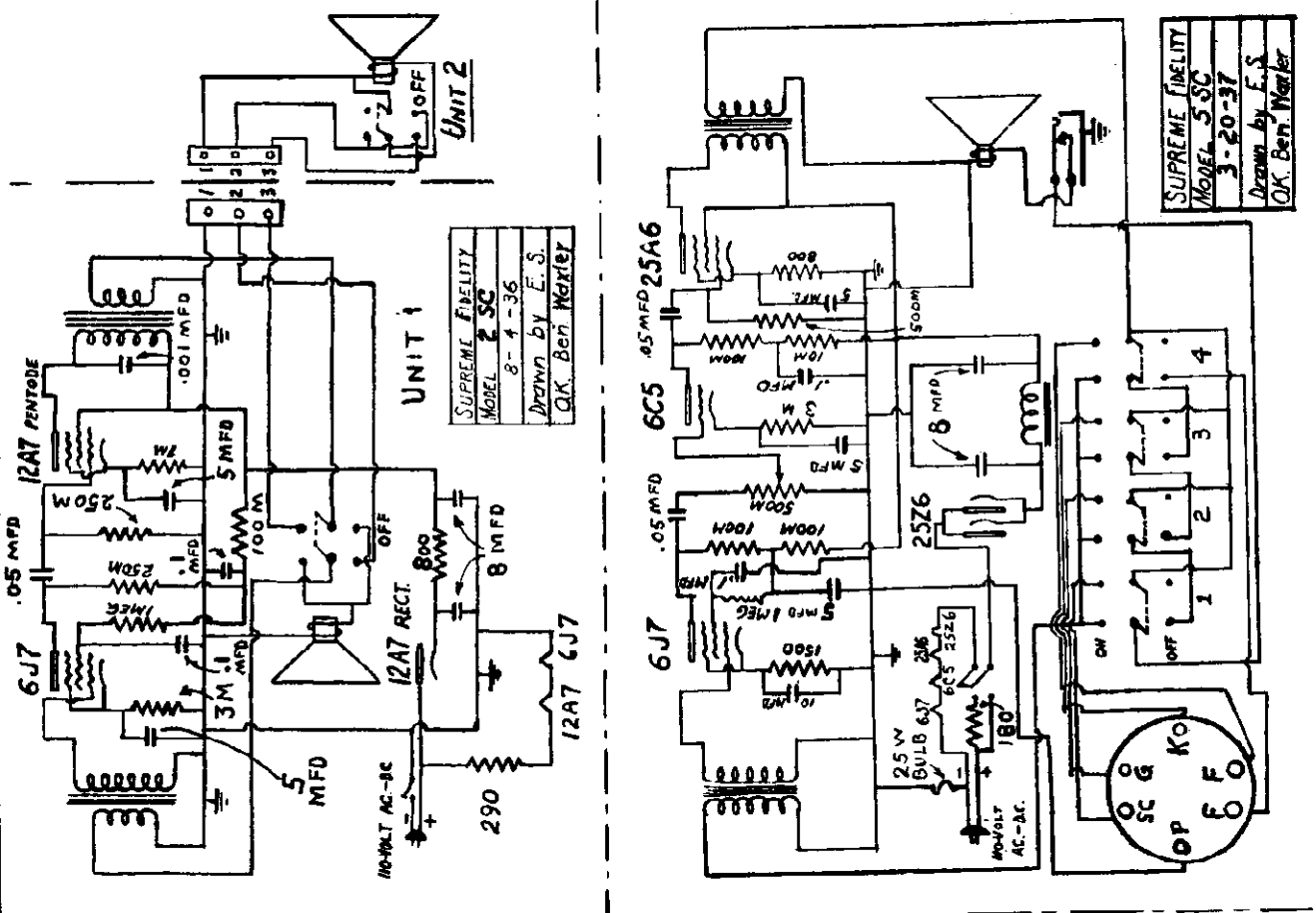
TUNING CURVE AS SHOWN ON CATHODE RAY OSCILLOGRAPH.

Fig. 4

SUPREME FIDELITY
2 1/2-5-10 Meter
SUPERHETERODYNE
Drawn-by-E.S. 1-23-36
O.K. Ben. Waxler

DAVID BOGEN CO., INC.

MODEL 2SC Communicator
Schematic, Data
MODEL 5SC Communo-Phone
Schematic

**INSTRUCTIONS FOR MODEL 2SC**

The two station Supreme Communicator consists of two units. The master station is unit #1 and the extension station is unit #2. The master uses two tubes: 1-12A7 and 1-6J7. A three wire cable is used to inter-connect the units. The master unit is connected to the power line. The communicator works equally as well on A.C. or D.C., 110 volts.

CONNECTIONS:-

The three terminal strip located on the rear of each unit is used to inter-connect the units. The three wires are connected in numerical sequence, i.e. - 1 to 1, 2 to 2, 3 to 3. The line cord incorporates a self contained resistor, hence, must not be tampered with. The line plug is inserted in any source of 110 volts A.C. or D.C.. In D.C. operation, if the system fails to operate, reverse the polarity by removing the plug from the receptacle, giving it a half turn, and reinserting. On A.C., if a hum is noticed, reverse plug as explained above.

CONTROLS:-

Master Unit - The switch located on the front panel at the left, controls the power for both units, and is put on or off as denoted by the on-off plate. In the center of each unit there is a plate marked "RELEASE TO LISTEN" and "PRESS TO TALK". Conversation is started by pressing the switch down and is held down while talking. When through talking, release and the switch will automatically come back to "RELEASE TO LISTEN" position. Then, the second party will push the switch and talk. This operation is repeated.

REMARKS:-

This amplifier is licensed by agreement with Electrical Research Products, Inc., under patents owned or controlled by Western Electric Co., and American Telephone and Telegraph Co.

CAUTION:-

Do not use any ground or let any of the connecting wires touch any ground, such as water or gas pipes or metal ceilings, etc.

MODEL 5SC Communo-Phone
Instructions

DAVID BOGEN CO., INC.

INSTRUCTIONS FOR MODEL 5SC

The Supreme Communo-Phone is a self powered combination microphone loud speaker system. It operates on either A.C. or D.C. current, 105-125 volts. Each unit draws 35 watts and is designed for continuous service. The tubes used are:- 1-25Z6, 1-6J7, 1-6C5, 1-25A6, and 1-25 watt, 120 volt bulb.

The simplest inter-communication system consists of two of these units connecting one office to a second and permitting instantaneous communication. These units may be combined into a more elaborate inter-communication system by using any number of units up to five. The standard Supreme Communicator is equipped with all the switches and a socket so that a five way system may be connected with a minimum of time and difficulty and without the necessity of additional equipment other than the cable and connector box.

System units with a selection of more than five stations can be supplied in accordance with specified requirements.

CONNECTIONS:-

These units are connected together by means of the Supreme Communicator connector box. Cables are supplied in any length to meet requirements and come equipped with a six prong male plug on each end. The connector box is supplied with a five foot length of cable and a six prong male plug. The cable from the connector box is plugged into the socket marked "A" (see Fig. #1) located on the rear of the first station. To connect the other stations insert one plug of the cable into the socket on the rear of the station, and insert the other plug into a socket on the connector box (see Fig. #2). When less than five stations are used the cables should be plugged into consecutive sockets on the connector box.

Insert the plugs of the line cords into any source of 110 Volt A.C. or D.C. Snap the line switches on and observe the 25 watt lamp. If the lamp is brilliant, reverse the line plug which will give the correct operating polarity. With each unit at correct polarity, the system should be operating. As a check, the line cord should grow slightly warm in operation. Do not attempt to shorten this line cord since the operation of the set is dependent upon a self-contained resistor in it. If you desire to connect your own connector box and cables - refer to figure #3.

WHEN USING THESE UNITS ON D.C.:-

When all units are plugged in as outlined above, inter-communication may be started among the various stations, making sure that the volume control is turned up. If no sound is heard, the polarity of the units is incorrect and all the plugs must be reversed at the same time. This applied to D.C. only.

NOTE:- Do not under any circumstances connect a ground to the chassis.

CONTROLS:-

On the panel there are four momentary contact switches, two on each side of the power switch. Each switch is a selector calling another unit or station. All call switches are normally set in the up or listening position. To call another station, press the appropriate switch down and talk. To listen, release the switch. In setting up this system, it may be found that the volume of voice at the listening end is insufficient for efficient operation. To adjust the volume of the loudness use the screwdriver control adjustment on the rear ("B" Fig. #1).

A headset may be used if it is undesirable to have others, who may be standing near the station, hear the conversation. A magnetic headset should be used with an ordinary phone plug which can be inserted in the jack on the rear panel ("C" Fig. #1). The names of the stations can be assigned to the respective switches by writing in the name. For new names remove the name plate, by taking off five nuts, and insert new paper.

The Supreme Communicator should be used at a distance of arm's length from the unit so as to prevent uncomfortable loud speech at the receiving end.

The person speaking should not raise his voice over that used in ordinary conversation since the Supreme communicator is designed to have enough sensitivity to pick up low voices of moderate distances.

One of the useful features obtainable with the Supreme Communicator System is the possibility of instantaneous call to all stations by pressing all the switches down, whereupon, all other stations listen to the master station. Any unit can become a master to call any number of stations at once.

It is possible for any station to speak to the listening station, although the latter is listening to another station. The station breaking in cannot, however, eavesdrop on any conversation not being directed to him.

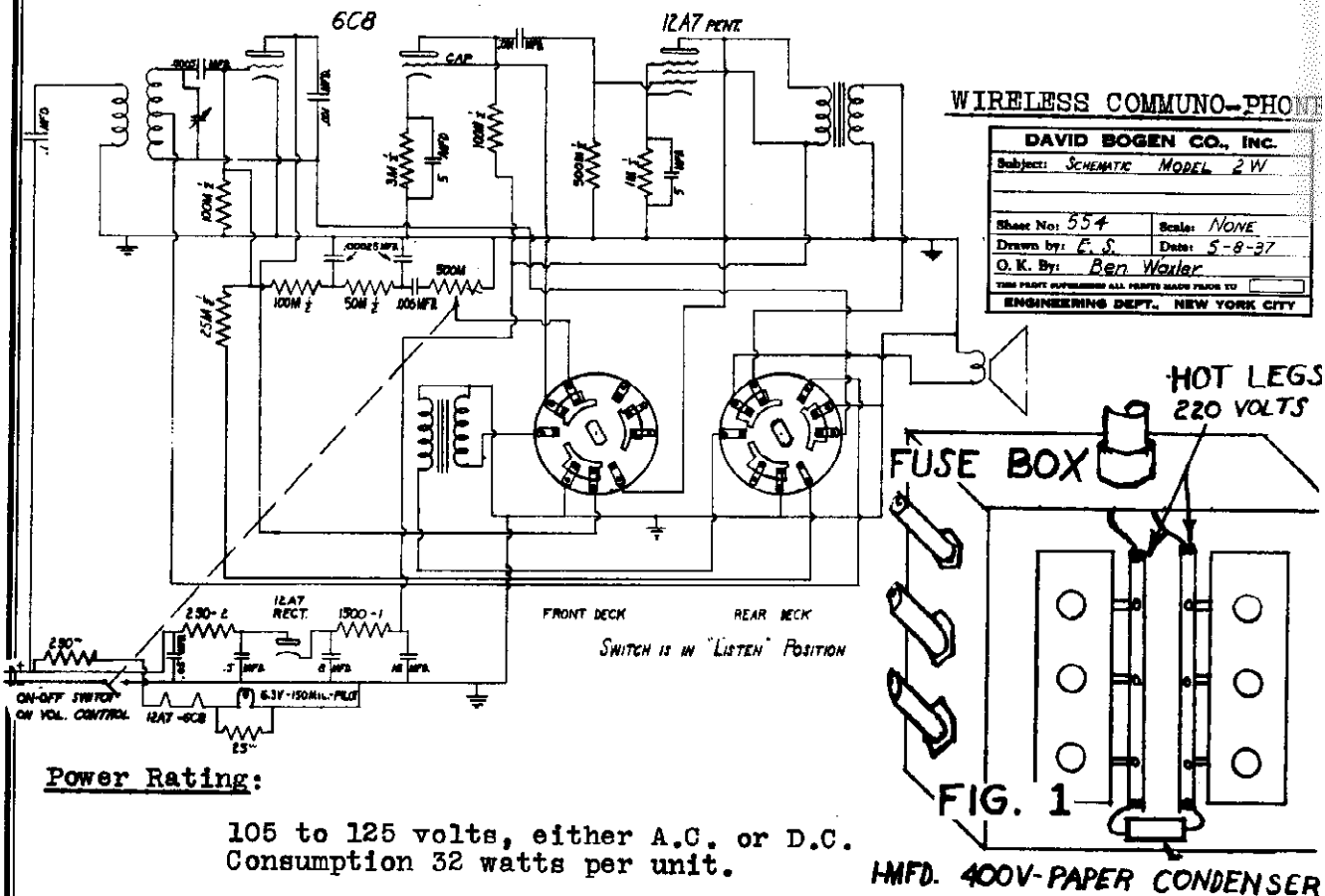
Another feature obtainable with the 5-Way Supreme Communicator System is that any two stations can talk to each other, while two other stations are talking without interfering with each other. In other words, each two units comprise a voice channel very much like a telephone switchboard.

NOTE: CAUTION - DO NOT UNDER ANY CIRCUMSTANCE CONNECT A GROUND TO THIS CHASSIS.

REMARKS:

This amplifier is licensed by agreement with Electrical Research Products, Inc., under patents owned or controlled by Western Electric Co., and American Telephone and Telegraph Co. -

DAVID BOGEN CO., INC.

MODEL 2W CommunoPhone
Schematic, Data

The model 2W Bogen Wireless Communo-Phone is an intercommunicating telephone system using the usual power lines both for power and to carry the voice currents. Two or more stations may be operated, but since this model is not selective, all stations will hear all conversations.

Talk-Listen: The knob in the center of the front panel controls the direction of conversation. It normally holds itself in the "Listen" position. To call the other station, depress the knob and speak. Release knob to hear the response from the answering station. The person at the remote or called station must depress his own "Talk" knob before speaking.

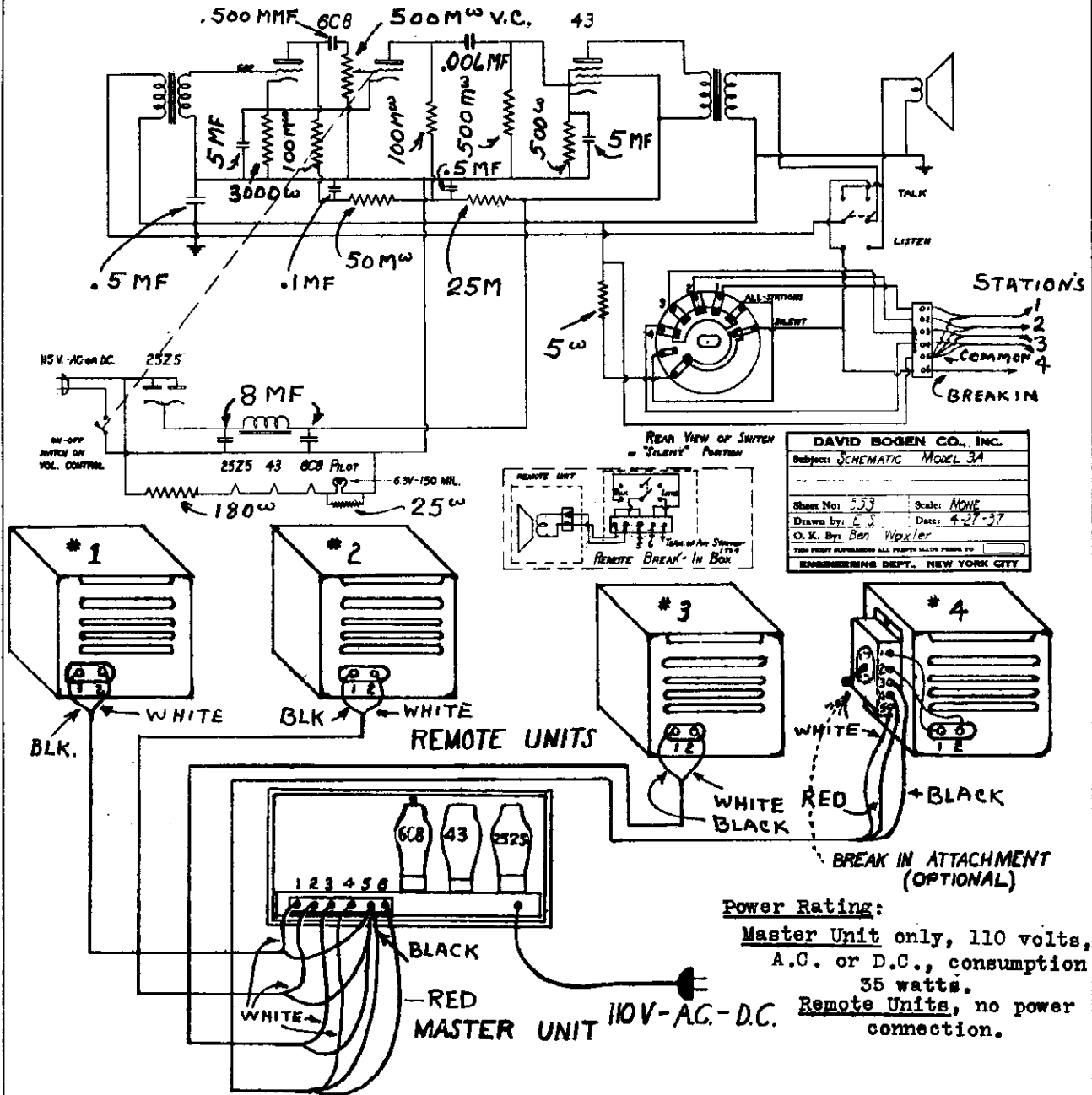
Connections: Insert the attachment cord plug from each unit into the nearest electrical outlet of proper voltage. There are no other connections to make unless the two electrical outlets used are wired on opposite sides of the common ground. In this case the two circuits should be bridged at the fuse box or meter with a paper condenser of a capacity of about 1 mfd. 400 volts. The two "hot" or ungrounded wires are joined thru the condenser as shown in figure 1.

Adjustments: These units are adjusted at the factory to match each other. However if there is reason to attempt to improve the match between the stations, the trimmer condenser screw located on the rear of the chassis may be adjusted. Turn the screw slightly left or right until the best results are observed as determined by the volume and quality of the received voice.

Noise: Some electrical devices such as small motors, flashing signs, oil burners, etc. radiate "man made static" which in some locations causes considerable annoyance to radio listeners and may cause a similar disturbance in the Wireless Communo-Phone. If the source of the noise can be determined, it can be reduced or entirely eliminated by the use of condensers or noise filters on the device creating the noise.

MODEL 3A CommuPhone
Schematic, Data

DAVID BOGEN CO., INC.



Power Rating:
Master Unit only, 110 volts, A.C. or D.C., consumption 35 watts.
Remote Units, no power connection.

The model 3A Bogen Selective Commu-Phone provides selective communication between the Master Station and one to four Remote Stations.

Connections: Using a two wire cable connect all the Remote Units so that their #1 terminals connect to #5 on the Master Unit. Then the remaining wire from each Remote Unit (Terminal #2) connects to its own selective terminal numbered 1, 2, 3 or 4 on the Master Unit. Plug line cord into the usual power outlet. If the device is silent when first connected to Direct Current the power line plug should be removed and rotated so that its prongs are reversed - this is done to correct the polarity.

Station Selector: The center knob is used to select the station called. It may be set to communicate with any single Remote Station or to call all at once. It is normally left in the "Silent" position. The Master Station can listen-in on any or all Remote Stations without warning.

Talk-Listen: The lower knob automatically remains in the "Listen" position. When it is desired to speak from the Master Station the knob is pressed down to the "Talk" position. It must be released to hear the reply from the station called. Because of the sensitivity of the Remote Units it is not necessary for the person called to approach the box closer than about 20 feet, thus saving steps and interruption of work. The Remote Stations can only "Talk" or "Listen" when the Master Switch is properly set.

DAVID BOGEN CO., INC.

- is supplied with each amplifier and is connected as follows:-
1. Skin outer rubber covering about 3/8" exposing the shield.
 2. Remove all cotton sleeving which in some cable is present over the metal shield and insert over the shield the metal sleeve supplied with the connector.
 3. Remove the exposed shielding up to the sleeve making sure to bend back over the sleeve all loose metal wires.
 4. Skin second rubber covering about 1/8" from the sleeve exposing about 1/4" of the conductor.
 5. Insert the cable thus prepared into one part of the connector, drop the spring washer in the recess, place bakelite washer over it allowing the conductor to pass through eyelet.
 6. Clean and solder conductor to eyelet, cut excessive wire, and screw set screw over the sleeve.
 7. Do not use soldering paste or acid on any connection on microphone or cable.

OUTPUT CONNECTIONS:-

Two, one thousand ohm speakers must be connected to the amplifier by means of sockets marked "SP" located on the right side of the amplifier. As a safety measure, these sockets are so wired that the A.C. to the amplifier is cut off unless both speaker plugs are inserted. The speakers are wired as shown in Fig. 1. Additional speakers having their own source of field supply may be connected by using the taps on the strip marked "OUTPUT". The terminal connections are as follows: Terminal #1 is common; #2 is four ohms; #3 is nine ohms; #4 is fifteen ohms and #5 is five hundred ohms.

A.C. RECEPTACLE:-

An A.C. receptacle is located on the rear panel. This can be used to connect the A.C. for additional speaker excitors, phonographs, etc. The A.C. to this outlet is controlled by the master switch on the front panel.

FIELD SUPPLY:-

The built-in field supply will furnish 100 mils. at 125 volts to each of two 1000 ohm speakers. This field supply is not taken from the plate voltage supply but has its own source of power.

FUSE:-

If the amplifier fails to operate when turned on, examine the fuse clip. A five ampere fuse is used. If this fuse is burned out, examine the connections for a possible short circuit.

CONTROLS:-

Mixer Fader - The first control on the left governs the gain for either channel #1 or #2. With this control it is possible to fade from channel #1, a high gain input to channel #2, a low gain input. The second control from the left governs the gain for either channel #3 or #4 similarly. By using both controls simultaneously it is possible to mix the inputs from channels #1 and #2 with those of channels #3 and #4.

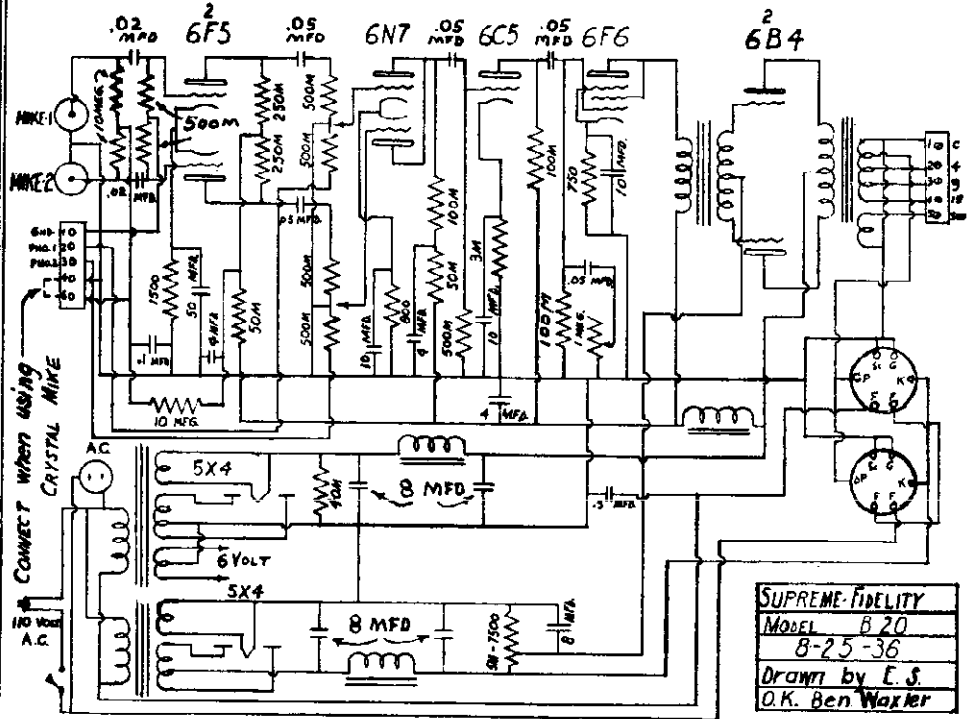
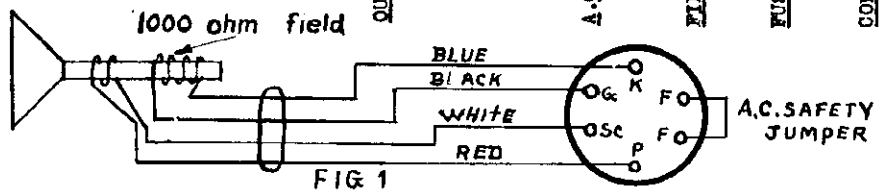
Tone - The control marked "Tone" is used for tone correction effects.

Master Switch - The switch at the extreme right on the control panel controls all A.C. The pilot light indicates when the amplifier is operating.

REMARKS:-

If any hum is noticed, when using the microphone, reverse the line polarity, by pulling out the line plug, giving it a half turn and reinserting.

Hum can be caused by faulty tubes, particularly with a high gain amplifier of this design. Check all tubes carefully before looking elsewhere. In rare cases an external ground may be necessary.



INSTRUCTIONS FOR MODEL B-20

The Supreme Fidelity Model B-20 is a nine tube amplifier operating on 110-125 volts, 50-60 cycles with a drain of 275 watts. The tubes used are: 2-6F5M, 1-6N7, 1-6C5, 1-6F6, 2-6B4, 2-5X4G.

INPUT CONNECTIONS:-

The five post input strip is used as follows: Terminals #1-2 are channel #2 for a phonograph or other low gain input. Terminal #1 is the ground side; terminals #1-3 are channel #4, for another phonograph or low gain input. When using a Crystal microphone connect posts #4 and #5 by a wire. Do not jump these terminals when using a Velotron or Velocity microphone.

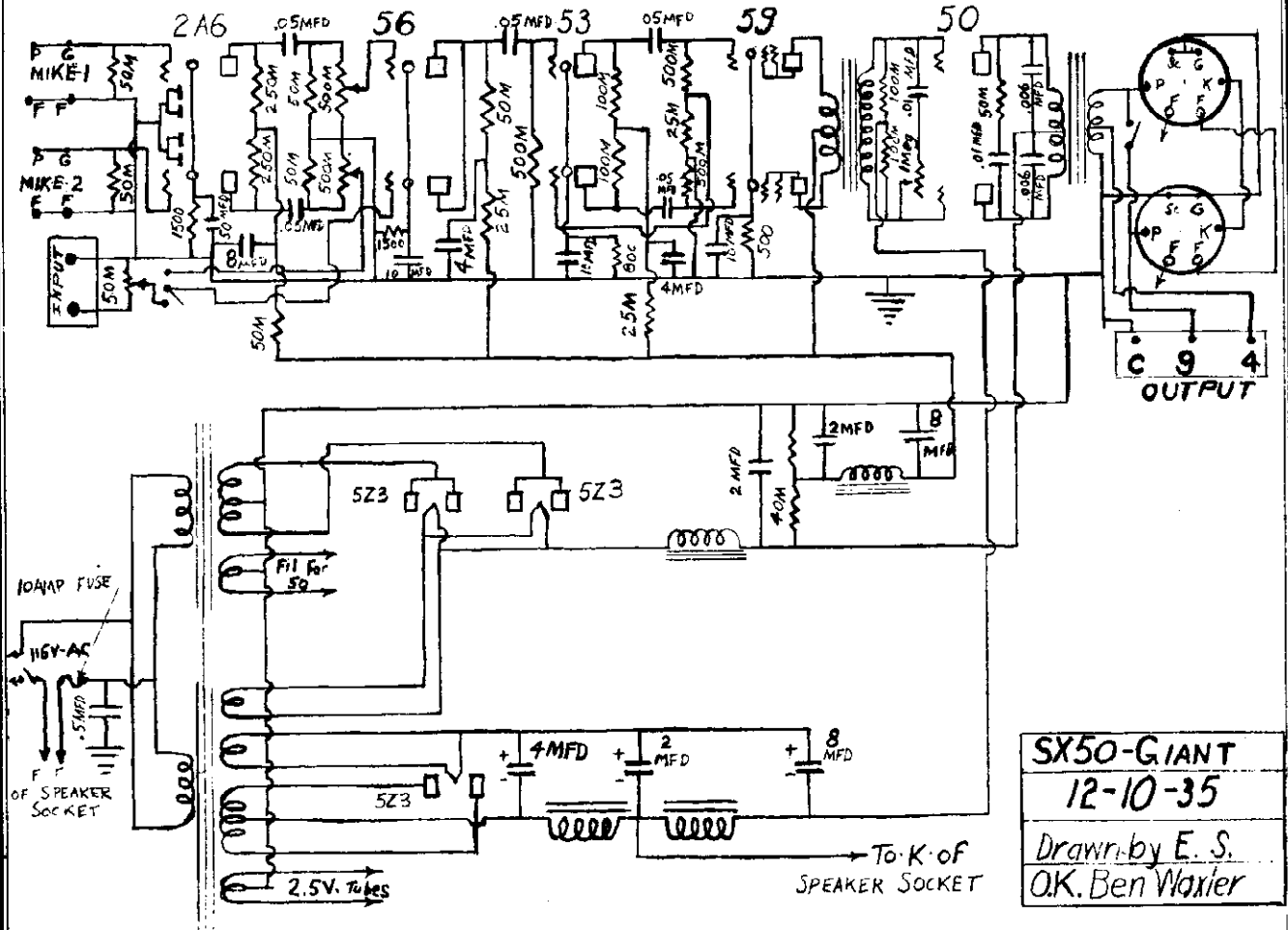
MICROPHONE CONNECTIONS:-

Above the five post strip are two screw cable connectors. These are the two channel inputs #1 and #3, for Velotron, Velocity or Crystal microphones. For each microphone, a single conductor shielded cable must be employed. The plug that is used on the microphone cable

SUPREME FIDELITY
MODEL B 20
8-25-36
Drawn by E. S.
D.K. Ben Waxler

MODEL SX-50 Amplifier
Schematic, Notes

DAVID BOGEN CO., INC.



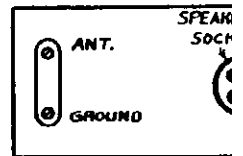
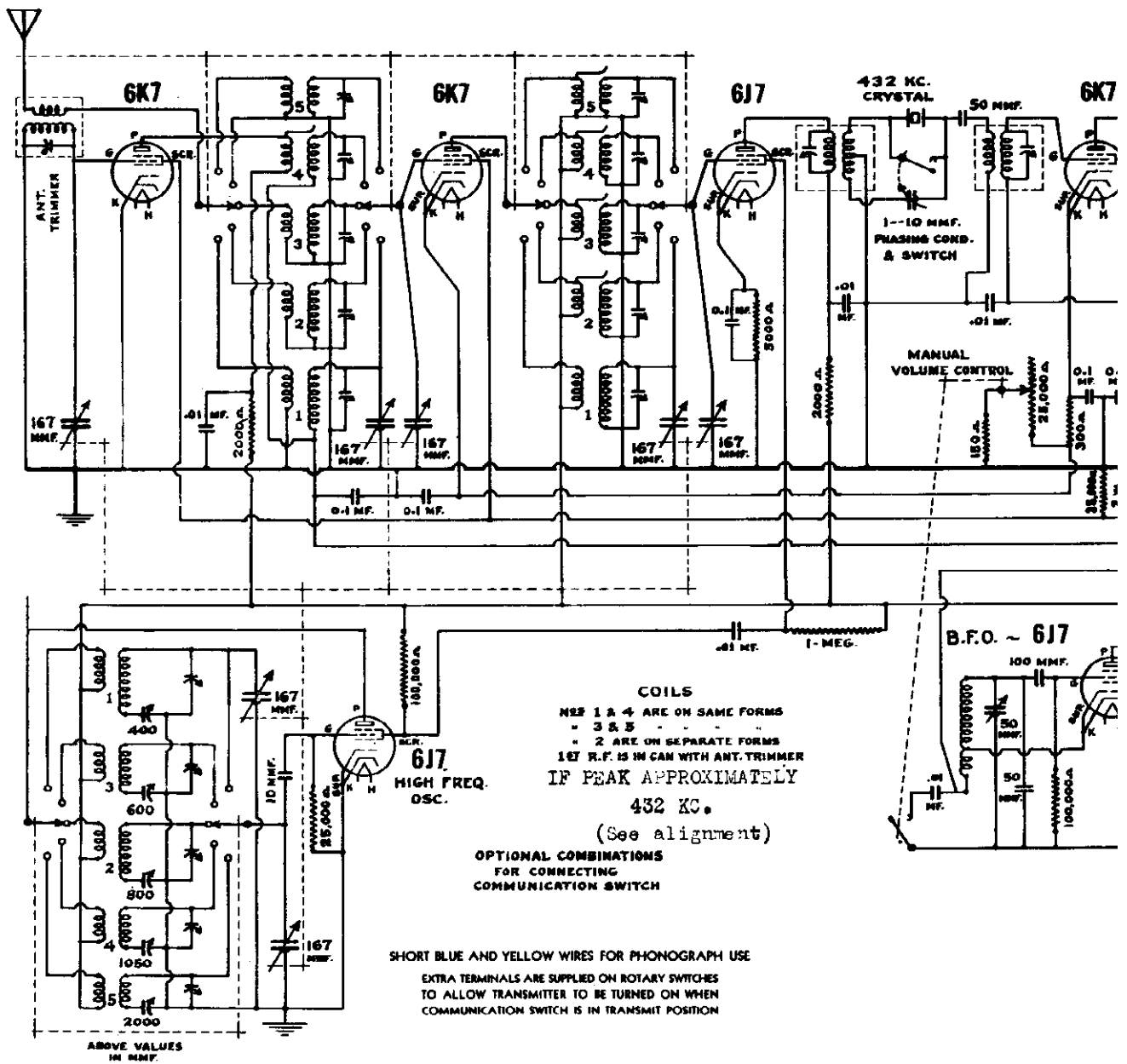
SX50-GIANT
12-10-35
Drawn by E. S.
OK. Ben Waxler

CONNECTIONS

On the left side of the amplifier, there are two sockets marked "MIKE #1" and "MIKE # 2". One or two microphones can be connected to the amplifier by plugging into these sockets. For microphone connections see Fig.1. Shielded cable and plug must be used between the amplifier and the microphone. The metal cover of the plug must be used between the amplifier and the microphone. The metal cover of the plug must be grounded to the shield as shown in Fig.1.

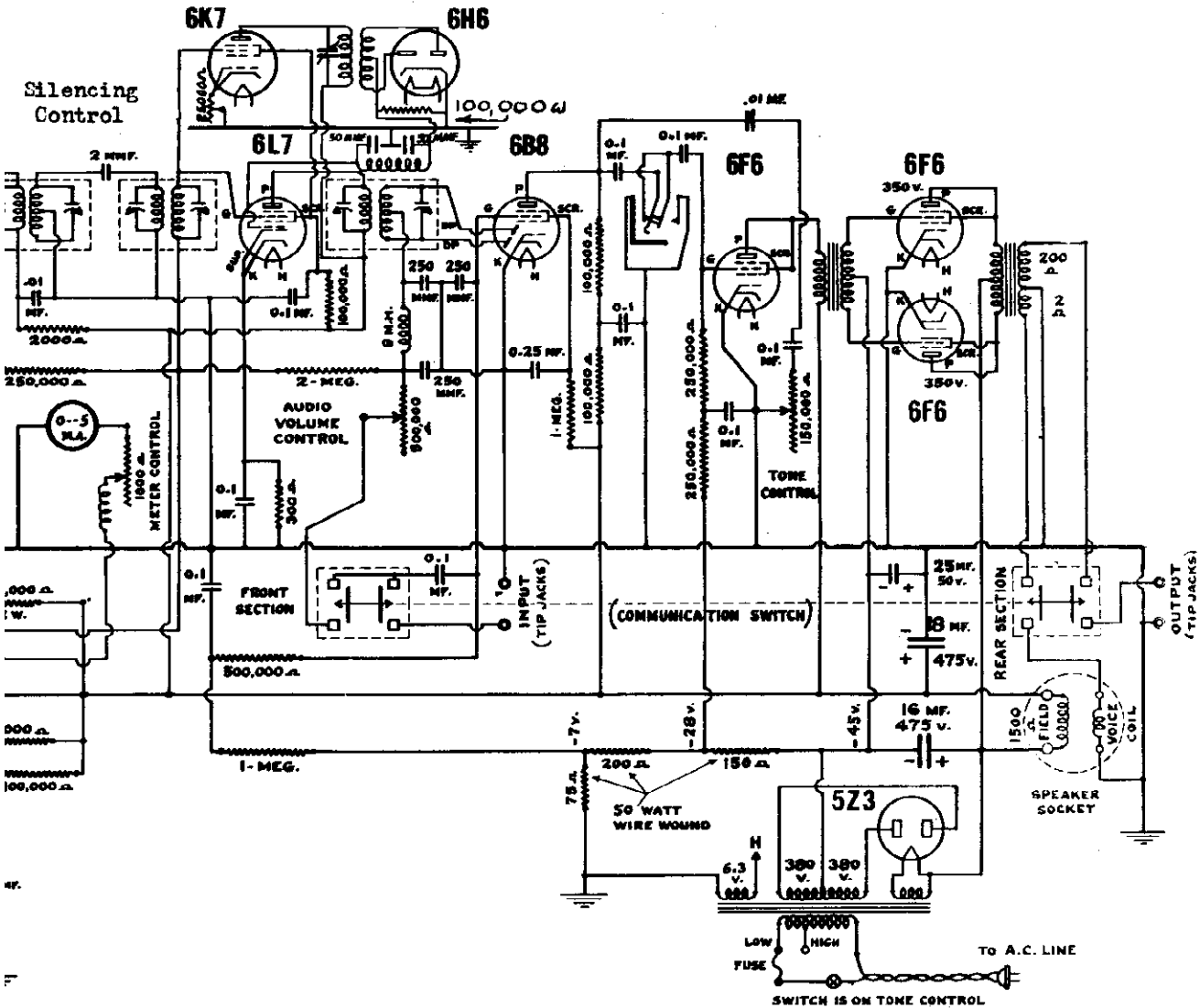
On this same side there is a tip jack marked "PHONO". This jack is used to connect phonographs having tip connectors. Above this jack is a two terminal strip marked "INPUT". These terminals can be used for various input connections such as any low gain input, phonograph, or microphone (dynamic), or radio. The jack and input strip are controlled by the # 3 control.

On the right side of the amplifier there are two six prong sockets marked "SPEAKER". These sockets are used to connect the two speakers required by the amplifier. For the speaker plug connections see Fig.2. The built-in field supply will furnish 100 mils, at 125 volts to each speaker. This field supply is not taken from the plate voltage supply, but has its own poer supply. A three terminal output strip marked C-4-9, is located at the right of the speaker sockets. These terminals can be used to match the voice coils of any additional speakers. Additional speakers must have their on source of field supply, either built in or external.

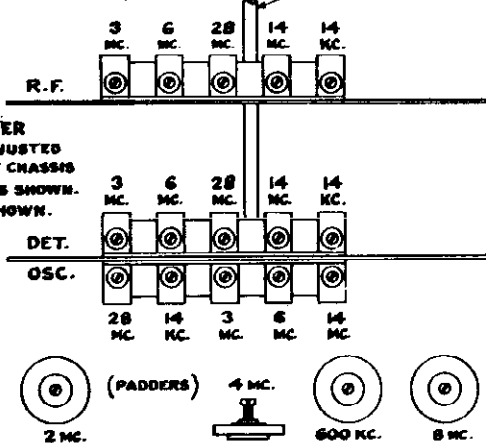


MODEL 14
Schematic, Trimmers

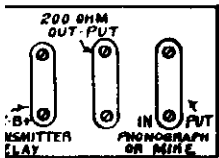
IO MFG. CO



BOTTOM VIEW OF
TRIMMERS & PADDERS
(BAND CHANGE SWITCH SHAFT)



LOW FREQUENCY PADDERS
CONDENSERS CAN BE ADJUSTED
FROM TOP OR BOTTOM OF CHASSIS
AND ARE IN THE POSITIONS SHOWN.
TRIM AT FREQUENCY SHOWN.



F CHASSIS

BREITING RADIO MFG. CO. 2117 VENICE BLVD., LOS ANGELES, CALIF.		
BREITING 14		
DESIGNED	RAY GUIDE	SCALE (NONE)
DRAWN	J.E. HEAD	PRINT NO
CHECKED	<i>[Signature]</i>	3756
APPROVED	<i>[Signature]</i>	

BRETING RADIO MFG. CO.

MODEL 14
Alignment, Notes

ANTENNA: To insure best results it is absolutely essential that a first-class antenna be used. We recommend a single solid wire, 50-75 feet in length, including lead-in. Height over any obstruction in the immediate vicinity is, of course, highly desirable, and should be obtained whenever possible. An ideal situation with respect to antenna would be the use of two or three antennas running in different directions and using a switch mounted near the radio. This procedure would enable the operator to select the antenna giving the best results in any particular location.

On the higher frequencies a short antenna will usually give better results, and on the 10 meter band a 16 ft. vertical generally proves most efficient.

The only advantage obtained in using a doublet antenna would be to locate the antenna pick-up portion out of a noisy field, such as is usually found in a location near a street car line or much traveled highway. In locations of this kind the antenna proper can be located as far away as possible from the disturbing factor, and the long lead-in can be brought to the receiver without a great amount of loss. Almost all commercially made doublets are furnished with the matching transformer equipped with electro-static shields to eliminate any capacity pick-up in the lead-in. There are many coupling transformers on the market that may be obtained by anyone who desires to construct their own doublet, but when this is done a matching transformer should be used that is equipped with electro-static shield.

NOISE SILENCER CONTROL: The noise silencer is equipped with a filament switch that turns the two noise silencer tubes off when in the extreme left position. To operate the silencer the control should be turned to the right, and after the tubes have had sufficient time to heat advancing the control will cause the set to block when a station is tuned in. The point of operation is very critical and just below the blocking point. The weaker the signal the more effective becomes the noise silencer. It is worthless on a strong signal and on certain types of noise. The silencer cannot be used on local or extremely strong signals. The silencer is not a cure-all for static generally speaking, but it is very efficient in eliminating certain types of interference.

COMMUNICATION SWITCH: The communication switch disconnects the audio amplifier from the radio and connects it to the tip jacks on the rear of the chassis. The middle terminals on rear of chassis are connected to the 200 ohm line, the bottom one of which is grounded to the chassis. The terminals nearest the speaker plug when opened break the B+ to the RF portion of the receiver. Needless to say, these terminals are hot with respect to the chassis. The audio amplifier

will drive any type of final amplifier, and if used as a modulator, will modulate approximately 100 watts. When using the receiver as a modulator, a modulation transformer with a 200 ohm primary and a secondary with a correct load to match the transmitter must be used. Numerous speaker transformers when reversed will operate satisfactorily for this purpose and several manufacturers have special transformers expressly made for this service, such as Inca Models N18 and N17.

A large number of amateurs are modulating at speech frequencies, 100W transmitters. In case feed back difficulties are encountered, try reversing connections on the external transformers and shielding all connecting wires. Sometimes a separate switch on the B+ terminals will be necessary while transmitting. A microphone transformer and volume control will be necessary for high level carbon microphones, and a high gain preamplifier is necessary for low level microphones. A single high gain stage is generally sufficient for the diaphragm type crystal microphones.

The filament and plate power for the preamplifier stage can be supplied by the receiver. On rotary type communication switch extra terminals are supplied to turn transmitter on with the communication switch.

CRYSTAL PHASING CONDENSER: To obtain results with the crystal circuit, a complete understanding of crystal selectivity must be had by the operator.

Let us consider the ordinary C. W. signal as received by a super with the crystal in the off position. The band width of the carrier is about 10,000 cycles and is heard as a series of dot and dash hissing sounds as the receiver is tuned thru the range of the 10,000 cycles. If the beat oscillator is turned on and adjusted when the dial is set to the center of the carrier, you will notice that the C. W. signal becomes a howl and the pitch varies as the beat oscillator adjustment is turned from one side to the other. It starts as an extremely high pitch howl down to a zero beat point and then up the other side until the pitch becomes so high it is lost to the ears.

Now set the beat oscillator until a 1,000 cycle note is heard. Next adjust the crystal trimmer until the background noise is at minimum and a ringing sound is heard in the speaker. The C. W. signal will probably have been lost during this operation and the main dial will have to be readjusted until you find the narrow peak of the signal.

Remember that the peak of the crystal is only 50 cycles wide compared to 10,000 cycles without crystal. You can understand by comparing the above figures why the average amateur never finds the C. W. peak on the crystal and is ready to condemn its performance. The signal strength should not change as the trimmer is turned from the left hand off position to the right hand position.

Greatest selectivity of the crystal will be found as the trimmer is turned about two-thirds of the way to the right. If the signal strength changes as the trimmer is adjusted, the signal is not tuned in on the peak or else the beat oscillator is not adjusted 1,000 cycles to one side of zero beat. Different degrees of selectivity can be obtained on C. W. by not bringing the crystal trimmer in exact phase. The broad positions are on either side of where minimum noise is heard.

For phone reception leave beat oscillator off and keep crystal in either position. At best the reception will be poor.

On C. W. turn the volume control three-quarters on and use the manual control to bring up the signal level. Do not advance it too far on the crystal as it will overload the first detector and motor booting will result.

BEAT FREQUENCY OSCILLATOR SWITCH: The beat oscillator control turns the R meter off and converts the vacuum tube volt meter tube into a beat oscillator. It also shorts out the AVC circuit requiring the manual volume control to be turned to the left to keep from blocking the receiver.

To locate weak stations, turn beat oscillator switch to the right. This should produce a hissing sound in the speaker, and as the tuning dial is rotated, all stations will be heard with a definite squeal. After locating station, retune to greatest volume.

Adjust beat oscillator by turning the condenser shaft extending through the bottom front, left corner until the desired pitch is obtained. To make the beat oscillator adjustable from the front panel solder a heavy wire or handle to the shaft and allow it to extend out under the base pan.

RF GAIN CONTROL OR MANUAL VOLUME CONTROL: The RF gain control is used for code reception and should be rotated to the left when silent tuning is desired.

R METER ADJUSTMENT: To adjust the R meter, disconnect the antenna, and after the receiver has been on a few minutes, turn the control marked "R" METER ADJUSTMENT until the pointer swings to the maximum left hand position. The meter is at ground potential and cannot be damaged except through rough handling in a mechanical way.

ANTENNA TRIMMER ADJUSTMENT: Adjust the antenna trimmer on any station around 14 megacycles. Turn adjusting screw carefully until greatest signal strength is shown on the R meter. DO NOT ADJUST ANY OTHER TRIMMERS. The trimmer is adjusted correctly at the factory and should not require over 1/2 turn in either direction.

ALIGNMENT PROCEDURE

Tune the Intermediate Frequency transformers to resonant point of Crystal. This point may be 200 to 1000 cycles different from the oscillating point of the crystal (if crystal was used as oscillator control). Adjust IF transformers in following sequence :-

- (1) Align the 2nd Detector stage.
- (2) Band-pass IF stage located in center of chassis.
- (3) Crystal grid coil.
- (4) 1st Detector plate coil (On rear of chassis)

Place crystal in the filter circuit, tune in a low frequency broadcast station of 600 KC, adjust sensitivity control until "R" meter reads R6. Then phase crystal and retune dial to minimum modulation and maximum R strength location. Turn crystal off, without disturbing dial, retune IF trimmers as before to greatest "R" strength. Next align crystal resonant point with the IF. Crystal oscillator not necessary if IF adjustments have not been disturbed.

To adjust Low Frequency of each band. Trimmers are located on top of chassis, 75 meter trimmer located on the rear. High frequency trimmers are located on coil switch. At most trimmers should not require more than 1/8 turn for correction.

If variable condenser plates have become bent, realign rear unit of the three double sections of variable condenser, using 20 to 40 meter band as a standard. The broadcast portion of variable condenser is located in front unit of the 3 double sections of variable condenser, and plates can be bent slightly for maximum gain and correct alignment when set is used on different antennas.

The oscillator section is located in rear double gang. In case the gear has slipped on condenser shaft or the belt damaged, set pointer at 580 KC when the condenser plates are even with front of condenser frame. This can be checked by laying knife along frame, opening the variable until rotor plates touch the knife. The pointer should be within 2 KC of 580 KC. For greater variations loosen gear on the condenser and slide rotors.

CADILLAC MOTOR CAR CO.

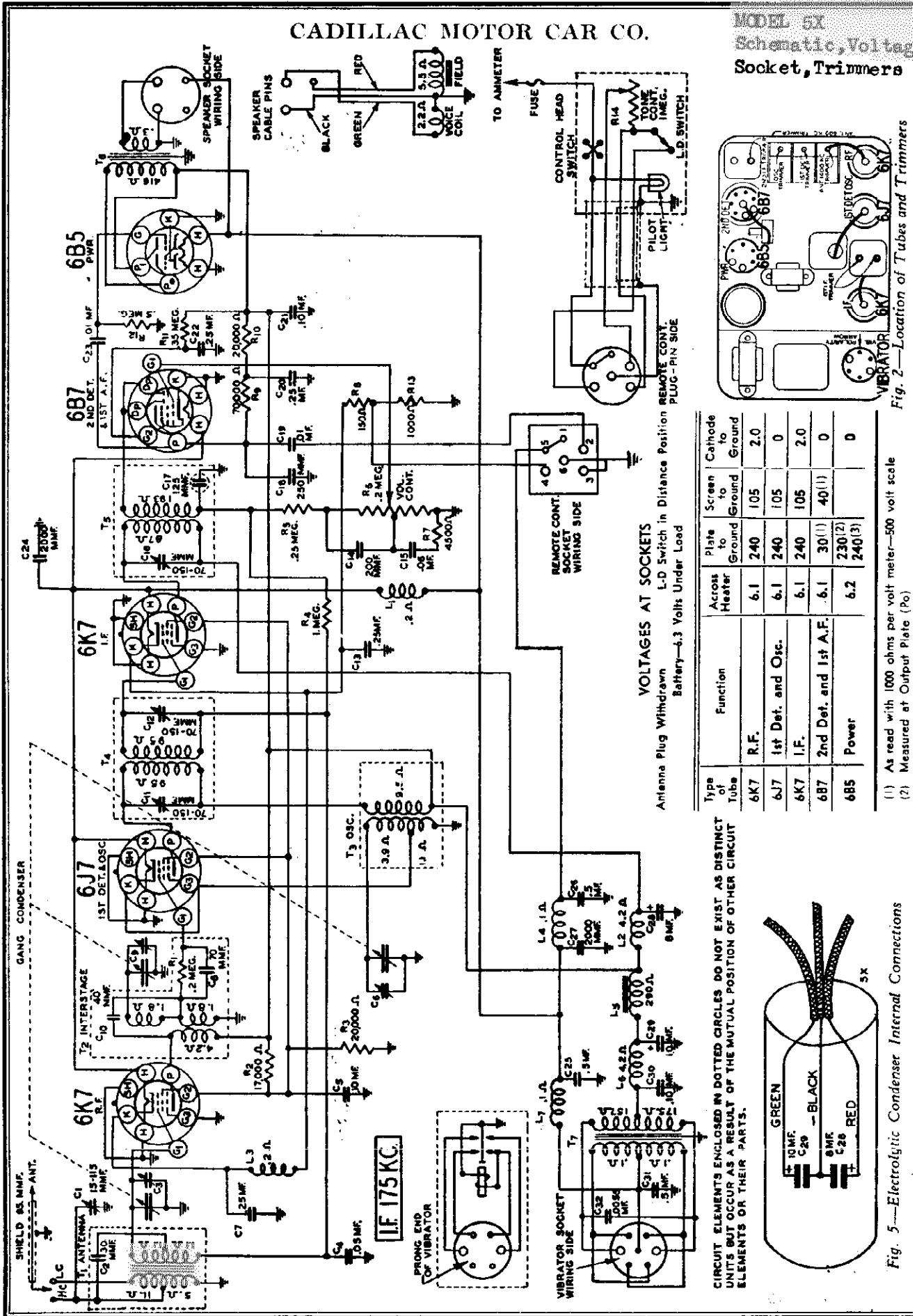
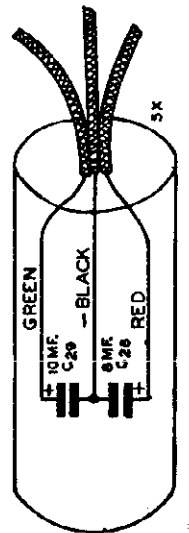


Fig. 5—Electrolytic Condenser Internal Connections



(1) As read with 1000 ohms per volt meter—500 volt scale
(2) Measured at Output Plate (P_o)

MODEL 5X
MODEL 6KB

Alignment, Notes

CADILLAC MOTOR CAR CO.

Calibrating the Radio

Tune in a signal of known frequency at about the center of the dial. Choose a station with a frequency which corresponds to one of the numbers on the dial drum. For example, WLW, with a frequency of 700 KC, corresponds to 70 on the dial.

Hold the tuning knob. Using a clean eraser on the end of a lead pencil, turn the dial drum until the frequency of the station tuned in is at the center of the dial opening.

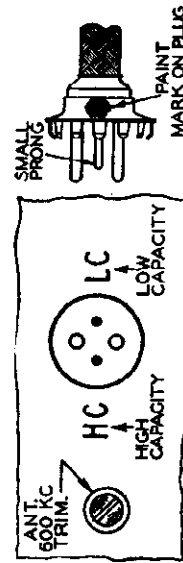
Inserting Antenna Plug

IMPORTANT—The antenna plug can be inserted in two ways depending on whether the antenna is of high or low capacity.

Referring to Fig. 3, it will be noted that the letters HC and LC are stamped on the case. There is a spot of paint on the antenna plug. When the plug is inserted with the spot of paint on the LC side, it is properly inserted for a high capacity antenna and when it is inserted with the spot of paint on the HC side, it is properly inserted for a low capacity antenna.

If the total capacity of the antenna and shielded lead is approximately 300 mmf., which would be the case in a running board or ordinary roof antenna (not metal roof), insert the antenna plug for a high capacity antenna or with the mark on the LC side.

If the total capacity of the antenna and shielded lead is approximately 70 mmf., such as may be the case if a "fish pole" antenna is used, insert the antenna plug for a low capacity antenna or with the mark on the HC side.



1400 KC Adjustment

Set the signal generator for 1400 KC. Turn the rotor of the tuning condenser, carefully until maximum output is obtained. Adjust the 1st det. and antenna 1400 KC trimmers for maximum output.

Do not change the setting of the oscillator trimmer.

600 KC Adjustment

Set the signal generator for 600 KC. Turn the tuning condenser rotor until maximum output is obtained.

Adjust the antenna 600 KC trimmer to maximum. This trimmer is reached from the outside of the case. See Fig. 3.

After the alignment procedure is completed, the antenna plug may be withdrawn and re-inserted for a low capacity antenna (mark on HC side) if a low capacity car antenna is used.

Adjusting Antenna 600 KC Trimmer

After the radio is installed and the car antenna is connected, it will be necessary to readjust the antenna 600 KC trimmer.

Tune in a weak signal at approximately 600 KC with the volume control about three-fourths on. Turn the adjusting screw of the antenna 600 KC trimmer up or down until maximum output is obtained. See Fig. 3 for location of this trimmer.

I. F. Adjustment

Set the signal generator for a signal of 175 KC.

Connect the output of the signal generator through a .05 mf. condenser to the stator of the 1st det. section of the tuning condenser. (See Fig. 2. for location of this section.)

Connect the ground lead of the signal generator to the chassis. The chassis should be in the "Distance" position and keep it in this position for all adjustments.

Set the volume control at the maximum position. Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

Then adjust the three I.F. trimmers until maximum output is obtained. The location of these trimmers is shown in Fig. 2.

1581 KC Adjustment

Set the signal generator for 1581 KC. Turn the rotor of the tuning condenser to the full open position.

Insert the antenna plug for a high capacity antenna (mark on LC side). Connect the shielded antenna lead from the chassis through a 120 mmf. condenser to the antenna post of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained—See Fig. 2 for location of this trimmer.

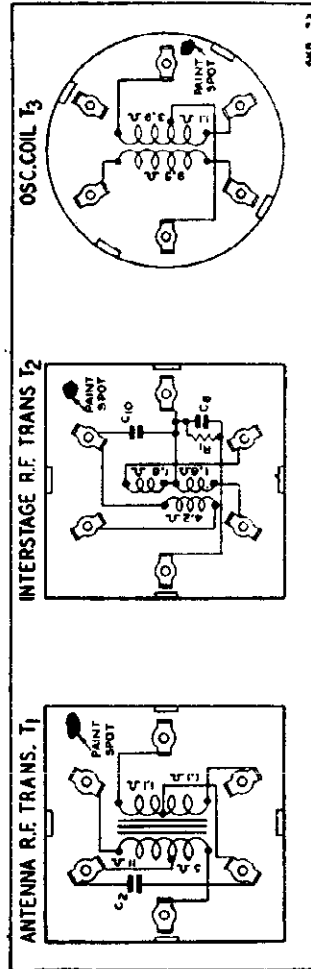
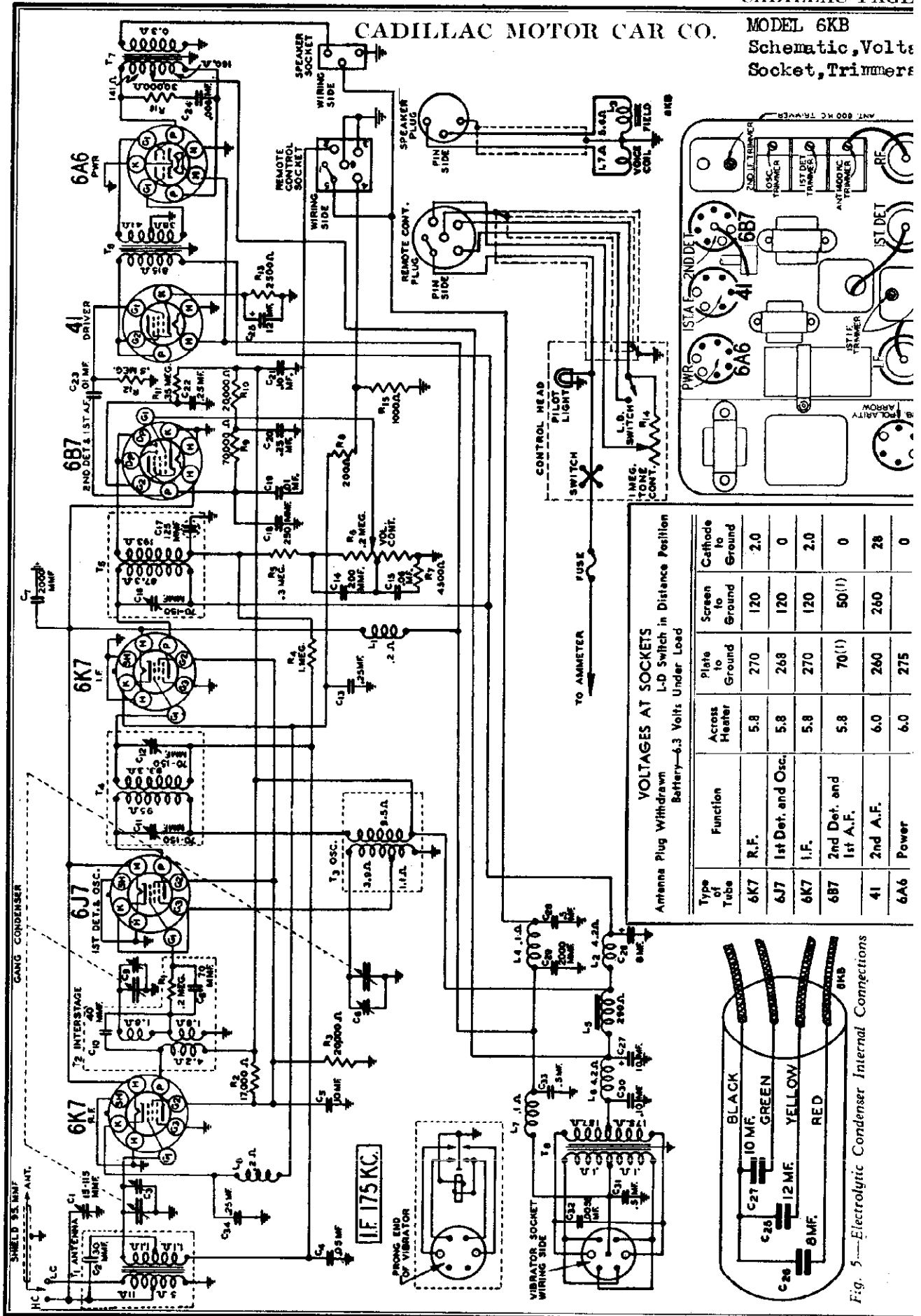


Fig. 4—R.F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings



VOLTAGES AT SOCKETS
Antenna Plug Withdrawn
L-D Switch in Distance Position
Battery—6.3 Volts Under Load

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground
6K7	R.F.	5.8	270	120	2.0
6J7	1st Det. and Osc.	5.8	268	120	0
6K7	1.F.	5.8	270	120	2.0
6B7	2nd Det. and 1st A.F.	5.8	70(1)	50(1)	0
4I	2nd A.F.	6.0	260	200	28
6A6	Power	6.0	275		0

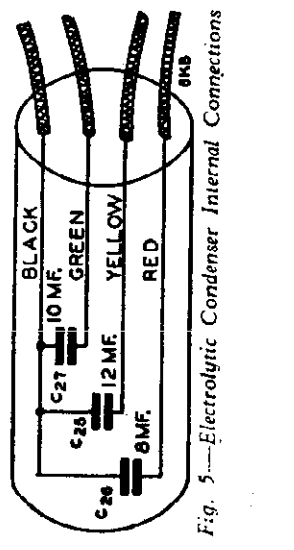
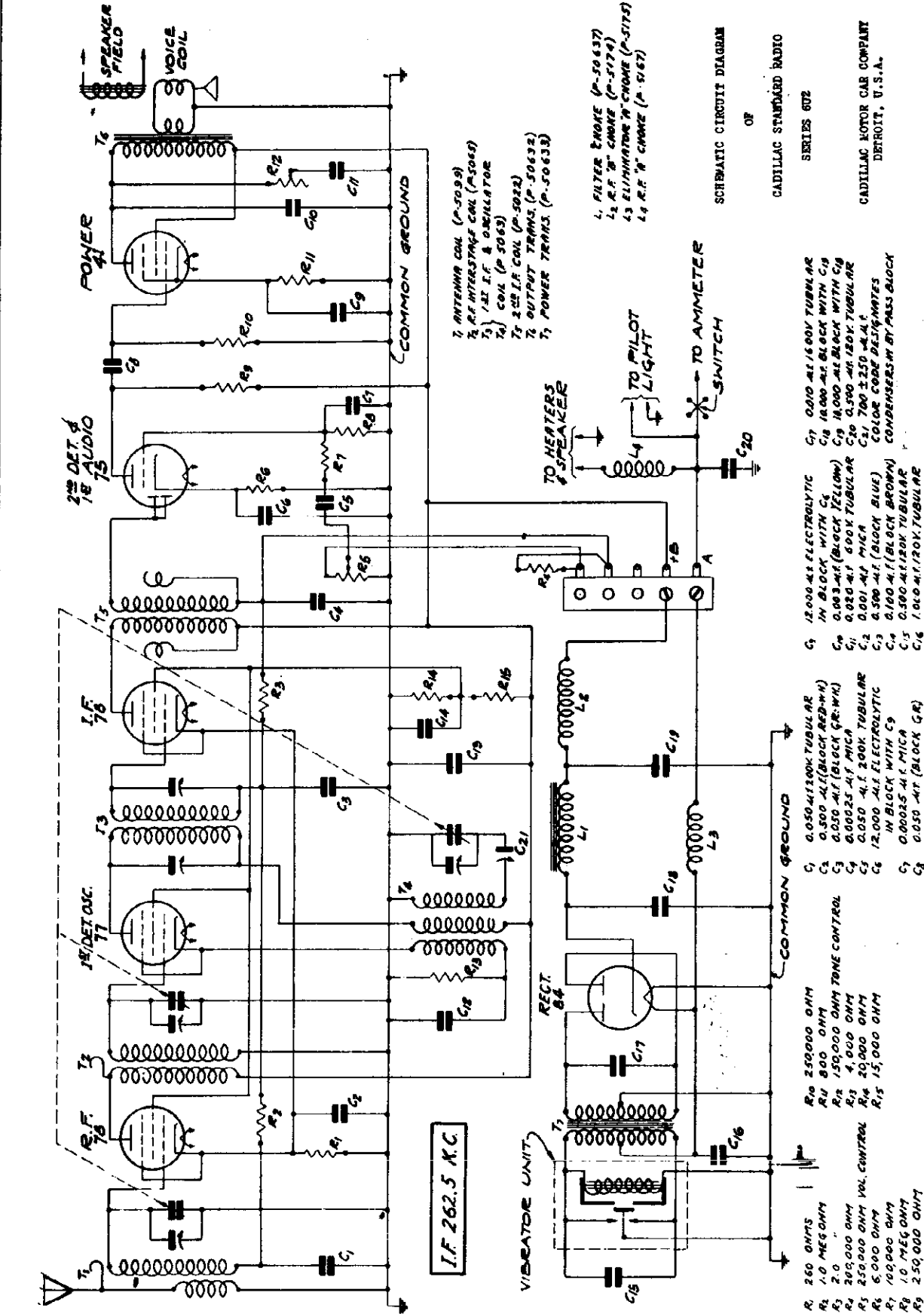


Fig. 5—Electrolytic Condenser Internal Connections

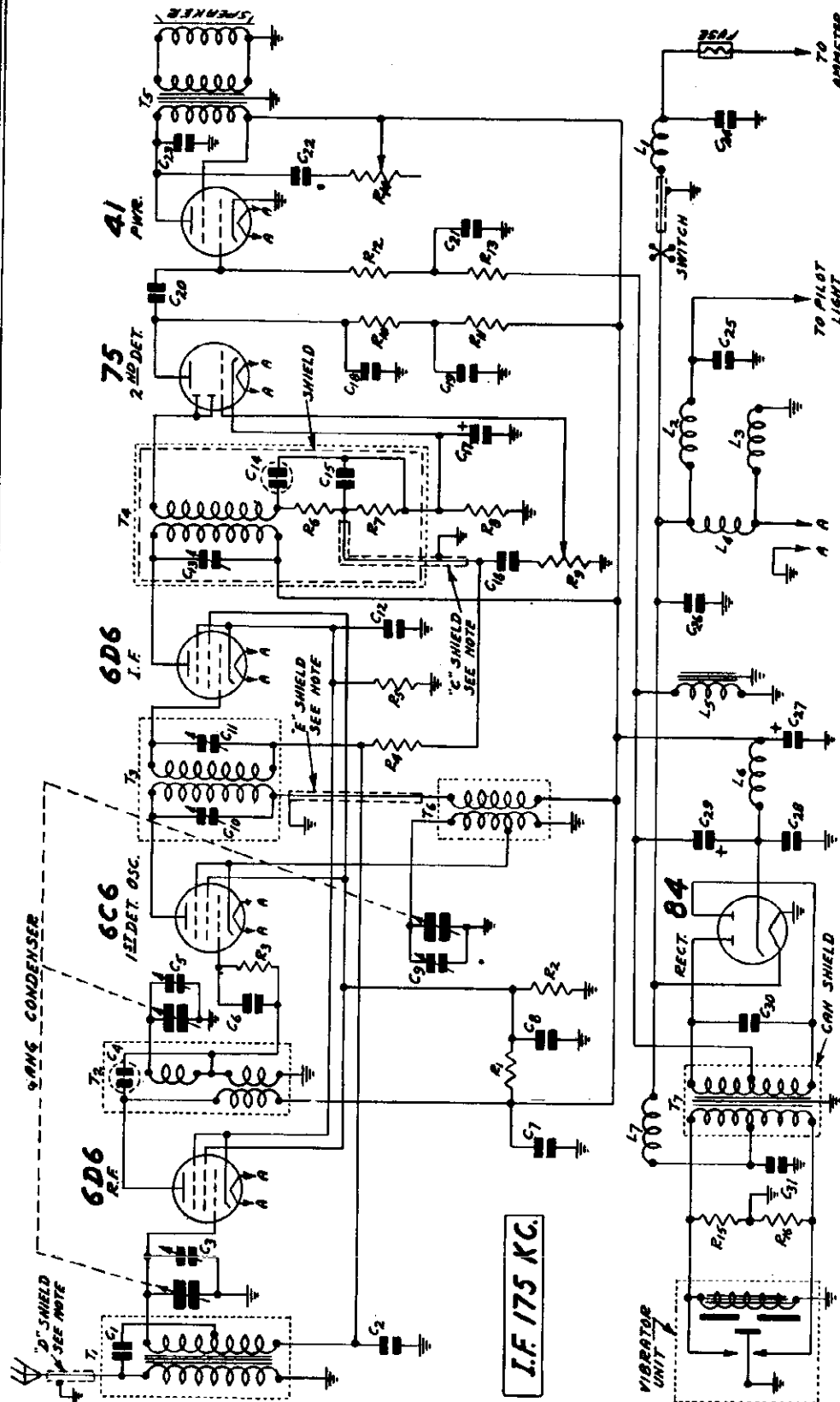
MODEL 6U2
Schematic

CADILLAC MOTOR CAR CO.



- SCHEMATIC CIRCUIT DIAGRAM
OF
CADILLAC STANDARD RADIO
SERIES 6U2
CADILLAC MOTOR CAR COMPANY
DETROIT, U.S.A.
1. FILTER BROKE (P-50437)
2. R.F. "B" CHOKER (P-5174)
3. ELIMINATOR "B" CHOKER (P-5175)
4. R.F. "A" CHOKER (P-5167)
1. 260 OHMS
2. 1.0 MEG OHM
3. 2.0 " "
4. 20,000 OHM
5. 250,000 OHM VOL. CONTROL
6. 5,000 OHM
7. 10,000 OHM
8. 1.0 MEG OHM
9. 250,000 OHM
10. 250,000 OHM
11. 800 OHM
12. 150,000 OHM TONE CONTROL
13. 4,000 OHM
14. 20,000 OHM
15. 15,000 OHM
16. 0.050 M.F. (BLOCK GR.)
17. 0.050 M.F. (BLOCK GR.)
18. 0.0025 M.F. MICA
19. 0.0025 M.F. MICA
20. 0.0025 M.F. MICA
21. 0.050 M.F. (BLOCK GR.)
22. 0.050 M.F. (BLOCK GR.)
23. 0.050 M.F. (BLOCK GR.)
24. 0.050 M.F. (BLOCK GR.)
25. 0.050 M.F. (BLOCK GR.)
26. 0.050 M.F. (BLOCK GR.)
27. 0.050 M.F. (BLOCK GR.)
28. 0.050 M.F. (BLOCK GR.)
29. 0.050 M.F. (BLOCK GR.)
30. 0.050 M.F. (BLOCK GR.)
31. 12,000 M.F. ELECTROLYTIC
32. IN BLOCK WITH C4
33. 0.003 M.F. (BLOCK YELLOW)
34. 0.020 M.F. 600K TUBULAR
35. 0.001 M.F. MICA
36. 0.500 M.F. (BLOCK BLUE)
37. 0.100 M.F. (BLOCK BROWN)
38. 0.500 M.F. 120K TUBULAR
39. 0.010 M.F. 1600V TUBULAR
40. 18,000 M.F. BLOCK WITH C18
41. 18,000 M.F. BLOCK WITH C18
42. 0.500 M.F. 120V TUBULAR
43. 700 ± 250 M.F. T
44. COLOR CODE DESIGNATES
45. CONDENSERS BY PALS BLOCK
46. 1/2 ANTENNA COIL (P-5059)
47. R.F. INTERSTAGE COIL (P-5064)
48. 1/2 I.F. & OSCILLATOR COIL (P-5083)
49. 325 I.F. COIL (P-5022)
50. OUTPUT TRANS. (P-50632)
51. POWER TRANS. (P-50633)
52. 2ND DET. & 1ST AUDIO
53. 1ST DET. OSC.
54. R.F.
55. VIBRATOR UNIT
56. RECT. B4
57. COMMON GROUND
58. TO HEATERS & SPEAKER
59. TO PILOT LIGHT
60. TO AMMETER SWITCH

CADILLAC MOTOR CAR CO.



GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES. CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS.

- THE CAPACITY OF "C" SHIELD IS 37 MMF, THE CAPACITY OF "D" SHIELD IS 85 MMF AND THE CAPACITY OF "E" SHIELD IS 15 MMF.
- C1 21 mmf.
 - C2 10 mf. 180 V.
 - C3 70-150 mmf.
 - C4 250 mmf.
 - C5 2000 mf.
 - C6 200 mf.
 - C7 350 ohm 2 W.
 - C8 5000 ohm 2 W.
 - C9 50 mf. 25 V.
 - C10 10 mf. 180 V.
 - C11 70-150 mmf. } One Unit
 - C12 .10 mf. 180 V.
 - C13 70-150 mmf.
 - C14 250 mmf.
 - C15 250 mmf.
 - C16 .01 mf. 300 V.
 - C17 10 mf. 300 V.
 - C18 250 mmf.
 - C19 .10 mf. 300 V.
 - C20 .01 mf. 300 V.
 - C21 .25 mf. 180 V.
 - C22 .02 mf. 600 V.
 - C23 .002 mf. 600 V.
 - C24 .50 mf. 180 V.
 - C25 2000 mf.
 - C26 200 mf.
 - C27 300 mf. 300 V.
 - C28 300 mf. 300 V.
 - C29 50 mf. 25 V. } Electrolytic Block
 - C30 4.0 mf. 350 V.
 - C31 8.0 mf. 350 V.
 - R1 17000 ohm 1.0 W.
 - R2 20000 ohm .5 W.
 - R3 50 Megohm 2 W.
 - R4 1.0 Megohm 2 W.
 - R5 350 ohm 2 W.
 - R6 5000 ohm 2 W.
 - R7 50000 ohm 2 W.
 - R8 2.0 Megohm Volume Control
 - R9 150000 ohm 2 W.
 - R10 50000 ohm 2 W.
 - R11 50000 ohm 2 W.
 - R12 50 Megohm 2 W.
 - R13 100000 ohm 2 W.
 - R14 150000 ohm Tone Control
 - R15 50 ohm .5 W.
 - R16 50 ohm .5 W.
 - L1 Motor Noise Reactor
 - L2 Pilot Light Reactor
 - L3 Speaker Field 3.3
 - L4 Filament Reactor
 - L5 Filament Reactor
 - L6 "B" Reactor
 - L7 Vibrator Reactor
 - T1 Antenna Trans.
 - T2 I.F. Trans.
 - T3 I.F. Trans.
 - T4 I.F. Trans.
 - T5 I.F. Trans.
 - T6 Osc. Inductor
 - T7 Power Trans.

MODEL 6R

Alignment, Voltage

I. F. Adjustment

Set the signal generator for a signal of 175 KC.

Connect the antenna lead of the signal generator thru a .05 mf. condenser to the stator of the 1st detector section of this section. (See Fig. 2 for location of this section.) This can be done by pushing a wire or conductor between the stator plates or by extending an insulated wire thru the hole in the shield over the stator and pushing the wire thru the hole in the lug which extends up from the insulated stator assembly.

Connect the ground lead of the signal generator to the chassis ground.

Short out the oscillator section of the tuning condenser.

Set the volume control at the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the A.V.C.

Then adjust the three I.F. trimmers until maximum output is obtained. The location of these trimmers is shown in Fig. 2.

1650 KC. Adjustment

Set the signal generator for 1650 KC.

Turn the rotor of the tuning condenser to the full open position.

Connect the shielded antenna lead from the chassis through a 150 mmf. condenser to the antenna post of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A.V.C. action.

Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained—see Fig. 2 for location of this trimmer.

1400 KC. Adjustment

Set the signal generator for 1400 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st detector and antenna trimmers for maximum output.

Do not change the setting of the oscillator trimmer.

Adjusting Antenna Trimmer

After the receiver is installed and the car antenna is connected it will be necessary to adjust the antenna trimmer. Tune in a weak signal between 1200 and 1400 KC. with the volume control about three-fourths on. Remove the cover of the chassis case. The antenna trimmer is on the center tuning condenser section—see Fig. 2. Turn the adjusting screw of this condenser up or down until maximum output is obtained. CAUTION—Do not turn any of the other trimmer adjusting screws for this adjustment.

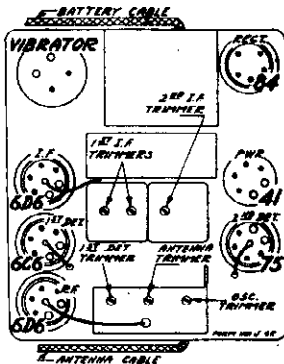


Fig. 2—Location of Tubes and Trimmers

VOLTAGES AT SOCKETS						
Antenna Disconnected			Battery 6 Volts Under Load			
Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground	Cathode Current M. A.
6D6	R. F. Amp.	5.8	220	90	4.5	6.3
6C6	1st Det. Osc.	5.8	220	90	0	2.4
6D6	L. F. Amp.	5.8	220	90	4.5	6.3
75	2nd Det.	5.8	130(1)		1.2	0.3
41	Power	5.8	210	220	16(2)	25.5
84	Rectifier	5.8				50.0

(1) With 250,000 Ohm Meter
(2) As read across filter choke.

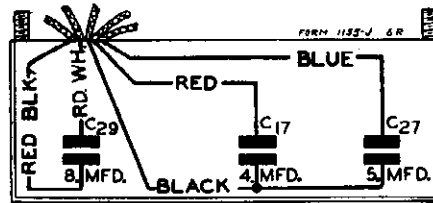


Fig. 4—Condenser Block—Internal Wiring

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Part No.	Winding	Code	D. C. Resistance in Ohms
P-9A443	Antenna Transformer	T1	
	Primary Winding		8.7
	Secondary Winding—Either Portion		1.0
P-9A439	Interstage Transformer	T2	
	Primary Winding		44.4
	Secondary Winding—Either Portion		1.4
P-9A441	1st I. F. Transformer	T3	
	Primary Winding		93.5
	Secondary Winding		97.6
P-9A442	2nd I. F. Transformer	T4	
	Primary Winding		44.1
	Secondary Winding		49.6
P-12A227	Dynamic Speaker		
	Output Transformer Primary	T5	416.6
	Output Transformer Secondary	T5	Small
	Speaker Field	L3	5.3
	Speaker Voice Coil		Small
P-9A440	Oscillator Coils	T6	
	Grid Coil		
	Long Portion		3.0
	Short Portion		0.9
	Plate Coil		5.8
P-53X108	Power Transformer	T7	
	Primary Winding		
	Center Tap to Inside		Small
	Center Tap to Outside		Small
	Secondary Winding		
	Center Tap to Inside		200.
	Center Tap to Outside		200.
P-9A444	Motor Noise Reactor	L1	Small
P-9A448	Pilot Light Line Reactor	L2	Small
P-9A446	Filament Reactor	L4	Small
P-52X42	Filter Choke	L5	312.5
P-9A447	R. F. "B" Plate Reactor	L6	4.1
P-9A445	Vibrator Filter Reactor	L7	Small

Tuning Frequency Range 530 - 1650 KC
Intermediate Frequency 175 KC
Speaker 6 Inch Dynamic
Power Consumption 6.5 Amperes at 6.3 Volts
Power Output 3 Watts Undistorted
Sensitivity 1.0 Microvolt Absolute
Selectivity 45 KC Broad at 1000 Times Signal

General Service Data

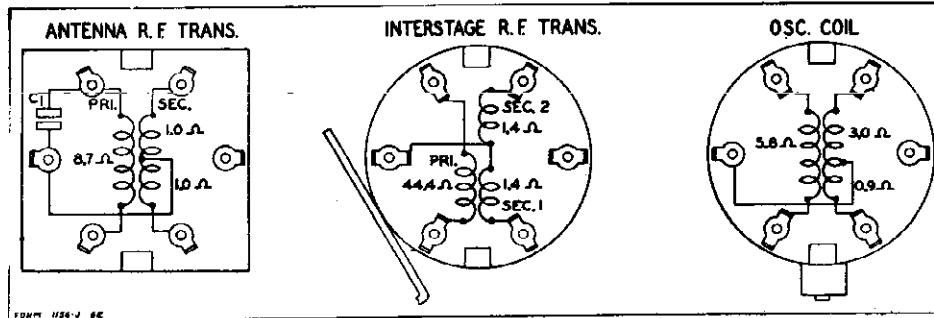
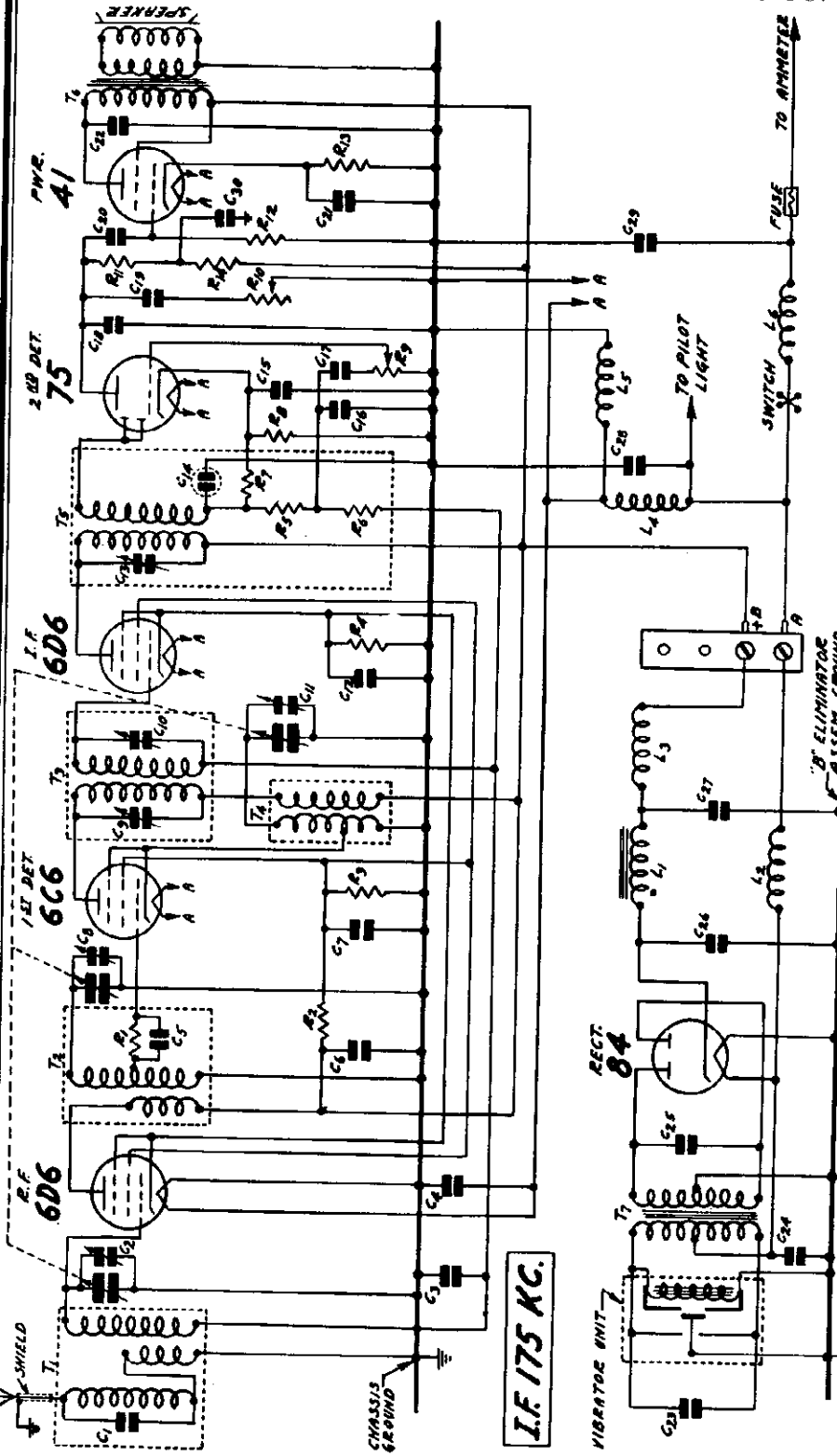


Fig. 3—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

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MODEL 65 Schematic Parts



PRICES SUBJECT TO CHANGE WITHOUT NOTICE
 GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.
 CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER
 CIRCUIT ELEMENTS OF THESE PARTS.

TRANSFORMERS AND COILS

New Part No.	Old Part No.	Description	Code	List Price
51X17-6S	50632	Output Transformer	T6	1.65
9A368-6S		Antenna Coil Assembly (Less Can)	T1	.30
9A369-6S		R.F. Interstage Coil Assembly (Less Can)	T2	1.25
1A23-6S		Dual-Coil Can Assembly Only (for above two coils)		.30
9A371-6S		1st I.F. Coil & Can Assembly Complete	T3	1.70
9A370-6S		Oscillator Coil & Can Assembly Complete	T4	.60
9A372-6S		2nd I.F. Coil & Can Assembly Complete	T5	2.05

9A375-6S		Pilot Light Choke Assembly	L4	.15
9A373-6S		Motor Noise Choke	L5	.25
9A368-6S	5174	R.F. "B" Choke Coil Assembly	L3	.10
9A374-6S		Filament Reactor	L1	.50
33X72-6S	50633	Power Transformer	T7	3.20
32X27-6S	50637	Filter Choke	L1	.90
9A268	5174	R.F. "B" Choke Coil Assembly	L3	.10
9A374		Filament Reactor	L2	.50
53X57	50633	Power Transformer	T7	3.20
32X27	50637	Filter Choke	L1	1.00
19A14	2380	Vibrator - Mallory		4.00
19A16	2110	Vibrator - Radiart		4.00
3A127	2023	Vibrator Socket		.10

RESISTORS

Code	Resistance	Wattage	Type	List Price
R1	50,000 Ohm	0.2	Carbon	.10
R2	15,000 Ohm	0.5	Carbon	.15
R3	20,000 Ohm	0.5	Carbon	.15
R4	450 Ohm	0.2 (1)	Armored Wire	.15
R13	800 Ohm	0.5 (1)	Wound	.30
R5	50,000 Ohm	0.2	Carbon	.10
R6	1.0 Megohm	0.2	Carbon	.10
R7	50,000 Ohm	0.2	Carbon	.10
R8	50,000 Ohm	0.2	Carbon	.10
R9	2.0 Megohm	0.2	Vacuum Control & Variable	.40
R10	300,000 Ohm		Tone Control	1.15
*A95204	200,000 Ohm	0.2	Carbon	.10
1A95154	150,000 Ohm	0.2	Carbon	.10
A95534	500,000 Ohm	0.2	Carbon	.10
1A95503	50,000 Ohm	0.2	Carbon	.10

CONDENSERS

Old Part No.	New Part No.	Capacity	Voltage	Type	List Price
C1	45X203	.0005 mfd.	180	Molded	.15
C2	47X52	.00025 mfd.	180	Antenna Trimmer-Part of Gang Condenser	.15
C3	46X84	.01 mfd.	180	Tubular	.15
C4	47X52	.00025 mfd.	180	Molded	.15
C5	46X86	.00025 mfd.	400	Molded	.10
C6	46X85	.00025 mfd.	400	Tubular	.10
C7	46X83	.00025 mfd.	180	Tubular	.10
C8	46X89	1st Detector Trimmer-Part of Gang Condenser	180	Tubular	.25
C9	130-300 mfd.	1st I.F. Trimmer Condensers	180	1st I.F. Trimmer Condensers	.50
C10	130-300 mfd.	1st I.F. Trimmer Condensers	180	1st I.F. Trimmer Condensers	.50
C11	70-150 mfd.	Oscillator Trimmer-Part of Gang Condenser	180	Oscillator Trimmer-Part of Gang Condenser	.25
C12	10 mfd.	10 mfd.	180	Tubular	.10
C13	70-150 mfd.	2nd I.F. Trimmer Condensers	180	2nd I.F. Trimmer Condensers	.25
C14	100.25 mfd.	Part of 2nd I.F. Coil Assembly	180	Part of 2nd I.F. Coil Assembly	.35

CONDENSERS

25	Dry Electro-Block	1.05
26	Molded	.15
180	Tubular	.15
600	Molded	.30
400	Tubular	.30
180	Tubular	.20
180	Tubular	.20
180	Tubular	.30
180	Tubular	.30
150	Dry Electro-Block	2.10
180	Tubular	.15
180	Tubular	.15

MODEL 68

Alignment, Voltage Socket, Trimmers

Changes, Notes

- Power Output - 3 Watts Maximum
- Sensitivity - 1.5 Microvolts Absolute
- Frequency Range - 530 to 1650 KC

CADILLAC MOTOR CAR CO.

- Speaker - 6 Inch Dynamic
- Power Consumption - 5.75 Amperes at 6 Volts
- I. F. - 175 KC

I. F. Adjustment

- Remove chassis from case.
- Establish ground connection between chassis and power supply.
- Reconnect A and B wires from power supply to chassis.
- Set the signal generator for a signal of 175 KC.
- Connect the antenna lead of the signal generator thru a .05 mf. condenser to the stator of the 1st detector (middle) section of the tuning condenser. This can be done by pushing a wire or conductor between the stator plates or by extending an insulated wire thru the hole in the shield over the stator and pushing the wire thru the hole in the lug which extends up from the insulated stator assembly.
- Connect the ground lead of the signal generator to the chassis ground.
- Short out the oscillator section of the tuning condenser.
- Set the volume control at the maximum position.
- Attenuate the signal from the signal generator to prevent the levelling off action of the A.V.C.
- Then adjust the three I.F. trimmers until maximum output is obtained. The location of these trimmers are shown in Fig. 2.

1650 KC. Adjustment

- Set the signal generator for 1650 KC.
- Turn the rotor of the tuning condenser to the full open position.
- Connect the shielded antenna lead from the chassis through a 250 mmf. condenser to the antenna post of the signal generator.
- For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A. V. C. action.
- Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained—see Fig. 2 for location of this trimmer.

1400 K C. Adjustment

- Set the signal generator for 1400 KC.
- Turn the rotor of the tuning condenser carefully until maximum output is obtained.
- Adjust the 1st detector and antenna trimmers for maximum output.
- Do not change the setting of the oscillator trimmer.

Adjusting Antenna Trimmer

After the receiver is installed and the car antenna is connected it will be necessary to adjust the antenna trimmer. Tune in a weak signal between 1200 and 1400 KC. with the volume control about three-fourths on. Remove the cover of the chassis case. The antenna trimmer is the trimmer condenser closest to the terminal strip—see Fig. 2. Turn the adjusting screw of this condenser up or down until maximum output is obtained. CAUTION—Do not turn any of the other trimmer adjusting screws for this adjustment.

Calibrating the Receiver

After installing the receiver in the car the control unit or flexible shaft will probably cause the setting of the dial pointer to change. The receiver may then be recalibrated as follows: Tune in a station of known frequency at about the center of the dial. Then loosen the set screw which secures the station selector knob to the shaft.

The station selector shaft is made up of two sections—an inner and an outer shaft. By loosening the set screw in the station selector knob one turn, the knob and the outer shaft are disengaged from the inner shaft. The inner shaft is directly connected to the tuning condenser in the chassis.

By turning the station selector knob it will be found that the dial scale can be adjusted without disturbing the tuning of the receiver. Turn the knob until the dial scale is exactly at the frequency of the station which has been tuned in.

Retighten the set screw in the station selector knob.

Circuit

The circuit consists of a 6D6 R.F. stage, a 6C6 1st detector-oscillator stage, a 6D6 I.F. stage, a 75 dual diode-triode tube, which functions as a diode 2nd-detector and a triode 1st audio stage, and a single 41 output stage. An 84 full wave rectifier is used in the power unit. The intermediate frequency is 175 KC. The diode current establishes a drop across a resistor which is used as additional bias voltage for the R.F. and I.F. tubes giving automatic volume control action. The manual volume control varies the audio voltage to the grid of the 75 tube.

Changes In Early Models

In the early models, resistor R14, and condenser C30, were not used. In these models resistor R11 was rated at 200,000 ohms. The capacity range of the 1st I.F. Trimmer Condensers C9 and C10, was from 130 to 300 mmf. in the early models.

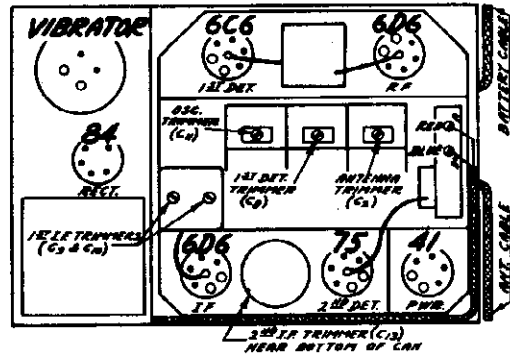


Fig. 2—Tube Arrangement and Trimmers

Voltages at Sockets						
Antenna Disconnected - Voltage at Battery 6.1						
Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cath. to Ground	Normal Plate M.A.
6D6	R. F.	5.8	218	100	5.2	5.8
6C6	1st Det. and Osc.	5.8	218	100		2.0
6D6	I. F.	5.8	218	100	5.2	5.8
75	2nd Det. & 1st A. F.	5.8	160 (1)		1.4	2.8
41	Output	5.8	210	220	16.0	16.0
84	Rectifier	5.8				20.0 per plate

Speaker Field . . . 1.15 Amperes "B" Unit . . . 3.00 Amperes
Chassis . . . 1.50 Amperes Pilot Lamp . . . 0.1 Amperes

(1) Measured on 1000 V. Scale (1000 Ohms per volt)

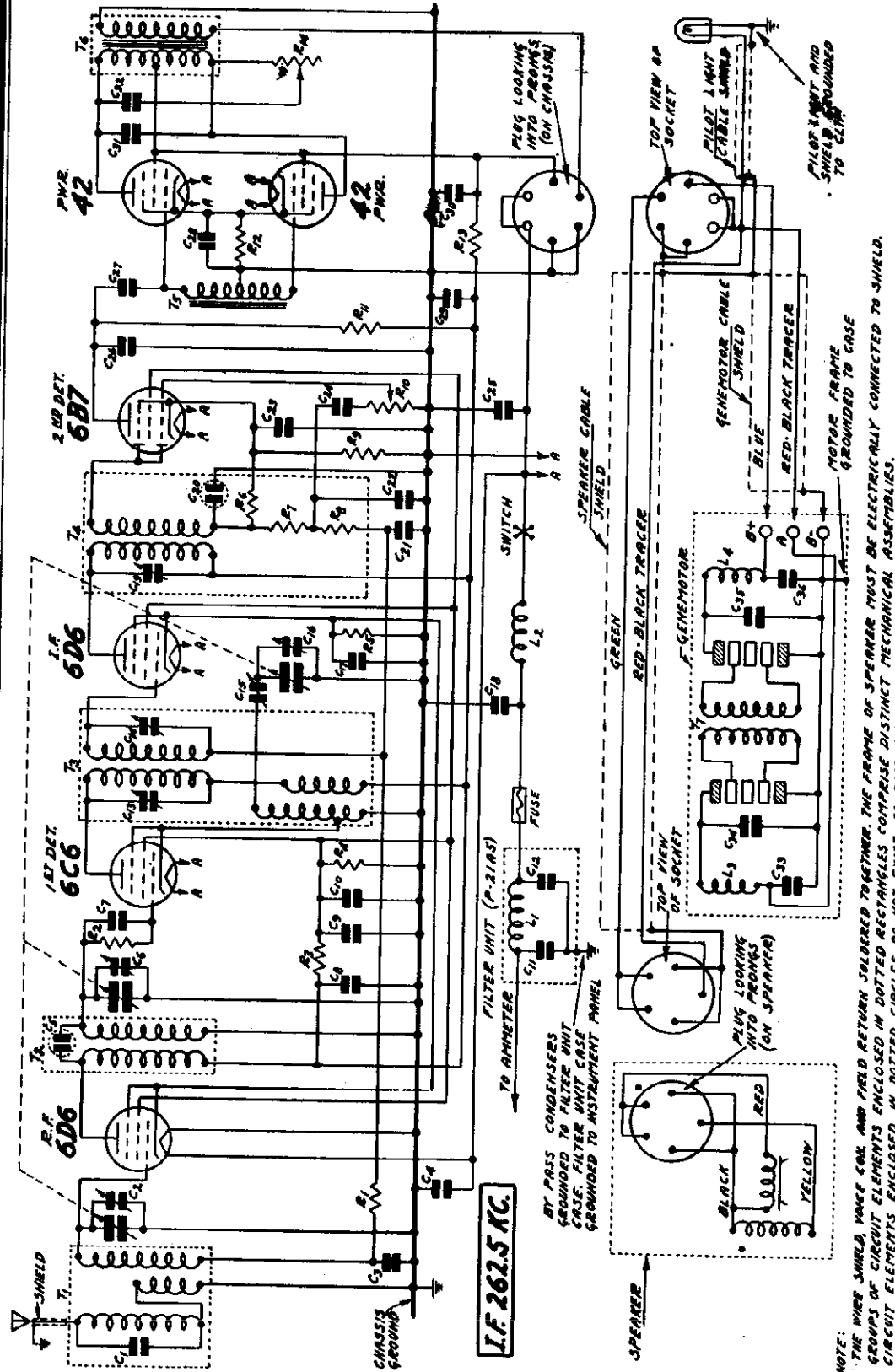
D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis.

New Part No.	ITEM	Code	D. C. Resistance in Ohms
9A368-6S	Antenna Trans. Primaries in Series	T1	6.3
	Antenna Trans. Secondary	T1	2.5
9A369-6S	R.F. Interstage Trans. Pri.	T2	4.5
	R.F. Interstage Trans. Sec.	T2	
	(Center Tap to inside)		1.8
	(Center Tap to ground)		1.3
9A371-6S	1st I.F. Trans. Primary	T3	58.
	1st I.F. Trans. Secondary	T3	58.
9A370-6S	Oscillator Cathode Coil (Total)	T4	3.
	Oscillator Plate Coil	T4	6.
9A372-6S	2nd I.F. Trans. Primary	T5	46.
	2nd I.F. Trans. Secondary	T5	46.
51X17-6S	Output Trans. Primary	T6	440.
	Output Trans. Sec. and Voice coil in parallel	T6	
53X72-6S	Power Trans. Primary	T7	4
	Power Trans. Secondary	T7	500.
52X27-6S	Filter Choke	L1	300.
9A374-6S	Filament Reactor	L2	Small
9A268-6S	R.F. "B" Choke	L3	3.5
9A375-6S	Pilot Light Choke Assembly	L4	Small
12A62A	Speaker Field	L5	5.
9A373-6S	Motor Noise Choke	L6	Small

CADILLAC MOTOR CAR CO.

MODEL 61
Schematic, Motor



Power Output - 8 Watts Maximum
Sensitivity - 1.5 Microvolts Absolute
Frequency Range - 530 to 1650 KC
Size of Speaker - 8" and 10"
Field Resistance - 5.4 Ohms (hot)

Power Consumption - at 6 Volts
Chassis - - - - 2.3 Amperes
Genemotor - - - 3.5 Amperes
Speaker Field - - 1.1 Amperes
Pilot Light - - - 0.1 Amperes
TOTAL - - - - 7.0 Amperes

Genemotor Assembly
The genemotor assembly contains all of the parts shown within the dotted lines in Fig. 4. We do not recommend that the genemotor itself be serviced in the field. The filter unit associated with the genemotor may be checked and any defective parts repaired or replaced. However, if the genemotor itself is at fault, it should be sent back to the factory for repair.

The circuit of this receiver consists of a 6D6 R. F. stage, a 6C6 1st detector-oscillator stage, a 6D6 I. F. stage, a 6B7 dual diode-pentode tube, which functions as a diode 2nd-detector and pentode 1st audio stage, and a 42 push pull output stage. A genemotor supplies the high voltage to the receiver. The intermediate frequency is 262.5 KC. The diode current establishes a drop across a resistor (R8) which is used as additional bias voltage for the R. F. and I. F. tubes.

Circuit
NOTE: THE WIRE SHIELD, WAVE COIL AND FIELD RETURN SOLDERED TOGETHER. THE FRAME OF SPEAKER MUST BE ELECTRICALLY CONNECTED TO SHIELD. GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES. CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS.

MODEL 6T
Alignment, Voltage
Trimmers, Socket
Data

CADILLAC MOTOR CAR CO.

Condenser Alignment

Misalignment or mistracking of condensers generally manifests itself in broad tuning and lack of volume at portions or all of the broadcast band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment. A signal generator that will provide accurately calibrated signals over the standard wave band and an accurately calibrated signal at 262.5 K. C., the intermediate frequency and an output indicating meter are necessary.

The chassis must be removed from the case.

I. F. Adjustment

Set the signal generator for a signal of 262.5 KC.

Connect the antenna lead of the signal generator thru a .05 mf. condenser to the coil end of the grid leak resistor R2. This connection can be made at either end of the lead between the stator of the 1st detector section of the gang condenser and the interstage R. F. coil.

Connect the ground lead of the signal generator to the chassis ground.

Short out the oscillator section of the tuning condenser. Set the volume control at the maximum position.

Attenuate the signal from the signal generator to prevent the levelling off action of the A. V. C.

Then adjust the three I. F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the back of the chassis - see Fig. 1.

CAUTION:—Use an insulated screwdriver for adjusting these trimmers to prevent short circuiting to ground.

1650 KC. Adjustment

Set the signal generator for 1650 KC.

Turn the rotor of the tuning condenser to the full open position.

Connect the shielded antenna lead from the chassis through a 250 mmf. condenser to the antenna post of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A. V. C. action.

Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained—see Fig. 4 for location of this trimmer.

1400 KC. Adjustment

Set the signal generator for 1400 KC.

Turn the rotor of the tuning condenser until maximum output is obtained.

Adjust the antenna and 1st detector trimmers of the gang condenser for maximum output—see Fig. 4 for location of these trimmers. Do not change the setting of the oscillator trimmer.

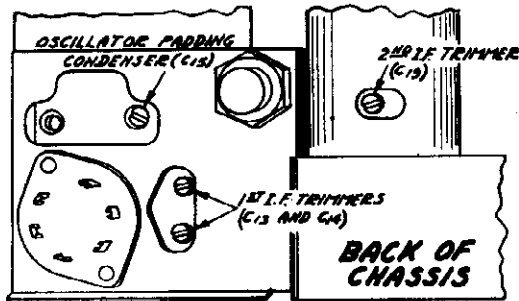


Fig. 1—Location of Trimmer Condensers

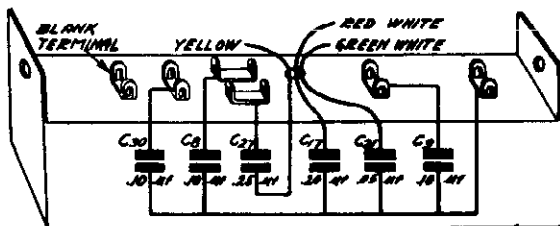


Fig. 3—Block Condenser

600 KC. Adjustment

Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Use a non-metallic screwdriver for this adjustment.

Turn the rotor slowly back and forth at the same time adjusting the oscillator padding condenser until the peak of greatest intensity is obtained. See Fig. 1 for location of this trimmer.

1400 KC. Adjustment Check

Set the signal generator for 1400 KC.

Check the setting of the antenna and 1st detector trimmers of the gang condenser for maximum output. Do not change the setting of the oscillator trimmer section.

Adjusting Antenna Trimmer

After the receiver is installed and the car antenna is connected it will be necessary to adjust the antenna trimmer. Tune in a weak signal between 1200 and 1400 KC. with the volume control about three-fourths on. The location of the antenna trimmer is shown in Fig. 4. This trimmer may be reached by removing the small metal plate on the end of the chassis case. Turn the adjusting screw of this condenser up or down until maximum output is obtained. **CAUTION:**—Do not turn any of the other trimmer adjusting screws for this adjustment.

Calibrating the Receiver

After reinstalling the receiver in the car the control unit or flexible shaft will probably cause the setting of the dial pointer to change. The receiver may then be recalibrated as follows: Tune in a station of known frequency at about the center of the dial. Then loosen the set screw which secures the station selector knob to the shaft.

The station selector shaft is made up of two sections—an inner and an outer shaft. By loosening the set screw in the station selector knob one turn, the knob and the outer shaft are disengaged from the inner shaft. The inner shaft is directly connected to the tuning condenser in the chassis.

By turning the station selector knob it will be found that the dial scale can be adjusted without disturbing the tuning of the receiver. Turn the knob until the dial scale is exactly at the frequency of the station which has been tuned in.

Retighten the set screw in the station selector knob.

Voltages at Sockets
 Antenna Disconnected - Battery 6 Volts Under Load

Type of Tube	Function	Across Fila. or Heater	Plate to Ground	Screen to Ground	Cath. to Ground	Normal Plate M. A.
6D6	R. F.	5.8	192	90	6.3	4.5
6C6	1st Det. & Osc.	5.8	192	90	—	4.0
6D6	I. F.	5.8	192	90	6.3	4.5
6B7	2nd Det.	5.8	90	90	3.5	2.7
42	Power	5.8	230	235	24.0	16.0

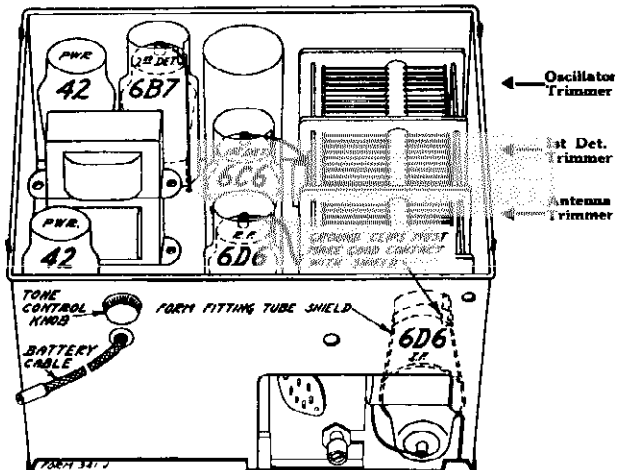
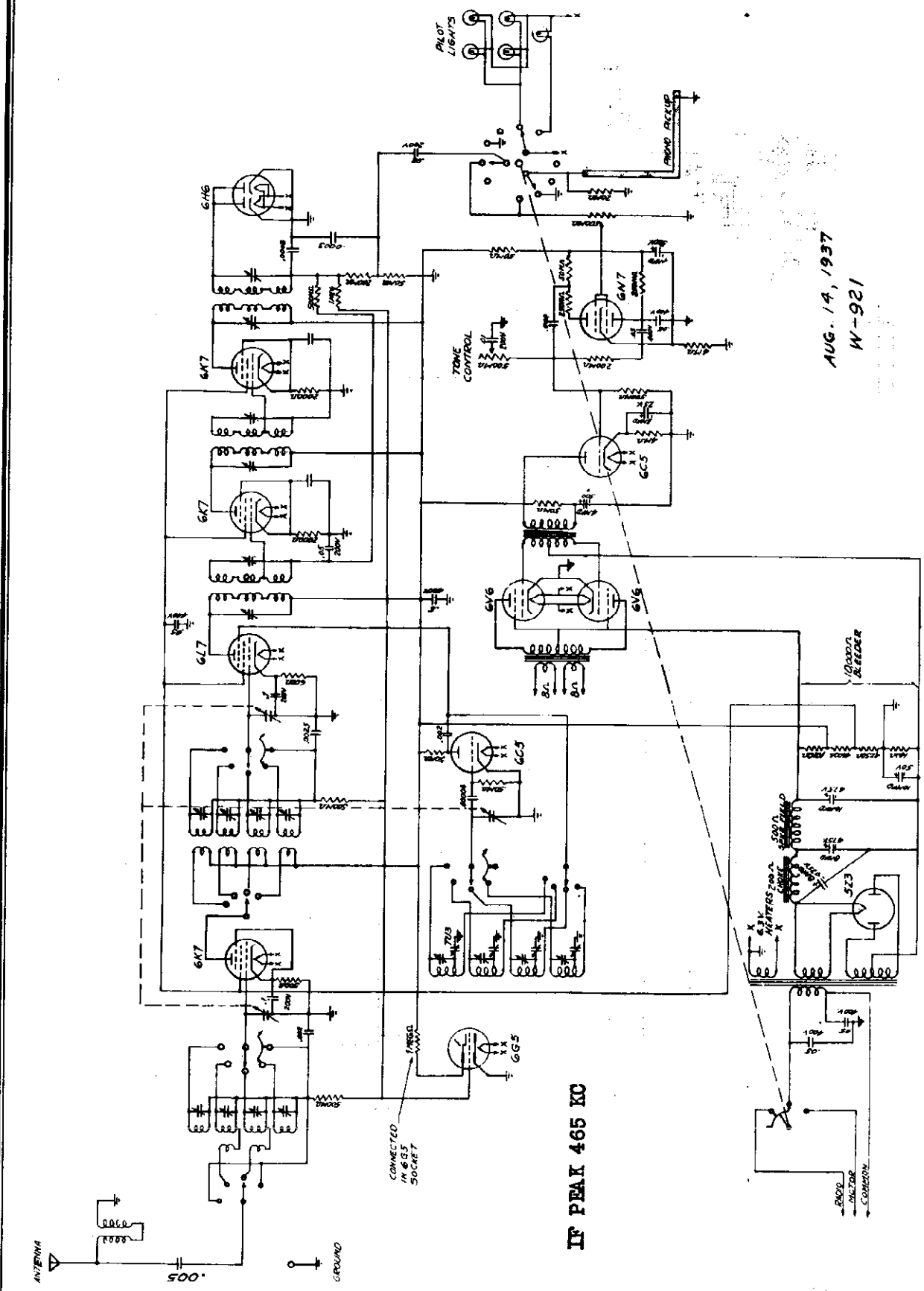


Fig. 4—Tube Arrangement

CAPEHART CORPORATION

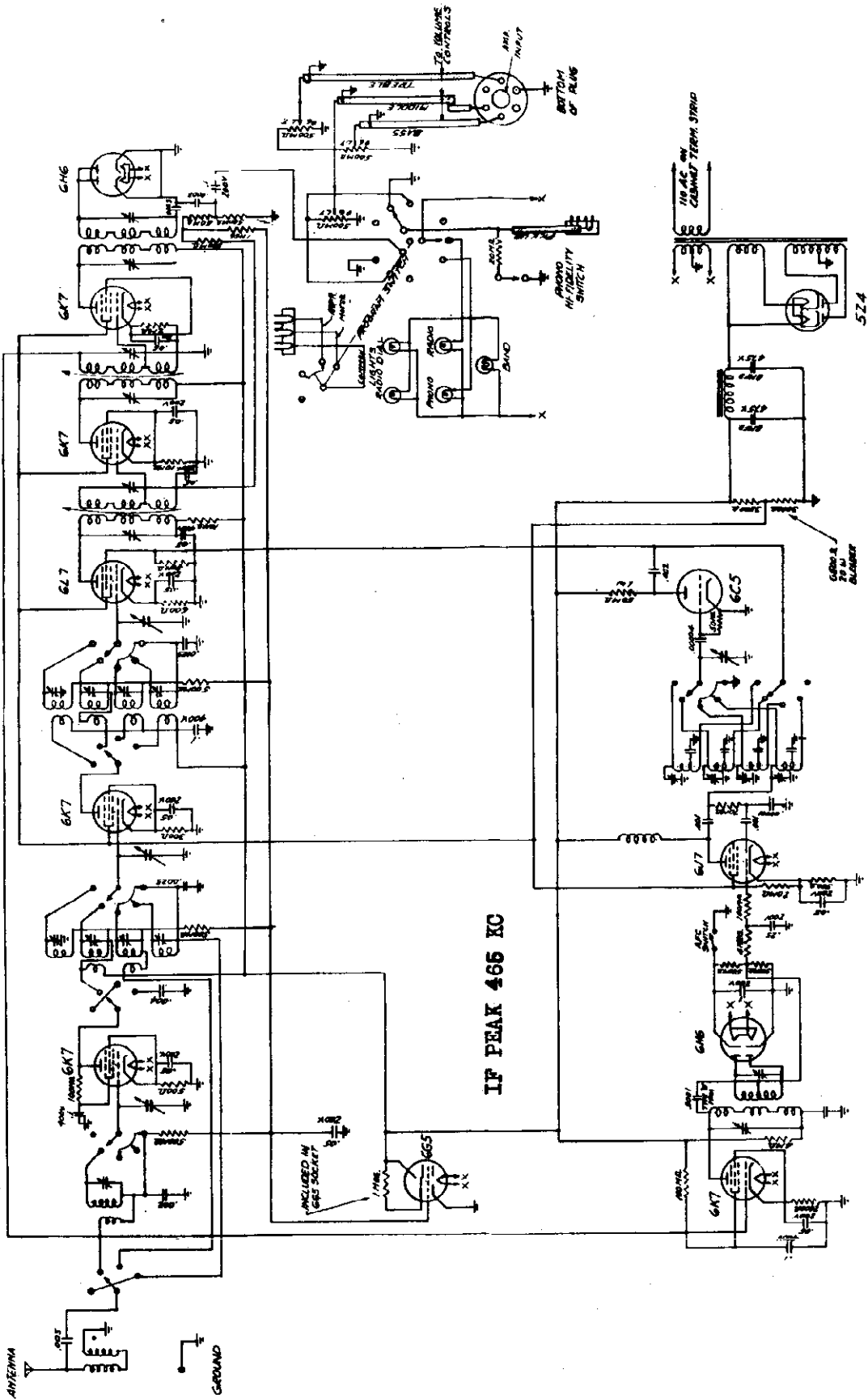


AUG. 14, 1937
W-921

IF PEAK 465 KC

MODEL 400-F Tuner
Schematic

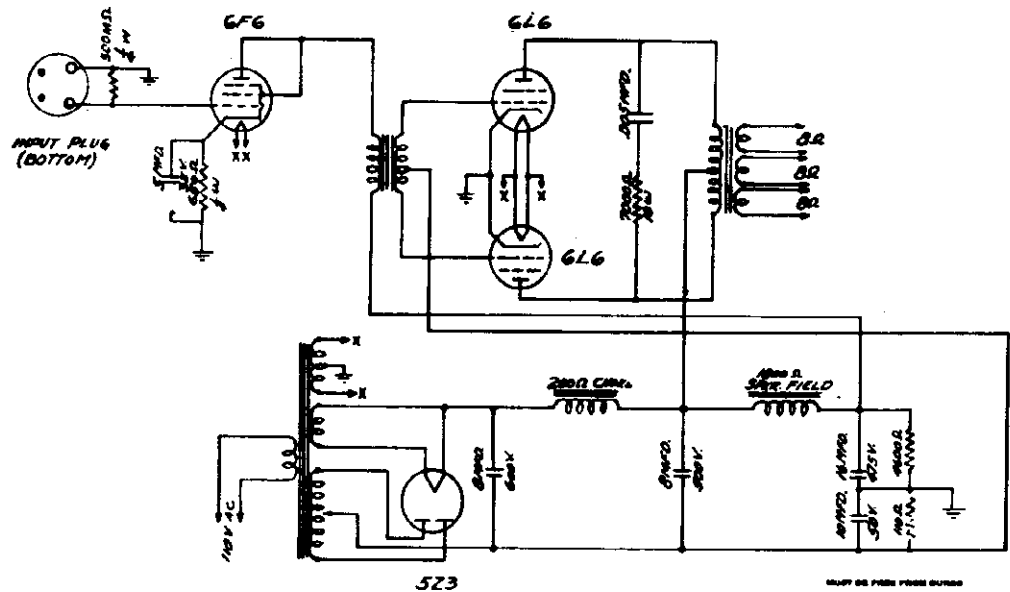
CAPEHART CORPORATION



W-918
8/12/37

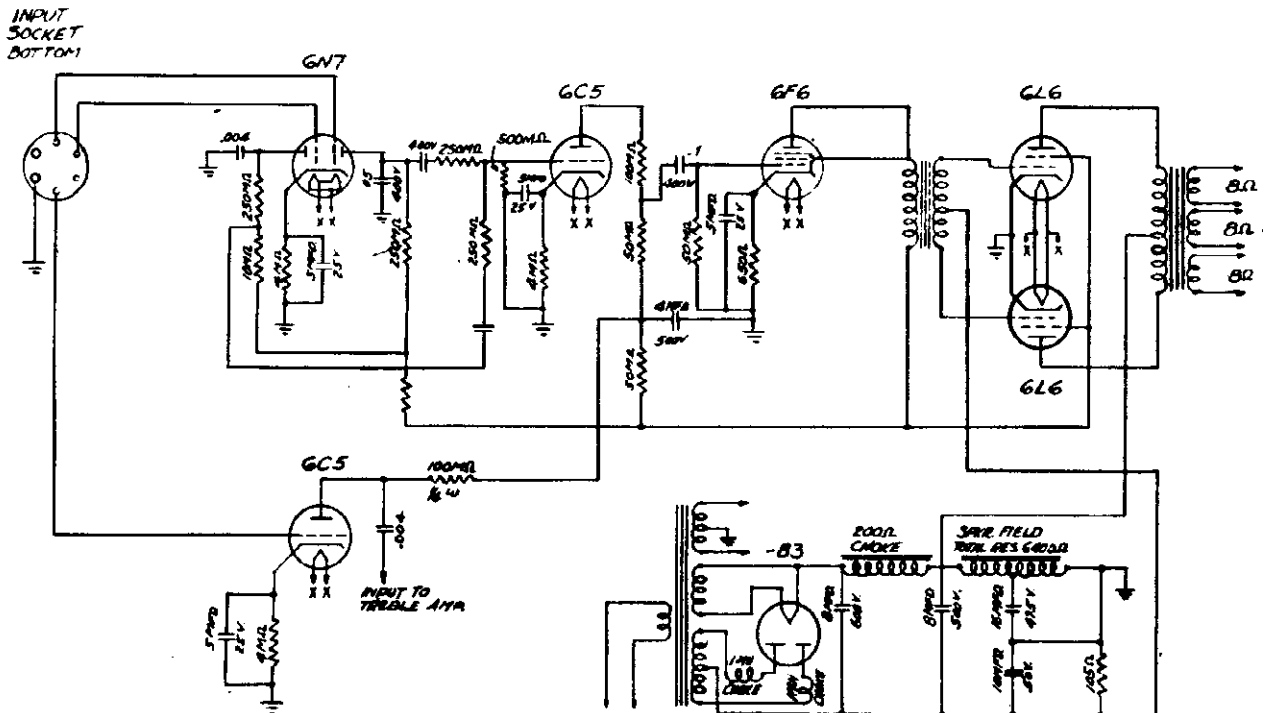
CAPEHART CORPORATION

MODEL 400-F
Treble Amplifier
Bass Amplifier
Schematics



SHUFFLE PINS FROM OTHERS

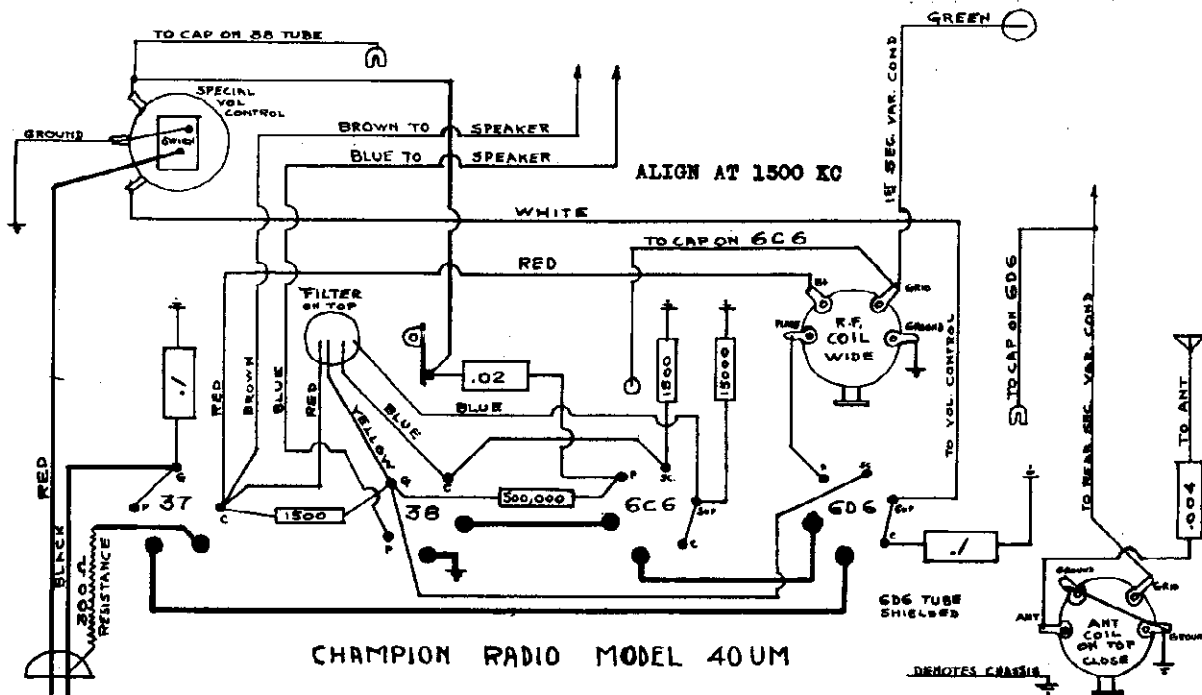
THE CAPEHART CORPORATION	
PORT WATKINS DIVISION	
NAME: 400-F TREBLE AMPLIFIER	
DATE:	SCALE: NO. 1000
DESIGNER:	NO. N-919
CHECKED:	DATE:
BY:	BY:



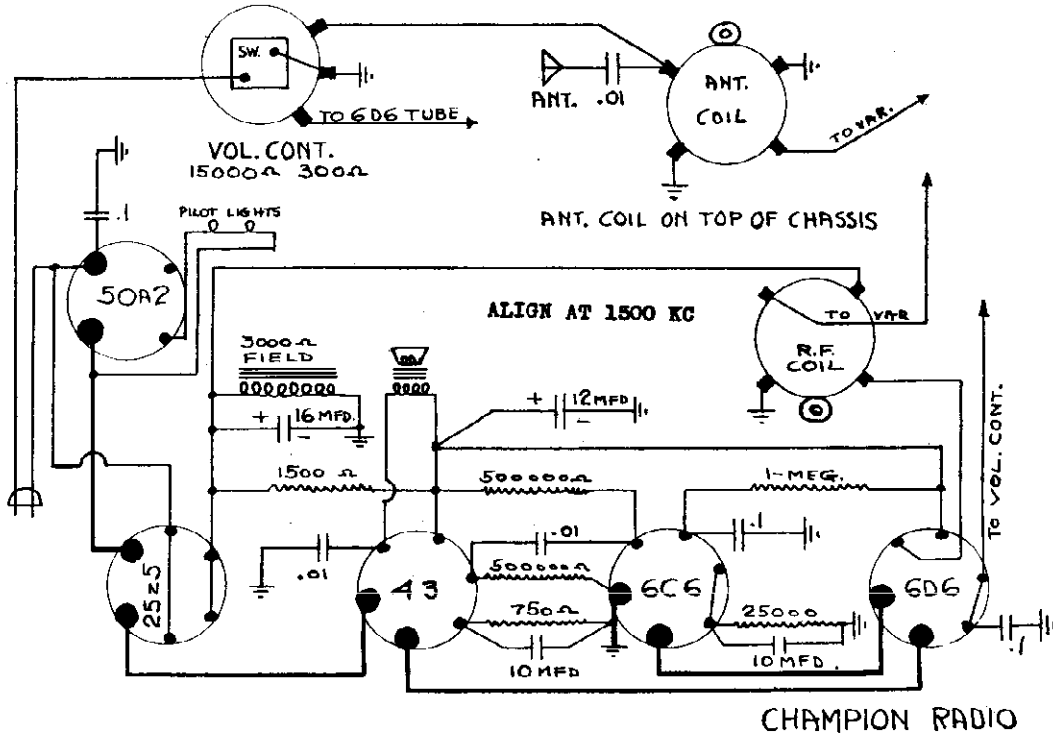
THE CAPEHART CORPORATION	
PORT WATKINS DIVISION	
NAME: 400-F BASS AMPLIFIER	
DATE:	SCALE: NO. 1000
DESIGNER:	NO. N-920
CHECKED:	DATE:
BY:	BY:

MODEL 40UM
 MODEL 543 I.D.
 Schematics

CHAMPION RADIO



5 TUBE A.C.-D.C. MODEL 543 I.D.



CHAMPION RADIO

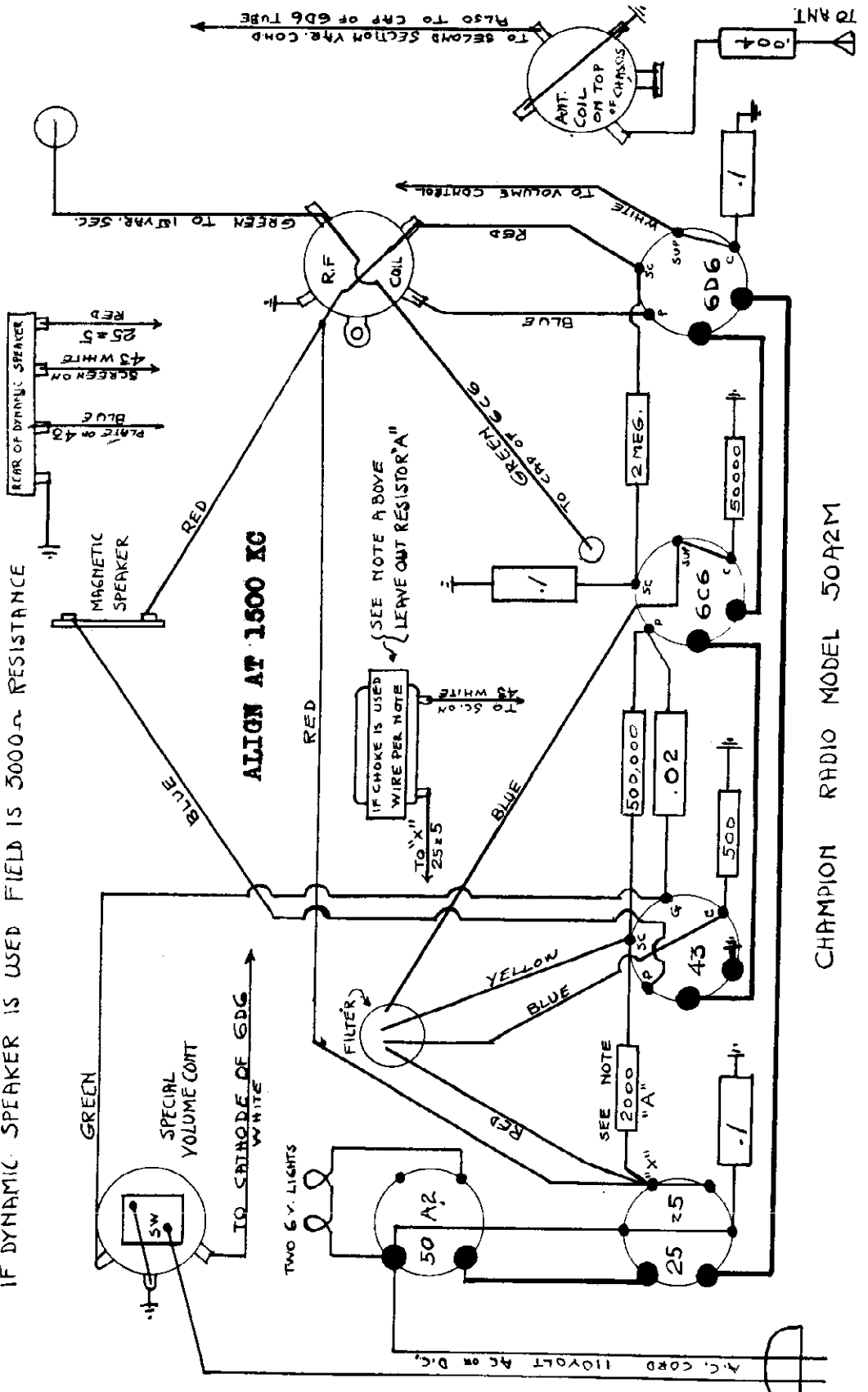
NOTE: IF POLICE COILS ARE USED SEE PRINT OF MODEL 50 UP FOR HOOK UP OF COILS AND SWITCH.

IF DYNAMIC SPEAKER IS USED; CHOKE IS USED INSTEAD OF 2000Ω RESISTOR MARKED "A"

AND REFER TO PRINT OF MODEL 50 UP FOR DYNAMIC HOOK UP

IF ABOVE CHANGES ARE MADE MODEL WILL BE 50-A-2-D

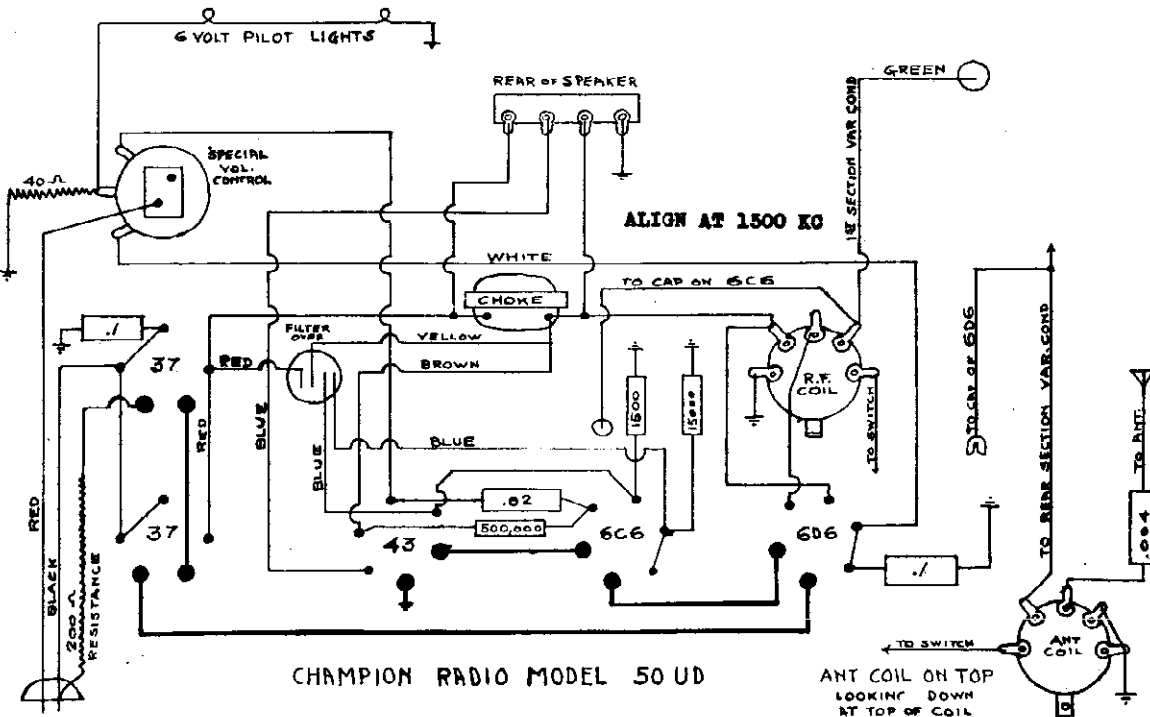
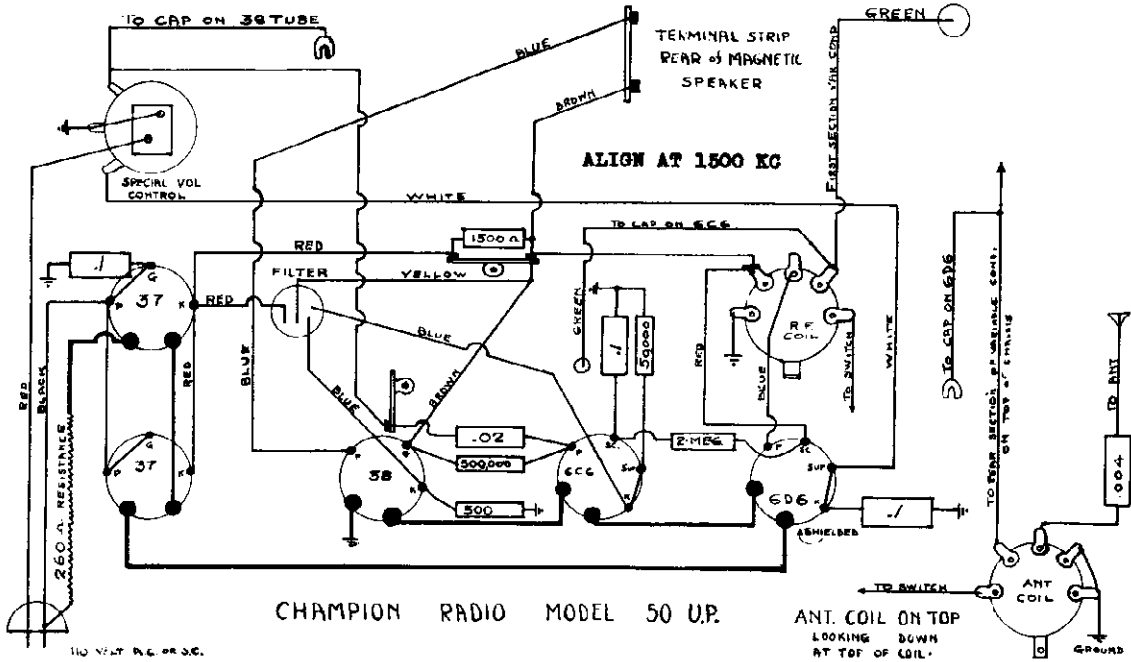
IF DYNAMIC SPEAKER IS USED FIELD IS 3000Ω RESISTANCE



CHAMPION RADIO MODEL 50A2M

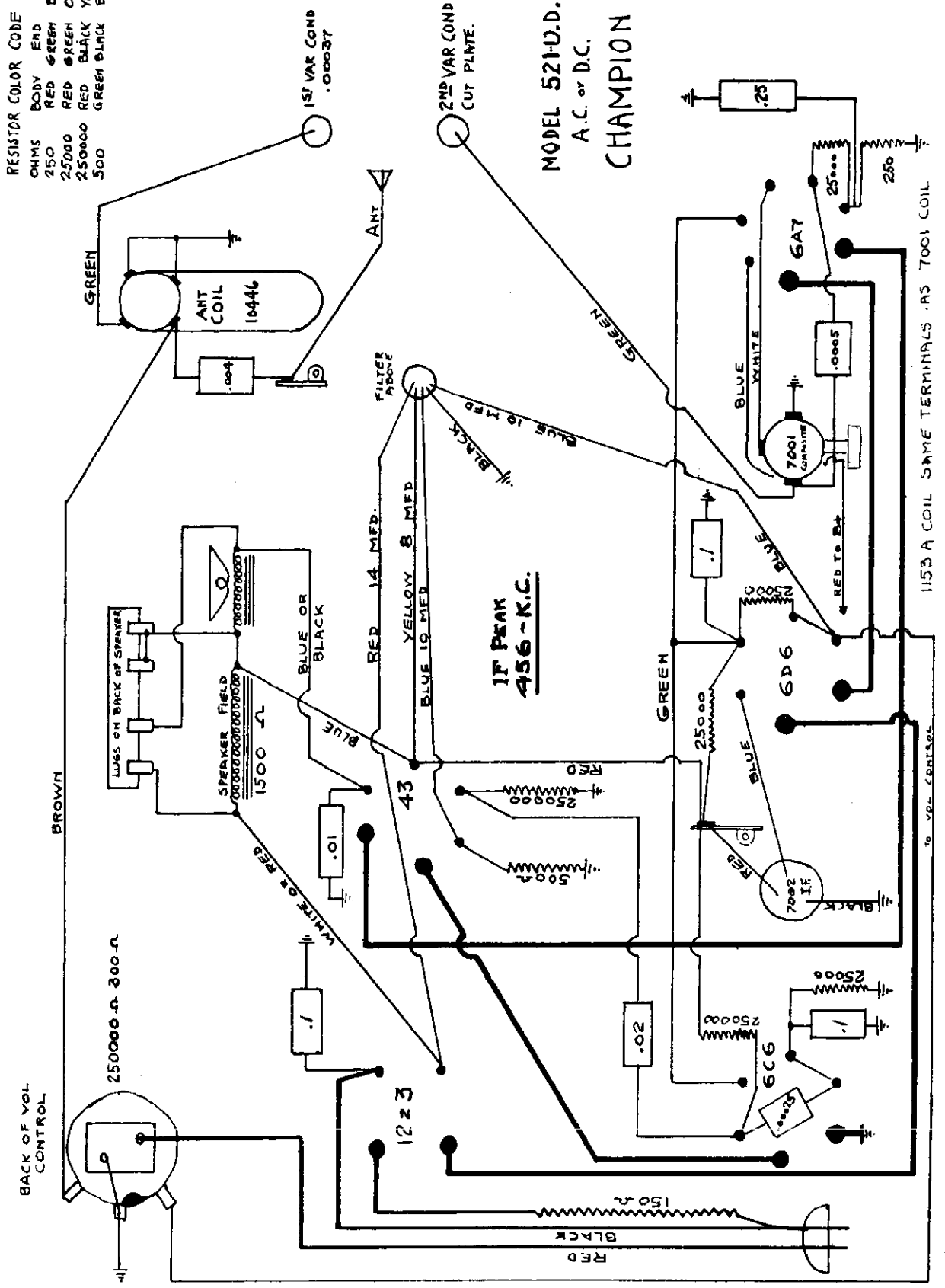
MODEL 50UD
 MODEL 50UP
 Schematics

CHAMPION RADIO



CHAMPION RADIO

RESISTOR COLOR CODE
 OHMS BODY END DOT
 250 RED GREEN BROWN
 25000 RED GREEN ORANGE
 250000 RED BLACK YELLOW
 500 GREEN BLACK BROWN



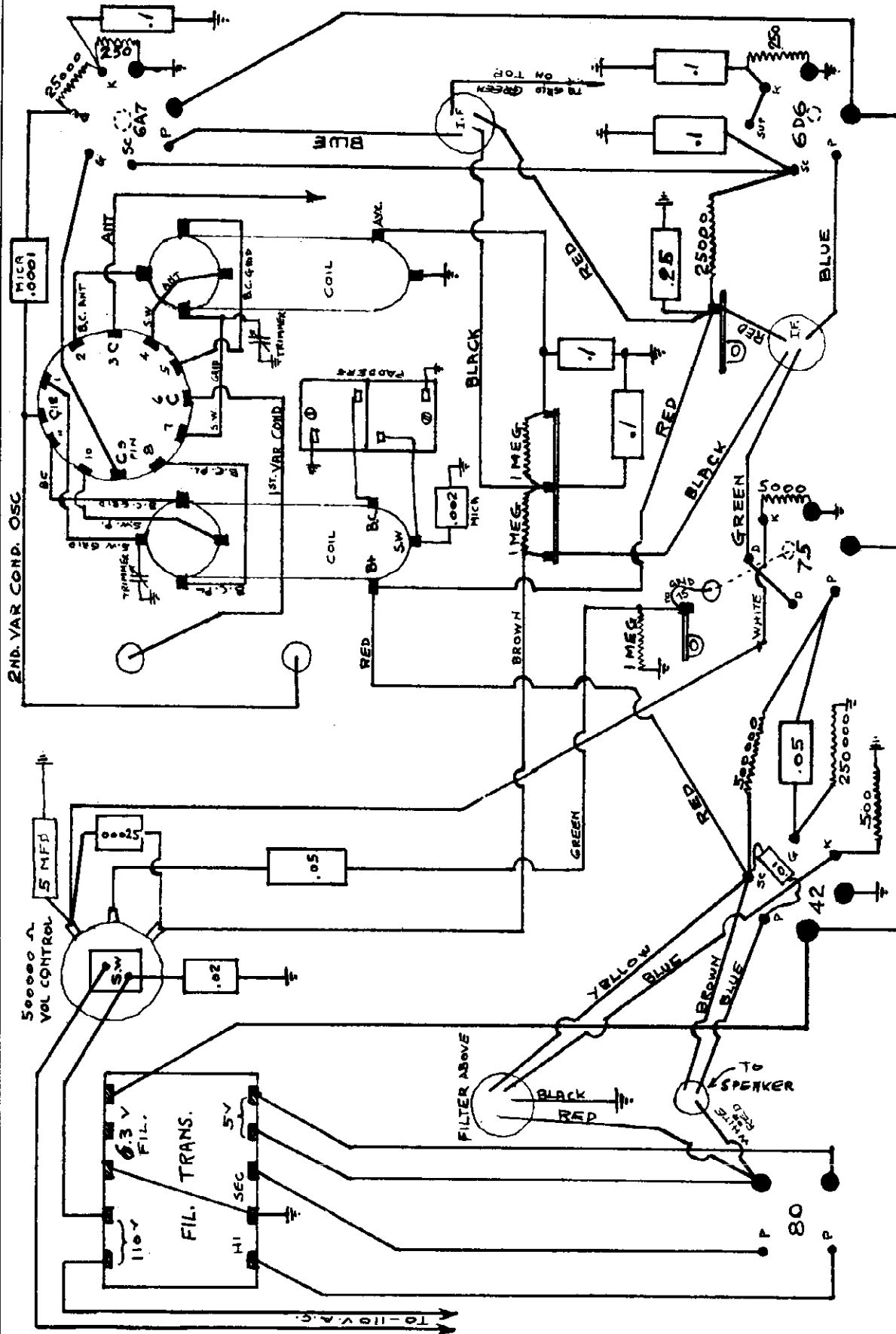
MODEL 521-U.D.
 A.C. or D.C.
 CHAMPION

IF PEAK
 456-K.C.

1153 A COIL SAME TERMINALS AS 7001 COIL

MODEL 525DWG
Schematic

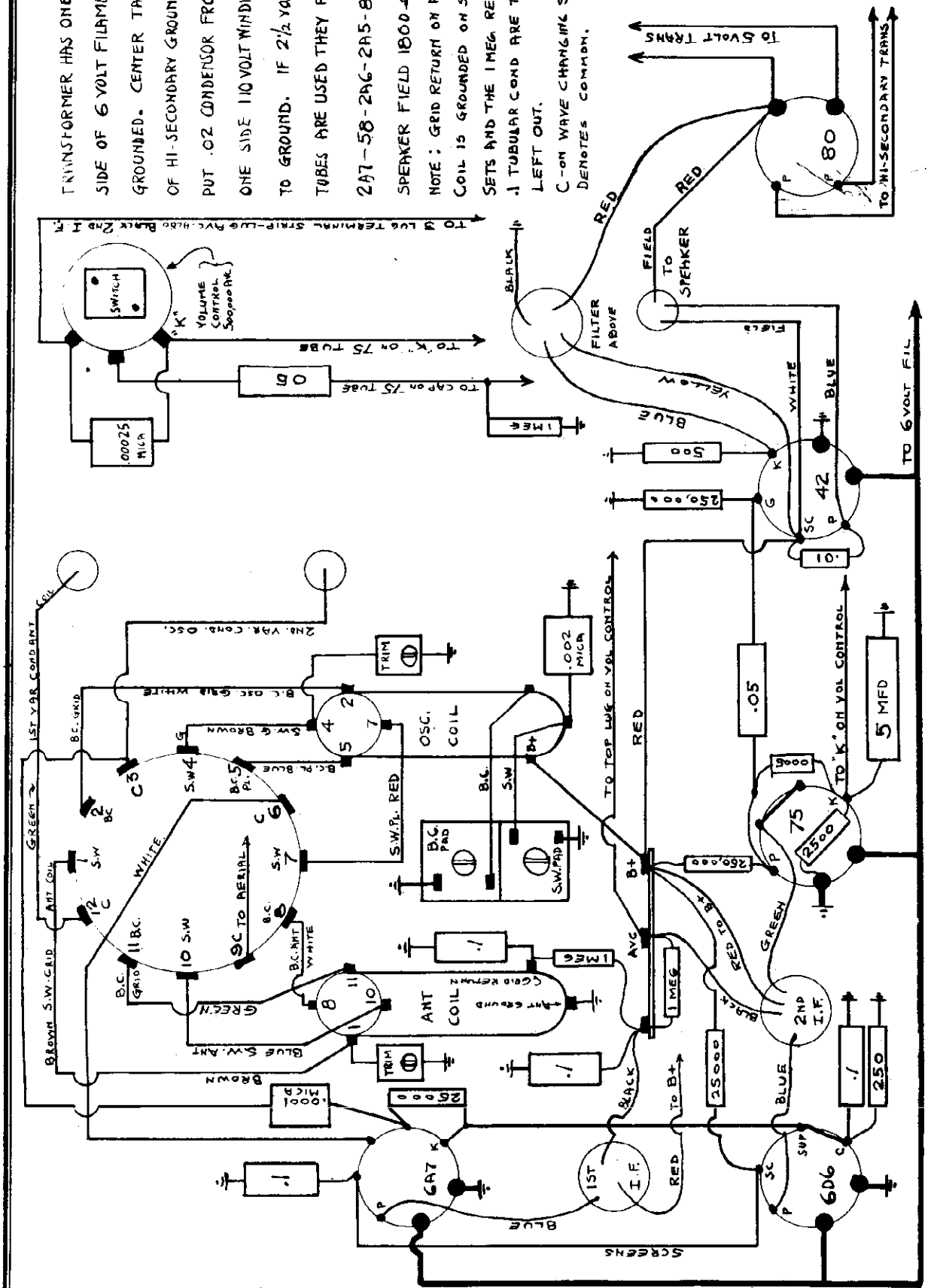
CHAMPION RADIO



IF PEAK-456 K.C. MODEL 525 DWG CHAMPION RADIO - DUAL WAVE

CHAMPION RADIO

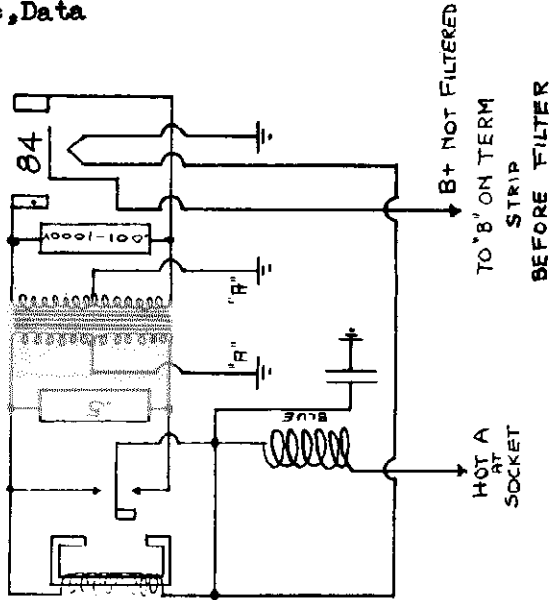
TRANSFORMER HAS ONE SIDE OF 6 VOLT FILAMENT GROUNDED. CENTER TAP OF HI-SECONDARY GROUNDED. PUT .02 CONDENSOR FROM ONE SIDE 110 VOLT WINDING TO GROUND. IF 2 1/2 VOLT TUBES ARE USED THEY ARE 2A7-58-2A6-2A5-80. SPEAKER FIELD 1800-Ω. NOTE: GRID RETURN ON ANT COIL IS GROUNDED ON SOME SETS AND THE 1MEG RES + .1 TUBULAR COND ARE THEN LEFT OUT. C-ON WAVE CHANGING SW. DENOTES COMMON.



IF PEAK 456 KC. CHAMPION RADIO DUAL WAVE MODEL 526 DW. 456 K.C.I.F.T.

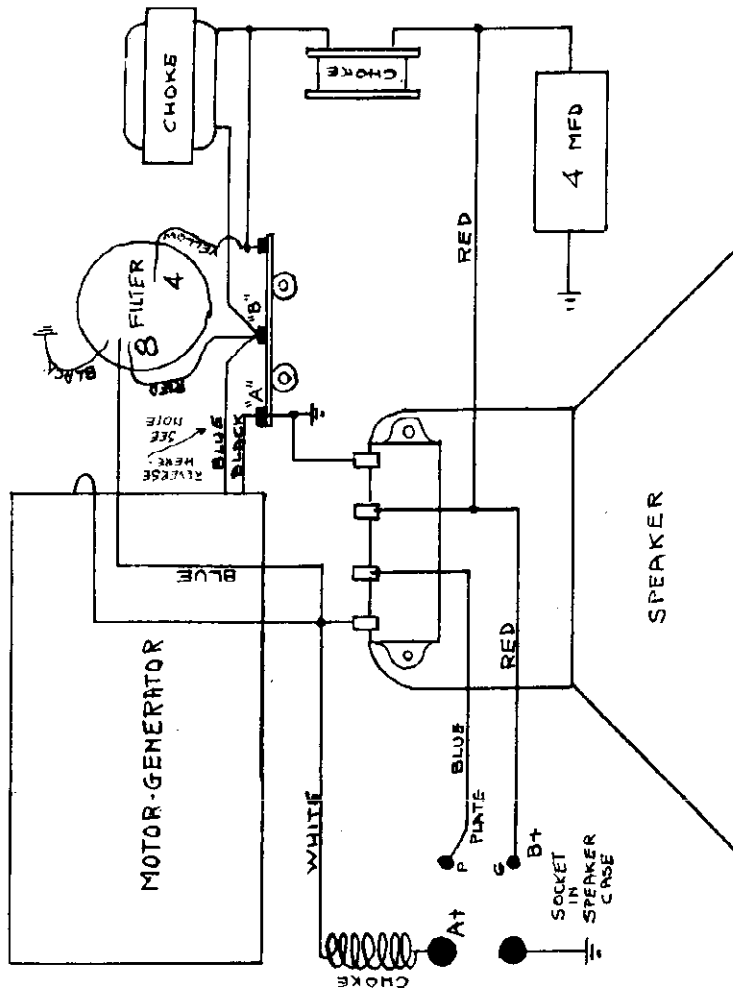
MODEL Auto Radio
Power Supply
Schematic, Data

CHAMPION RADIO



IF VIBRATOR IS USED ABOVE DIAGRAM IS USED THEN SPEAKER AND SUPPLY PLUG IS WIRED SAME AS MOTOR GENERATOR DIAGRAM

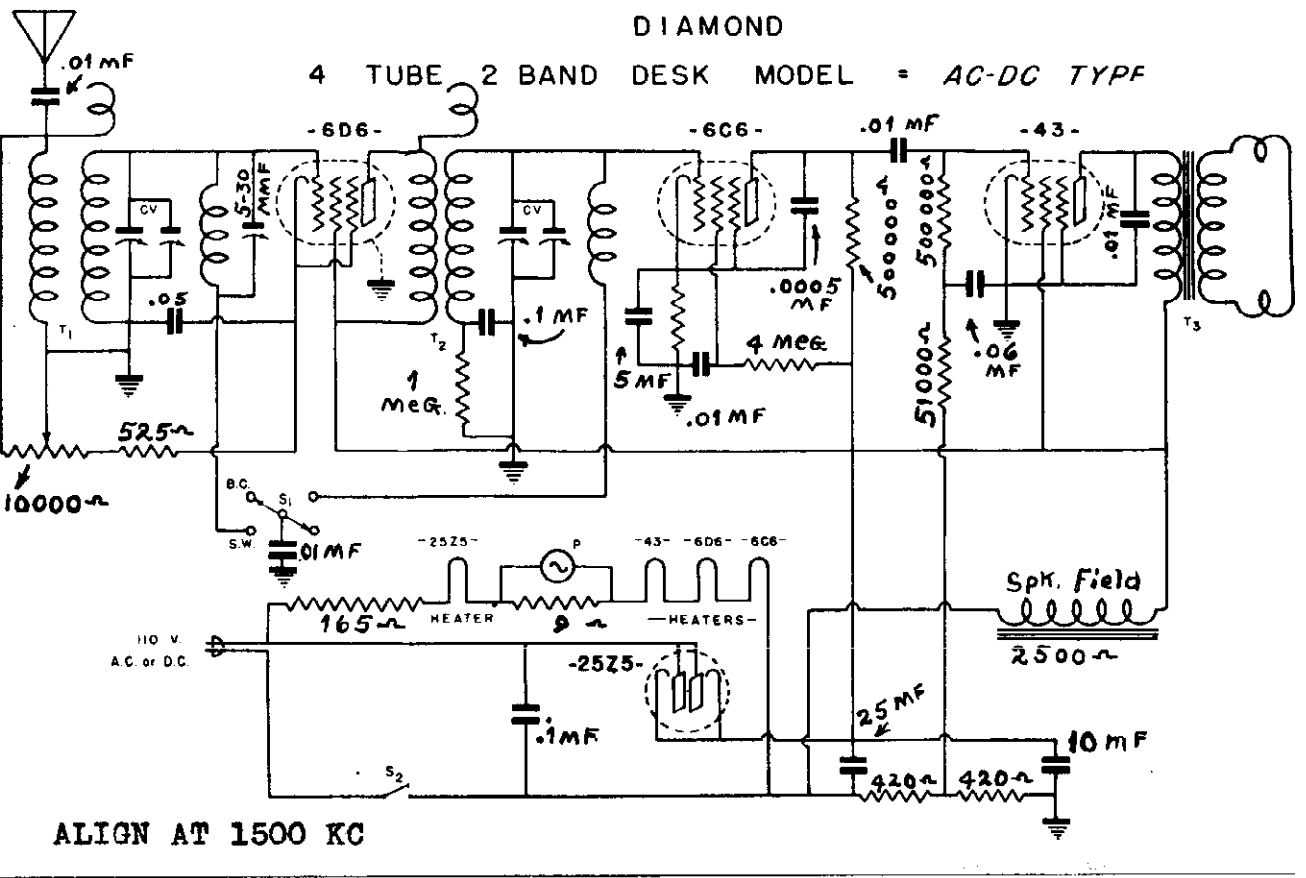
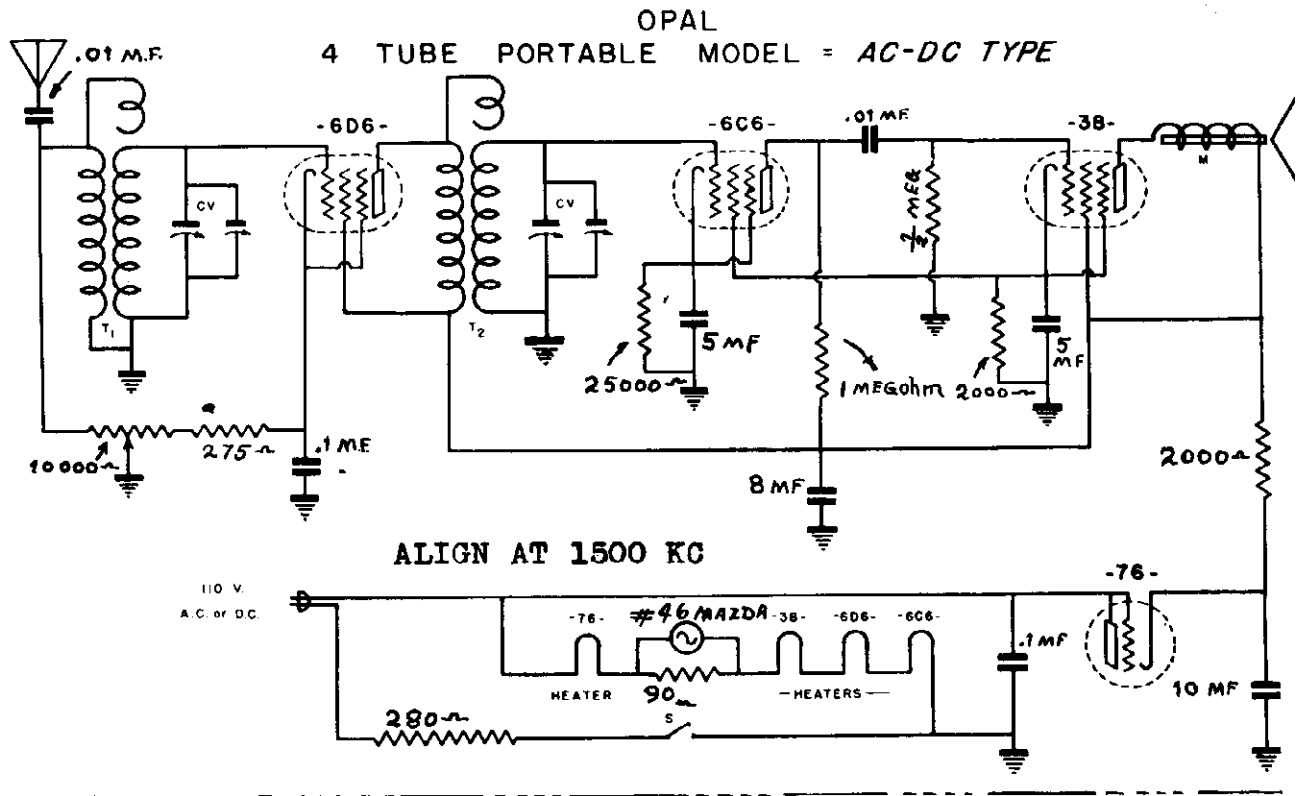
CHAMPION RADIO
AUTO RADIO POWER SUPPLY
AND
SPEAKER DIAGRAM



IF POSITIVE OF BATTERY IS GROUNDED BLUE "B" IS B POSITIVE
IF NEGATIVE OF BATTERY IS GROUNDED REVERSE WIRES AT "A"-"B"
IF CHANGE IS NECESSARY JUST REVERSE BLACK AND BLUE WIRES FROM MOTOR

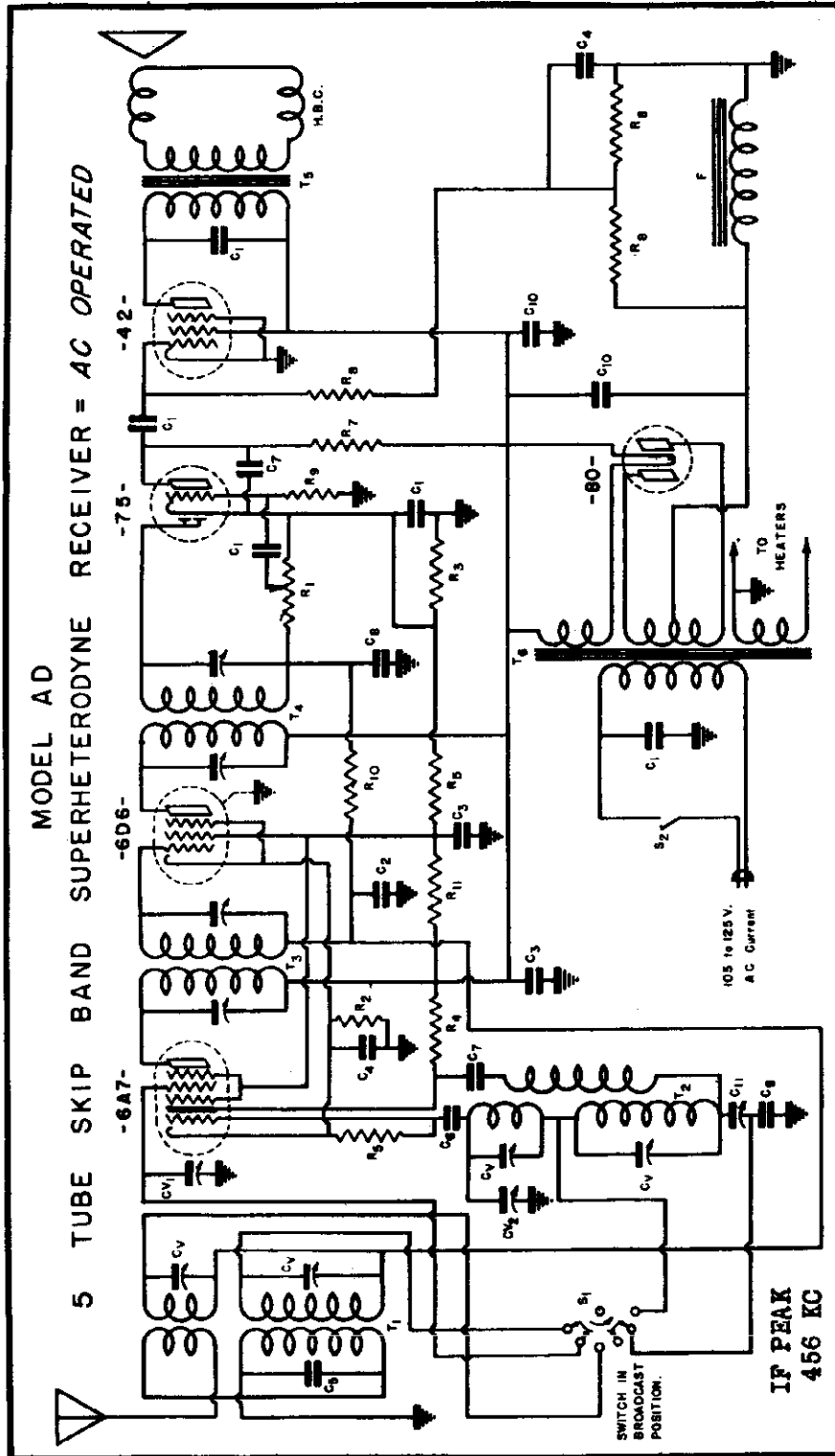
CLIMAX RADIO & TELEV. CO., INC.

MODEL Opal
MODEL Diamond
Schematics



MODEL AD
Schematic
Parts

CLIMAX RADIO & TELEV. CO., INC.



LEGEND PART NO.	DESCRIPTION
R1	200K 500,000 OHM VOLUME CONTROL
R2	103 250 OHM 1/2 WATT CARBON RESISTOR
R3	139 400 OHM 1/2 WATT CARBON RESISTOR
R4	109 10,000 OHM 1/2 WATT CARBON RESISTOR
R5	113 80,000 OHM 1/2 WATT CARBON RESISTOR
R6	115 100,000 OHM 1/2 WATT CARBON RESISTOR
R7	118 250,000 OHM 1/2 WATT CARBON RESISTOR
R8	145 400,000 OHM 1/2 WATT CARBON RESISTOR
R9	117 500,000 OHM 1/2 WATT CARBON RESISTOR
R10	119 1 MEG OHM 1/2 WATT CARBON RESISTOR
R11	146 25,000 OHM 1 WATT CARBON RESIST.

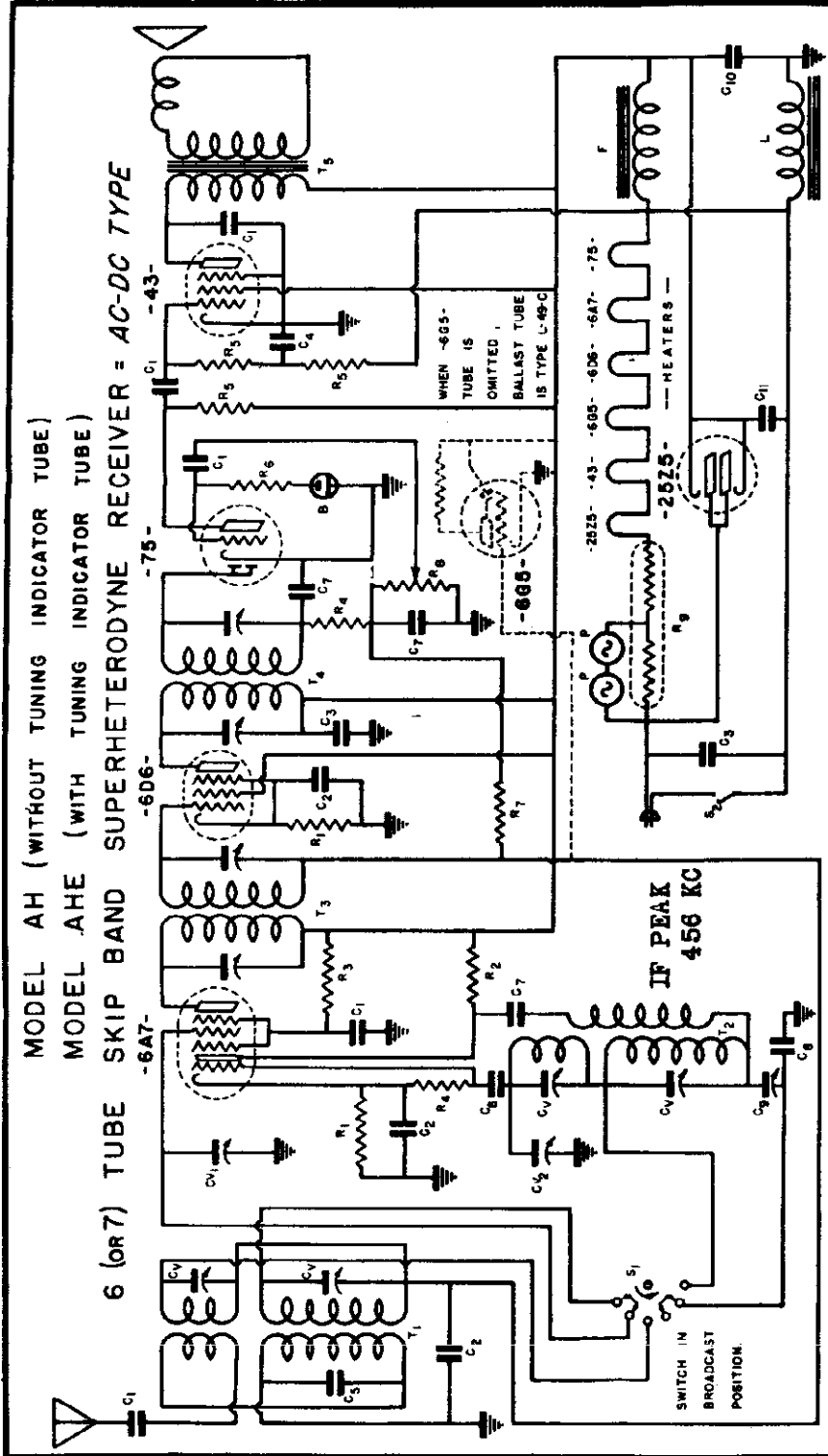
LEGEND PART NO.	DESCRIPTION
CV1-2	612-A 2 GANG VARIABLE CONDENSER
CY	500 5-30 MMFD. TRIMMER CONDENSER
T1	1225 B.C.B. SHIP BAND ANTENNA COIL
T2	1412 B.C.B. SHIP BAND OSCILLATOR COIL
T3	1503 INPUT I.F. TRANSFORMER
T4	1507 DIODE I.F. TRANSFORMER
T5	111 SPEAKER TRANSFORMER
T6	1014 POWER TRANSFORMER
F	111 SPEAKER FIELD (1600 OHMS)
S1	1920 BAND SELECTOR SWITCH
S2	— LINE SWITCH ON VOLUME CONTROL.

LEGEND PART NO.	DESCRIPTION
C1	211 .01 MFD.-400 V. TUBULAR CONDENSER
C2	203 .1 MFD.-200 V. TUBULAR CONDENSER
C3	210 .1 MFD.-400 V. TUBULAR CONDENSER
C4	204 .25 MFD. 200 V. TUBULAR CONDENSER
C5	412 .0005 MFD. MICA CONDENSER
C6	400 .0001 MFD. MICA CONDENSER
C7	401 .0025 MFD. MICA CONDENSER
C8	402 .0005 MFD. MICA CONDENSER
C9	410 .0018 MFD. MICA CONDENSER
C10	317 .8 MFD. 450 WVWET ELECTROLYTIC COND.
C11	507 5 PLATE PADDING CONDENSER

W.F.S.

CLIMAX RADIO & TELEV. CO., INC.

MODELS AH, AHE
Schematic
Parts



OUR LEGEND PART NO.	DESCRIPTION
T ₁	12L5 ANTENNA COIL
T ₂	1412 OSCILLATOR COIL
T ₃	1507 OUTPUT I.F. TRANSFORMER
T ₄	1503 INPUT I.F. TRANSFORMER
T ₅	800 SPEAKER TRANSFORMER
L	1100 FILTER CHOKER
S ₁	1920 BANC. SELECTOR SWITCH
S ₂	--- LINE SWITCH ON VOLUME CONTROL
P	2902 MAZDA NO. 46 PILOT LIGHT
B	3000 BIAS CELL
F	IN SPEAKER FIELD

OUR LEGEND PART NO.	DESCRIPTION
CV-1	62A 2 GANG VARIABLE CONDENSER
C ₁	50C 5-30 MMFD. TRIMMER CONDENSER
R ₁	103 250 OHM 1/2 WATT CARBON RESISTOR
R ₂	108 5000 OHM 1/2 WATT CARBON RESISTOR
R ₃	111 25,000 OHM 1/2 WATT CARBON RESISTOR
R ₄	115 50,000 OHM 1/2 WATT CARBON RESISTOR
R ₅	116 250,000 OHM 1/2 WATT CARBON RESISTOR
R ₆	117 500,000 OHM 1/2 WATT CARBON RESISTOR
R ₇	119 1 MEG OHM 1/2 WATT CARBON RESISTOR
R ₈	2009 500,000 OHM VOLUME CONTROL
R ₉	2806 L-42-C BALLAST TUBE (with 6B5 tube)
R ₉	2805 L-49-C BALLAST TUBE (without 6B5 tube)

OUR LEGEND PART NO.	DESCRIPTION
C ₁	211 .01MFD. 400V. TUBULAR CONDENSER
C ₂	203 .1MFD. 200V. TUBULAR CONDENSER
C ₃	210 .1MFD. 400V. TUBULAR CONDENSER
C ₄	204 .25MFD. 200V. TUBULAR CONDENSER
C ₅	412 00005 MFD. MICA CONDENSER
C ₆	400 .0001 MFD. MICA CONDENSER
C ₇	401 00025 MFD. MICA CONDENSER
C ₈	410 .0018 MFD. MICA CONDENSER
C ₉	507 5 PLATE PADDING CONDENSER
C ₁₀	314 10 MFD. 150 V.W. WET ELECTROLYTIC COND.
C ₁₁	311 20 MFD. 150 V.W. WET ELECTROLYTIC COND.

W.F.S.

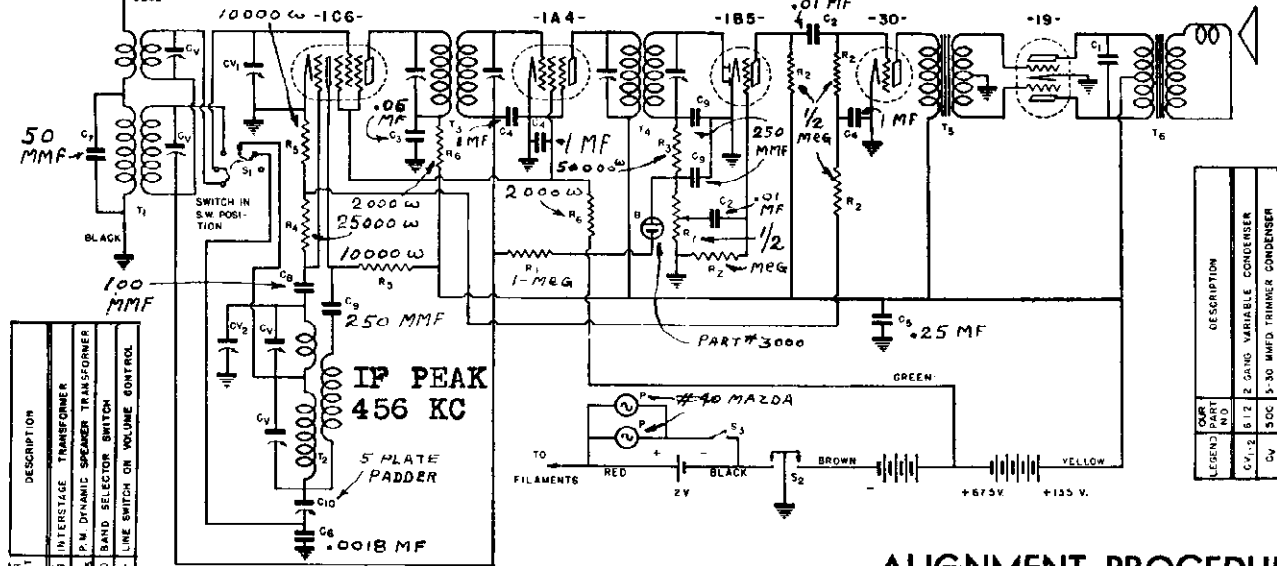
MODEL AJ

Schematic, Socket Trimmers, Alignment

CLIMAX RADIO & TELEV. CO., INC.

MODEL A. J.

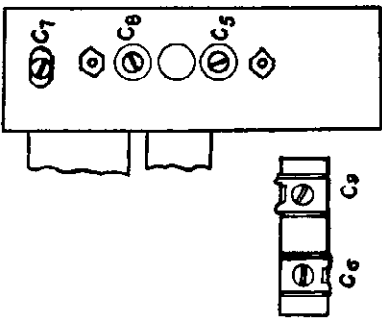
5 TUBE 2 VOLT BATTERY OPERATED SKIP-BAND RECEIVER



OUR LEGEND NO.	DESCRIPTION
C1, 2	2 GANG VARIABLE CONDENSER
C9	5-30 MMFD. TRIMMER CONDENSER

OUR LEGEND NO.	DESCRIPTION
T1	SKIP-BAND ANTENNA COIL
T2	6X4 P.M. DYNAMIC SPEAKER TRANSFORMER
T3	1472 SKIP-BAND OSCILLATOR COIL
T4	1503 IMPUT IF TRANSFORMER
T5	1507 DIODE IF TRANSFORMER

SIDE VIEW



ALIGNMENT PROCEDURE

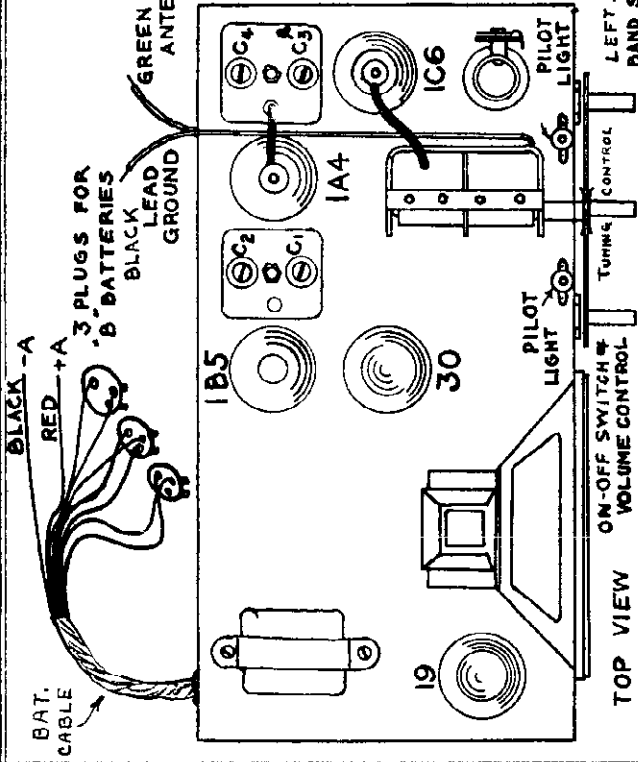
If at any time it becomes necessary to realign this receiver, the following procedure should be employed: Set pointer so it is perfectly horizontal when the variable condenser is fully engaged. Connect the green antenna lead in series with a 200 mmfd. mica condenser to the output of the signal generator. Connect the black lead to the ground lead of the signal generator. Set the signal generator to 456 K.C. and turn the variable condenser on the receiver until the plates are completely intermeshed. Turn the selector switch to the Broadcast position and set the volume control knob to maximum. Connect an output meter between the plate and screen of the 42 output tube. Adjust trimmers C1, C2, C3 and C4 for maximum output as indicated by the meter. At all times keep the output control on the signal generator turned down as low as possible so as to obtain only a very small reading on the output meter. (At larger inputs the automatic volume control system may tend to obscure the correct adjustment.) Next set the signal generator to 1400 K.C., and turn the dial of the receiver to correspond to that frequency. Adjust trimmer C8 for maximum reading of the output meter and then adjust C6 to secure final adjustment. Next rotate the receiver dial to about 600 K.C. and set the signal generator at the same frequency. Adjust trimmer C7 while rocking the condenser back and forth until maximum output results. If it is necessary to turn that adjustment screw more than about one turn, it will be necessary to repeat the adjustment at 1400 K.C. again. This completes the alignment of the Broadcast band.

LEFT S.W. - RIGHT A.C. BAND SELECTOR SWITCH

ON-OFF SWITCH & VOLUME CONTROL

PILOT LIGHT CONTROL

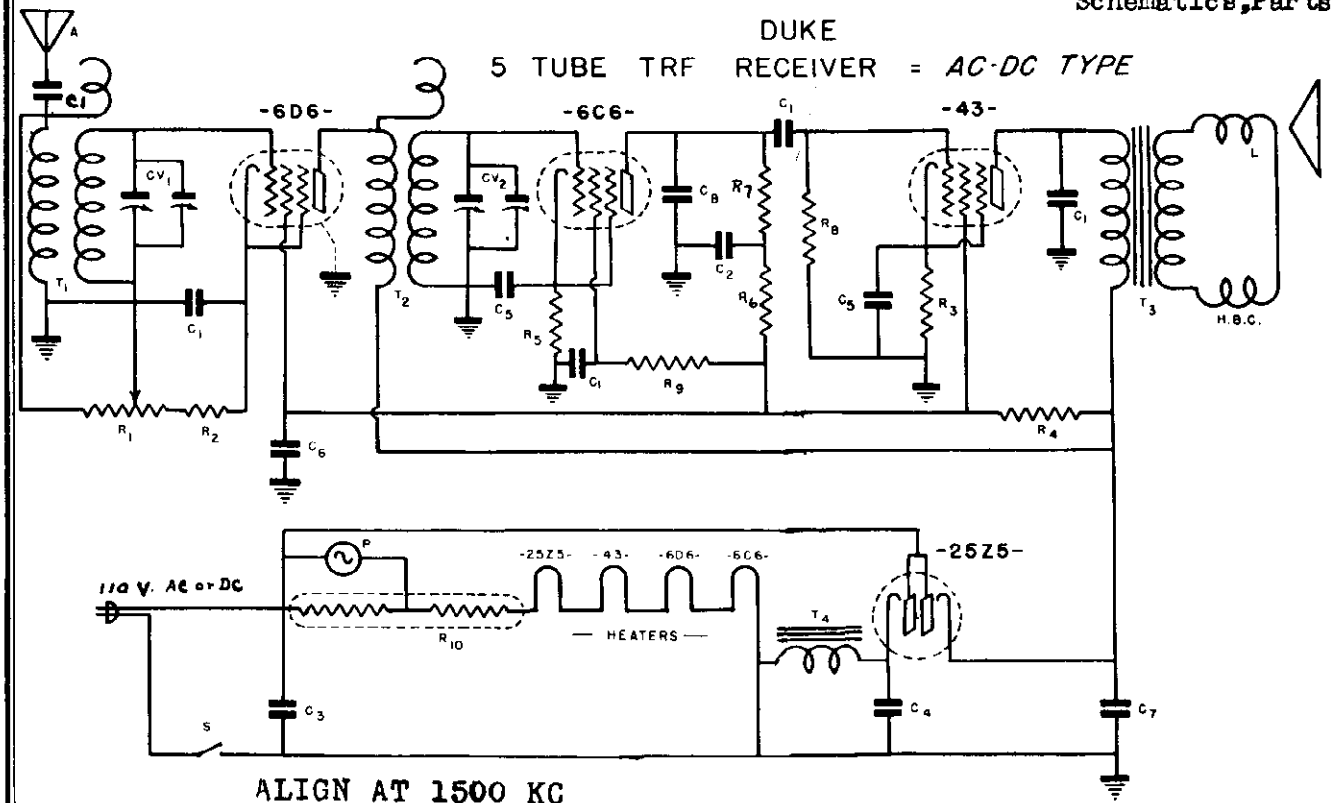
TOP VIEW



Next, substitute a 400 ohm carbon resistor for the series mica condenser between the receiver and the signal generator and set the switch to the short wave position. Rotate the receiver dial to 14M.C. and set the signal generator to the same frequency. Adjust trimmer C5 to resonance and then increase the generator frequency to 14.9M.C. and observe if the signal can be heard without changing the receiver dial setting. If it can be heard, then the image is properly placed and the signal generator should again be set to 14 M.C.. Adjust trimmer C9 for final adjustment.

CLIMAX RADIO & TELEV. CO., INC.

MODEL Duke
MODEL AKE
Schematics, Parts

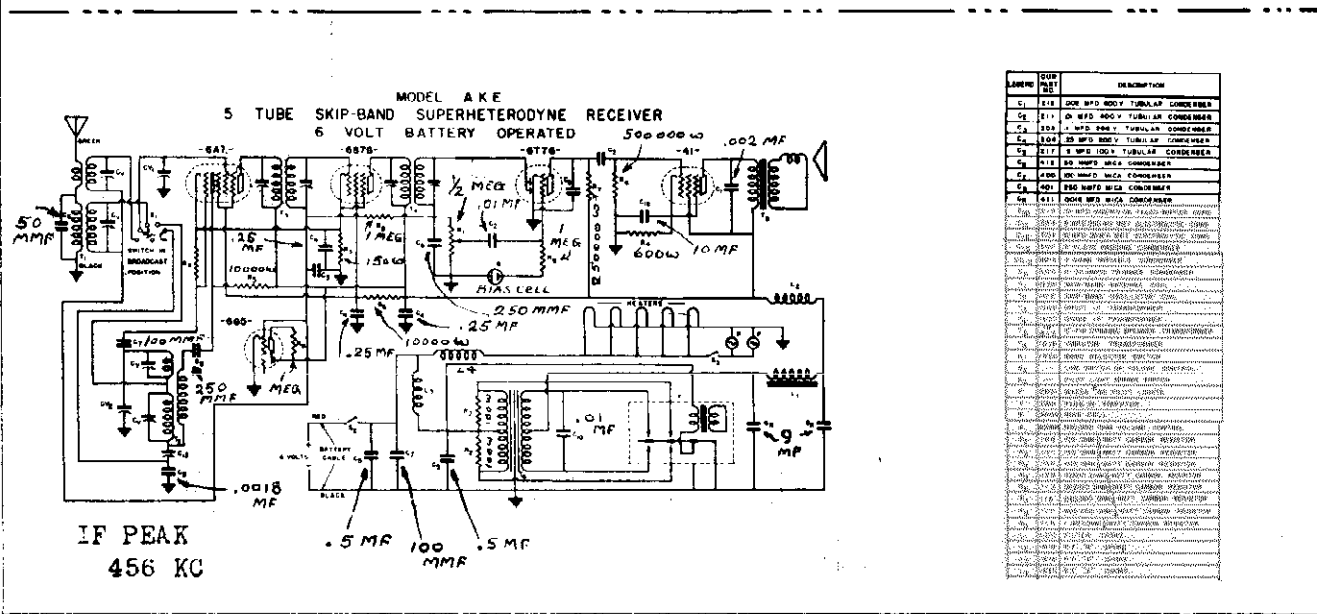


ALIGN AT 1500 KC

LEGEND	OUR PART NO.	DESCRIPTION
C ₁	211	01 MFD 400 V. TUBULAR CONDENSER
C ₂	216	018 MFD 400V. TUBULAR CONDENSER
C ₃	210	1 MFD 400V. TUBULAR CONDENSER
C ₄	316	4 MFD 175 W.V. ELECTROLYTIC COND.
C ₅	316	5 MFD 75 W.V. ELECTROLYTIC COND.
C ₆	316	8 MFD 150 W.V. ELECTROLYTIC COND.
C ₇	316	14 MFD 175 W.V. ELECTROLYTIC COND.
C ₈	401	.00025 MICA CONDENSER
CV ₁₋₂	621	2 GANG VARIABLE CONDENSER

LEGEND	OUR PART NO.	DESCRIPTION
R ₁	2006	10,000 OHM VOLUME CONTROL
R ₂	—	275 OHM (Minimum on Volume Control)
R ₃	104	600 OHM 1/2 WATT CARBON RESISTOR
R ₄	108	5,000 OHM 1/2 WATT CARBON RESISTOR
R ₅	111	25,000 OHM 1/2 WATT CARBON RESISTOR
R ₆	142	51,000 OHM 1/2 WATT CARBON RESISTOR
R ₇	116	250,000 OHM 1/2 WATT CARBON RESISTOR
R ₈	117	500,000 OHM 1/2 WATT CARBON RESISTOR
R ₉	120	3 MEGOHM 1/2 WATT CARBON RESISTOR

LEGEND	OUR PART NO.	DESCRIPTION
R ₁₀	2903	L-55-B BALLAST TUBE
T ₁	1213	ANTENNA COIL
T ₂	1312	R F COIL
T ₃	IN 809	SPEAKER OUTPUT TRANSFORMER
T ₄	IN 809	SPEAKER FIELD (2500 ohms)
S	—	LINE SWITCH ON VOLUME CONTROL
P	2902	MAZDA #46 PILOT LIGHT
A	2400	INDOOR ANTENNA HANK
L	809	5" DYNAMIC SPEAKER



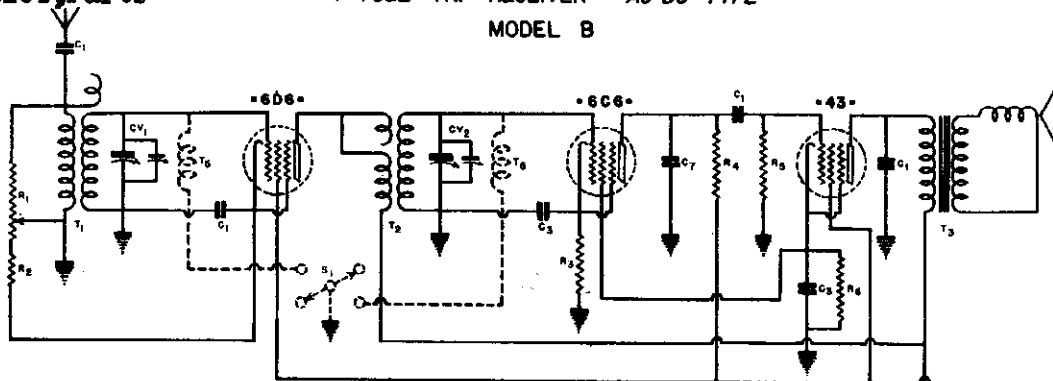
LEGEND	OUR PART NO.	DESCRIPTION
C ₁	211	01 MFD 400 V. TUBULAR CONDENSER
C ₂	216	018 MFD 400V. TUBULAR CONDENSER
C ₃	210	1 MFD 400V. TUBULAR CONDENSER
C ₄	316	4 MFD 175 W.V. ELECTROLYTIC COND.
C ₅	316	5 MFD 75 W.V. ELECTROLYTIC COND.
C ₆	316	8 MFD 150 W.V. ELECTROLYTIC COND.
C ₇	316	14 MFD 175 W.V. ELECTROLYTIC COND.
C ₈	401	.00025 MICA CONDENSER
CV ₁₋₂	621	2 GANG VARIABLE CONDENSER

MODEL B
MODEL C, D
Schematics, Parts

CLIMAX RADIO & TELEV. CO., INC.

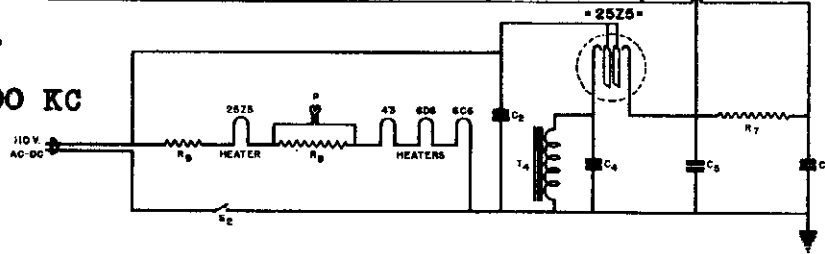
4 TUBE TRF RECEIVER — AC-DC TYPE —

MODEL B



DOTTED CONNECTIONS APPLY TO SHORT WAVE VERSION ONLY.

ALIGN AT 1500 KC



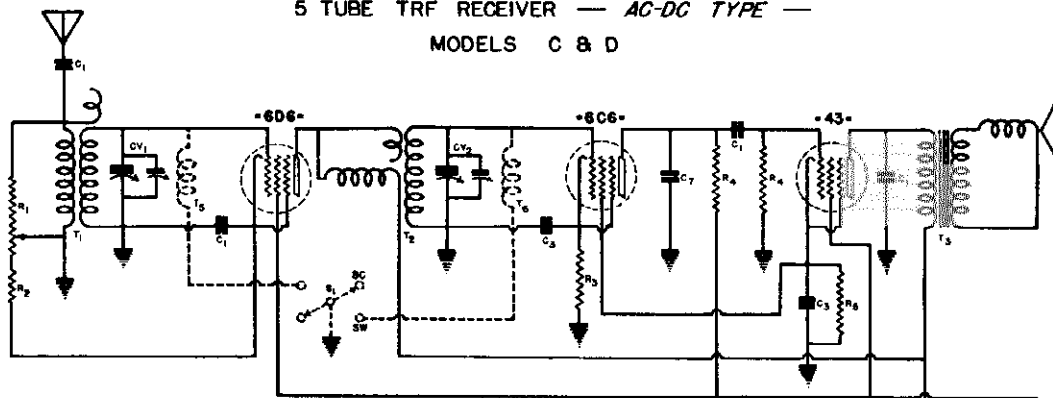
LEGEND	OUR PART NO.	DESCRIPTION
R ₁	2004	10,000 OHM VOLUME CONTROL
R ₂	—	275 OHM (Min. on Volume Control)
R ₃	111	25,000 OHM 1/2 WATT CARBON RESISTOR
R ₄	117	500,000 OHM 1/2 WATT CARBON RESISTOR
R ₅	141	500,000 OHM 1/2 WATT CARBON RESISTOR
R ₆	104	500 OHM 1/2 WATT CARBON RESISTOR
R ₇	108	5,000 OHM 1/2 WATT CARBON RESISTOR
R ₈	142	90 OHM 2 WATT WIRE WOUND RES.
R ₉	1807	185 OHM RESISTOR GRID

LEGEND	OUR PART NO.	DESCRIPTION
CV ₁	410	2 GANG VARIABLE CONDENSER
C ₁	211	.01 MFD. 400V. TUBULAR CONDENSER
C ₂	210	.1 MFD. 400V. TUBULAR CONDENSER
C ₃	316	5 MFD. 25V. ELECTROLYTIC CONDENSER
C ₄	318	4 MFD. 150V. ELECTROLYTIC CONDENSER
C ₅	318	4 MFD. 150V. ELECTROLYTIC CONDENSER
C ₆	318	4 MFD. 150V. ELECTROLYTIC CONDENSER
C ₇	316	5 MFD. 25V. ELECTROLYTIC CONDENSER
C ₈	60	.00025 MFD. MICA CONDENSER

LEGEND	OUR PART NO.	DESCRIPTION
S ₁	1914	BAND SELECTOR SWITCH
S ₂	—	LINE SWITCH ON VOLUME CONTROL
T ₁	1200	ANTENNA COIL
T ₂	1300	R.F. COIL
T ₃	110	SPEAKER OUTPUT TRANSFORMER
T ₄	110	SPEAKER FIELD (2500 OHMS)
S ₃	1812	SHORT WAVE ANTENNA SHUNT
T ₅	1812	SHORT WAVE R.F. SHUNT
P	2902	MAZDA #44 PILOT LIGHT

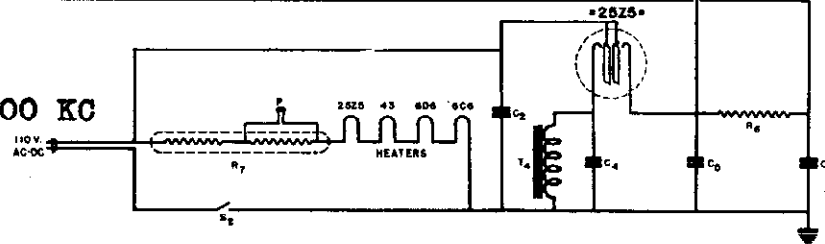
5 TUBE TRF RECEIVER — AC-DC TYPE —

MODELS C & D



DOTTED CONNECTIONS APPLY TO SHORT WAVE VERSION ONLY.

ALIGN AT 1500 KC



LEGEND	OUR PART NO.	DESCRIPTION
R ₁	2004	10,000 OHM VOLUME CONTROL
R ₂	—	275 OHM (Minimum on Volume Control)
R ₃	111	20,000 OHM 1/2 WATT CARBON RESISTOR
R ₄	117	500,000 OHM 1/2 WATT CARBON RESISTOR
R ₅	104	500 OHM 1/2 WATT CARBON RESISTOR
R ₆	108	5,000 OHM 1/2 WATT CARBON RESISTOR
R ₇	2903	L-85-B BALLAST TUBE
P	2902	MAZDA #46 PILOT LIGHT

LEGEND	OUR PART NO.	DESCRIPTION
CV ₁	410	2 GANG VARIABLE CONDENSER
CV ₂	211	.01 MFD. 400V. TUBULAR CONDENSER
C ₁	210	.1 MFD. 400V. TUBULAR CONDENSER
C ₂	318	5 MFD. 25 VV. ELECTROLYTIC CONDENSER
C ₃	318	4 MFD. 150 VV. ELECTROLYTIC CONDENSER
C ₄	318	4 MFD. 150 VV. ELECTROLYTIC CONDENSER
C ₅	318	4 MFD. 150 VV. ELECTROLYTIC CONDENSER
C ₆	318	4 MFD. 150 VV. ELECTROLYTIC CONDENSER
C ₇	401	.00025 MFD. MICA CONDENSER

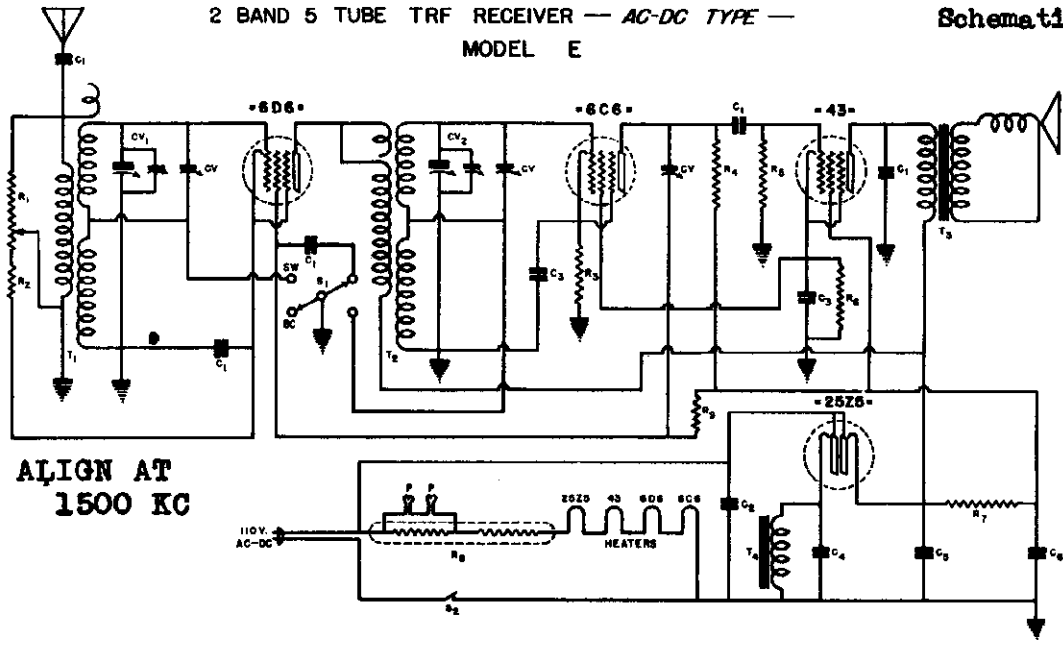
LEGEND	OUR PART NO.	DESCRIPTION
S ₁	1914	BAND SELECTOR SWITCH
S ₂	—	LINE SWITCH ON VOLUME CONTROL
T ₁	1204	ANTENNA COIL
T ₂	1304	R.F. COIL
T ₃	110	SPEAKER OUTPUT TRANSFORMER
T ₄	110	SPEAKER FIELD (2500 OHMS)
T ₅	1206	SHORT WAVE ANTENNA SHUNT
T ₆	1306	SHORT WAVE R.F. SHUNT

CLIMAX RADIO & TELEV. CO., INC.

2 BAND 5 TUBE TRF RECEIVER — AC-DC TYPE —

MODEL E

MODEL E
MODEL F
Schematics, Part



ALIGN AT
1500 KC

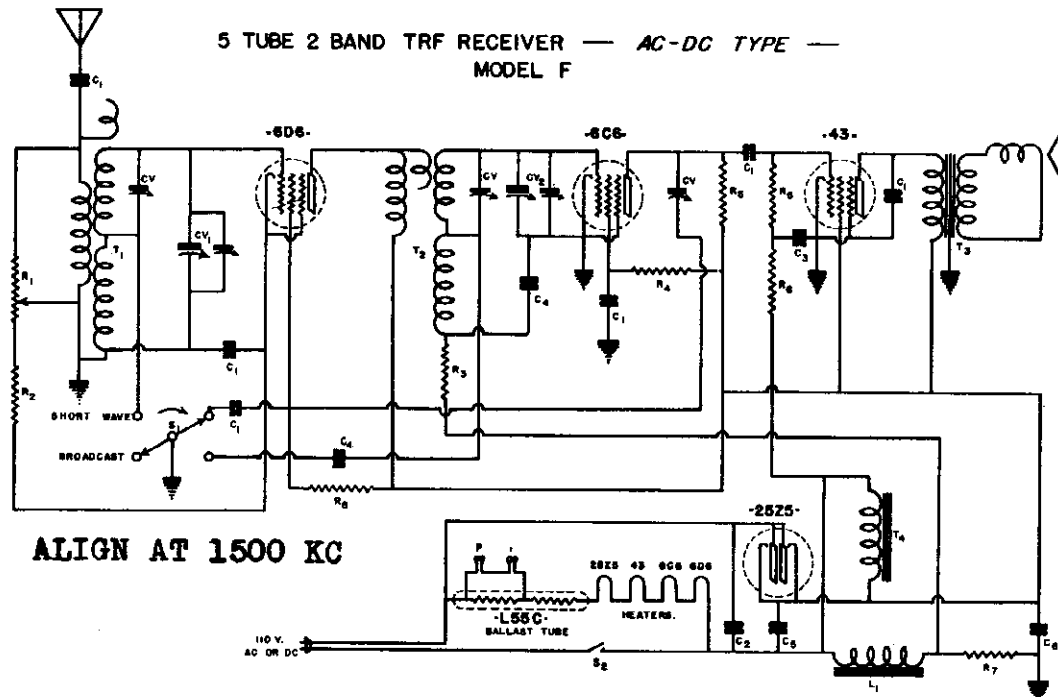
LEGEND	PART NO.	DESCRIPTION
R ₁	2008	10,000 OHM VOLUME CONTROL
R ₂	—	275 OHM (Minimum on Volume Control)
R ₃	111	25,000 OHM 1/2 WATT CARBON RESISTOR
R ₄	117	500,000 OHM 1/2 WATT CARBON RESISTOR
R ₅	141	350,000 OHM 1/2 WATT CARBON RESISTOR
R ₆	104	500 OHM 1/2 WATT CARBON RESISTOR
R ₇	108	5000 OHM 1/2 WATT CARBON RESISTOR
R ₈	2804	L-55-C BALLAST TUBE

LEGEND	PART NO.	DESCRIPTION
R ₉	110	15,000 OHM 1/2 WATT CARBON RESISTOR
CV ₁	518	2 GANG VARIABLE CONDENSER
CV ₂	500	5-30MFD. TRIMMER CONDENSER
C ₁	211	.01 MFD. 400V. TUBULAR CONDENSER
C ₂	210	1 MFD. 400V. TUBULAR CONDENSER
C ₃	316	5 MFD. 25 WV ELECTROLYTIC CONDENSER
C ₄	316	4 MFD. 150 WV ELECTROLYTIC CONDENSER
C ₅	316	14 MFD. 150 WV ELECTROLYTIC CONDENSER

LEGEND	PART NO.	DESCRIPTION
C ₆	316	8 MFD. 150 WV ELECTROLYTIC CONDENSER
S ₁	1814	BAND SELECTOR SWITCH
S ₂	—	LINE SWITCH ON VOLUME CONTROL
T ₁	1218	2 BAND RF COIL
T ₂	1811	2 BAND AF COIL
T ₃	1810	SPEAKER OUTPUT TRANSFORMER
T ₄	1810	SPEAKER FIELD (2500 OHMS)
P	2802	MAZDA 446 PILOT LIGHT

5 TUBE 2 BAND TRF RECEIVER — AC-DC TYPE —

MODEL F



ALIGN AT 1500 KC

LEGEND	PART NO.	DESCRIPTION
R ₁	2008	10,000 OHM VOLUME CONTROL
R ₂	—	275 OHM (Minimum on Volume Control)
R ₃	118	1 MEG OHM 1/2 WATT CARBON RESISTOR
R ₄	120	3 MEG OHM 1/2 WATT CARBON RESISTOR
R ₅	117	500,000 OHM 1/2 WATT CARBON RESISTOR
R ₆	116	1 MEG OHM 1/2 WATT CARBON RESISTOR
R ₇	139	85 OHM 1/2 WATT WIRE WOUND RES.
R ₈	110	15,000 OHM 1/2 WATT CARBON RESISTOR

LEGEND	PART NO.	DESCRIPTION
CV ₁	500	5-30MFD. TRIMMER CONDENSER
CV ₂	518	TWO GANG VARIABLE CONDENSER
C ₁	211	.01 MFD. 400V. TUBULAR CONDENSER
C ₂	210	1 MFD. 400V. TUBULAR CONDENSER
C ₃	204	.25 MFD. 200V. TUBULAR CONDENSER
C ₄	203	1 MFD. 200V. TUBULAR CONDENSER
C ₅	211	20 MFD. 150V. ELECTROLYTIC COND.
C ₆	314	10 MFD. 150V. ELECTROLYTIC COND.

LEGEND	PART NO.	DESCRIPTION
T ₄	800	SPEAKER FIELD (2500 OHM)
L ₁	1100	IRON CORE FILTER CHOKER
S ₁	1814	BAND SELECTOR SWITCH
S ₂	—	LINE SWITCH ON VOLUME CONTROL
T ₁	1218	5C & 6W ANTENNA COIL
T ₂	1303	5C & 6W RF COIL
T ₃	800	SPEAKER OUTPUT TRANSFORMER
P	2802	MAZDA 446 PILOT LIGHT

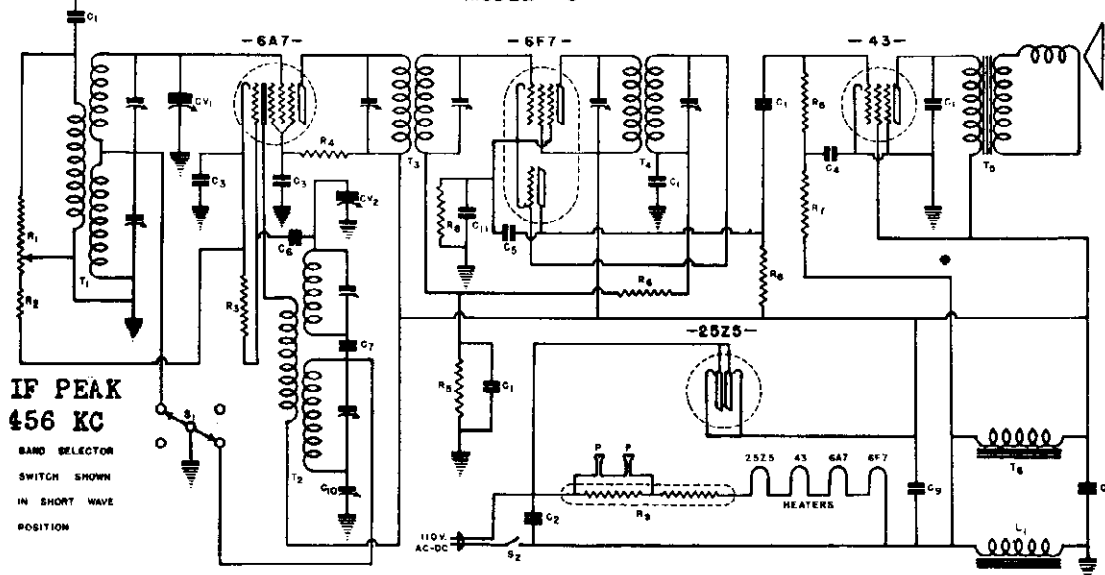
MODEL G
MODEL R

CLIMAX RADIO & TELEV. CO., INC.

Schematics, Parts

5 TUBE EXTENDED SKIP-BAND SUPERHETERODYNE RECEIVER — AC-DC TYPE —

MODEL G



IF PEAK
456 KC
BAND SELECTOR
SWITCH SHOWN
IN SHORT WAVE
POSITION

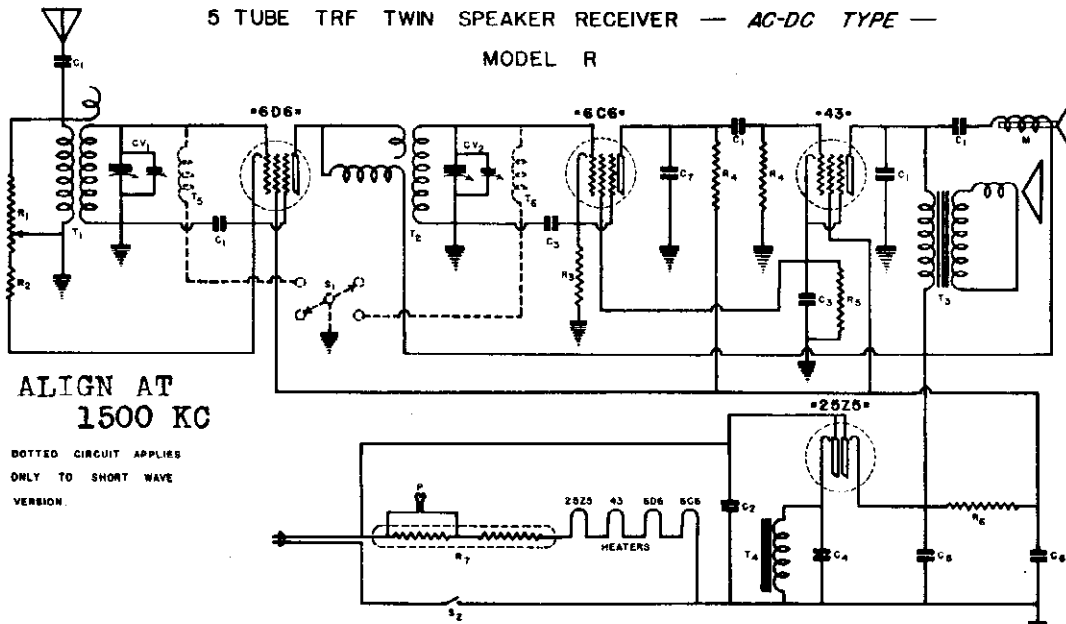
LEGEND	OUR PART NO.	DESCRIPTION
R ₁	2013	10,000 OHM VOLUME CONTROL
R ₂	—	275 OHM Minimum on Volume Control
R ₃	113	50,000 OHM 1/2 WATT CARBON RESISTOR
R ₄	109	10,000 OHM 1/2 WATT CARBON RESISTOR
R ₅	126	2 MEGOHM 1/2 WATT CARBON RESISTOR
R ₆	117	.5 MEGOHM 1/2 WATT CARBON RESISTOR
R ₇	118	.25 MEGOHM 1/2 WATT CARBON RESISTOR
R ₈	128	400 OHM 1/2 WATT CARBON RESISTOR
R ₉	2804	L-55-C BALLAST TUBE
C ₁₀	612	2 GANG VARIABLE CONDENSER

LEGEND	OUR PART NO.	DESCRIPTION
C ₁	611	.01 MFD. 400V. TUBULAR CONDENSER
C ₂	210	.1 MFD. 400V. TUBULAR CONDENSER
C ₃	203	.1 MFD. 200V. TUBULAR CONDENSER
C ₄	204	25MFD. 200V. TUBULAR CONDENSER
C ₅	401	.00025 MFD. MICA CONDENSER
C ₆	400	.0001 MFD. MICA CONDENSER
C ₇	411	.00125 MFD. MICA CONDENSER
C ₈	314	10 MFD. 150V. ELECTROLYTIC CONDENSER
C ₉	311	20 MFD. 150V. ELECTROLYTIC CONDENSER
C ₁₀	502	5 PLATE PADDING CONDENSER
G ₁	212	.05 MFD. 200V. TUBULAR CONDENSER

LEGEND	OUR PART NO.	DESCRIPTION
T ₁	1217	ANTENNA COIL
T ₂	1408	OSCILLATOR COIL
T ₃	1503	456 KC IF TRANSFORMER
T ₄	1504	456 KC DIODE COUPLING TRANSFORMER
T ₅	1500	SPEAKER OUTPUT TRANSFORMER
T ₆	1500	2500 OHM SPEAKER FIELD
L ₁	1100	IRON CORE FILTER CHOKE
S ₁	1814	BAND SELECTOR SWITCH
S ₂	—	LINE SWITCH ON VOLUME CONTROL
P	2802	MAZDA 46 PILOT LIGHT

5 TUBE TRF TWIN SPEAKER RECEIVER — AC-DC TYPE —

MODEL R



ALIGN AT
1500 KC

DOTTED CIRCUIT APPLIES
ONLY TO SHORT WAVE
VERSION.

LEGEND	OUR PART NO.	DESCRIPTION
R ₁	2008	10,000 OHM VOLUME CONTROL
R ₂	—	275 OHM Minimum on Volume Control
R ₃	111	25,000 OHM 1/2 WATT CARBON RESISTOR
R ₄	117	500,000 OHM 1/2 WATT CARBON RESISTOR
R ₅	104	500 OHM 1/2 WATT CARBON RESISTOR
R ₆	108	5000 OHM 1/2 WATT CARBON RESISTOR
R ₇	2803	L-55-B BALLAST TUBE
R ₈	2802	MAZDA 46 PILOT LIGHT

LEGEND	OUR PART NO.	DESCRIPTION
C ₁₀	610	2 GANG VARIABLE CONDENSER
C ₁	211	.01 MFD. 400V. TUBULAR CONDENSER
C ₂	210	.1 MFD. 400V. TUBULAR CONDENSER
C ₃	316	3MFD. 250V. ELECTROLYTIC CONDENSER
C ₄	316	4MFD. 150V. ELECTROLYTIC CONDENSER
C ₅	316	4MFD. 150V. ELECTROLYTIC CONDENSER
C ₆	316	10MFD. 150V. ELECTROLYTIC CONDENSER
C ₇	401	.00025 MFD. MICA CONDENSER
M	800	MAGNETIC SPEAKER

LEGEND	OUR PART NO.	DESCRIPTION
S ₁	1814	BAND SELECTOR SWITCH
S ₂	—	LINE SWITCH ON VOLUME CONTROL
T ₁	1200	ANTENNA COIL
T ₂	1300	RF COIL
T ₃	1510	SPEAKER OUTPUT TRANSFORMER
T ₄	1510	2500 OHM SPEAKER FIELD
T ₅	1612	SHORT WAVE ANTENNA SHUNT
T ₆	1612	SHORT WAVE RF SHUNT

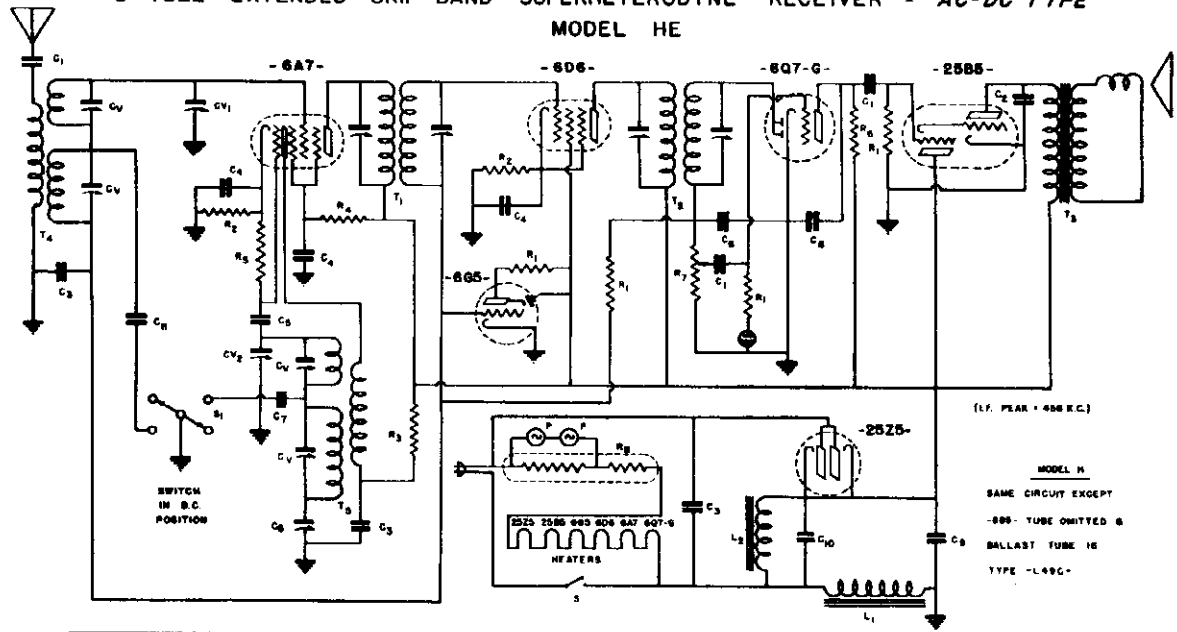
Schematics, Parts

CLIMAX RADIO & TELEV. CO., INC.

MODEL HE
MODEL JE

6 TUBE EXTENDED SKIP-BAND SUPERHETERODYNE RECEIVER = AC-DC TYPE

MODEL HE



(IF. PEAK - 456 K.C.)

MODEL H
SAME CIRCUIT EXCEPT
-6D6- TUBE OMITTED &
BALLAST TUBE IS
TYPE -L-49C-

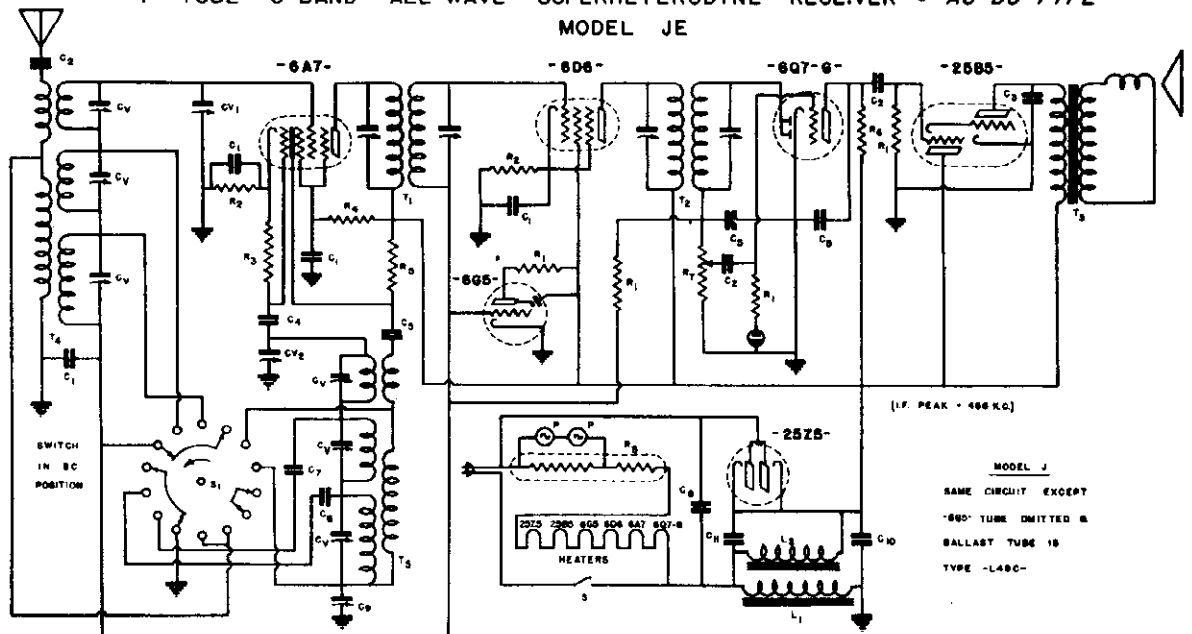
LEGEND	PART NO.	DESCRIPTION
C ₁	311	.01 MFD -400V TUBULAR CONDENSER
C ₂	308	.05 MFD -400V TUBULAR CONDENSER
C ₃	310	.1 MFD -400V TUBULAR CONDENSER
C ₄	303	.1 MFD -500V TUBULAR CONDENSER
C ₅	400	.0001 MICA CONDENSER
C ₆	401	.00025 MICA CONDENSER
C ₇	411	.00125 MICA CONDENSER
C ₈	507	5 PLATE PADDING CONDENSER
C ₉	314	10 MFD 150 W.V. ELECTROLYTIC COND.
C ₁₀	311	20 MFD 150 W.V. ELECTROLYTIC COND.

LEGEND	PART NO.	DESCRIPTION
Cv ₁	612	2 GANG VARIABLE CONDENSER
R ₁	119	1 MEGOHM 1/2 WATT CARBON RESISTOR
R ₂	103	250 OHMS 1/2 WATT CARBON RESISTOR
R ₃	108	10,000 OHMS 1/2 WATT CARBON RESISTOR
R ₄	111	25,000 OHMS 1/2 WATT CARBON RESISTOR
R ₅	112	50,000 OHMS 1/2 WATT CARBON RESISTOR
R ₆	118	250,000 OHMS 1/2 WATT CARBON RESISTOR
R ₇	2009	50,000 OHMS VOLUME CONTROL & SWITCH
R ₈	2905	L-49-C BALLAST TUBE (MODEL H)
R ₉	2908	L-42-C BALLAST TUBE (MODEL HE)
C	212	.05 MFD -200V TUBULAR CONDENSER

LEGEND	PART NO.	DESCRIPTION
T ₁	1503	1st IF TRANSFORMER
T ₂	1506	DIODE IF TRANSFORMER (2500 OHMS)
T ₃	808	SPEAKER OUTPUT TRANSFORMER
T ₄	1210	ANTENNA COIL
T ₅	1404	OSCILLATOR COIL
L ₁	1101	CHDKE
L ₂	808	SPEAKER FIELD (2500 OHMS)
S	1914	BAND SELECTOR SWITCH
P	2902	MAZDA #48 PILOT LIGHT

7 TUBE 3 BAND ALL-WAVE SUPERHETERODYNE RECEIVER = AC-DC TYPE

MODEL JE



(IF. PEAK - 456 K.C.)

MODEL J
SAME CIRCUIT EXCEPT
-6D6- TUBE OMITTED &
BALLAST TUBE IS
TYPE -L-49C-

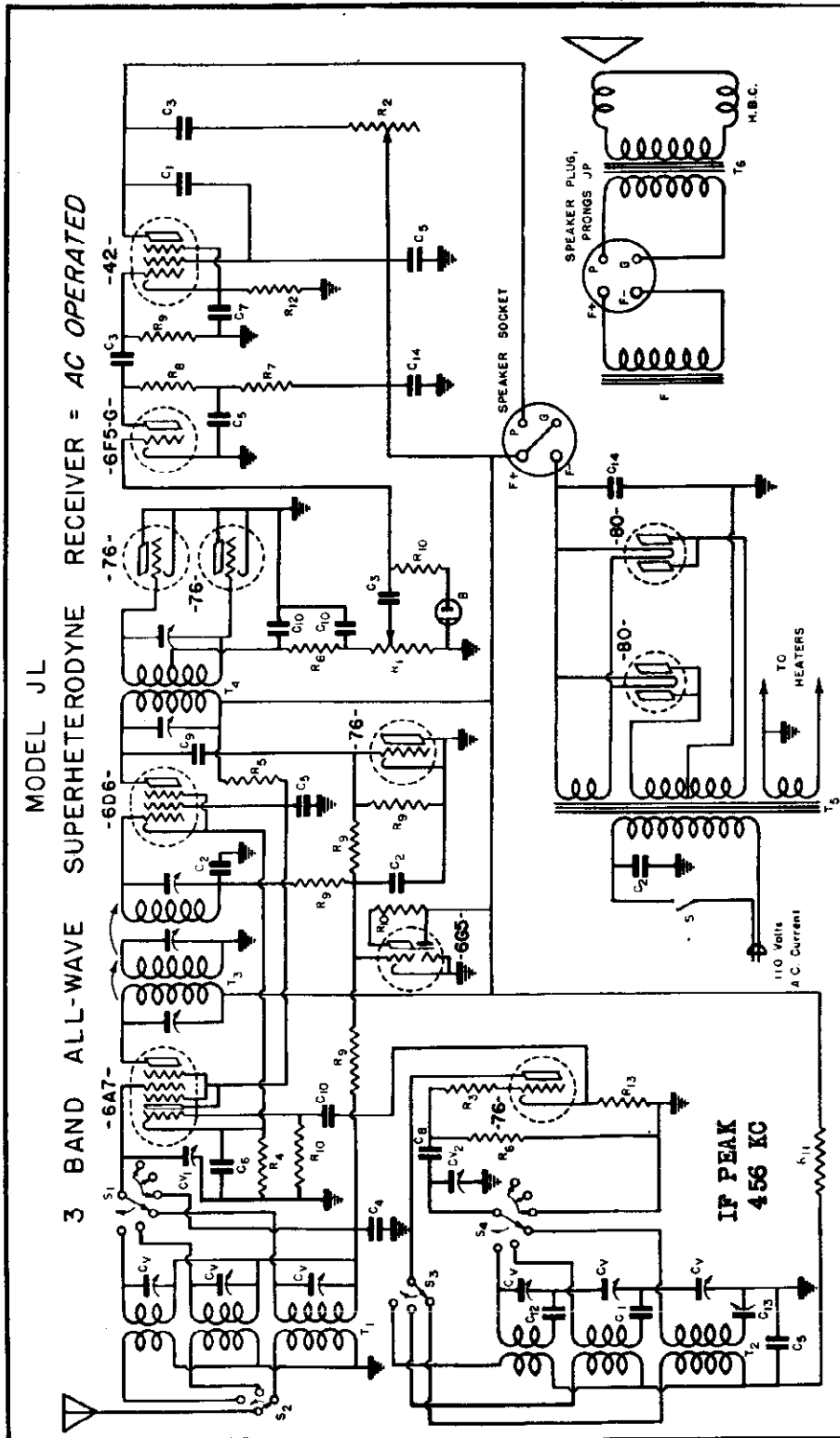
LEGEND	PART NO.	DESCRIPTION
C ₁	203	.1 MFD -200V TUBULAR CONDENSER
C ₂	211	.01 MFD -400V TUBULAR CONDENSER
C ₃	206	.05 MFD -400V TUBULAR CONDENSER
C ₄	400	.0001 MICA CONDENSER
C ₅	401	.00025 MICA CONDENSER
C ₆	410	.00125 MICA CONDENSER
C ₇	413	.0048 MICA CONDENSER
C ₈	210	.1 MFD -400V TUBULAR CONDENSER
C ₉	311	20 MFD 150 W.V. ELECTROLYTIC COND.
C ₁₀	314	10 MFD 150 W.V. ELECTROLYTIC COND.
Cv ₁	612	2 GANG VARIABLE CONDENSER
Cv ₂	612	2 GANG VARIABLE CONDENSER
Cv ₃	612	2 GANG VARIABLE CONDENSER
T ₁	1214	3 BAND ANTENNA COIL

LEGEND	PART NO.	DESCRIPTION
R ₁	119	1 MEGOHM 1/2 WATT CARBON RESISTOR
R ₂	103	250 OHMS 1/2 WATT CARBON RESISTOR
R ₃	118	250,000 OHMS 1/2 WATT CARBON RESISTOR
R ₄	111	25,000 OHMS 1/2 WATT CARBON RESISTOR
R ₅	104	10,000 OHMS 1/2 WATT CARBON RESISTOR
R ₆	118	250,000 OHMS 1/2 WATT CARBON RESISTOR
R ₇	2008	50,000 OHM VOLUME CONTROL & SWITCH

LEGEND	PART NO.	DESCRIPTION
R ₈	2905	L-49-C BALLAST TUBE (MODEL J)
R ₉	2908	L-42-C BALLAST TUBE (MODEL JE)
T ₁	1503	1st IF TRANSFORMER
T ₂	1506	DIODE IF TRANSFORMER
T ₃	808	SPEAKER OUTPUT TRANSFORMER
L ₁	1101	CHDKE
L ₂	808	SPEAKER FIELD (2500 OHMS)
L ₃	1101	CHDKE
L ₄	1101	CHDKE
S	1915	3 BAND SELECTOR SWITCH
P	2902	MAZDA #48 PILOT LIGHT
T ₅	1405	3 BAND OSCILLATOR COIL

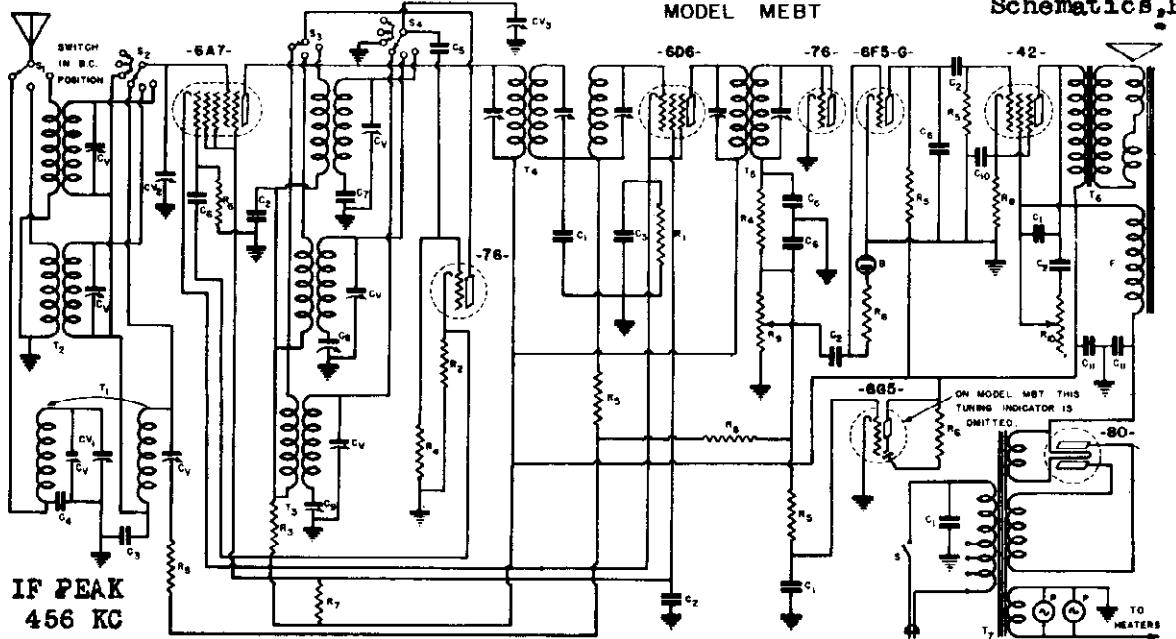
MODEL JL
Schematic
Parts

CLIMAX RADIO & TELEV. CO., INC.



LEGEND PART NO.	DESCRIPTION
C1	2.13 .005 MFD. 400V. TUBULAR CONDENSER
C2	2.11 .01 MFD. 400 V. TUBULAR CONDENSER
C3	2.12 .05 MFD. 400 V. TUBULAR CONDENSER
C4	2.03 .1 MFD. 200V. TUBULAR CONDENSER
C5	2.10 .1 MFD. 400V. TUBULAR CONDENSER
C6	2.05 .25 MFD. 200V. TUBULAR CONDENSER
C7	3.04 10 MFD. 35V. DRY ELECTROLYTIC TUB. COND.
C8	4.12 .00005 MFD. MICA CONDENSER
C9	4.00 .0001 MFD. MICA CONDENSER
C10	5.01 .00025 MFD. MICA CONDENSER
C11	4.10 .0018 MFD. MICA CONDENSER
C12	4.13 .0039 MFD. MICA CONDENSER
C13	4.04 5 PLATE PADDING CONDENSER
C14	8 MFD. 450 V. WET ELECTROLYTIC COND.
C15	2 GINA. VARIABLE CONDENSER
C16	5.30 5-30 MFD. TRIMMER CONDENSER
C17	2.01 500,000 OHM. VOLUME CONTROL
C18	2.02 75,000 OHM. TONE CONTROL & SWITCH
C19	1.01 150 OHM. 1/2 WATT CARBON RESISTOR
C20	1.03 250 OHM. 1/2 WATT CARBON RESISTOR
C21	1.11 25,000 OHM. 1/2 WATT CARBON RESISTOR
C22	1.13 100,000 OHM. 1/2 WATT CARBON RESISTOR
C23	1.15 100,000 OHM. 1/2 WATT CARBON RESISTOR
C24	1.16 250,000 OHM. 1/2 WATT CARBON RESISTOR
C25	1.17 500,000 OHM. 1/2 WATT CARBON RESISTOR
C26	1.18 1,000 OHM. 1/2 WATT CARBON RESISTOR
R1	1.21 5 MEGOHM. 1/2 WATT CARBON RESISTOR
R2	1.14 25,000 OHM. 1/2 WATT CARBON RESISTOR
R3	1.15 420 OHM. 1/2 WATT V.V.V. RESISTOR
R4	1.21 5 SHIELDED 3 BAND ANTENNA COIL
R5	1.22 SHIELDED 3 BAND OSCILLATOR COIL
R6	1.30 150 OHM. DIODE I.F. TRANSFORMER
R7	1.4 15.10 DIODE I.F. TRANSFORMER
R8	1.4 10.15 POWER TRANSFORMER
R9	1.6 8.75 SPEAKER TRANSFORMER
R10	5.2-3.4 19.13 2 GANG BAND SWITCH
R11	5 LINE SWITCH ON TONE CONTROL
R12	6 8.75 1600 OHM. SPEAKER FIELD
R13	3000 BIAS CELL
T1	1.1 3 BAND ANTENNA COIL
T2	1.22 SHIELDED 3 BAND OSCILLATOR COIL
T3	1.30 150 OHM. DIODE I.F. TRANSFORMER
T4	1.4 15.10 DIODE I.F. TRANSFORMER
T5	1.4 10.15 POWER TRANSFORMER
T6	1.6 8.75 SPEAKER TRANSFORMER
S1	5 LINE SWITCH ON TONE CONTROL
S2	6 8.75 1600 OHM. SPEAKER FIELD
S3	3000 BIAS CELL

CLIMAX RADIO & TELEV. CO., INC. MODELS M, ME (Revised)
 LONGWAVE 3 BAND SUPERHETERODYNE RECEIVER - AC OPERATED MODEL MEBT
 Schematics, Part



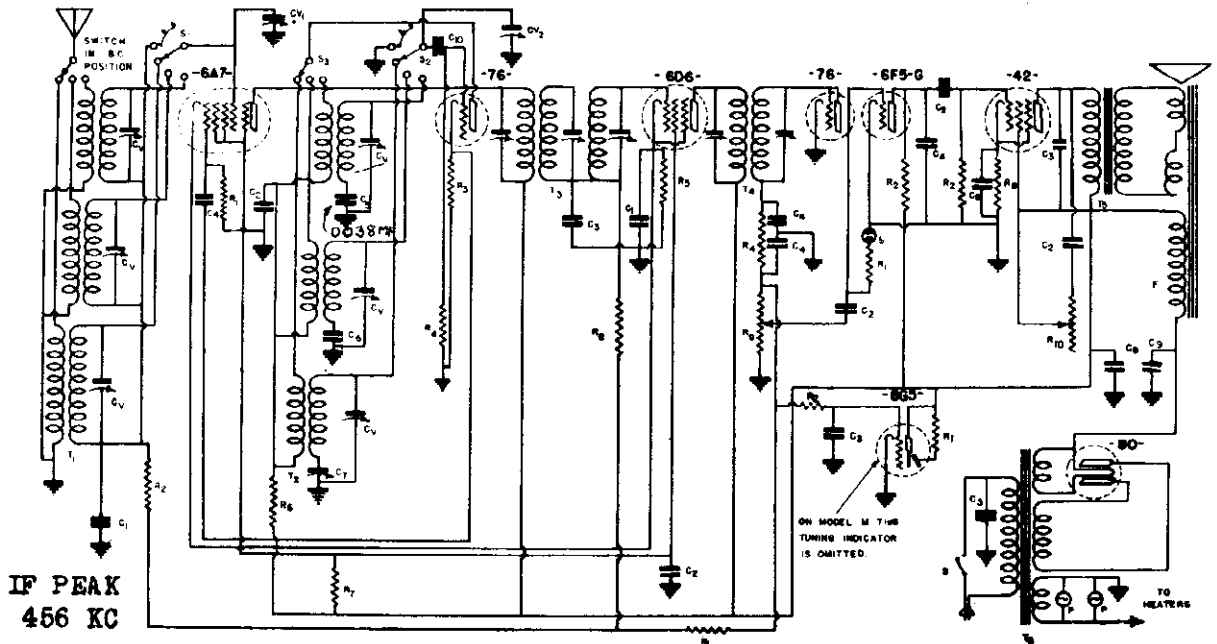
IF PEAK
456 KC

LEGEND	PART NO.	DESCRIPTION
C1	211	01 MFD-400V TUBULAR CONDENSER
C2	204	05 MFD-400V TUBULAR CONDENSER
C3	203	1 MFD-200V TUBULAR CONDENSER
C4	214	01 MFD-250V TUBULAR CONDENSER
C5	412	00005 MICA CONDENSER
C6	401	00025 MICA CONDENSER
C7	413	0038 MICA CONDENSER
C8	411	5 PLATE PADDING CONDENSER
C9	306	3 PLATE PADDING CONDENSER
C10	304	10 MFD 25 W.V. ELECTROLYTIC COND.
C11	317	8 MFD 450 W.V. ELECTROLYTIC COND.
C12	500	5-30 MFD TRIMMER CONDENSER

LEGEND	PART NO.	DESCRIPTION
CVL2-3	513	3 GANG VARIABLE CONDENSER
R1	103	250 OHM 1/2 WATT CARBON RESISTOR
R2	105	1000 OHM 1/2 WATT CARBON RESISTOR
R3	111	25,000 OHM 1/2 WATT CARBON RESISTOR
R4	113	50,000 OHM 1/2 WATT CARBON RESISTOR
R5	117	1 MEGOHM 1/2 WATT CARBON RESISTOR
R6	119	1 MEGOHM 1/2 WATT CARBON RESISTOR
R7	112	25,000 OHM 1/2 WATT CARBON RESISTOR
R8	122	420 OHM 2 WATT WIRE WOUND RESISTOR
R9	2011	500,000 OHM VOLUME CONTROL
R10	2012	75,000 OHM TONE CONTROL & SWITCH

LEGEND	PART NO.	DESCRIPTION
T1	1614	LONG-WAVE PRESELECTION COIL
T2	1221	B.C. & SKIP-BAND ANTENNA COIL
T3	1411	LONG-WAVE 3 BAND OSCILLATOR COIL
T4	1506	TRIPLE TUNE I.F. TRANSFORMER
T5	1506	DIODE I.F. TRANSFORMER
T6	1611	SPEAKER TRANSFORMER
T7	1013	POWER TRANSFORMER
T8	1611	1800 OHM SPEAKER FIELD
S	2-23-4	2 GANG BAND SWITCH
B	3000	BIAS CELL
P	2802	SWITCH ON VOLUME CONTROL
P	2802	MAZDA #46 PILOT LIGHT

MODELS M & ME 8 (7) TUBE 3 BAND SUPERHETERODYNE RECEIVER - AC OPERATED



IF PEAK
456 KC

LEGEND	PART NO.	DESCRIPTION
C1	203	1 MFD-200V TUBULAR CONDENSER
C2	204	05 MFD-400V TUBULAR CONDENSER
C3	211	01 MFD-400V TUBULAR CONDENSER
C4	401	00025 MICA CONDENSER
C5	412	00005 MICA CONDENSER
C6	413	0038 MICA CONDENSER
C7	506	5 PLATE PADDING CONDENSER
C8	304	3-30MFD TRIMMER CONDENSERS
C9	304	10 MFD 25 W.V. TUBULAR ELECTROLYTIC COND.
C10	317	8 MFD 450 W.V. TUBULAR ELECTROLYTIC COND.
C11	412	00005 MFD MICA CONDENSER

LEGEND	PART NO.	DESCRIPTION
CVL2-3	513	3 GANG VARIABLE CONDENSER
R1	117	1 MEGOHM 1/2 WATT CARBON RESISTOR
R2	119	1 MEGOHM 1/2 WATT CARBON RESISTOR
R3	105	1,000 OHMS 1/2 WATT CARBON RESISTOR
R4	113	50,000 OHMS 1/2 WATT CARBON RESISTOR
R5	103	250 OHMS 1/2 WATT CARBON RESISTOR
R6	111	25,000 OHMS 1/2 WATT CARBON RESISTOR
R7	112	25,000 OHMS 1/2 WATT CARBON RESISTOR
R8	122	420 OHMS 2 WATT WIRE WOUND RESISTOR
R9	2011	500,000 OHM VOLUME CONTROL
R10	2012	75,000 OHM TONE CONTROL AND SWITCH

LEGEND	PART NO.	DESCRIPTION
T1	1213	SHIELDED 3 BAND ANTENNA COIL
T2	1406	SHIELDED 3 BAND OSCILLATOR COIL
T3	1506	TRIPLE TUNED I.F. TRANSFORMER
T4	1506	DIODE I.F. TRANSFORMER
T5	1611	SPEAKER TRANSFORMER
T6	1013	POWER TRANSFORMER
S	2-23-4	2 GANG BAND SWITCH
P	2802	MAZDA #46 PILOT LIGHT
F	1611	1800 OHM SPEAKER FIELD
B	3000	BIAS CELL

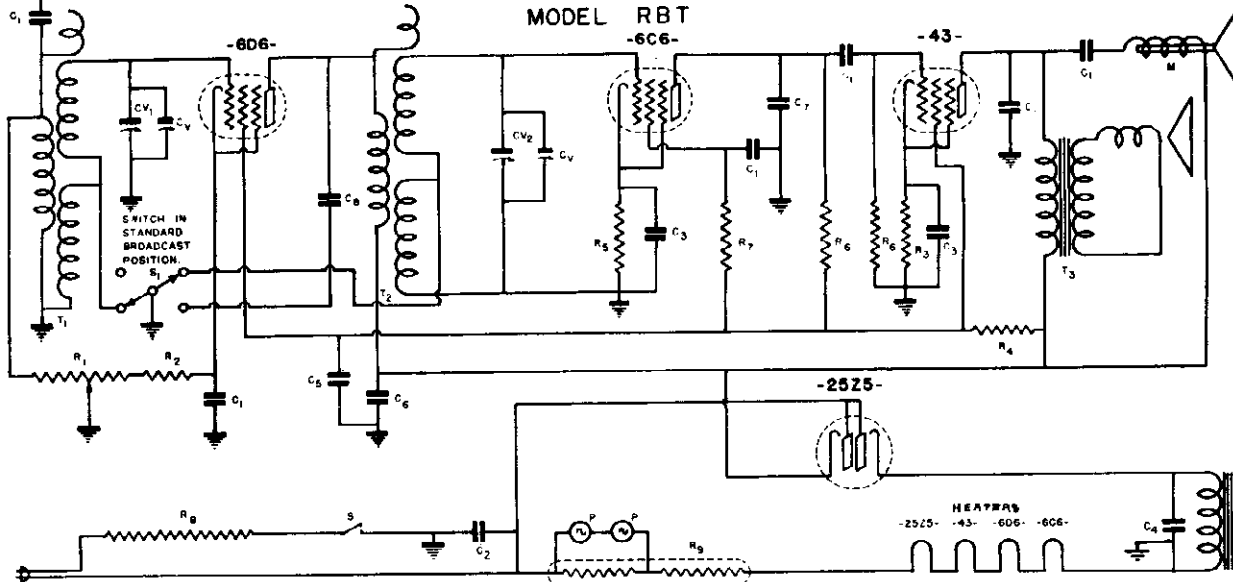
MODEL RBT

MODEL T

Schematics, Parts

CLIMAX RADIO & TELEV. CO., INC.

5 TUBE LONGWAVE 2 BAND TRF RECEIVER = AC-DC TYPE



LEGEND	PART NO.	DESCRIPTION
C ₁	211	01 MFD 400V TUBULAR CONDENSER
C ₂	210	1 MFD 400V TUBULAR CONDENSER
C ₃	316	5 MFD 25 WV ELECTROLYTIC COND.
C ₄	316	4 MFD 150 WV ELECTROLYTIC COND.
C ₅	316	8 MFD 50 WV ELECTROLYTIC COND.
C ₆	316	14 MFD 150 WV ELECTROLYTIC COND.
C ₇	401	00025 MICA CONDENSER
C ₈	405	0004 MICA CONDENSER
C _v	610	VARIABLE CONDENSER TRIMMER

LEGEND	PART NO.	DESCRIPTION
C _v	610	2 GANG VARIABLE CONDENSER
R ₁	2006	10,000 OHM VOLUME CONTROL
R ₂	—	250 OHM (Minimum on Volume Control)
R ₃	104	600 OHM 1/2 WATT CARBON RESISTOR
R ₄	108	5,000 OHM 1/2 WATT CARBON RESISTOR
R ₅	111	25,000 OHM 1/2 WATT CARBON RESISTOR
R ₆	—	500,000 OHM 1/2 WATT CARBON RESISTOR
R ₇	120	3 MEGOHM 1/2 WATT CARBON RESISTOR
R ₈	101	285 OHM RESISTOR GRID

LEGEND	PART NO.	DESCRIPTION
R ₉	2904	L-55-C BALLAST TUBE
T ₁	1208	LONG WAVE ANTENNA COIL
T ₂	1307	LONG WAVE R.F. COIL
T ₃	800	SPEAKER TRANSFORMER
L	800	SPEAKER FIELD (2500 OHMS)
M	900	MAGNETIC SPEAKER
S ₁	1914	BAND SELECTOR SWITCH
S	—	LINE SWITCH ON VOLUME CONTROL
P	2900	MAZDA #46 PILOT LIGHT

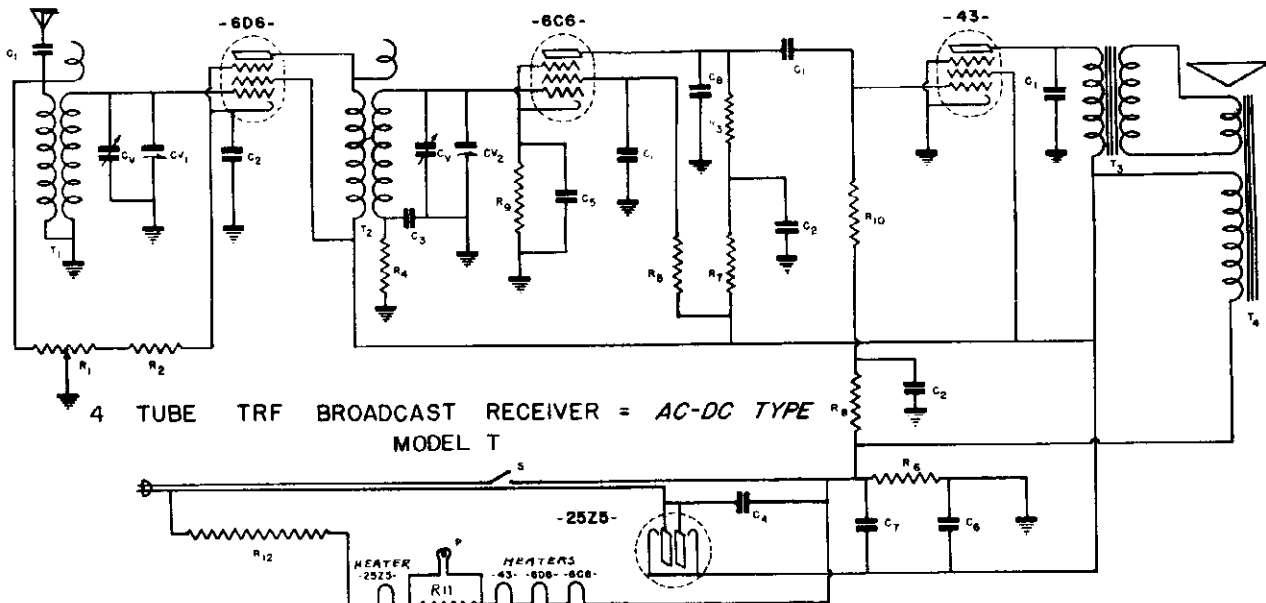
LEGEND	PART NO.	DESCRIPTION
C ₁	211	01 MFD 400V TUBULAR CONDENSER
C ₂	212	05 MFD 200V TUBULAR CONDENSER
C ₃	203	11 MFD 200V TUBULAR CONDENSER
C ₄	210	1 MFD 400V TUBULAR CONDENSER
C ₅	320	10 MFD 25 WV ELECTROLYTIC CONDENSER
C ₆	320	8 MFD 150 WV ELECTROLYTIC CONDENSER
C ₇	320	14 MFD 150 WV ELECTROLYTIC CONDENSER
C _v	617	VARIABLE CONDENSER TRIMMER
C _v	617	2 GANG VARIABLE CONDENSER
C ₈	401	00025 MICA CONDENSER

LEGEND	PART NO.	DESCRIPTION
R ₁	2006	10,000 OHM VOLUME CONTROL
R ₂	—	275 OHM (Minimum on Volume Control)
R ₃	117	5 MEGOHM 1/2 WATT CARBON RESISTOR
R ₄	119	1 MEGOHM 1/2 WATT CARBON RESISTOR
R ₅	120	3 MEGOHM 1/2 WATT CARBON RESISTOR
R ₆	135	420 OHM 1/2 WATT CARBON RESISTOR
R ₇	115	100,000 OHM 1/2 WATT CARBON RESISTOR
R ₈	138	150,000 OHM 1/2 WATT CARBON RESISTOR
R ₉	111	25,000 OHM 1/2 WATT CARBON RESISTOR

LEGEND	PART NO.	DESCRIPTION
R ₁₀	141	350,000 OHM 1/2 WATT CARBON RESISTOR
R ₁₁	142	90 OHM 2 WATT WIRE WOUND RESISTOR
R ₁₂	1817	175 OHM RESISTOR COIL
T ₁	1200	HIGH IMPEDANCE PRIMARY ANTENNA COIL
T ₂	1300	HIGH IMPEDANCE PRIMARY R.F. COIL
T ₃	803	SPEAKER OUTPUT TRANSFORMER
T ₄	803	SPEAKER FIELD (2500 OHMS)
S	—	SWITCH ON TONE CONTROL
P	2902	MAZDA #46 PILOT LIGHT

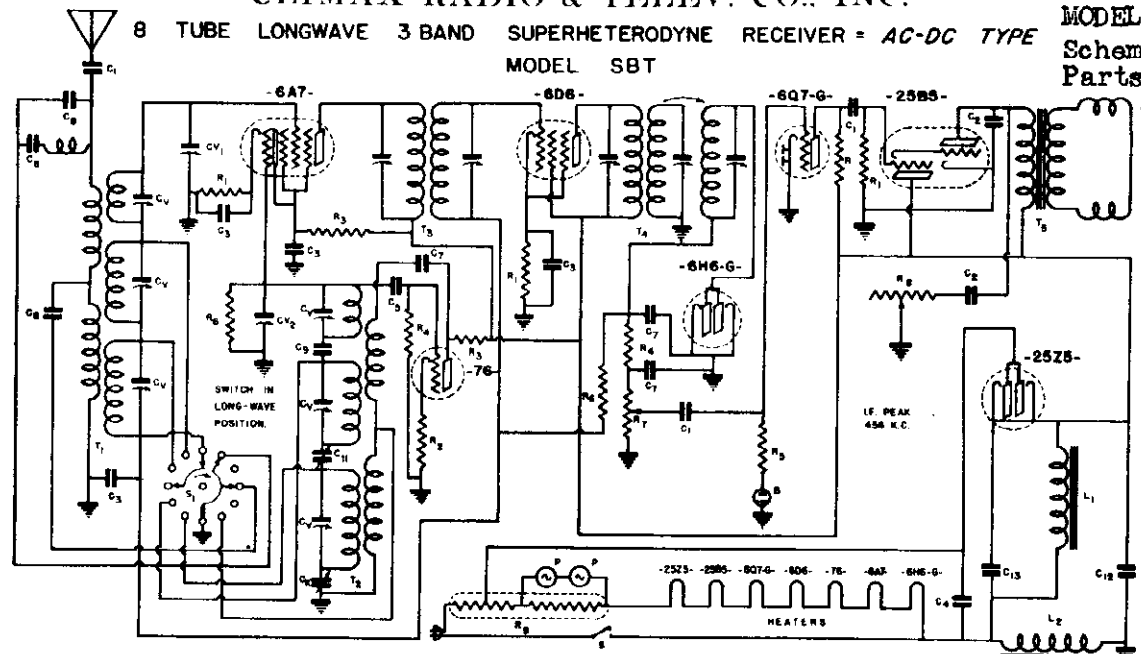
4 TUBE TRF BROADCAST RECEIVER = AC-DC TYPE

MODEL T



CLIMAX RADIO & TELEV. CO., INC.

MODEL JEB
MODEL SBT
Schematic
Parts



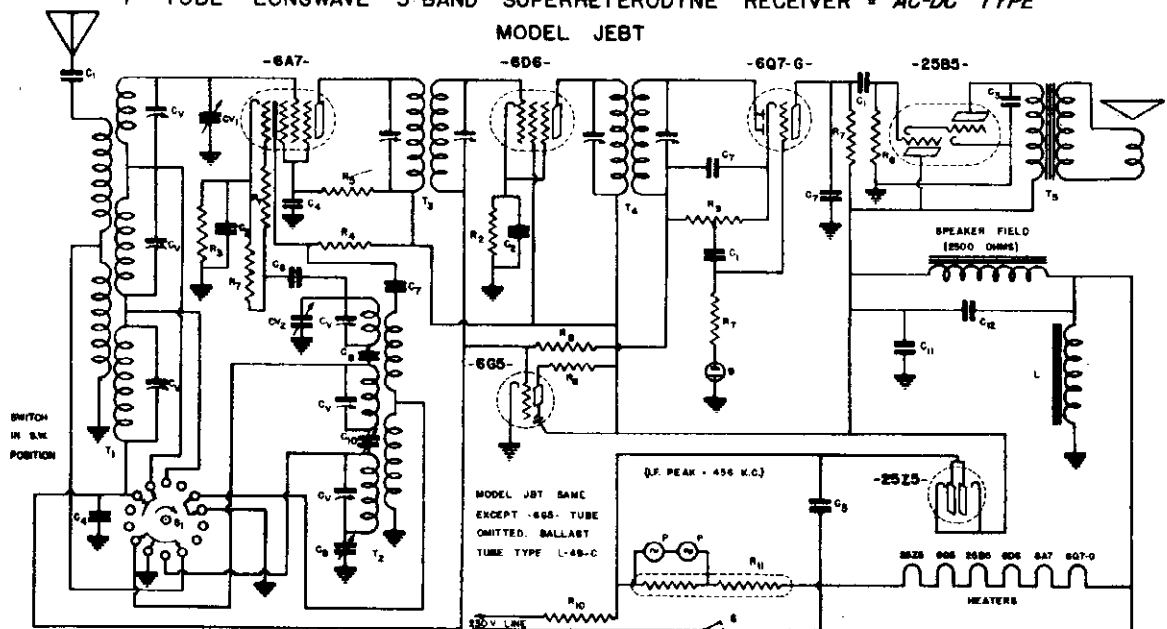
LEGEND	OUR PART NO.	DESCRIPTION
C ₁	211	01 MFD-400 V TUBULAR CONDENSER
C ₂	206	05 MFD-400 V TUBULAR CONDENSER
C ₃	203	1 MFD-200 V TUBULAR CONDENSER
C ₄	210	1 MFD-400 V TUBULAR CONDENSER
C ₅	412	00005 MICA CONDENSER
C ₆	400	0001 MICA CONDENSER
C ₇	401	00025 MICA CONDENSER
C ₈	408	0005 MICA CONDENSER
C ₉	407	008 MICA CONDENSER
C ₁₀	506	3 PLATE PADDING CONDENSER
C ₁₁	507	5 PLATE PADDING CONDENSER
C _v	5N	5N COIL TRIMMER CONDENSER

LEGEND	OUR PART NO.	DESCRIPTION
D _v	608	2 GANG VARIABLE CONDENSER
C ₁₂	314	10 MFD 150 W.V. ELECTROLYTIC COND.
C ₁₃	311	20 MFD 150 W.V. ELECTROLYTIC COND.
R ₁	103	250 OHM 1/2 WATT CARBON RESISTOR
R ₂	105	1000 OHM 1/2 WATT CARBON RESISTOR
R ₃	118	10,000 OHM 1/2 WATT CARBON RESISTOR
R ₄	113	50,000 OHM 1/2 WATT CARBON RESISTOR
R ₅	117	500,000 OHM 1/2 WATT CARBON RESISTOR
R ₆	119	1 MEG OHM 1/2 WATT CARBON RESISTOR
R ₇	200A	500,000 OHM VOLUME CONTROL
R ₈	200B	75,000 OHM TONE CONTROL

LEGEND	OUR PART NO.	DESCRIPTION
R ₉	251	580 V. BALLAST TUBE
T ₁	1207	LONG WAVE ANTENNA COIL
T ₂	1401	LONG WAVE OSCILLATOR COIL
T ₃	1509	INPUT I.F. TRANSFORMER
T ₄	1805	TRIPLE TUNED DIODE I.F. TRANSFORMER
T ₅	204	SPEAKER TRANSFORMER
L ₁	1101	FILTER CHOKER
S ₁	1908	3 BAND SELECTOR SWITCH
P	2502	MAZDA 1/4 W. PILOT LIGHT
B	3000	BIAS CELL

7 TUBE LONGWAVE 3 BAND SUPERHETERODYNE RECEIVER - AC-DC TYPE

MODEL JEBT



LEGEND	OUR PART NO.	DESCRIPTION
C ₁	211	01 MFD-400 V TUBULAR CONDENSER
C ₂	212	05 MFD-200 V TUBULAR CONDENSER
C ₃	206	05 MFD-400 V TUBULAR CONDENSER
C ₄	203	1 MFD-200 V TUBULAR CONDENSER
C ₅	210	1 MFD-400 V TUBULAR CONDENSER
C ₆	400	0001 MICA CONDENSER
C ₇	401	00025 MICA CONDENSER
C ₈	407	008 MICA CONDENSER
C ₉	506	3 PLATE PADDING CONDENSER
C ₁₀	507	5 PLATE PADDING CONDENSER
C ₁₁	314	10 MFD 150 W.V. ELECTROLYTIC COND.
C ₁₂	311	20 MFD 150 W.V. ELECTROLYTIC COND.

LEGEND	OUR PART NO.	DESCRIPTION
D _v	612	2 GANG VARIABLE CONDENSER
C _v	5N	TRIMMER CONDENSER
R ₁	101	150 OHM 1/2 WATT CARBON RESISTOR
R ₂	103	250 OHM 1/2 WATT CARBON RESISTOR
R ₃	138	400 OHM 1/2 WATT CARBON RESISTOR
R ₄	108	5,000 OHM 1/2 WATT CARBON RESISTOR
R ₅	111	25,000 OHM 1/2 WATT CARBON RESISTOR
R ₆	113	50,000 OHM 1/2 WATT CARBON RESISTOR
R ₇	117	500,000 OHM 1/2 WATT CARBON RESISTOR
R ₈	119	1 MEG OHM 1/2 WATT CARBON RESISTOR
R ₉	200B	500,000 OHM VOLUME CONTROL
R ₁₀	1801	225 OHM RESISTOR (CORD)

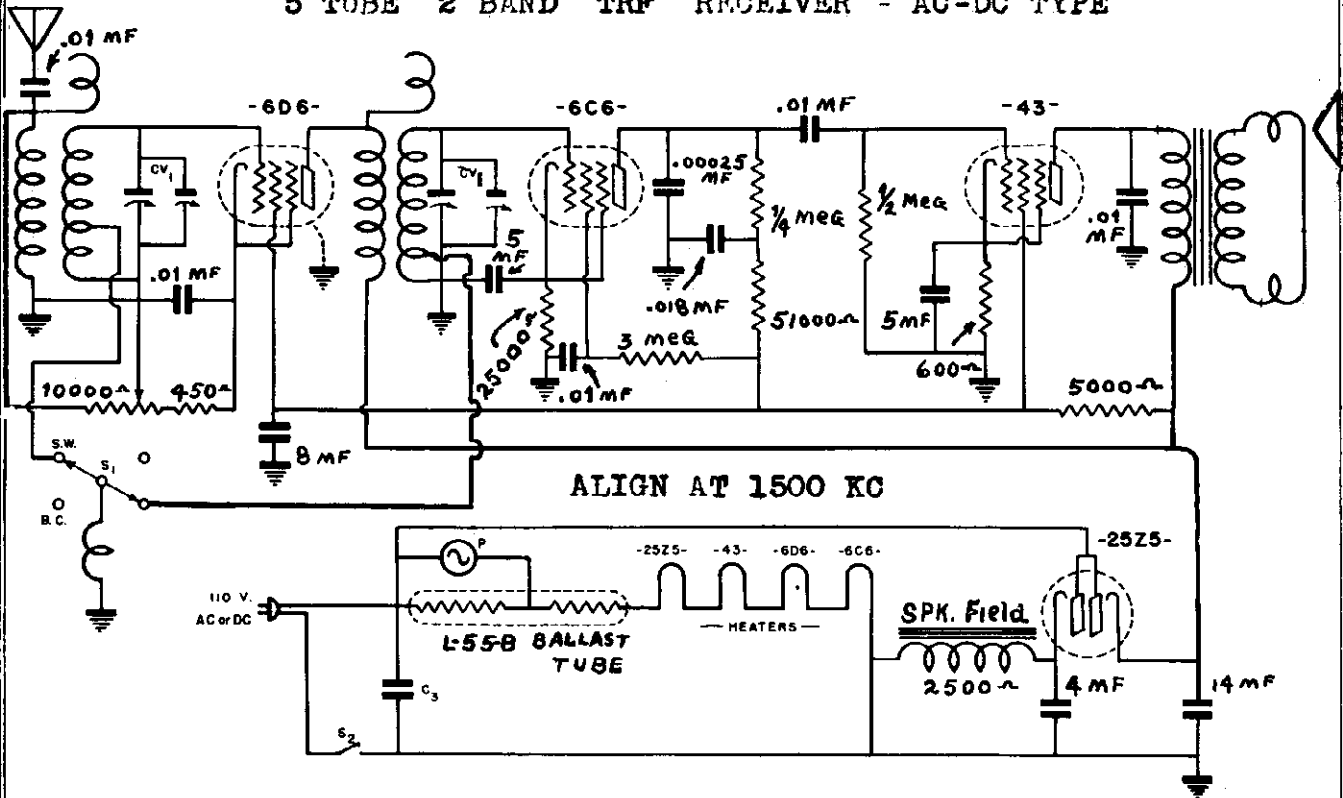
LEGEND	OUR PART NO.	DESCRIPTION
R ₁₁	2505	L-49-C BALLAST TUBE (MODEL JBT)
R ₁₂	2506	L-42-C BALLAST TUBE (MODEL JEBT)
T ₁	1220	LONG WAVE ANTENNA COIL
T ₂	1410	LONG WAVE OSCILLATOR COIL
T ₃	1503	I.F. TRANSFORMER
T ₄	1308	DIODE I.F. TRANSFORMER
T ₅	204	SPEAKER TRANSFORMER
L ₁	1101	FILTER CHOKER
S ₁	1915	3 BAND SELECTOR SWITCH
P	2502	MAZDA 1/4 W. PILOT LIGHT
B	3000	BIAS CELL

MODEL Q-69
 MODEL Z-55
 Schematics

CLIMAX RADIO & TELEV. CO., INC.

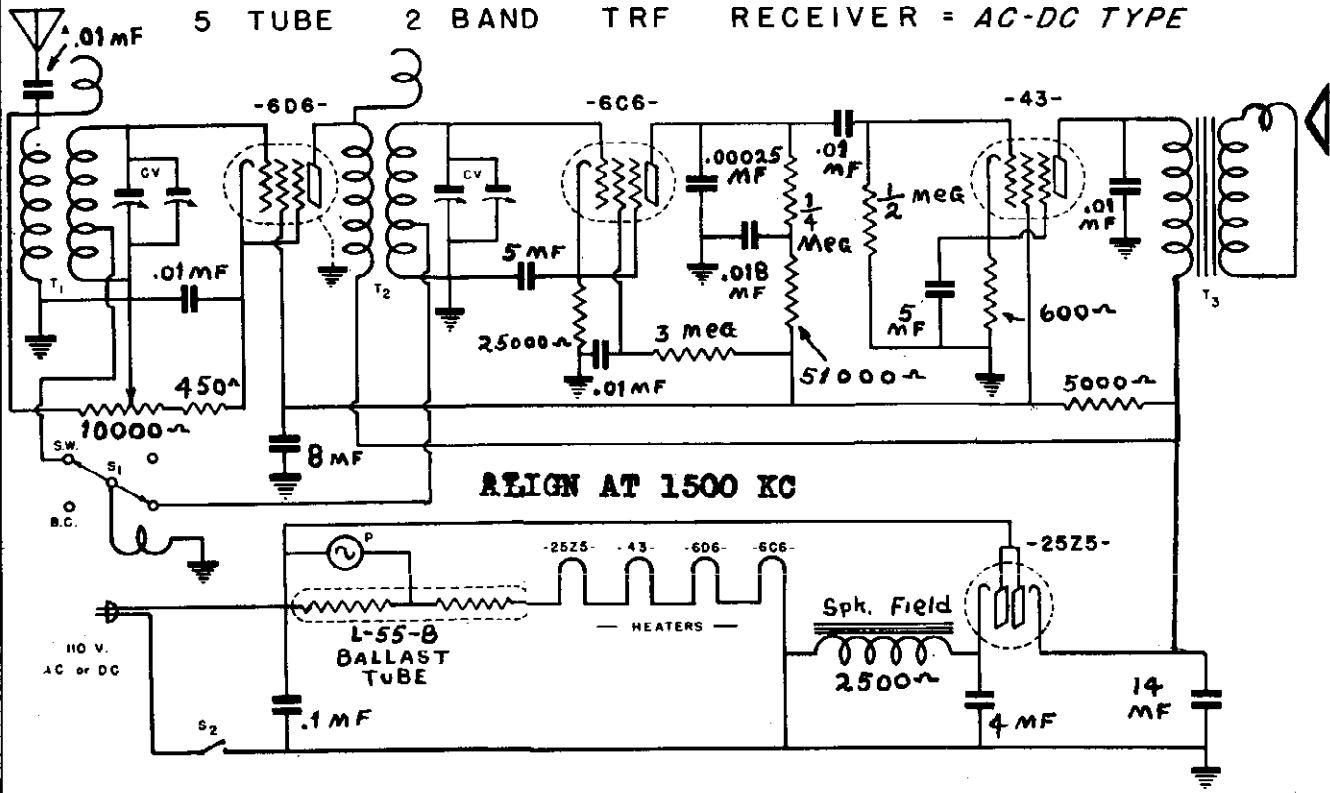
Z-55

5 TUBE 2 BAND TRF RECEIVER - AC-DC TYPE

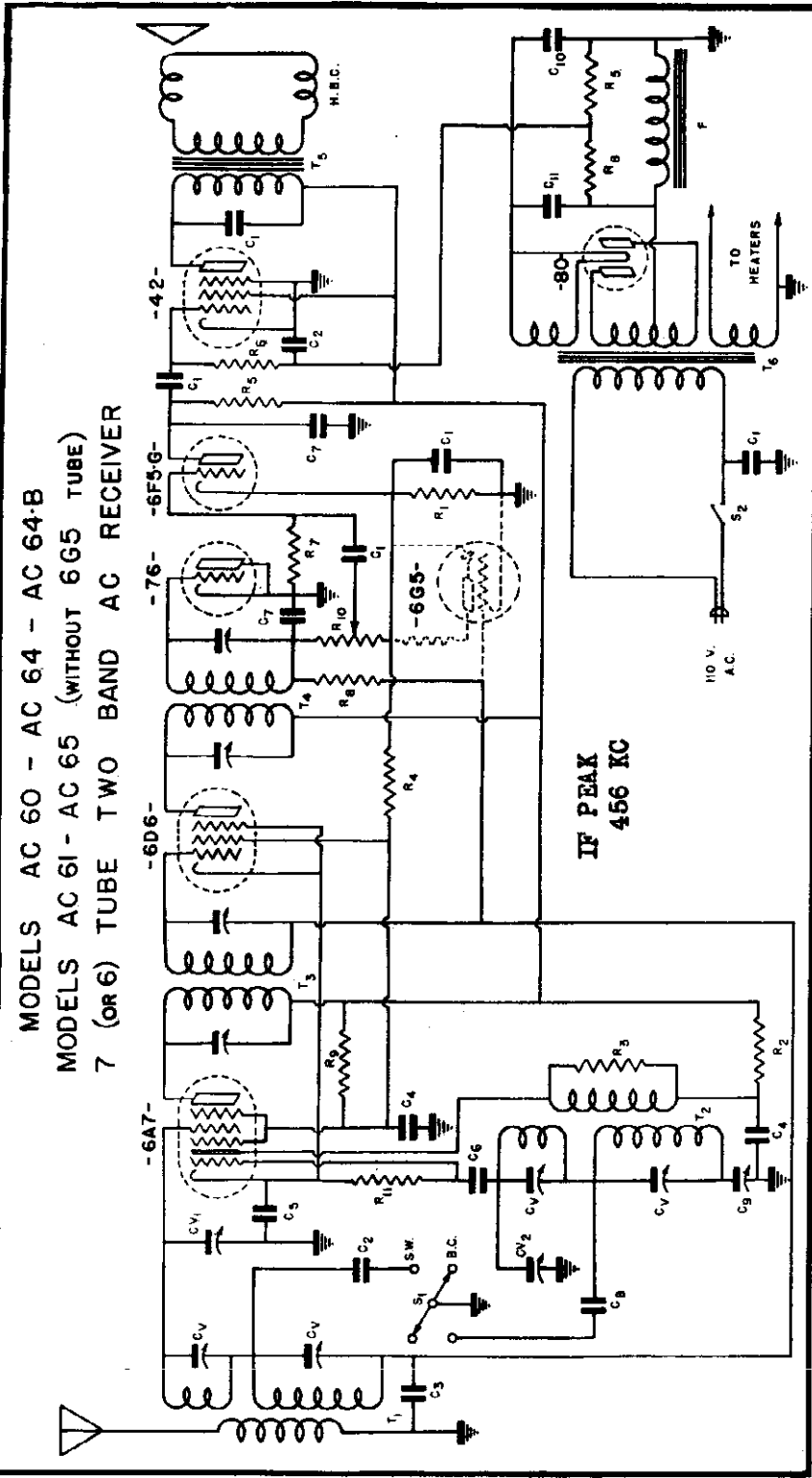


Q-69

5 TUBE 2 BAND TRF RECEIVER - AC-DC TYPE



CLIMAX RADIO & TELEV. CO., INC.



MODELS AC 60 - AC 64 - AC 64B
 MODELS AC 61 - AC 65 (WITHOUT 6G5 TUBE)
 7 (OR 6) TUBE TWO BAND AC RECEIVER

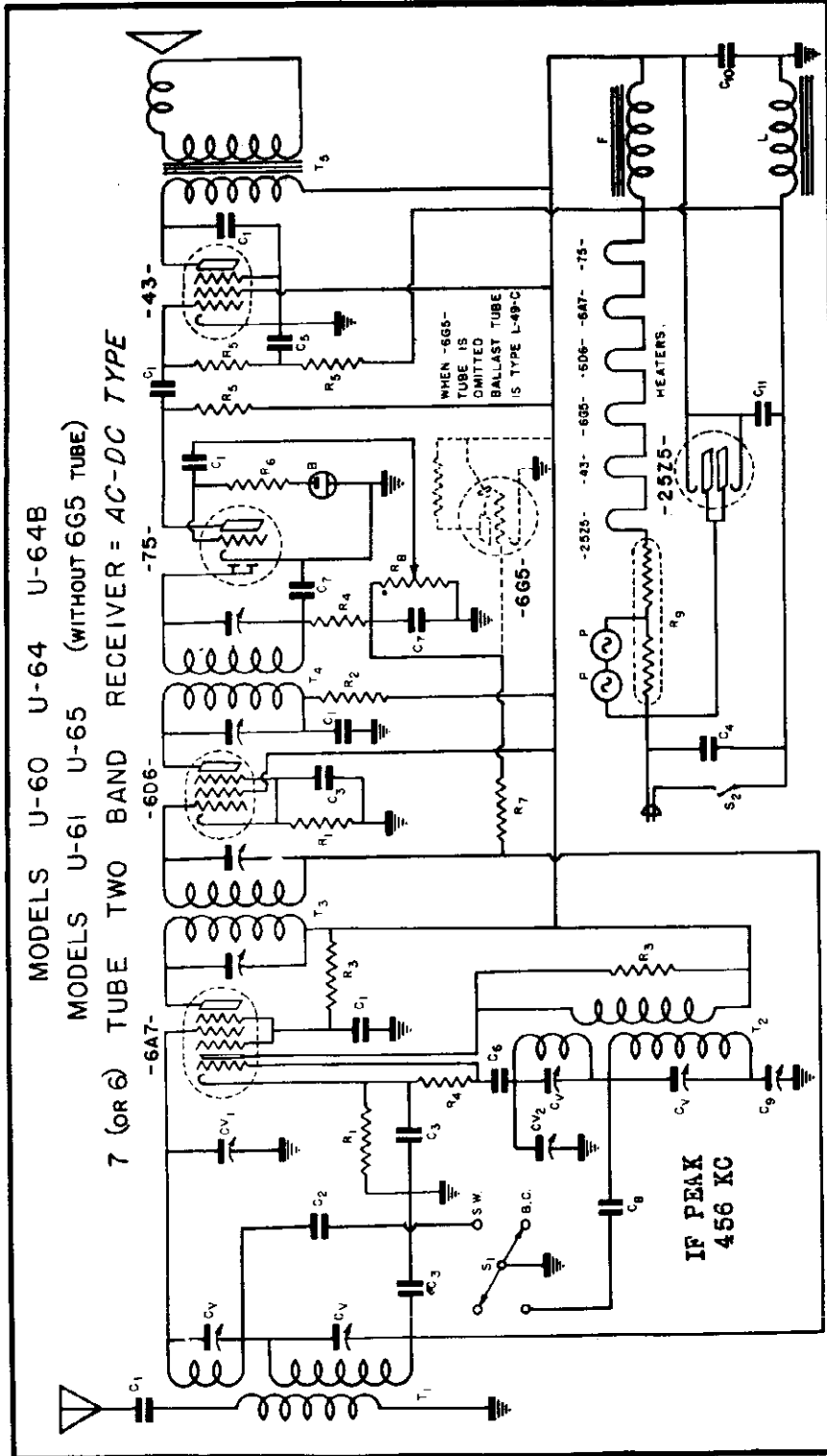
OUR LEGEND PART NO.	DESCRIPTION
R1	400 OHM 1/2 WATT CARBON RESISTOR
R2	10,000 OHM 1/2 WATT CARBON RESISTOR
R3	25,000 OHM 1/2 WATT CARBON RESISTOR
R4	50,000 OHM 1/2 WATT CARBON RESISTOR
R5	250,000 OHM 1/2 WATT CARBON RESISTOR
R6	350,000 OHM 1/2 WATT CARBON RESISTOR
R7	500,000 OHM 1/2 WATT CARBON RESISTOR
R8	1 MEG OHM 1/2 WATT CARBON RESISTOR
R9	25,000 OHM 1/2 WATT CARBON RESISTOR
R10	500,000 OHM VOLUME CONTROL
R11	250 OHM 1/2 WATT CARBON RESISTOR

OUR LEGEND PART NO.	DESCRIPTION
CV1-2	2 GANG VARIABLE CONDENSER
C10	4 MFD 600 PV ELECTROLYTIC COND.
C11	8 MFD 600 PV ELECTROLYTIC COND.
T1	12 10' ANTENNA COIL
T2	14 04' OSCILLATOR COIL
T3	15 07' OUTPUT I F TRANSFORMER
T4	15 03' INPUT I F TRANSFORMER
T5	1R SPEAKER TRANSFORMER
S1	19 14 BAND SELECTOR SWITCH
S2	— LINE SWITCH ON VOLUME CONTROL
F	16 11 1800 OHM SPEAKER FIELD

OUR LEGEND PART NO.	DESCRIPTION
C1	0.1 MFD 400 V. TUBULAR CONDENSER
C2	0.5 MFD 200 V. TUBULAR CONDENSER
C3	1 MFD 200V. TUBULAR CONDENSER
C4	1 MFD 400V. TUBULAR CONDENSER
C5	25 MFD 200V. TUBULAR CONDENSER
C6	400 0001 MICA CONDENSER
C7	4 01 00025 MICA CONDENSER
C8	41 1 00128 MICA CONDENSER
C9	5 07 5 PLATE PADDING CONDENSER
CV	5-30 MFD TRIMMER CONDENSER

MODELS U60, U61, U64
U64B, U65
Schematic, Parts

CLIMAX RADIO & TELEV. CO., INC.



OUR LEGEND PART NO.	DESCRIPTION
T1	1210 ANTENNA COIL
T2	1404 OSCILLATOR COIL
T3	1507 OUTPUT IF TRANSFORMER
T4	1503 INPUT IF TRANSFORMER
T5	300 SPEAKER TRANSFORMER
L	1100 FILTER CHOKE
S1	1914 BAND SELECTOR SWITCH
S2	LINE SWITCH ON VOLUME CONTROL
P	2902 MAZDA #46 PILOT LIGHT
B	3000 BIAS CELL
F	300 SPEAKER FIELD (2500 OHMS)

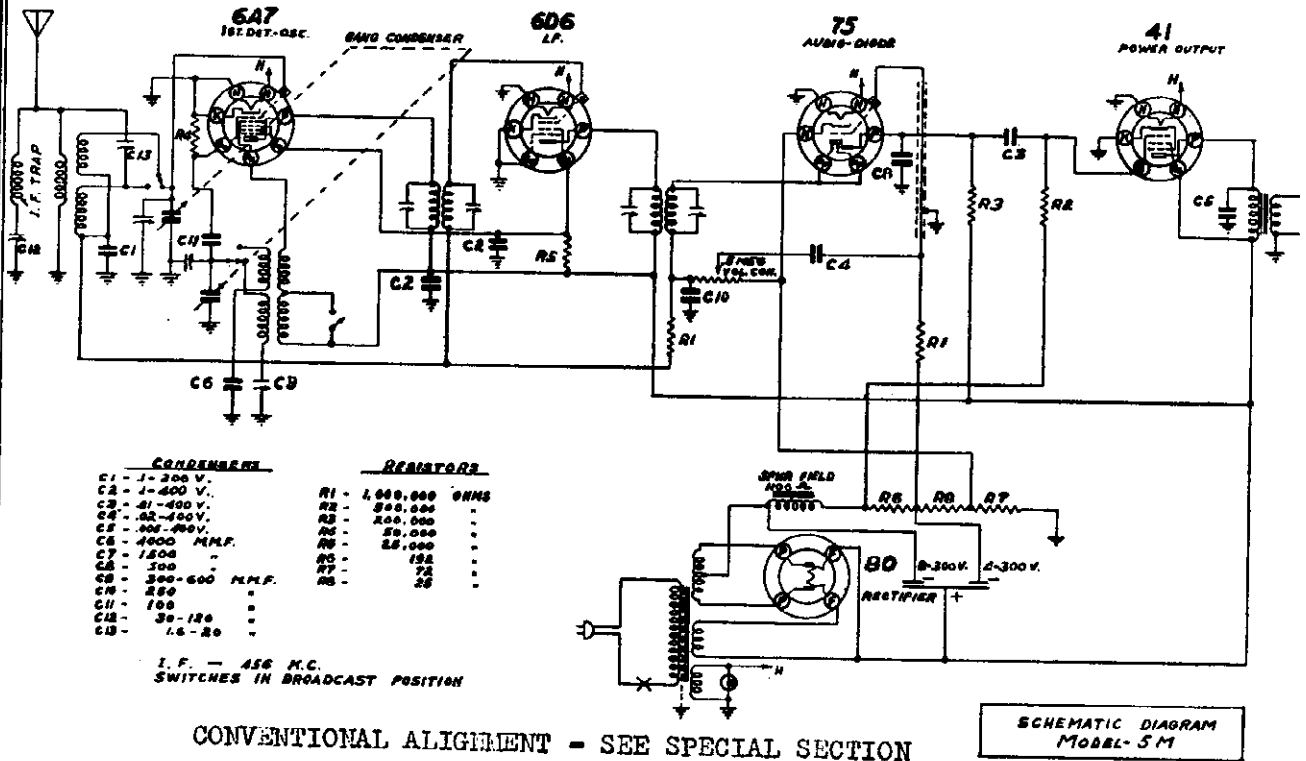
OUR LEGEND PART NO.	DESCRIPTION
CV1-2	612-A 2 GANG VARIABLE CONDENSER
CV	500 5-30 MFD TRIMMER CONDENSER
R1	103 250 OHM 1/2 WATT CARBON RESISTOR
R2	116 2000 OHM 1/2 WATT CARBON RESISTOR
R3	111 25000 OHM 1/2 WATT CARBON RESISTOR
R4	113 50000 OHM 1/2 WATT CARBON RESISTOR
R5	116 250,000 OHM 1/2 WATT CARBON RESISTOR
R6	117 500,000 OHM 1/2 WATT CARBON RESISTOR
R7	119 1 MEG OHM 1/2 WATT CARBON RESISTOR
R8	2009 500,000 OHM VOLUME CONTROL
R9	2906 L-42-C BALLAST TUBE (with 6G5 tube)
R9	2905 L-49-C BALLAST TUBE (without 6G5 tube)

OUR LEGEND PART NO.	DESCRIPTION
C1	211 .01 MFD 400V TUBULAR CONDENSER
C2	206 .05 MFD 200V TUBULAR CONDENSER
C3	203 .1 MFD 200V TUBULAR CONDENSER
C4	210 .1 MFD 400V TUBULAR CONDENSER
C5	204 .25 MFD 200V TUBULAR CONDENSER
C6	400 .0001 MICA CONDENSER
C7	401 .00025 MICA CONDENSER
C8	411 .00125 MICA CONDENSER
C9	507 5 PLATE PADDING CONDENSER
C10	314 10 MFD 50 WV WET ELECTROLYTIC COND.
C11	311 20 MFD 150 WV WET ELECTROLYTIC COND.

V.F.S.

CONTINENTAL RADIO & TELEV. CORP.

MODEL 5M Chassis
Schematic, Sock
Trimmers,
Alignment



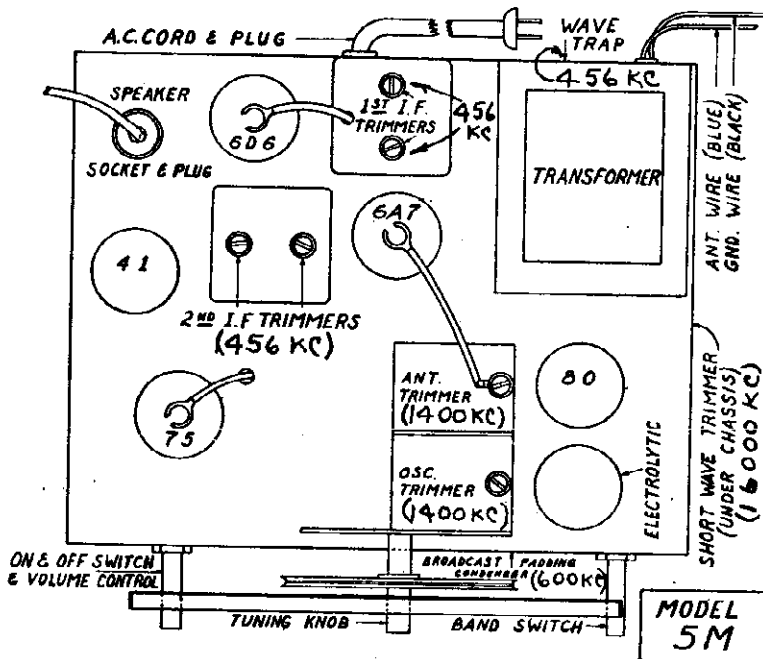
CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION

SCHEMATIC DIAGRAM
MODEL-5M

FREQUENCY RANGE -
535 to 1750 - KC
5600 to 18100 - KC

5 Tube AC Superheterodyne
5M Chassis

This receiver is designed to operate from a power supply main of 110-120 volt, 60 cycle alternating current (AC). **Never plug into a DC outlet.**



ANTENNA
Use a standard outside antenna of at least 50 feet including lead-in. Connect the antenna to the "Blue" lead.

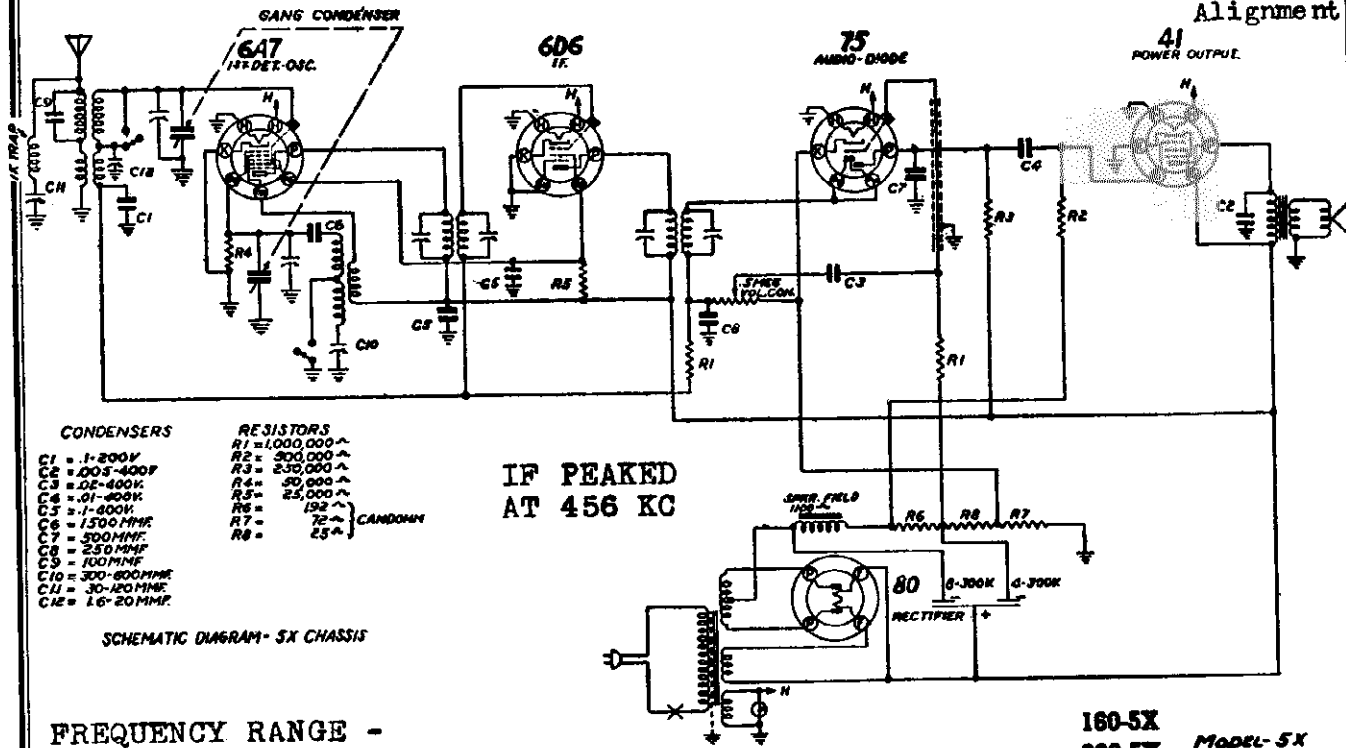
In remote locations that are far away from powerful broadcasting stations, a longer antenna may be used for increased receiving range. Antennas as long as 150 to 200 feet may be employed in "dead spots." (Longer antennas increase sensitivity and decrease selectivity slightly.)

The ground wire should be connected to the "Black" lead.

MODELS 160-5X, 980-5X
Chassis 5X

CONTINENTAL RADIO & TELEV. CORP.

Schematic
Trimmers
Socket
Alignment



- CONDENSERS**
- C1 = .1-200V
 - C2 = .005-400F
 - C3 = .02-400K
 - C4 = .01-400K
 - C5 = .1-400V
 - C6 = 1500MMF
 - C7 = 500MMF
 - C8 = 250MMF
 - C9 = 100MMF
 - C10 = 300-600MMF
 - C11 = 30-120MMF
 - C12 = 1.6-20MMF

- RESISTORS**
- R1 = 1,000,000 Ω
 - R2 = 500,000 Ω
 - R3 = 250,000 Ω
 - R4 = 50,000 Ω
 - R5 = 25,000 Ω
 - R6 = 192 Ω
 - R7 = 72 Ω
 - R8 = 25 Ω
- CANDOM

IF PEAKED
AT 456 KC

SCHEMATIC DIAGRAM - 5X CHASSIS

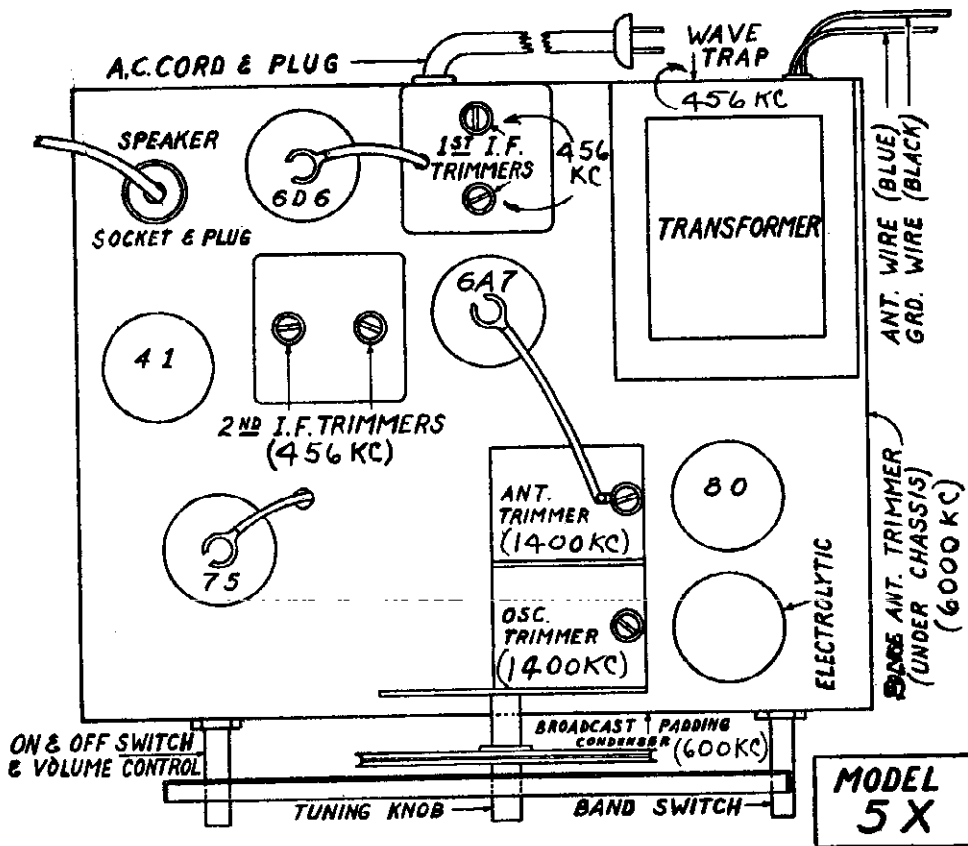
FREQUENCY RANGE -

535 to 1750 KC
5600 to 18100 KC

160-5X
980-5X Model-5X

**5 Tube AC Superheterodyne
5X Chassis**

CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION



**MODEL
5X**

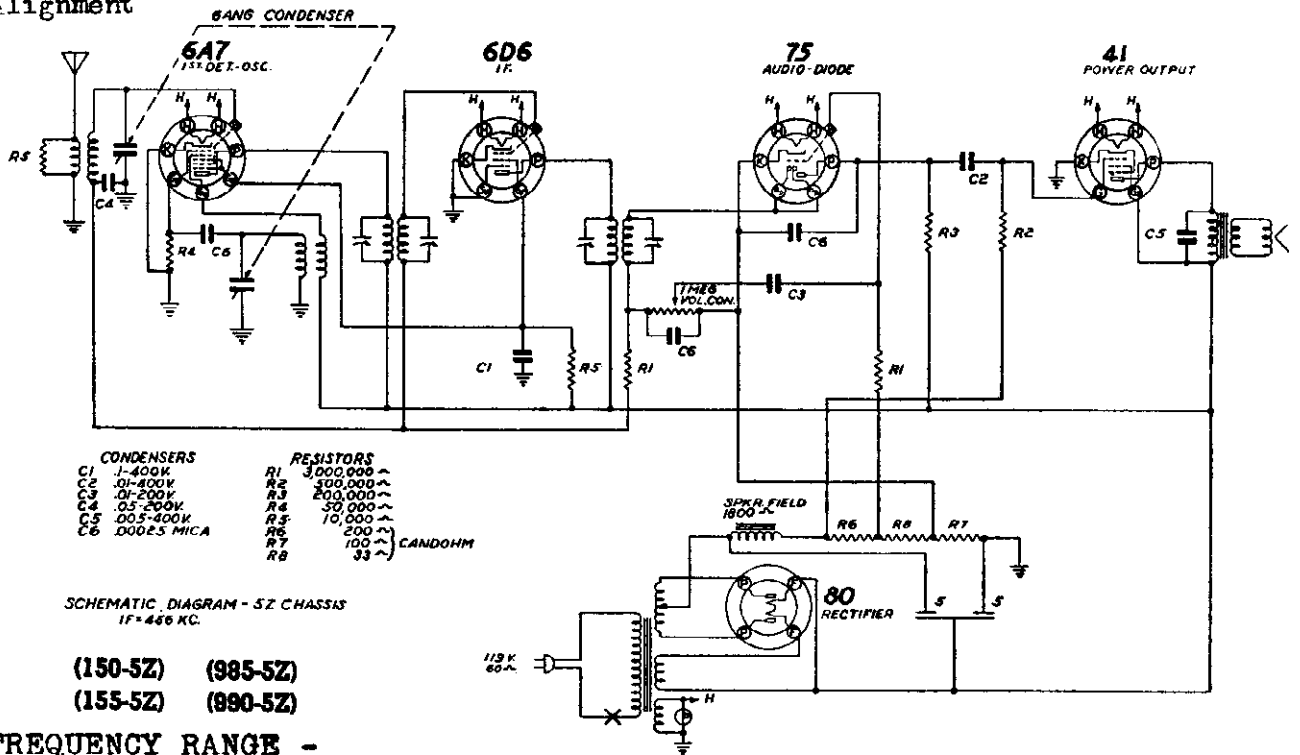
Schematic
Trimmers
Socket
Alignment

CONTINENTAL RADIO & TELEVISION CORP.

MODELS 150-5Z, 155-5Z

985-5Z, 990-5Z

Chassis 5Z



CONDENSERS		RESISTORS	
C1	1-400K	R1	3,000,000 Ω
C2	0.1-400V	R2	300,000 Ω
C3	0.1-200V	R3	200,000 Ω
C4	0.5-200V	R4	50,000 Ω
C5	0.05-400K	R5	10,000 Ω
C6	0.0025 MICA	R6	200 Ω
		R7	100 Ω
		R8	33 Ω

CANDOHM

SCHEMATIC DIAGRAM - 5Z CHASSIS
IF = 456 KC.

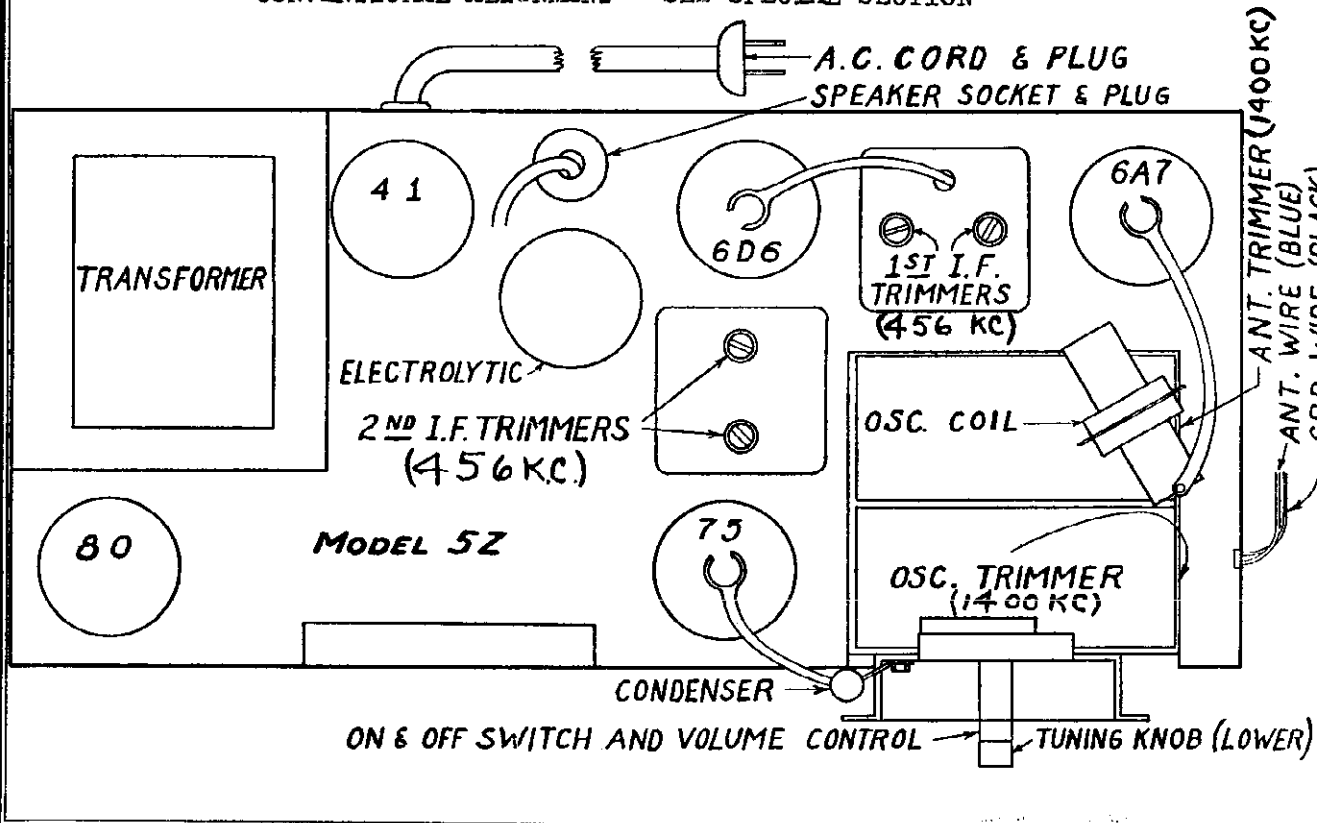
(150-5Z) (985-5Z)
(155-5Z) (990-5Z)

FREQUENCY RANGE -
535 to 1720 KC

Model-5Z

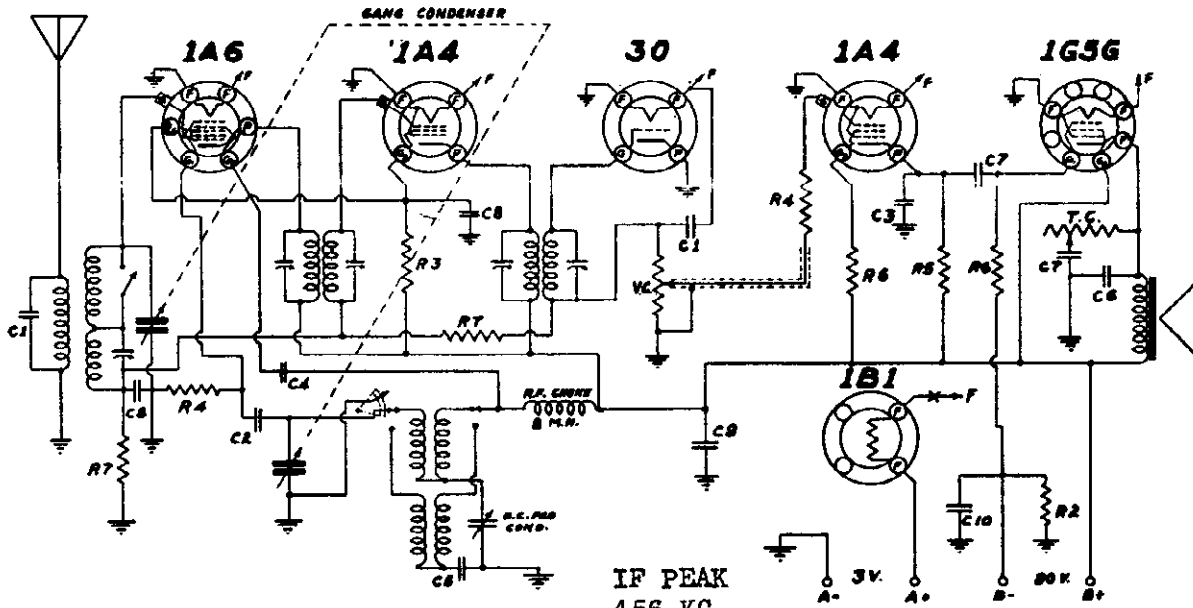
Five Tube A C Superheterodyne 5Z Chassis

CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION



MODEL 6Q Chassis
Schematic, Socket
Trimmers, Alignment
Battery Connections

CONTINENTAL RADIO & TELEV. CORP.



IF PEAK
456 KC

V.C. - VOLUME CONTROL - 1 MEGOHM.
T.C. - TONE CONTROL - 100,000 OHMS.
SWITCHES IN BROADCAST POSITION.

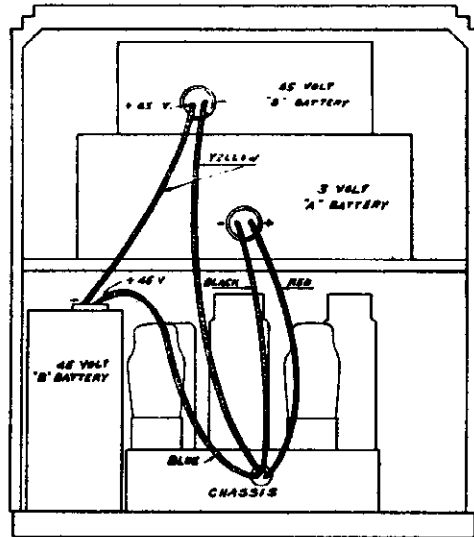
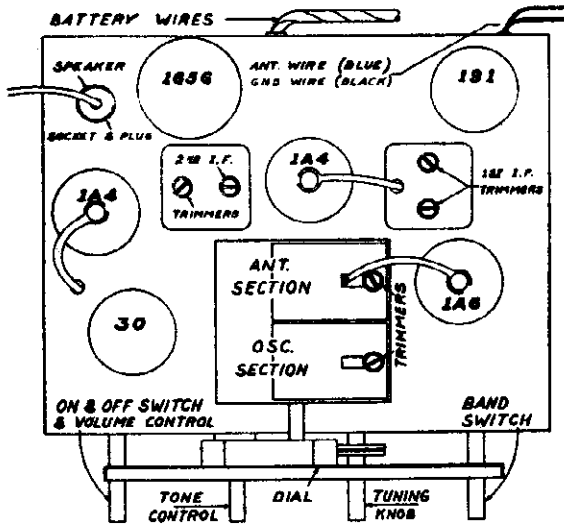
FREQUENCY RANGE -
535 to 1730 KC
2.2 to 6.5 MC

CONDENSERS	
NO.	M.F.D.
1	.0001 MICA
2	.00025
3	.0005
4	.001
5	.0015
6	.002 200 VOLTS
7	.01 200
8	.05 200
9	.25

10 10.0 ELECT. 25 V.

RESISTORS		
NO.	OHMS	WATTS
1	50.	1/2
2	535. ± 5%	1/2
3	10,000.	1/2
4	50,000.	1/2
5	200,000.	1/2
6	1. MEG.	1/2
7	2. MEG.	1/2

**SCHEMATIC DIAGRAM
MODEL 6Q**



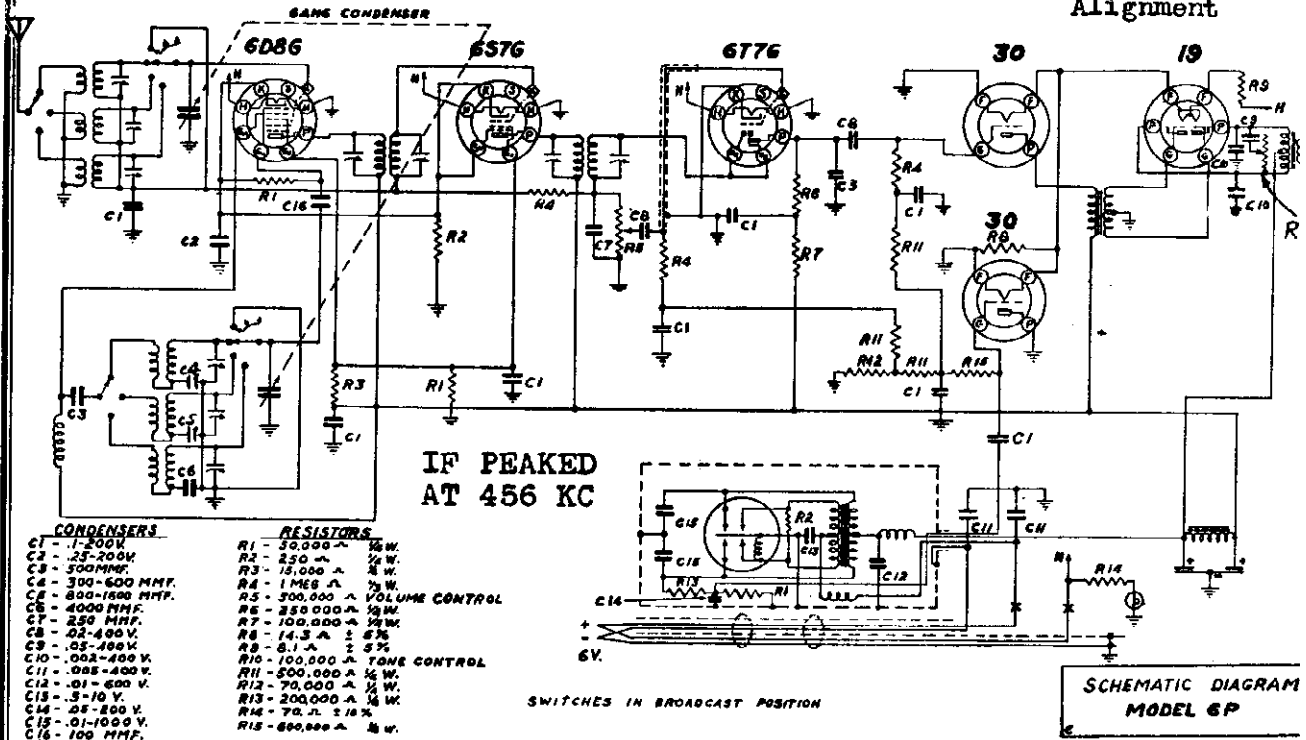
IF ALIGNMENT - Wave change Sw. in BC position. Gang condenser at minimum, generator at 456 KC, output to 1A6 CG thru .05 MFD condenser, Generator grounded to receiver, align four trimmers of IF transformers.

BROADCAST - Generator connected to antenna lead thru 200 MMFD condenser, and set at 1400 KC. Gang condenser at minimum. Trim oscillator then Antenna trimmers. Pad the oscillator circuit at 600 KC while rooking gang condenser.

SHORT WAVE - Generator at 6000 KC, start rotating gang condenser from HF end, when signal is heard, adjust antenna trimmer (SW) for maximum peak. Repeat all adjustments for maximum performance.

CONTINENTAL RADIO & TELEV. CORP.

MODEL 6P Chassis
Schematic,
Alignment



IF PEAKED
AT 456 KC

- | CONDENSERS | RESISTORS |
|--------------------|-------------------------------|
| C1 - 1-200K | R1 - 50,000 Ω 1/2 W. |
| C2 - 25-200K | R2 - 250 Ω 1/2 W. |
| C3 - 500MMF. | R3 - 15,000 Ω 1/2 W. |
| C4 - 300-600 MMF. | R4 - 1 MΩ 1/2 W. |
| C5 - 600-1600 MMF. | R5 - 500,000 Ω VOLUME CONTROL |
| C6 - 4000 MMF. | R6 - 350,000 Ω 1/2 W. |
| C7 - 250 MMF. | R7 - 100,000 Ω 1/2 W. |
| C8 - 02-400 V. | R8 - 14.3 Ω 1/2 W. |
| C9 - 05-100 V. | R9 - 8.1 Ω 2 3/4 W. |
| C10 - 002-400 V. | R10 - 100,000 Ω TONE CONTROL |
| C11 - 005-400 V. | R11 - 500,000 Ω 1/2 W. |
| C12 - .01 - 600 V. | R12 - 70,000 Ω 1/2 W. |
| C13 - 5-10 V. | R13 - 200,000 Ω 1/2 W. |
| C14 - .01 - 200 V. | R14 - 70 Ω 1 1/2 W. |
| C15 - .01-1000 V. | R15 - 600,000 Ω 1/2 W. |
| C16 - 100 MMF. | |

FREQUENCY RANGE-
550 to 1700 KC
1700 to 5400 KC
5600 to 18100 KC

Six Tube 6 Volt Battery Superheterodyne 6P Chassis ALIGNMENT DATA AND SERVICING

GENERAL DATA

The alignment of this receiver requires the use of a test oscillator which will cover the frequencies of 456, 600, 1400, 1730, 1800, 4000, 5600, 6000, and 18,000 KC and an output meter which is to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible, to prevent the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE

The intermediate frequency (I.F. stage should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the Broadcast Band should always be the next procedure; after which, both of the Short Wave Bands may be aligned.

I.F. ALIGNMENT

With the wave switch in the broadcast band and the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (6D8G) through a .05 or .1 mfd. condenser. The ground on the test oscillator can be connected to the chassis ground. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT

Connect the output of the signal generator to the antenna lead (blue) through a .0002 mfd. mica condenser. Set the gang condenser to minimum and the oscillator to 1730 KC and adjust the "oscillator trimmer" to receive this signal. Make no other adjustments at this frequency. Then set the generator to 1400 KC and tune in this signal by rotating the gang to 1400 on the dial. Adjust the "antenna" trimmer to maximum signal. Set the signal generator to 600 KC and tune in the signal on the receiver. **Note:** Approximately the same sensitivity should be noted at this point as was at 1400 KC. The signal strength may sometimes be improved by padding the circuits. This is done by slowly increasing or decreasing the oscillator padding condenser and, at the

same time, continuously tuning back and forth across the signal with the receiver until the maximum reading is obtained on the output meter. This adjustment may seem a little complicated but is the easiest way to adjust the oscillator to the antenna. Retune to 1400 KC and again go over the adjustments of this frequency to be certain that they were not put slightly out of alignment when adjustment was made at 600 KC.

POLICE BAND ALIGNMENT

The police band is adjusted by first replacing the .004 dummy with a 400 ohm resistor and setting the gang to 5600 KC. With the gang set at minimum, adjust the "police oscillator trimmer" to receive this signal, then set the signal generator to 4000 KC and adjust "police antenna trimmer" to get maximum output. Next, set the oscillator to 1800 KC and "pad" the circuit at this frequency as described in the instructions for padding the broadcast circuits.

SHORT WAVE BAND ALIGNMENT

The short wave band is adjusted by setting the gang to 18,100 KC and with the gang at minimum, adjust the "short wave oscillator trimmer" to receive the signal. Set the generator at 16,000 KC and adjust the "short wave antenna" to get maximum output. As there is no variable low frequency padding condenser on this band, the sensitivity of the receiver should be checked at 6000 KC to determine whether the circuits are in line at this frequency. Should the receiver lack sensitivity at 6000 KC the antenna and oscillator coils, as well as the .004 mica padding condenser, should be tested for defects as sometimes these components become subject to mechanical or electrical injuries, despite their rugged construction and liberal ratings.

SERVICE DATA FOR ALL BANDS

If it is suspected that the oscillator has stopped but is doubtful due to the presence of the usual amount of noise level, it is suggested that the oscillator plate voltage be checked. To ascertain whether the tube is oscillating, ground the oscillator grid of the 6D8G (signal and rotor plates of oscillator section on gang condenser). Oscillating properly, grounding the grid will cause an appreciable drop in oscillator voltage.

MODEL 6P Chassis
Socket, Trimmers CONTINENTAL RADIO & TELEV. CORP.
Notes, Parts

tion does not in any way enter the interior of the battery.

ANTENNA

REGULAR ANTENNA Use a standard outside antenna of at least 50 feet including lead-in. Connect the antenna to the "Blue" lead.

In remote locations that are far away from powerful broadcasting stations, a longer antenna may be used for increased receiving range. Antennas as long as 150 to 200 feet may be employed in "dead spots." (Longer antennas increase sensitivity and decrease selectivity slightly.)

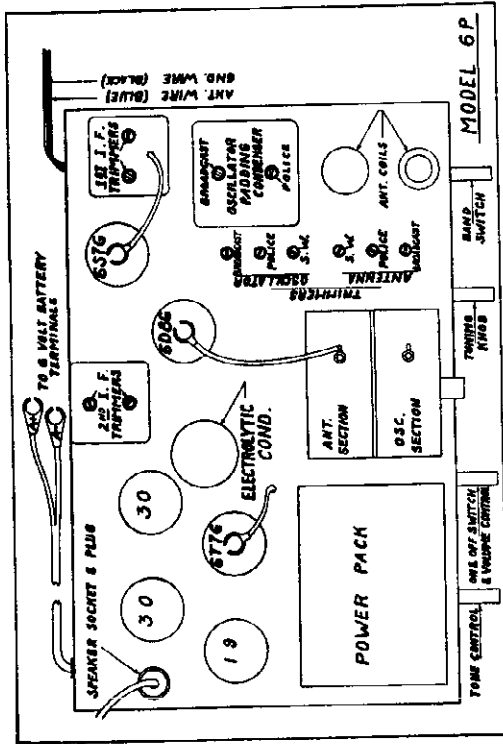
GROUND

This receiver requires a good ground. Water pipes make a very desirable ground connection. Where the wire makes contact, the pipe must be clean and free of paint or corrosion. The ground wire should be connected to the "Black" lead.

Where the above mentioned ground facilities are not available, a good outside ground may be had by staking a metal pipe or ground rod about six feet into moist earth. An excellent bed can be prepared by digging a hole and filling with charcoal, in which the ground rod is placed. The charcoal bed surrounding the ground rod will maintain a desirable moist condition throughout the year.

IMPORTANT NOTE: The battery must never be charged while set in operation. If a recharger, when it should always be disconnected from the set, is being used, an insulating switch can be used for disconnecting the battery from the set. This will increase the life of the tubes and give additional economy to the use of the receiver.

This receiver is designed to operate over three tuning ranges; the broadcast range which extends from 550 to 1700 Kilocycles (KC) (176 to 545 meters), Police and Aviation Band which extends from 1700 to 5400 Kilocycles (KC) (56 to 176 Meters) and the International Short Wave Band which extends from 5600 to 18,100 Kilocycles (KC) (16.5 to 53 Meters). This latter range is the one which includes the four internationally assigned bands—the 19, 25, 31 and 49 meter bands.



NOTICE — MICROPHONIC NOISE CORRECTION
 If this radio instrument appears to be microphonic during operation, loosen the four (4) mounting screws that secure the chassis to the cabinet and remove the two (2) wooden strips that are underneath the chassis. This allows the chassis to float and rest on the four (4) rubber pads used for this purpose. After the strips have been removed, adjust the

INSTALLATION

BATTERY CONNECTIONS At the rear of the receiver there will be found extending from the right end of the chassis, the battery connecting cable. Observation will show that 5 wires are brought out from the braided cable. The red and red with black tracer wires are joined together and should both be securely fastened to the positive (+) terminal of the 6 volt storage battery. The other 3 wires which are brown, black with green tracer and metallic shield lead are also joined together and should be securely connected to the negative (-) post of the battery.

Note: It is extremely important that only the best possible means of obtaining a secure connection to the battery terminals be employed. If a battery with auto-

mobile terminal posts is used, the large post is the positive (+) post; the smaller post is the negative (-) terminal. It is suggested, when using a battery with auto type posts that large heavy lead covered battery clips be used in making connections. Make sure that all wires are firmly connected to clips (solder if possible). Also see that the low teeth of the clips are clean, and firmly bite into the post. It is very important that the battery posts and battery clip teeth be cleaned at frequent intervals to assure maintaining good connections. Corrosion may be readily removed by cleaning with a solution of 3 tablespoons of bicarbonate of soda (baking soda) and one cup of water. This solution neutralizes the acid coating that causes the corrosion and leaves a protective condition that retards further corrosion. It is important that this solu-

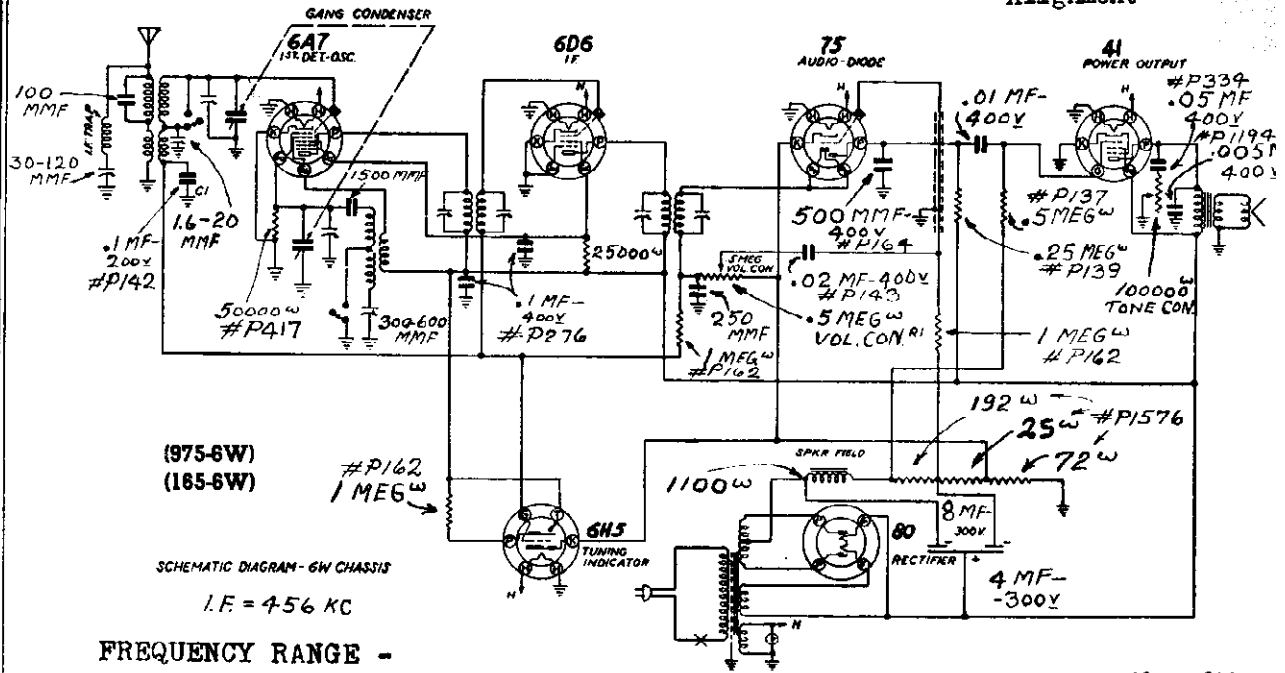
tion be used in the cabinet so that the dial will be in the center of the front escutcheon plate. Do not retighten the mounting screws.
 "Should this radio set be moved any great distance, it is best to put the wooden strips back under the chassis and have the mounting screws securely tightened. If this is not done, damage may be done to the instrument, cabinet or tubes."

- P1727 Antenna Coil
- P1728 Antenna Cable
- P1729 1/2" x 1/2" Dial
- P1730 Vibrator Socket
- P1731 Filter Choke
- P1732 Type 30 Socket
- P1733 Type 19 Socket
- P1734 Type 6B7G Socket
- P1735 Type 6BE6 Socket
- P1736 Speaker Socket
- P1737 1st I.F. Transformer
- P1738 Power Transformer
- P1739 Electrolytic Condenser
- P1740 6 Conductor
- P1741 Tube Socket
- P1742 Knob (Volume)
- P1743 Knob (Selector)
- P1744 Knob (Band Switch)
- P1745 Knob (Tone)
- P1746 Tone Control
- P1747 200,000 Ohm 1/3 Watt 20% Resistor
- P1748 200,000 Ohm 1/3 Watt 20% Resistor
- P1749 1 Megohm 1/3 Watt Resistor
- P1750 1.43 Ohm 1/2 Watt 5% Wire Wound Resistor
- P1751 81 Ohm 1/2 Watt 5% Wire Wound Resistor
- P1752 1.2 Mid. 200 Volt Condenser
- P1753 .02 Mid. 400 Volt Condenser
- P1754 .02 Mid. 400 Volt Condenser
- P1755 .02 Mid. 400 Volt Condenser
- P1756 .02 Mid. 400 Volt Condenser
- P1757 .02 Mid. 400 Volt Condenser
- P1758 .01 Meg. 1000 Volt Condenser
- P1759 .005 Mid. 400 Volt Condenser
- P1760 .005 Mid. 400 Volt Condenser
- P1761 .0005 Mid. Mica Condenser
- P1762 .0005 Mid. Mica Condenser
- P1763 .0005 Mid. Mica Condenser
- P1764 .0025 Mid. Mica Condenser
- P1765 .0025 Mid. Mica Condenser
- P1766 Rubber Mounting Pads
- P1767 Gang Condenser
- P1768 Volume Control and Switch
- P1769 Trimmer Condenser
- P1770 Potentiometer
- P1771 Bond Switch
- P1772 Pilot Light Socket
- P1773 Pilot Light Bulb
- P1774 Dial Scale
- P1775 2nd I.F. Transformer
- P1776 E. P. M. Speaker
- P1777 E. P. M. Speaker for Console
- P1778 20,000 Ohm 1/4 Watt 20% Resistor
- P1779 250 Ohm 1/4 Watt 20% Resistor
- P1780 70 Ohm 1/2 Watt 10% Wire Wound Resistor
- P1781 250 Ohm 1/4 Watt 20% Resistor
- P1782 500 Ohm 1/4 Watt 20% Resistor
- P1783 15,000 Ohm 1/4 Watt 20% Resistor
- P1784 100,000 Ohm 1/4 Watt 20% Resistor
- P1785 50,000 Ohm 1/4 Watt 20% Resistor
- P1786 .05 Mid. 200 Volt Condenser
- P1787 .05 Mid. 200 Volt Condenser
- P1788 .05 Mid. 200 Volt Condenser
- P1789 .01 Meg. 1000 Volt Condenser
- P1790 .005 Mid. 400 Volt Condenser
- P1791 .005 Mid. 400 Volt Condenser
- P1792 .0005 Mid. Mica Condenser
- P1793 .0005 Mid. Mica Condenser
- P1794 .0025 Mid. Mica Condenser
- P1795 .0025 Mid. Mica Condenser

Chassis 6W

CONTINENTAL RADIO & TELEV. CORP.

MODELS 165-6W, 975-6W
Schematic, Socket
Trimmers, Parts
Alignment



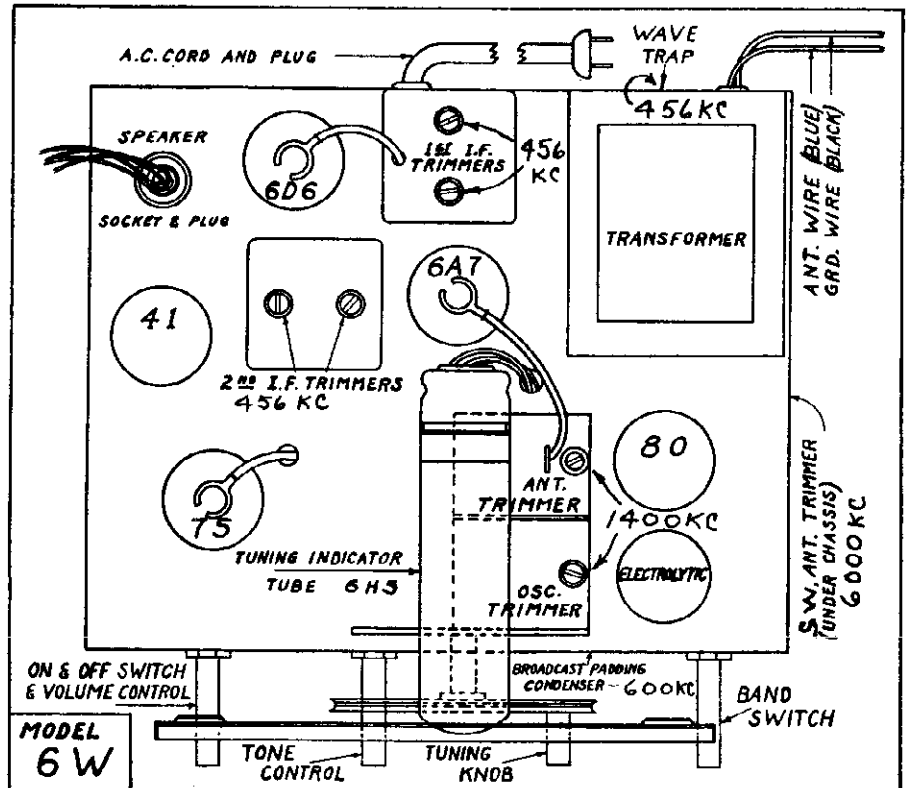
FREQUENCY RANGE -
535 to 1750 KC
5600 to 18100 KC

CONVENTIONAL ALIGNMENT -SEE SPECIAL SECTION

MODEL-6W

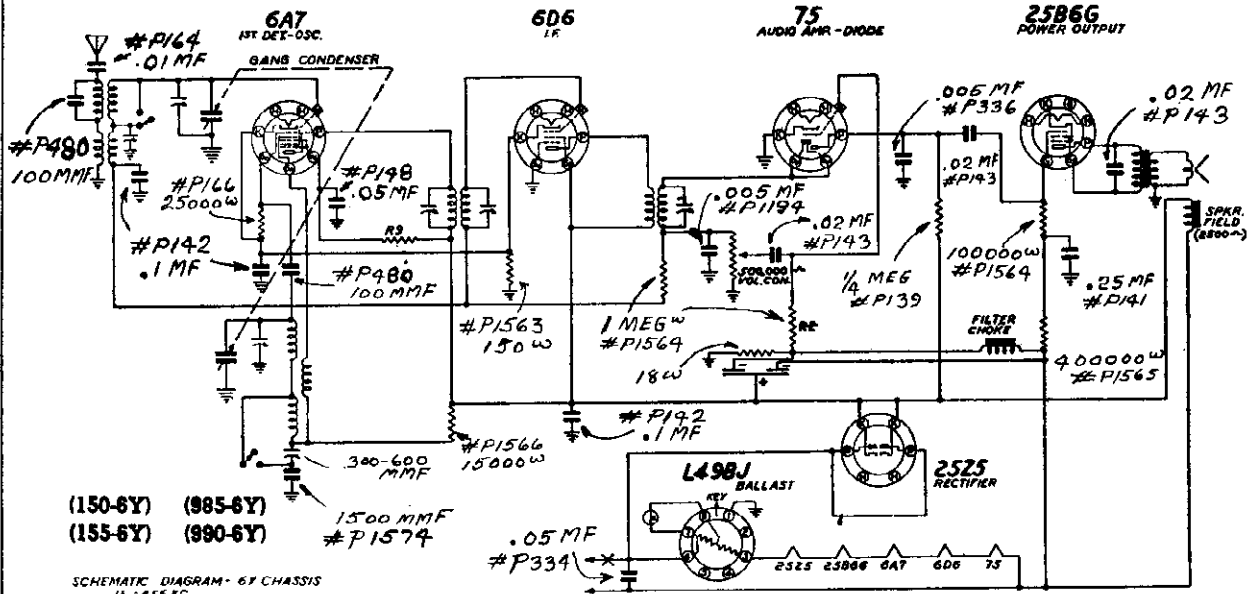
6 Tube AC Superheterodyne 6W Chassis

- P1368 4 Prong Socket
- P1277 Type 41 Socket
- P521 Type 75 Socket
- P492 Type 80 Socket
- P506 Type 6A7 Socket
- P536 Type 6D6 Socket
- P617 Padding Condenser
- P1576 Candohm Resistor
- P1577 Trimmer Cond. with Bracket
- P1578 Gang Condenser
- P1663 Dial Pointer
- P1641 Dial Scale
- P1642 Tone Control
- P334 .05 Mid. 400V Condenser
- P1643 Escutcheon
- P1672 Selector Knob
- P1673 Tone Knob
- P1674 Volume Knob
- P1875 Band Switch Knob
- P166 25,000 Ohm 1/4 Watt Resistor
- P417 50,000 Ohm 1/4 Watt Resistor
- P162 1 Megohm 1/4 Watt Resistor
- P139 250,000 Ohm 1/4 Watt Resistor
- P137 500,000 Ohm 1/4 Watt Resistor
- P817 .00025 Mid. Mica Condenser
- P336 .005 Mid. Mica Condenser
- P1194 .005 Mid. 400V Condenser
- P142 .1 Mid. 200V Condenser
- P164 .01 Mid. 400V Condenser
- P276 .1 Mid. 400V Condenser
- P916 1st I.F. Transformer Coil
- P1579 Volume Control and Switch
- P143 .02 Mid. 400V Condenser
- P1580 Band Change Switch
- P1581 Oscillator Coil
- P1582 Antenna Coil
- P1557 Riveted Mica Condenser
- P1503 Pilot Light Socket
- P1504 Pilot Light Bulb
- P914a Power Transformer
- P929 AC Cord and Plug
- P1591 Elec. Condenser
- P917 2nd I.F. Transformer
- P1455 Tube Shield
- P1645 Magic Eye Socket & Cable Assembly
- P1574 .0015 Mica Condenser



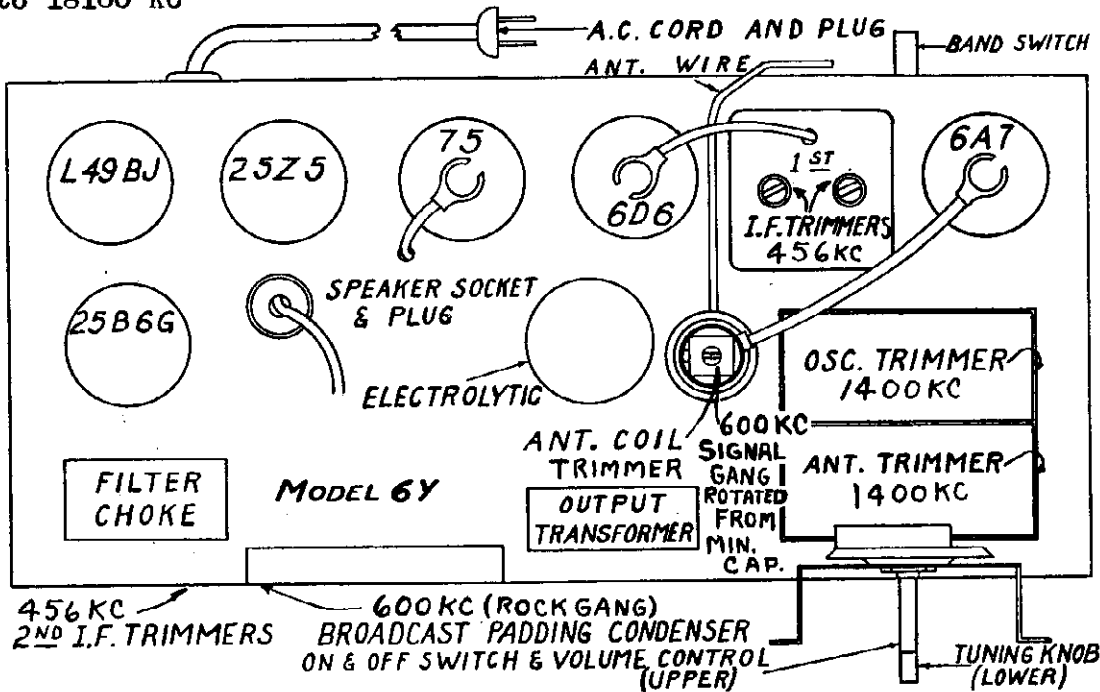
MODELS 150-6Y, 155-6Y
 985-6Y, 990-6Y CONTINENTAL RADIO & TELEV. CORP.
 Chassis 6Y

Schematic, Socket
 Trimmers, Alignment
 Parts



FREQUENCY RANGE- 535 to 1750 KC
 5600 to 18100 KC
Six Tube AC-DC Superheterodyne
6Y Chassis

Model 6Y



Part No.	Description
P506	Socket, Type 6A7
P521	Socket, Type 7S
P536	Socket, Type 6D6
P559	Socket, Type 25Z5
P1549	Socket, Type L49BJ
P1550	Socket, Type 25B6G
P530	Tube Shield
P1647	Trimmer
P816	1st L.F. Transformer
P829	AC Cord & Plug
P1489	Pointer
P1491	Dial Glass
P1498	Rubberized Bell
P1497	Takeup Spring
P1498	Drive Bushing
P1503	Pilot Light Socket
P1504	Pilot Light Bulb
P1508	Baffle Board

CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION

P1542	Gang Condenser
P1543	Dial Scale
P1551	Iron Core Filter Choke
P1552	Output Transformer
P1555	Volume Control & Switch
P1556	Antenna Coil
P1558	2nd L.F. Transformer
P1559	Oscillator Coil
P1560	Speaker
P1561	Electrolytic Condenser
P1562	Band Change Switch
P1568	Knob, (Specify Color)
P1566	20 Antenna Cord

P148	.05 Mid. 200 V
P164	.01 Mid. 400 V
P334	.05 Mid. 400 V
P336	.0005 Mica Condenser
P480	.0001 Mica Condenser
P1574	.0015 plus or 5% Mica
P1557	Riveted Mica Condenser

RESISTORS

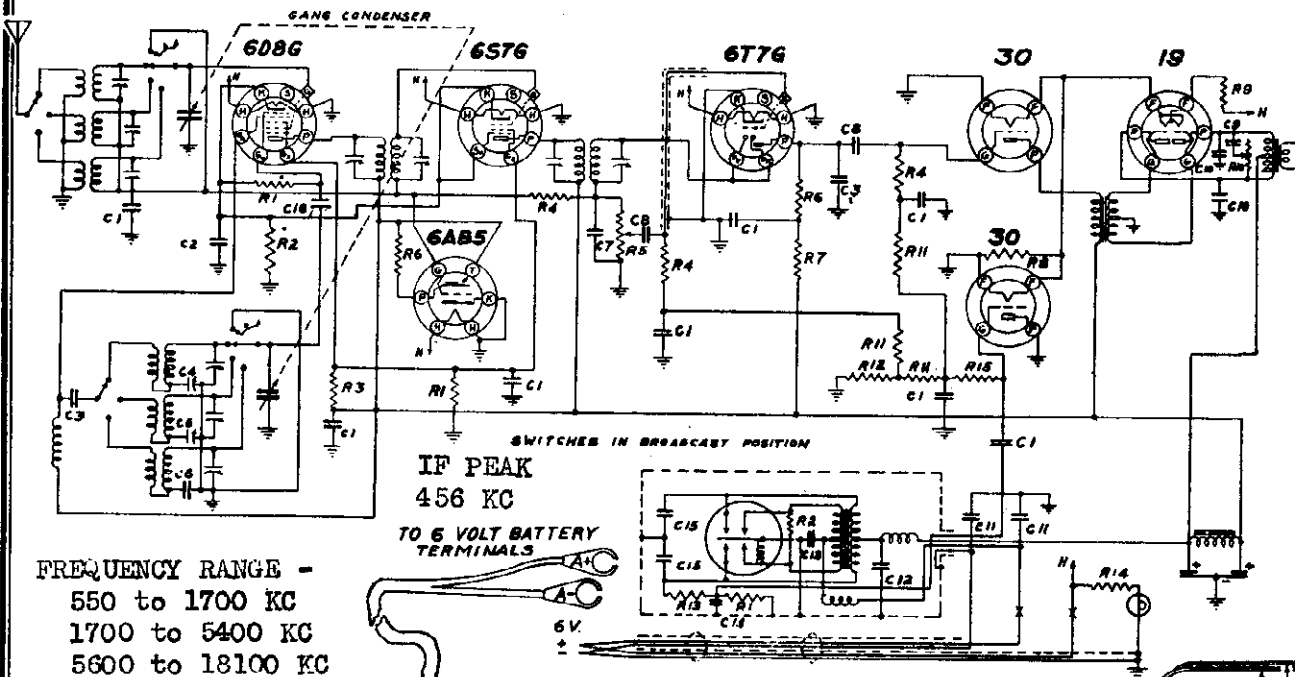
P1567	Condohm Resistor
P166	25,000 1/4 Watt
P419	20,000 1/4 Watt
P1563	150 1/3 Watt
P139	250,000 1/4 Watt
P162B	1 Megohm 1/3 Watt
P1564	100,000 Ohm 1/3 Watt
P1565	400,000 Ohm 1/3 Watt
P1566	15,000 Ohm 1/3 Watt

CONDENSERS

P141	.25 Mid. 200 V
P142	.1 Mid. 200 V
P143	.02 Mid. 200 V

CONTINENTAL RADIO & TELEV. CORP.

MODEL 7J Chassis
Schematic, Socket
Trimmers, Alignme
Parts

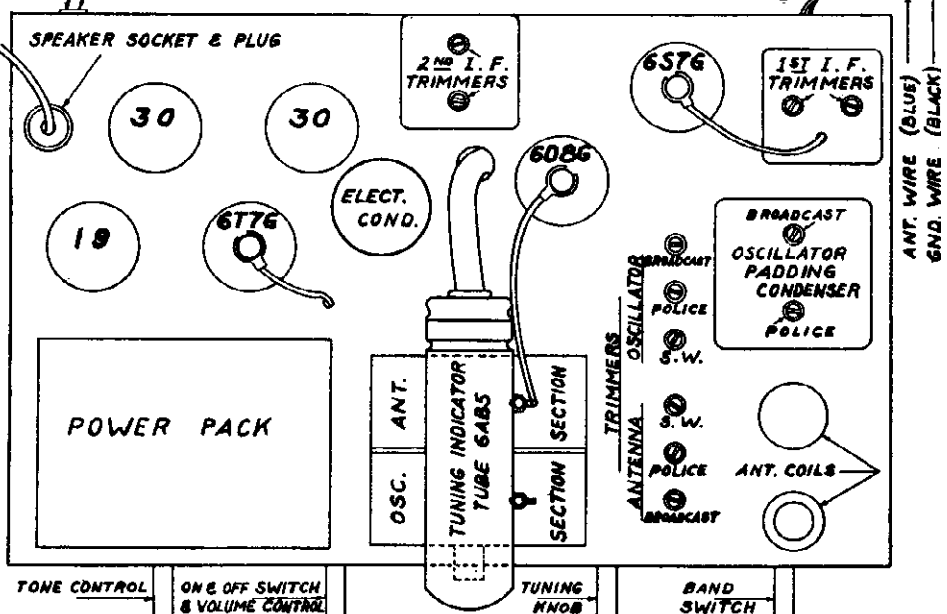


FREQUENCY RANGE -
550 to 1700 KC
1700 to 5400 KC
5600 to 18100 KC

MODEL 7J
6-17-37

PARTS

- CONDENSERS**
 C1 - 1-200V.
 C2 - .25-100V.
 C3 - 500MMF.
 C4 - 300-600MMF.
 C5 - 600-1850MMF.
 C6 - 4000MMF.
 C7 - 250MMF.
 C8 - .05-500V.
 C9 - .05-400V.
 C10 - .005-450V.
 C11 - .005-250V.
 C12 - .01-500V.
 C13 - .2-10V.
 C14 - .05-200V.
 C15 - .01-1000V.
 C16 - 100MMF.
- RESISTORS**
 R1 - 50,000 Ω $\frac{1}{2}$ W.
 R2 - 250 Ω $\frac{1}{2}$ W.
 R3 - 15,000 Ω $\frac{1}{2}$ W.
 R4 - 1,000 Ω $\frac{1}{2}$ W.
 R5 - 500,000 Ω VOLUME CONTROL
 R6 - 250,000 Ω $\frac{1}{2}$ W.
 R7 - 100,000 Ω $\frac{1}{2}$ W.
 R8 - 14.3 Ω 2 $\frac{1}{2}$ W.
 R9 - 21 Ω 2 $\frac{1}{2}$ W.
 R10 - 100,000 Ω TONE CONTROL
 R11 - 500,000 Ω $\frac{1}{2}$ W.
 R12 - 70,000 Ω $\frac{1}{2}$ W.
 R13 - 200,000 Ω $\frac{1}{2}$ W.
 R14 - 70 Ω 1 $\frac{1}{2}$ W.
 R15 - 600,000 Ω $\frac{1}{2}$ W.



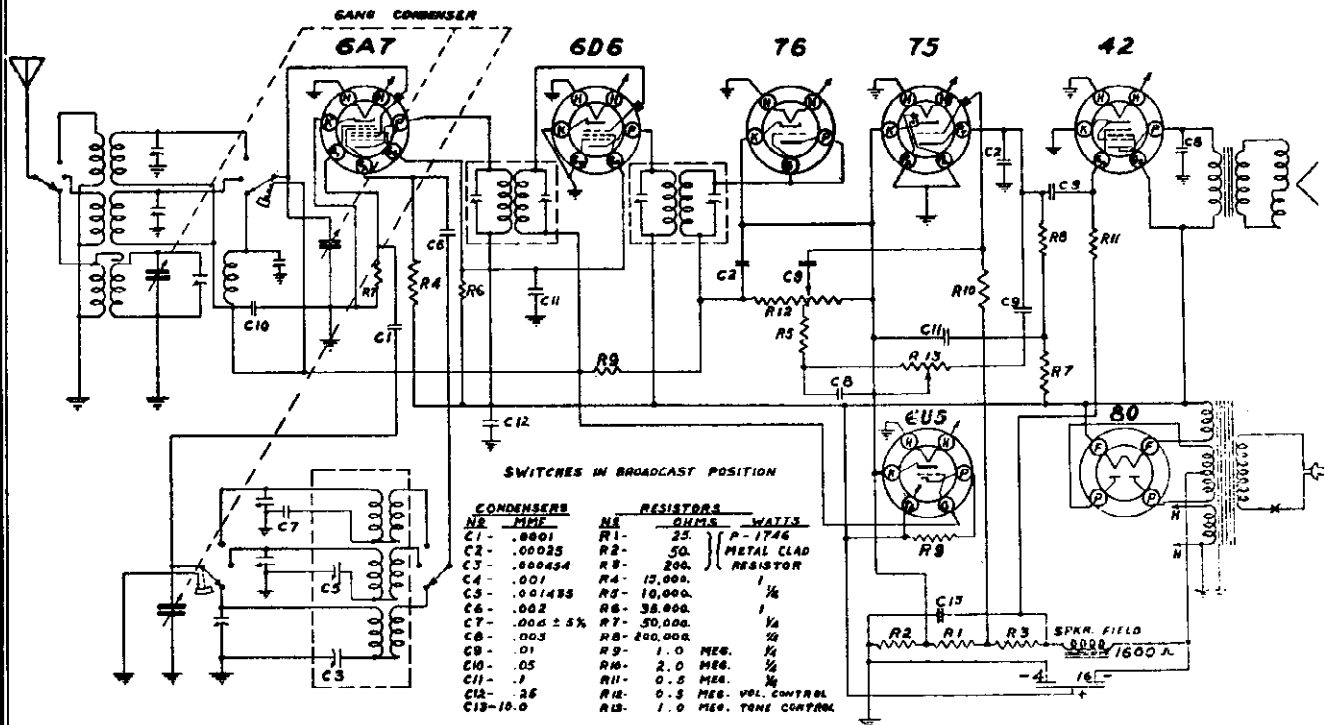
IF ALIGNMENT - Wave change Sw. in BC position. Gang cond. set to minimum, test oscillator at 456 KC, to CG of 6D8G thru .05 MFD cond., GND to set, Align IF.

BROADCAST - Gen. connected to ANT lead thru 200 MMFD condenser, Gang at minimum Osc. to 1730 KC, and adjust OSC. trimmer of set. Shift Gen. and dial to 1400 KC and adjust ANT trimmer. Generator at 600 KC, pad oscillator to maximum peak.

POLICE - Replace 200 MMFD cond. with 400 ohm resistor, Generator at 5600 KC, Gang condenser at minimum, trim Osc. circuit, Gen. at 4000 KC, trim ANT trimmer. Gen. at 1800 KC and pad Police Oscillator circuit to maximum peak.

SHORT WAVE - Generator at 18100 KC, gang condenser at minimum, adjust oscillator trimmer to peak, Generator at 16000 KC adjust SW ANT trimmer to peak. No padding required on this band but check 6000 KC for alignment & sensitivity. For maximum performance, all above adjustments should be repeated. Rock Gang condenser for padding adjustments.

MODEL 7M Chassis
 Schematic, Socket Trimmers
 CONTINENTAL RADIO & TELEV. CORP.



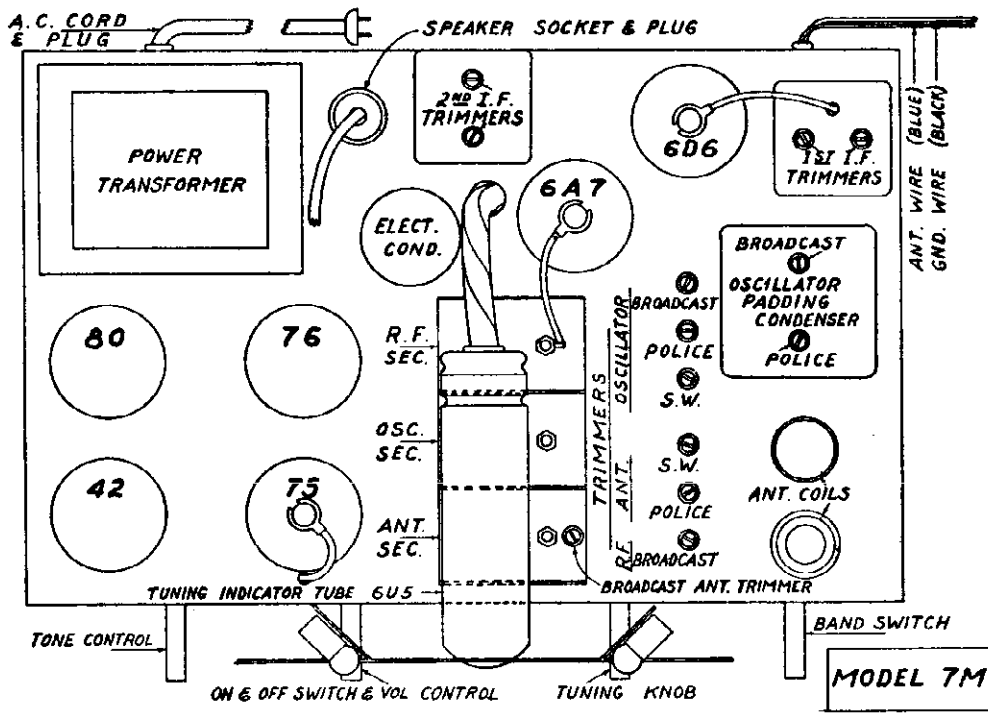
FREQUENCY RANGE -

550 to 1700 KC
 1700 to 5400 KC
 5600 to 18100 KC

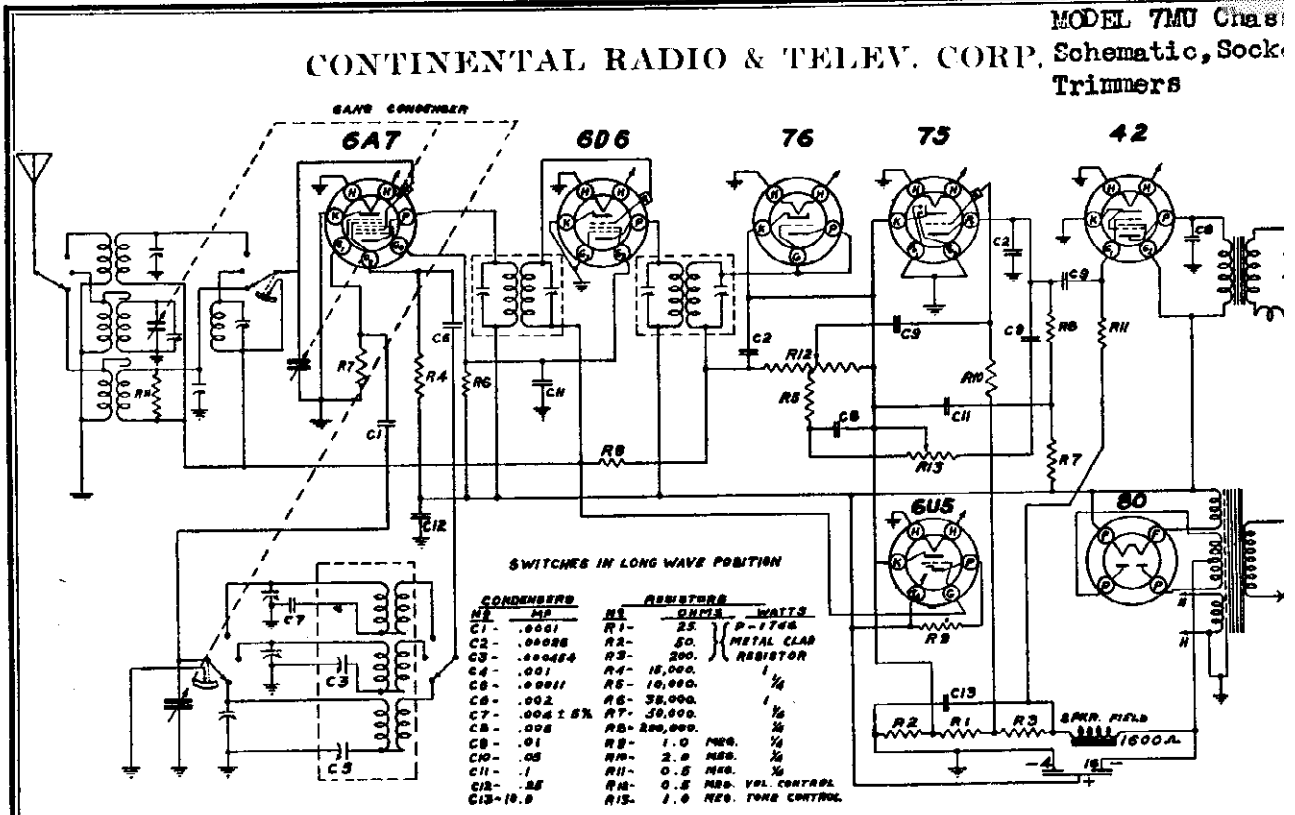
IF PEAKED
 AT 456 KC

SCHEMATIC DIAGRAM
 MODEL 7M

**Seven Tube AC Superheterodyne
 7M Chassis**



MODEL 7MU Chassis
 Schematic, Sock
 Trimmers

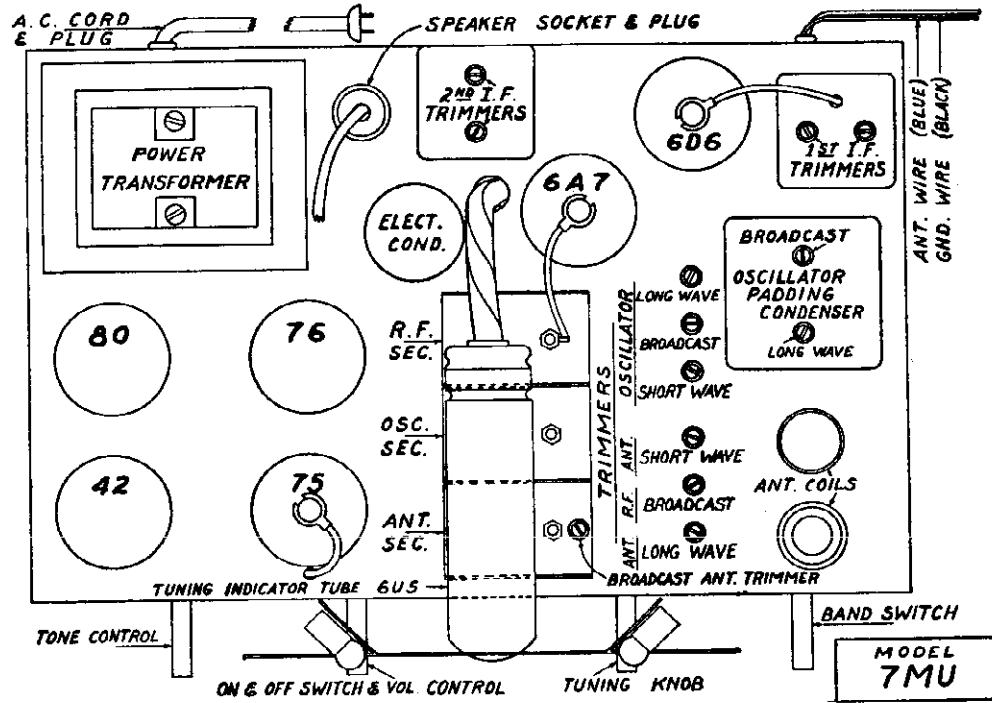


FREQUENCY RANGE
 550 to 1700 KC
 375 to 150 KC
 5600 to 18100 KC

IF PEAKED
 AT 456 KC

SCHEMATIC DIAGRAM
 MODEL 7MU

Seven Tube AC Superheterodyne
 7MU Chassis



MODEL 7M Chassis
MODEL 7MU Chassis
Alignment

CONTINENTAL RADIO & TELEV. CORP.

MODEL 7M CHASSIS

This receiver is designed to operate over three tuning ranges; the broadcast range which extends from 550 to 1700 Kilocycles (KC) (176 to 545 meters), Police and Aviation Band which extends from 1700 to 5400 Kilocycles (KC) (56 to 176 Meters) and International Short Wave Band which extends from 5600 to 18,100 Kilocycles (KC) (16.5 to 53 Meters). This latter range is the one which includes the four internationally assigned bands—the 19, 25, 31 and 49 meter bands.

ALIGNMENT DATA AND SERVICING

GENERAL DATA

The alignment of this done by slowly increasing or decreasing the oscillation of the receiver requires the frequency tuning knob and, at the same time, connect the tuning knob and forth across the signal of 456, 600, 1400, 1730, 1800, 4000, 5600, 6000, 16,000 with the maximum reading is observed on the output meter to be connected with the receiver until the maximum reading is observed on the output meter. This adjustment may be made with the volume control on maximum and the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE

The intermediate frequency (I.F.) stage should be aligned properly on the first step. After the I.F. transformer has been properly adjusted and peaked, the Broadcast Band should always be the next procedure; after which, either or both of the Short Wave Bands may be aligned.

I.F. ALIGNMENT

With the wave switch in the Broadcast Band maximum output As there is no variable low frequency padding condenser on this band, the sensitivity of the receiver should be checked at 5000 KC and the gang condenser set at minimum. Adjust the sensitivity of the receiver through a .002 mica antenna lead. Then set the gang to minimum and adjust the "oscillator trimmer" to receive this signal. Then set the generator to 1730 KC and tune in this set the generator to 325 KC and adjust the long wave antenna trimmer to give maximum output. Next set the generator to 180 KC and tune in this set the generator to 600 KC and adjust the antenna trimmer to receive maximum output. Owing to the nature of the long wave antenna trimmer, the trimmer and padding condensers react upon each other to quite a degree; consequently several re-adjustments at the trimming and padding positions are required before the circuits are adjusted to the same sensitivity should be noted at this point.

SHORT WAVE BAND ALIGNMENT

Connect the output of their rugged construction and liberal ratings. The short wave band is adjusted by setting the generator to 18,100 KC and with the gang at minimum, adjust the "short wave oscillator trimmer" to receive the signal. Set the generator at 16,000 KC, tune in the signal and adjust the "short wave antenna" trimmer to give maximum output. As there is no variable low frequency padding condenser on this band, the sensitivity of the receiver should be checked at 5000 KC and the gang condenser set at minimum. Adjust the sensitivity of the receiver through a .002 mica antenna lead. Then set the gang to minimum and adjust the "oscillator trimmer" to receive this signal. Then set the generator to 1730 KC and tune in this set the generator to 325 KC and adjust the long wave antenna trimmer to give maximum output. Next set the generator to 180 KC and tune in this set the generator to 600 KC and adjust the antenna trimmer to receive maximum output. Owing to the nature of the long wave antenna trimmer, the trimmer and padding condensers react upon each other to quite a degree; consequently several re-adjustments at the trimming and padding positions are required before the circuits are adjusted to the same sensitivity should be noted at this point.

BROADCAST BAND ALIGNMENT

Connect the output of their rugged construction and liberal ratings. The short wave band is adjusted by setting the generator to 18,100 KC and with the gang at minimum, adjust the "short wave oscillator trimmer" to receive the signal. Set the generator at 16,000 KC, tune in the signal and adjust the "short wave antenna" trimmer to give maximum output. As there is no variable low frequency padding condenser on this band, the sensitivity of the receiver should be checked at 5000 KC and the gang condenser set at minimum. Adjust the sensitivity of the receiver through a .002 mica antenna lead. Then set the gang to minimum and adjust the "oscillator trimmer" to receive this signal. Then set the generator to 1730 KC and tune in this set the generator to 325 KC and adjust the long wave antenna trimmer to give maximum output. Next set the generator to 180 KC and tune in this set the generator to 600 KC and adjust the antenna trimmer to receive maximum output. Owing to the nature of the long wave antenna trimmer, the trimmer and padding condensers react upon each other to quite a degree; consequently several re-adjustments at the trimming and padding positions are required before the circuits are adjusted to the same sensitivity should be noted at this point.

MODEL 7MU CHASSIS

This receiver is designed to operate over three tuning ranges; the broadcast range which extends from 550 to 1700 Kilocycles (KC) (173 to 562 meters), Longwave Band which extends from 375 to 150 Kilocycles (KC) (800 to 2000 Meters) and the International Short Wave Band which extends from 5600 to 18,100 Kilocycles (KC) (16.5 to 53 Meters). This latter range is the one which includes the four internationally assigned bands—the 19, 25, 31 and 49 meter bands.

ALIGNMENT DATA AND SERVICING

GENERAL DATA

The alignment of this for padding condenser and, at the same time, connect the tuning knob and forth across the signal of 16, 25, 380, 456, 600, 1400, 1730, 6000, 16,000 with the maximum reading is observed on the output meter to be connected with the receiver until the maximum reading is observed on the output meter. This adjustment may be made with the volume control on maximum and the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE

The intermediate frequency (I.F.) stage should be aligned properly on the first step. After the I.F. transformer has been properly adjusted and peaked, the Broadcast Band should always be the next procedure; after which, either or both of the Short Wave Bands may be aligned.

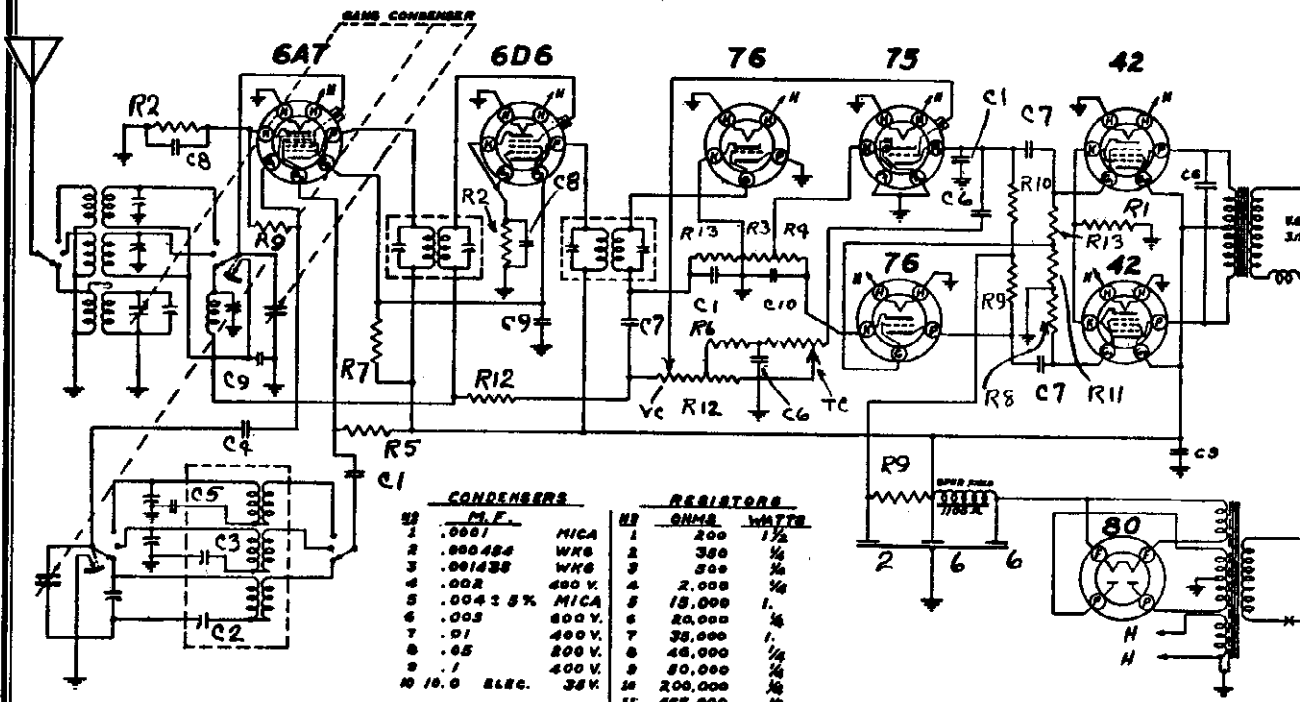
I.F. ALIGNMENT

With the wave switch in the Broadcast Band maximum output As there is no variable low frequency padding condenser on this band, the sensitivity of the receiver should be checked at 5000 KC and the gang condenser set at minimum. Adjust the sensitivity of the receiver through a .002 mica antenna lead. Then set the gang to minimum and adjust the "oscillator trimmer" to receive this signal. Then set the generator to 1730 KC and tune in this set the generator to 325 KC and adjust the long wave antenna trimmer to give maximum output. Next set the generator to 180 KC and tune in this set the generator to 600 KC and adjust the antenna trimmer to receive maximum output. Owing to the nature of the long wave antenna trimmer, the trimmer and padding condensers react upon each other to quite a degree; consequently several re-adjustments at the trimming and padding positions are required before the circuits are adjusted to the same sensitivity should be noted at this point.

BROADCAST BAND ALIGNMENT

Connect the output of their rugged construction and liberal ratings. The short wave band is adjusted by setting the generator to 18,100 KC and with the gang at minimum, adjust the "short wave oscillator trimmer" to receive the signal. Set the generator at 16,000 KC, tune in the signal and adjust the "short wave antenna" trimmer to give maximum output. As there is no variable low frequency padding condenser on this band, the sensitivity of the receiver should be checked at 5000 KC and the gang condenser set at minimum. Adjust the sensitivity of the receiver through a .002 mica antenna lead. Then set the gang to minimum and adjust the "oscillator trimmer" to receive this signal. Then set the generator to 1730 KC and tune in this set the generator to 325 KC and adjust the long wave antenna trimmer to give maximum output. Next set the generator to 180 KC and tune in this set the generator to 600 KC and adjust the antenna trimmer to receive maximum output. Owing to the nature of the long wave antenna trimmer, the trimmer and padding condensers react upon each other to quite a degree; consequently several re-adjustments at the trimming and padding positions are required before the circuits are adjusted to the same sensitivity should be noted at this point.

MODEL 8K Chassis
 CONTINENTAL RADIO & TELEV. CORP. Schematic,
 Alignment



CONDENSERS		RESISTORS	
#	M.F.	#	OHMS WATTS
1	.0001 MICA	1	200 1/2
2	.000484 WMS	2	300 1/2
3	.001438 WMS	3	500 1/2
4	.002 400 V.	4	2,000 1/2
5	.004 3.5% MICA	5	15,000 1.
6	.005 500 V.	6	20,000 1/2
7	.01 400 V.	7	35,000 1.
8	.05 500 V.	8	45,000 1/2
9	.1 400 V.	9	50,000 1/2
10	10.0 ELEC. 35V.	10	200,000 1/2
		11	450,000 1/2
		12	1 MEG. 1/2
		13	5 MEG. 1/2

V.C. - VOLUME CONTROL.
 T.C. - TONE CONTROL.
 SWITCHES IN BROADCAST POSITION.

FREQUENCY RANGE
 535 to 1730- KC
 1.7 to 5.6 - MC
 5.6 to 18.1- MC

**SCHEMATIC DIAGRAM
 MODEL 8K**

**Eight Tube AC Superheterodyne
 8K Chassis
 ALIGNMENT DATA AND SERVICING**

GENERAL DATA

The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400, 1730, 1800, 4000, 5600, 6000, 16,000 and 18,100 KC and an output meter to be connected across the primary or secondary of the output transformers. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible, to prevent the AVC from operating and giving false readings.

signal strength may sometimes be improved by padding the circuits. This is done by slowly increasing or decreasing the oscillating condenser and, at the same time, continuously tuning back and forth across the signal with the receiver until the maximum reading is obtained on the output meter. This adjustment may seem a little complicated but is the easiest way to adjust the oscillator to the preselector of the R.F. section. Return to 1400 KC and again go over the adjustments of this frequency to be certain if they were not put slightly out of alignment when adjustment was made at 600 KC.

CORRECT ALIGNMENT PROCEDURE

The intermediate frequency (I.F.) stage should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the Broadcast Band should always be the next procedure; after which, either or both of the Short Wave Bands may be aligned.

POLICE BAND ALIGNMENT

The police band is adjusted by first replacing the .01 dummy with a 400 ohm resistor and setting the generator to 5600 KC. With the gang set minimum, adjust the "police oscillator trimmer" to receive this signal, then set the signal generator to 4000 KC and adjust "police antenna trimmer" to give maximum output. Next, set the oscillator to 1800 KC and "pad" the circuit of this frequency as described in the instructions for padding the broadcast circuits.

I.F. ALIGNMENT

With the wave switch in the Broadcast Band and the gang condenser set at minimum. Adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (6A7) through a .05 or .1 mfd. condenser. The ground on the test oscillator can be connected to the chassis ground. Align all four I.F. trimmers to peak or maximum reading on the output meter.

SHORT WAVE BAND ALIGNMENT

The short wave band is adjusted by setting the generator to 18,100 KC and with the gang at minimum, adjust the "short wave oscillator trimmer" to receive the signal. Set the generator at 16,000 KC, tune in the signal and adjust the "short wave antenna" trimmer to give maximum output. As there is no variable low frequency padding condenser on this band, the sensitivity of the receiver should be checked at 6000 KC to determine whether the circuits are in line at this frequency. Should the receiver lack sensitivity at 6000 KC, the antenna and oscillator coils, as well as the .004 mica padding condenser, should be tested for defects as sometimes these components become subject to mechanical or electrical injuries, despite their rugged construction and liberal ratings.

BROADCAST BAND ALIGNMENT

Connect the output of the signal generator to the antenna lead (blue) through a .0002 mfd. mica condenser. Set the gang condenser to minimum and the oscillator to 1730 KC and adjust the "oscillator trimmer" to receive this signal. Make no other adjustments at this frequency. Then set the generator to 1400 KC and tune in this signal by rotating the gang to 1400 on the dial. Adjust the "preselector" and "antenna" trimmer to maximum signal. Set the signal generator to 600 KC and tune in the signal on the receiver. **Note:** approximately the same sensitivity should be noted at this point as was at 1400 KC. The

MODEL 8K Chassis
 Socket, Trimmers
 Dial Adjustments

CONTINENTAL RADIO & TELEV. CORP.

**PROCEDURE FOR SETTING TELEPHONE DIAL STATIONS
 CHOOSING THE STATIONS TO BE USED**

The telephone dial has 10 buttons located in a ring within the dial scale. Make a list of 10 of your favorite stations, stations which are tuned in regularly. Shown in Fig. 1 is the approximate frequency

range that each button will cover. **Note:** If 2 stations happen to fall within the range of one button, one station will necessarily have to be tuned in with the selector knob.

**PROCEDURE FOR ADJUSTING THE
 TELEPHONE DIAL BUTTONS**

(1) Choose one of the stations out of the list of stations selected and by means of the station selector very carefully tune in this station, noting at the same time the exact pointer location on the dial.

(2) Now select the proper button for the first station chosen by referring to Fig. 1 and noting the button into whose range the station falls. For example, station WGN with a frequency of 720 KC comes under the button whose frequency ranges from 670 to 755 KC. Usually the button nearest the tuning point or the bottom of the dial will be the proper button.

(3) Loosen the button by unscrewing it (not the dial) 1/2 turn to the left. Now press the button in all the way and rock the dial back and forth a trifle until a click is heard. Do not release the button now but set the pointer to its former location and with the dial in this position, being careful not to move it, proceed to tighten the button by turning it in the opposite direction (to the right). Make sure the button is very securely tightened as it may get out of adjustment.

(4) From the station call sheet supplied remove the proper station disc and insert into the push button so that the wording is horizontal when the button is at the bottom, and then insert a clear celluloid insert. Follow this same procedure for the remaining buttons.

(5) If for any reason it is necessary to remove a station call letter disc, the use of a pen knife or any sharp pointed instrument will facilitate the removal.

**HOW TO TUNE IN STATIONS ON
 THE TELEPHONE DIAL**

Press in the button of the station desired tuned and rotate the dial slowly until a click is heard and the dial will not turn in either direction until the button is released. The station is now tuned in and can be adjusted to the volume desired by means of the volume control. The proper direction of rotation of the dial can be determined by turning the dial in the direction which will not allow the wide space adjacent to the pointer to converge into the space at the bottom of the dial. See Fig. (1).

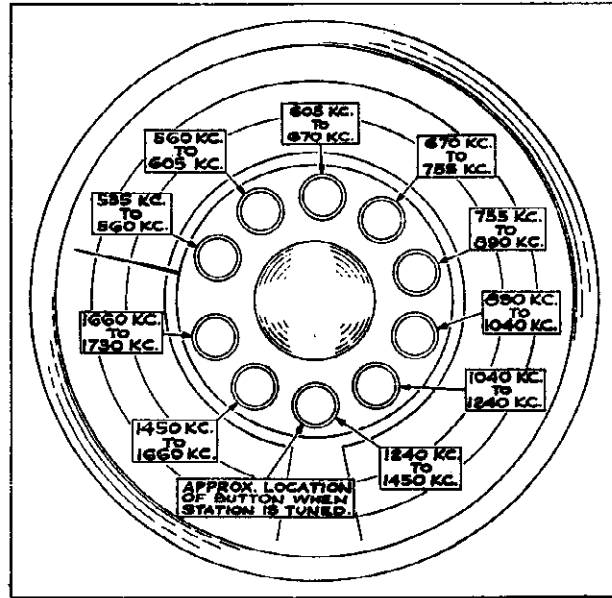
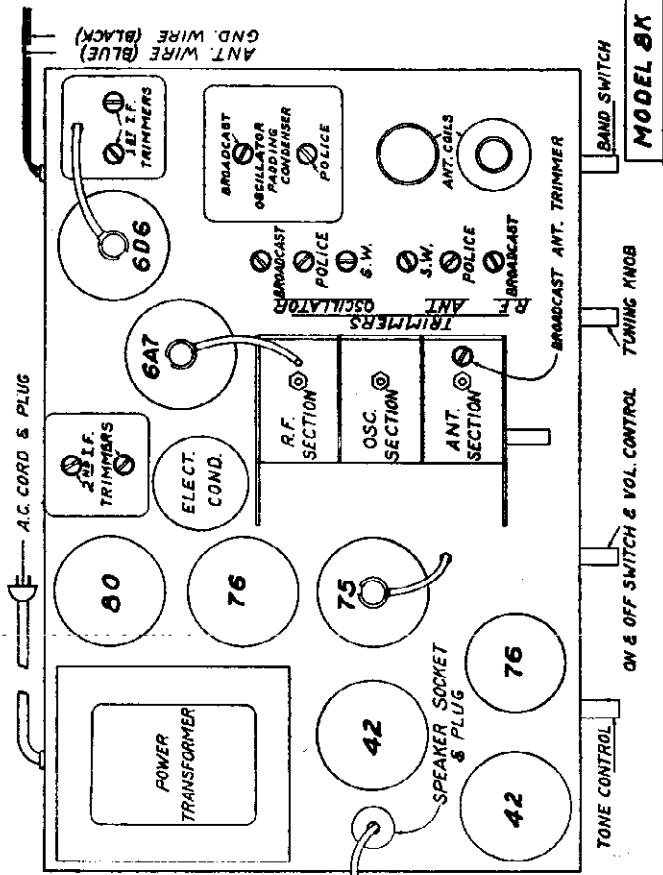
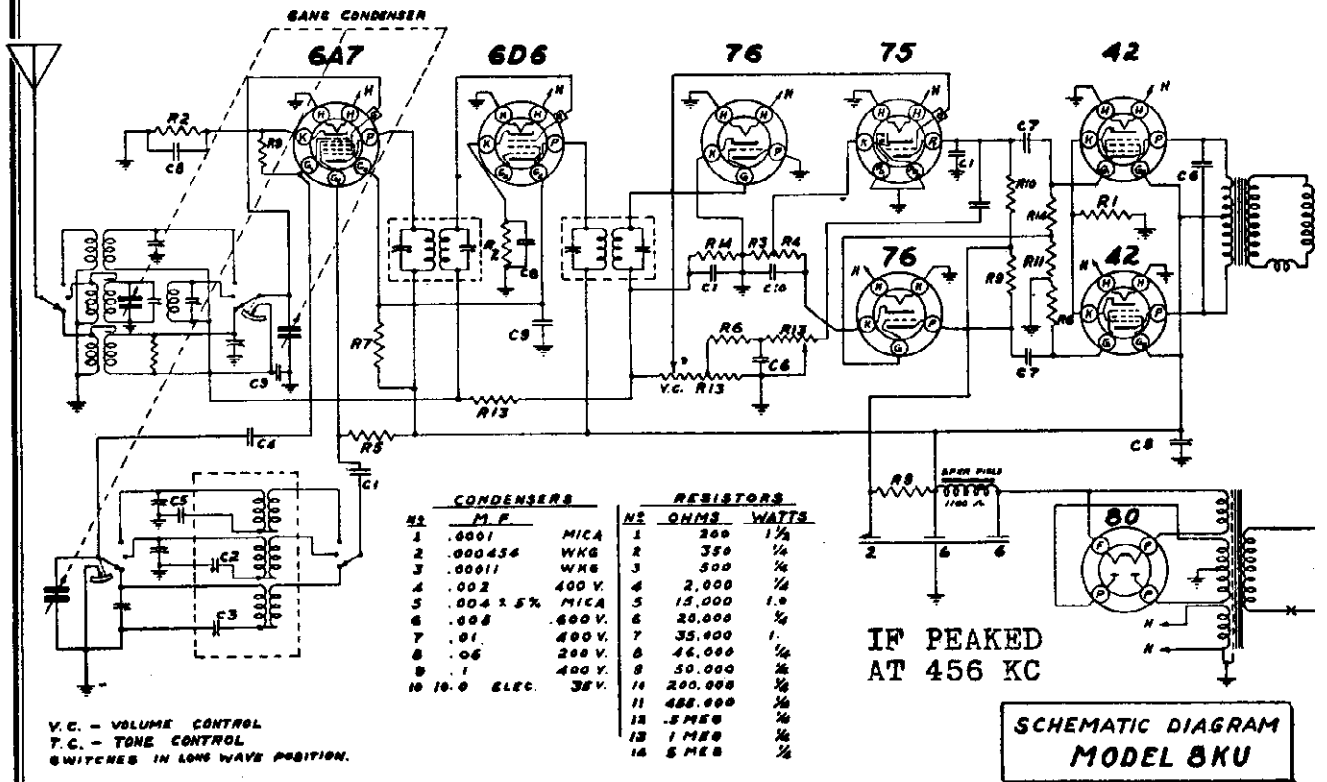


Figure 1



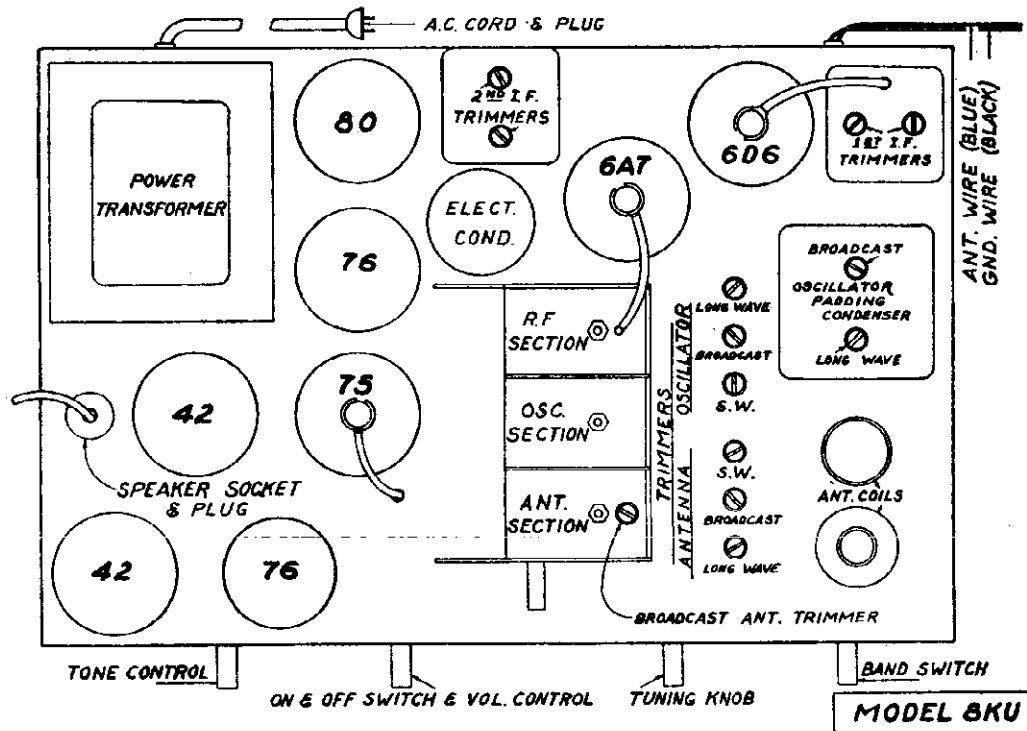
Reduce 9%

MODEL 8KU Chassis
 Schematic, Socket
 Trimmers



FREQUENCY RANGE -
 550 to 1700 KC
 375 to 1500 KC
 5600 to 18100 KC

**Eight Tube AC Superheterodyne
 8KU Chassis**



MODEL 8KU Chassis
Alignment
Dial Adjustments

CONTINENTAL RADIO & TELEV. CORP.

PROCEDURE FOR SETTING TELEPHONE DIAL STATIONS CHOOSING THE STATIONS TO BE USED

The telephone dial has 10 buttons located in a ring within the dial scale. Make a list of 10 of your favorite stations, stations which are tuned in regularly. Shown in Fig. 1 is the approximate frequency range that each button will cover. **Note:** If 2 stations happen to fall within the range of one button, one station will necessarily have to be tuned in with the selector knob.

(3) Loosen the button by unscrewing it (not the dial) $\frac{1}{2}$ turn to the left. Now press the button in all the way and rock the dial back and forth a trifle until a click is heard. Do not release the button now but set the pointer to its former location and with the dial in this position, being careful not to move it, proceed to tighten the button by turning it in the opposite direction (to the right). Make sure the button is very securely tightened as it may get out of adjustment.

(4) From the station call sheet supplied remove the proper station disc and insert into the push button so that the wording is horizontal when the button is at the bottom, and then insert a clear celluloid insert. Follow this same procedure for the remaining buttons.

(5) If for any reason it is necessary to remove a station call letter disc, the use of a pen knife or any sharp pointed instrument will facilitate the removal.

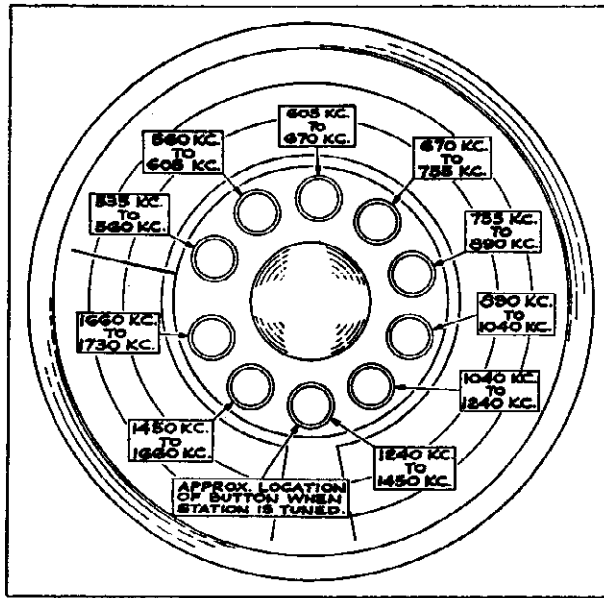


Figure 1

HOW TO TUNE IN STATIONS ON THE TELEPHONE DIAL

Press in the button of the station desired tuned and rotate the dial slowly until a click is heard and the dial will not turn in either direction until the button is released. The station is now tuned in and can be adjusted to the volume desired by means of the vol-

ume control. The proper direction of rotation of the dial can be determined by turning the dial in the direction which will not allow the wide space adjacent to the pointer to converge into the space at the bottom of the dial. See Fig. (1).

I.F. ALIGNMENT

With the wave switch in the Broadcast Band and the gang condenser set at minimum. Adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (6A7) through a .05 or .1 mfd. condenser. The ground on the test oscillator can be connected to the chassis ground. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT

Connect the output of the signal generator to the antenna lead (blue) through a .0002 mfd. mica condenser. Set the gang condenser to minimum and the oscillator to 1730 KC and adjust the "oscillator trimmer" to receive this signal. Make no other adjustments at this frequency. Then set the generator to 1400 KC and tune in this signal by rotating the gang to 1400 on the dial. Adjust the "preselector" and "antenna" trimmer to maximum signal. Set the signal generator to 600 KC and tune in the signal on the receiver. **Note:** approximately the same sensitivity should be noted at this point as was at 1400 KC. The signal strength may sometimes be improved by padding the circuits. This is done by slowly increasing or decreasing the oscillator padding condenser and, at the same time, continuously tuning back and forth across the signal with the receiver until the maximum reading is obtained on the output meter. This adjustment may seem a little complicated but is the easiest way to adjust the oscillator to the preselector of the R.F. section. Return to 1400 KC and again go over the adjustments of this frequency to be certain that they were not put slightly out of alignment when adjustment was made at 600 K.C.

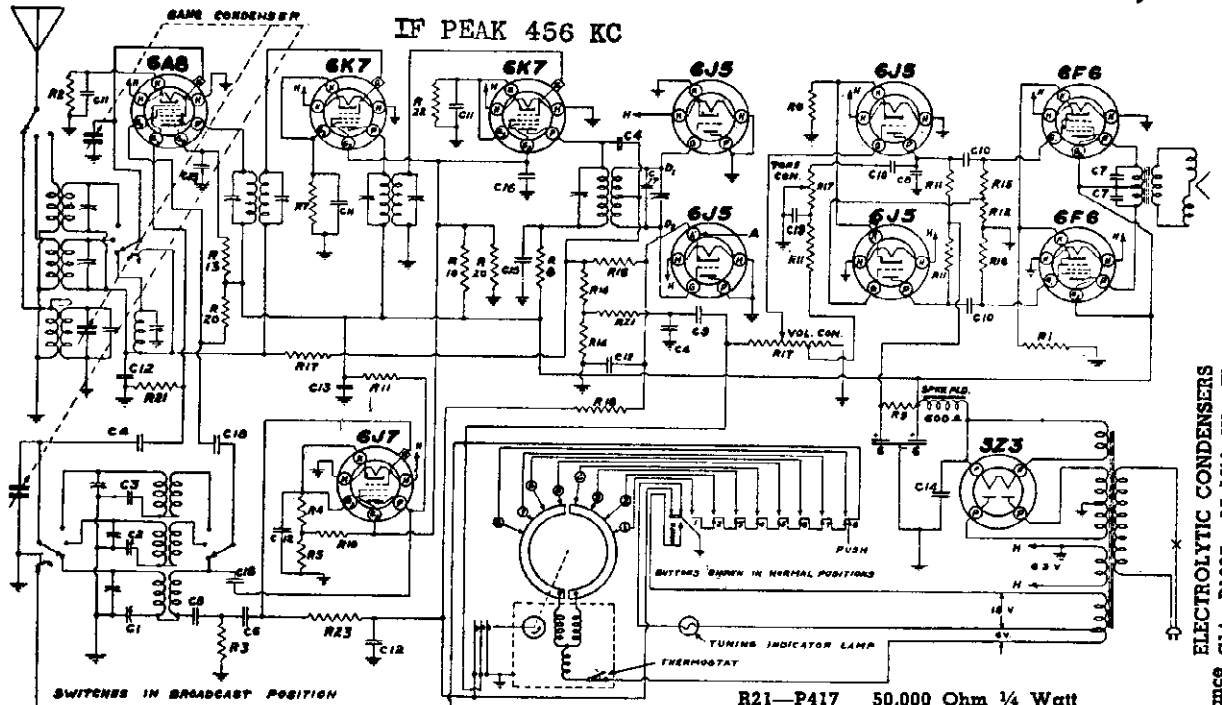
SHORT WAVE BAND ALIGNMENT

The short wave band is adjusted by setting the generator to 18,100 KC and with the gang at minimum, adjust the "short wave oscillator trimmer" to receive the signal. Set the generator at 16,000 KC, tune in the signal and adjust the "short wave antenna" trimmer to give maximum output. As there is no variable low frequency padding condenser on this band, the sensitivity of the receiver should be checked at 6000 KC to determine whether the circuits are in line at this frequency. Should the receiver lack sensitivity at 6000 KC, the antenna and oscillator coils, as well as the .004 mica padding condenser, should be tested for defects as sometimes these components become subject to mechanical or electrical injuries, despite their rugged construction and liberal ratings.

LONG WAVE BAND ALIGNMENT

The long wave band is adjusted by connecting the output of the signal generator through a .0002 Mfd. mica condenser to the blue antenna lead. Then set the gang to minimum and the generator to 380 KC and adjust the long wave oscillator trimmer to receive this signal. Then set the generator to 325 KC and adjust the long wave antenna trimmer to give maximum output. Next set generator to 160 KC and pad the circuits to maximum output. Owing to the nature of the long wave band, the trimmer and padding condensers react upon each other to quite a degree; consequently, several re-adjustments at the trimming and padding positions are required before the circuits are adjusted properly.

CONTINENTAL RADIO & TELEV. CORP. MODEL 118
Schematic, Sock
Trimmers, Parts

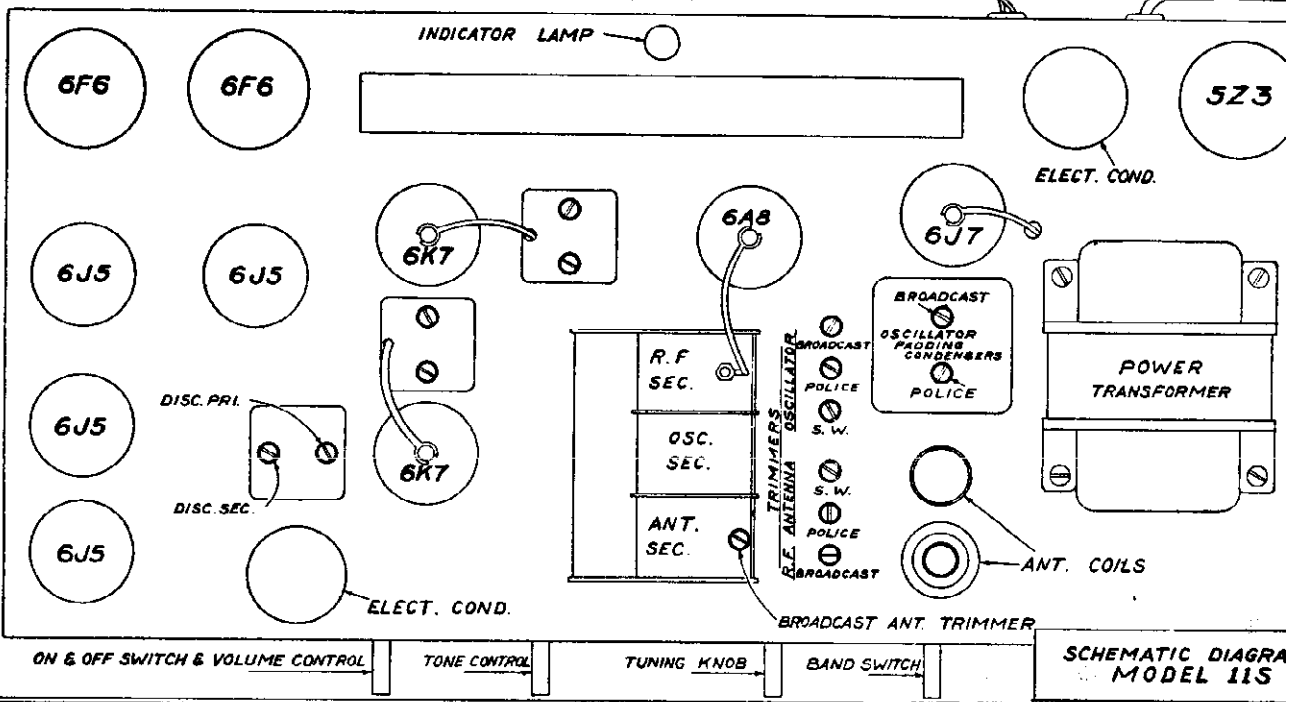


- RESISTORS**
- R1 - P1818 210 Candohm Resistor
 - R2 - P1942 250 Ohm 1/4 Watt
 - R3 - P1950 350 Ohm 1/4 Watt
 - R4 - P279 500 Ohm 1/4 Watt
 - R5 - P1951 650 Ohm 1/4 Watt
 - R6 - P1729 750 Ohm 1/4 Watt
 - R7 - P1973 1,000 Ohm 1/4 Watt
 - R8 - P1216 5,000 Ohm 1/4 Watt
 - R9 - P673 10,000 Ohm 1/2 Watt
 - R10 - P1944 15,000 Ohm 2 Watt
 - R11 - P166 25,000 Ohm 1/4 Watt
 - R12 - P1943 35,000 Ohm 1/4 Watt
 - R13 - P1952 50,000 Ohm 1/2 Watt
 - R14 - P139 250,000 Ohm 1/4 Watt
 - R15 - P1843 455,000 Ohm 1/4 Watt
 - R16 - P137 500,000 Ohm 1/4 Watt
 - R17 - P162 1,000,000 Ohm 1/4 Watt
 - R18 - P310 4,000,000 Ohm 1/4 Watt
 - R19 - P1949 15,000 Ohm 1/2 Watt
 - R20 - P165 25,000 Ohm 1 Watt
 - R21 - P417 50,000 Ohm 1/4 Watt
 - R22 - P1972 2,000 Ohm 1/4 Watt
 - R23 - P280 100,000 Ohm 1/4 Watt

- PAPER CONDENSERS**
- C3 - P1947 .004 Mfd. 400 V.
 - C7 - P904 .002 Mfd. 600 V.
 - C9 - P164 .01 Mfd. 400 V.
 - C10 - P334 .05 Mfd. 400 V.
 - C11 - P148 .05 Mfd. 200 V.
 - C12 - P142 .10 Mfd. 200 V.
 - C13 - P1789 .25 Mfd. 400 V.
 - C15 - P276 .10 Mfd. 400 V.
 - C16 - P141 .25 Mfd. 200 V.
 - C18 - P1193 .002 Mfd. 400 V.
- MICA CONDENSERS**
- C4 - P480 .0001 Mfd.
 - C5 - P1044 .0002 Mfd.
 - C6 - P672 .001 Mfd.
 - C8 - P336 .0005 Mfd.
 - C17 - P1044 .0002 Mfd. 5% Tolerance

- RESISTORS**
- R21 - P417 50,000 Ohm 1/4 Watt
 - R22 - P1972 2,000 Ohm 1/4 Watt
 - R23 - P280 100,000 Ohm 1/4 Watt

ANTENNA WIRE (BLUE) GROUND WIRE (BLACK) POWER CORD & PLUG



MODEL 118**Alignment
Notes****CONTINENTAL RADIO & TELEV. CORP.****ALIGNMENT DATA AND SERVICING****GENERAL DATA**

The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400, 1730, 1800, 4000, 5600, 6000, 16,000 and 18,100 KC and an output meter to be connected across the primary or secondary of the output transformers. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible, to prevent the AVC from operating and giving false readings.

**CORRECT ALIGNMENT
PROCEDURE**

The intermediate frequency (I.F.) stage should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the Broadcast Band should always be the next procedure, after which, either or both of the Short Wave Bands may be aligned.

I.F. ALIGNMENT

With the wave switch in the Broadcast Band and the gang condenser set at minimum push in the white button until it locks. Adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (6A7) through a .05 or .1 mfd. condenser. The ground on the test oscillator can be connected to the chassis ground. Align the first four I.F. trimmers to peak or maximum reading on the output meter.

After the first two I.F. transformers have been tuned, the discriminator transformer should be aligned. This is a critical adjustment and must be performed with care.

First — connect a 0-200 micro ammeter between the ungrounded cathode of the 6J5G tube serving as a diode rectifier, and ground. This cathode is indicated as point "A" in the circuit diagram. Then place a .0001 mfd. mica condenser across the secondary of the discriminator transformer. These terminals are indicated as points "D1" and "D2" on the circuit diagram. This condenser is used to detune completely the secondary circuit during the following primary adjustment.

The primary is tuned by impressing an I.F. signal on the converter (6A8-G) grid and adjusting the trimmer marked "DISC. PRI." on the chassis layout diagram, to give maximum audio output. Signal strength should be the same as in an ordinary aligning operation. For this particular receiver about 30-micro volts of I.F. signal is required for standard output. (50 milliwatts). At this point it would be well to go over the adjustments of the two other I.F. transformers and bring the entire system to maximum sensitivity. Now without further adjustments of either the frequency setting of the signal generator or the I.F. transformer trimmers the "DISC. SEC." trimmer should be tuned.

After removing the .0001 mfd. mica condenser from the 6J5G grids "D1 and D2" increase the I.F. signal input to the maximum that the signal generator will supply (at least 100,000 micro volts). Then, with the volume control turned down to limit the audio output, slowly turn the "DISC. SEC." trimmer until a sudden, sharp drop in current as indicated by the micro ammeter is seen. The meter will now probably read in reverse and off scale. The trimmer should be reversed and the meter reading brought to zero. If a metallic screw driver is used it will be necessary, continually, to

lift the screw driver away from the trimmer screw after each slight adjustment to observe the meter reading.

It is sometimes convenient to use an offset of "remote zero" setting of the micro ammeter in making this adjustment so that the zero current setting is higher on the scale than the conventional zero point.

After the current has been brought to zero by the above described method the I.F. alignment and discriminator tuning is completed and the R.F. tracking may be done.

**BROADCAST BAND
ALIGNMENT**

Connect the output of the signal generator to the antenna lead (blue) through at .0002 mfd. mica condenser. Set the gang condenser to minimum and the oscillator to 1730 KC and adjust the "oscillator trimmer" to receive this signal. Make no other adjustments at this frequency. Then set the generator to 1400 KC and tune in this signal by rotating the gang to 1400 on the dial. Adjust the "preselector" and "antenna" trimmer to maximum signal. Set the signal generator to 600 KC and tune in the signal on the receiver. **Note:** approximately the same sensitivity should be noted at this point as was at 1400 KC. The signal strength may sometimes be improved by padding the circuits. This is done by slowly increasing or decreasing the oscillator padding condenser and, at the same time, continuously tuning back and forth across the signal with the receiver until the maximum reading is obtained on the output meter. This adjustment may seem a little complicated but is the easiest way to adjust the oscillator to the preselector of the R.F. section. Return to 1400 KC and again go over the adjustments of this frequency to be certain that they were not put slightly out of alignment when adjustment was made at 600 KC.

**POLICE BAND
ALIGNMENT**

The police band is adjusted by first replacing the .0002 dummy with a 400 ohm resistor and setting the generator to 5600 KC. With the gang set at minimum, adjust the "police oscillator trimmer" to receive this signal, then set the signal generator to 4000 KC and adjust "police antenna trimmer" to give maximum output. Next, set the oscillator to 1800 KC and "pad" the circuit of this frequency as described in the instructions for padding the broadcast circuits.

**SHORT WAVE BAND
ALIGNMENT**

The short wave band is adjusted by setting the generator to 18,100 KC and with the gang at minimum, adjust the "short wave oscillator trimmer" to receive the signal. Set the generator at 16,000 KC, tune in the signal and adjust the "short wave antenna" trimmer to give maximum output. As there is no variable low frequency padding condenser on this band, the sensitivity of the receiver should be checked at 6000 KC to determine whether the circuits are in line at this frequency. Should the receiver lack sensitivity at 6000 KC, the antenna and oscillator coils, as well as the .004 mica padding condenser, should be tested for defects as sometimes these components become subject to mechanical or electrical injuries, despite their rugged construction and liberal ratings.

CONTROLS AND OPERATION**RIGHT HAND KNOB**

(Three Position Wave Band Selecting Switch)—Turned to the right, it is set for Standard Broadcast Band; turned to the extreme left, it is set for Foreign and American Short Wave Reception; when in the center position, it is set for reception of Police, Aviation, Amateurs, and Ships at Sea.

SHORT WAVE TUNING

When tuning short wave stations, the selector knob must be turned more slowly and carefully, due to the sharp selectivity of the receiver in these bands. If you tune rapidly, many stations will be skipped entirely. When a response is heard, work the dial a little from left to right until you hit a point where the station comes in at maximum volume. This critical tuning is necessary if results are to be expected. It may require a little patient experimenting to become accustomed to short wave tuning. The use of a short wave "log" will be of great assistance in picking up short wave stations. Such logs are available from any of the leading radio magazines. They list the location, frequency and operating time schedules of short wave stations all over the world.

(Three Position Wave Band Selecting Switch)—**LEFT HAND KNOB**

Turned to the extreme right. The switch will click and the dial will become illuminated. Wait about one-half minute for the tubes to become heated.

LEFT CENTER KNOB

(Continuous Variable Tone Control)—The tone control permits tonal regulation to meet individual musical taste. When turned completely to the right the normal proportion of high to low notes is obtained. Upon turning the control from the extreme right position toward the center a gradually increasing emphasis of the low notes is noted. Further, increase in this direction serves to eliminate the more extreme "highs" which result in a greater apparent bass increase. A very useful application of this particular type of tone control is its ability to compensate for apparent lack of base at low volume levels. If when listening to a musical program at a low volume level the tone control is set at a position half way between its extreme settings a very pleasing effect is obtained.

(Manual Volume Control and "On-Off" Switch)—

Turn the left

(Continuous Variable Tone Control)—

The tone control permits tonal regulation to meet individual musical taste. When turned completely to the right the normal proportion of high to low notes is obtained. Upon turning the control from the extreme right position toward the center a gradually increasing emphasis of the low notes is noted. Further, increase in this direction serves to eliminate the more extreme "highs" which result in a greater apparent bass increase. A very useful application of this particular type of tone control is its ability to compensate for apparent lack of base at low volume levels. If when listening to a musical program at a low volume level the tone control is set at a position half way between its extreme settings a very pleasing effect is obtained.

CONTINENTAL RADIO & TELEV. CORP.

MODEL 11S
Electric Tuner
Data

11S Chassis

INSTRUCTIONS FOR ADJUSTMENT AND OPERATION OF THE ELECTRIC TUNE

It is very important to read the following instructions carefully before attempting to adjust the electric tuner. The electric tuner is made up of three integral units:

PUSH BUTTON SWITCH: The push button switch consists of one (1) white button (extreme left), and eight (8) brown buttons whose numerical sequence is reckoned from left to right. The white button is provided for converting the set from automatic electric push button tuning to manual knob tuning. The brown buttons are provided for automatic electric tuning.

SELECTOR MECHANISM: The selector mechanism is made up of the selector plate, eight (8) thumb screws, and the adjustment light bulb.

ELECTRIC MOTOR: The power for this tuner is provided by a small, efficient electric motor, of the brushless variety. It is fitted with an automatic clutch and a silent gear train. The bearings and the oil retainer hold sufficient oil to lubricate the motor for a lifetime.

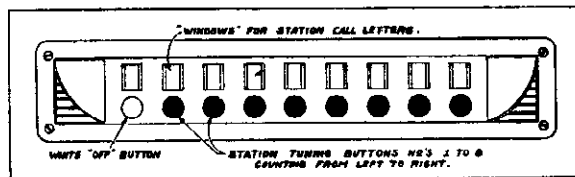


Fig. 1

The first step to take in adjusting the electric push button de incorporated into this receiver is to choose eight (8) of the 1 powerful local stations, stations which are free from excess fat Turn on the receiver (broadcast band) and press in the white ton; tune in the station of the **lowest frequency**, using the stc selector knob. Now hold the white button in and press in bu number one (1), next to the white button. (See Figure 1). Both tons are now locked into place; a small pilot lamp located at rear of the chassis will light up unless the thumb screw at the accidentally happens to be correctly set. Loosen thumb screw r ber one (See Figure 2 for order of thumb screws) enough to a it to slide freely back and forth until the light goes out. I tighten the thumb screw; the adjustment for the first station is complete. Out of the station call letter sheet supplied remove proper station call block and insert into the window directly at button number one. Now release button number one by pres the white button in as far as it will go.

With the white button still in, tune in the station of the next hig frequency and holding the white button, press in button nur two. Both buttons are now locked into place. Loosen thumb sc number two (see Figure 2) and slide back and forth until a r is reached at which the pilot lamp in the rear goes out; tig the thumb screw. Insert the proper station call into the windo button number two.

Follow this same procedure for the remaining stations, alv choosing the station with the next highest frequency. After eight (8) stations have been adjusted, check each adjustmen tuning in each station. Note: In the window above the w button insert the word "OFF" found in the call letter sheet.

HOW TO TUNE IN STATIONS USING THE ELECTRIC PUSH BUTTON TUNER

In order to operate the receiver satisfactorily—using the electric push button tuner, the white button must be in released position, that is, all the way out. To tune in a station, merely press the selector button which designates the station desired. **Note:** Should the station fail to come in clearly, check the adjustment by following the adjustment procedure described in the paragraph above. If by chance all of the buttons are pressed in, they may be released by pressing any one button all the way in.

To change from electric tuning to manual selecting, simply press in the white button. When the white button is in, the set may be tuned as a conventional receiver. **Note:** If it is desired to tune Short Wave or Police while the set is being operated with push buttons, it is not necessary to change over from push button tuning to manual tuning. Simply turn the band switch and proceed to tune with the selector knob. When the band switch is returned to broadcast the station last selected by button will automatically tune in by itself.

RIGHT CENTER KNOB

narrow range of the dial at a point where the desired station is located, until the station is received with maximum volume; then re-adjust the volume control to the proper level. **Never** use the station selector to adjust volume as this practice results in dis-

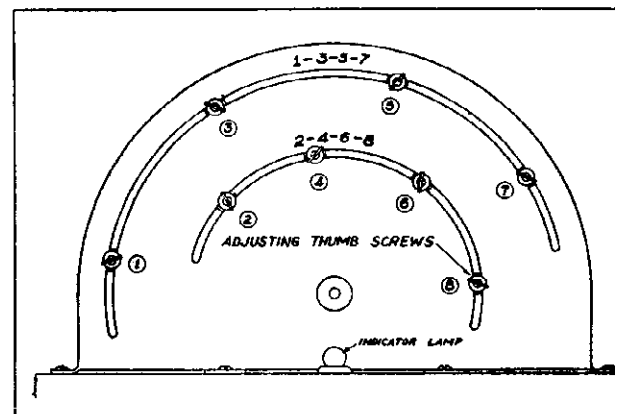


Fig. 2

NOTE: The white push button must be pressed in, in order to tune the set manually.

(Station Selector)—Rotate the indicator needle slowly over a perted tone quality and deficient bass response. The Volume trol **only** is to be used for this purpose. For maximum clarit indicator needle should be adjusted to the center of the covered by the station being tuned.

MODELS 77, 770

Schematic, Socket CONTINENTAL RADIO & TELEV. CORP.

Trimmers, Alignment

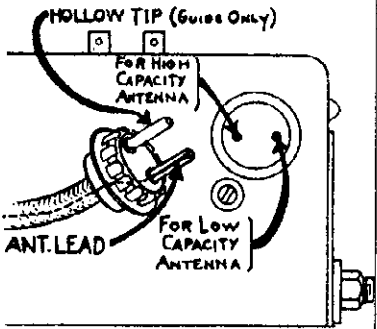
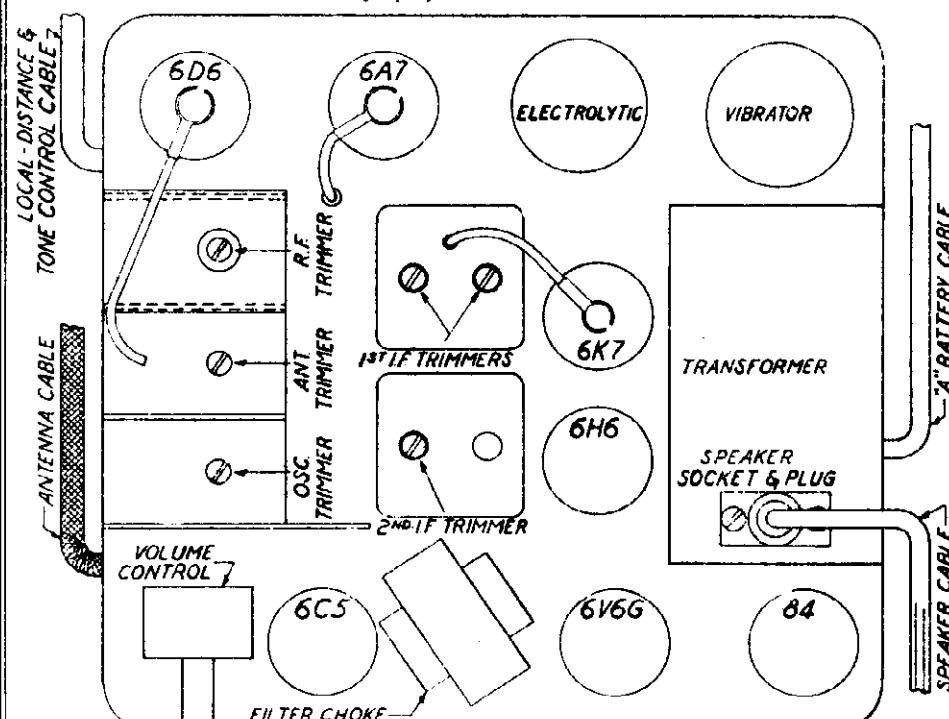
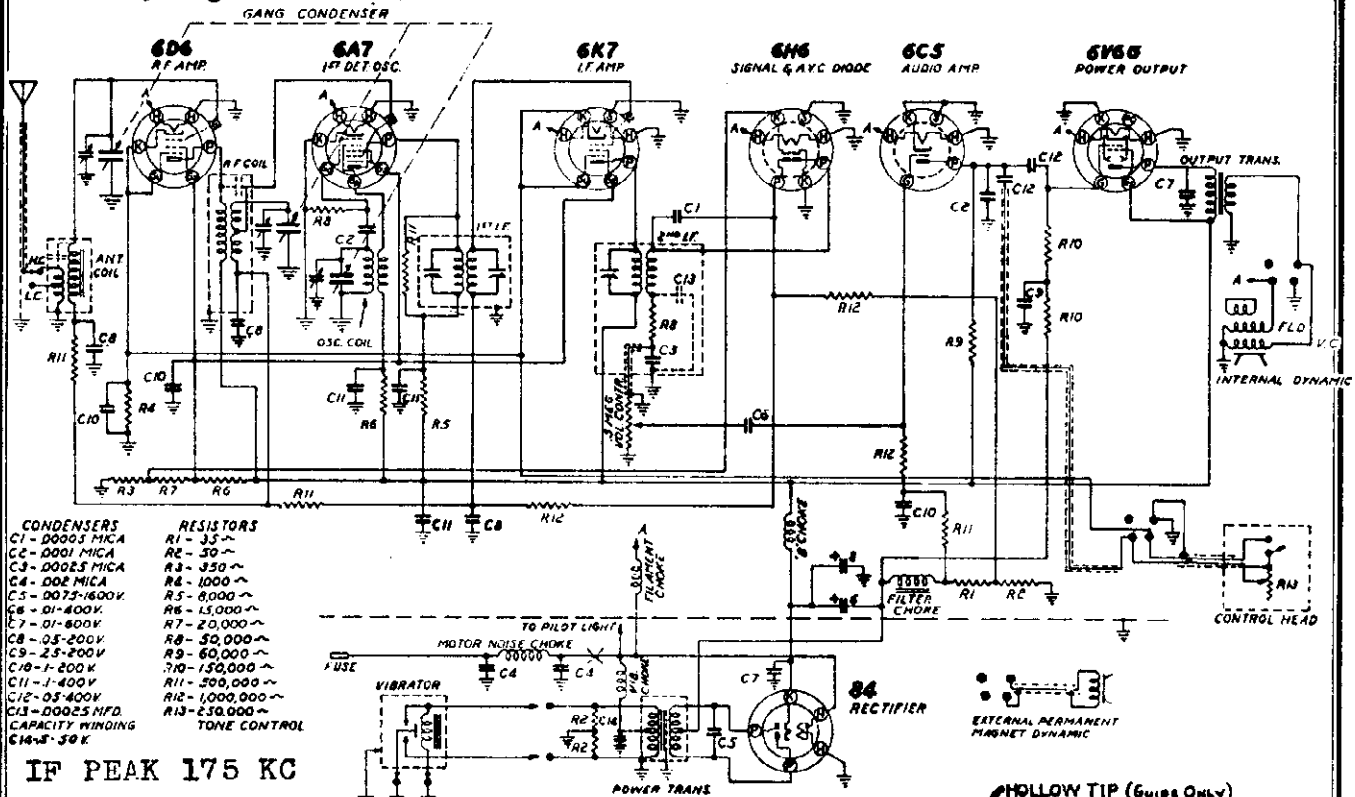
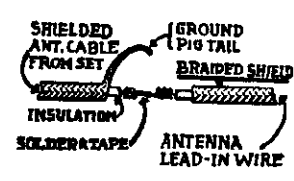


FIG. 17



7-Tube Auto Radio—
 Model 77 & 770 Chassis
 & Schematic

I.F. ALIGNMENT. Adjust the test oscillator to 175 K.C. and connect the output directly to the grid of the first detector tube (6A7), without the use of any series condenser or resistor; the omission of series condenser and resistor to block out the AVC action. The ground on the test oscillator can be connected to the chassis ground. Align the trimmers of the first and second I.F. transformers to peak or maximum reading on the output meter.

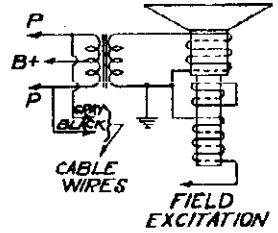
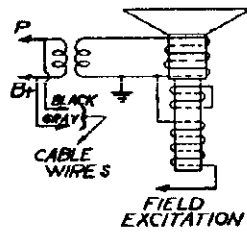
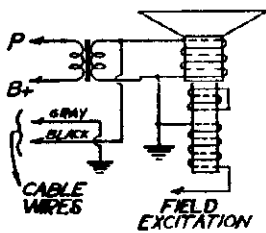
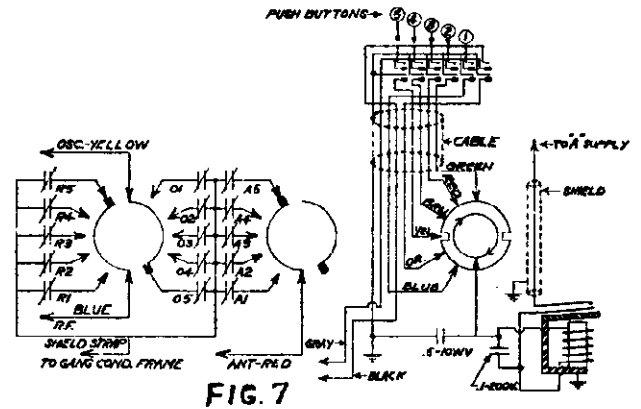
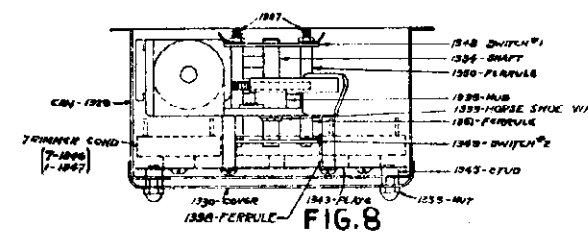
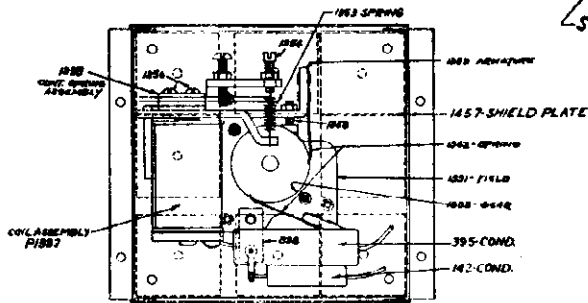
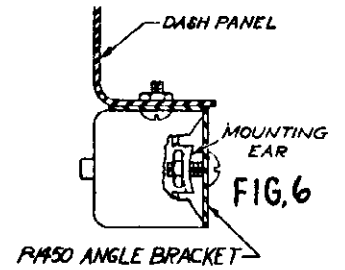
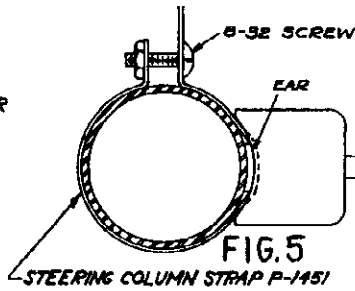
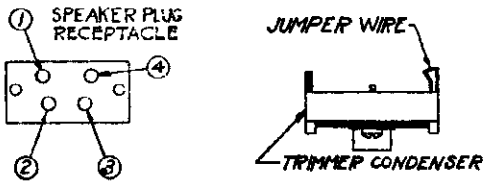
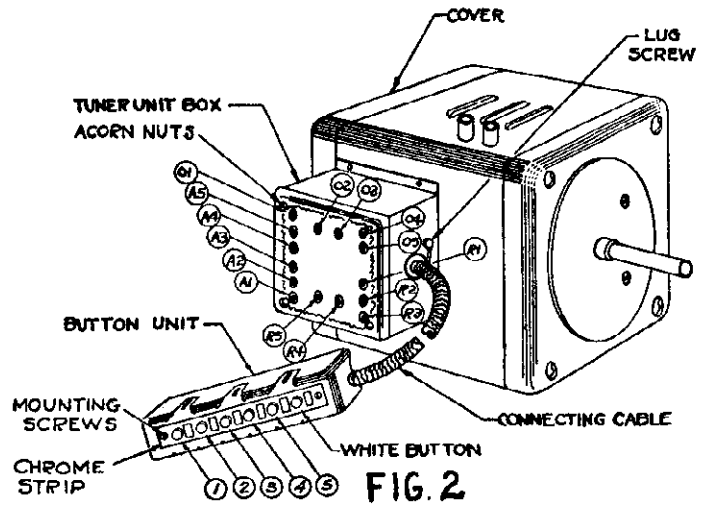
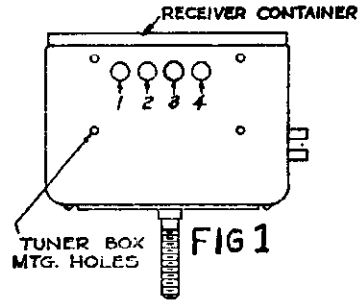
OSCILLATOR ALIGNMENT. Adjust the test oscillator to 1400 K.C. and connect the output to the antenna through

a .0001 mfd. mica condenser to give the equivalent of a low capacity type average auto antenna. Set the dial pointer to 1400 K.C. and adjust the oscillator trimmer to peak. (Front section of gang condenser.)

R.F. ALIGNMENT. The next step is to adjust the center and rear trimmers of the gang condenser to peak. The center section of the gang condenser tunes the antenna amplifier stage (6D6 tube), and the rear condenser section tunes the detector grid coil of the 6A7 tube.

CONTINENTAL RADIO & TELEV. CORP.

MODEL Touch-O-Matic
Type T-21
Schematic
Assembly



TYPE 1
FIG. 9

TYPE 2
FIG. 9

TYPE 3
FIG. 9

MODEL Touch-O-Matic
Type T-21

CONTINENTAL RADIO & TELEV. CORP.

Installation
Adjustments
Notes

Mount. Fasten tuner box cover in place, with the four screws. Replace the radio set cover.

MOUNTING BUTTON UNIT.

Included in the bag of parts:

- 1—Instructions
- 2—Driver screws
- 3—Steering Dash Mounting Bracket
- 4—8/32 x 3/4 R.H.M. screws
- 4—No. 8 lock washers
- 4—8/32 hex nuts
- 1—Celluloid strip
- 1—Station call letter sheet

Included with the TOUCH-O-MATIC is a printed sheet of station call letters, varying upward from 1000 wain and between 550 and 1430 K.C. These call letters are arranged in alphabetical order across the sheet. Each call letter can be selected by the use of a special call letter key. Remove the call letters to be used. Remove the celluloid strip by unscrewing the two small bolts (Fig. 2). Now place the call letters in the proper recess left exposed by the removal of the celluloid strip. Over them place the celluloid strip supplied in the bag of parts, replace the two small bolts, and fasten the station call letter sheet. The set has been mounted in the car, fasten the steering column either on the steering column or under the dash. To mount on the steering column, use the two steering post mounting straps. Bend straps to fit column. Slide bent straps through button case centered on the rear dash cover of the motor button car. Tighten the two screws. The set will hold securely to column (See Fig. 5).

For under dash mounting, a special angle bracket is supplied. This necessitates the drilling of two holes in the bottom edge of the dash. Bolts are supplied for fastening. (See Fig. 6). After the unit has been mounted in the position selected, the set is ready for operation.

OPERATION OF TOUCH-O-MATIC

Switch on the radio. Turn the volume up about half-way and wait about 30 seconds for the tubes to heat, before attempting to operate the set. Now turn the dial pointer as far as it will go to the left—to the high frequency end of the dial. Press the button corresponding to the station wanted. If the above instructions have been followed, and the adjustment has been made accurately, your station will come in precisely tuned. For manual tuning, simply press the white button and operate dial in conventional manner. For TOUCH-O-MATIC tuning, turn dial pointer to extreme high frequency end.

T-21 TOUCH-O-MATIC PARTS LIST

- P1397 Magnet Coil
- P1343 Trimmer Cond.,
- P1350 Terminal Panel
- P1346 Trimmer Cond.
- P1347 Trimmer Cond.
- P1348 Switch segment
- P1349 Switch segment
- P1350 Automatic tuner
- P1352 Control cable
- P1353 Coil spring
- P1354 Condenser
- P1355 Babbler gear
- P1356 Babbler gear
- P1357 Electro-magnet
- P1358 Electro-magnet
- P1359 Electro-magnet
- P1360 Electro-magnet
- P1361 Field Piece
- P1362 Armature
- P1363 Babbler gear
- P1364 Babbler gear
- P1365 Gear shaft's hub
- P1366 Electro-magnet
- P1367 Electro-magnet
- P1368 Electro-magnet
- P1369 Electro-magnet
- P1370 Updr dash
- P1371 Steering post
- P1372 Steering post
- P1373 Steering post
- P1374 Celluloid Shield
- P1375 Shield Plate
- P1376 Acorn Nuts (end.)

ADJUSTING TOUCH-O-MATIC FOR STATIONS CHOSEN.

Connect the radio to a battery and turn the set "on"; press the white button and hold down until clicking stops. (If clicking is not heard, press any red button, then press white button. If a clicking is not heard now, check all the above connections for errors.)

Turn the tuning condenser all the way out and by using a signal generator or a test oscillator, adjust the oscillator trimmer condenser located on tuning condenser to 1590 K.C. Having once made this adjustment it is important that this trimmer condenser remains untouched while making further adjustments. Now set the signal generator to 1400 K.C. and rotate the tuning condenser until the signal is received. Adjust the R.F. and Antenna trimmer condensers to the loudest signal or for the greatest deflection of an output meter. No further adjustments of trimmer condensers located by the set are necessary. Rotate the tuning condenser to the extreme high frequency end, that is, the position with the condenser plates all the way out. This is the position that the condenser plates must take when making adjustments on TOUCH-O-MATIC.

Select the five most desirable stations in your vicinity. The best selection will lie in the most powerful local stations having a frequency of less than 1430 K.C. For convenience, arrange the selected stations in order, according to their frequency—from the lowest to the highest. Press button No. 1, shown in Fig. 2. Select the station of low frequency; set the generator to this frequency. Remove the tuner box cover by removing the four screws, located in the corners of the cover, (Fig. 2). Now adjust trimmer screws "O1", "R1", and "A1" (Fig. 2) in the order named, for the loudest signal or greatest deflection of an output meter. If the frequency of the station cannot be reached with the trimmer screw completely open, cut jumper wire (See Note No. 2 below). It will be necessary to cut jumper wire for all stations having a frequency greater than 1000 K.C. When all three trimmer screws "O1", "R1" and "A1", have been adjusted for button No. 1, proceed with station No. 2.

Press button No. 2 and set the signal generator to the frequency of this station and adjust trimmers screws "O2", "R2", and "A2". Repeat this operation for the three remaining stations, using "O3", "R3", and "A3" for button No. 3; "O4", "R4", and "A4" for button No. 4; and "O5", "R5", and "A5" for button No. 5.

NOTE 2: If the frequency of the station selected cannot be reached when the trimmer screw is completely open on the cable side of the tuning unit, the four self-tapping screws (See Fig. 2) and the four nuts. Now the tuner box can be lifted off, leaving the inner mechanism exposed. Now cut jumper wire (Fig. 4) of trimmer which does not reach frequency. If any other trimmer condenser does not reach frequency when screw is completely opened, cut its trimmer wire. Now replace the tuner box, the four self-tapping screws, the four nuts, and the lug screw. Adjust trim-

mer of the installation. Depend largely upon the amount of these wires. Long leads may be used to the end of the dial.

The driver cover, No. 35 holes close to the side of the tuning condenser. Drill 3/16" holes close to the side of the tuning condenser. Locate these holes in such a manner as to provide the most direct path for the red, yellow, and blue leads. It is important that these wires be cut and filed, and that they are not in close relation to one another. Solder the wires to the tuner box to cross or come in close relation to the tuner box. The tuner box should be provided with some form of low capacity shield to capacity between any of the wires in the tuner box, as suppressor will cause excess oscillation and feed back. Solder the tuning condenser to the tuner box. Any tendency for the tuner to cause oscillation, or any tendency to capacity between these three wires. Proper shielding will stop the oscillation in all cases. If the installation will permit the choice of the yellow wire for the oscillator section, the red for the antenna section, and the blue wire for the frequency or R.F. section, the group letters "O", "A", "R", "MATIC" will have the following meaning: Oscillator, Antenna, and R.F., respectively.

If this selection of wires cannot be made, it may be necessary to add a small shield around the yellow wire in the TOUCH-O-MATIC unit. This shield should be of the low capacity variety, similar to that found on the blue wire, and not of the high capacity variety. Under every condition, the tuning condenser should be shielded. A fourth hole is necessary to allow the admittance of the shielded wire and the gray and black wire into the receiver container. The location of this hole is purely arbitrary as long as it is in the confines of the tuner box.

Fasten the tuner to the sides of the receiver by means of the four self-tapping screws provided in the bag of parts. After cutting to the proper size, solder the yellow, blue and red wires to the station-section lugs of the tuning condenser. The tuner box should be fastened to the receiver by means of the four screws provided in the bag of parts. The tuner box should be fastened to the receiver by means of the four screws provided in the bag of parts. The tuner box should be fastened to the receiver by means of the four screws provided in the bag of parts. The tuner box should be fastened to the receiver by means of the four screws provided in the bag of parts.

1. Determine whether or not the receiver in question has push-pull output.
2. Determine whether the output transformer is connected to the set or on the speaker; (if an external speaker, the speaker wires are easily accessible).
3. Determine whether the output transformer is connected to the set or on the speaker; (if an external speaker, the speaker wires are easily accessible).
After the above data is obtained, connect the gray and black wires according to the most suitable method suggested by one of the three diagrams, (Fig. 9, type 1-2-3). For sets with external or internal speaker with output transformer in chassis, use circuit Type 1. For sets with push-pull output, use circuit Type 2. For sets with push-pull output in set or on speaker, use circuit suggested in Type 3. For all other sets, use circuit suggested in Type 2.
Connect the receiver to battery and turn the set "on". Press white button and hold down until clicking stops. If no clicking is heard, check wiring carefully. Be sure that the shielded wire is connected to some source of "A" supply). Press white button again and hold down until the clicking stops. This places tuner in minimum capacity position in which no trimmer condensers are connected to the receiver. Align the set in the conventional manner. Adjust TOUCH-O-MATIC adjustment screws according to information given under the heading: ADJUSTING TOUCH-O-MATIC FOR STATIONS CHOSEN.

GENERAL INFORMATION.

The ADMIRAL TOUCH-O-MATIC Tuner can be installed on any radio receiver which uses a six volt source of supply, where the mechanical layout of the set is of such nature that the tuner unit of the TOUCH-O-MATIC may be mounted near the tuning condenser. TOUCH-O-MATIC is not a booster unit and will not increase the volume or range of the set since it contains no tubes.

INSTALLATION OF ADMIRAL TOUCH-O-MATIC ON MODELS 66, 660; 77, 770; 78, 780; 88, 880.

Remove the cover of the radio and take the set out of the container. Now press out the four knock-out slugs located on the condenser side of the container (See Fig. 1) (For models 88-880 see Note 1 before replacing set in container). Replace and secure the set in the container. Scrape away the paint from around each one of the four mounting holes, shown in Fig. 1, to insure good electrical contact with the tuner box. Fig. 2 shows a complete assembly view.

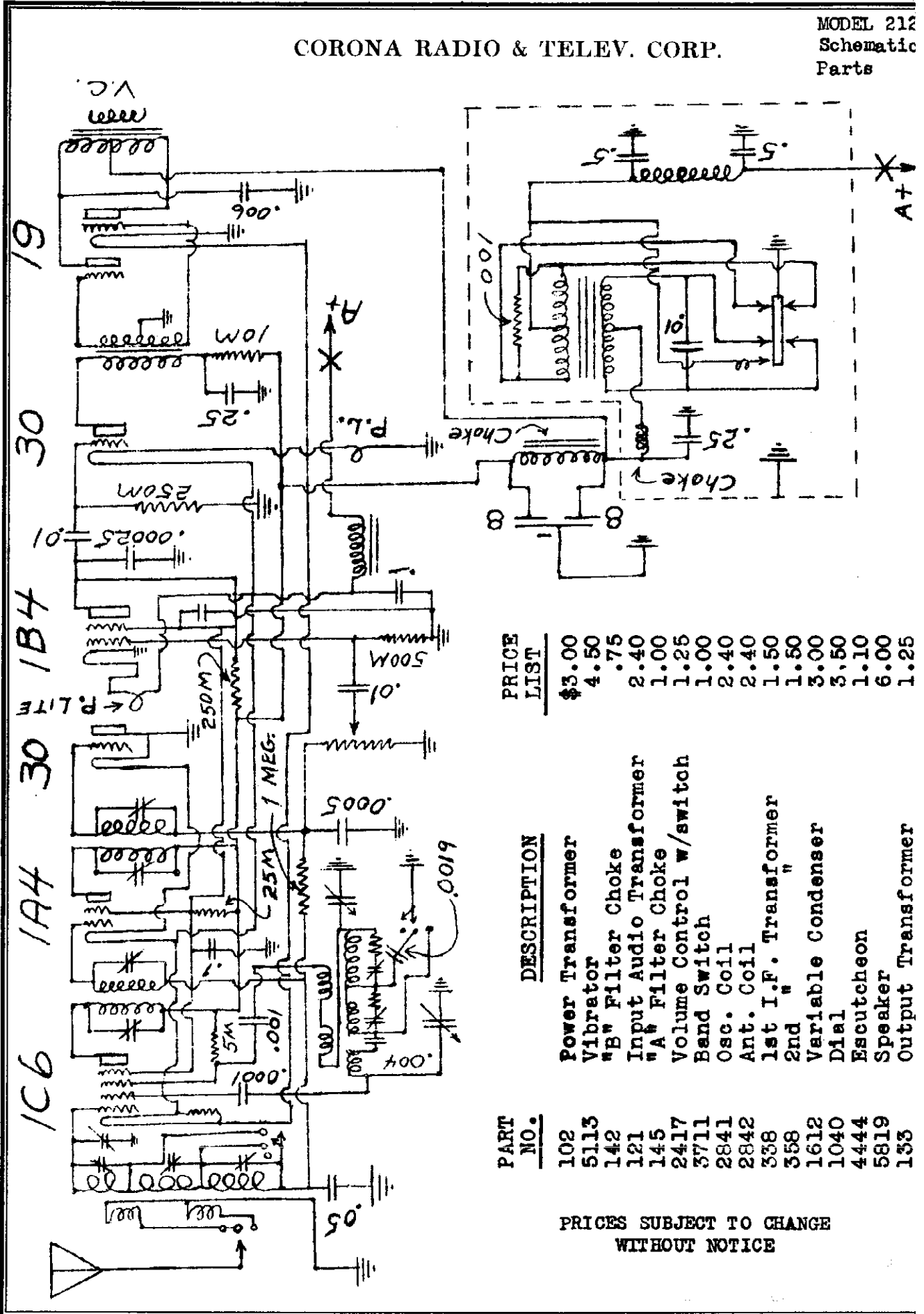
The tuner box and the button unit are shipped from the factory, connected together by a heavy cable. The only connections to be made are projecting from the open end of the tuner box. These holes are to be introduced into the four large holes in the side of the receiver container, shown in Fig. 1. Pull the gray, black, and shielded wire through hole No. 1. Through hole No. 2, pull the blue wire. Pull the red wire and the copper strap through hole No. 3, and the yellow wire through hole No. 4. Now mount the tuner box in the position shown in Fig. 2. Use the four self-tapping screws supplied in bag of parts. After the tuner box has been securely fastened to the container, remove the single section shield located at the top of the R.F. section of the tuning condenser. This may be removed by loosening the two bolts at the rear plate of the tuning condenser. Now solder the blue wire to the lug left exposed by the removal of the shield, replace the shield and tighten bolts. Make the red, blue and yellow wires as short as possible without losing the floating properties of the tuning condenser. Solder the red wire to the stator lug of the middle sector of the tuning condenser. Solder the copper strap to the frame of the tuning condenser; preferably one of the center partitions. Solder the yellow wire to the stator lug of the oscillator—front section of the tuning condenser. When the unit is being mounted on the models 66, 660; 77, 770; 78, 780; (For 88, 880 see Note 1 below) solder the gray wire to lug No. 2 of the speaker plug receptacle located in the set (See Fig. 3) Solder the wire of the shielded cable to lug No. 3 (Fig. 3). Solder the black wire to lug No. 1 (Fig. 3).

NOTE 1—When the unit is being mounted on the models 88, 880, solder the black wire to lug No. 4 (Fig. 3). Solder the shielded wire to the ungrounded side of the filament of any conveniently located tube, and the gray wire to lug No. 1 (Fig. 3). All the necessary connections are now made.

GENERAL INSTALLATION OF TOUCH-O-MATIC ON OTHER THAN ADMIRAL SETS
For receivers other than types listed above, proceed in the following order: (1) Follow the instructions carefully. (2) Determine the location of the tuning condenser unit of the TOUCH-O-MATIC. Selecting a position for the unit so that the three Radio Frequency wires can be made as short as possible. These wires are the red, yellow and blue wires which connect directly to the switch mechanism of the TOUCH-O-MATIC (See Fig. 4). The inc-

CORONA RADIO & TELEV. CORP.

MODEL 212
Schematic
Parts

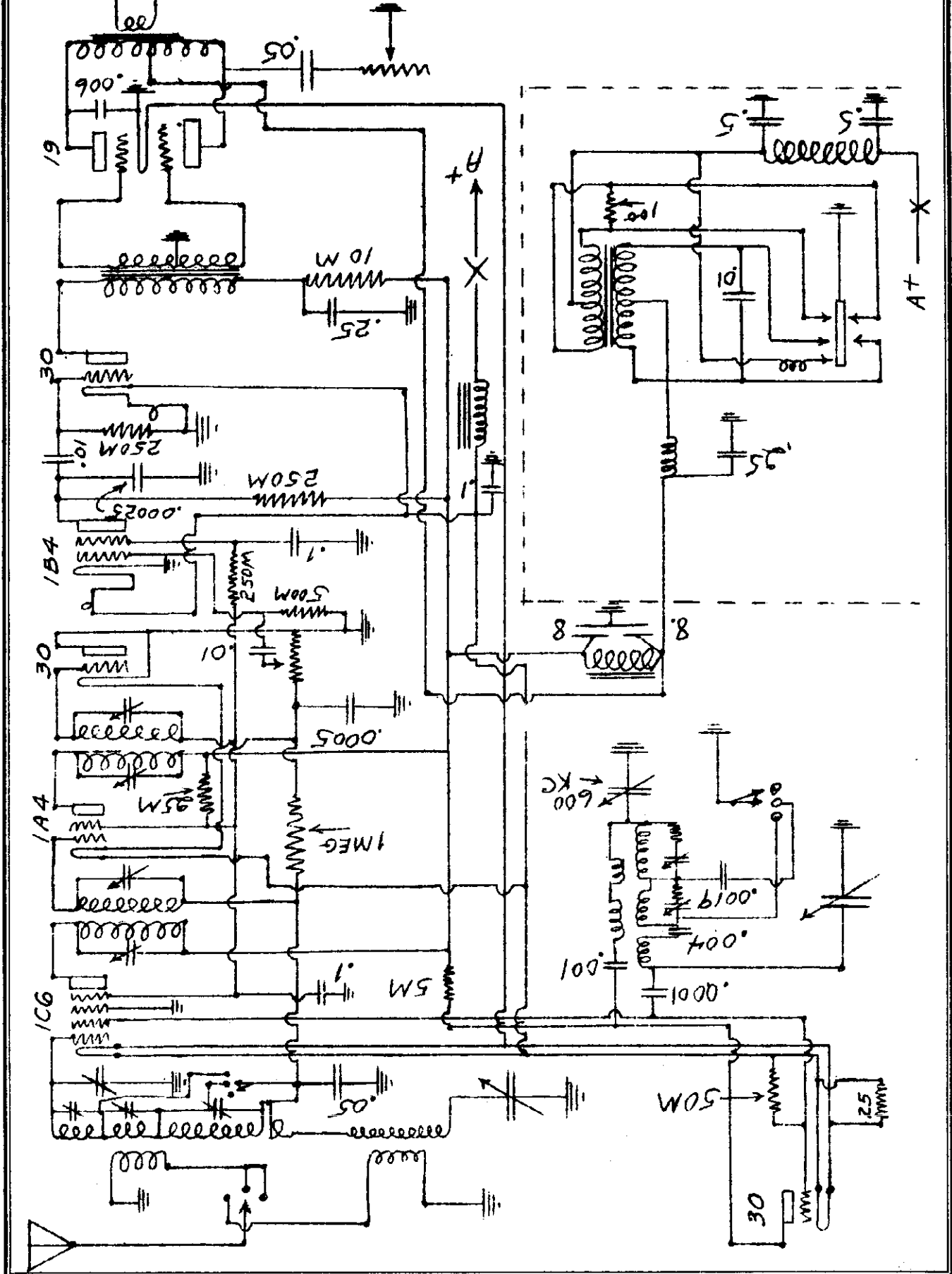


PART NO.	DESCRIPTION	PRICE LIST
102	Power Transformer	\$3.00
5113	Vibrator	4.50
142	"B" Filter Choke	.75
121	Input Audio Transformer	2.40
145	"A" Filter Choke	1.00
2417	Volume Control w/switch	1.25
3711	Band Switch	1.00
2841	Osc. Coil	2.40
2842	Ant. Coil	2.40
338	1st I.F. Transformer	1.50
358	2nd " "	1.50
1612	Variable Capacitor	3.00
1040	Dial	3.50
4444	Escutcheon	1.10
5819	Speaker	6.00
133	Output Transformer	1.25

PRICES SUBJECT TO CHANGE
WITHOUT NOTICE

MODEL 214
Schematic

CORONA RADIO & TELEV. CORP.



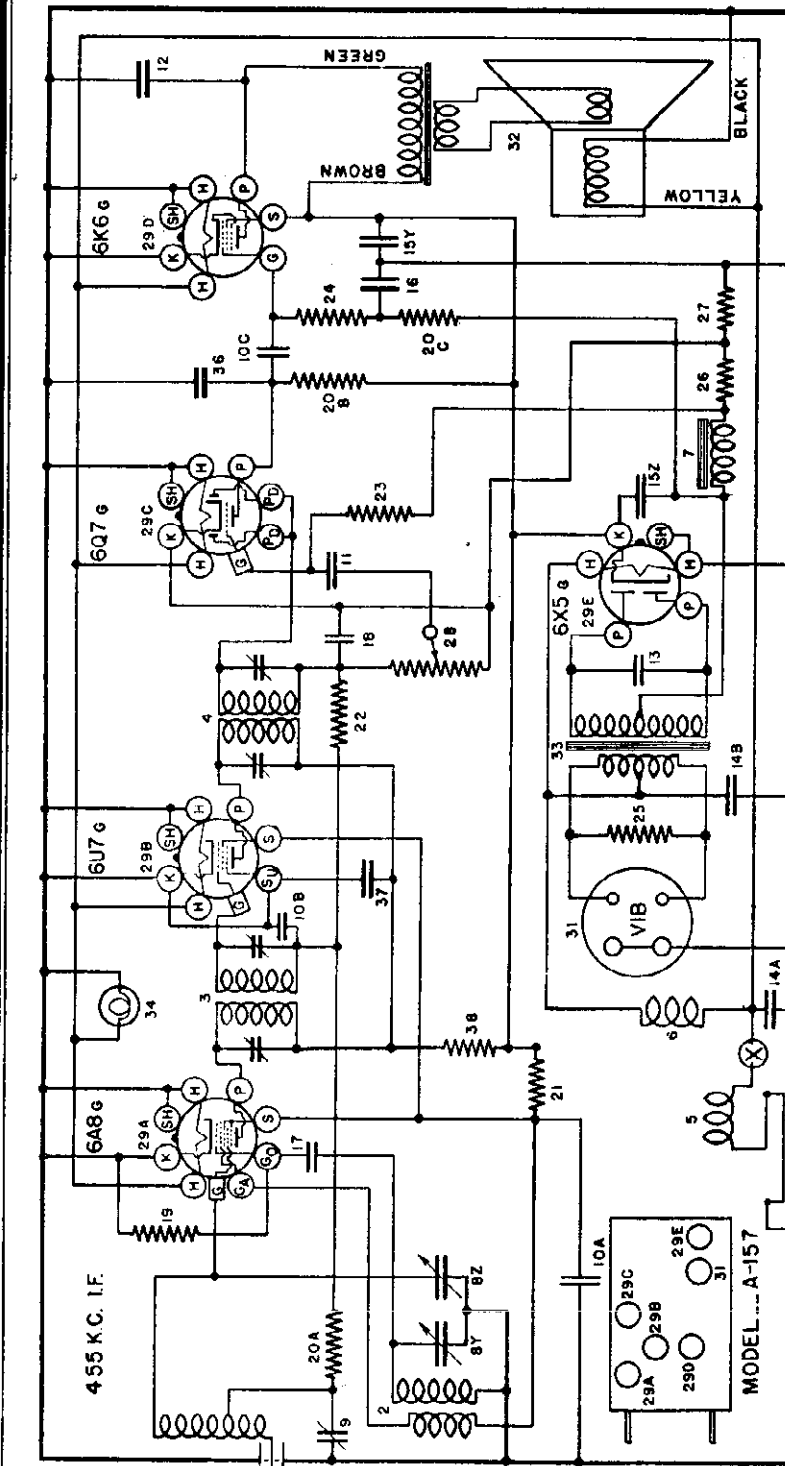
CROSLEY RADIO CORP.

MODEL A-157, Fiver Roamio
Schematic, Voltage, Parts

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	K	Ga	Co
6A8-G	Oscillator-Modulator	6.0	220	90	—	—	90	—
6U7-G	I-F Amplifier	6.0	220	90	—	—	—	—
6Q7-G	Diode Detector & A-F Amp.	6.0	110	—	—	—	—	—
6K6-G	Output	6.0	200	—	—	—	—	—
6X5-G	Rectifier	6.0	—	—	—	—	—	—

Power Output approximately 4 Watts.
Battery Drain approximately 5.7 Amperes at 6 Volts.



Item No.	Part No.	Description	Part No.	Description
1	G137-32000	Antenna Coil	21	Resistor 20,000 Ohm 1/2 W.
2	G137-32002	Oscillator Coil	22	Resistor 1 Megohm 1/4 W.
3	G146-32004	1st I-F Assembly, 455 Kc.	23	Resistor 1/2 W.
4	G146-32004	2nd I-F Assembly, 455 Kc.	24	Resistor 20,000 Ohm 1/2 W.
5	G16-32977	Motor Noise Choke	25	Resistor 500,000 Ohm 1/2 W.
6	G21-28067	"A" Filter Choke	26	Resistor 220 Ohm 1/2 W.
7	G16-21635	"B" Filter Choke	27	Resistor 40 Ohm 1/2 W.
8	G36-33001	Var. Tuning Cond., 2 Section	28	Resistor 60 Ohm 1/2 W.
9	38998A	Condenser Ant. Comp.	29	Socket, Octal
10ABC	32380	Condenser .05 Mf. 200 V.	G178-36400	Socket, Octal
11	37226	Condenser .02 Mf. 160 V.	W-50142	Tube Shield, Plain Half } 6U7-G
12	W-23191A	Condenser .01 Mf. 400 V.1	W-50143	Tube Shield, Cut-out Half }
13	W-50170	Condenser .01 Mf. 1000 V.	W-31210	Tube Shield Ring
14AB	W-50161	Condenser 5 Mf. 120 V.	W-50123	Socket (Vibrator)
15ZY	W-50160	Condenser 4 Mf. 350 V.	G105-28807	Gnd. Clip (Vibrator)
16	W-50105	Condenser 1 Mf. 160 V.	253-BL7-C	Speaker, Spec. 5-S-21
17	G1-31002	Condenser .00025 Mf. 200 V.	W-44062	V. C. & Cone Assembly
18	G3-34002	Condenser .0005 Mf. 200 V.	W-44063	Output Trans.
19	35928	Resistor 60,000 Ohm 1/2 W.	G15-32769	Power Trans./ormer
20ABC	35601	Resistor 300,000 Ohm 1/2 W.	W-50130	P. T. Shield
			W-43567	Dial Light Bulb

MODEL A-157 (Fiver Roamio)

April, 1937

- Bracket--Dial Light
- "A" Lead Assembly
- Fuse, 12 Amp.
- Fuse Cap (Female)
- Fuse Insulator
- Fuse Cap (Male)
- Condenser .000025 Mfd. 200 V.
- Condenser .05 Mfd. 400 V.
- Resistor 750 Ohm 1/2 W.
- Resistor 1000 Ohm 1/2 W.
- Dist. Suppressor
- Gen. Condenser
- Mtg. Bracket (Set)
- Mtg. Screw (Set)
- Mtg. Nut
- Mtg. Bolt
- Ant. Connecting Lead (Extra)
- Knob
- Dial Face (Glass)
- Support Ring (Dial)
- Support Bracket (Dial)
- Dial Mask
- Pulley and Hub Assembly
- Drive Cord
- Shaft (Drive)
- Mtg. Bracket (Shaft)

MODEL A-157, Fiver Radio
Socket, Trimmers, Chassis
Alignment

CROSLEY RADIO CORP.

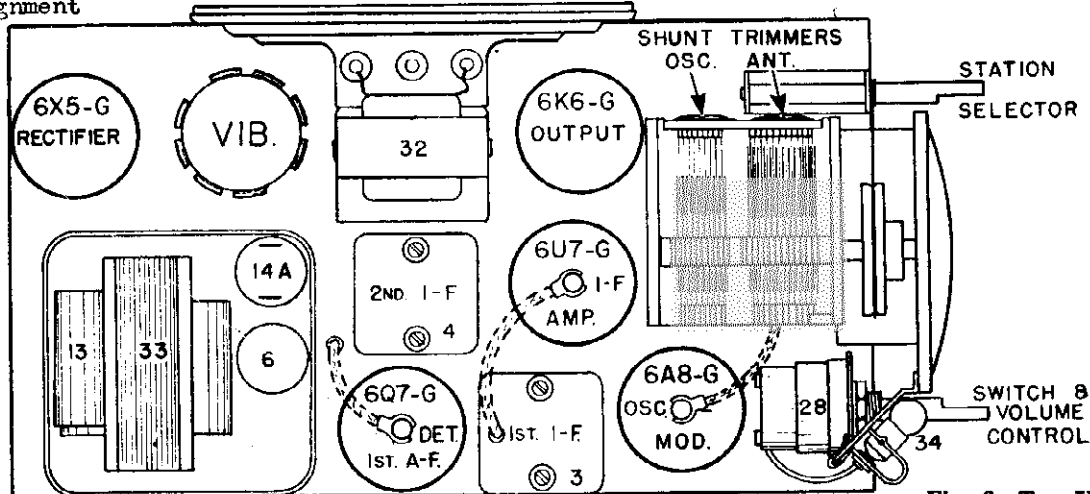


Fig. 2 Top View A-157

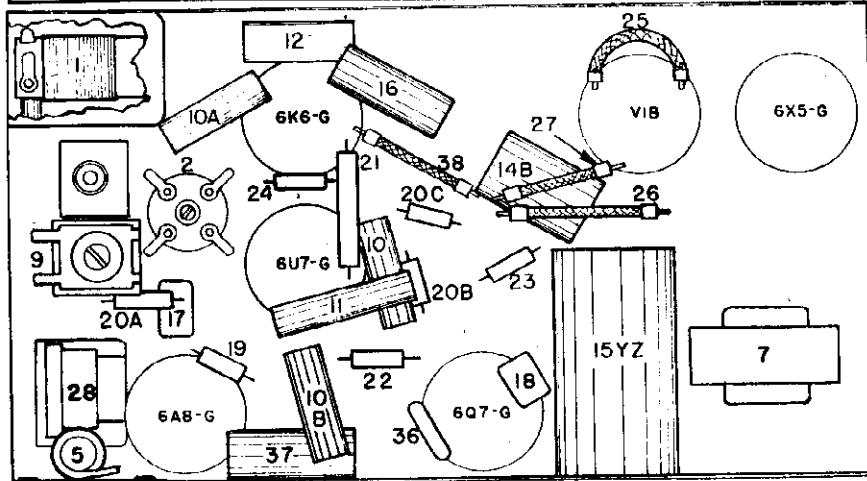


Fig. 3 Bottom View A-157

CONNECTING OUTPUT METER

Connect the output meter to P and S of the 6K6G Output tube. Be sure the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier To 455 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd., or larger, condenser to the top cap of the 6A8G Osc-Mod. tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the receiver chassis frame. **KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.**

(b) Adjust the station selector so that the rotor plates of the tuning condenser are completely disengaged and turn Vol. Cont. to maximum position (RIGHT).

- (c) Set the signal generator to 455 kilocycles.
- (d) Adjust both trimmers located on the 2nd I-F transformer for maximum output. Fig. 2.
- (e) Adjust both trimmers located on the 1st I-F transformer for maximum output.
- (f) Repeat operations (d) and (e) for more accurate adjustments.

IN ORDER TO PREVENT A. V. C. ACTION ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

2. Aligning R-F Amplifier.

(a) Connect the output lead from the signal generator through a .00025 mfd. condenser to the "ANT" connection of the receiver.

- (b) Set the signal generator to 1400 kilocycles.
- (c) Adjust the station selector to 140 on the dial.
- (d) Adjust the trimmer on the "OSC" section of the tuning condenser for maximum output.
- (e) Adjust the trimmer on the "ANT" section of the tuning condenser for maximum output.
- (f) Readjust the station selector for maximum output. **DO NOT READJUST THE OSC. TRIMMER.**
- (g) Repeat operation (e) for more accurate adjustment.

3. Adjusting Antenna Compensating Condenser.

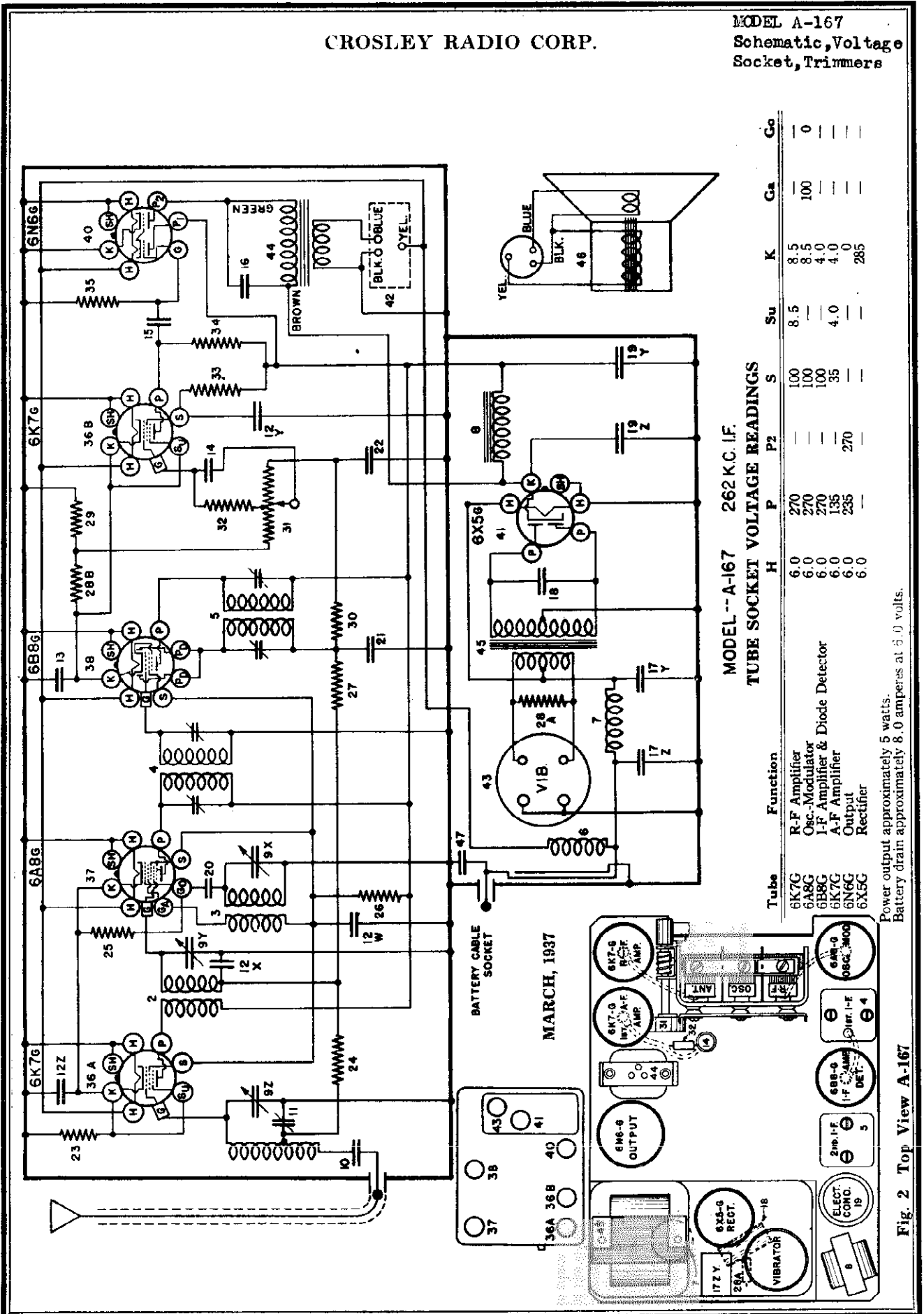
- (a) Set the signal generator to 600 kilocycles.
- (b) Tune in the 600 kilocycle signal with the station selector for maximum output.
- (c) Adjust the antenna compensating condenser, Illustration No. 9, Fig. 3, for maximum output.
- (d) Repeat operations (b) and (c) alternately until no further improvement can be obtained.
- (e) Set the signal generator to 1400 kilocycles again.
- (f) Tune-in the 1400 kilocycle signal with the station selector for maximum output.
- (g) Readjust the trimmer on the "ANT" section of the tuning condenser for maximum output.

It will be necessary to adjust the antenna compensating condenser to the car antenna after the receiver has been installed in the car.

- (a) After the installation is complete, tune-in a WEAK station between 55 and 65 on the dial.
- (b) Adjust the antenna compensating condenser for maximum volume in the speaker.

CROSLLEY RADIO CORP.

MODEL A-167
Schematic, Voltage
Socket, Trimmers



MODEL A-167 262 K.C. I.F.

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	K	Ga	Go
6K7G	R-F Amplifier	6.0	270	100	8.5	8.5	100	0
6A8G	Osc.-Modulator	6.0	270	100	8.5	8.5	100	0
6B8G	I-F Amplifier & Diode Detector	6.0	270	100	8.5	8.5	100	0
6K7G	A-F Amplifier	6.0	135	35	4.0	4.0	4.0	0
6X5G	Output Rectifier	6.0	235	—	—	285	—	—

Power output approximately 5 watts.
Battery drain approximately 8.0 amperes at 5.0 volts.

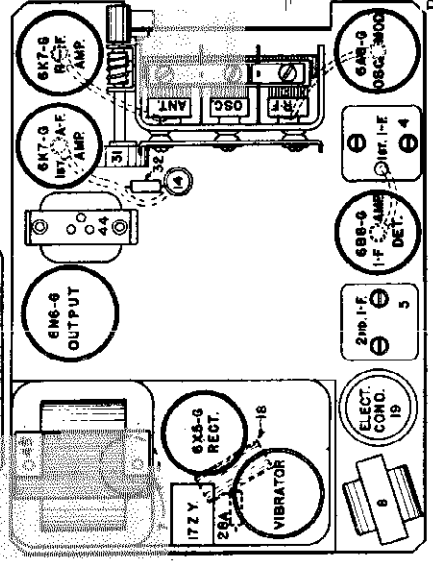


Fig. 2 Top View A-167

MODEL A-167
Chassis, Parts
Alignment

CROSLLEY RADIO CORP.

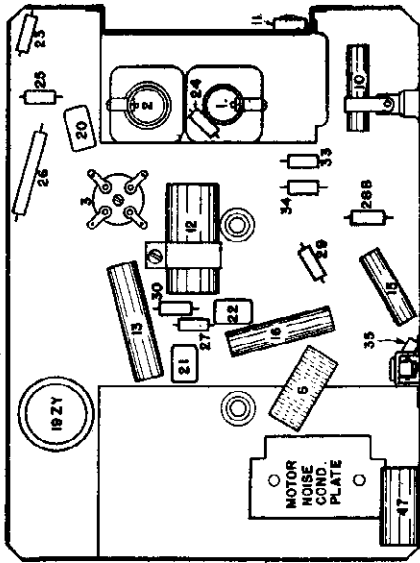


Fig. 3 Bottom View A-167
Resistor 60,000 Ohm 1/4W.
Resistor 30,000 Ohm 1W.
Resistor 1 Megohm 1/4W.
Resistor 220 Ohm 1/2W.
Resistor 600 Ohm 1/2W.
Resistor 20,000 Ohm 1/4W.
Volume Control 300,000 Tap 150,000 Ohm
Resistor 2 Megohm 1/4W.
Resistor 750,000 Ohm 1/4W.
Resistor 100,000 Ohm 1/4W.
Resistor 250,000 Ohm 1/4W.
Socket Type 6K7
Socket Type 6A8
Socket Type 6B8
Socket Type 6N6
Socket Type 6Y5
Socket Speaker
Socket Vibrator
Vibrator Ground Clip
Synchronous Mtg. Stud
Base—Tube Shield
Tube Shield—Half
Tube Shield—Half
Tube Shield—Half (2), 6x5
Ring—Tube Shield
Output Transformer
Speaker Socket, part of G1—43619
Brikt. Assy.
Power Transformer
Vibrator
Speaker Spec. 1-D-895
Cone Assembly
Field Coil
Top Cover Assembly
F. Scutcheon
Screen—Speaker
Grille Cloth
Clamp—Speaker Cable
Ground Clip (16 used)
Stud—Sync. Mtg.

Item No.	Part No.	Description
1	G134—32000	Ant. Coil
2	G93—32001	R-F Coil
3	W—38935	Coil Shield only
4	MC23—50000	Ant. and R-F Shield Assy. (Cans and Brackets)
5	MG24—50000	Ant. and R-F Coils and Shield Assy. Complete
6	W—32912	Wood Coil Spacer
7	G134—32005	Osc. Coil
8	G37—32006	1st I-F Assembly
9	G15—32977	2nd I-F Assembly
10	G20—28067	Choke—Motor Noise
11	G75—24628	Choke "A" Filter
12	G57—33002	Choke "B" Filter
13	W—38899A	3-Section Var. Tuning Cond.
14	W—50039	Var. Cond. Connection
15	W—50054	Condenser .003 Mf. 160 V.
16	W—40698	Condenser .005 Mf. 160 V.
17	W—50044A	Condenser .05 Mf. 400 V.
18	W—24049C	Condenser .1 Mf. 200 V.
19	W—37226	Condenser .02 Mf. 160 V.
20	W—32380	Condenser .05 Mf. 200 V.
21	W—50043	Condenser .005 Mf. 160 V.
22	W—38990	Condenser .5 Mf. 160 V.
23	W—38904	Condenser .005 Mf. 1000 V.
24	W—50045A	Condenser 6 Mf. 350 V.
25	G1	Condenser .0025 Mf.
26	G3	Condenser .0025 Mf.
27	G2	Condenser .0001 Mf.
28	W—50046	Resistor 1000 Ohm 1/4W.
29	W—35601	Resistor 300,000 Ohm 1/4W.

(h) Repeat operations (e) and (f) for more accurate adjustments.

3. Adjusting Antenna Compensating Condenser.

- (a) Set the signal generator to 600 kilocycles.
- (b) Tune in the 600 kilocycle signal with the station selector for maximum output.
- (c) Adjust the antenna compensating condenser, Illustration No. 11, Fig. 3, for maximum output.
- (d) Repeat operations (b) and (c) alternately until no further improvement can be obtained.
- (e) Set the signal generator to 1400 kilocycles again.
- (f) Tune-in the 1400 kilocycle signal with the station selector for maximum output.
- (g) Readjust the trimmer on the "ANT" section of the tuning condenser for maximum output.

It will be necessary to adjust the antenna compensating condenser to the car antenna after the receiver has been installed in the car.

(a) After the installation is complete, tune-in a WEAK station between 55 and 65 on the dial.

(b) Adjust the antenna compensating condenser for maximum volume in the speaker.

CONNECTING OUTPUT METER
Connect the output meter to P1 and P2 of the 6N6G Output tube. Be sure the meter is protected from D. C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.
NOTE:The receiver chassis should be in i.s. case and a speaker similar to one used with the receiver must be connected to the chassis before making adjustments. It is advisable to use a spare control unit for making adjustments of the volume control and tuning condenser. A standard control unit with short cables (6" to 8") makes a very convenient and useful tool. If it is desired to shorten a pair of long cables it will be absolutely necessary to heavily tin the cables before cutting them.

1. Tuning I-F Amplifier To 262 Kilocycles.

- (a) Connect the output of the signal generator through a .02 mfd., or larger, condenser to the top cap of the 6A8G Osc-Mod. tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the receiver chassis frame. **KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.**
- (b) Adjust the station selector so that the rotor plates of the tuning condenser are completely in mesh.
- (c) Set the signal generator to 262 kilocycles.
- (d) Adjust both trimmers located on the 2nd I-F transformer for maximum output. (Fig. 2).
- (e) Adjust both trimmers located on the 1st I-F transformer for maximum output.
- (f) Repeat operations (d) and (e) for more accurate adjustments.

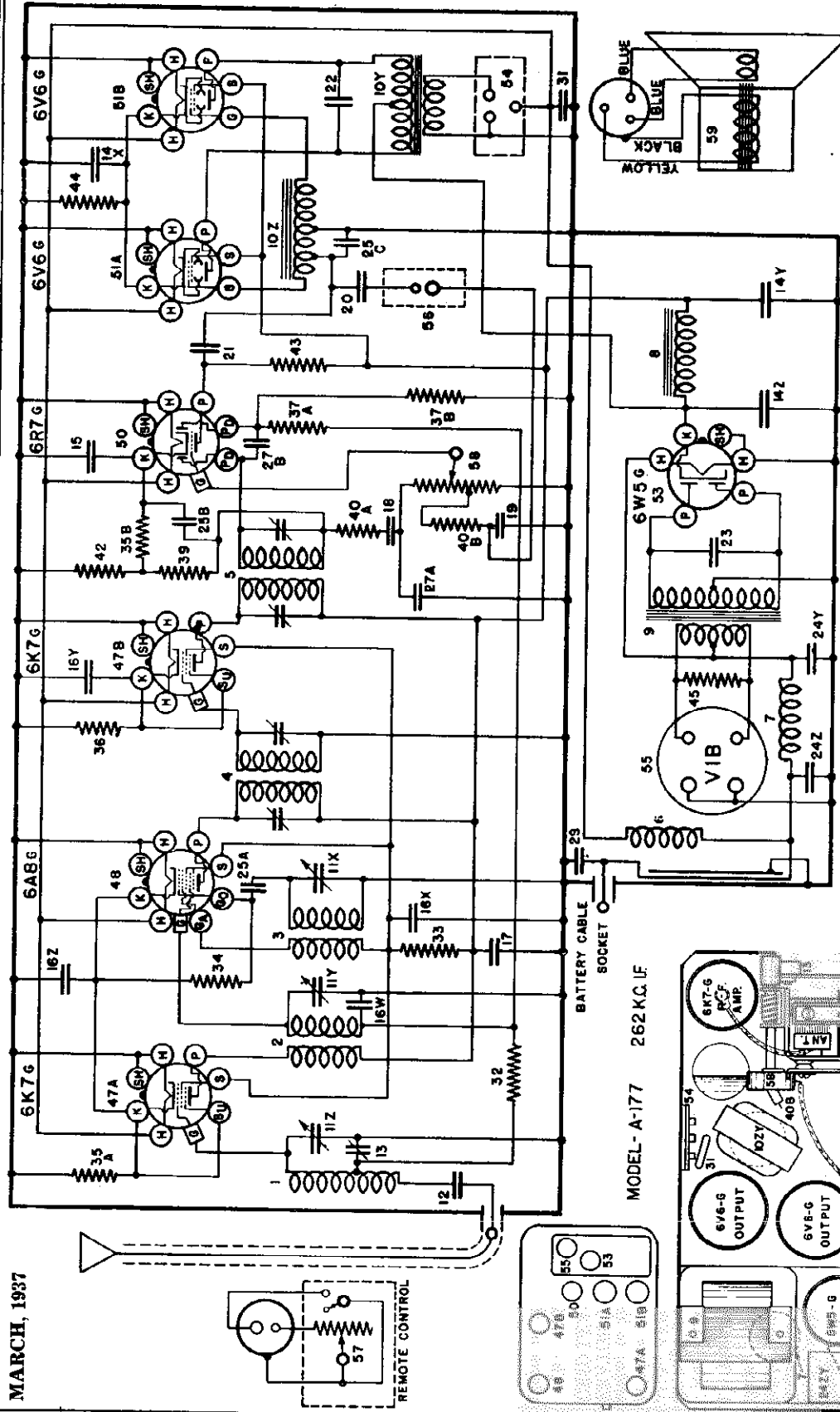
2. Aligning R-F Amplifier

- (a) Connect the output lead from the signal generator through a .00025 mfd. condenser to the "ANT" section of the receiver.
- (b) Set the signal generator to 1400 kilocycles.
- (c) Adjust the station selector to 140 on the dial.
- (d) Adjust the trimmer on the "OSC" section of the tuning condenser for maximum output.
- (e) Adjust the trimmer on the "R.F." section of the tuning condenser for maximum output.
- (f) Adjust the trimmer on the "ANT" section of the tuning condenser for maximum output.
- (g) Readjust the station selector for maximum output. **DO NOT READJUST THE OSC. TRIMMER.**

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

CROSLLEY RADIO CORP.

MODEL A-177
Schematic, Voltage
Socket, Trimmers



TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	Su	K	Ca	Co
6K7G	R-F Amplifier	6.0	225	90	4.0	4.0	90	-18
6A8G	Osc.-Modulator	6.0	225	90	3.2	3.2	90	---
6K7G	1-F Amplifier	6.0	225	90	3.2	3.2	90	---
6R7G	Diode Det. & 1st A-F Amplifier	6.0	170	295	---	7.0	---	---
6V6G	(2) Output	6.0	240	---	---	13.0	---	---
6W5G	Rectifier	6.0	---	---	---	13.0	250	---

Power output approximately 9 watts.
Battery drain approximately 10 amperes at 6.0 volts.

MARCH, 1937

MODEL A-177 262 KC. IF

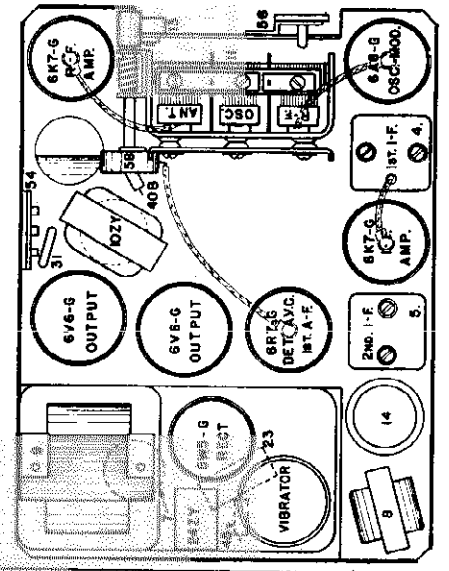


Fig. 2 Top View A-177

MODEL A-177
Chassis, Parts
Alignment

CROSLLEY RADIO CORP.

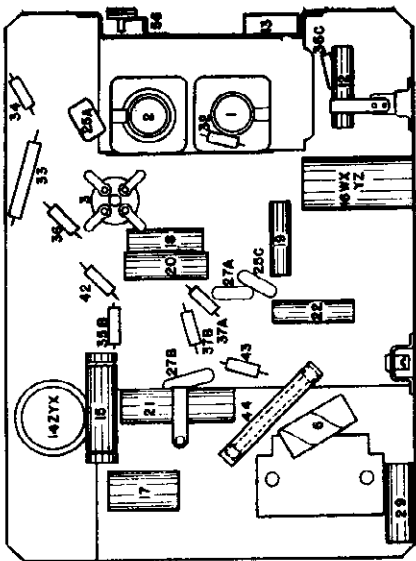


Fig. 3 Bottom View A-177

30084	Condenser .003 Mf. 160 V.
50065	Condenser .03 Mf. 160 V.
50066	Condenser .15 Mf. 400 V.
25435	Condenser .003 Mf. 400 V.
50068A	Condenser .006 Mf. 1000V.
38990	Condenser .5 Mf. 160 V.
34002	Condenser .5 Mf. 160 V.
34002	Condenser .0025 Mf. Molded
34002	Condenser .0025 Mf. Molded
34002	Condenser .001 Mf. Molded
50105	Condenser .1 Mf. 160 V.
34002	Condenser .0025 Mf. Molded
34002	Condenser .005 Mf. Molded
35601	Resistor 300,000 Ohm 1/4W.
37377	Resistor 20,000 Ohm 1W.
35928	Resistor 60,000 Ohm 1/4W.
38916	Resistor 350 Ohm 1/2W.
38918	Resistor 600 Ohm 1/4W.
35602	Resistor 1 Megohm 1/4W.
35600	Resistor 150,000 Ohm 1/4W.
35600	Resistor 100,000 Ohm 1/4W.
38916	Resistor 350 Ohm 1/2W.
36316	Resistor 2700 Ohm 1/4W.
36760	Resistor 20,000 Ohm 1/4W.
22172A	Resistor 220 Ohm 1/2W. Flex.
38977	Resistor 220 Ohm 1/2W.
35600	Resistor 100,000 Ohm 1/4W.
G151-36400	Socket Type 6K7
G156-36400	Socket Type 6A8
36400	Socket Type 6R7
G176-36400	Socket Type 6V6
36400	Socket Type 6W5
G177-36400	Socket 3 Prong Speaker
38993	Socket Vibrator
G105-28807	Socket 2 Prong—T. C. & B. Comp.
W-50063	Vibrator
G6-38000	Control Head, etc.
See Remote	Volume Control
50056	Tap 1 Meg.
424C8-M	Speaker—Header Assembly

(f) Adjust the trimmer on the "ANT" section of the tuning condenser for maximum output.
 (g) Readjust the station selector for maximum output. **DO NOT READJUST THE OSC. TRIMMER.**
 (h) Repeat operations (e) and (f) for more accurate adjustments.

3. Adjusting Antenna Compensating Condenser.

(a) Set the signal generator to 600 kilocycles.
 (b) Tune in the 600 kilocycle signal with the station selector for maximum output.
 (c) Adjust the antenna compensating condenser, Illustration No. 13, Fig. 3, for maximum output.
 (d) Repeat operations (b) and (c) alternately until no further improvement can be obtained.
 (e) Set the signal generator to 1400 kilocycles again.
 (f) Tune-in the 1400 kilocycle signal with the station selector for maximum output.

(g) Readjust the trimmer on the "ANT" section of the tuning condenser for maximum output.
 It will be necessary to adjust the antenna compensating condenser to the car antenna after the receiver has been installed in the car.

(a) After the installation is complete, tune-in a WEAK station between 55 and 65 on the dial.
 (b) Adjust the antenna compensating condenser for maximum volume in the speaker.

Connect the output meter to the plate (P) terminals of the 6V6G output tubes. Be sure the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

NOTE: The receiver chassis should be in its case and a speaker similar to one used with the receiver should be connected to the chassis before making any adjustments. It is also advisable to use a spare control unit for making adjustments of the volume control and tuning condenser. A standard control unit with short cables (6" to 8") makes a very convenient and useful tool. If it is desired to shorten a pair of long cables it will be absolutely necessary to heavily tin the cables before cutting them.

1. Tuning I-F Amplifier To 262 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd., or larger, condenser to the top cap of the 6A8G Osc.-Mod. tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the receiver chassis frame. **KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.**
 (b) Adjust the station selector so that the rotor plates of the tuning condenser are completely in mesh.
 (c) Turn the volume control full on.
 (d) Leave the Fidelity Control cable disconnected from the chassis as this automatically sets the Fidelity Control in the TREBLE position and the Bass Compensation control in the OFF position.
 (e) Set the signal generator to 262 kilocycles.
 (f) Adjust both trimmers located on the 2nd I-F transformer for maximum output. (Fig. 2).
 (g) Adjust both trimmers located on the 1st I-F transformer for maximum output.
 (h) Repeat operations (f) and (g) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

2. Aligning R-F Amplifier

(a) Connect the output lead from the signal generator through a .00025 mfd. condenser to the "ANT" section of the receiver.
 (b) Set the signal generator to 1400 kilocycles.
 (c) Adjust the station selector to 140 on the dial.
 (d) Adjust the trimmer on the "OSC" section of the tuning condenser for maximum output.
 (e) Adjust the trimmer on the "R-F" section of the tuning condenser for maximum output.

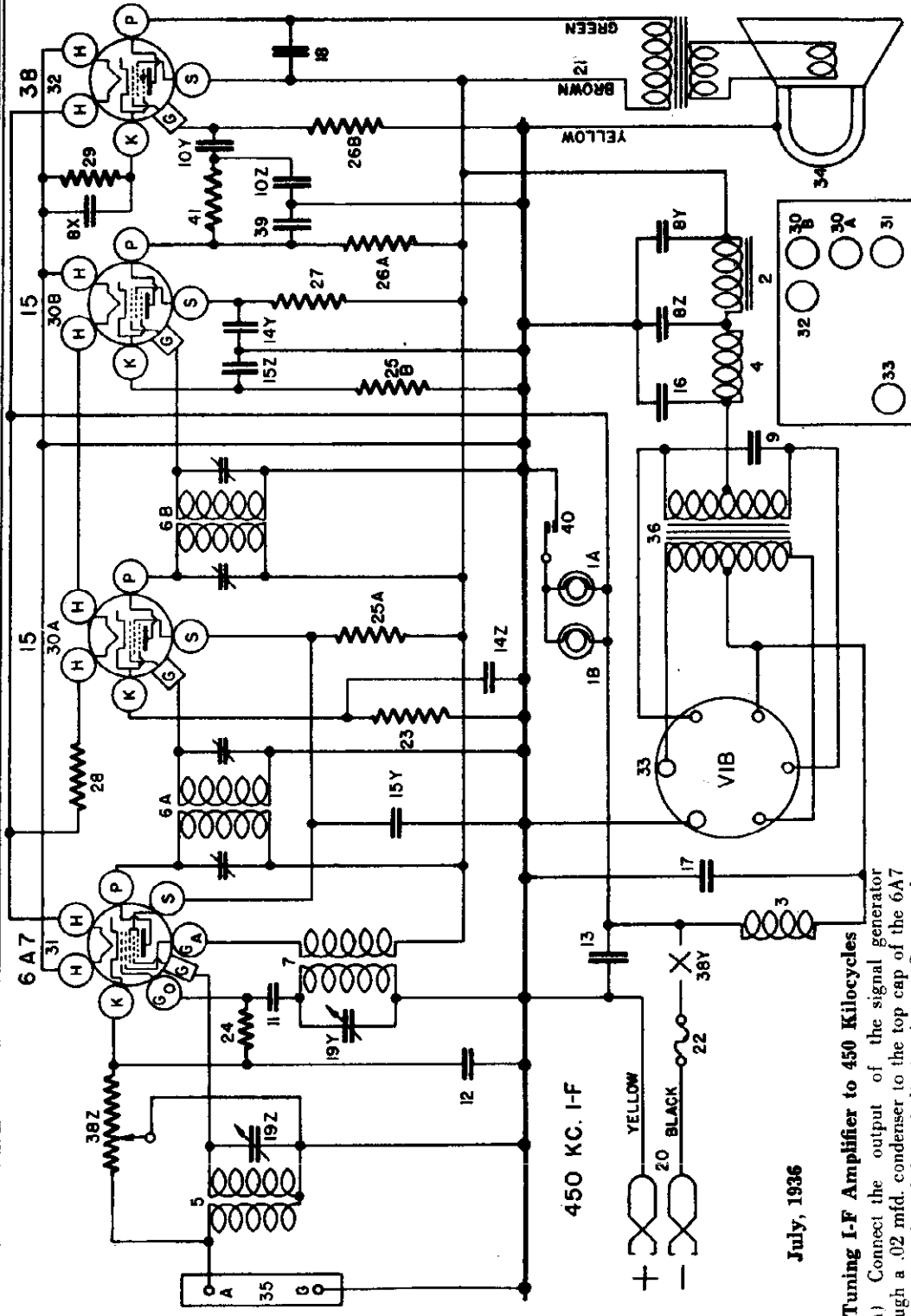
Item No.	Part No.	Description
1	G134-32000	Ant. Coil (only)
2	G93-32001	R-F Coil (only)
	W-38995	Coil Shield
	W-32912	Wood Spacer (Coil)
3	G134-32002	Cac. Coil
4	G38-32005	1st I-F Assembly
5	G39-32005	2nd I-F Assembly
6	C15-32977	Choke—A Filter
7	G20-24067	Choke—B Filter
8	G75-24628	Power Transformer
9	G14-32769	Input and Output Unit Complete
10	G11-50053	Input Transformer Coil
10Z	G6-38857	Output Transformer Coil
10Y	G3-38884	Output Transformer Slug
11	W-50062	3 Section Var. Tuning Cond.
12	G57-33002	Var. Cond. Connection
13	W-38899A	Condenser .003 Mf. 160 V.
14	W-50039	Ant. Series Trimmer Cnd.
14Z	W-50054A	Condenser 8 Mf. 350 V.—Red
14X	W-50076A	Condenser 8 Mf. 350 V.—Blue
15	W-38430	Condenser 12 Mf. 25 V.—Yellow
16Z	W-50075	Condenser .05 Mf. 160 V.—Green
16Y	W-50075	Condenser .05 Mf. 160 V.—Green
16X	W-50075	Condenser .05 Mf. 160 V.—Green
16W	W-32780B	Condenser .05 Mf. 400 V.—
17	W-50064	Condenser .01 Mf. 160 V.—
18		

CROSLLEY RADIO CORP.

MODEL 416
Schematic, Voltage
Socket, Alignment

Tube	Where Used	S	G	S	G	K	Ga	Go
6A7	Osc.-Mod.	6.3	185	70	0	2.5	185	-10 to -20
15	I-F Amplifier	2.1	185	70	0	2.5	—	—
15	Detector	2.1	20	4	0	4.5	—	—
38	Output	6.3	170	185	0	11.0	—	—

POWER OUTPUT APPROXIMATELY 1 WATT.
"A" BATTERY DRAIN APPROXIMATELY 1.95 AMPERES AT 6 VOLTS.

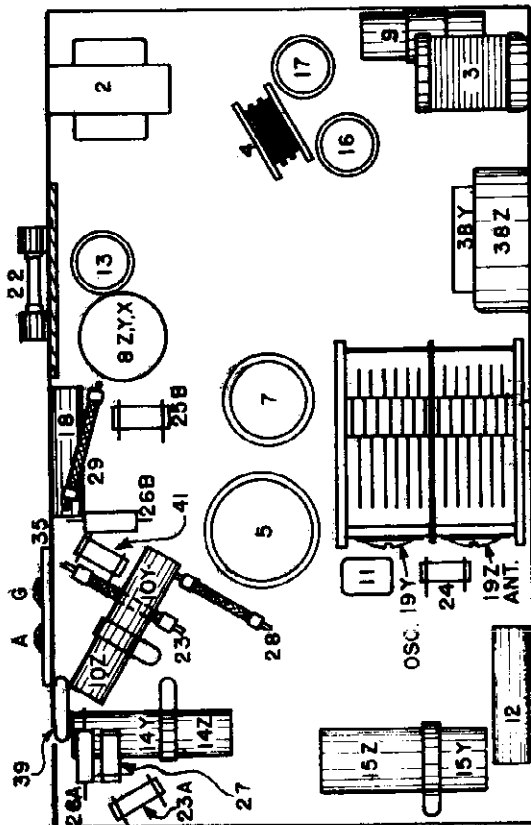
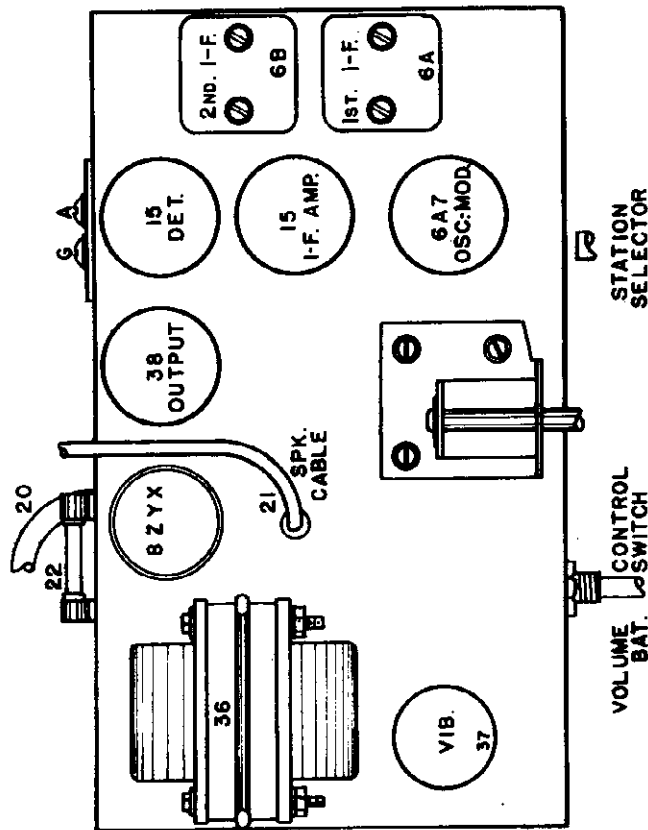


- Tuning I-F Amplifier to 450 Kilocycles**
 - Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 6A7 tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the "GND" terminal of the receiver. **KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.**
 - Adjust the station selector so that the plates of the condenser gang are completely out of mesh and turn the volume control to the right (ON).
 - Set the signal generator to 450 kilocycles.
- Aligning R-F Amplifier.**
 - Connect the output lead from the signal generator through a .00025 mfd. condenser to the "ANT" terminal of the receiver.
 - Set the signal generator to 1400 kilocycles.
 - Adjust the station selector to 140 on the dial.
 - Adjust the trimmer on the "OSC" section of the condenser gang for maximum output. (Fig. 3.)
 - Adjust the trimmer on the "ANT" section of the condenser gang for maximum output.

July, 1936

MODEL 416
Chassis, Parts

CROSLLEY RADIO CORP.



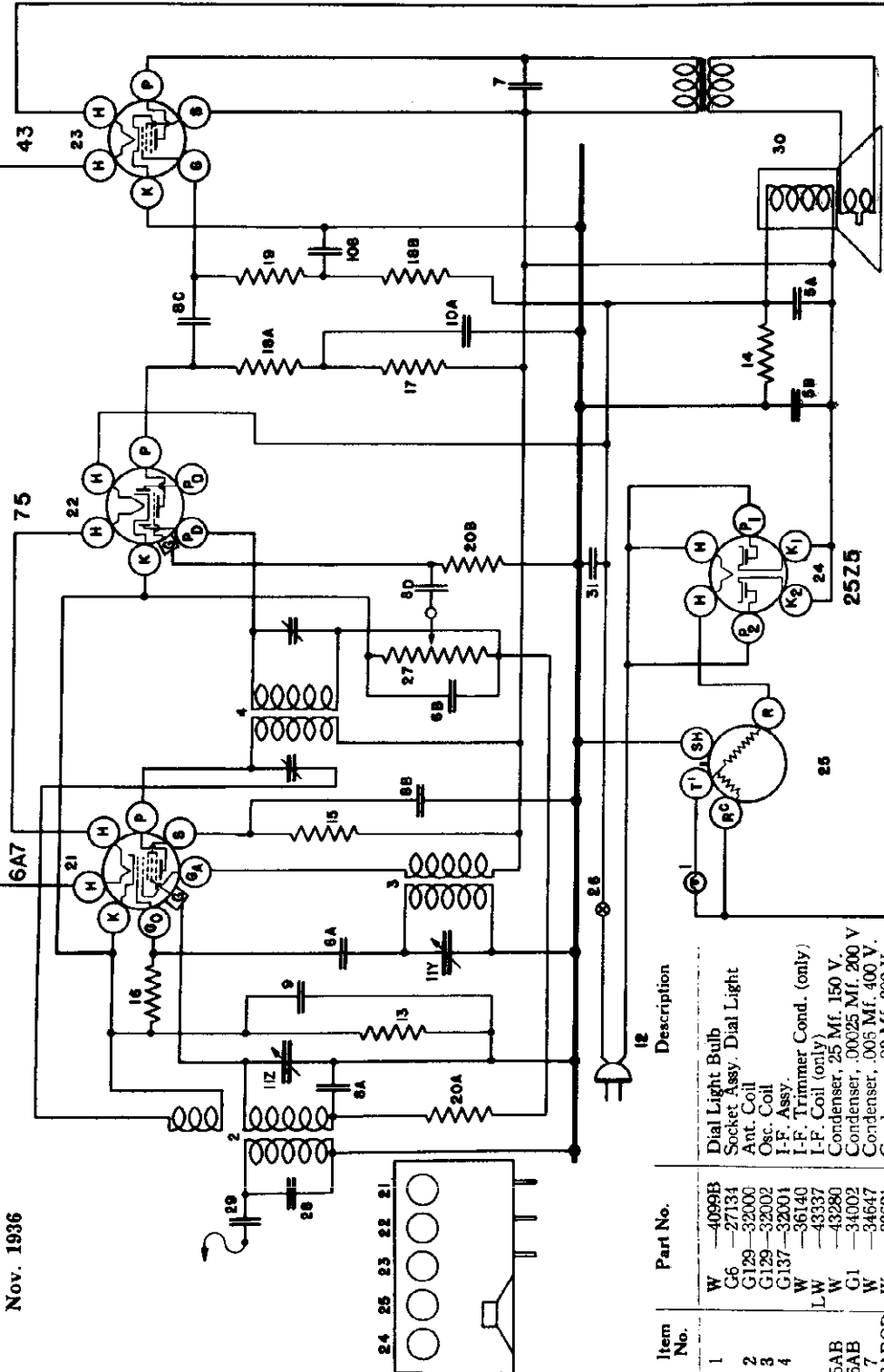
Item No.	Part No.	Description
1AB	W -37922	Bulb Dial Light
	G3 -37965	Socket Assembly Dial Light
2	G10 -28535	Choke 2.4H. Hum Filter
3	G13 -28067	Choke Vib. "A" Filter
4	G1 -24234	Choke R-F Filter
5	G55 -32000	Coil 540-1725 Kc. Antenna
6A	G119 -32004	Coil 450 Kc. 1st I-F Assembly
6B	G119 -32004	Coil 450 Kc. 2nd I-F Assembly
7	G9 -32002	Coil 540-1725 Kc. Oscillator
8Z		Cond. 12 MF. 250V. Filter Bypass
8Y	W -34896	Cond. 8 MF. 250V. Plate Bypass
8X		Cond. 8 MF. 25V. Output Bias Bypass
9	W -37214	Cond. .001 MF. 1000V. Synchronizing
10Z	W -30322A	Cond. .00017 MF. Det. Plate Bypass
10Y		Cond. .006 MF. A-F Coupling
11	G1 -34002	Cond. .00025 MF. Osc. Grid Coupling
12	W -28621	Cond. .02 MF. 200V. Osc.-Mod. Cathode Bypass
13	W -37190	Cond. .02 MF. 160V. Filament Bypass (Metal Clad H-F)
14Z	W -28623	Cond. .02 MF. 200V. I-F Cathode Bypass
14Y		Cond. .02 MF. 200V. Det. Screen Bypass
15Z	W -28622	Cond. .1 MF. 200V. Det. Cath. Bypass
15Y		Cond. .1 MF. 200V. Common Scr. Bypass
16	W -37173	Cond. .25 MF. 300V. VIB. "B" Bypass (Metal Clad H-F Type)
17	W -37174	Cond. .5 MF. 160V. VIB. "A" Bypass (Metal Clad H-F Type)
18	W -34647	Cond. .006 MF. 400V. Output Plate to Screen
19Z	G25 -33001	Cond. Var. Tuning Antenna Section
19Y		Osc. Section
	C -41755	Glass Dial—Calibrated
	W -41739	Dial Drive Unit
	W -41751	Dial Support Brkt. (R. H.)
	W -41752	Dial Support Brkt. (L. H.)
	W -41753	Dial Mtg. Brkt. (R. H.)
	W -40797	Dial Mtg. Brkt. (L. H.)
	W -40735B	Hand Shaft
	W -40907	Shaft Bearing Brkt.
	W -40909	Spring Washer (Shaft)
	W -41611	Shaft Retaining Ring
	W -40818C	Pointer Disc
	W -40486	Disc. Mtg. Screw
	W -41578	Gear Spring
20	MG25 -37103	Cable (Assembly) Battery Supply
21	G6 -35696	Cable 3 Lead Speaker
22	W -7983A	Fuse 3 Amp. "A" Supply
	G2 -33339	Panel (Assembly) Fuse
23	W -22514	Resistor 750 Ohm. 1/4W. I-F Cathode
24	W -21453	Resistor 40,000 Ohm. 1/4W. Osc. Grid Leak
25A	W -21237A	Resistor 60,000 Ohm. 1/4W. Screen Series
25B	W -21237A	Resistor 60,000 Ohm. Det. Cathode Bypass
26A	W -35602	Resistor 1 Megohm 1/4W. Det. Plate
26B	W -35602	Resistor 1 Megohm 1/4W. Output Grid
27	W -33490	Resistor 10 Megohm 1/4W. Det. Screen
28	W -41786	Resistor 9 Ohm. Filament Series
29	W -21452	Resistor 1100 Ohm. 1/4W. Output Cathode
30A	G88 -28807	Type 15 I-F Amp.
30B	G88 -28807	Type 15 A-F Amp.
31	G47 -28807	Type 6A7 Osc.—Mod.
32	G15 -28807	Type 38 Output
33	G92 -28807	Type V1B Full Wave Vibrator
	W -35772	Tube Shield (Half) (6)
	W -35774	Tube Shield Base
	W -35773	Tube Shield Cap
34	W -41316	Speaker Type 38PJ3, "A"
	W -41434	Cone Assembly Used on 41316
	W -41458	Mtg. Ring Used on 41316
	W -41454	Output Trans. Used on 41316
35	G25 -26719	Terminal Board Assy. Ant. & Gnd.
36	G5 -31618	Transformer Power
37	W -37216	Vibrator
	W -37195	Vibrator Shield
	W -37217	Vibrator Side Packing
	W -37218	Vibrator Top Packing
	W -26973B	Shield Base
38Z	W -41754	Volume Control 4800 Ohm.
38Y	W -34002	Battery Switch
39	G2 -34002	Cond. .0001 MF. Det. Plate Bypass
40	W -41068A	Switch Momentary Dial Light
41	W -35600	Resistor 100,000 Ohm. 1/4W. I-F Filter
Misc. Parts		
B	W -37172A	Cover V1B. Compartment
BB	W -41886	Eacutcheon
D	W -28	Eacutcheon Mtg. Screw
W	W -40840A	Crosley Shield
W	W -41221	Knob (Upper) Volume Control
W	W -41222	Knob (Lower) Dial Light Switch
W	W -41606	Knob Station Selector

CROSLEY RADIO CORP.

MODEL 506
Below Serial 1508741
Schematic, Socket, Parts

SALES MODEL C-516

CHASSIS MODEL 506



Nov. 1936

MODEL 506 450 KC. I-F

Socket Type 43	6DD	Cabinet
Socket Type 25Z5	43302	Dial
Socket Type W-4357	43321	Pointer Knob
Tube Shield	43320	Knob—V. C. & Sw.
Line Switch	23615	Condenser .05 Mfd. 400 V.
Volume Control, 1 Meg.		
Condenser, .0005 Mf. 200 V.		
Condenser, .003 Mf. 200 V.		
Speaker - Spec. 23393		
Cone Assy. (above Spk.)		
Output Trans. (above Spk.)		
Mtg. Ring, Cone (above Spk.)		

Part No.

Description

4099B	Dial Light Bulb
27134	Socket Assy. Dial Light
G6	Ant. Coil
G129	Occ. Coil
G129	I-F. Assy.
G137	I-F. Coil (only)
W	I-F. Coil (only)
W	I-F. Coil (only)
LW	I-F. Coil (only)
G1	Condenser, .0025 Mf. 200 V.
W	Condenser, .0025 Mf. 200 V.
W	Condenser, .005 Mf. 400 V.
W	Condenser, .02 Mf. 200 V.
W	Condenser, .017 Mf. 200 V.
W	Condenser, .017 Mf. 200 V.
W	Condenser, .017 Mf. 200 V.
W	Condenser, .017 Mf. 200 V.
G28	2 Gang Var. Tuning Cond.
W	Power Cord and Plug
B	Resistor, 275 Ohm 1/2 W. Flex.
W	Resistor, 750 Ohm 1/2 W. Flex.
W	Resistor, 40,000 Ohm 1/4 W.
W	Resistor, 60,000 Ohm 1/4 W.
W	Resistor, 100,000 Ohm 1/4 W.
W	Resistor, 300,000 Ohm 1/4 W.
W	Resistor, 500,000 Ohm 1/4 W.
W	Resistor, 2 Megohm 1/4 W.
G47	Socket Type 6A7
G41	Socket Type 75

MODEL 506
 Below Serial 1308741
 Trimmers, Chassis
 Alignment, Voltage

CROSLLEY RADIO CORP.

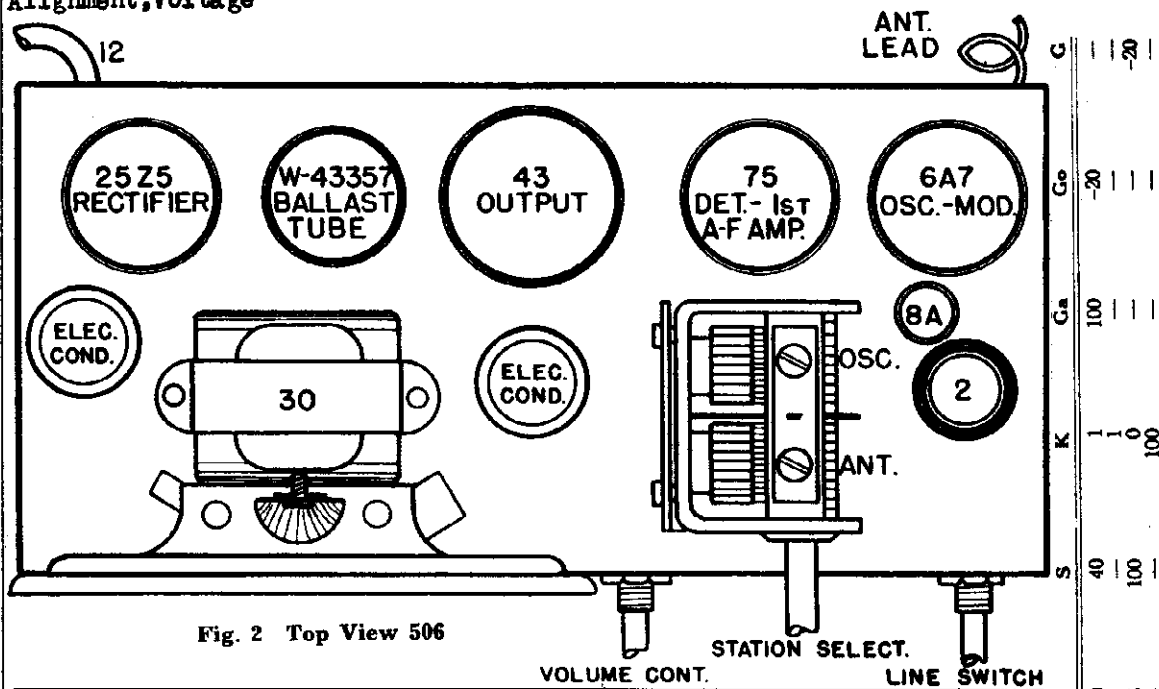


Fig. 2 Top View 506

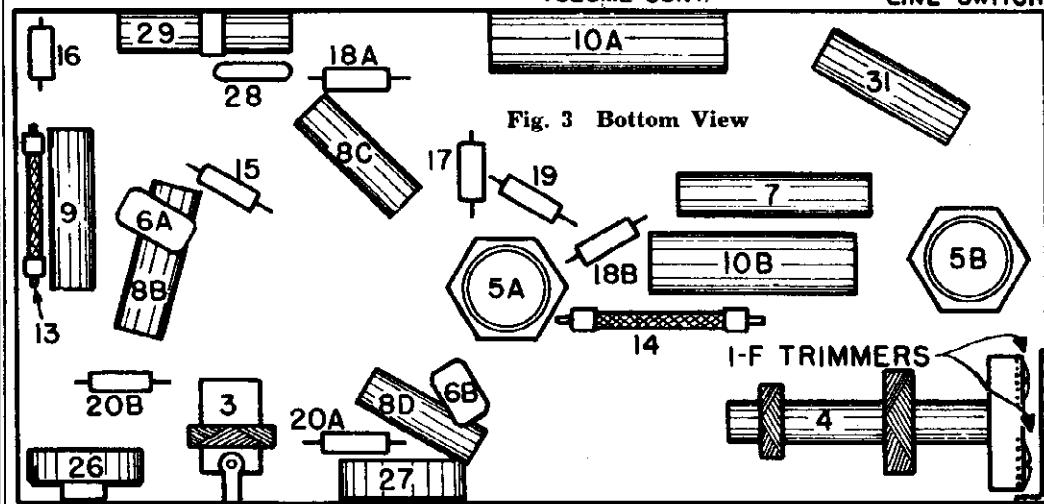


Fig. 3 Bottom View

ALIGNMENT PROCEDURE

The chassis of this receiver is connected through a resistor to one side of the power supply and for this reason all test equipment should be thoroughly isolated in order that the power supply will not be short circuited while attempting to align the receiver.

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 93 Output tube. Be sure the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier to 450 Kilocycles.

- (a) Connect the output of the signal generator through a .02 condenser to the top cap of the 6A7 Oscillator-Modulator tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator direct to the receiver chassis but do not run a wire direct to ground. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.
- (b) Set the station selector so that the plates of the

condenser gang are completely out of mesh and turn the volume control to the right (ON).

- (c) Set the signal generator to 450 kilocycles.
- (d) Adjust the I-F trimmer condensers for maximum reading on the output meter.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

2. Aligning R-F Amplifier.

- (a) Connect the output lead from the signal generator through a .00025 mfd. condenser to the antenna lead on the chassis.
- (b) Set the signal generator to 1400 kilocycles.
- (c) Adjust the station selector to 140 on the dial.
- (d) Adjust the trimmer located on the "OSC" section of the condenser gang for maximum output.
- (e) Adjust the trimmer located on the "ANT" section of the condenser gang for maximum output.
- (f) Readjust the station selector slightly for maximum output.
- (g) Repeat operation (e) for more accurate adjustment.

Tube	Function	H	P	S	K	Ga	Ce
6A7	Oscillator-Mod.	6.5	100	40	1	100	1
75	Det. & A-F Amp.	6.5	11	100	1	100	1
43	Output	6.5	11	100	1	100	1
25Z5	Rectifier	25.0	96	100	1	100	1
W-43357	Ballast Tube.						

Power output approximately 1 watt.
 Power consumption approximately 50 watts.
 Voltage drop across speaker field 120 volts.
 All readings taken on 117.5 volt A. C. power supply.
 All readings except filaments will be approximately 15% lower on 117.5 volts D. C.

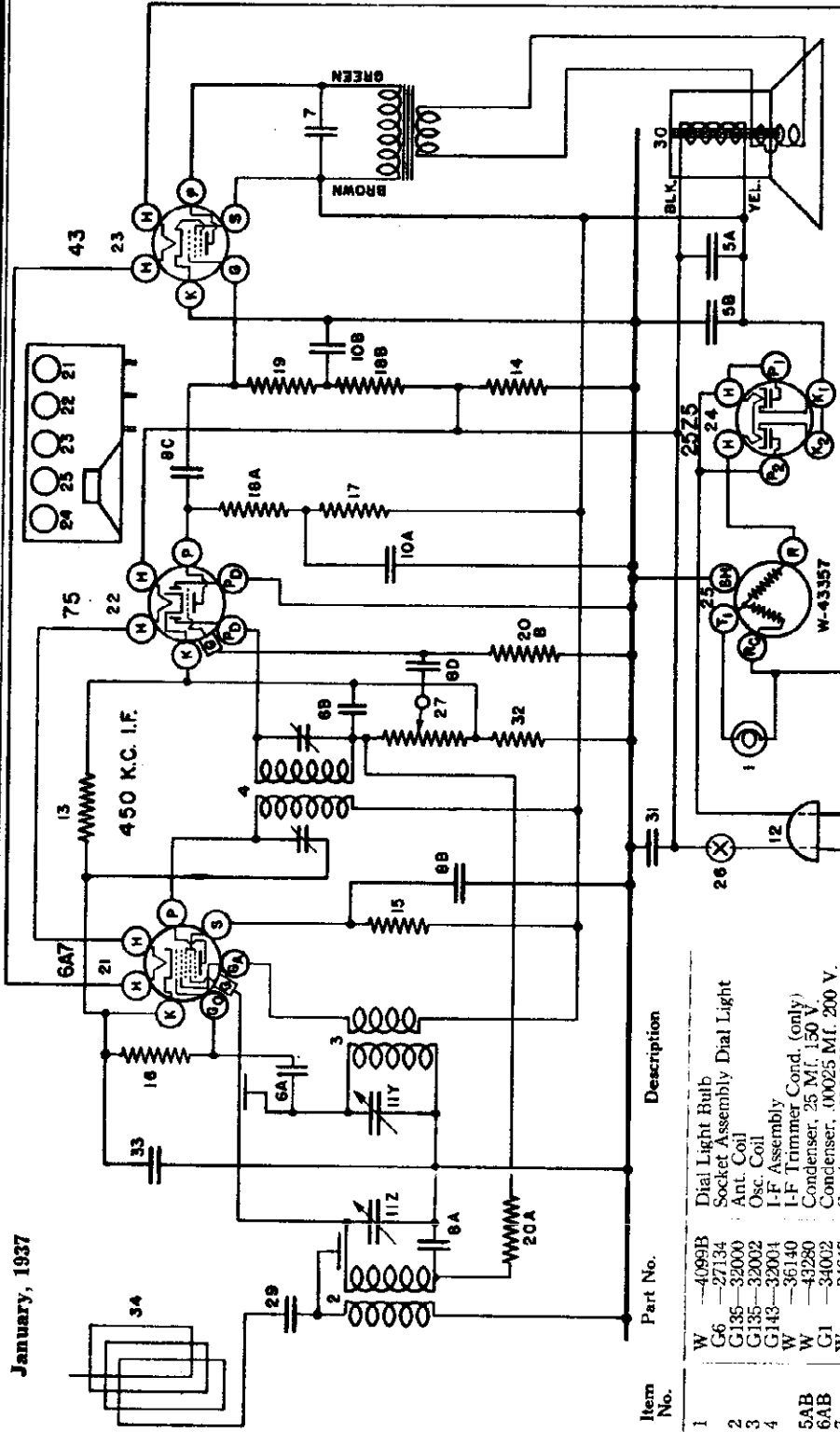
CROSLLEY RADIO CORP.

MODEL 506
Above Serial 1308741

Tube	Function	H	P	S	K	Ga	Go	C	Schematic, Voltage
6A7	Oscillator-Mod.	6.5	100	40	1	100	-20	||	||
75	Det. & A-F Amp.	6.5	11	—	—	—	—	||	||
43	Output	25.0	95	100	0	—	—	||	||
25Z5	Rectifier	25.0	—	—	100	—	—	||	||
W-43357	Ballast Tube.	—	—	—	—	—	—	||	||

Power output approximately 1 watt.
Power consumption approximately 50 watts.
Voltage drop across speaker field 112 volts.
All readings taken on 117.5 volt A. C. power supply.
All readings except filaments will be approximately 15% lower on 117.5 volts D. C.

SALES MODEL C-516 CHASSIS MODEL 506
For Serial Numbers Above 1,308,741



- W -28832 Tube Shield
- 43339 Line Switch
- 43340 Volume Control, 1 Meg.
- W -30325A Condenser, .003 Mf. 200 V.
- 255BL6Q Resistor - Spec. 23393
- 43464 Cone Assembly (above Speaker)
- 43465 Output Trans. (above Speaker)
- 43466 Mtg. Ring, Cone (above Speaker)
- 6DD Cabinet
- 43302 Dial
- 43321 Pointer Knob
- 43320 Knob-V. C. and Sw.
- 23615 Condenser, .05 Mfd. 400 V.
- 21964 Resistor, 165 Ohm 1/2 W. Flex.
- 43627 Condenser, .003 Mfd. 160 V.
- 31765 Antenna Wire Roll

January, 1937

MODEL 506
 Above Serial 1308741
 Trimmers, Chassis
 Alignment

CROSLLEY RADIO CORP.

ALIGNMENT PROCEDURE

The chassis of this receiver is connected through a resistor to one side of the power supply and for this reason all test equipment should be thoroughly isolated in order that the power supply will not be short circuited while attempting to align the receiver.

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 43 Output tube. Be sure the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier to 450 Kilocycles.

(a) Connect the output of the signal generator through a .02 condenser to the top cap of the 6A7 Oscillator-Modulator tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator direct to the receiver chassis but do not run a wire direct to ground. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the plates of the

condenser gang are completely out of mesh and turn the volume control to the right (ON).

(c) Set the signal generator to 450 kilocycles.

(d) Adjust the I-F trimmer condensers for maximum reading on the output meter.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

2. Aligning R-F Amplifier.

(a) Connect the output lead of the signal generator through a .00005 mf. condenser to the junction of the antenna and antenna blocking condenser (Items 34 and 29).

(b) Set the signal generator to 1725 kilocycles.

(c) Open gang all the way (minimum capacity).

(d) Adjust the trimmer located on the "Osc" section of the gang for maximum output.

(e) Set signal generator to 1400 Kc.

(f) Tune station selector to 1400 kc. signal.

(g) Adjust the trimmer located on the "Ant" section of the gang for maximum output.

(h) Repeat e, f, and g for more accurate adjustment.

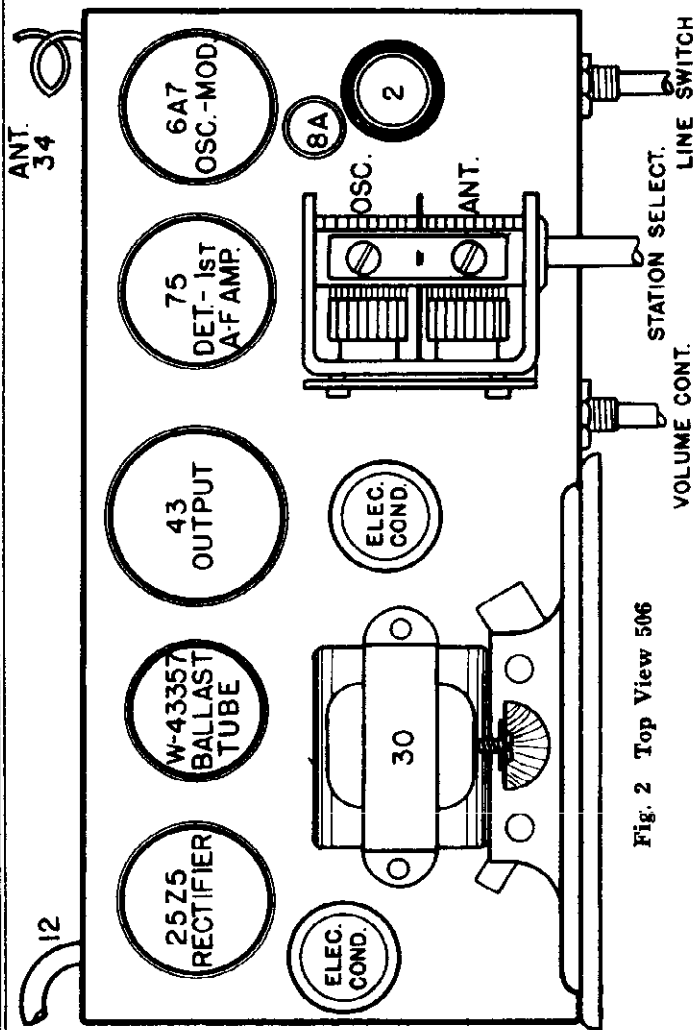


Fig. 2 Top View 506

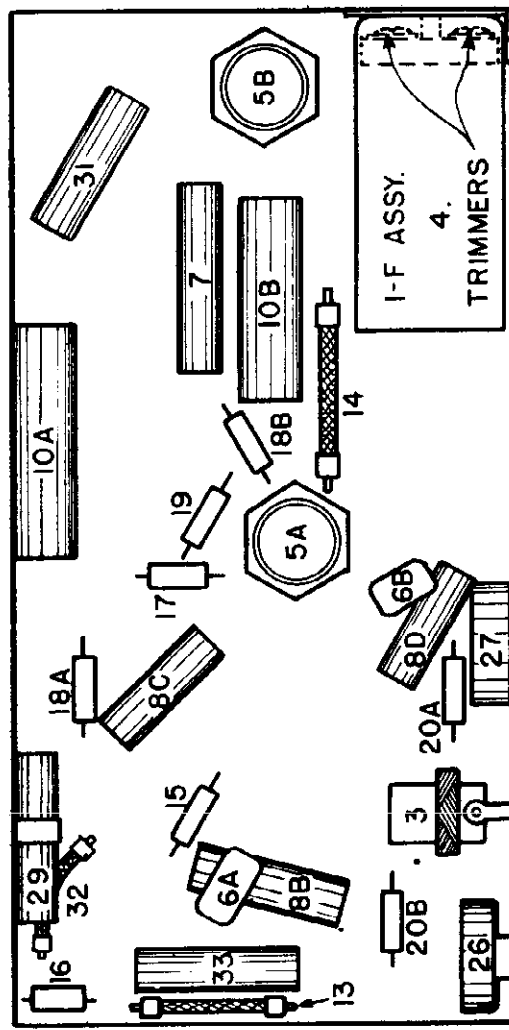


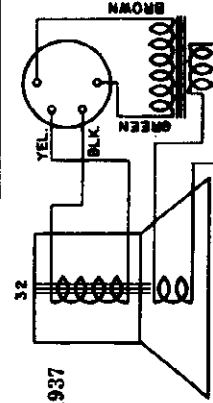
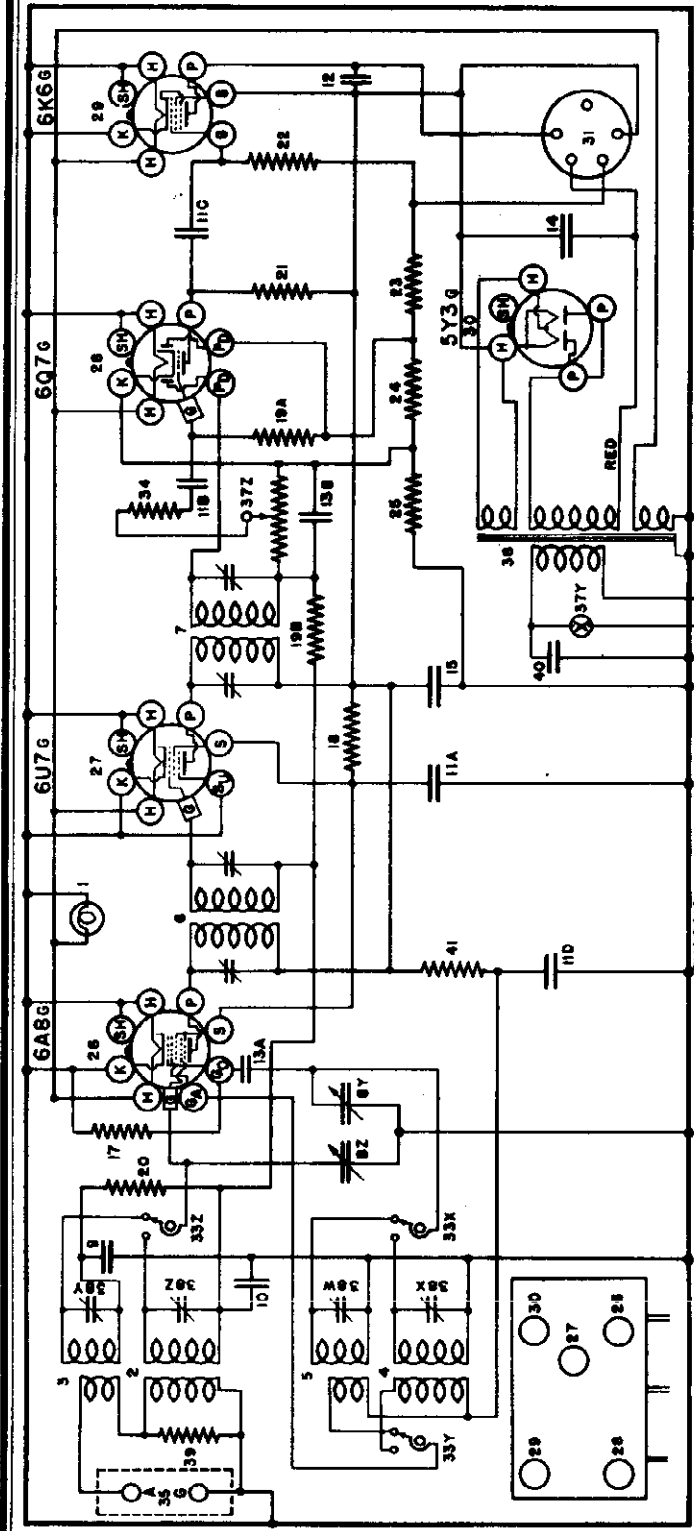
Fig. 3 Bottom View 506

CROSLLEY RADIO CORP.

MODELS 517, 547, Fiver
Teletune Fiver
Schematic, Socket, Parts

SALES MODEL "FIVER" CHASSIS NO. 517
"TELETUNE FIVER" CHASSIS NO. 547

510-1725 kilocycles (American Broadcast Band)
6-15 megacycles (High Frequency Band)



Item No.	Part No.	Description	MODELS 517 & 547	455 K.C. I.F.	MARCH, 1937
1	W-4357	Bulb-Dial Light			
2	W-4358	Light Bracket			
3	G132-32000	Ant. Coil, B. C.			
4	G133-32000	Osc. Coil, H. F.			
5	G132-32002	Osc. Coil, B. C.			
6	G133-32002	Osc. Coil, H. F.			
7	G136-32004	1st I-F Assembly			
8	G137-32001	2nd I-F Assembly			
9	G31-33001	2 Sect. Var. Tuning Cond. (517 only)			
10	G12-34002	Condenser 0005 Mf. H.F. Osc. Ser.			
11	W-36541	Condenser 02 Mf. 160 V.			
12	W-29621	Condenser 02 Mf. 200 V.			
13	G1-34647	Condenser 01 Mf. 400 V.			
14	W-41031	Condenser 00025 Mf. Molde1			
15	W-13450	Condenser 16 Mf. 250 V.			
16	W-31907A	Condenser 16 Mf. 200 V.			
17	B-24814	Power Cord and Plug			
18	W-36688	Resistor 7,000 Ohm 1/4 W.			
19	W-21455	Resistor 3,000 Ohm 1/4 W.			
20	W-35701	Resistor 300,000 Ohm 1/4 W.			
21	W-23765	Resistor 300,000 Ohm 1/4 W.			
22	W-28589	Resistor 500,000 Ohm 1/4 W.			
23	W-33012A	Resistor 40 Ohm 1/2 W. Flex.			
24	W-24537	Resistor 60 Ohm 1/2 W. Flex.			
25	W-24537	Resistor 60 Ohm 1/2 W. Flex.			
26	C-155-36400	Socket Type 6A8			
27	G171-36400	Socket Type 6U7			
28	G170-36400	Socket Type 6Q7			
29	G172-36400	Socket Type 6K6			
30	W-40911	Tube Shield			
31	G103-29807	Speaker, Spec. No. 51-A-5			
32	257BP11 "B"	(Cab. 6K & 7KA) O. P. Trans. for 257BP11 "B" Spkr. Cardb'd Ring for 257BP11 "B" Spkr. Speaker, Spec. No. 51-A-8 (Cab. 7H & 7HA) Cone for 257BP18 "B" Spkr. O. P. Trans. for 257BP18 "B" Spkr. Cardb'd Ring for 257BP18 "B" Spkr. Spkr., Spec. No. 1-D-971 (Cab. 6FF) 39 Cone for 462CP11 "M" Spkr. O. P. Trans. for 462CP11 "M" Spkr. Field Coil for 462CP11 "M" Spkr. Spkr., Spec. No. 1-D-1017 (Cab. 7M) Cone for 464BP15 "M" Spkr. Field Coil for 464BP15 "M" Spkr. O. P. Trans. for 464BP15 "M" Spkr. Switch Band Selector Resistor 40,000 Ohm 1/4 W.			
33	W-43941	Ant. and Ground Terminal Board			
34	W-43479	Power Trans. 110 V. 60 Cy.			
	W-43480	Power Trans. 110 V. 25 Cy.			
	W-43481	Power Trans. 220 V. 25 Cy.			
	W-43449	(Volume Control, 1 Megohm Lame Switch) Trimmer Cond. B. C. Ant. Trimmer Cond. H. F. C. Osc. Trimmer Cond. H. F. C. Osc. Resistor 20,000 Ohm 1/4 W. Condenser .01 Mf. 400 V. Resistor 3,500 Ohm 1/4 W. Tel. Tun. Escutcheon Pointer-Cabinet (547 only) Knob (2 required) Small Rubber Mtg. Foot Clamp-Speaker Plug Celluloid Disc (547 only)			

**MODELS 517, 547, Fiver
Teletune Fiver
Trimmers, Chassis
Voltage, Alignment**

CROSLLEY RADIO CORP.

Tube	Function	H	P	S	K	G	C
6A8C	Oscillator/Modulator	6.3	160	115	0	-1.2	160
6U7C	I-F Amplifier	6.3	160	115	0	-1.2	160
6Q7C	Diode Det & A-F Amplifier	6.3	160	115	2.5	-2.5	160
6K6G	Output Rectifier	6.3	160	160	2.5	-5.0	160
5Y3	Rectifier	5.0	160	160	2.25	-	160

Power output approximately 2 watts.
Power consumption approximately 40 watts at 117.5 volts.
Voltage drop across speaker field 36 volts.

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits can best be properly aligned with the use of a modulated signal generator and an output meter.

CONNECTING OUTPUT METER

Connect the output meter to P and S of the 6K6G Output Tube. Be sure the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier To 455 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 6A8C tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the "GND" terminal of the receiver. **KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.**

(b) Set the station selector so that the tuning condenser plates are completely out of mesh and turn the volume control knob to the right (ON).

(c) Turn the band selector switch to the right (High Frequency).

(d) Set the signal generator to 455 kilocycles.

(e) Adjust both trimmers located on top of the 2nd I-F Transformer for maximum output. (Fig. 2).

(f) Adjust both trimmers located on top of the 1st I-F Transformer for maximum output.

(g) Check operations (e) and (f) for more accurate adjustments. **USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.**

2. Aligning B-F Amplifier

When aligning the B-F Amplifier the output lead from the signal generator should be connected through a dummy antenna to the "ANT" terminal of the receiver. For the broadcast band the dummy antenna should be a .00025 mfd. condenser and for the high frequency band this condenser should be replaced by a 400 ohm (Non Inductive) carbon resistor.

(a) Set the band selector switch to the Broadcast Band.

(b) Set the signal generator to 1725 kilocycles.

(c) Open the condenser gang all the way.

(d) Adjust the "OSC" trimmer condenser for the B-C Band (38X) for maximum output.

(e) Set the signal generator to 1400 kilocycles.

(f) Tune the receiver to the generator signal for maximum output (approx. 140 on the dial).

(g) Adjust the "ANT" trimmer condenser for the B-C Band (36Z) for maximum output. **DO NOT RE-**

ADJUST THE "OSC" TRIMMER AT 1400 KILOCYCLES.

(h) Repeat operations (f) and (g) alternately until no further improvement in output can be obtained.

(i) Set the band selector switch to the H-F Band.

(j) Set the signal generator to 15,400 kilocycles.

(k) Open the condenser gang all the way.

(l) Adjust the "OSC" trimmer condenser for the H-F Band (38W) for maximum output.

(m) Set the signal generator to 15,000 kilocycles.

(n) Tune the receiver to the generator signal for maximum output (approx. 15 on the dial).

(o) Adjust the "ANT" trimmer condenser for the H-F Band (38Y) for maximum output. **DO NOT RE-ADJUST THE "OSC" TRIMMER AT 15,000 KILOCYCLES.**

(p) Repeat operations (n) and (o) alternately until no further improvement in output can be obtained.

NOTE: If at any time the H-F coils in this receiver are replaced, it may be necessary to vary the inductance of the "OSC" coil by moving the cross-over turn of wire at the gap to make the set track at the 6 megacycle end.

Moving the turn toward the short end of the coil will decrease the inductance and moving it toward the long end will increase the inductance. If the signal is weak at 6 megacycles, a similar slight change in the inductance of the "ANT" coil should bring up the signal strength. **THIS IS A CRITICAL OPERATION AND SHOULD NOT BE DONE ON ANY SET UNLESS CHANGING COILS MAKES IT NECESSARY.**

NOTE: When aligning the high frequency band care should be exercised so that the circuits will be aligned on the fundamental frequency rather than on the image frequency which is approximately 910 kilocycles less than the fundamental. To check on this, increase the output of the signal generator approximately 10 times and try to tune-in the signal both at the generator frequency as indicated on the station selector dial and at approximately 910 kilocycles below the correct frequency. If the circuits have been properly aligned the signal can be tuned-in at both positions but much stronger at the correct dial setting.

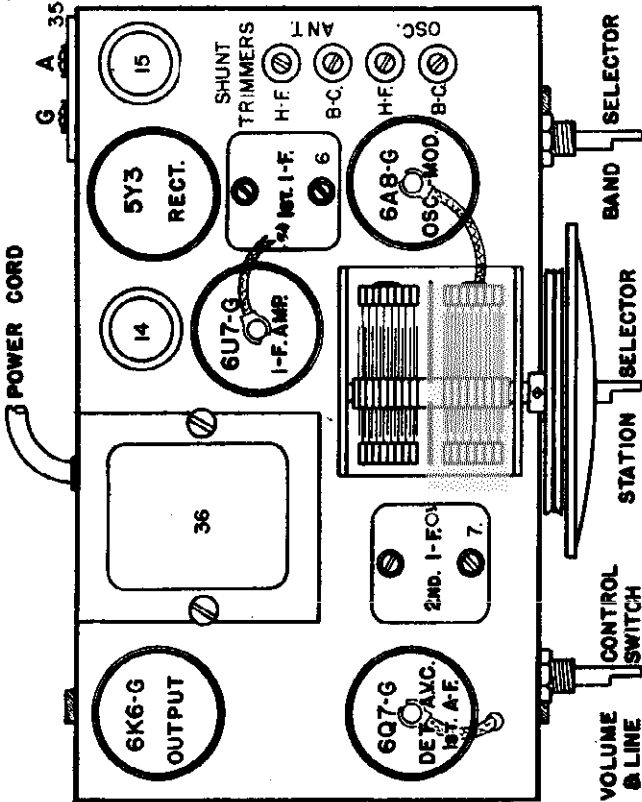


Fig. 2 Top View 517 and 547

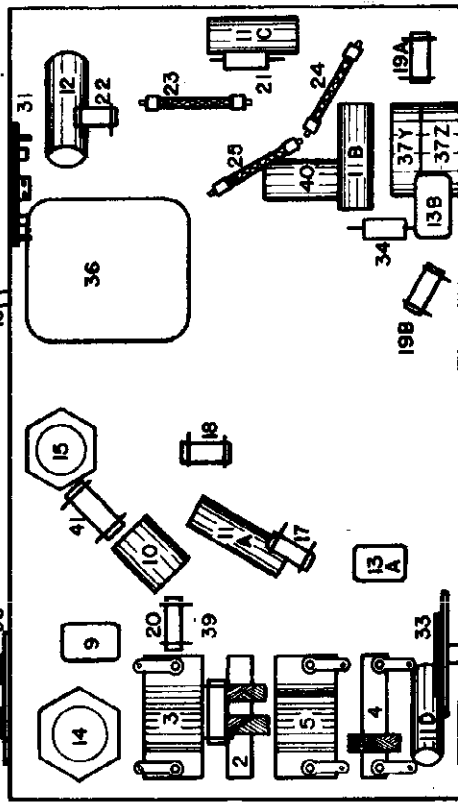


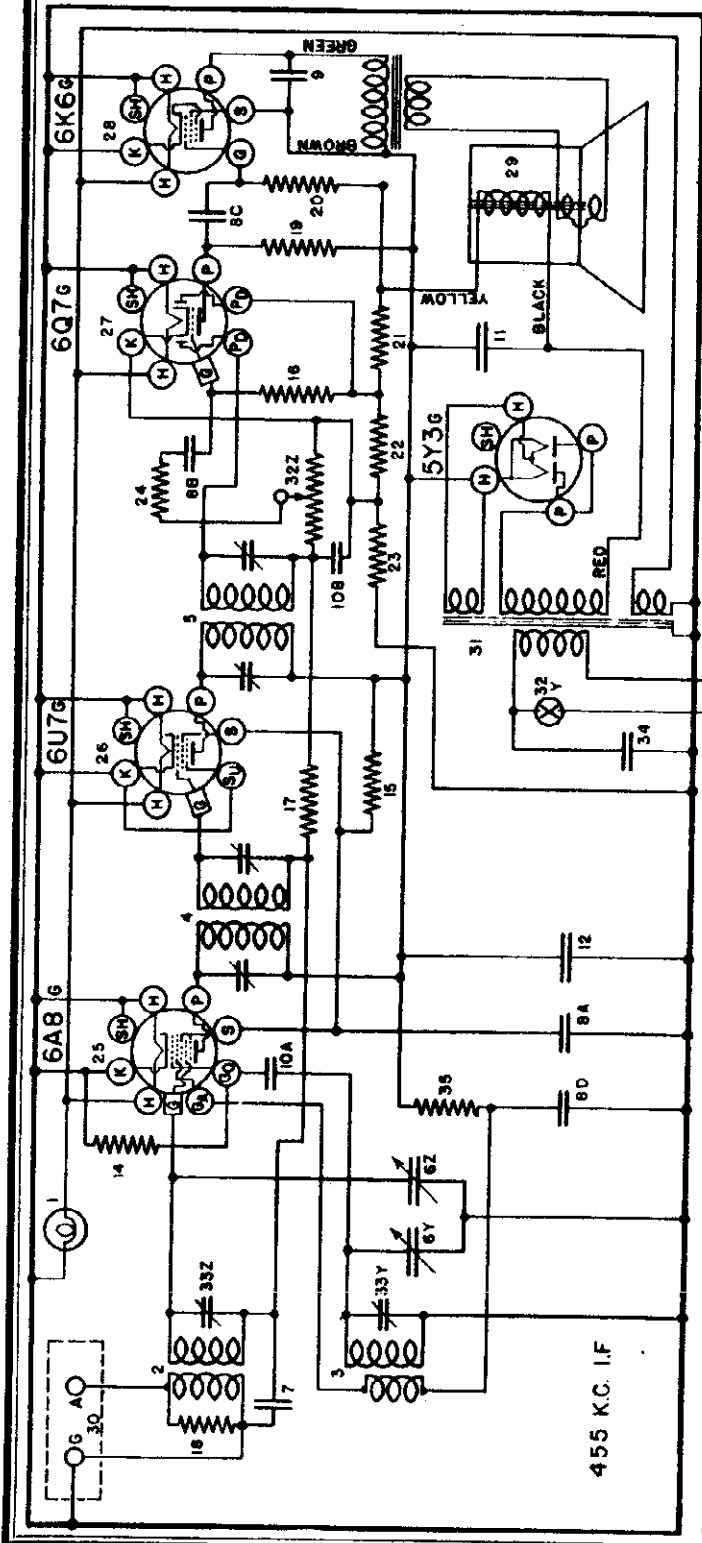
Fig. 3 Bottom View 517 and 547

CROSLY RADIO CORP.

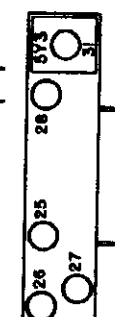
MODEL 537
Schematic, Voltage
Socket, Parts

Tube	Function	H	P	S	K	G	Ca
6A8G	Oscillator-Modulator	6.3	160	115			
6U7G	I-F Amplifier	6.3	160	115			160
6Q7G	Diode Det. & A-F Amplifier	6.3	160				
6K6G	Output	6.3	160	160	2500		
5Y3	Rectifier	5.0					

Power output approximately 2 watts.
Power consumption approximately 40 watts at 117.5 volts.
Voltage drop across speaker field 36 volts.



Item No.	Part No.	Description
1	W 43567	Bulb—Dial Light
2	W 43568	Bracket—Dial Light
3	G132-32000	Ant. Coil
4	G144-32004	Osc. Coil
5	G145-32004	1st I-F Assembly
6	G34-33001	2nd I-F Assembly
	G2-43564	2 Section Var. Cond. Gang
	C 43763	Pulley Assembly
	W 43779	Dial Glass—Calibrated
	W 43739	Mask—Dial
	W 41582	Support—Dial
	W 43561	Cable—Cond. Drive
	W 43740	Spring—Cable Tension
	W 41611	Shaft—Drive
	W 43770	Retaining Ring—Drive Shaft
7	W 36541	Pointer
8A-D	W 28621	Condenser .02 Mf. 160 V.
9	W 34647	Condenser .02 Mf. 200 V.
10AB	W 34002	Condenser .006 Mf. 400 V.
11	W 41081	Condenser .0025 Mf. 200 V.
12	W 43450	Condenser 16 Mf. 250 V.
13	W 43742	Condenser 16 Mf. 200 V.
14	W 21237A	Power Cord and Plug
15	W 24814	Resistor 60,000 Ohm 1/2 W. Carb.
16	W 26577	Resistor 7,000 Ohm 1/2 W. Carb.
17	W 36688	Resistor 3 Megohm 1/2 W. Carb.
18	W 22196	Resistor 3 Megohm 1/2 W. Ins.
19	W 35601	Resistor 20,000 Ohm 1/2 W. Carb.
	W 35601	Resistor 300,000 Ohm 1/2 W. Ins.
	W 23785	Resistor 500,000 Ohm 1/2 W. Carb.
	W 28589	Resistor 350 Ohm 1/2 W. Flex.
	W 23012A	Resistor 40 Ohm 1/2 W. Flex.
	W 24537	Resistor 60 Ohm 1/2 W. Flex.
	G156-36761	Resistor 40,000 Ohm 1/2 W. Ins.
	G171-36400	Socket Type 6A8
	G160-36400	Socket Type 6U7
	G172-36400	Socket Type 6Q7
	W 40911	Socket Type 6K6
	W 27981	Tube Shield
	W 260BL9 "B"	Base—Tube Shield
	W 27981	Speaker Spec. No. 50-A-4
	W 41472	Cone for 260BL9 "B" Speaker
	W 13943	O. P. Trans. for 260BL9 "B" Spkr.
	W 43540	Card'd Ring for 260BL9 "B" Spkr.
	W 26719	Ant. and Ground Term. Assembly
	W 43748	Power Trans. 50-60 Cy. 110 V.
	W 43747	Power Trans. 25 Cy. 110 V.
	W 43733	Vol. Cont. 1 Meg.
	W 37986A	Line Switch
	W 30805	2 Sect. Shunt Trimmer
	W 30137	Condenser .01 Mf. 400 V.
	W 43788	Resistor 3,500 Ohm 1/2 W.
	G2	Grille Cloth Assy.—HC9-Cab.
	G3	Grille Cloth Assy.—HE9-Cab.
	W 43789	Escutcheon—Cab-Mod. HC 50 & 60
	W 43789	Escutcheon—Cab-Mod. HE 43, 50 & 61
	W 43782	Escut.—Cab-Mod. HE 71 & HC 71
	W 43764	Knob



REFRIGERATOR RADIO,
CHASSIS NO. 537

MARCH, 1937

MODEL 537

Trimmers, Chassis
Alignment

CROSLLEY RADIO CORP.

This model Crosley radio chassis is especially designed for installation in Crosley Shelvador electric refrigerators. It should be operated only from an ALTERNATING CURRENT power supply as specified

on the Model Label which is fastened to the inside of the refrigerator top.

The tuning range of the receiver is from 540 to 1725 kilocycles or 555 to 173 metres.

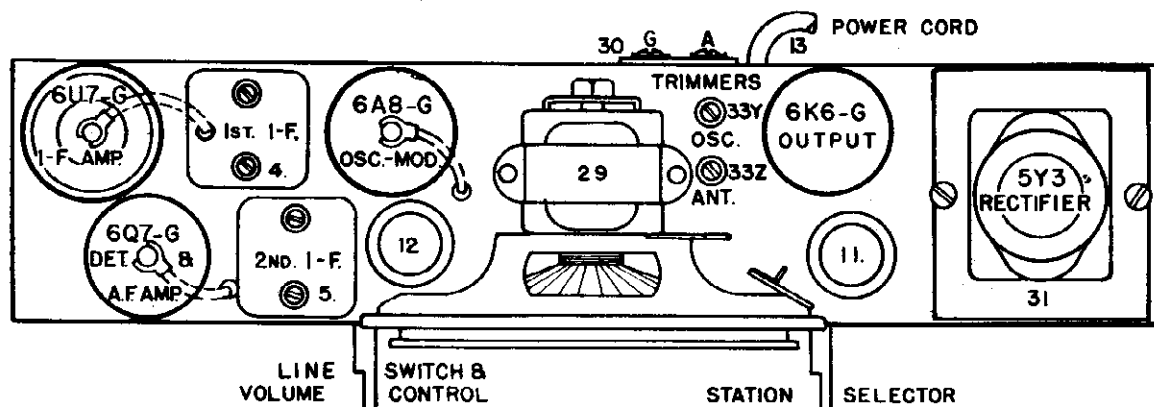


Fig. 2 Top View 537

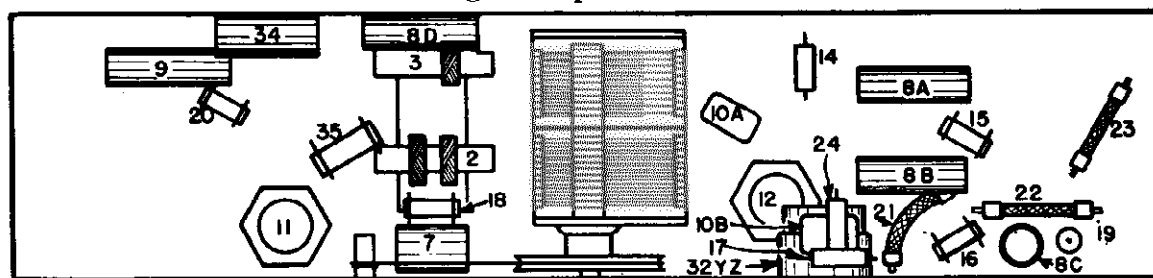


Fig. 3 Bottom View 537

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary, the circuits can best be properly aligned with the use of a modulated signal generator and an output meter.

CONNECTING OUTPUT METER

Connect the output meter across the "P" and "S" terminals of the 6K6G output tube. Be certain that the meter is protected from D. C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier To 455 Kilocycles.

(a) Connect the output of the signal generator through .02 mfd. condenser to the top cap of the 6A8G tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the "GND" terminal of the receiver. **KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.**

(b) Set the station selector so that the tuning condenser plates are completely in mesh and turn the volume control knob to the right (ON).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust both trimmers located on top of the

2nd I-F transformer for maximum reading on the output meter. (Fig. 2).

(e) Adjust both trimmers located on top of the 1st I-F transformer for maximum output.

(f) Check operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

2. Aligning R-F Amplifier

When aligning the R-F amplifier the output lead from the signal generator should be connected through a .00025 mfd. condenser to the "ANT" terminal of the receiver.

(a) Set the signal generator to 1725 kilocycles.

(b) Open the condenser gang all the way.

(c) Adjust the "OSC" trimmer condenser (33Y) for maximum output.

(d) Set the signal generator to 1400 kilocycles.

(e) Tune the receiver to the generator signal for maximum output (appx. 140 on the dial).

(f) Adjust the "ANT" trimmer condenser (33Z) for maximum output. **DO NOT READJUST THE "OSC" TRIMMER AT 1400 KILOCYCLES.**

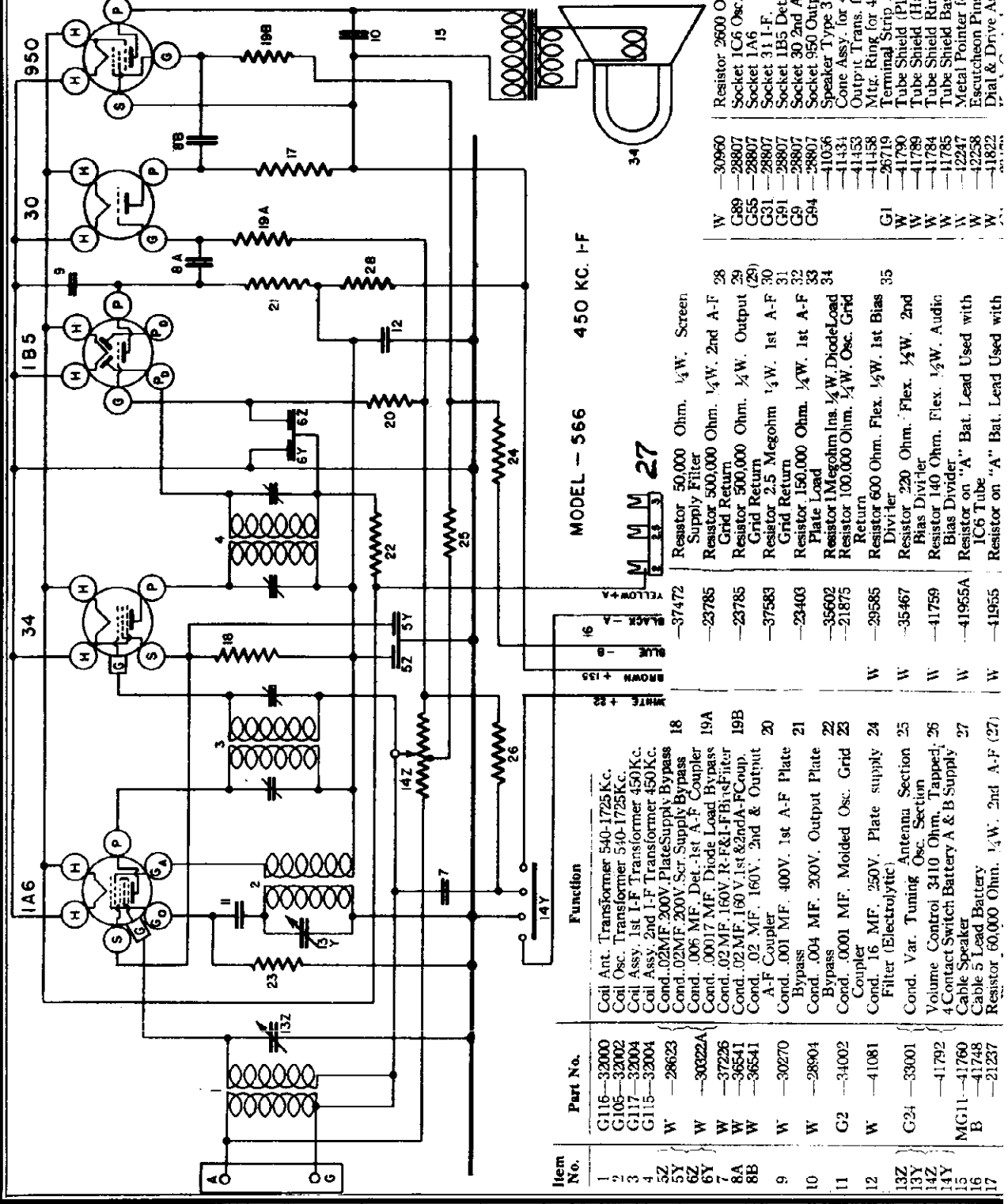
(g) Repeat operations (e) and (f) alternately until no further improvement in output can be obtained.

CROSLLEY RADIO CORP.

MODEL 56
Schematic
Parts
Voltage

Tube	Where Used	H	P	S	G	Ga	Go
1C6	(*) Oscillator-Modulator	2.0	112	45	0	112	-5 to -20
34	I-F Amplifier	2.0	112	45	0	112	—
1B5	Detector & A-F Amplifier	2.0	60	—	—	—	—
30	2nd. A-F Amplifier	2.0	45	—	—	—	—
950	Output	2.0	110	112	4 (C)	—	—

Power output approximately .5 watt.
 "A" Battery drain approximately .36 ampere at 2 volts.
 "B" Battery drain approximately 16 milliamperes at 135 volts.
 *This model previous to Serial No. 1,196,783 employed a type 1A6 tube as an Oscillator-Modulator. Socket voltage readings as given.
 □ Measured at grid through 500,000 ohm grid resistor.



Item No.	Part No.	Function
1	G116-32000	Coil Ant. Transformer 540-1725 Kc.
2	G105-32002	Coil Osc. Transformer 540-1725 Kc.
3	G117-32004	Coil Assy. 1st I-F Transformer 450 Kc.
4	G115-32004	Coil Assy. 2nd I-F Transformer 450 Kc.
5Z	W-28623	Cond. .02 MF. 200V. Plate Supply Bypass
6Z	W-30322A	Cond. .0017 MF. Det. 1st A-F Coupler
7	W-37226	Cond. .02 MF. 160V. R-F&I-F Bypass
8A	W-36541	Cond. .02 MF. 160V. 1st & 2nd A-F Coupl.
8B	W-36541	Cond. .02 MF. 160V. 2nd & Output A-F Coupler
9	W-30270	Cond. .001 MF. 400V. 1st A-F Plate Bypass
10	W-28804	Cond. .004 MF. 200V. Output Plate Bypass
11	G2-34002	Cond. .0001 MF. Molded Osc. Grid Coupler
12	W-41081	Cond. .16 MF. 250V. Plate supply Filter (Electrolytic)
13Z	G24-33001	Cond. Var. Tuning Osc. Section
14Z	—41792	Volume Control 3410 Ohm, Tapped;
14Y	—41760	4-Contact Switch Battery A & B Supply
15	MG11-41748	Cable Speaker
16	B-41748	Cable 5 Lead Battery
17	—21237	Resistor 60,000 Ohm. 1/4 W. 2nd A-F (27)
18	—37472	Resistor 50,000 Ohm. 1/4 W. Screen Supply Filter
19A	—23785	Resistor 500,000 Ohm. 1/4 W. 2nd A-F Grid Return
19B	—23785	Resistor 500,000 Ohm. 1/2 W. Output Grid Return (28)
20	—37583	Resistor 2.5 Megohm 1/4 W. 1st A-F Grid Return
21	—23403	Resistor 150,000 Ohm. 1/4 W. 1st A-F Plate Load
22	—35602	Resistor 1 Megohm 1/4 W. Diode Load Return
23	—21875	Resistor 100,000 Ohm. 1/4 W. Osc. Grid Return
24	W-29585	Resistor 600 Ohm. Flex. 1/2 W. 1st Bias Divider
25	W-35467	Resistor 220 Ohm. Flex. 1/4 W. 2nd Bias Divider
26	—41759	Resistor 140 Ohm. Flex. 1/2 W. Audio Bias Divider
27	—41955A	Resistor on "A" Bat. Lead Used with 1C6 Tube
28	—41955	Resistor on "A" Bat. Lead Used with 1C6 Tube
29	—30950	Resistor 2500 Ohm. Flex. 1/4 W.
30	—28807	Socket 1C6 Osc.-Mod.
31	—28807	Socket 1A6
32	—28807	Socket 31 I-F.
33	—28807	Socket 1B5 Det. 1st A-F.
34	—28807	Socket 30 2nd A-F
35	—28807	Socket 950 Output
36	—41036	Speaker Type 31P13, "A"
37	—41431	Cone Assy. for 41056 Speaker
38	—41431	Output Trans. for 41056 speaker
39	—26719	Mtg. Ring for 41434 Cone Assembly
40	—41790	Terminal Strip Ant. & Grid.
41	—41789	Tube Shield (Plain Half)
42	—41784	Tube Shield (Hail with Slot)
43	—41784	Tube Shield Ring
44	—41784	Tube Shield Base
45	—42247	Escutcheon Pins
46	—42258	Dial & Drive Assembly
47	—41822	Dial & Drive Assembly

MODEL 566
Trimmers, Socket
Chassis, Alignment

CROSLLEY RADIO CORP.

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits can best be properly aligned with the use of a modulated signal generator and an output meter.

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 950 Output tube. Be sure the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier to 450 Kilocycles.

(a) Connect the output of the signal generator through a .02, or larger, mfd. condenser to the top cap of the 1C6 Osc-Mod tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the "GND" terminal of the receiver. **KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.**

(b) Set the station selector so that the tuning condenser plates are completely out of mesh. Turn the volume control knob to the right (ON).

(c) Turn the band selector switch to the left (High Frequency).

(d) Set the signal generator to 450 kilocycles.

(e) Adjust both trimmers located on top of the 2nd I-F transformer for maximum output. Fig. 2.

(f) Adjust both trimmers located on top of the 1st I-F transformer for maximum output.

(g) Check operations (e) and (f) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

2. Aligning R-F Amplifier.

(i) Connect the output lead from the signal generator through a .00025 mfd. condenser to the "ANT" terminal of the receiver.

(b) Set the signal generator to 1400 kilocycles.

(c) Adjust the station selector to 140 on the dial.

(d) Adjust the trimmer located on the "OSC" section of the condenser gang for maximum output. Fig. 3.

(e) Adjust the trimmer located on the "ANT" section of the condenser gang for maximum output.

(f) Tune the station selector to the generator signal for maximum output.

(g) Repeat operation (e) for more accurate adjustment.

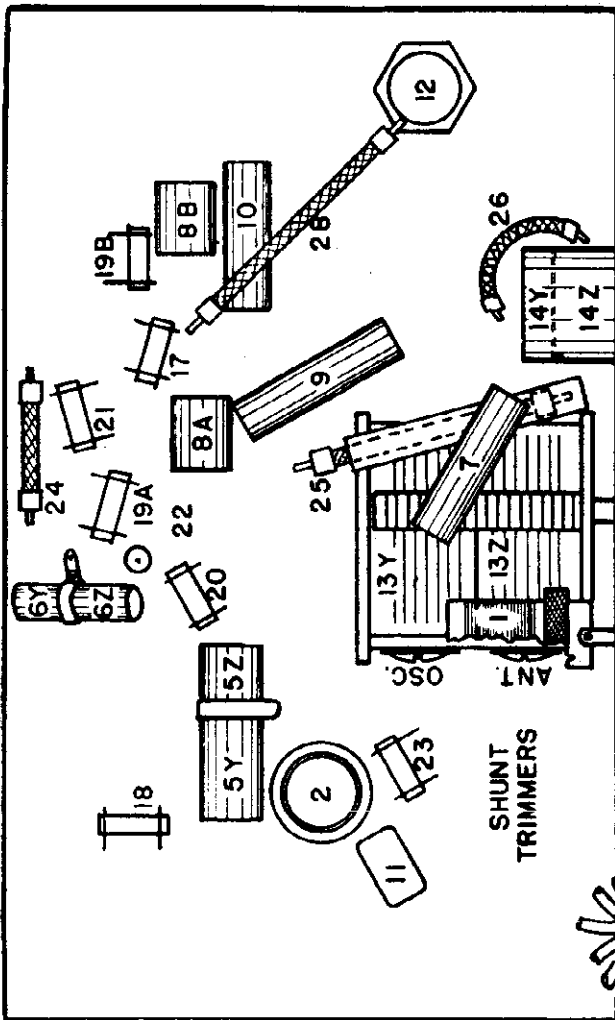


Fig. 3. Bottom View 566

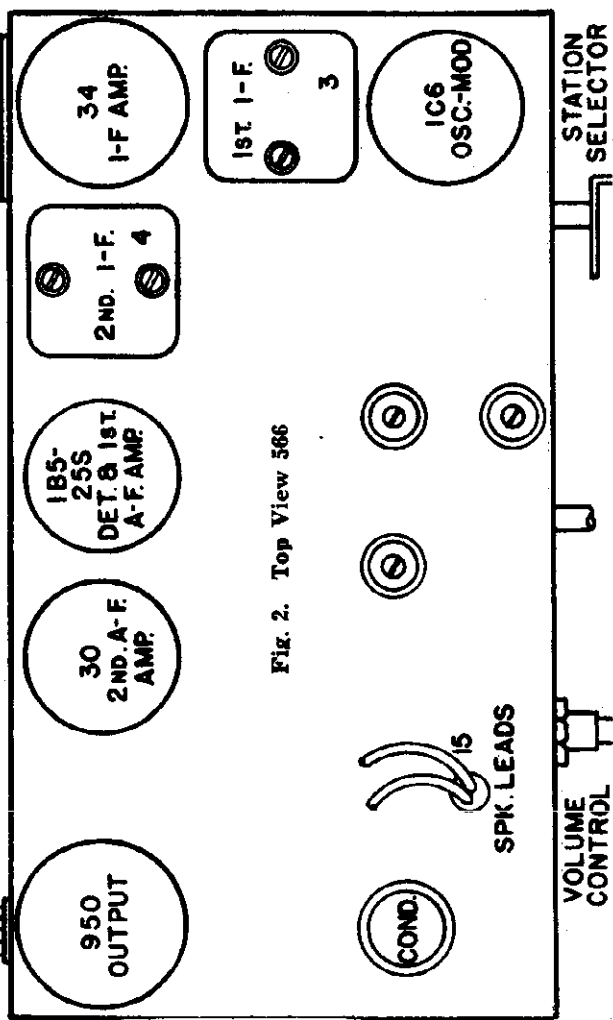


Fig. 2. Top View 566

CROSLY RADIO CORP.

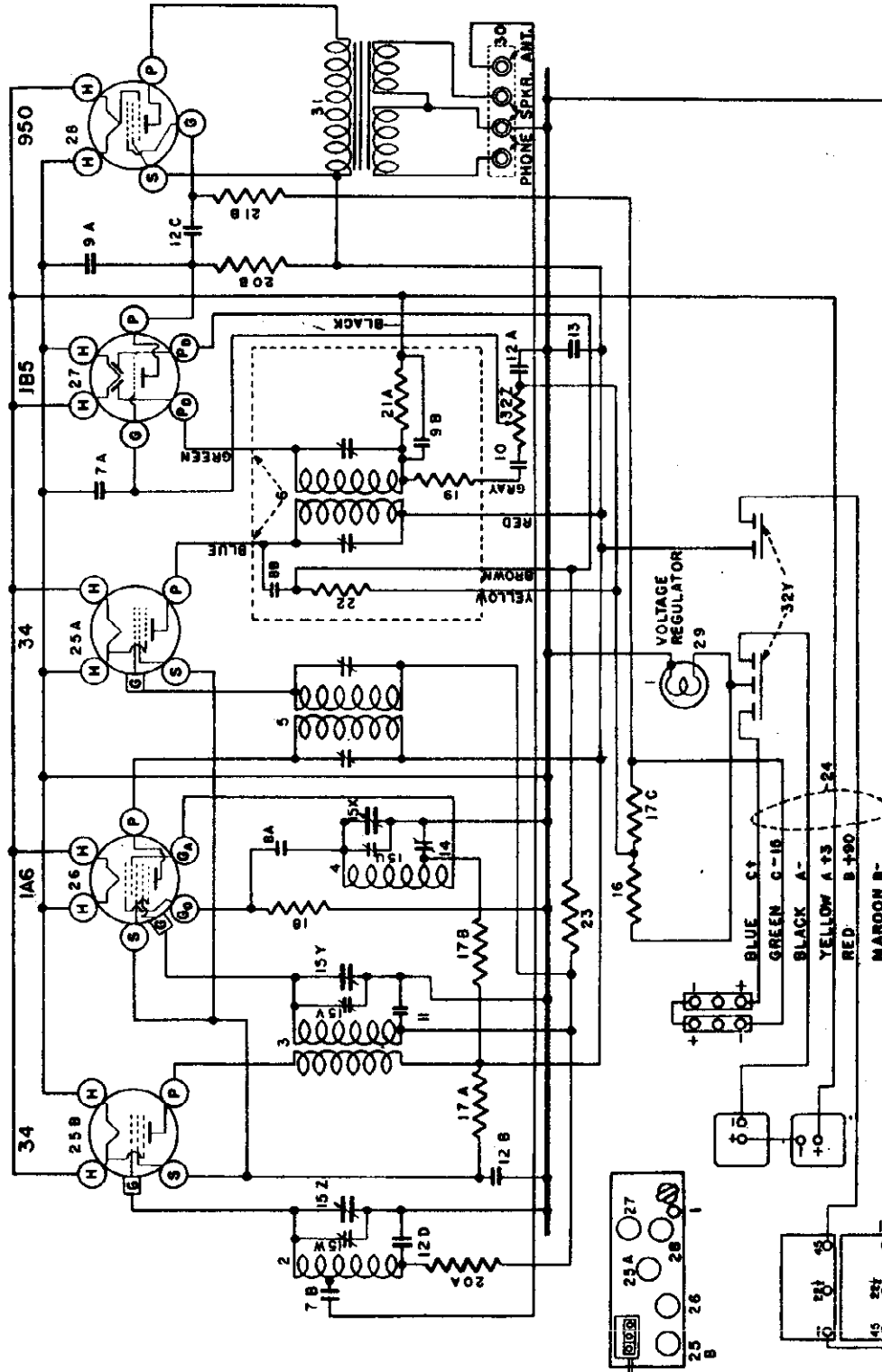
MODEL 586, Carrier Schematic, Voltage Socket

NOV. 1936

SALES MODEL B-637

(CARRIOR)

CHASSIS MODEL 586



TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	S	G	Ca	Co
34	R-F Amplifier	2.0	90	45	-1.5	55	-2 to -5
1A6	Oscillator Modulator	2.0	90	45	-1.5	55	---
34	I-F Amplifier	2.0	90	45	-1.5	55	---
1B5/25S	Detector and A-F Amplifier	2.0	90	90	-13.5	---	---
950	Output	2.0	90	90	---	---	---

Power output approximately 2 watt.
 "A" battery drain approximately 360 ampere.
 "B" battery drain approximately .010 ampere.

SPECIFICATIONS

This model Crosley radio is a six-tube battery receiver designed for portable use. A detachable antenna approximately 18' long is supplied as standard equipment. Provision is made for operating the receiver

either with headphones or a permanent-magnet dynamic speaker.

The tuning range is approximately from 540 to 1710 kilocycles.

**MODEL 586, Carrier
Trimmers, Chassis
Alignment, Parts**

CROSLLEY RADIO CORP.

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits can best be properly aligned with the use of a modulated signal generator and an output meter.

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 950 Output tube. Be sure the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier to 282 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd., or larger, condenser to the top cap of the 1A6 Osc-Mod. tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the receiver chassis frame. **KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.**
(b) Adjust the station selector so that the rotor plates of the tuning condenser are completely out of mesh.

(c) Turn the volume control of the receiver full on.
(d) Set the signal generator to 262 kilocycles.

(e) Adjust both trimmers located on the 2nd I-F transformer for maximum output. (Fig. 2).

(f) Adjust both trimmers located on the 1st I-F transformer for maximum output.

(g) Repeat operations (e) and (f) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

2. Aligning R-F Amplifier.

(a) Connect the output lead from the signal generator through a .00025 mfd. condenser to the "ANT" section of the receiver.

(b) Set the signal generator to 1400 kilocycles.

(c) Adjust the station selector to 140 on the dial.

(d) Adjust the trimmer on the "OSC" section of the tuning condenser for maximum output.

(e) Adjust the trimmer on the "R.F." section of the tuning condenser for maximum output.

(f) Adjust the trimmer on the "ANT" section of the tuning condenser for maximum output.

(g) Readjust the station selector for maximum output. **DO NOT READJUST THE OSC. TRIMMER.**

(h) Repeat operations (e) and (f) for more accurate adjustments.

(i) Set the signal generator to 600 kilocycles.

(j) Tune in this signal with the station selector for maximum reading on the output meter.

(k) Adjust the series trimmer, item 14, Fig. 2, while rocking the tuning condenser back and forth slightly until no further improvement in output can be obtained.

(l) Return the signal generator to 1400 kilocycles and repeat operations (g) and (h).

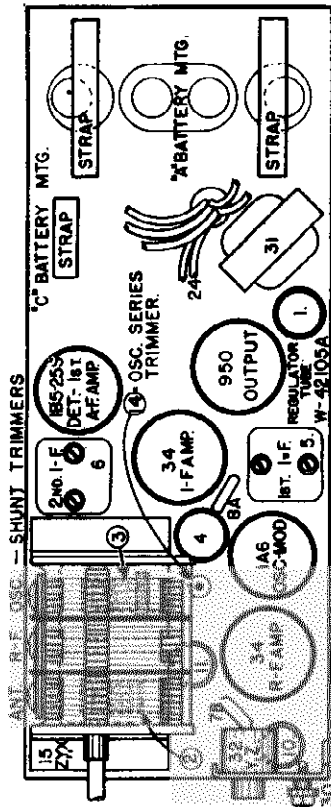


Fig. 2. Top View 586

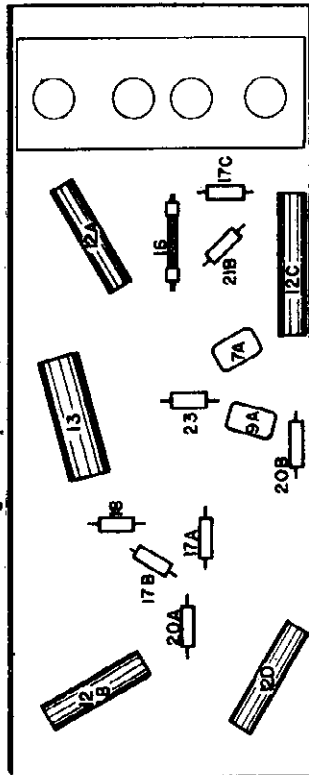
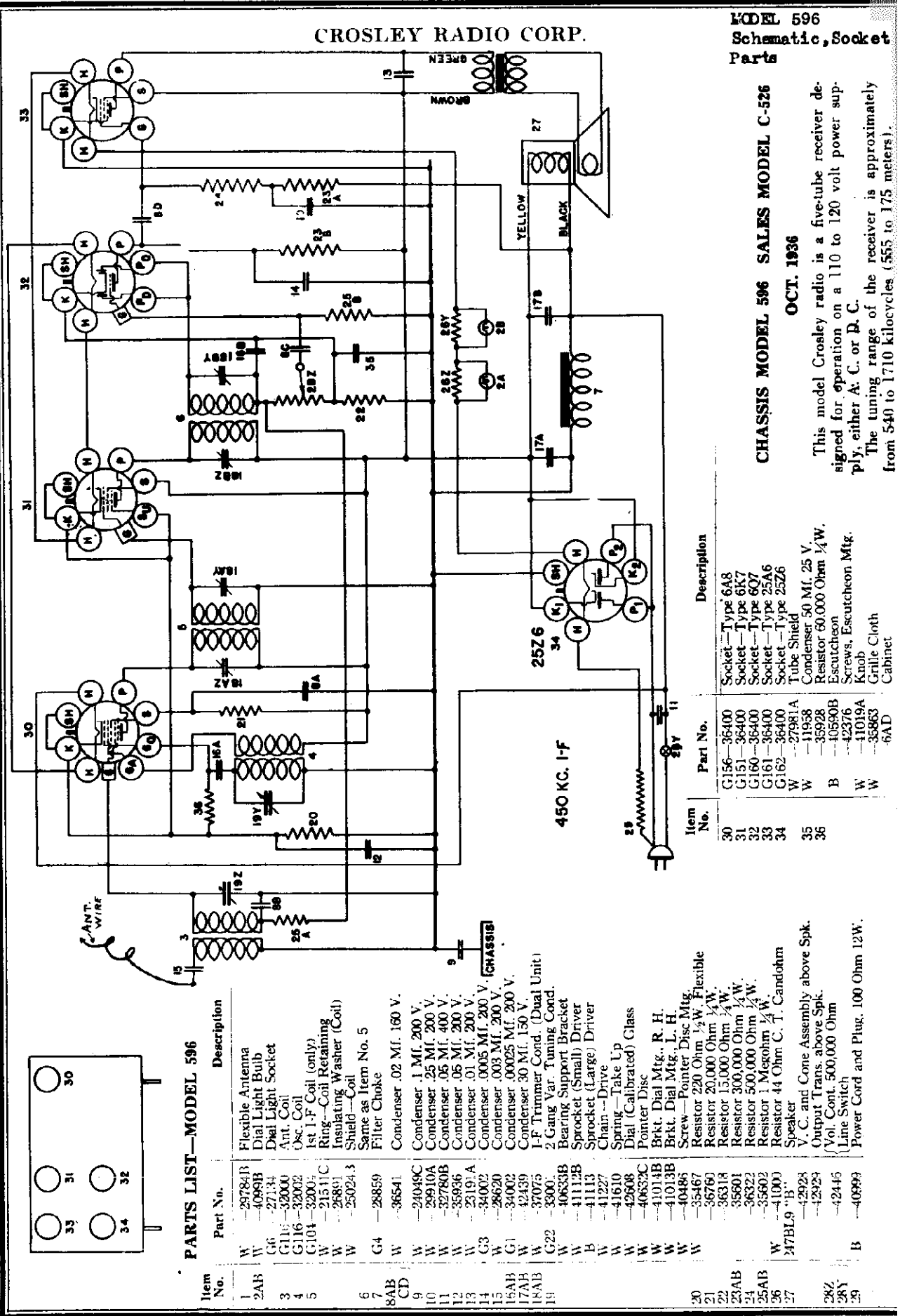


Fig. 3. Bottom View 586

Item No.	Part No.	Description
1	42105A	Voltage Regulator Tube
2	W-42105A	Ant. Coil
3	G117-32001	R.F. Coil
4	G106-32002	Osc. Coil
5	G35-32005	1st I-F. Assembly (contains Items 8B, 8C, 8D, 8E, 8F, 8G, 8H, 8I, 8J, 8K, 8L, 8M, 8N, 8O, 8P, 8Q, 8R, 8S, 8T, 8U, 8V, 8W, 8X, 8Y, 8Z)
6	G31-32005	2nd I-F. Assembly (contains Items 8B, 8C, 8D, 8E, 8F, 8G, 8H, 8I, 8J, 8K, 8L, 8M, 8N, 8O, 8P, 8Q, 8R, 8S, 8T, 8U, 8V, 8W, 8X, 8Y, 8Z)
7A	G5-34002	Condenser .0005 Mf. 200 V.
8A	G2-34002	Condenser .0005 Mf. 200 V.
9A	G1-36541	Condenser .02 Mf. 160 V.
10	W-35935	Condenser .05 Mf. 200 V.
11	W-35935	Condenser .05 Mf. 200 V.
12A	W-27215	Condenser .05 Mf. 200 V.
13	W-40729	Condenser .05 Mf. 200 V.
14	W-39007	3 Sec. Var. Tun. Cond. Gang
15	G55-42122	Dial (Calibrated Disc.)
	W-42122	Bearing Support Bracket
	W-42141	Sprocket Shaft Assembly
	W-1315A	Sprocket Hub Assembly
	W-42170	Drive Chain
	W-42120	Take Up Spring (Chain)
	W-40456	Dial Mfg. Screw
	W-22514	Resistor .750 Ohm 1/4W.
16	W-36318	Resistor 15,000 Ohm 1/4W.
17A	W-36761	Resistor 40,000 Ohm 1/4W.
18	W-45600	Resistor 100,000 Ohm 1/4W.
19	W-35600	Resistor 100,000 Ohm 1/4W.
	20A	Resistor 300,000 Ohm 1/4W.
	21A	Resistor 500,000 Ohm 1/4W.
	22	Resistor 35602
	23	Resistor 35602
	24	Resistor 35602
	25A	Resistor 1 Megohm 1/4W.
	26	Battery Cable Assembly
	27	Socket Type 34
	28	Socket Type 1A6
	29	Socket Type 950
	30	Socket Volt. Regulator
	31	Tube Shield (Type)
	32	Out-Put Transformer
	33	Vol. Cont. 1 Megohm
	34	Battery Switch
	35	Spk., Phone and Ant. Term. Assembly
	36	Battery Clamp ("A" Batt.)
	37	Battery Clamp ("C" Batt.)
	38	Case Assembly (see End Covers)
	39	Rear Cover Assembly
	40	Front Cover Assembly
	41	Control Handle
	42	Handle Fastener
	43	Phone Tip Jack (only)
	44	Knob (Vol. Cont.)
	45	Knob (Sta. Sel.)
	46	35252A
	47	Head-Phones
	48	Antenna Assembly
	49	Speaker Case only
	50	Speaker Cable
	51	Speaker Cord
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	100	Speaker Cord

CROSLY RADIO CORP.

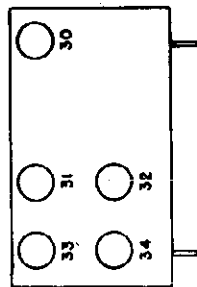
MODEL 596
Schematic, Socket
Parts



CHASSIS MODEL 596 SALES MODEL C-526

OCT. 1936

This model Crosley radio is a five-tube receiver designed for operation on a 110 to 120 volt power supply, either A. C. or D. C.
The tuning range of the receiver is approximately from 540 to 1710 kilocycles (555 to 175 meters).



PARTS LIST—MODEL 596

Item No.	Part No.	Description
1	29784B	Flexible Antenna
2AB	4098B	Dial Light Bulb
3	27134	Dial Light Socket
4	32000	Ant. Coil
5	G116-32002	Osc. Coil
	G104-32004	1st I-F Coil (only)
	21511C	Ring-Coil Retaining
	26891	Insulating Washer (Coil)
	25024.3	Shield-Coil
6	28859	Filter Choke
8AB	36541	Condenser .02 Mf. 160 V.
CD		Condenser .1 Mf. 200 V.
9	24049C	Condenser .25 Mf. 200 V.
10	29910A	Condenser .05 Mf. 400 V.
11	32780B	Condenser .05 Mf. 200 V.
12	35936	Condenser .05 Mf. 200 V.
13	2319.A	Condenser .01 Mf. 200 V.
14	34002	Condenser .0005 Mf. 200 V.
15	28620	Condenser .003 Mf. 200 V.
17AB	34002	Condenser .00025 Mf. 200 V.
18AB	42439	Condenser .30 Mf. 150 V.
19	37075	I-F Trimmer Cond. (Dual Unit)
	3300L	2 Gang Var. Tuning Cond.
	40633B	Bearing Support Bracket
	41112B	Sprocket (Small) Driver
	41113	Sprocket (Large) Driver
	41227	Chain—Drive
	41610	Spring—Take Up
	42608	Dial (Calibrated) Glass
	40632C	Pointer Disc
	41014B	Brkt. Dial Mtg., R. H.
	41013B	Brkt. Dial Mtg., L. H.
	40486	Screw—Pointer Disc Mtg.
20	35467	Resistor 220 Ohm 1/2 W. Flexible
21	36760	Resistor 20,000 Ohm 1/4 W.
22	36318	Resistor 15,000 Ohm 1/4 W.
23AB	35601	Resistor 300,000 Ohm 1/4 W.
24	36322	Resistor 500,000 Ohm 1/4 W.
25AB	35602	Resistor 1 Megohm 1/4 W.
26	41000	Resistor 44 Ohm C. T. Candohm
27	247BL9 "B"	Speaker
	42928	V. C. and Cone Assembly above Spk.
28Z	42928	Output Trans. above Spk.
28Y	42446	(Vol. Cont. 500,000 Ohm
29	40993	Line Switch
		Power Cord and Plug, 100 Ohm 12W.

Item No.	Part No.	Description
30	G156-36400	Socket—Type 6A8
31	G151-36400	Socket—Type 6K7
32	G160-36400	Socket—Type 6O7
33	G161-36400	Socket—Type 25A6
34	G162-36400	Socket—Type 25Z6
	W-27981A	Tube Shield
	W-11938	Condenser 50 Mf. 25 V.
	W-35928	Resistor 60,000 Ohm 1/4 W.
	B-40590B	Escutcheon
	W-42376	Screws, Escutcheon Mtg.
	W-41019A	Knob
	W-35863	Grille Cloth
	-6AD	Cabinet

MODEL 596
Trimmers, Chassis
Voltage, Alignment

CROSLLEY RADIO CORP.

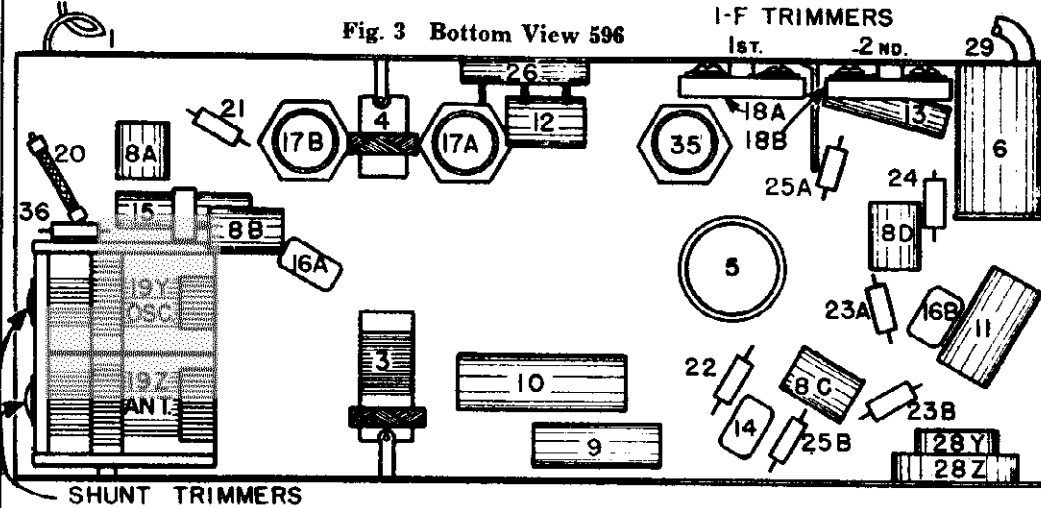


Fig. 3 Bottom View 596

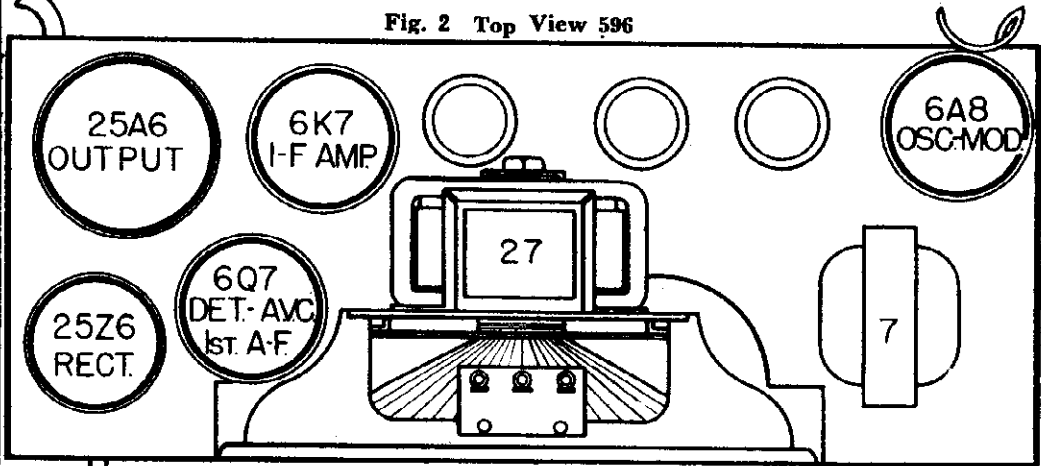


Fig. 2 Top View 596

Tube	Function	H	P	S	Su	K	Ca	Co
6A8G	Oscillator-Modulator	6.3	115	65	3.8	3.8	115	Neg.
6K7G	I-F Amplifier	6.3	115	115	3.8	3.8	115	---
6Q7G	Det and A-F Amplifier	6.3	25	115	1.2	0	---	---
25A6G	Output	25.0	115	115	---	115	---	---
25Z6G	Rectifier	25.0	---	---	---	---	---	---

TUBE SOCKET VOLTAGE READINGS

Power output approximately 1.8 watts.
Power consumption approximately 50 watts.
Voltage drop across speaker field 125 volts.
All readings taken on 117.5 volt A. C. power supply.
All readings except filaments will be approximately 10% lower on 117.5 volts D. C.

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits can best be properly aligned with the use of a modulated signal generator and an output meter.

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 25A6 Output tube. Be sure the meter is protected from D. C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier to 450 Kilocycles.

(a) Connect the output of the signal generator through a .02 condenser to the top cap of the 6A8 Oscillator-Modulator tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator through a .05 mfd., or larger, condenser to the receiver chassis. **KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.**

(b) Set the station selector so that the plates of the condenser gang are completely out of mesh and turn the volume control to the right (ON).

(c) Set the signal generator to 450 kilocycles.

(d) Adjust the 2nd I-F trimmer condensers (18B, Fig. 3) located on the rear of the receiver chassis for maximum reading on the output meter.

(e) Adjust the 1st I-F trimmer condensers (18A, Fig. 3) located on the rear of the receiver chassis for maximum reading on the output meter.

(f) Check operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

2. Aligning R-F Amplifier.

(a) Connect the output lead from the signal generator through a .00025 mfd. condenser to the antenna condenser at the point where the antenna wire is connected.

(b) Set the signal generator to 1400 kilocycles.

(c) Adjust the station selector to 140 on the dial.

(d) Adjust the trimmer located on the "OSC" section of the condenser gang for maximum output.

(e) Adjust the trimmer located on the "ANT" section of the condenser gang for maximum output.

(f) Readjust the station selector slightly for maximum output.

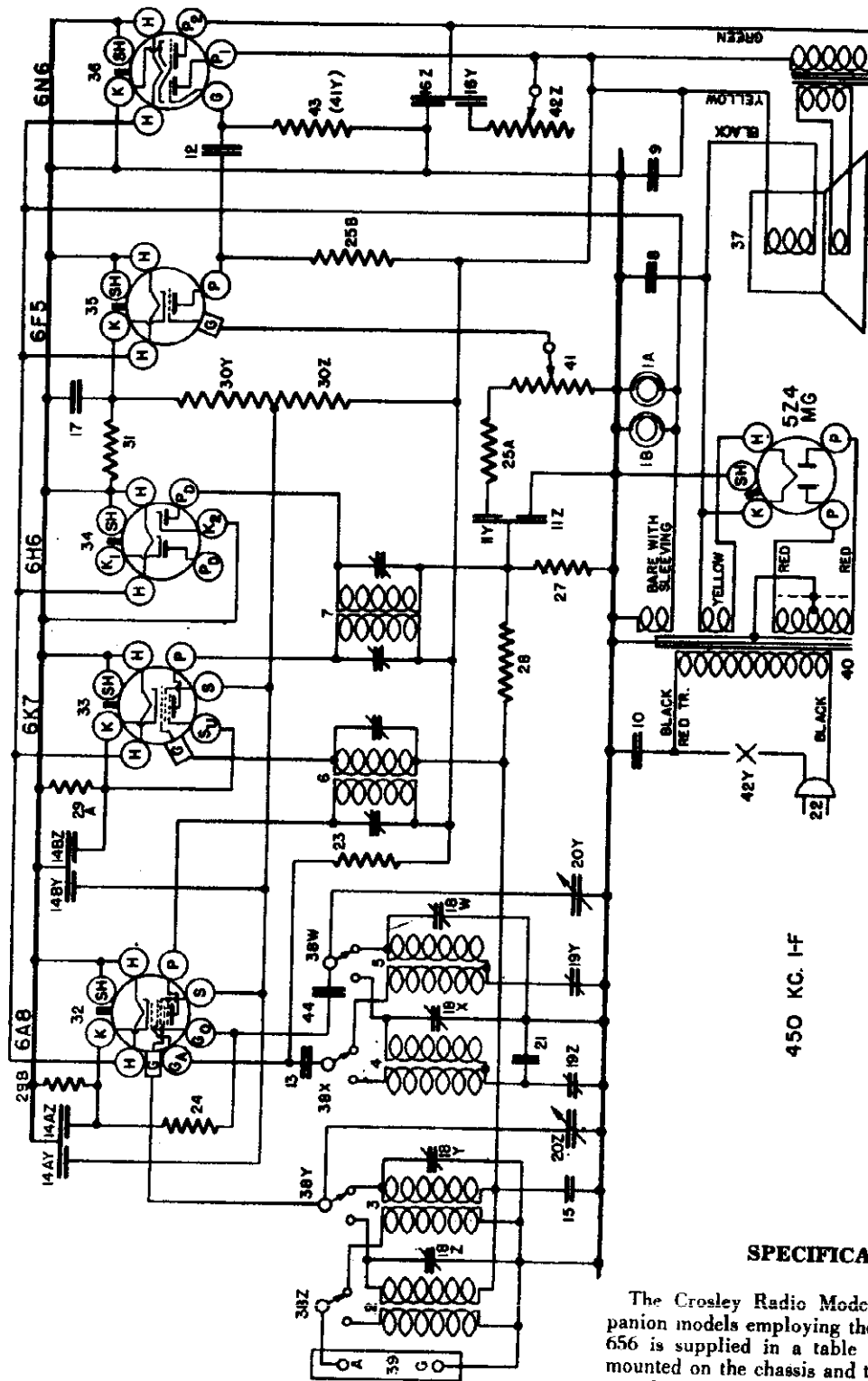
(g) Repeat operation (e) for more accurate adjustment.

CROSLLEY RADIO CORP.

MODELS 656, 6566
Schematic, Voltage
Notes

September, 1936 SALES MODELS 634 and 649

CHASSIS 656 and 5656



TUBE SOCKET VOLTAGE READINGS

Tube	Where Used	H	Su	S	P2	K	Ca	Co
6A8	Osc-Mod	6.3	275	120	---	5	170	-5 to -20
6K7	I.F. Amp.	6.3	275	120	---	4	---	---
6H6	Det. & AVC	6.3	0	---	---	0	---	---
6F5	A.F. Amp.	6.3	160	---	---	2	---	---
6N6	Output	6.3	275	---	260	0	---	---
5Z4MG	Rectifier	5.0	---	---	---	0	---	---

Power Output Approximately 4 Watts.
Power Consumption Approximately 85 Watts at 117.5 Volts.
Voltage Drop Across Speaker Field Approximately 78 Volts.

SPECIFICATIONS

The Crosley Radio Models 656 and 5656 are companion models employing the same circuit. The Model 656 is supplied in a table cabinet having the speaker mounted on the chassis and the Model 5656 is a console type having the speaker mounted in the cabinet. The frequency ranges covered are from 540 to 1710 kilocycles in the broadcast band and from 6,000 to approximately 18,000 kilocycles in the high frequency band.

Signal Generator Frequencies.

	Shunt Alignment	Series Alignment
Broadcast Band	1400 Kc.	600 Kc.
High Frequency Band	18000 Kc.	6000 Kc.

MODELS 656, 5656
Socket, Trimmers
Chassis, Alignment
Parts

CROSLEY RADIO CORP.

frequency band this condenser should be replaced by a 400 ohm (Non Inductive) carbon resistor.

Each band should be shunt aligned, series aligned and then shunt aligned again in the order given. The band selector switch should be set for the band being aligned and the signal generator should be set to the frequency indicated below for each adjustment.

Adjust the "OSC" and "ANT" shunt trimmers (Shunt alignment). See Fig. 3 in the order given for maximum output. Tune the station selector to the generator signal for maximum output and then check the adjustment of the "ANT" trimmer. NOTE: When adjusting the high frequency band, care should be exercised so that the circuits will be aligned on the fundamental frequency rather than on the image frequency which is approximately 500 kilocycles less than the fundamental. To check on this, increase the output of the signal generator approximately 10 times and try to tune in the signal both at the generator frequency as indicated on the station selector dial and at approximately 900 kilocycles below the correct frequency. If the circuits have been properly aligned the signal can be tuned-in at both positions but much stronger at the correct dial setting.

To adjust the "series" trimmers (Fig. 3) set the signal generator to the frequency indicated below and then tune in this signal with the station selector for maximum output. Adjust the series trimmer while rocking the tuning condenser back and forth slightly, until no further improvement in output can be obtained.

by connecting a condenser (1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier to 450 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 6K8 tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the "GND" terminal of the receiver. KEEP THE GENERATOR GRID LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the tuning condenser plates are completely out of mesh. Turn the volume control knob to the right (ON) and turn the tone control knob to the left (TREBLE).

(c) Turn the band selector switch to the right (High Frequency).

(d) Set the signal generator to 450 kilocycles.

(e) Adjust both trimmers located on top of the 2nd I-F Transformer for maximum output. (Fig. 2).

(f) Adjust both trimmers located on top of the 1st I-F Transformer for maximum output.

(g) Check operations (c) and (f) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

2. Aligning R-F Amplifier.

(a) When aligning the R-F Amplifier the output lead from the signal generator should be connected through a dummy antenna to the "ANT" terminal of the receiver. For the broadcast band the dummy antenna should be a .00025 mfd. condenser and for the high

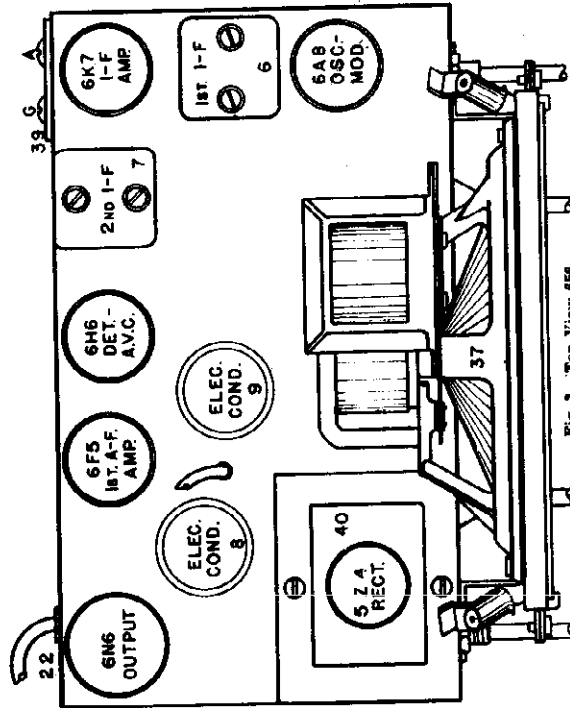


Fig. 2. Top View 656

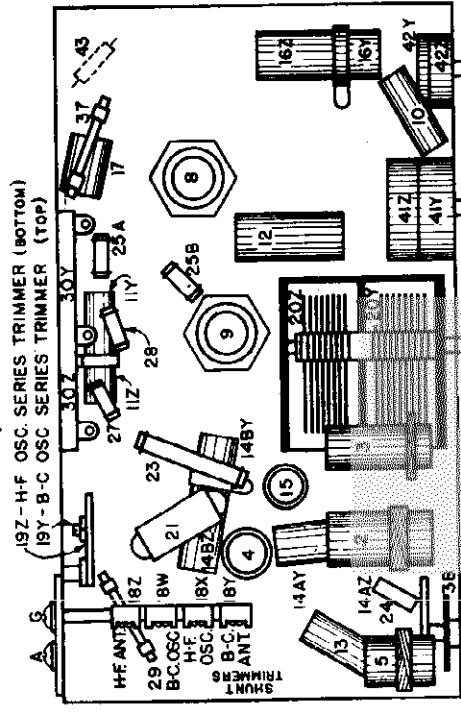


Fig. 3. Bottom View 656

properly aligned with the use of a modulated signal generator and an output meter.

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory, and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary, the circuits can best be

CONNECTING OUTPUT METER

Connect the output meter to P and P2 of the 6N6 Output Tube. Be sure the meter is protected from D.C.

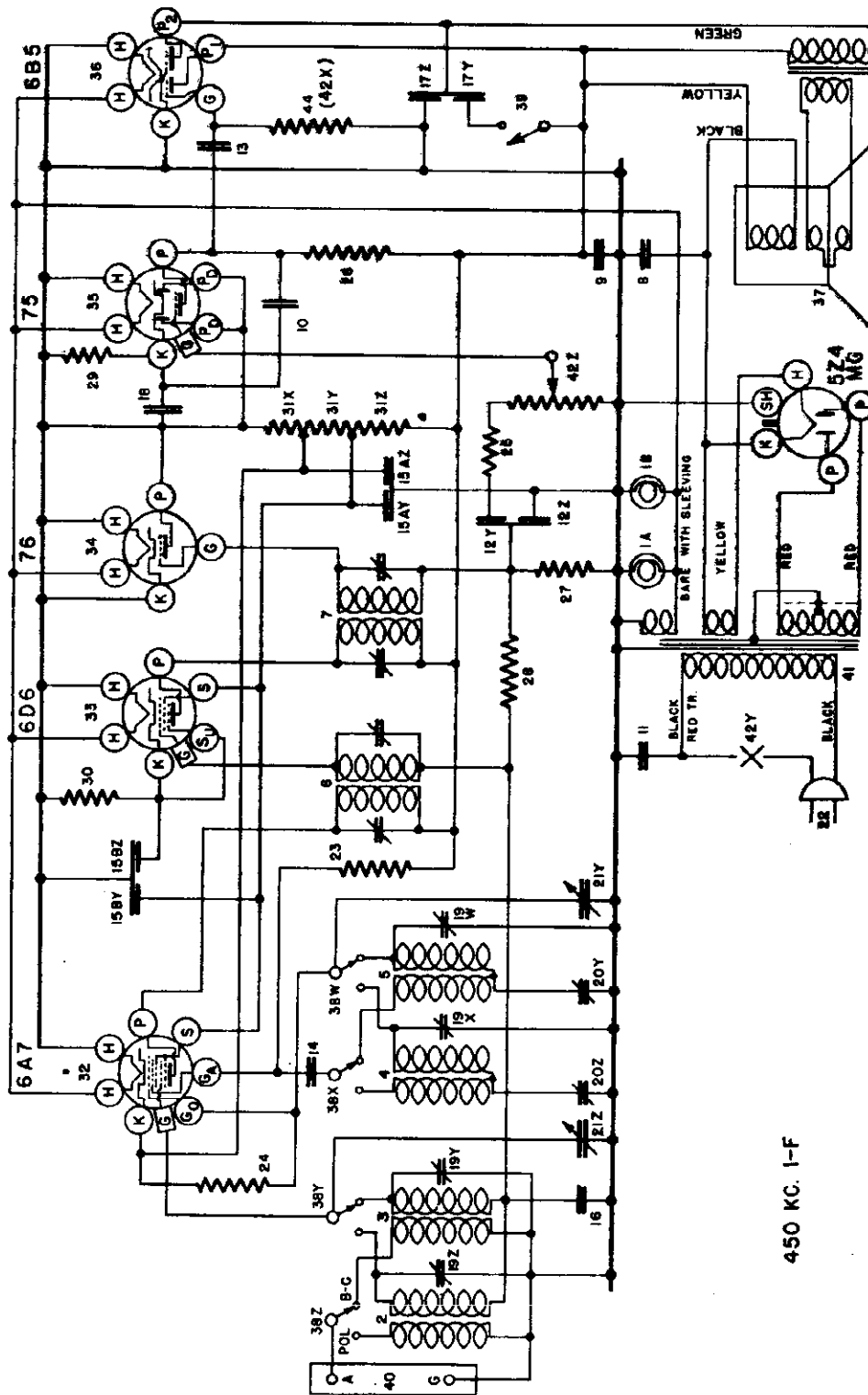
Item No.	Part No.	Name
23	5370-A	Resistor, 20,000 Ohm 1/2 W.
24	32440	Resistor, 20,000 Ohm 1/2 W.
25A	32440	Resistor, 150,000 Ohm 1/2 W.
26	35928	Resistor, 150,000 Ohm 1/2 W.
27	33344	Resistor, 400,000 Ohm 1/2 W.
28	37245	Resistor, 50,000 Ohm 1/2 W. Flat
29	28286	Resistor, 10,000 Ohm Carbon
30	32301	Resistor, 15,000 Ohm Carbon
31	G156-35400	Socket, Type 6K7
32	G156-35400	Socket, Type 6K8
33	G156-35400	Socket, Type 6H6
34	G156-35400	Socket, Type 6N6
35	G156-35400	Socket, Type 6N7
36	33181-B	Speaker, 16 Ohm only
37	37008	Core Assy. For above
	40275	Field Coil
	40276	Output Transformer
	639CJ3	Speaker, 16 Ohm only
	42879	Core Assy. For above
	42880	Field Coil
	42881	Output Transformer
	35895	Speaker Cable, Model 5656 only
	35718	Terminal Board, Antenna & Grid
	35719	Transformer, 110V, 80 Cy. Power
	41978-A	Volume Control, (1 Meg.) See Note
	41027	Volume Control, (80,000 Ohm)
	41028-A	Tone Control, (80,000 Ohm)
	42945	Excutcheon Screws
	37	Excutcheon Screws
	38	Excutcheon Screws
	39	Excutcheon Screws
	40	Excutcheon Screws
	41	Excutcheon Screws
	42	Excutcheon Screws
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	98	Excutcheon Screws
	99	Excutcheon Screws
	100	Excutcheon Screws

*May be used in place of Dual Volume Control.

CROSLY RADIO CORP.

September, 1936 SALES MODELS 629 and 644

CHASSIS 666 and 5666



TUBE SOCKET VOLTAGE READINGS

Tube	Where Used	H	P	P2	S	Su	K	Ga	Go
6A7	Osc-Mod	6.3	235	—	125	—	6.2	154	—6 to —30
6D6	I. F. Amp.	6.3	235	—	125	—	6.4	—	—
76	Detector	6.3	0	—	125	5.7	0	—	—
75	A. F. Amp. & AVC	6.3	110	—	—	—	2	—	—
6B5	Output	6.3	235	—	—	—	0	—	—
5Y3	Rectifier	5.0	—	222	—	—	—	—	—

Power Output Approximately 4 Watts.
Power Consumption Approximately 68 Watts at 117.5 Volts.
Voltage Drop Across Speaker Field Approximately 95 Volts.

Signal Generator Frequencies.

Broadcast Band
High Frequency Band

Shunt Alignment
1400 Kc.
6000 Kc.

Series Alignment
600 Kc.
1500 Kc.

MODELS 666, 5666
Socket, Trimmers
Alignment, Parts

CROSLLEY RADIO CORP.

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits can best be properly aligned with the use of a modulated signal generator and an output meter.

CONNECTING OUTPUT METER

Connect the output meter to P. and P2 of the 6B5 Output Tube. Be sure the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier to 450 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 6A7 tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the "GND" terminal of the receiver. **KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.**

(b) Set the station selector so that the tuning condenser plates are completely out of mesh. Turn the volume control knob to the right (ON) and turn the tone control knob to the left (TREBLE).

(c) Turn the band selector switch to the right (High Frequency).

(d) Set the signal generator to 450 kilocycles.

(e) Adjust both trimmers located on top of the 2nd I-F Transformer for maximum output. (Fig. 2).

(f) Adjust both trimmers located on top of the 1st I-F Transformer for maximum output.

(g) Check operations (e) and (f) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

2. Aligning R-F Amplifier.

(a) When aligning the R-F Amplifier the output lead from the signal generator should be connected through a dummy antenna to the "ANT" terminal of the receiver. For the broadcast band the dummy antenna should be a .00025 mfd. condenser and for the high frequency band this condenser should be replaced by a 400 ohm (Non Inductive) carbon resistor.

Each band should be shunt aligned, series aligned and then shunt aligned again in the order given. The band selector switch should be set for the band being aligned and the signal generator should be set to the frequency indicated below for each adjustment.

Adjust the "OSC" and "ANT" shunt trimmers (Shunt alignment. See Fig. 3) in the order given for maximum output. Tune the station selector to the generator signal for maximum output and then check the adjustment of the "ANT" trimmer. **NOTE:** When

aligning the high frequency band care should be exercised so that the circuits will be aligned on the fundamental frequency rather than on the image frequency which is approximately 900 kilocycles less than the fundamental. To check on this, increase the output of the signal generator approximately 10 times and try to tune-in the signal both at the generator frequency as indicated on the station selector dial and at approximately 900 kilocycles below the correct frequency. If the circuits have been properly aligned the signal can be tuned-in at both positions but much stronger at the correct dial setting.

To adjust the "series" trimmers (Fig. 3) set the signal generator to the frequency indicated below and then tune-in this signal with the station selector for maximum output. Adjust the series trimmer while rocking the tuning condenser back and forth slightly, until no further improvement in output can be obtained.

PARTS LIST—MODELS 666 and 5666

Item No.	Part No.	Name
1	W -37922	6-8 V. Bulb, Dial Light
2	G3 -37965	Socket Assy., Dial Light
3	Q82 -33000	Coil Antenna—2350—7000 Kc.
4	C81 -33000	Coil Antenna—540—1725 Kc.
5	C 65 -33002	Coil—2350—7000 Kc. Osc.
6	C 66 -32002	Coil—540—1725 Kc. Osc.
7	G118 -32004	Coil—Assy., 1st I-F.
8	G 72 -32004	Coil—Assy., 2nd I-F.
9	W -36065	Cond. 35 Mf. 400 V.
10	W -36067	Cond. 40 Mf. 300 V.
11	W -30770	Cond. .001 Mf. 400V.
12	W -30805	Cond. .01 Mf. 400V.
13	W -30822 A	Cond. .00017 Mf.
14	W -32615	Cond. .05 Mf. 400V.
15	W -23191 A	Cond. .01 Mf. 400V.
16	W -28623	Cond. .02 Mf. 400V.
17	W -28623	Cond. .02 Mf. 400V.
18	W -27216	Cond. .02 Mf. 400V.
19	W -31062	Cond. .05 Mf. 200V.
20	W -37732	Cond. .04 Mf. 400V.
21	W -37241	Cond. .05 Mf. 400V.
22	C 31 -33006	Cond. 4 Section Trimmer
23	C 17 -33601	Cond. Var. Tuning
24	W -41736	Drive Unit, RPI Disc Assy.
25	W -41897	Dial-Calibrated Glass
26	W -41737	Mtg. Brkt. Dial Glass, R.H.
27	W -41738	Mtg. Brkt. Dial Glass, L.H.
28	W -41739	Drive Unit
29	B -42617	Dial (Calibrated)
30	MG-14 -41980	Dial Glass, Mtg. Brkt. R.H.
31	W -40798	Dial Glass, Mtg. Brkt. L.H.
32	W -40797 A	Dial Glass Retaining Brkt.
33	W -42629	Pointer—Dial

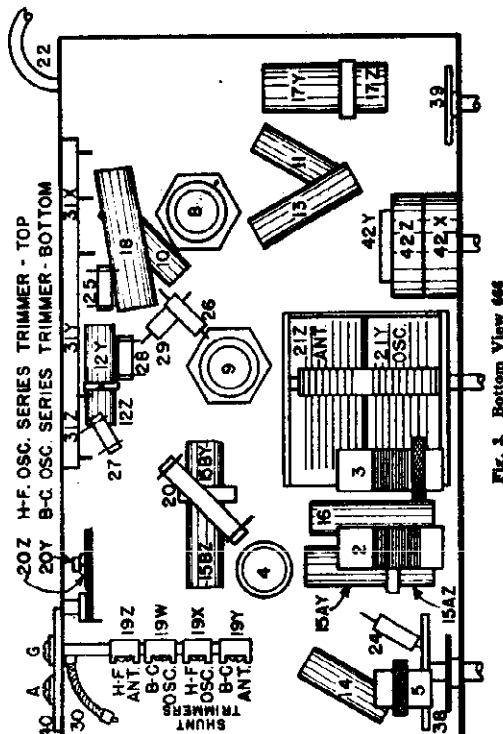
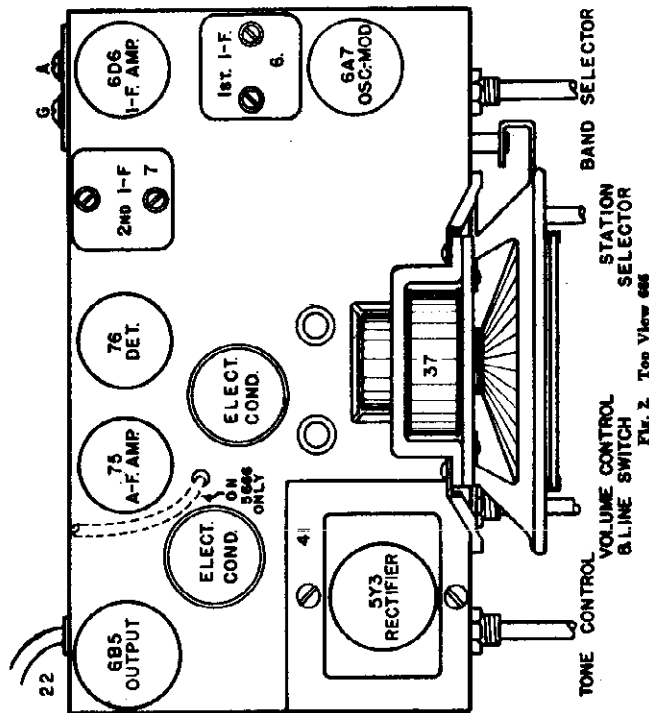
34	W -40795	Shaft—Pointer
35	W -40809	Washer (Spring) Shaft
36	W -41611	Ring—Shaft, Retaining
37	W -42574 A	Mach. (Metal) Dial
38	B -33805 A	Cord & Plug—Power
39	W -5370 A	Resistor, 50,000 Ohm, 1/2 W
40	W -35928	Resistor, 100,000 Ohm, 1/2 W
41	W -21875	Resistor, 150,000 Ohm, 1/2 W
42	W -35929 C	Resistor, 400,000 Ohm, 1/2 W
43	W -33344	Resistor, 15 Megohm, 1/2 W
44	W -77245 C	Resistor, 2,700 Ohm, 1/2 W
45	W -36316	Resistor, 500 Ohm, 1/2 W Flex.
46	W -28106	Resistor, 1,000 Ohm
47	W -37246	Resistor, 185-185 Ohm
48	G47 -28807	Socket—Type 6A7
49	G75 -28807	Socket—Type 6D6
50	G80 -28807	Socket—Type 76
51	G41 -28807	Socket—Type 75
52	G90 -28807	Socket—Type 6B5
53	W -27081	Base Tube Shield
54	W -40911	Shield—Tube
55	244-BL-9	Speaker, "B" Spec. 50A-2
56	-42928	Cone Assy. For above Speaker
57	-41473	Output Trans. For above Speaker
58	832-CJ-3	Speaker, "M" Spec. I-D-610
59	-42879	Cone Assy. For above Speaker
60	-42880	Field Coil. For above Speaker
61	-42881	Output Trans. For above Speaker
62	-37247	Switch Band Sel.
63	W -36184 A	Switch, Tone Con.
64	36719	Terminal Board, Ant. & Grid
65	-41978	Transformer, 110V—60 Cy. Power
66	-37395	Volume Control 3 Meg. 1st A-F
67	-42828	Volume Control 10 Meg. 2nd A-F
68	-35601	Resistor, 500,000 Ohm, 1/2 W
69	B -40590	Escutcheon, (666)
70	W -42345	Escutcheon, (5666)
71	D -28	Escutcheon Mtg. Screws
72	W -37339	Knob, (2) V.C. & S.S.
73	W -37341	Knob, (2) T.C. & B. S. W.
74	W -36297	Volume Control, 3 Meg.*
75	AC	Cabinet Model 666
76	MA	Cabinet Model 5666

*May be used in place of Dual Volume Control.

SPECIFICATIONS

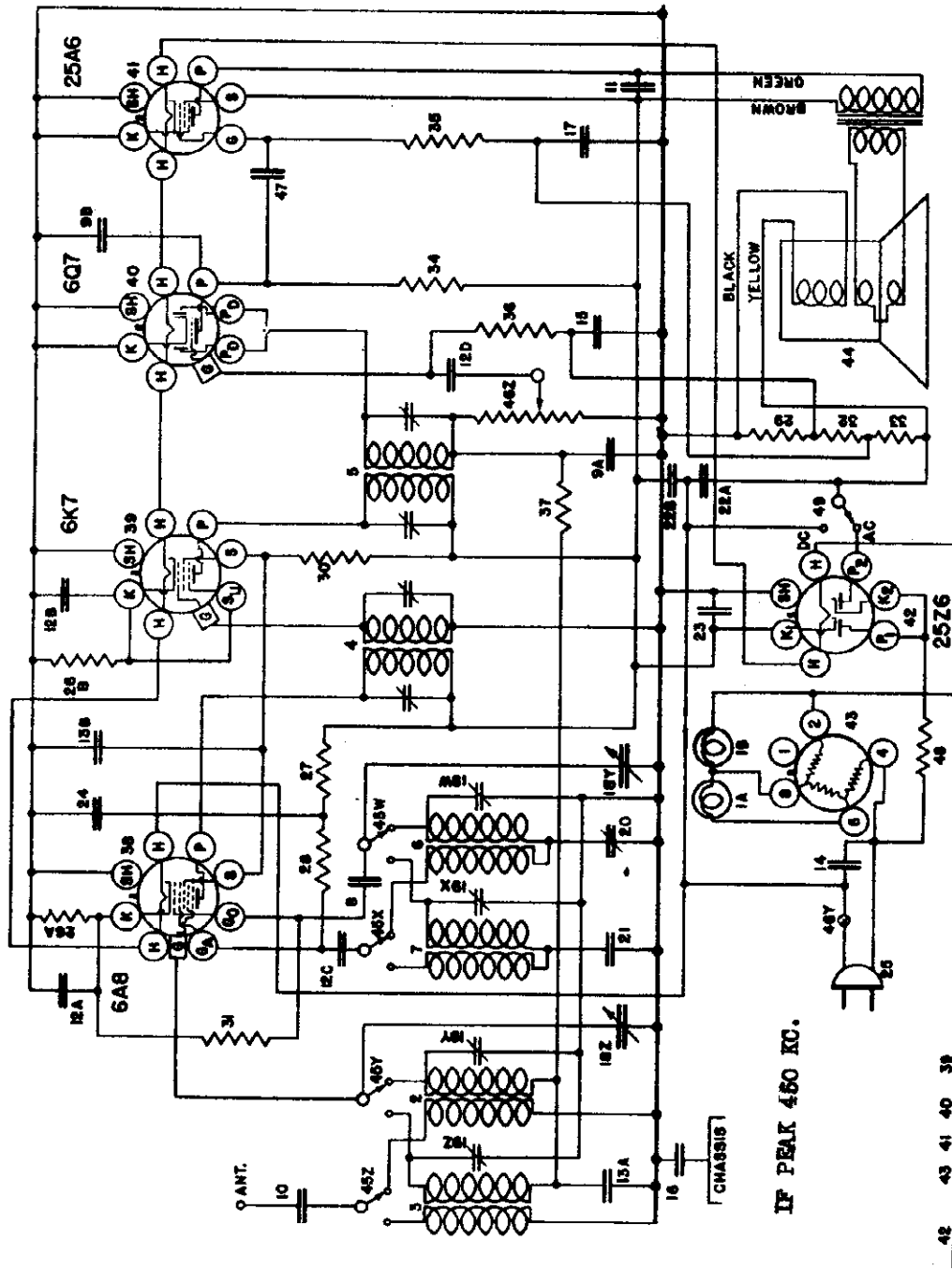
The Crosley Radio Models 666 and 5666 are companion models employing the same circuit. The Model 666 is supplied in a table cabinet having the speaker mounted on the chassis and the Model 5666 is a console type having the speaker mounted in the cabinet.

The frequency ranges covered are from 540 to 1710 kilocycles in the broadcast band and from 2350 to approximately 7500 kilocycles in the high frequency band.



CROSLY RADIO CORP.

MODEL 676
Schematic, Socket
Voltage



Signal Generator Frequencies.
Shunt Alignment 1400 Kc.
6000 Kc.
Series Alignment 600 Kc.

TUBE SOCKET VOLTAGE READINGS

Tube		H	P	S	G	Su	K	Ga	Go
6A8G	Oscillator-Modulator	6.3	150	90	—	—	—	—	—
6K7G	I-F Amplifier	6.3	150	90	—	—	3.0	115	—
6Q7G	Det. & A-F Amp.	6.3	80	—	—3	3.0	3.0	—	Neg.
25A8G	Output	25.0	125	150	-16	—	—	—	—
25Z6G	Rectifier	25.0	—	—	—	—	0	—	—
W-42520	Ballast Tube	—	—	—	—	—	—	—	—

Power output approximately 3 watts.
Power consumption approximately 75 watts.
Voltage drop across speaker field 80 volts.
All readings taken on 117.5 volt A.C. power supply.
All voltages except filaments will be approximately 40% lower if measured on 117.5 volt D.C. power supply.

MODEL 676

Socket, Trimmers
Alignment, Parts

CROSLLEY RADIO CORP.

be set to the frequency indicated below for each adjustment.
Adjust the "OSC" and "ANT" shunt trimmers. (See Fig. 3) in the order given for maximum output. (See the station selector to the generator signal for maximum output and then check the adjustment of the "ANT" trimmer. NOTE: When aligning the high frequency band care should be exercised so that the circuits will be aligned on the fundamental frequency rather than on the image frequency which is approximately 900 kilocycles less than the fundamental. To check on this, increase the output of the signal generator approximately 10 times and try to tune in the signal both at the generator frequency as indicated on the station selector dial and at approximately 900 kilocycles below the correct frequency. If the circuits have been properly aligned the signal can be tuned-in at both positions but much stronger at the correct dial setting.
To adjust the "series" trimmer (Fig. 3) set the signal generator to the frequency indicated below and then tune in this signal with the station selector for maximum output. Adjust the series trimmer while rocking the tuning condenser back and forth slightly, until no further improvement in output can be obtained.

FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.
(b) Set the station selector so that the plates of the condenser gang are completely out of mesh, turn the band selector switch to the right (High Frequency Position) and turn the volume control to the right (ON).
(c) Set the signal generator to 450 kilocycles.
(d) Adjust both trimmer condensers located on top of the 2nd I-F transformer for maximum reading on the output meter.
(e) Adjust both trimmers located on top of the 1st I-F transformer for maximum reading on the output meter.
(f) Check operations (d) and (e) for more accurate adjustments.
ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

2. Aligning B-F Amplifier.
(a) When aligning the B-F Amplifier the output lead from the signal generator should be connected through a dummy antenna to the "ANT" terminal of the receiver. For the broadcast band the dummy antenna should be a .00025 mid. condenser and for the high frequency band the condenser should be replaced by a 40 μ ohm (Non Inductive) carbon resistor.
Each band should be shunt aligned, series aligned (Broadcast Band) and then shunt aligned again in the order given. The band selector switch should be set for the band being aligned and the signal generator should

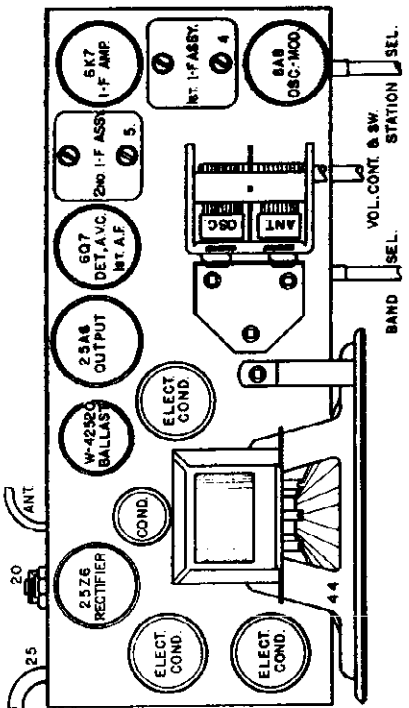


Fig. 2. Top View 676

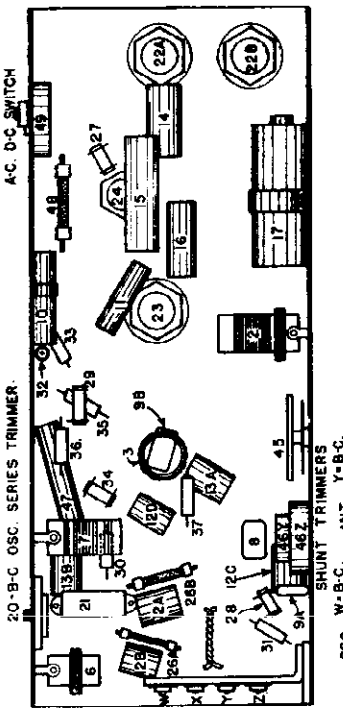


Fig. 3. Bottom View 676

adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits can best be properly aligned with the use of a modulated signal generator and an output meter.

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 2B6G Output tube. Be sure the meter is protected from D.C. by connecting a condenser (.1 mid. or larger—not electrolytic) in series with one of the leads.

Tuning I-F Amplifiers to 450 Kilocycles.

(a) Connect the output of the signal generator through a .02 condenser to the top of the 8A8 Oscillator-Modulator tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator through a .05 mid. or larger condenser to the receiver chassis. KEEP THE GENERATOR LEADS AS

A switch is located on the rear of the receiver chassis for the purpose of adapting the receiver to either an A.C. or D.C. power supply. To change the position of the switch, remove the screw in the locking bracket and move the end of the bracket to the other position as marked on the chassis. Replace the screw so as to lock the switch in the new position.
The receiver will operate satisfactorily on either A.C. or D.C. with the switch in the D.C. position, but the performance of the receiver will be greatly improved with the switch in the A.C. position when being operated on A.C. DO NOT OPERATE THE RECEIVER ON A D.C. POWER SUPPLY WITH THE SWITCH IN THE A.C. POSITION AS IT WILL CAUSE DAMAGE TO THE RECEIVER PARTS.

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately

PARTS LIST—MODEL 676

Figures in first column refer to parts in Diagrams.

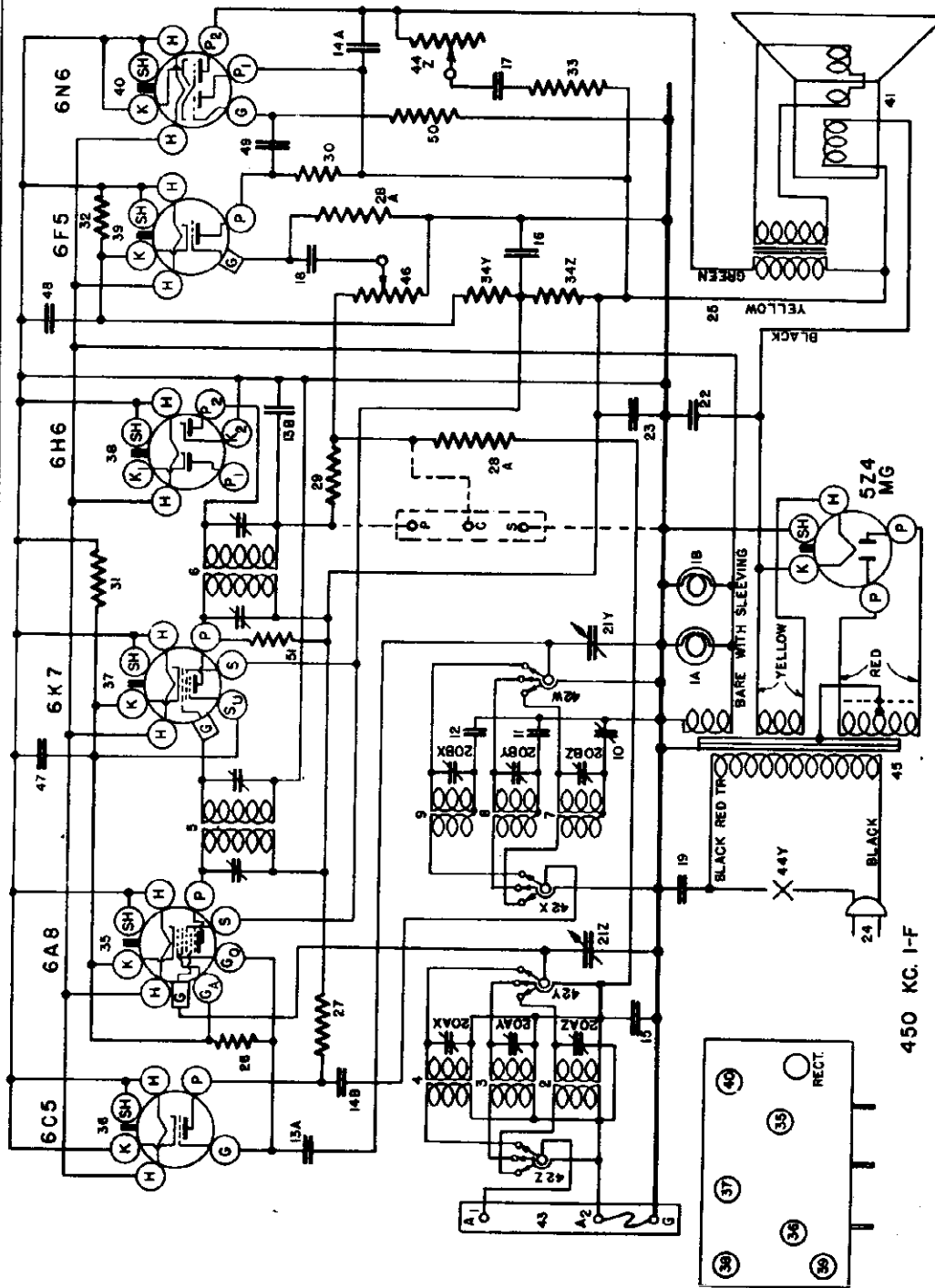
Item No.	Part No.	Description	Item No.	Part No.	Description
1A-B	W-4089B	Dial Light Bulb	38A-B	W-28580	Resistor 150 Ohm 1/4W. Freestable
1	W-5300	Ant. Coil B-C	37	W-2481A	Resistor 200 Ohm 1/4W. Freestable
2	G-24	Ant. Coil H-F	26	W-2702A	Resistor 100 Ohm 1/4W. Freestable
3	G-25	1st I-F Assembly	25	W-2625	Resistor 100 Ohm 1/4W. Freestable
4	G-25	2nd I-F Assembly	30	W-3569	Resistor 100 Ohm 1/4W. Freestable
5	G-25	3rd I-F Assembly	31	W-3569	Resistor 100 Ohm 1/4W. Freestable
6	G-11	4th I-F Assembly	32	W-3569	Resistor 100 Ohm 1/4W. Freestable
7	G-11	5th I-F Assembly	33	W-3569	Resistor 100 Ohm 1/4W. Freestable
8	C-1	Condenser .0025 Mf.	34	W-3569	Resistor 100 Ohm 1/4W. Freestable
9	S-9AB	Condenser .0025 Mf.	35	W-3569	Resistor 100 Ohm 1/4W. Freestable
10	W-3278	Condenser .01 Mf. 400V.	36	W-3569	Resistor 100 Ohm 1/4W. Freestable
11	W-3654	Condenser .05 Mf. 180 V.	37	G-15	Type 6A8
12A-B	W-3566A	Condenser .05 Mf. 200 V.	38	G-151	Type 6B7
13	W-3278B	Condenser .05 Mf. 400 V.	39	G-161	Type 6C7
14	W-3171C	Condenser .05 Mf. 180 V.	40	G-181	Type 5206
15	W-3021	Condenser 1 Mf. 180 V.	41	G-189	Type 507
16	W-3001	Condenser 1 Mf. 160 V.	42	G-189	Type 507
17	C-96	2-Section Var. Tuning Cond. Gang	43	W-3577A	Tube Shield Base
18Z-Y	MAC-15	Dial Assembly (Complete)	W	W-5772	Tube Shield Hat
19	W-4084	Drive Unit—Dial	W	346BL9	Core Assembly J.D.-687
20	W-4084	Dial (Sub-assembly)	44	40275	Field Coil
21	W-4084	Dial Vern. Induc. Assembly		42878	Output Trans.
22	W-4084	Drive Unit		42519	Band Selector Switch
23	W-4084	Drive Unit—Dial		42522	Line Switch
24	W-4084	Dial Vern. Induc. Assembly		42522	Line Switch
25	W-4084	Drive Unit		42522	Line Switch
26	W-4084	Drive Unit		42522	Line Switch
27	W-4084	Drive Unit		42522	Line Switch
28	W-4084	Drive Unit		42522	Line Switch
29	W-4084	Drive Unit		42522	Line Switch
30	W-4084	Drive Unit		42522	Line Switch
31	W-4084	Drive Unit		42522	Line Switch
32	W-4084	Drive Unit		42522	Line Switch
33	W-4084	Drive Unit		42522	Line Switch
34	W-4084	Drive Unit		42522	Line Switch
35	W-4084	Drive Unit		42522	Line Switch
36	W-4084	Drive Unit		42522	Line Switch
37	W-4084	Drive Unit		42522	Line Switch
38	W-4084	Drive Unit		42522	Line Switch
39	W-4084	Drive Unit		42522	Line Switch
40	W-4084	Drive Unit		42522	Line Switch
41	W-4084	Drive Unit		42522	Line Switch
42	W-4084	Drive Unit		42522	Line Switch
43	W-4084	Drive Unit		42522	Line Switch
44	W-4084	Drive Unit		42522	Line Switch
45	W-4084	Drive Unit		42522	Line Switch

CROSLLEY RADIO CORP.

MODEL 716
Schematic, Socket
Voltage

September, 1936 SALES MODELS 744 and 745

CHASSIS 716



Tube	Where Used	H	P	P2	S	G	K	Co
6C5	Rectifier	5.0	—	—	—	—	—	—
6A8	Oscillator	6.3	165	—	—	—	—	—
6K7	Modulator	6.3	270	—	120	0	0	—
6H6	I. F. Amp.	6.3	270	—	120	0	0	—
6F5	Diode Detector	6.3	—	—	—	—	—	—
6N6	A. F. Amp.	6.3	170	—	—	—	—	—
524MG	Output	6.3	270	255	—	—	—	—
	Rectifier	5.0	—	—	—	—	—	—

Power Consumption Approximately 80 Watts at 117.5 Volts.
Power Output Approximately 6 Watts.
Voltage Drop Across Speaker Field Approximately 60 Volts.

SPECIFICATIONS

The Crosley Radio Model 716 is a seven-tube superheterodyne receiver designed to operate on an ALTER-

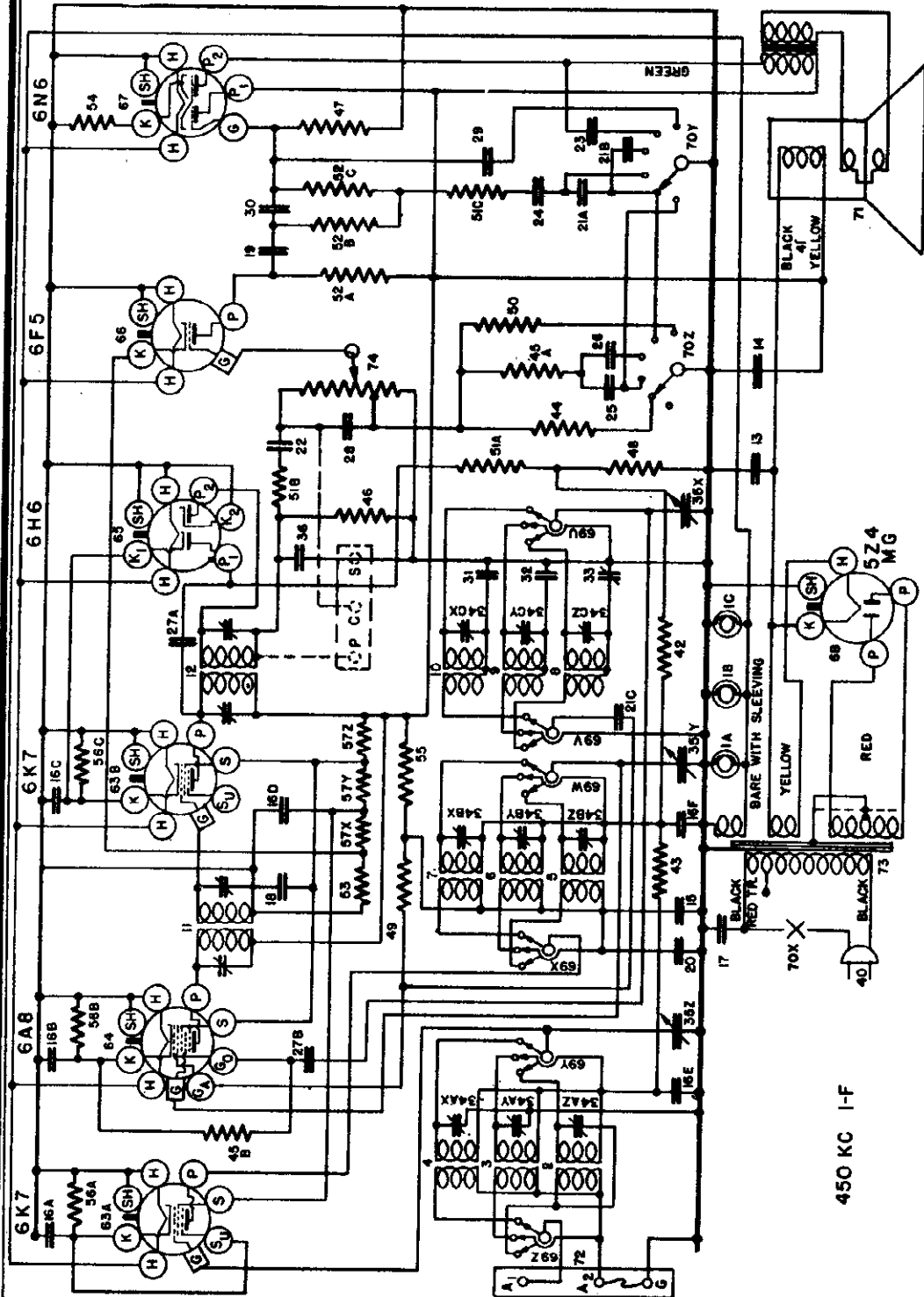
NATING CURRENT power supply.

It is a three band receiver and the dial is divided into three sections as follows:

- BLUE 540-1800 Kilocycles (American Broadcast Band)
- RED 1.8- 6.0 Megacycles (Police and Amateurs)
- GREEN 6.0-18.0 Megacycles (High Frequency Bands)

CROSLLEY RADIO CORP.

MODEL 726
Schematic, Voltage



Sept. 1936 SALES MODEL 769 CHASSIS MODEL 726

SPECIFICATIONS
The Crosley Radio Model 726 is a seven tube super-heterodyne receiver designed to operate on an ALTER-NATING CURRENT power supply. It is available with either 110 V., 60 Cy., or 110 V., 25 Cy., Transformers. It is a three band receiver and the dial is divided into three sections as follows:

- BLUE 540-1800 Kilocycles (American Broadcast Band)
- RED 1.8- 6.0 Megacycles (Police and Amateurs)
- GREEN 6.0-18.0 Megacycles (High Frequency Band)

TUBE SOCKET VOLTAGE READINGS

Tube	Where Used	H	P	P ₂	S	G	S _u	K	G _a
6K7	R. F. Amplifier	6.3	235	—	73	0	3.0	3.0	—
6A8	Osc.-Mod.	6.3	270	—	96	0	—	—	—
6K7	I. F. Amplifier	6.3	270	—	96	0	2.7	3.5	145
6H6	Det. & AVC	6.3	0	—	—	—	—	2.7	—
6F5	A. F. Amplifier	6.3	135	—	—	0	—	0	—
6N6	Output	6.3	270	260	—	0	—	2.5	—
5Z4MG	Rectifier	5.0	—	—	—	—	—	2.2	—
								350	—

Power Output Approximately 6 Watts.
Power Consumption Approximately 83 Watts at 117.5 Volts.
Voltage Drop Across Speaker Field 77 Volts

MODEL 726
Socket, Trimmers
Chassis, Alignment
Parts

CROSLEY RADIO CORP.

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits may be properly aligned with the use of a modulated signal generator and an output meter.

CONNECTING OUTPUT METER

Connect the output meter to the two plates of the 6N6 Output Tube. Be sure the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier to 450 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 6A8 tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the "GND" terminal of the receiver. **KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.**

(b) Set the station selector so that the tuning condenser plates are completely out of mesh. Turn the volume control knob to the right (ON) and turn the fidelity control knob to the left (NORMAL).

(c) Turn the band selector switch to the High Frequency Band.

(d) Set the signal generator to 450 kilocycles.

(e) Adjust both trimmers located on top of the 2nd I-F transformer for maximum output.

(f) Adjust both trimmers located on top of the 1st I-F Transformer for maximum output.

(g) Check operations (e) and (f) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

Aligning E-F Amplifier.

When aligning the R-F Amplifier the output lead of the signal generator is connected to the "ANT" terminal of the receiver. For the BLUE and RED bands a .00025 mfd. condenser must be connected in series with the output lead of the signal generator and for the high-frequency band a 400 ohm carbon resistor should be used in place of the condenser.

Each band should first be shunt aligned and then series aligned, where provision is made for series alignment (BLUE band). The band selector switch should be set for the band being aligned and the station selector and signal generator should be set to the frequency indicated (c) for each adjustment.

(a) Adjust the "OSC," "ANT" and "R-F" shunt trimmers in the order given for maximum output. Readjust the station selector slightly so that the generator signal is tuned-in with maximum output and then check the adjustments of the "ANT" and "R-F" trimmers. **DO NOT READJUST THE "OSC" TRIMMER.**

NOTE: When shunt aligning the RED and GREEN bands care must be exercised so that the circuits will be aligned on the correct frequency rather than on the image frequency which is approximately 900 kilocycles less than the fundamental. To check on this, increase the output of the signal generator ten times, or more, and try to tune-in the signal both at the generator frequency as indicated on the station selector dial and at approximately 900 kilocycles less than the correct frequency. If the circuits have been properly aligned the signal can be tuned-in at both positions but much stronger at the correct position.

(b) To align the series trimmer (Item 33, Fig. 2) set the signal generator to the frequency indicated (c) and then tune-in this signal with the station selector for maximum output. To obtain the best adjustment for the series trimmer it will be necessary to rotate the station selector back and forth slightly while adjusting the trimmer for maximum output.

(c) Signal Input Frequencies:

Shunt Alignment Series Alignment	50
American Broadcast Band (BLUE) 1700 Kilocycles	51A
Police Band (RED) 6000 Kilocycles	51B
High-Frequency Band (GREEN) 18000 Kilocycles	51C

PARTS LIST

Item No.	Part No.	Description
IABC	W -37922	Dial Light
2	G3 -37956	Socket Assy. Dial Light
3	G10 -32000	Coil Ant. 540-1800 Kc.
4	G11 -32000	Coil Ant. 1800-6000 Kc.
5	G112 -32000	Coil Ant. 6-18 Mc.
6	G76 -32001	Coil R. F. 540-1800 Kc.
7	G80 -32001	Coil R. F. 1800-6000 Kc.
8	G80 -32001	Coil R. F. 6-18 Mc.
9	G115 -32002	Coil Osc. 500-1800 Kc.
10	G121 -32002	Coil Osc. 1800-6000 Kc.
11	G121 -32002	Coil Osc. 6-18 Mc.
12	G120 -32004	Int. I-F Assy.
13	W -36055	2nd. I-F Assy.
14	W -36057	Condenser, 32Mf. 400V.
15	W -41081	Condenser, 40Mf. 300V.
16A	W -36541	Condenser, 16Mf. 250V.
17	W -30805	Condenser, 02Mf. 160V.
18	W -35936	Condenser, 01Mf. 400V.
19	W -32780B	Condenser, 05Mf. 200V.
20	W -32778	Condenser, 01Mf. 400V.
21A	W -35139	Condenser, 004Mf. 400V.
21B	W -35139	Condenser, 004Mf. 400V.
21C	W -35139	Condenser, 004Mf. 400V.
22	W -28221	Condenser, 0005Mf. 600V.
23	W -23615	Condenser, 0005Mf. 600V.
24	W -30323	Condenser, 01Mf. 400V.
25	W -28619	Condenser, 0005Mf. 600V.
26	W -26126	Condenser, 0005Mf. 600V.
27A	G2 -34002	Condenser, 0001Mf. (Mica)
27B	G6 -34002	Condenser, 0001Mf. (Mica)
28	G6 -34002	Condenser, 0005Mf. (Mica)
29	G6 -34002	Condenser, 000025Mf. (Mica)
30	G20 -34000	Condenser, 4910Mmf. (Mica)
31	G7 -34000	Condenser, 1460Mmf. (Mica)
32	-40769	Condenser, B. C. Osc. Series Trim.
33	S-35851	Condenser, 3 Section Trimmer
34	W -33002	Condenser, 3 Gang Var. Tuning
35	MG33 -42255	Dial Drive Assy.
C	-42491	Dial Glass (Calibrated)
	-42300	Drive Unit
	-42597	Dial Mask (Cardboard)
W	-42180	Dial Hand, Pointer
	-41144	Dial Hand, Time Log
	40486	Portler Mtg. Screws
W	-34002	Condenser, 00025 Mf. (Mica)
W	-30270	Condenser, .001 Mf. 400V.
W	-33906A	Power Cord & Plug
B	G3	35695
	-37345	Resistor, Mfg. Ohm. 1/4 W.
	-35600	Resistor, 100,000 Ohm. 1/4 W.
	-36519	Resistor, 75,000 Ohm. 1/4 W.
	-36528	Resistor, 60,000 Ohm. 1/4 W.
	-36528	Resistor, 60,000 Ohm. 1/4 W.
	-36321	Resistor, 400,000 Ohm. 1/4 W.
	-36622	Resistor, 750,000 Ohm. 1/4 W.
	-36322	Resistor, 20,000 Ohm. 1/4 W.
	-35929	Resistor, 150,000 Ohm. 1/4 W.
	-35601	Resistor, 300,000 Ohm. 1/4 W.
	-35601	Resistor, 300,000 Ohm. 1/4 W.
	-35601	Resistor, 300,000 Ohm. 1/4 W.
	-35930	Resistor, 200,000 Ohm. 1/4 W.
	-35930	Resistor, 200,000 Ohm. 1/4 W.
	-35930	Resistor, 200,000 Ohm. 1/4 W.
W	-30127	Resistor, 450 Ohm. 1/4 W. Flex.
W	-23012A	Resistor, 40 Ohm. 1/4 W. Flex.
	-6705	Resistor, 3500 Ohm. 1/4 W.
W	-28589	Resistor, 350 Ohm. 1/4 W. Flex.
W	-28589	Resistor, 350 Ohm. 1/4 W. Flex.
W	-28589	Resistor, 350 Ohm. 1/4 W. Flex.
W	-37781	Resistor, 18,500 Ohm. Cand. Ohm.
G151	36400	Socket Type 6K7
G151	36400	Socket Type 6K7
G156	36400	Socket Type 6A8
G155	36400	Socket Type 6F6
G158	36400	Socket Type 6F5
G165	36400	Socket Type 6N6
G164	36400	Socket Type 5Z4
C	-40810A	Band Selector Switch
B	-4237C	Fidelity Switch
	-645C13	Speaker "M" Spec. 1D640
	-42983	Cone Assy. For Above
	40406	Field Coil Speaker
	-42985	Output Trans.
G27	-28719	Ant. & Grid Terminal Assy.
	-42260	Power Trans. 60 Cy. 110 V.
	-42261	Power Trans. 25 Cy. 110 V.
	-42501	Volume Control 3 Mfg.
		Misc. Parts
C	-42045	Eucutcheon Rubber
	-42043	Eucutcheon Rubber
	30	Screws—Eucutcheon Mtg.
	-42044	Lens—Eucutcheon
	-40230B	Emblem
	-36520	Nut—Emblem Mtg.
	-36117	Rubber Mtg. Foot
	-37339	Knob, (2 Req.)
	-40192B	Knob, B. S. Sw. (1 Req.)
	-42490	Knob, F. S. (1 Req.)
	6-NC	Cabinet

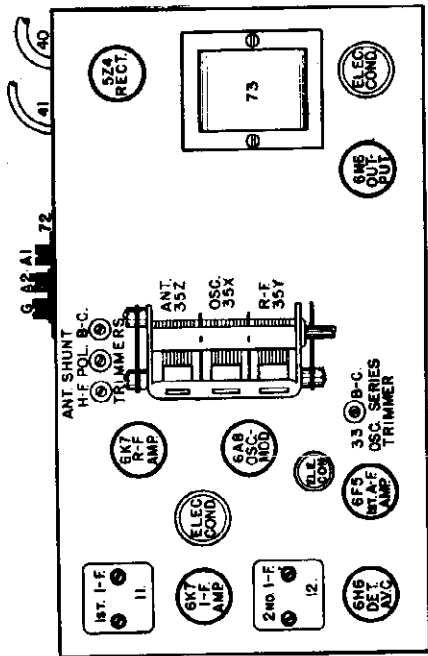


Fig. 2 Top View 726

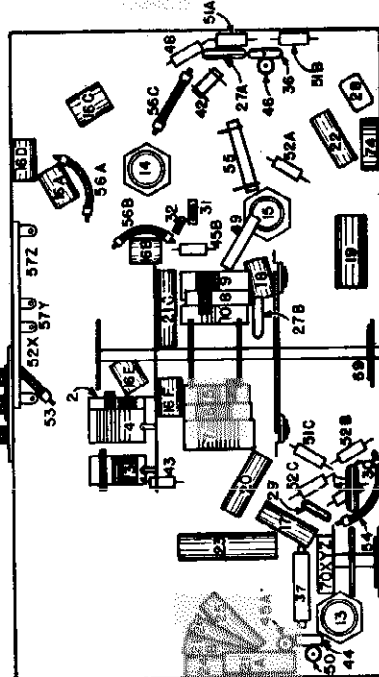


Fig. 3 Bottom View 726

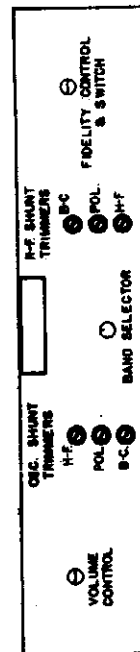
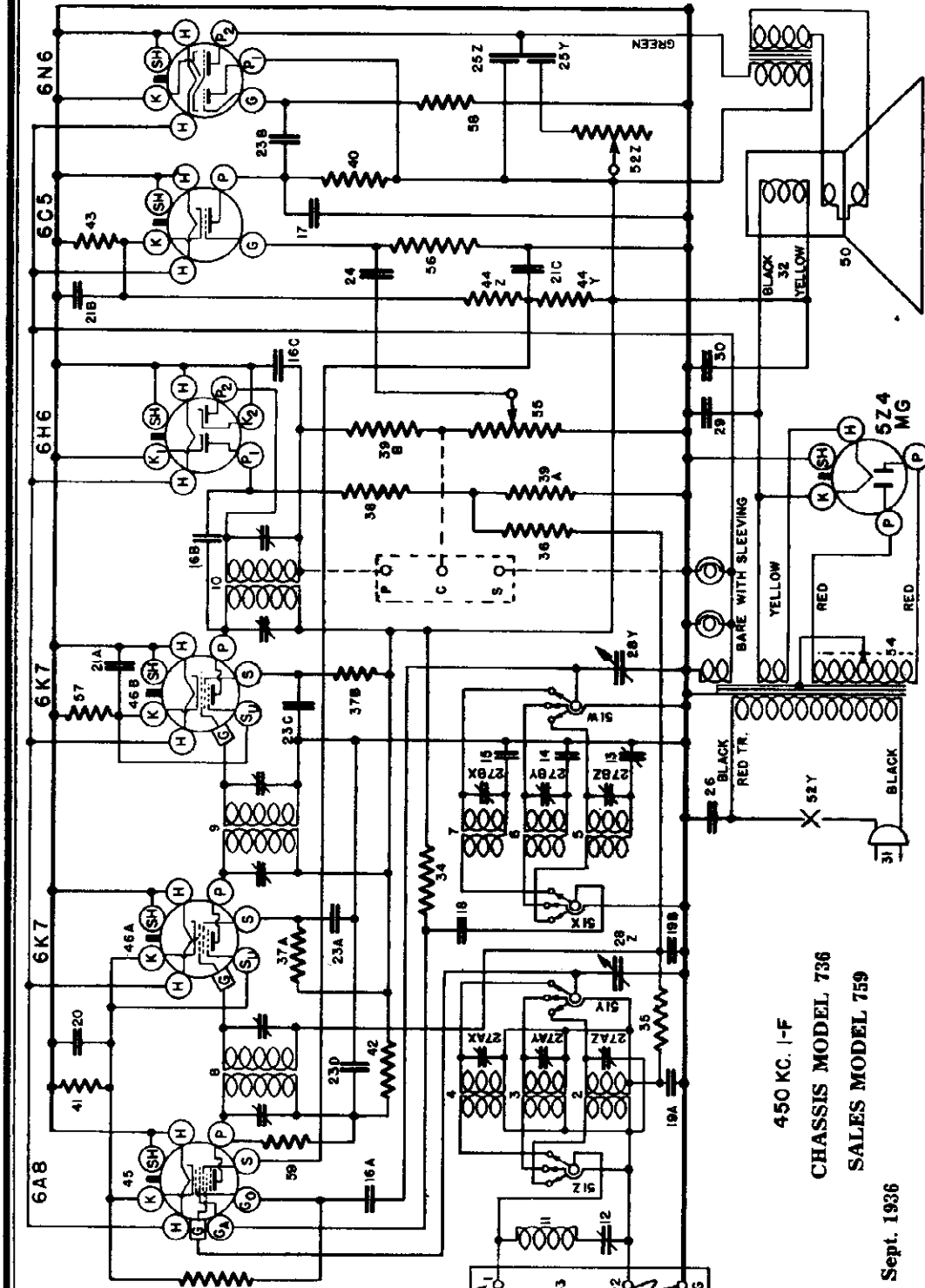


Fig. 4 Front View 726

CROSLY RADIO CORP.

MODEL 736
Schematic, Voltage



nals between the frequencies of approximately 440 and 480 Kilocycles may be reduced so that they are not objectionable if not entirely eliminated from over riding station being received.
It is a three band receiver and the dial is divided into three sections as follows:
(American Broadcast Band)
(Police and Amateurs)
(High Frequency Band)

SPECIFICATIONS

The Crosley Receiver Model 736 is a seven tube superheterodyne radio designed to operate on an ALTERNATING CURRENT power supply. It incorporates a WAVE-TRAP in its construction so that interfering signals between the frequencies of approximately 440 and 480 Kilocycles may be reduced so that they are not objectionable if not entirely eliminated from over riding station being received.

- BLUE 540-1800 Kilocycles (American Broadcast Band)
- RED 1.8- 6.0 Megacycles (Police and Amateurs)
- GREEN 6.0- 18.0 Megacycles (High Frequency Band)

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	K	S	Co	Ca
6A8	Osc. Mod.	6.3					
6K7	1st. I. F. Amp.	6.3	280	3.2	130	-5 to -30	160
6K7	2nd. I. F. Amp.	6.3	280	3.2	110		
6H6	Det. & AVC	6.3	280	8.0	130		
6C5	1st. A. F. Amp.	6.3	155	6.5			
6N6	Output	6.3	220				
5Z4	Rectifier	5.0		330	P ₂ 280		

Power Output Approximately 6 Watts.
Power Consumption Approximately 80 Watts at 117.5 Volts
Voltage Drop Across Speaker Field Approximately 50 Volts.

MODEL 736

Socket, Trimmers
Alignment, Chassis
Parts

CROSLEY RADIO CORP.

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits can best be properly aligned with the use of a modulated signal generator and an output meter.

CONNECTING OUTPUT METER

Connect the output meter to the two plates of the 6N6 Output Tube. Be sure the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger - not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier to 450 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 6AB tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the "GND" terminal of the receiver. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the tuning condenser plates are completely out of mesh. Turn the volume control knob to the right (ON) and turn the tone control knob to the left (TREBLE).

(c) Turn the band selector switch to the High Frequency Band.

(d) Set the signal generator to 450 kilocycles. (e) Adjust both trimmers located on top of the 3rd I-F Transformer for maximum output.

(f) Adjust both trimmers located on top of the 2nd I-F Transformer for maximum output.

(g) Adjust both trimmers located on top of the 1st I-F Transformer for maximum output.

(h) Check operations (e), (f) and (g) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

Aligning R-F Amplifier.

When aligning the R-F Amplifier the output lead of the signal generator is connected to the "ANT" terminal of the receiver. For the BLUE and RED bands a .0002 mfd. condenser must be connected in series with the output lead of the signal generator and for the high-frequency band a 400 ohm carbon resistor should be used in place of the condenser.

Each band should first be shunt aligned and then series aligned, where provision is made for series alignment (BLUE band). The band selector switch should be set for the band being aligned and the station selector and signal generator should be set to the frequency indicated (c) for each adjustment.

(a) Adjust the "OSC" and "ANT" shunt trimmers in the order given for maximum output. Readjust the station selector slightly so that the generator signal is tuned-in with maximum output and then check the adjustments of the "ANT" trimmers. DO NOT READJUST the "OSC" TRIMMER.

NOTE: When shunt aligning the RED and GREEN bands care must be exercised so that the circuits will be aligned on the correct frequency rather than on the im-

age frequency which is approximately 900 kilocycles less than the fundamental. To check on this, increase the output of the signal generator ten times, or more, and try to tune-in the signal both at the generator frequency as indicated on the station selector dial and at approximately 900 kilocycles less than the correct frequency. If the circuits have been properly aligned the signal can be tuned-in at both positions but much stronger at the correct position.

(b) To align the series trimmer (Item 13, Fig. 2) set the signal generator to the frequency indicated (c) and then tune-in this signal with the station selector for maximum output. To obtain the best adjustment for the series trimmer it will be necessary to rotate the station selector back and forth slightly while adjusting the trimmer for maximum output.

Signal Input Frequencies:

Band	Shunt Alignment	Series Alignment
American Broadcast Band (BLUE)	1700 Kilocycles	800 Kilocycles
Police Band (RED)	6000 Kilocycles	6000 Kilocycles
High-Frequency Band (GREEN)	18000 Kilocycles	18000 Kilocycles

TO ADJUST WAVE TRAP

Connect the output of the signal generator through an .02 mfd. condenser to the ANT. terminal on the chassis and the other lead to GND. terminal.

(a) Adjust signal generator to frequency of interfering signal.

(b) Set station selector to approximately 650 Kilocycles with the band selector in the Broadcast position.

(c) Adjust Wave Trap trimmer (Item 12, Fig. 2) to minimum signal.

For simple adjustment tune-in station with maximum interference and adjust Wave Trap Trimmer for minimum interference.

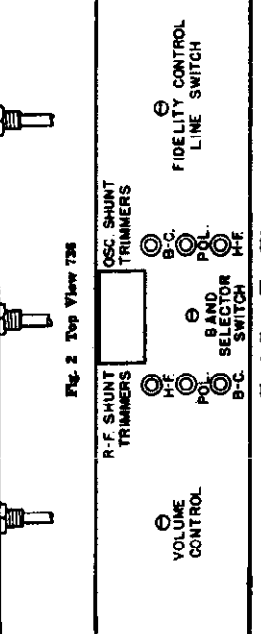
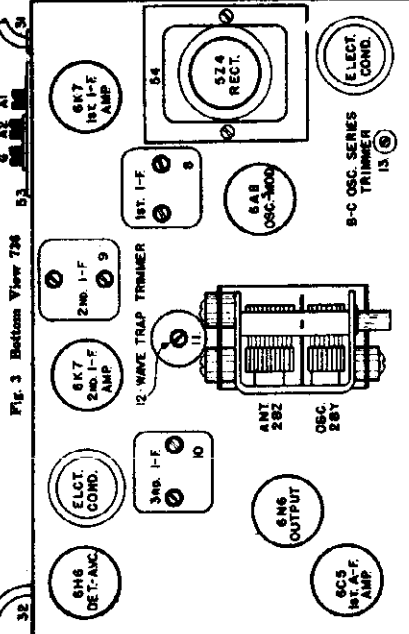
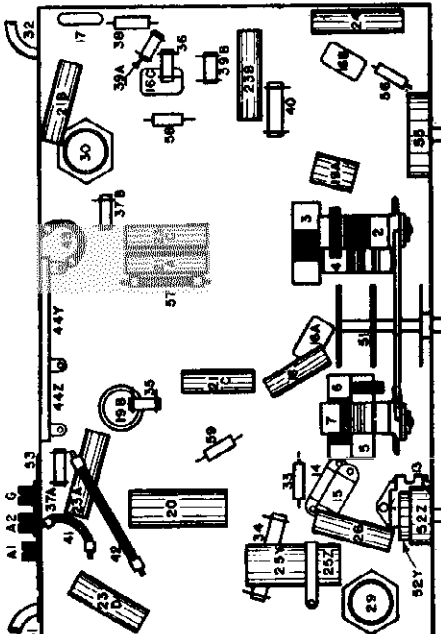
16A
16B
16C
17
18
19A
19B
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21A
21B
21C
22A
22B
22C
23D
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25
26
27A
27B
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36
37A
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38A
39B
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46A
46B
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PARTS LIST

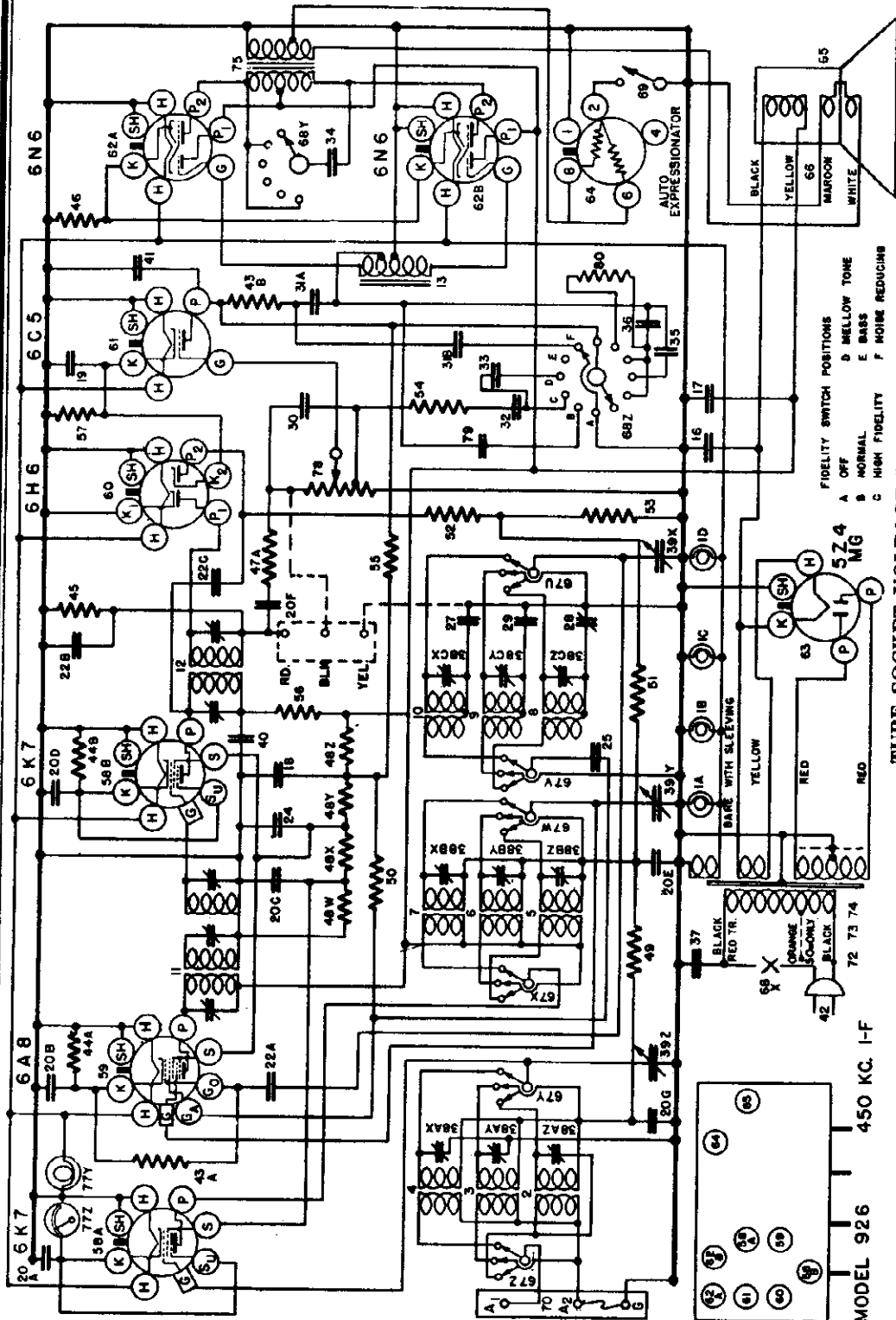
Item No.	Part No.	Name Value
1AB	W-37992	Bulb, Dial Light 6-8V.
	G3-37966	Socket Assy. Dial Light
2	G110-32000	Coil, Ant. 540-1800 Kc.
3	G111-32000	Coil, Ant. 1800-6000 Kc.
4	G112-32000	Coil, Ant. 6000-18000 Kc.
5	G113-32002	Coil, Osc. 540-1800 Kc.
6	G114-32002	Coil, Osc. 1800-6000 Kc.
7	G115-32002	Coil, Osc. 6000-18000 Kc.
8	G120-32001	Coil, Assy. 1st. I-F 450 Kc.
9	G124-32001	Coil, Assy. 2nd. I-F 450 Kc.
10	G101-32004	Coil, Assy. 3rd. I-F 150 Kc.
11	W-32476	Coil, Assy. Wave Trap
12	LW-37235A	Coil, Only Wave Trap
13	W-37232	Condenser, Wave Trap Trimmer
G5	W-31927	Shield, Assy. Wave Trap
	W-40768	Condenser, 400 to 500 Mmf., B. C. Osc. Series Trimmer
14	C7-34007	Condenser, 1750 Mmf., Pol. Osc. Series, Fixed
15	G8-34007	Condenser, 4350 Mmf., H. F. Osc. Series, Fixed

G2-34002	Condenser, .001 Mf. Molded
G2-34002	Condenser, .001 Mf. Molded
G2-34002	Condenser, .001 Mf. Molded
G1-34002	Condenser, .0025 Mf. Molded
W-35133	Condenser, 60 Mf. 400 V. Tub.
W-36936	Condenser, 65 Mf. 200 V. Tub.
W-36936	Condenser, 65 Mf. 200 V. Tub.
W-29910A	Condenser, 25 Mf. 200 V. Tub.
W-28621	Condenser, 62 Mf. 200 V. Tub.
W-28621	Condenser, 62 Mf. 200 V. Tub.
W-28621	Condenser, 62 Mf. 200 V. Tub.
W-30488	Condenser, 62 Mf. 400 V. Tub.
W-30188	Condenser, 62 Mf. 400 V. Tub.
W-30188	Condenser, 62 Mf. 400 V. Tub.
W-30488	Condenser, 62 Mf. 400 V. Tub.
W-35758	Condenser, 68 Mf. 400 V. Tub.
W-31052	Condenser, 65 Mf. 400 V. Tub.
W-30905	Condenser, 61 Mf. 400 V. Tub.
W-32551	Condenser, Sect. Trimmer, Ant. Shunt
W-36941	Condenser, Sect. Trimmer, Osc. Shunt
G21-33001	Condenser, 2 Sect. Gans.
MG27-42330	Dial Drive Assy.
C-42120	Dial Glass (Calibrated)
W-41844	Drive Nut
W-42684	Dial Hand
W-40486	Screw, Hand Mtg
W-41582	Cable, Drive
W-36935	Condenser, 35 Mf. 400 V. Elect.
W-30057	Condenser, 40 Mf. 300 V. Elect.
B-5306A	Cord & Plug, Power
G3-36996	Cable, Speaker
W-40757	Resistor, 51000 Ohm, 1/4 W.
W-20616	Resistor, 15,000 Ohm, 1/4 W.
W-21454	Resistor, 1 Megohm 1/4 W.
W-37215	Resistor, 1.5 Megohm 1/4 W.
W-21875	Resistor, 100,000 Ohm, 1/4 W.
W-21875	Resistor, 100,000 Ohm, 1/4 W.
W-21875	Resistor, 100,000 Ohm, 1/4 W.
W-36590	Resistor, 300,000 Ohm, 1/4 W.
W-21455	Resistor, 300,000 Ohm, 1/4 W.
W-21455	Resistor, 300,000 Ohm, 1/4 W.
W-37768	Resistor, 500 Ohm, 1/4 W.
W-21964	Resistor, 165 Ohm, 1/2 W. Flex.
W-23013	Resistor, 200 Ohm, 1 W. Flex.
W-22514	Resistor, 750 Ohm, 1/4 W. Flex.
W-442	Resistor, 10000 Ohm
W-32201	Resistor, 15000 Ohm
G156-36400	Socket Type, 6A5
G151-36400	Socket Type, 6K7
G151-36400	Socket Type, 6K7
G156-36400	Socket Type, 6H6
G157-36400	Socket Type, 6L6
G155-36400	Socket Type, 6N6
W-632CJ3	Speaker, "M" Spec. 1-D-410
W-42879	One Assy. For Above Spk.
W-42880	Fund. Coil, For Above Spk.
W-42881	Output Trans., For Above Spk.
W-40770A	Switch, Band Selector
W-37908	Tone Control, 100,000 Ohm. Line Switch
G27-26719	Terminal Board, Ant. & Gnd.
W-41978A	Transformer, Power 110 V. 60 Cy.
W-37957	Volume Control, 1 Megohm.
W-36966	Resistor, 3 Megohm, 1/4 W.
W-28106	Resistor, 500 Ohm, 1/4 W. Flex.
W-36922	Resistor, 500,000 Ohm, 1/4 W.
W-35928	Resistor, 60,000 Ohm, 1/4 W.
W-42406	Erection Ring Assy.
W-41890	Dial Lens
W-41881	Lens Retaining Ring
W-35710	Screws, (2 Req.), Erection Mtg.
W-37339	Knob, (3 Req.)
W-40192B	Knob, (1 Req.)
W-36117	Foot, (4 Req.) Rubber Mtg. Cabinet
W-6-T	Cabinet



CROSLLEY RADIO CORP.

MODEL 926
Schematic, Socket
Voltage



SPECIFICATIONS

The Crosley Model 926 radio is a nine-tube superheterodyne receiver and uses metal tubes, except the Auto Expressionator tube which is always glass and the

BLUE
RED
GREEN

540-1800 Kc. or 555-170 Meters (Standard American Broadcast)
1.8- 6.0 Mc. or 158- 50 Meters (Police and Amateurs)
6.0- 18.0 Mc. or 50- 17 Meters (High Frequency)

5Z4 rectifier which should always be the MG type. Chassis are available either with a standard 110 Volt—60 Cycle, or 110 Volt—25 Cycle Power Transformer. The tuning range of the receiver is from 540 to 18100 Kilocycles and is divided into three bands as follows:

FIDELITY SWITCH POSITIONS
A OFF
B MELLOW TONE
C NORMAL
D HIGH FIDELITY
E BASS
F NOISE REDUCING

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	P ₁	P ₂	S	Su	C	K	Ga	Go
6K7	R-F Amplifier	6.3	228	—	—	90	4.0	—	4.0	—	—
6A8	Osc.-Modulator	6.3	250	—	—	120	—	—	5.0	Var.	150
6K6	I-F Amplifier	6.3	235	—	—	120	4.0	—	4.0	—	—
6C5	Det. & A. V. C.	6.3	—	—	—	—	—	—	4.0	—	—
6G6	1st A-F Amp.	6.3	120	—	—	—	—	—	12.0	—	—
6N6	(2) Output	6.3	250	—	—	—	—	—	4.0	—	—
5Z4	Rectifier	5.0	—	—	—	—	—	—	4.0	—	—
W-41187	Expressionator—Variable.	—	—	—	—	—	—	—	—	—	—

Power consumption approximately 115 watts.
All readings taken on 117.5 line voltage.

CHASSIS MODEL 926

SALES MODEL 989

Sept. 1936

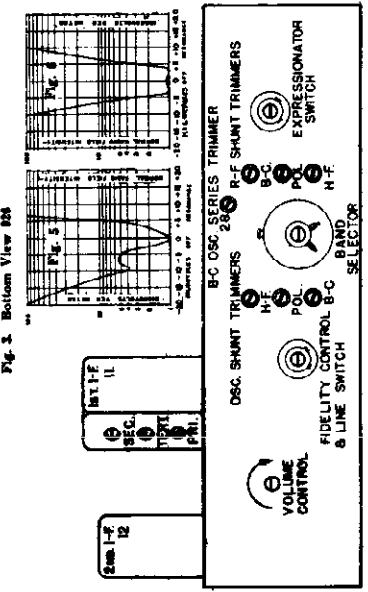
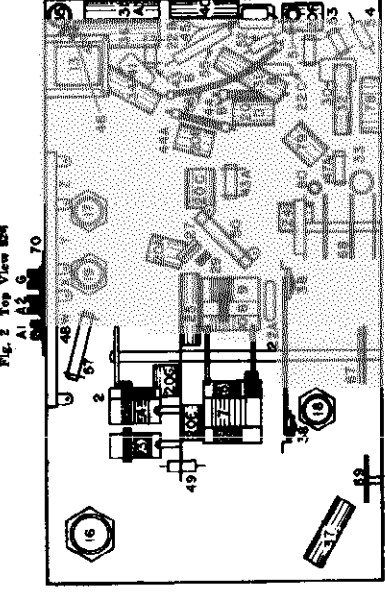
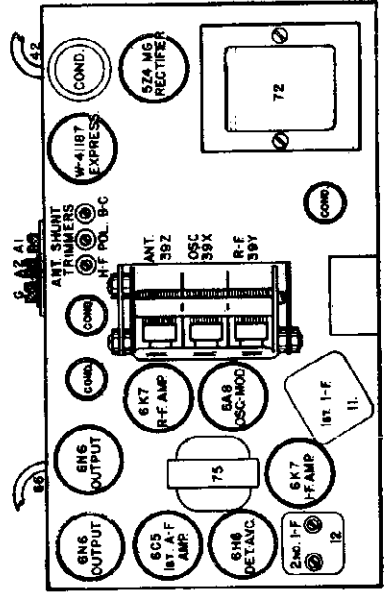
MODEL 926
Socket, Trimmers
Alignment, Parts

CROSLLEY RADIO CORP.

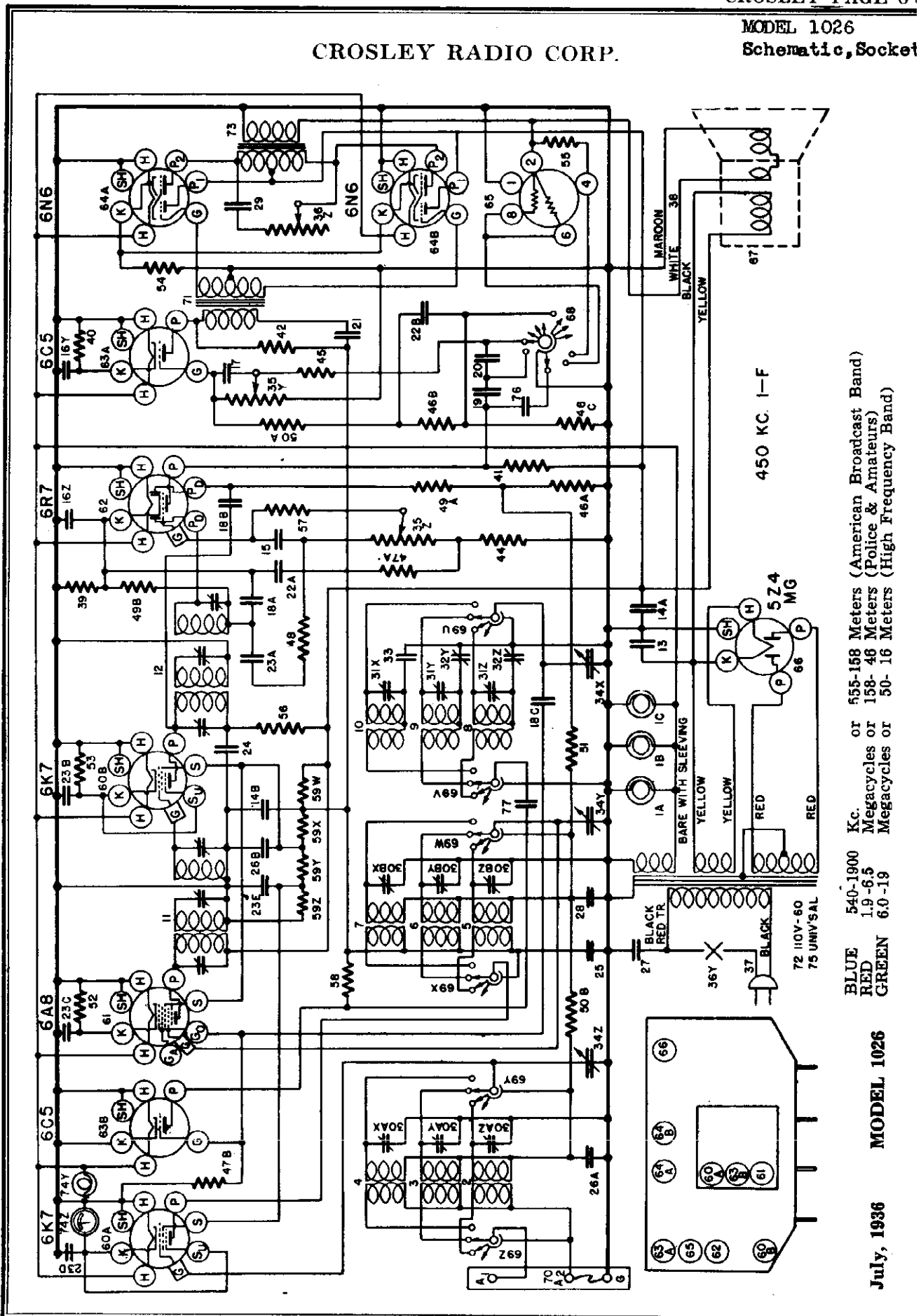
Table with columns: Item No., Part No., Description. Lists various components like resistors, capacitors, tubes, and trimmers with their respective part numbers and descriptions.

(4) Set the signal generator to 450 Kilocycles. The headphones supplied with signal generator and oscillator... (5) Adjust the trimmer for maximum amplitude and symmetry of the selectivity curve on the resonant line (B). NOTE: Keep the signal generator output as low as possible in order to prevent AVC action in the receiver... (b) Increase the output of the signal generator and adjust the top trimmer (See the 1st. I.F. transformer for maximum symmetry and amplitude.)

ALIGNMENT PROCEDURE This is a High Fidelity receiver and in order to obtain maximum performance the alignment of its circuits should be done with precision instruments. TUNING I.F. Amplifier to 450 Kilocycles. The I.F. amplifier employs one triple-tuned and one double-tuned I.F. transformer... (1) Connect one terminal of the output meter to P2 of one of the 6K7 tubes and the other terminal through the 6K7 tube to the 6K7 terminal of the 6K7 tube... (12) Set the band selector switch to the Broadcast Band and rotate the station selector to approximately 60 on the dial.



CROSLEY RADIO CORP.



450 KC. I-F

524 MG

5Z4 MG

72 110V-60
75 UNIV'SAL

BLUE 540-1900 Kc.
RED 1.9-6.5 Megacycles or 158-48 Meters (Police & Amateurs)
GREEN 6.0-19 Megacycles or 50-16 Meters (High Frequency Band)

or 555-158 Meters (American Broadcast Band)

MODEL 1026

July, 1936

MODEL 1026

Parts

CROSLLEY RADIO CORP.

SPECIFICATIONS

The Crosley Model 1026 radio is a ten-tube super-heterodyne receiver and is available either with a standard 110 volt—60 cycle power transformer or with a universal power transformer.

The tubes used are 6K7 R-F Amplifier, 6A8 Modula-

tor, 6C5 Oscillator, 6K7 I-F Amplifier, 6R7 Detector and 1st Audio Amplifier, 6C5 2nd Audio Amplifier, two 6N6 Output, 5Z4 Rectifier and the newly developed Auto-Expressionator or Volume Expander tube.

The tuning range of the receiver is from 540 to 19000 Kilocycles and is divided into three bands

PARTS LIST—MODEL 1026

Item No.	Part No.	Description	Item No.	Part No.	Description
1ABC	W —37922	Dial Light	38	G3 —37918	Speaker Cable
	G3 —37965	Dial Light Socket	39	—31093	Resistor, 2,700 Ohm ¼ W.
2	G94 —32000	Ant. Coil, B. C. B.	40	W —21452	Resistor, 1,100 Ohm ½ W. Flex.
3	G95 —32000	Ant. Coil, Pol. B.	41	—37768	Resistor, 65,000 Ohm ¼ W.
4	G113—32000	Ant. Coil, H. F. B.	42	— 5370A	Resistor, 20,000 Ohm 1 W.
5	G68 —32001	R. F. Coil, B. C. B.	43	None	
6	G80 —32001	R. F. Coil, Pol. B.	44	—21454	Resistor, 1 Megohm ¼ W.
7	G79 —32001	R. F. Coil, H. F. B.	45	—21455	Resistor, 300,000 Ohm ¼ W.
8	G101—32002	Osc. Coil, B. C. B.	46A	—23785	Resistor, 500,000 Ohm ¼ W.
9	G102—32002	Osc. Coil, Pol. B.	46B	—23785	Resistor, 500,000 Ohm ¼ W.
10	G103—32002	Osc. Coil, H. F. B.	46C	—23785	Resistor, 500,000 Ohm ¼ W.
11	G90 —32004	1st I. F. Assembly	47A	—21453	Resistor, 40,000 Ohm ¼ W.
12	G91 —32004	2nd I. F. Assembly	47B	—21453	Resistor, 40,000 Ohm ¼ W.
13	W —36055	Condenser 35 Mfd. 400 V. Electrolytic	48	—23403	Resistor, 150,000 Ohm ¼ W.
14A	W —36057	Condenser 40 Mfd. 300 V. Electrolytic	49A	—33344	Resistor, 400,000 Ohm ¼ W.
14B	W —36057	Condenser 40 Mfd. 300 V. Electrolytic	49B	—33344	Resistor, 400,000 Ohm ¼ W.
15	G8 —34002	Condenser, .00001 Mfd. (Molded)	50A	—35600	Resistor, 100,000 Ohm ¼ W.
16Z	W —37778	Condenser, 12. Mfd. 25 V. Electrolytic	50B	—35600	Resistor, 100,000 Ohm ¼ W.
16Y			51	—37245	Resistor, 1.5 Megohm ¼ W.
17	G6 —34002	Condenser, .000025 Mfd. (Molded)	52	W —28589	Resistor, 350 Ohm ½ W. Flex.
18A	G2 —34002	Condenser, .0001 Mfd. (Molded)	53	W —28106	Resistor, 500 Ohm ½ W. Flex.
18B	G2 —34002	Condenser, .0001 Mfd. (Molded)	54	W —23012A	Resistor, 40 Ohm ¼ W. Flex.
18C	G2 —34002	Condenser, .0001 Mfd. (Molded)	55	W —41193	Resistor, 1. Ohm 2½ W. Flex.
19	W —32780B	Condenser, .05 Mfd. 400 V.	56	W —23013	Resistor, 2,000 Ohm 1¼ W. Flex.
20	G3 —34002	Condenser, .0005 Mfd. (Molded)	57	—21273A	Resistor, 60,000 Ohm ¼ W.
21	W —37732	Condenser, .3 Mfd. 160 V.	58	W —37987	Resistor, 15,000 Ohm I. W. Wire Wound
22A	W —31219	Condenser, .023 Mfd. 200 V.	59	W —41225	4 Section Candohm
22B	W —31219	Condenser, .023 Mfd. 200 V.	60A	G151—36400	Socket Type 6K7
23A	W —36541	Condenser, .02 Mfd. 160 V.	60B	G151—36400	Socket Type 6K7
23A			61	G156—36400	Socket Type 6A8
to	W —36541	Condenser, .02 Mfd. 160 V.	62	G164—36400	Socket Type 6R7
23E			63A	G152—36400	Socket Type 6C5
24	W —30488	Condenser, .02 Mfd. 400 V.	63B	G152—36400	Socket Type 6C5
25	W —32378	Condenser, .01 Mfd. 400 V.	64A	G165—36400	Socket Type 6N6
26A	W —35936	Condenser, .05 Mfd. 200 V.	64B	G165—36400	Socket Type 6N6
26B	W —35936	Condenser, .05 Mfd. 200 V.	65	G167—36400	Socket Type 2C2
27	W —30805	Condenser, .01 Mfd. 400 V.	66	G154—36400	Socket Type 5Z4
28	W —32380	Condenser, .05 Mfd. 200 V.	67	—40193	Speaker, Type 633CJ4 "M"
29	W —23615	Condenser, .05 Mfd. 400 V.		—40701	Cone Assembly for 40193
30	W —37891	3 Section Shunt Trimmer Assembly		—40702	Field Coil for 40193
31	W —35951	3 Section Shunt Trimmer Assembly	68	W —41446	Switch Multivox Control
32Z			69	C —37958E	Switch Band Selector
32Y	W —37874	B. C. Osc. Series Trimmer Cond.	70	G27 —26719	Ant. & Grd. Terminal Board Assembly
33	G18 —34000	H. F. Fixed Series Condenser	71	G1 —37995	Audio Input Transformer
34	G47 —33002	3 Section Var. Tuning Cond.	72	G43 —25669	Power Supply Transformer (110V.60Cy.)
	MG54—41214	Dial Drive Complete	73	G48 —24628	Audio Output Transformer
	—41153	Drive Unit (only)	74Z		Tuning Meter
	C —41148	Dial—Calibrated Glass	74Y		Tuning Meter Bulb
	—41136	Dial Paper Mask	75	—37685A	Universal Power Transformer
	—40485	Long Hand	76	W —41445	Condenser, .036 Mfd. 400 V.
	—41145	Short Hand	77	W —34647	Condenser, .006 Mfd. 400 V.
	W —40486	Hand Mtg. Screw		C —37894	Escutcheon
	—40537	Coupling Unit		B —37876A	Escutcheon Ret. Spring
	—41157	Belt (Drive)		B —37898	Dial Lens (Escutcheon Glass)
	—40638	Indicator Cable		B —37897	Lens Retaining Spring
	—41417	Volume Control 1st A. F. 3 Meg.		W —40365	Escutcheon Felt
35Z		Volume Control 2nd A. F. 1 Meg.		W —37339	Knob (3 required)
35Y	—37966	Tone Control — 80000 OHMS		W —40192B	Knob (2 required)
36Z		A. C. Switch		W —40230A	Emblem (Crosley Shield)
36Y					
37	B —33906A	Power Cord & Plug			

CROSLY RADIO CORP.

MODEL 1026
 Socket, Trimmer
 Voltage, Chassis
 Resonance Cur
 Photo Pickup

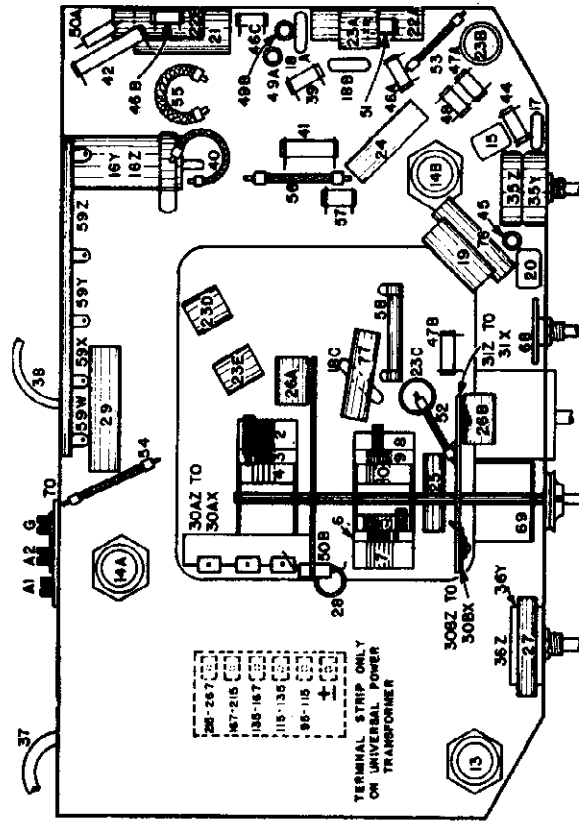


Fig. 3. Bottom View 1026

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P	F ₁	S	S ₂	G	K	G ₂
6K7	R-F Amplifier	6.3	221	—	—	—	0	4.5	—
6A8	Modulator	6.3	138	—	—	—	0	4.5	—
6C5	Oscillator	6.3	140	—	—	—	0	5	—
6K7	I-F Amplifier	6.3	260	—	—	—	0	6.5	—
6R7	Detector & 1st A-F Amplifier	6.3	130	—	—	—	0	6.5	—
6C5	2nd A-F Amplifier	6.3	150	—	—	—	0	3.2	—
6N6	(2) Output	6.3	278	—	—	—	0	—	—
5Z4	Rectifier	4.5	285	—	—	—	—	—	—
6X4	Auto-Expression Tube (W41187)	4.5	357	—	—	—	—	—	—

Power Consumption approximately 117 Watts.
 All readings taken on 117.5 volt power supply.

Varies with power output.

Voltage drop across speaker field 72 Volts.
 Power Output approximately 5 Watts.

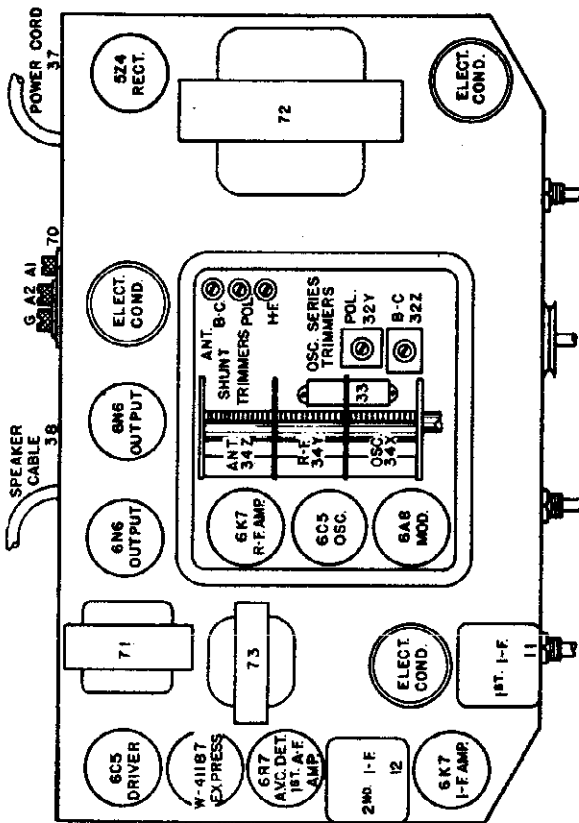


Fig. 2. Top View 1026

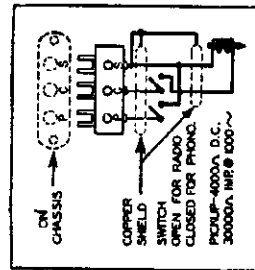


Fig. 7. Photograph Pickup

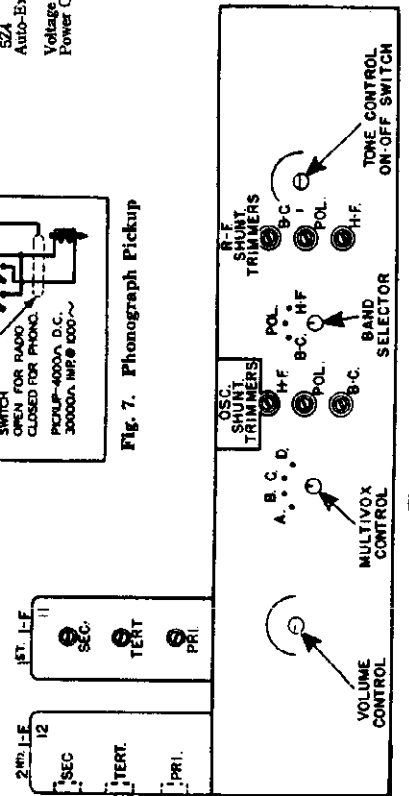


Fig. 4. Front View 1026

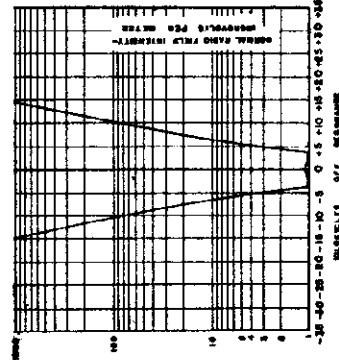


Fig. 6

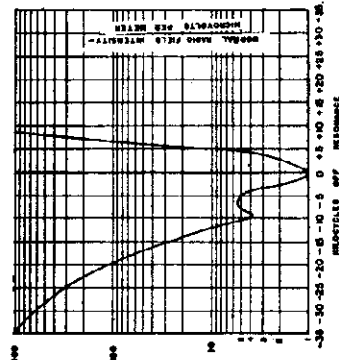


Fig. 5

MODEL 1026

Alignment Notes

CROSLLEY RADIO CORP.

UNIVERSAL POWER TRANSFORMER

The Model 1026 chassis for use on other than 110 volts -60 cycles, is supplied with a universal power transformer designed to operate on a power supply of from 95 to 267 volts and any commercial frequency of 25 cycles or above. To adapt the set to a different line voltage it is necessary to remove the chassis from the cabinet, remove the bottom from the chassis, locate the terminal strip on the bottom of the power transformer and locate the wire leading from the power switch to the terminal strip. After careful measurement of the maximum values of line voltage, unsolder the wire described above, from the lug on the terminal strip and solder it to the correct lug. The correct lug will be the one marked so as to cover or nearly cover the maximum line voltage. **THE MAXIMUM LINE VOLTAGE SHOULD NOT EXCEED THE HIGHEST VOLTAGE STAMPED ON THE TERMINAL STRIP BESIDE THE LUG TO BE USED BY MORE THAN 3%.**

AUTO-EXPRESSIONATOR

The Auto-Expressionator tube, Illustration No. 65, is connected across the voice coil of the speaker. When it is operating its resistance varies so as to increase the volume of loud tones, thus giving a wider volume range to reproduced music which tends to compensate for the electrical limitations of broadcasting equipment.

PHONOGRAPH PICKUP

Chassis equipped with a universal power transformer also have three terminals on the back for connecting a phonograph pickup. These terminals are marked P C S and the pickup is connected through a double pole-single throw switch to these terminals as shown in Fig. 7.

SOCKET VOLTAGES

The tube socket voltages are measured from the tube socket contacts to the chassis with a 1000 ohm per volt 500 volt D.-C. voltmeter (except filaments) with the receiver in operating condition and no signal input. The filament voltages should be measured with an accurate low range A.-C. voltmeter. Readings may vary plus or minus 10% of values given.

Aligning R.-F. Amplifier.

The R.-F. amplifier can best be aligned in the conventional manner, using a modulated signal generator and output meter.

When aligning the R.-F. amplifier the output lead of the signal generator is connected to the antenna terminal of the receiver. For the BLUE and RED bands a 0.0025 mfd. condenser must be connected in series with the output lead of the signal generator and for the High-Frequency Band a 400 ohm carbon resistor should be used in place of the condenser.

Each band should first be shunt aligned and then series aligned, where provision is made for series alignment (BLUE and RED bands). The band selector switch should be set for the band being aligned and the signal generator should be set to the frequency indicated for each adjustment.

(a) Adjust the "OSC.", "R.F." and "ANT." shunt trimmers in the order given for maximum output. Re-adjust the station selector slightly so that the generator signal is tuned-in with maximum output and then check the adjustments of the "R.F." and "ANT." trimmers in the order given. **DO NOT READJUST THE "OSC." TRIMMER.**

NOTE: When shunt aligning the RED and GREEN bands care must be exercised so that the circuits will be aligned on the fundamental frequency rather than on the image frequency which is approximately 900 kilocycles less than the fundamental. To check on this, increase the output of the signal generator ten times or more and try to tune-in the signal both at the generator frequency as indicated on the station selector dial and at approximately 900 kilocycles less than the correct frequency. If the circuits have been properly aligned the signal can be tuned-in at both positions but much stronger at the correct position.

(b) To align the series trimmers, 32Y and 32Z Fig. 2, set the signal generator to the frequency indicated below and then tune-in this signal with the station selector for maximum output. At the time that any series trimmer is being adjusted rotate the station selector back and forth slightly until no further improvement in output can be obtained.

(c) Signal Input Frequencies:

American Broadcast Band (BLUE)
Police Band (RED)
High-Frequency Band (GREEN)

Exact Aligned Series Aligned
(BLUE) 1700 Kc. 600 Kc.
(RED) 8000 Kc. 2600 Kc.
(GREEN) 18000 Kc.

II. Oscilloscope Method.

(a) Connect the output of the signal generator through a .02 mf. condenser to the top cap of the 6K7 I.-F. amplifier tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the receiver chassis. **KEEP THE GENERATOR OUTPUT LEAD AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.**

(b) Connect the vertical plates of the cathode ray oscilloscope to the receiver as follows: The binding post marked "GND" should be connected to the receiver chassis and the other binding post should be connected to the terminal marked "P" of the 6K7 tube. (Be sure the oscilloscope is protected from D. C. by connecting a condenser .1 to .05 mf. in series with the lead connected to the plate of the 6K7 tube).

(c) Set the band selector switch to the Broadcast Band and rotate the station selector to approximately 60 on the dial. The exact setting should be at a position where no broadcast signal will be received. Turn the volume control knob to the right (ON), turn the tone control knob to the left (TREBLE) and turn the Multivox control knob to the Auditorium Position (Third position in the clockwise direction).

(d) Set the signal generator to 450 kilocycles. See instructions supplied with signal generator and oscilloscope.

(e) Close the middle trimmer condenser of the 2nd. I.-F. transformer (Tert. Fig. 4) so that it is moderately tight. (Do not force adjustment screw).

(f) Adjust the top trimmer (Sec) of the 2nd. I.-F. transformer so that the nose of the selectivity curve is centered on the resonance axis (R) of the transparent scale supplied with the oscilloscope.

(g) Adjust the bottom trimmer (Pri) of the 2nd. I.-F. transformer for maximum amplitude of the selectivity curve on resonance line (R).

(h) Reduce the output of the signal generator and adjust the middle trimmer of the 2nd. I.-F. transformer for maximum amplitude and symmetry of the selectivity curve about the resonance line.

NOTE: Keep the base of the selectivity curve centered on the transparent scale from -15 to +15 and keep the signal generator output as low as possible in order to prevent AVC action in the receiver.

(i) Readjust the bottom trimmer of the 2nd. I.-F. transformer for maximum symmetry and amplitude.

(j) Transfer the output lead of the signal generator from the 6K7 tube to the top cap of the 6A8 Modulator tube, leaving the tube's grid clip in place.

(k) Open the middle trimmer of the 1st. I.-F. transformer three or four turns from the closed position. (Care should be taken that the adjustment screw does not become dislodged from the nut).

(l) Increase the output of the signal generator and adjust the top trimmer (Sec) of the 1st. I.-F. transformer for maximum symmetry and amplitude.

(m) Adjust the bottom trimmer of the 1st. I.-F. transformer for maximum amplitude.

(n) Reduce the output of the signal generator and adjust the middle trimmer of the 1st. I.-F. transformer for maximum symmetry and amplitude.

(o) Carefully repeat operations (h), (i) and (n) for more accurate adjustment.

ALIGNMENT PROCEDURE

This is a High Fidelity receiver and in order to secure maximum performance the alignment of its circuits should be done with precision instruments.

Tuning I.-F. Amplifier to 450 Kilocycles

The I.-F. amplifier employs two triple-tuned I.-F. transformers and under no condition should their trimmer condensers be readjusted just to determine if they are properly tuned. Fig. 5 shows the selectivity curve of a receiver whose I.-F. amplifier was slightly mis-tuned while Fig. 6 shows a curve made from actual measurements of a receiver which was properly aligned with the use of an oscilloscope.

I. Conventional Method--

(a) Connect one terminal of the output meter to P2 of one of the 6N6 Output tubes and the other terminal through a .1 mf. or larger, condenser--not electrolytic--to P2 of the other 6N6 Output tube.

(b) Connect the output of the signal generator through a .02 mf. condenser to the top cap of the 6K7 I.-F. Amplifier tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the "GND" terminal of the receiver chassis. **KEEP THE GENERATOR OUTPUT LEAD AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.**

(c) Set the band selector switch to the Broadcast Band and rotate the station selector to approximately 60 on the dial. Turn the volume control knob to the right (ON), turn the tone control knob to the left (TREBLE) and turn the Multivox control knob to the Auditorium Position (Third position in the clockwise direction).

(d) Set the signal generator to 450 kilocycles.

(e) Close the middle trimmer condenser on the 2nd. I.-F. transformer (Tert. Fig. 4) so that it is moderately tight. (Do not force the adjustment screw).

(f) Adjust the top trimmer and then the bottom trimmer (Sec. & Pri) of the 2nd. I.-F. transformer for maximum output. **ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.**

(g) Transfer the output lead of the signal generator from the 6K7 tube to the top cap of the 6A8 Modulator tube, leaving the tube's grid clip in place.

(h) Open the middle trimmer of the 1st. I.-F. transformer three or four turns from the closed position. (Care should be taken that the adjustment screw does not become dislodged from the nut).

(i) Adjust the top trimmer and then the bottom trimmer of the 1st. I.-F. transformer for maximum output.

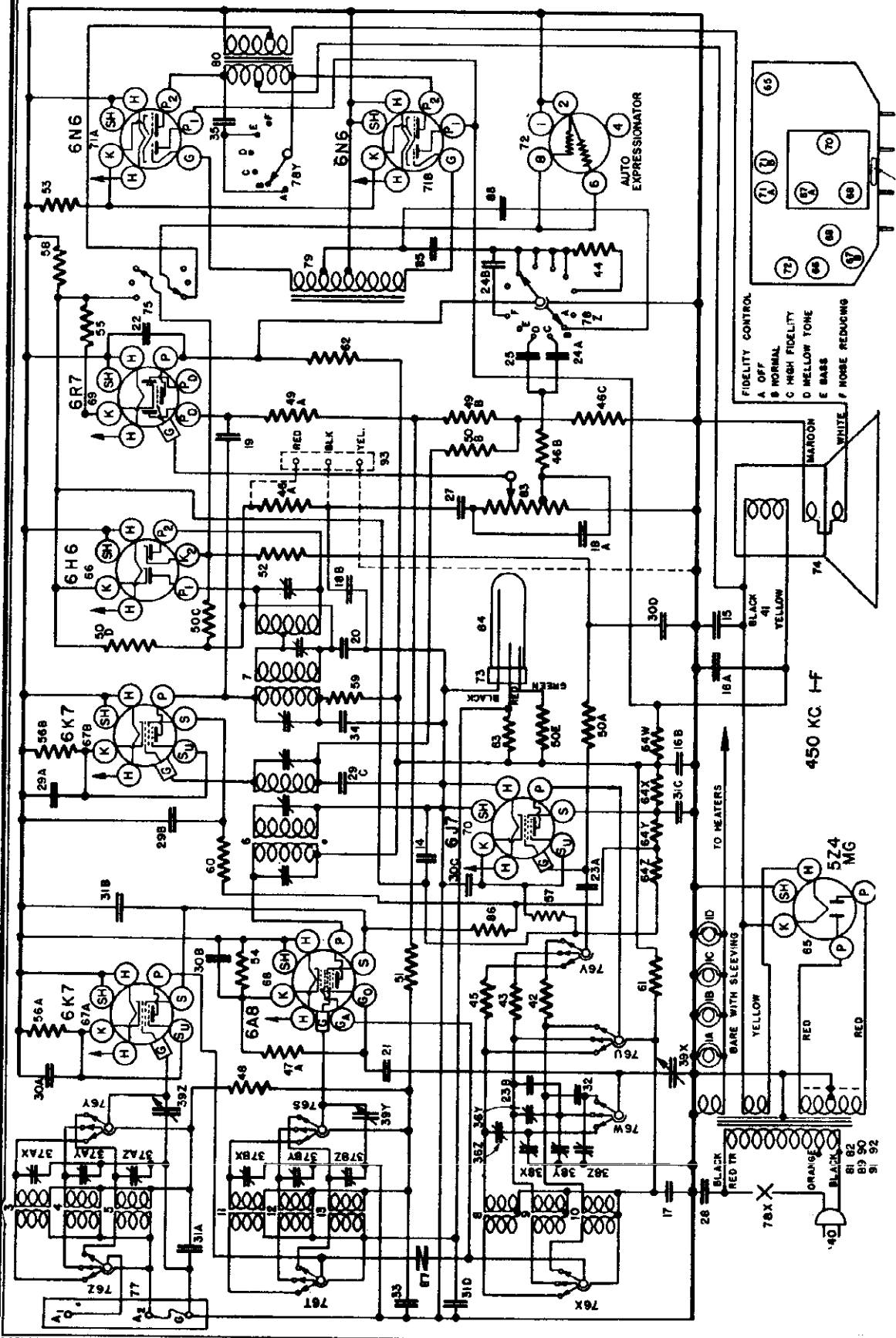
(j) Transfer the output lead of the signal generator from the 6A8 tube to the "ANT" terminal of the receiver and increase the output of the signal generator, if necessary.

(k) Adjust the middle trimmer of the 2nd. I.-F. transformer by opening until maximum output is obtained. **DO NOT READJUST THE TOP AND BOTTOM TRIMMERS.**

(l) Adjust the middle trimmer of the 1st. I.-F. transformer by closing until maximum output is obtained. **DO NOT READJUST TOP AND BOTTOM TRIMMERS.**

CROSLY RADIO CORP.

MODEL 1126
Schematic
Socket, Not



CHASSIS MODEL 1126

Shunt Alignment	
1,400 Kilocycles	Series Alignment
5,000 Kilocycles	600 Kilocycles
18,000 Kilocycles	2,000 Kilocycles

SALES MODEL 1199

Oct., 1936

(c) SIGNAL INPUT FREQUENCIES

- BLUE 540-1725 Kc. or 555-173 Meters (Amer. American Broadcast Band (BLUE))
- RED 1.8- 5.5 Megacycles or 170-55 Meters Police and Amateur Band (RED)
- GREEN 5.6- 18.1 Megacycles or 54-16.5 Meters High Frequency Band (GREEN)

MODEL 1126
Parts, Notes

CROSLLEY RADIO CORP.

50 CYCLE POWER TRANSFORMER
ADJUSTMENT

Receivers equipped with a 50 cycle power transformer have a "high" and "low" voltage tap on the under side of the chassis. The "high" voltage lead (BLACK) and the "low" voltage lead (ORANGE) are connected to a terminal strip near the transformer.

The voltage range of the "low" tap of the 95-130 volt transformer is from 95 to 112½ volts and of the "high" tap is from 112½ to 130 volts. The range of the "low" tap of the 190-260 volt transformer is from 190 to 225 volts and of the "high" tap is from 225 to 260 volts.

The accompanying illustration shows the connections for changing from high to low or low to high line voltage. Note the "jumper" wire which is attached to the terminal at which one side of the power cord is attached. The other end of this jumper wire should be connected to the ORANGE or BLACK lead of the transformer primary, according to the line voltage the receiver is to be used on.

NOTE: Any change made in the power supply circuit of the receiver should be plainly stamped or otherwise permanently recorded on the rear of the chassis.

Item No.	Part No.	Description	Item No.	Part No.	Description
IABCD	W -37922	Dial Light Bulb, 6.3V.	45	-34019	Resistor, 75,000 Ohm. ¼W.
	G3 -37965	Socket, Dial Light	46ABC	-35600	Resistor, 100,000 Ohm. ¼W.
	W -40570	Shield, Dial Light	47A	-35930	Resistor, 200,000 Ohm. ¼W.
2	W -41187	Expressionator Tube	48	-35601	Resistor, 300,000 Ohm. ¼W.
3	G94 -32000	Antenna Coil--B. C. B.	49AB	-36321	Resistor, 400,000 Ohm. ¼W.
4	G108 -32000	Antenna Coil--Pol. B.	50A	-36322	Resistor, 500,000 Ohm. ¼W.
5	G107 -32000	Antenna Coil--H. F. B.	to		
6	G90 -32004	1st I-F Assembly	50E	-36322	Resistor, 500,000 Ohm. ¼W.
7	G126 -32004	2nd I-F Assembly	51	-21454	Resistor, 1 Megohm. ¼W.
8	G97 -32002	Osc. Coil--B. C. B.	52	-36688	Resistor, 3 Megohm. ¼W.
9	G96 -32002	Osc. Coil--Pol. B.	53	-32961	Resistor, 100 Ohm. 3W. Flex.
10	G95 -32002	Osc. Coil--H. F. B.	54	W -25937	Resistor, 275 Ohm. ¼W. Flex.
11	G68 -32001	R-F Coil--B. C. B.	55	W -34900	Resistor, 68 Ohm. ¼W. Flex.
12	G75 -32001	R-F Coil--Pol. B.	56AB	W -28589	Resistor, 350 Ohm. ¼W. Flex.
13	G74 -32001	R-F Coil--H. F. B.	57	-24814	Resistor, 7,000 Ohm. ¼W. Carbon
14	W -41598	Condenser, 50 Mf. 25V. (Elect.)	58	W -42518	Resistor, 150 Ohm. ¼W. Flex.
15	W -36055	Condenser, 35 Mf. 400V. (Elect.)	59	W -21452	Resistor, 1,100 Ohm. ¼W. Flex.
16A	W -42386	Condenser, 20 Mf. 300V. (Elect.)	60	W -27503	Resistor, 1,400 Ohm. ¼W. Flex.
16B	W -42386	Condenser, 20 Mf. 300V. (Elect.)	61	-4921	Resistor, 10,000 Ohm. 1W. Carbon
17	G18 -34000	Condenser, 5600 Mmf. H-F Osc. Series	62	-36952	Resistor, 30,000 Ohm. 1W. Carbon
18A	G5 -34002	Condenser, .00005 Mf. Mica 200V.	63	W -42516	Resistor, 20,000 Ohm. 1W. W. W.
18B	G5 -34002	Condenser, .00005 Mf. Mica 200V.	64Z		4,000 Ohm.
19	G10 -34002	Condenser, .00005 Mf. Mica 300V.	64Y	W -41966	1,000 Ohm.
20	G2 -34002	Condenser, .0001 Mf. Mica 200V.	64X		3,000 Ohm.
21	G6 -34002	Condenser, .000025 Mf. Mica 200V.	64W		200 Ohm.
22	G1 -34005	Condenser, .00025 Mf. Mica 300V.	65	G154 -36400	Socket Type 5Z4
23A	G3 -34002	Condenser, .0005 Mf. Mica 200V.	66	G155 -36400	Socket Type 6H6
23B	G3 -34002	Condenser, .0005 Mf. Mica 200V.	67AB	G151 -36400	Socket Type 6K7
24A	W -35758	Condenser, .008 Mf. 400V.	68	G156 -36400	Socket Type 6A8
24B	W -35758	Condenser, .008 Mf. 400V.	69	G164 -36400	Socket Type 6R7
25	W -41461	Condenser, .0014 Mf. 200V.	70	G157 -36400	Socket Type 6J7
26		None	71AB	G165 -36400	Socket Type 6N6
27	W -28621	Condenser, .02 Mf. 200V.	72	G167 -36400	Socket Type Expressionator
28	W -30805	Condenser, .01 Mf. 400V.	73	G2 -42584	Socket Neon Tube
29A	W -27216	Condenser, .05 Mf. 200V.	74	649CJ4 "M"	Speaker Spec. 1-D-668
29B	W -27216	Condenser, .05 Mf. 200V.		-40701	Cone Assy. for above Speaker
29C	W -27216	Condenser, .05 Mf. 200V.		-40699	Field Coil for above Speaker
30A	W -36541	Condenser, .02 Mf. 160V.		634CJ4 "M"	Speaker Spec. 1-D-244
to				-40268	Cone Assy. for above Speaker
30D	W -36541	Condenser, .02 Mf. 160V.		-40272	Field Coil for above Speaker
31A	W -35936	Condenser, .05 Mf. 200V.	75	W -41029B	Phantom Control Switch
to			76	C -41235A	Band Sel. Switch
31D	W -35936	Condenser, .05 Mf. 200V.	77	G27 -26719	Ant. & Gnd. Terminal Assy.
32	W -41209	Condenser, .048 Mf. 200V.	78	B -42295A	Fidelity & Line Switch
33	W -32380	Condenser, .05 Mf. 200V.	79	G64 -24628	Choke, Audio Input
34	W -32780B	Condenser, .05 Mf. 400V.	80	G60 -24628	Output Transformer
35	W -22688	Condenser, .1 Mf. 400V.	81	-42557	Power Trans. 60 Cy. 110V.
36	W -41218	Trimmer Cond. B.C. & Pol. Osc.Ser.		-43088	Power Trans. 50 Cy. 110V.
37A	W -37891	Trimmer Cond. 3 Sect. Shunt		-43089	Power Trans. 50 Cy. 220V.
37B	W -37891	Trimmer Cond. 3 Sect. Shunt		-43008	Power Trans. 25 Cy. 110V.
38	W -35951	Trimmer Cond. 3 Sect. Shunt		-43170	Power Trans. 25 Cy. 220V.
39	G47 -33002	Cond. Gang--3 Sect. Var. Tuning	82		None
	MG12 -42411	Dial Drive Assembly	83	-41301	Vol. Cont. 3 Meg. Tap 1 Meg.
	C -42421	Dial Glass (Calibrated)	84	W -42419A	Neon Tube
	-42598A	Dial Mask (Paper Backing)		W -42589	Tube Cover
	-42325B	Dial Drive Unit (only)		W -42592	Cover Gasket
	W -41144	Dial Hand--Long	85	W -42554	Condenser .12 Mf. 160V.
	W -42180	Dial Hand--Short	86	-6705	Resistor, 3,500 Ohm. 1W.
	W -40486	Screw--Hand Mtg.	87	G101 -34403	R-F Neutralizer Assembly
	E -13647	Mystic Hand, etc., Flipper (L. H.)	88	W -43091	Condenser .07 Mf. 160V.
	E -13648	Fidelity, etc., Flipper (R. H.)		G37 -26719	Phono Terminal Assembly
	W -42308	Flipper Pulley (2)		C -43134	Escutcheon
	W -37909A	Band Indi. Pulley		-42043	Escutcheon Rubber Strip
	-43061	L. H. Flipper Control Cable		C -42044	Escutcheon Lens
	-43060	R. H. Flipper Control Cable		D -30	Mtg. Screws, Escutcheon
	-40638	Band Indicator Control Cable		W -37339	Knob, V. C. & Sta. Sel.
	-41157	Drive Belt		W -40192	Knob, Bd. Sel. & Phantom Cont.
	-40537	Drive Flexible Coupling		W -42490	Knob, Fidelity Cont.
40	B -33906A	Power Cord & Plug		W -36117	Rubber Mtg. Foot
41	G2 -37918	Speaker Cable		W -40230B	Emblem
42	-36760	Resistor, 20,000 Ohm. ¼W.		W -32620	Nut, Emblem Mtg.
43	-33390	Resistor, 30,000 Ohm. ¼W.		-6-W	Cabinet
44	-21453	Resistor, 40,000 Ohm. ¼W.			

CROSLLEY RADIO CORP.

MODEL 1126
 Socket, Trimmers
 Voltage, Data
 Resonance Curve
 Phono Pickup

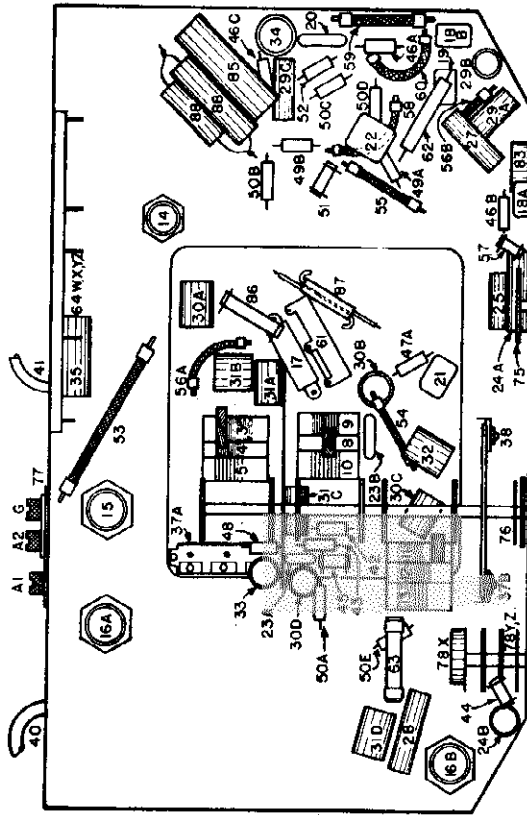


Fig. 3 Bottom View—1126

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	F1	F2	S	K	Ga	Go
6K7	R-F Amplifier	80	100	100	100	3.5	---	---
6A8	Oscillator-Modulator	63	100	100	100	3.5	---	---
6B7	AFC Control	63	100	100	100	10.7	190	-4.10 -12
6K7	I-F Amplifier	63	100	100	100	3.5	---	---
6B6	AFC Diode	63	100	100	100	3.5	---	---
6B7	A-F Amplifier	63	100	100	100	3.5	---	---
6N6	(2) Output	63	100	100	100	6.0	---	---
6Z4	Rectifier	63	100	100	100	5.2	---	---
W42419A	Neon Tuning Tube	5.0	---	---	---	---	---	---
W41187	Auto-Expressionator Tube	155	80	80	80	345	---	---

Power consumption approximately 123 watts.
 All readings taken on 117.5 volt power supply.

Varies with power output
 Voltage drop across speaker field 110 volts.
 Power output approximately 15 watts.

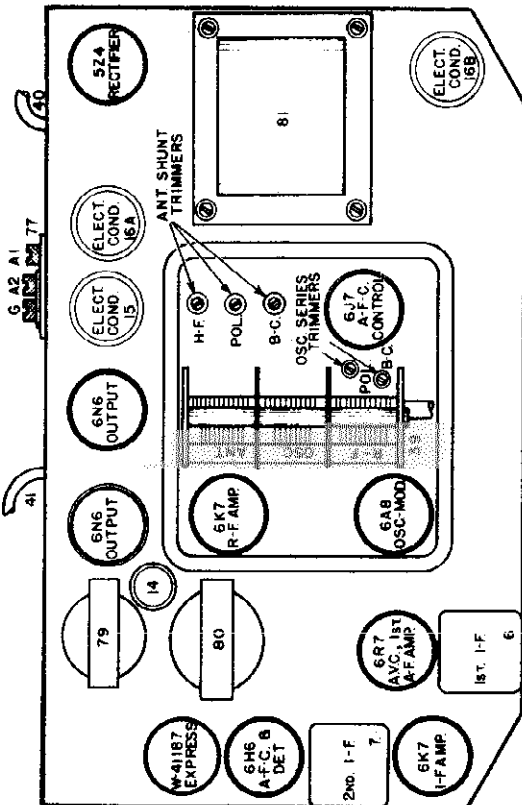


Fig. 2 Top View—1126

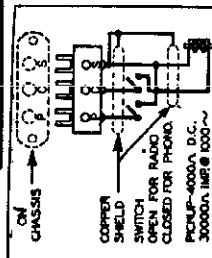
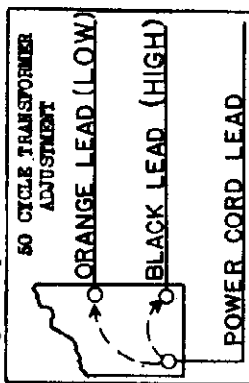


Fig. 7. Phonograph Pickup



AUTO-EXPRESSIONATOR

The Auto-Expressionator tube, item No. 72, Fig. 1, is connected across the voice coil of the speaker. When it is operating its resistance varies so as to increase the volume of loud tones, thus giving a wider volume range to reproduced music, which tends to compensate for the electrical limitations of broadcasting equipment.

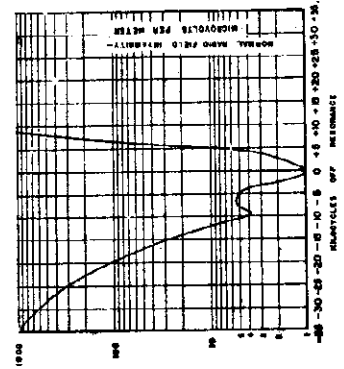


Fig. 5

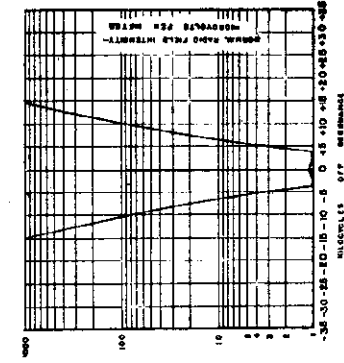


Fig. 6

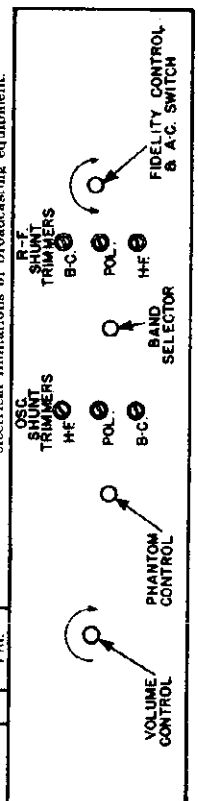


Fig. 4 Front View—1126

MODEL 1126
Alignment Notes

CROSLLEY RADIO CORP.

ALIGNMENT PROCEDURE

This model receiver should be turned on and allowed to "warm-up" for about 15 minutes before aligning its circuits.

It is a High Fidelity receiver and in order to secure maximum performance the alignment should be done with precision instruments. The alignment condensers should not be re-adjusted just to determine if they are properly tuned. Fig. 5, shows the selectivity curve of a receiver whose I-F amplifier was slightly mistuned while Fig. 6, shows a curve made from actual measurements of a receiver employing a triple-tuned I-F amplifier which was properly aligned with the use of a FREQUENCY MODULATED R-F signal generator and an oscilloscope.

The alignment of the AFC circuit may be checked by means of a modulated signal generator and output meter as follows:

(a) Connect one terminal of the output meter to P2 of one of the 6N6 Output tubes and the other terminal through a .1 mf. or larger, condenser—not electrolytic—to P2 of the other 6N6 Output tube.

(b) Connect the output of the signal generator through a .00025 mf. condenser to the top cap of the 6A8 Oscillator-Modulator tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the "GND" terminal of the receiver chassis.

(c) Rotate the Phantom Control to the left-hand position (NORMAL).

(d) Adjust the frequency of the signal generator in the region of 450 kilocycles for maximum reading on the output meter.

(e) Without altering the connections or adjustments of the signal generator or output meter connect an antenna to the antenna terminal "A1" and tune-in a local broadcasting station. Turn off modulation of signal generator. Adjust station selector slightly for zero beat.

(f) Rotate the Phantom Control to the Mystic Hand position and listen to the beat note. If the note is less than 200 cycles, or the equivalent of some tone below middle C on the piano, the AFC alignment is satisfactory.

(g) If the beat note is higher than middle C re-alignment is necessary.

(h) In cases where the beat note is not more than about two octaves above middle C or from 1000 to 1500 cycles the AFC circuit may be aligned for zero beat by making a slight adjustment of the top trimmer condenser on the 2nd I-F transformer. This circuit is very critical and a slight adjustment will produce a great change in the beat note.

(i) Where the AFC is considerably out of alignment as evidenced by a beat note of higher than 1500 cycles the standard alignment procedure outlined below should be followed.

TUNING I-F AMPLIFIER

I. Conventional Method.

(a)

(b) Check the 6J7 cathode bias which should be approximately 6.5 volts with no signal applied.

(c) Connect the output of the signal generator through a .02 mf. condenser to the top cap of the 6K7 I-F amplifier tube, leaving the tube's grid clip in place. Connect the ground lead of the signal generator to the "GND" terminal of the receiver chassis.

(d) Set the band selector switch to the Broadcast Band and route the station selector to approximately 60 on the dial. The exact setting should be at a position where no broadcast signal will be received. Turn the volume control all the way to the right (clockwise).

(e) Turn the fidelity control to HIGH FIDELITY and the Phantom Control to NORMAL.

(f) Set the signal generator to 450 kilocycles.

(g) Adjust the middle trimmer and then the bottom trimmer of the 2nd I-F transformer for maximum reading on the output meter. Caution: do not attempt to adjust the top trimmer at this time. ALWAYS USE THE LOWEST GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

(h) Transfer the output lead of the signal generator from the 6K7 tube to the top cap of the 6A8 oscillator.

(i) Open the middle trimmer of the 1st I-F transformer three or four turns of the adjustment screw. (Care should be taken that the adjustment screw does not become dislodged from the nut).

(j) Adjust the top trimmer, and then the bottom trimmer of the 1st I-F transformer for maximum reading on the output meter.

(k) Adjust the middle trimmer of the 1st I-F transformer by closing until maximum reading is obtained on the output meter.

(l) Transfer the output lead of the signal generator from the 6A8 tube to the antenna terminal "A1" of the receiver and recheck the adjustment of the bottom trimmer of the 1st I-F transformer.

(m) To adjust the AFC system it will be necessary to transfer the output lead of the signal generator back to the top cap of the 6K7 I-F amplifier tube. The .02 mf. condenser should still be connected in series with this lead.

(n) Insert a 0.5 millimeter in series with the cathode circuit of the 6J7 tube and with a strong 450 kilocycle signal from the signal generator, the reading of the cathode current should be recorded.

(o) Turn the Phantom Control to the MYSTIC HAND position and without changing the output of the signal generator, adjust the top trimmer condenser of the 2nd I-F transformer so that the reading of the 0.5 millimeter is the same as was recorded with the Phantom Control in the NORMAL position. This value of current will be obtained with the trimmer closed, with the trimmer open and at some intermediate position. A very slight adjustment while in the intermediate position will cause the meter to read from 0 to 1.5 milliamperes. This is the setting that should be used. An insulated screw

driver should be used in adjusting the AFC trimmer condenser.

(p) As a final check on the AFC adjustment, disconnect the test equipment and tune-in a fairly weak broadcast station in the region of 1500 kilocycles. Turn the AFC "ON" and "OFF." If reception is the same in both positions and will automatically tune-in strong stations within approximately plus or minus 10 kilocycles of the station selector setting with AFC "ON," the AFC is properly aligned. If distortion is noted and the receiver will not automatically tune-in stations as desired, the AFC alignment should be rechecked.

II. Oscilloscope Method.

(a) Connect the output of a FREQUENCY MODULATED R-F signal generator through a .02 mf. condenser to the top cap of the 6K7 I-F amplifier tube, leaving the tube's grid clip in place. KEEP THE GENERATOR LEAD AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Connect the vertical plates of the cathode ray oscilloscope to the receiver as follows: The "High" side should be connected to the plate of the 6R7 tube and the "low" side should be connected to the receiver chassis. Be sure the oscilloscope is protected from D.C. by connecting a condenser: 1 mf. to .05 mf., in series with the lead of the 6R7 tube).

(c) Set the band selector switch to the Broadcast Band and rotate the station selector to approximately 60 on the dial. The exact setting should be at a position where no broadcast signal will be received. Turn the volume control to the right (clockwise), turn the fidelity control to HIGH FIDELITY and the Phantom Control to NORMAL.

(d) Set the signal generator to 450 kilocycles. See instructions supplied with signal generator and oscilloscope.

(e) Adjust the middle trimmer of the 2nd I-F transformer so that the nose of the selectivity curve is centered on the resonance axis (R) of the transparent scale supplied with the oscilloscope.

(f) Adjust the bottom trimmer of the 2nd I-F transformer for maximum amplitude of the selectivity curve on resonance axis (R).

(g) Transfer the output lead of the signal generator from the 6K7 tube to the top cap of the 6A8 oscillator.

(h) Open the middle trimmer of the 1st I-F transformer three or four turns of the adjustment screw. (Care should be taken that the adjustment screw does not become dislodged from the nut).

(i) Increase the output of the signal generator and adjust the top trimmer of the 1st I-F transformer for maximum symmetry and amplitude.

(j) Adjust the bottom trimmer of the 1st I-F transformer for maximum amplitude.

(k) Reduce the output of the signal generator and adjust the middle trimmer of the 1st I-F transformer for maximum symmetry and amplitude.

(l) Carefully repeat operations (f) and (k) for

more accurate adjustments.

Aligning R-F Amplifier.
The R-F amplifier can best be aligned in the conventional manner, using a modulated signal generator and output meter.

When aligning the R-F amplifier the output lead of the signal generator is connected to the antenna terminal "A1" of the receiver. For the BLUE and RED bands a .00025 mf. condenser must be connected in series with the output lead of the signal generator and for the high frequency band a 400 ohm carbon resistor should be used in place of the condenser.

Each band should first be skunt aligned and then series aligned, where provision is made for series alignment (BLUE and RED bands). The band selector switch should be set for the band being aligned and the signal generator should be set to the frequency indicated in "C" below for each adjustment.

(a) Adjust the "OSC.", "R-F" and "ANT" skunt trimmers in the order given for maximum output. Re-adjust the station selector slightly so that the generator signal is tuned-in with maximum output and then check in the order given. DO NOT READJUST THE "OSC" TRIMMER.

NOTE: When skunt aligning the RED and GREEN bands care must be exercised so that the circuits will be aligned on the fundamental frequency rather than on the image frequency which is approximately 900 kilocycles less than the fundamental. To check on this, increase the output of the signal generator ten times or more and try to tune-in the signal both at the generator frequency as indicated on the station selector dial and at approximately 900 kilocycles less than the correct frequency. If the circuits have been properly aligned the signal can be tuned-in at both positions but much stronger at the correct position.

(b) To align the series trimmers, 39Z and 39Y—Fig. 2, set the signal generator to the frequency indicated below and then tune-in this signal with the station selector for maximum output. At the time that any series trimmer is being adjusted rotate the station selector back and forth slightly until no further improvement in output is obtained.

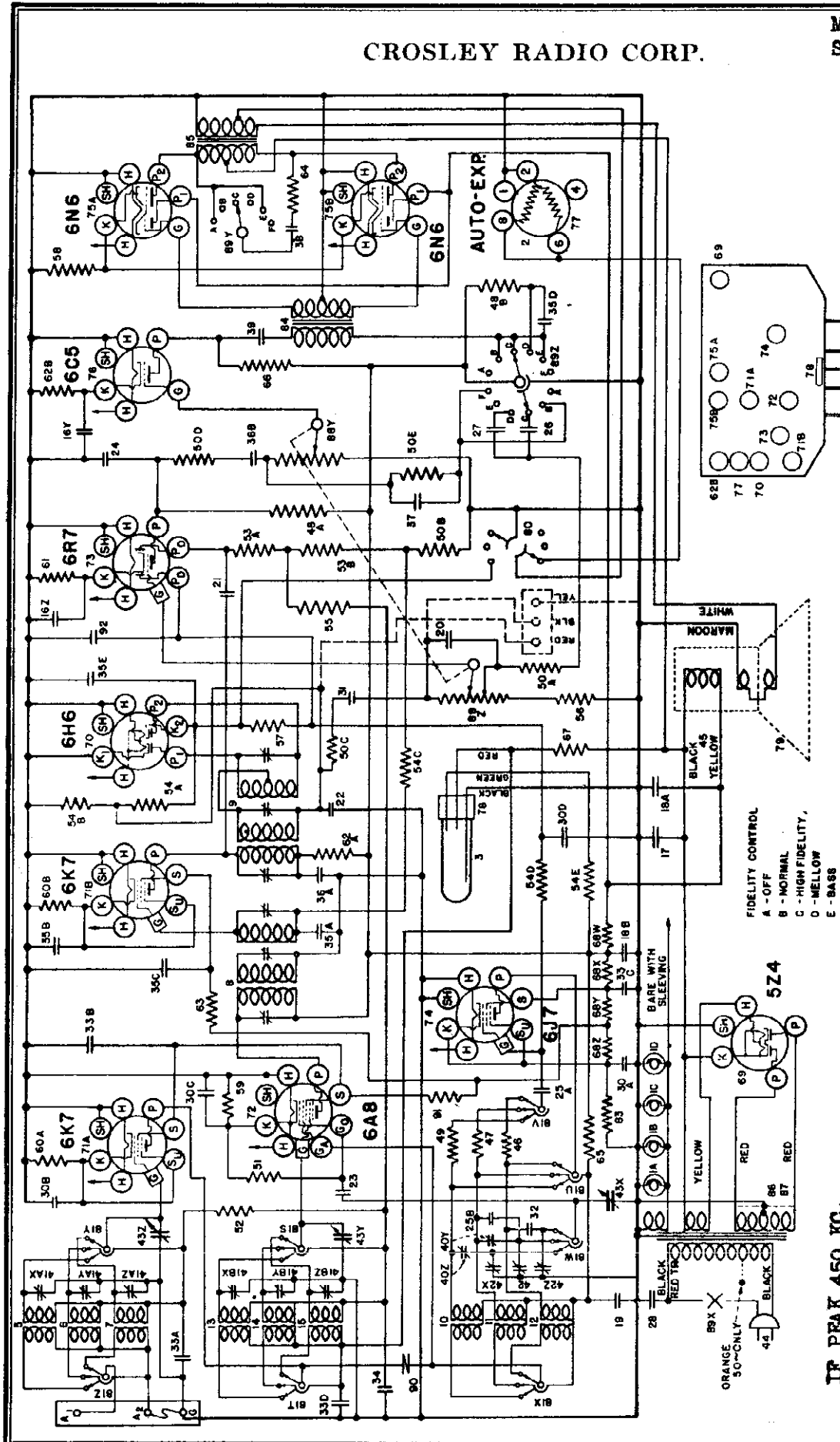
PHANTOM CONTROL

The Phantom Control permits the listener to use the Mystic Hand (Automatic Frequency Control) and the Auto-Expressionator as desired. The various positions of the control are shown on an illuminated indicator on the dial.

The receiver may be operated with normal power output and fidelity, such as would ordinarily be desired in the average home, with the control in the NORMAL position.

The Mystic Hand automatically tunes the receiver accurately to the strongest signal within a frequency range of approximately 10 kilocycles of the station selector setting.

CROSLY RADIO CORP.



CHASSIS MODEL 1216

SALES MODEL 1211

Oct., 1936

(c) SIGNAL INPUT FREQUENCIES

Series Alignment
600 Kilocycles
2000 Kilocycles

Shunt Alignment
1,400 Kilocycles
5,000 Kilocycles
18,000 Kilocycles

BLUE 540-1725 Kc. or 555-173 Meters (American Broadcast Band)
RED 1.8- 5.5 Megacycles or 170-55 Meters (Police and Amateurs)
GREEN 5.6- 18.1 Megacycles or 54-16.5 Meters (High Frequency Band)

IF PEAK 450 KC.

MODEL 1216

Parts

CROSLLEY RADIO CORP.

SPECIFICATIONS

The Crosley Model 1216 radio is a Twelve-tube receiver featuring High Fidelity, Volume Expansion which is accomplished by the Auto-Expressionator tube and Automatic Frequency Control which is known as the Mystic Hand.

The tubes used are 6K7 R-F Amplifier, 6A8 Oscillator-Modulator, 6J7 AFC Control, 6K7 I-F Amplifier, 6H6 AFC Detector, 6R7 AVC Diode and A-F Amplifier 6C5 A-F Driver, two 6N6 Output, 5Z4 Rectifier, W41187 Auto-Expressionator and W42419A Neon Tuning Tube.

Item No.	Part No.	Description	Item No.	Part No.	Description
1ABCD	W —37922	Dial Light Bulb	45	G 2—37918	Speaker Cable
	G 3—37965	D. L. Socket	46	—35760	Resistor, 20,000 Ohm 1/4 W.
	W —4057	D. L. Shield	47	—33390	Resistor, 30,000 Ohm 1/4 W.
2	W —41187	Auto Express. Tube	48AB	—35928	Resistor, 60,000 Ohm 1/4 W.
3	W —42419A	Neon Tuning Indi. Tube	49	—34019	Resistor, 75,000 Ohm 1/4 W.
	G 2—42584	Neon Socket Assembly	50ABC	—35600	Resistor, 100,000 Ohm 1/4 W.
	W —42589	Neon Tube Cover	51	—35930	Resistor, 200,000 Ohm 1/4 W.
	—42592	Cover Gasket, (N. T.)	52	—35601	Resistor, 300,000 Ohm 1/4 W.
4		None	53AB	—36321	Resistor, 400,000 Ohm 1/4 W.
5	G 94—32000	Antenna Coil, B. C. B.	54AB		
6	G108—32000	Antenna Coil, Pol. B.	CDE	—36322	Resistor, 500,000 Ohm 1/4 W.
7	G107—32000	Antenna Coil, H. F. B.	55	—36176	Resistor, 1.3 Megohm 1/4 W.
8	G 90—32004	1st I-F Assembly	56	—21454	Resistor, 1. Megohm 1/4 W.
9	G126—32004	2nd I-F Assembly	57	—36688	Resistor, 3. Megohm 1/4 W.
10	G 97—32002	Osc. Coil, B. C. B.	58	W —32961	Resistor, 100 Ohm 3W. Flex.
11	G 96—32002	Osc. Coil, Pol. B.	59	W —25937	Resistor, 275 Ohm 1/2 W. Flex.
12	G 95—32002	Osc. Coil, H. F. F.	60AB	W —28589	Resistor, 350 Ohm 1/2 W. Flex.
13	G 68—32001	R-F Coil, B. C. B.	61	W —22514	Resistor, 750 Ohm 1/2 W. Flex.
14	G 75—32001	R-F Coil, Pol. B.	62AB	W —21452	Resistor, 1100 Ohm 3/4 W. Flex.
15	G 74—32001	R-F Coil, H. F. B.	63	W —23013	Resistor, 2000 Ohm 1 1/2 W. Flex.
16Z	W —37778	Condenser, 12 Mf. 25V.	64	W —23907	Resistor, 750 Ohm 1 1/2 W. Flex.
16Y	W —42386	Condenser, 12 Mf. 25V.	65	—4921C	Resistor, 10,000 Ohm 1W.
17	W —36055	Condenser, 35 Mf. 400V.	66	—36952	Resistor, 30,000 Ohm 1W.
18AB	W —42386	Condenser, 20 Mf. 300V.	67	W —42516	Resistor, 20,000 Ohm 1W.
19	G 18—34000	Condenser, 5600 Mmf.	68Z		(Resistor, 4,000 Ohm)
20	G 5—34002	Condenser, .00005 Mf. 200V.	68Y		Resistor, 1,000 Ohm Candohm
	G 10—34002	Condenser, .00005 Mf. 300V.	68X	W —41966	Resistor, 3,000 Ohm
	G 2—34002	Condenser, .0001 Mf. 200V.	68W		Resistor, 200 Ohm
22	G 6—34002	Condenser, .000025 Mf. 200V.	69	G154—36400	Socket Type, 5Z4
23	G 1—34005	Condenser, .00025 Mf. 300V.	70	G155—36400	Socket Type, 6H6
24	G 3—34002	Condenser, .0005 Mf. 200V.	71AB	G151—36400	Socket Type, 6K7
25AB	W —35758	Condenser, .008 Mf. 400V.	72	G156—36400	Socket Type, 6A8
26	W —41461	Condenser, .0014 Mf. 200V.	73	G164—36400	Socket Type, 6R7
27	W —30805	Condenser, .01 Mf. 400V.	74	G157—36400	Socket Type, 6J7
28		NONE	75AB	G165—36400	Socket Type, 6N6
29			76AB	G152—36400	Socket Type, 6C5
30AB	W —36541	Condenser, .02 Mf. 160V.	77	G167—36400	Socket Type, Auto Expressionator
CD	W —28621	Condenser, .02 Mf. 200V.	78		See Item 3
31	W —41209	Condenser, .048 Mf. 200V.	79	649CJ4 "M"	Speaker, Spec. I-D-668
32				—40701	Cone Assembly for above Spk.
33AB	W —35936	Condenser, .05 Mf. 200V.		—40699	Field Coil for above Spk.
CD	W —32380	Condenser, .05 Mf. 200V.	80	W —41029A	Phantom Control Switch
34			81	C —41235A	Band Selector Switch
35AB	W —27216	Condenser, .05 Mf. 200V.	82	G 27—26719	Ant. and Gnd. Terminal Assembly
CDE	W —32780B	Condenser, .05 Mf. 400V.	83	W —42679	Resistor, 245 Ohm 1/2 W. Flex.
36AB	W —43094	Condenser, .011 Mf. 160V.	84	G 1—37995	A-F Driver Transformer
37	W —22688	Condenser, .1 Mf. 200V.	85	G 60—24628	Out-Put Transformer
38	W —42554	Condenser, .12 Mf. 160V.		—42557	Pwr. Trans., 60 Cy. 110V.
39		(B. C. Osc. Series Trimmer		—43088	Pwr. Trans., 50 Cy. 110V.
40Z		Pol. Osc. Series Trimmer		—43089	Pwr. Trans., 50 Cy. 220V.
40Y	W —37891	3 Section Trimmer (Shunt)		—43008	Pwr. Trans., 25 Cy. 110V.
41	W —35951	3 Section Trimmer (Shunt)		—43170	Pwr. Trans., 25 Cy. 220V.
42	G 47—33002	3 Section Var. Tuning Cond. Gang	87		See Item 86
43	MG12 —42411	Dial Drive Assembly	88Z		{Vol. Cont., 3 Meg.
	C —42421	Dial Glass (Calibrated)	88Y	—41375	{Vol. Cont., 1 Meg.
	—42325A	Drive Unit	89	B —42295A	Fidelity Cont. and Line Switch
	W —41144	Dial Hand (Long)	90	G101—34403	Neutralizing Cond. Assembly
	W —42180	Dial Hand (Short)	91	W —6705	Resistor, 3500 Ohm 1W.
	W —40486	Hand Mtg. Screw	92	W —24049A	Condenser, .1 Mf. 200V.
	E —13648	R. H. Indic. Flipper		C —43134	Escutcheon
	E —13647	L. H. Indic. Flipper		—42043	Escutcheon Gasket
	W —42308	Flipper Pulley		C —42044	Escutcheon Lens
	—43081	L. H. Flipper Cont. Cable		D —30	Screws Escut. Mtg.
	—43080	R. H. Flipper Cont. Cable		W —37339	Knob, V. C. and Station Selector
	—40638	Indi. Cont. Cable		W —40192B	Knob, Bd. Sel. and Phantom Cont.
	—41157	Drive Belt		W —42490	Knob, Fid. Cont.
	W —23877	Flex. Coupling		W —36117	Rubber Mtg. Feet
	W —37909A	Band Sel. Pulley			Cabinet
44	B —33906A	Power Cord and Plug			

CROSLLEY RADIO CORP.

MODEL 1216
Socket, Trimmers
Voltage, Notes
Resonance Curve
Pickup Data

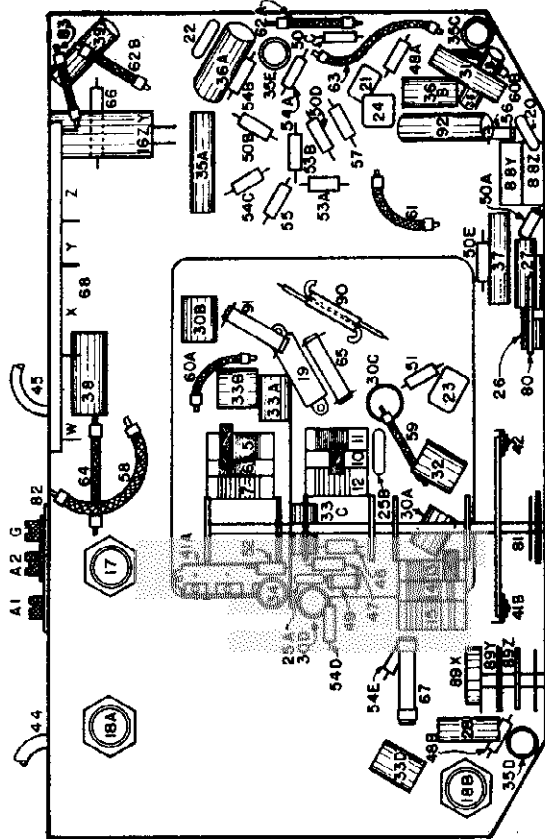


Fig. 3 Bottom View—1216

TUBE SOCKET VOLTAGE READINGS

Tube	H	F ₁	F ₂	S	Su	K	Ca	Ce
6K7	6.3	100	—	—	—	3.3	—	—
6A8	6.3	250	—	110	—	3.3	175	-4 to -12
6B7	6.3	150	—	140	6.3	3.0	—	—
6H6	6.3	240	—	108	3.0	—	—	—
6R7	6.3	75	—	—	—	2.3	—	—
6C5	6.3	170	—	—	—	5.2	—	—
6N6	6.3	250	—	370	—	6.0	—	—
5Z4	5.0	—	—	—	—	370	—	—

Varies with power output.
Voltage drop across speaker field 120 volts.
Power output approximately 2 1/2 watts.

Power consumption approximately 123 watts.
All readings taken on 117.5 volt. power supply.

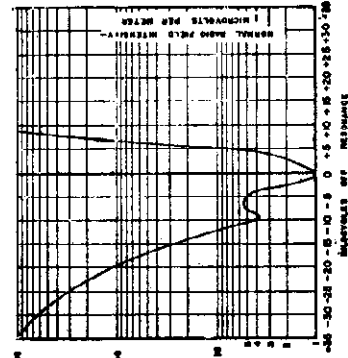


Fig. 5

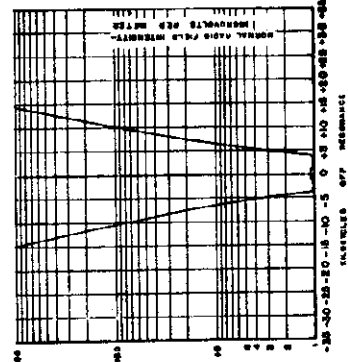


Fig. 6

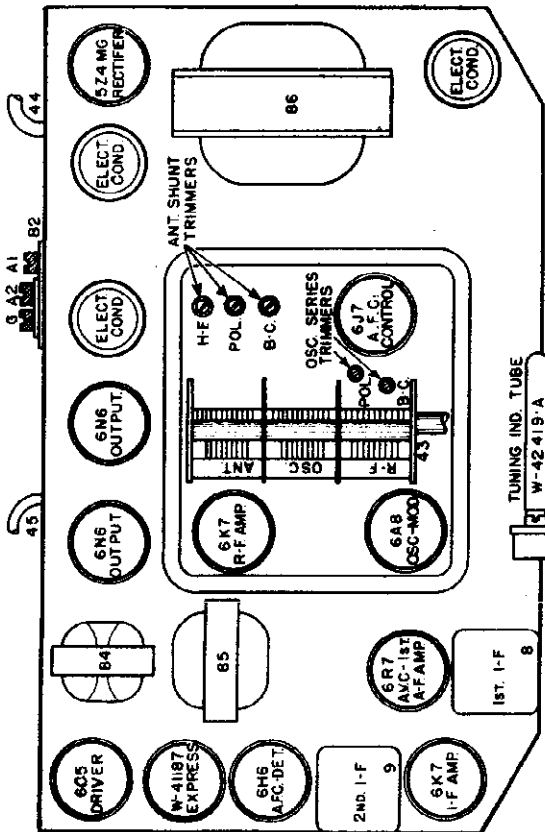


Fig. 2 Top View—1216

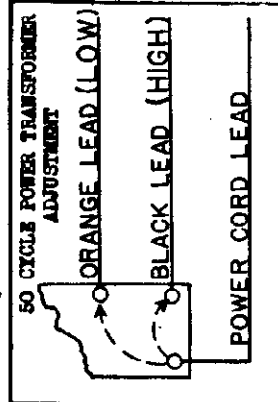


Fig. 7 Phonograph Pickup

AUTO-EXPRESSIONATOR

The Auto-Expressionator tube, item No. 77, Fig. 1, is connected across the voice coil of the speaker. When it is operating its resistance varies so as to increase the volume of loud tones, thus giving a wider volume range to reproduced music, which tends to compensate for the electrical limitations of broadcasting equipment.

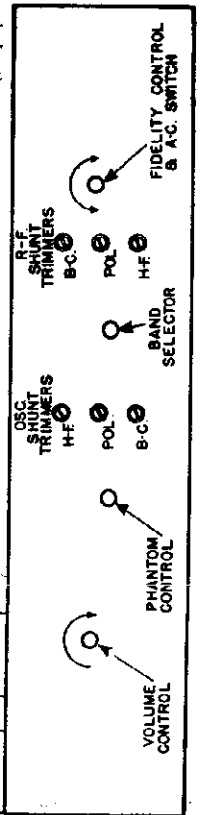


Fig. 4 Front View—1216

**MODEL 1216
Alignment
Notes**

CROSLLEY RADIO CORP.

in the order given. **DO NOT READJUST THE "OSC" TRIMMER.** When about aligning the RED and GREEN bands care must be exercised so that the circuits will be aligned on the fundamental frequency rather than on the image frequency which is approximately 900 kilocycles less than the fundamental. To check on this, increase the output of the signal generator ten times or more and try to tune in the signal both at the generator frequency as indicated on the station selector dial and at approximately 900 kilocycles less than the correct frequency. If the circuits have been properly aligned the signal can be tuned-in at both positions but much stronger at the correct position.

(b) To align the series trimmers, "Osc. Series"—Fig. 2, set the signal generator to the frequency indicated below and then tune-in this signal with the station selector trimmer for maximum output. At the time that any series trimmer is being adjusted rotate the station selector back and forth slightly until no further improvement in output is obtained.

PHANTOM CONTROL

The Phantom Control permits the listener to use the Mystic Hand (Automatic Frequency Control) and the Auto-Expressionist as desired. The various positions of the control are shown on an illuminated indicator on the dial.

The receiver may be operated with normal power output and fidelity, such as would ordinarily be desired in the average home, with the control in the NORMAL position.

The Mystic Hand automatically tunes the receiver accurately to the strongest signal within a frequency range of approximately 10 kilocycles of the station selector setting.

50 CYCLE POWER TRANSFORMER ADJUSTMENT

Receivers equipped with a 50 cycle power transformer have a "high" and "low" voltage tap on the under side of the chassis. The "high" voltage lead (BLACK) and the "low" voltage lead (ORANGE) are connected to a terminal strip near the transformer.

The voltage range of the "low" tap of the 95-130 volt transformer is from 95 to 112½ volts and of the "high" tap is from 112½ to 130 volts. The range of the "low" tap of the 190-260 volt transformer is from 190 to 225 volts and of the "high" tap is from 225 to 260 volts.

The accompanying illustration shows the connections for changing from high to low or low to high line voltage. Note the "jumper" wire which is attached to the terminal at which one side of the power cord is attached. The other end of this jumper wire should be connected to the ORANGE or BLACK lead of the transformer primarily, according to the line voltage the receiver is to be used on.

NOTE: Any change made in the power supply circuit of the receiver should be plainly stamped or otherwise permanently recorded on the rear of the chassis.

SOCKET VOLTAGES

The tube socket voltages are measured from the tube socket contacts to the chassis with a 1000 ohm per volt, 500 volt D.C. meter (except filaments) with the receiver in operating condition and no signal input. The filament voltages should be measured with an accurate low range A.C. voltmeter. Readings may vary plus or minus 10% of values given.

ness to the top cap of the 6K7 I.F. amplifier tube, leaving the tube's grid clip in place. **KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.**

(b) Connect the vertical plates of the cathode ray oscilloscope to the receiver as follows: The "High" side should be connected to the plate of the 6R7 tube and the "Low" side should be connected to the receiver chassis. Be sure the oscilloscope is protected from D.C. by connecting a condenser, .1 mf. to .05 mf., in series with the lead of the 6R7 tube.

(c) Set the band selector switch to the Broadcast Band and rotate the station selector to approximately 60 on the dial. The exact setting should be at a position where no broadcast signal will be received. Turn the volume control to the right (clockwise), turn the fidelity control to HIGH FIDELITY and the Phantom Control to NORMAL.

(d) Set the signal generator to 450 kilocycles. See instructions supplied with signal generator and oscilloscope.

(e) Adjust the middle trimmer of the 2nd I.F. transformer so that the nose of the selectivity curve is centered on the resonance axis (R) of the transparent scale supplied with the oscilloscope.

(f) Adjust the bottom trimmer of the 2nd I.F. transformer for maximum amplitude of the selectivity curve on resonance axis (R).

(g) Transfer the output lead of the signal generator from the 6K7 tube to the top cap of the 6A8 oscillator-modulator tube, leaving the tube's grid clip in place.

(h) Open the middle trimmer of the 1st I.F. transformer three or four turns of the adjustment screw. (Care should be taken that the adjustment screw does not become dislodged from the nut).

(i) Adjust the top trimmer and then the bottom trimmer of the 1st I.F. transformer for maximum reading on the output meter.

(j) Adjust the middle trimmer of the 1st I.F. transformer by closing until maximum reading is obtained on the output meter.

(k) Transfer the output lead of the signal generator from the 6A8 tube to the antenna terminal "A1" of the receiver and recheck the adjustment of the bottom trimmer of the 1st I.F. transformer.

(l) To adjust the AFC system it will be necessary to transfer the output lead of the signal generator back to the top cap of the 6K7 I.F. amplifier tube. The .02 mf. condenser should still be connected in series with the cathode circuit of the 6I7 tube and with a strong 450 kilocycle signal from the signal generator, the reading of the cathode current should be recorded.

(m) Insert a 0.5 millimeter in series with the cathode circuit of the 6I7 tube and with a strong 450 kilocycle signal from the signal generator, the reading of the cathode current should be recorded.

(n) Turn the Phantom Control to the MYSTIC HAND position and without changing the output of the signal generator, adjust the top trimmer of the 2nd I.F. transformer so that the reading of the 0.5 milliammeter is the same as was recorded with the Phantom Control in the NORMAL position. This value of current will be obtained with the trimmer closed, with the trimmer open and at some intermediate position. A very slight adjustment while in the intermediate position will cause the meter to read from 0 to 1.5 milliamperes. This is the setting that should be used. An insulated screw driver should be used in adjusting the AFC trimmer condenser.

(o) As a final check on the AFC adjustment, disconnect the test equipment and tune-in a fairly weak broadcast station in the region of 1500 kilocycles. Turn the AFC "ON" and "OFF". If reception is the same in both positions and will automatically tune-in strong stations within approximately plus or minus 10 kilocycles of the station selector setting with AFC "ON", the AFC is properly aligned. If distortion is noted and the receiver will not automatically tune-in stations as described, the AFC alignment should be rechecked.

(a) Adjust the "OSC", "R.F." and "ANT" shunt trimmers in the order given for maximum output. Realign the station selector slightly so that the generator signal is tuned-in with maximum output and then check

(d) Set the band selector switch to the Broadcast Band and rotate the station selector to approximately 60 on the dial. The exact setting should be at a position where no broadcast signal will be received. Turn the volume control all the way to the right (clockwise), turn the fidelity control to HIGH FIDELITY and the Phantom Control to NORMAL.

(e) Set the signal generator to 450 kilocycles.

(f) Adjust the middle trimmer and then the bottom trimmer of the 2nd I.F. transformer for maximum reading on the output meter. Caution: do not attempt to adjust the top trimmer at this time. **ALWAYS USE THE LOWEST GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.**

(g) Transfer the output lead of the signal generator from the 6K7 tube to the top cap of the 6A8 oscillator-modulator tube, leaving the tube's grid clip in place.

(h) Open the middle trimmer of the 1st I.F. transformer three or four turns of the adjustment screw. (Care should be taken that the adjustment screw does not become dislodged from the nut).

(i) Adjust the top trimmer and then the bottom trimmer of the 1st I.F. transformer for maximum reading on the output meter.

(j) Adjust the middle trimmer of the 1st I.F. transformer by closing until maximum reading is obtained on the output meter.

(k) Transfer the output lead of the signal generator from the 6A8 tube to the antenna terminal "A1" of the receiver and recheck the adjustment of the bottom trimmer of the 1st I.F. transformer.

(l) To adjust the AFC system it will be necessary to transfer the output lead of the signal generator back to the top cap of the 6K7 I.F. amplifier tube. The .02 mf. condenser should still be connected in series with the cathode circuit of the 6I7 tube and with a strong 450 kilocycle signal from the signal generator, the reading of the cathode current should be recorded.

(m) Insert a 0.5 millimeter in series with the cathode circuit of the 6I7 tube and with a strong 450 kilocycle signal from the signal generator, the reading of the cathode current should be recorded.

(n) Turn the Phantom Control to the MYSTIC HAND position and without changing the output of the signal generator, adjust the top trimmer of the 2nd I.F. transformer so that the reading of the 0.5 milliammeter is the same as was recorded with the Phantom Control in the NORMAL position. This value of current will be obtained with the trimmer closed, with the trimmer open and at some intermediate position. A very slight adjustment while in the intermediate position will cause the meter to read from 0 to 1.5 milliamperes. This is the setting that should be used. An insulated screw driver should be used in adjusting the AFC trimmer condenser.

(o) As a final check on the AFC adjustment, disconnect the test equipment and tune-in a fairly weak broadcast station in the region of 1500 kilocycles. Turn the AFC "ON" and "OFF". If reception is the same in both positions and will automatically tune-in strong stations within approximately plus or minus 10 kilocycles of the station selector setting with AFC "ON", the AFC is properly aligned. If distortion is noted and the receiver will not automatically tune-in stations as described, the AFC alignment should be rechecked.

(a) Connect the output meter as outlined above in Fig. 6. Check the 6I7 cathode bias which should be approximately 65 volts with no signal applied.

(b) Connect the output of the signal generator through a .02 mf. condenser to the top cap of the 6K7 I.F. amplifier tube, leaving the tube's grid clip in place. Connect the ground lead of the signal generator to the "GND" terminal of the receiver chassis.

(c) Rotate the Phantom Control to the left-hand position (NORMAL).

(d) Adjust the frequency of the signal generator in the region of 450 kilocycles for maximum reading on the output meter.

(e) Without altering the connections or adjustments of the signal generator or output meter, connect an antenna to the antenna terminal "A1" and tune-in a local broadcasting station. Turn off modulation of signal generator. Adjust station selector slightly for zero beat.

(f) Rotate the Phantom Control to the Mystic Hand position and listen to the beat note. If the note is less than 200 cycles, or the equivalent of some tone below middle C on the piano, the AFC alignment is satisfactory.

(g) If the beat note is higher than middle C re-alignment is necessary.

(h) In cases where the beat note is not more than about two octaves above middle C or from 1000 to 1500 cycles the AFC circuit may be aligned for zero beat by making a slight adjustment of the top trimmer condenser on the 2nd I.F. transformer. This circuit is very critical and a slight adjustment will produce a great change in the beat note.

(i) Where the AFC is considerably out of alignment as evidenced by a beat note of higher than 1500 cycles the standard alignment procedure outlined below should be followed.

TUNING I.F. AMPLIFIER

(a) Connect the output meter as outlined above in Fig. 6. Check the 6I7 cathode bias which should be approximately 65 volts with no signal applied.

(b) Connect the output of the signal generator through a .02 mf. condenser to the top cap of the 6K7 I.F. amplifier tube, leaving the tube's grid clip in place. Connect the ground lead of the signal generator to the "G" terminal of the receiver chassis.

(d) Set the band selector switch to the Broadcast Band and rotate the station selector to approximately 60 on the dial. The exact setting should be at a position where no broadcast signal will be received. Turn the volume control all the way to the right (clockwise), turn the fidelity control to HIGH FIDELITY and the Phantom Control to NORMAL.

(e) Set the signal generator to 450 kilocycles.

(f) Adjust the middle trimmer and then the bottom trimmer of the 2nd I.F. transformer for maximum reading on the output meter. Caution: do not attempt to adjust the top trimmer at this time. **ALWAYS USE THE LOWEST GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.**

(g) Transfer the output lead of the signal generator from the 6K7 tube to the top cap of the 6A8 oscillator-modulator tube, leaving the tube's grid clip in place.

(h) Open the middle trimmer of the 1st I.F. transformer three or four turns of the adjustment screw. (Care should be taken that the adjustment screw does not become dislodged from the nut).

(i) Adjust the top trimmer and then the bottom trimmer of the 1st I.F. transformer for maximum reading on the output meter.

(j) Adjust the middle trimmer of the 1st I.F. transformer by closing until maximum reading is obtained on the output meter.

(k) Transfer the output lead of the signal generator from the 6A8 tube to the antenna terminal "A1" of the receiver and recheck the adjustment of the bottom trimmer of the 1st I.F. transformer.

(l) To adjust the AFC system it will be necessary to transfer the output lead of the signal generator back to the top cap of the 6K7 I.F. amplifier tube. The .02 mf. condenser should still be connected in series with the cathode circuit of the 6I7 tube and with a strong 450 kilocycle signal from the signal generator, the reading of the cathode current should be recorded.

(m) Insert a 0.5 millimeter in series with the cathode circuit of the 6I7 tube and with a strong 450 kilocycle signal from the signal generator, the reading of the cathode current should be recorded.

(n) Turn the Phantom Control to the MYSTIC HAND position and without changing the output of the signal generator, adjust the top trimmer of the 2nd I.F. transformer so that the reading of the 0.5 milliammeter is the same as was recorded with the Phantom Control in the NORMAL position. This value of current will be obtained with the trimmer closed, with the trimmer open and at some intermediate position. A very slight adjustment while in the intermediate position will cause the meter to read from 0 to 1.5 milliamperes. This is the setting that should be used. An insulated screw driver should be used in adjusting the AFC trimmer condenser.

(o) As a final check on the AFC adjustment, disconnect the test equipment and tune-in a fairly weak broadcast station in the region of 1500 kilocycles. Turn the AFC "ON" and "OFF". If reception is the same in both positions and will automatically tune-in strong stations within approximately plus or minus 10 kilocycles of the station selector setting with AFC "ON", the AFC is properly aligned. If distortion is noted and the receiver will not automatically tune-in stations as described, the AFC alignment should be rechecked.

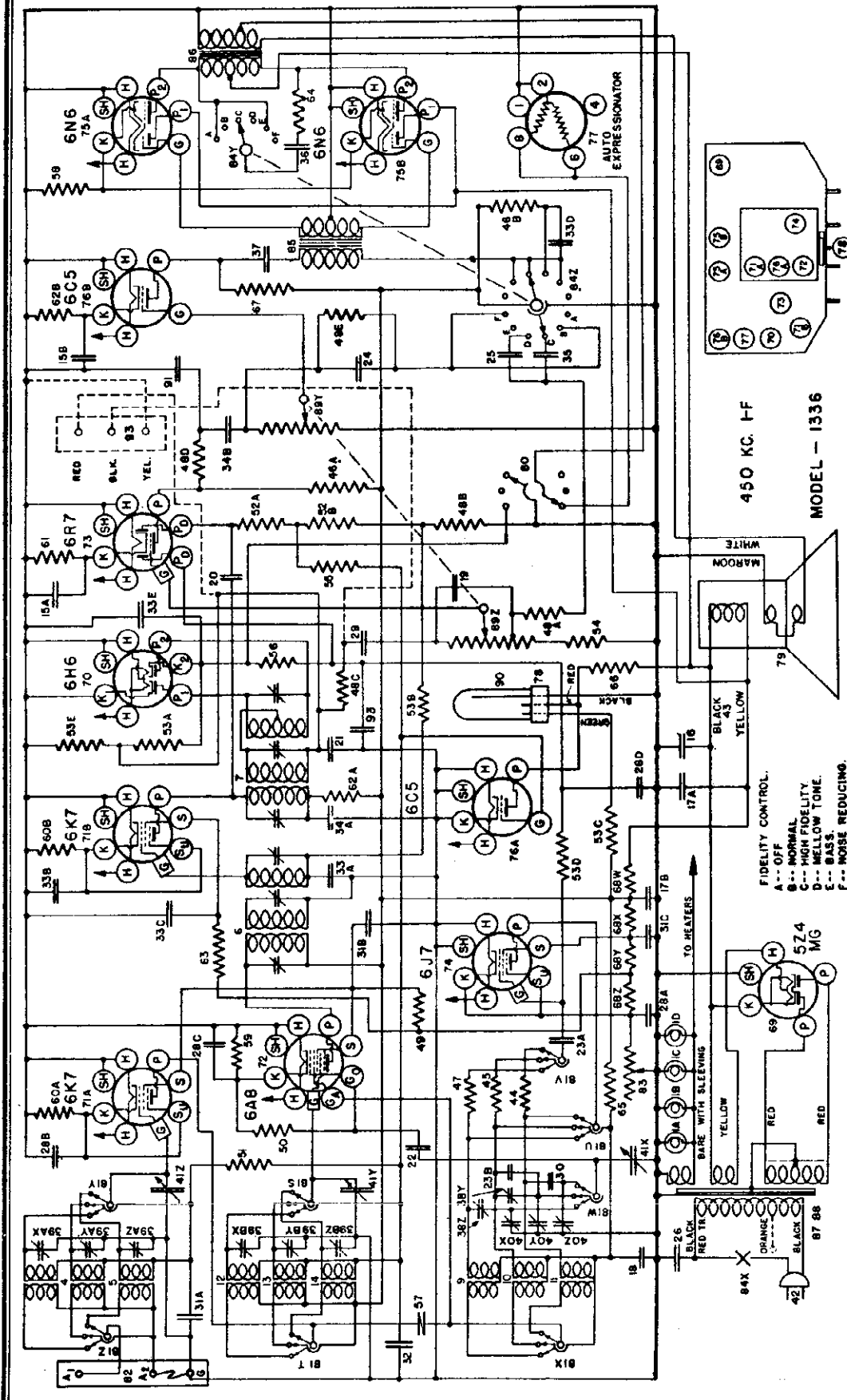
II. Oscilloscope Method

(a) Connect the output meter as outlined above in Fig. 6. Check the 6I7 cathode bias which should be approximately 65 volts with no signal applied.

(b) Connect the output of the signal generator through a .02 mf. condenser to the top cap of the 6K7 I.F. amplifier tube, leaving the tube's grid clip in place. Connect the ground lead of the signal generator to the "G" terminal of the receiver chassis.

CROSLLEY RADIO CORP.

MODEL 1
Schemat.
Socket



Series Alignment
600 Kilocycles
2000 Kilocycles

Shunt Alignment
1,400 Kilocycles
5,000 Kilocycles

CHASSIS MODEL 1336

SALES MODEL 1313

Oct., 1936

(c) SIGNAL INPUT FREQUENCIES

540-1725 Kc. or 555-173 Meters (American Broadcast Band)
1.8- 5.5 Megacycles or 170-55 Meters (Police and Amateurs)

BLUE
RED
GREEN

MODEL 1336

Parts

CROSLLEY RADIO CORP.

SPECIFICATIONS

The Crosley Model 1336 radio is a Thirteen-tube receiver featuring High Fidelity, Volume Expansion which is accomplished by the Auto-Expressionator tube and Automatic Frequency Control which is known as the Mystic Hand.

The tubes used are 6K7 R-F Amplifier, 6A8 Oscilla-

tor-Modulator, 6J7 AFC Control, 6K7 I-F Amplifier, 6H6 AFC Detector, 6R7 AVC Diode and A-F Amplifier, 6C5 A-F Driver, two 6N6 Output, 6C5 Tuning Indicator, Amplifier, 5Z4 Rectifier, W41187 Auto-Expressionator, and W42419A Neon Tuning Indicator Tube.

Item No.	Part No.	Description	Item No.	Part No.	Description
1ABCD	W —37922	Dial Light Bulb	52AB	—36321	Resistor, 400,000 Ohm 1/4 W.
	G 3—37965	Dial Light Socket	53AB	—36322	Resistor, 500,000 Ohm 1/4 W.
	W —40570	Dial Light Shield	CDE	—21454	Resistor, 1 Megohm 1/4 W.
	W —41187	Auto Expressionator Tube	54	—36176	Resistor, 1.3 Megohm 1/4 W.
	G 94—32000	Antenna Coil, B. C. B.	55	—36688	Resistor, 3. Megohm 1/4 W.
	G108—32000	Antenna Coil, Pol. B.	56	G101—34403	R. F. Neutralizing Condenser
	G107—32000	Antenna Coil, H. F. B.	57	W —32926	Resistor, 100 Ohm 3W. Flex.
	G 90 —32004	1st I-F Assembly	58	W —25937	Resistor, 275 Ohm 1/2 W. Flex.
	G126—32004	2nd I-F Assembly	59	W —28589	Resistor, 350 Ohm 1/2 W. Flex.
	G 97—32002	Osc. Coil, B. C. B.	60AB	W —22514	Resistor, 750 Ohm 1/2 W. Flex.
	G 96—32002	Osc. Coil, Pol. B.	61	W —21452	Resistor, 1100 Ohm 3/4 W. Flex.
	G 95—32002	Osc. Coil, H. F. B.	62AB	W —23013	Resistor, 2000 Ohm 1 1/4 W. Flex.
	G 68—32001	R. F. Coil, R.C.H.	63	W —23907	Resistor, 750 Ohm 1 1/2 W. Flex.
	G 75—32001	R. F. Coil, Pol. B.	64	—4921C	Resistor, 10,000 Ohm 1W.
G 74—32001	R. F. Coil, H. F. B.	65	W —42418A	Resistor, 30,000 Ohm 4W.	
15AB	W —41598	Condenser, 50 Mf. 25V.	66	—36952	Resistor, 30,000 Ohm 1W.
16	W —36055	Condenser, 35 Mf. 400V.	67	68Z	Resistor, 4,000 Ohm
17AB	W —36057	Condenser, 40 Mf. 300V.	68Y	W —41966	Resistor, 1,000 Ohm } Candohm
18	G 18—34000	Condenser, 5600 Mmf. 300V.	68X		Resistor, 3,000 Ohm
19	G 5—34002	Condenser, .000050 Mf. 200V.	68W		Resistor, 200 Ohm
20	G 10—34002	Condenser, .000050 Mf. 300V.	69	G154—36400	Socket Type, 5Z4
21	G 2—34002	Condenser, .0001 Mf. 200V.	70	G155—36400	Socket Type, 6H6
22	G 6—34002	Condenser, .000025 Mf. 200V.	71AB	G151—36400	Socket Type, 6K7
23AB	G 3—34002	Condenser, .0005 Mf. 200V.	72	G156—36400	Socket Type, 6A8
24	W —34713	Condenser, .005 Mf. 160V.	73	G164—36400	Socket Type, 6R7
25	W —41461	Condenser, .0014 Mf. 200V.	74	G157—36400	Socket Type, 6J7
26	W —30805	Condenser, .01 Mf. 400V.	75AB	G165—36400	Socket Type, 6N6
27		NONE	76AB	G152—36400	Socket Type, 6C5
28AB	W —36541	Condenser, .02 Mf. 160V.	77	G167—36400	Auto Expressionator
CD	W —28621	Condenser, .02 Mf. 200V.	78	G 1—42584	Neon Tube Socket Assembly
29	W —41209	Condenser, .048 Mf. 200V.		W —42589	Neon Tube Cover
30	W —35936	Condenser, .05 Mf. 200V.		—42592	Cover Rubber Gasket
31ABC	W —32380	Condenser, .05 Mf. 200V.	79	734CJ4 "M"	Speaker Spec. 1-D-437
32				—41603	Cone Assembly } For above Spk.
33AB	W —27216	Condenser, .05 Mf. 200V.		—41601	Field Coil
CDE			80	W —41029	Phantom Cont. Switch
34AB	W —32780B	Condenser, .05 Mf. 400V.	81	C —41235	Band Select. Switch
35	W —35758	Condenser, .003 Mf. 400V.	82	G 27—26719	Ant. and Gnd. Terminal Assembly
36	W —22688	Condenser, .1 Mf. 400V.	83	W —11287	300 Ohm 1/2 W. A-F-C Bias Resistor
37	W —42554	Condenser, .12 Mf. 160V.	84	B —42295A	Fidelity and Line Switch
38	—41218	B. C. and Pol. Osc. Series Trimmer	85	G 2—37995	A-F Transformer
39AB	W —37891A	3 Section Shunt Trimmer	86	G 60—24628	Out-Put Transformer
40	W —35951A	3 Section Shunt Trimmer	87	—42557	Power Trans. 60 Cy. 110V.
41	G 47—33002	3 Gang Var. Tuning Cond.		—43008	Power Trans. 25 Cy. 110V.
	MG12—42411	Dial Drive Assembly, Complete		—43088	Power Trans. 50 Cy. 110V.
	C —42421	Dial Glass (Calibrated)		—43089	Power Trans. 50 Cy. 220V.
	—42325	Dial Drive Unit only	89Z	—41375B	Vol. Cont. 3 Meg. Tap 1 Meg.
	W —41144	Dial Hand (Long)	89Y		Vol. Cont. 1 Meg.
	W —42180	Dial Hand (Short)	90	W —42419A	Neon Tuning Indic. Tube
	W —40486	Screw, Hand Mtg.	91	G 5—34005	Condenser, .00005 Mf. 300V.
	E —13648	R.H. Indicator Flipper (Phan. Cont.)	92	G 37—26719	Phono Terminal
	E —13647	L.H. Indicator Flipper (Fidelity Cont.)	93	W —24049	Condenser, .1 Mf. 200V.
	W —42308	Indicator Control Pulley (2)		C —41219	Escutcheon
	—43080	R.H. Indicator Cont. Cable Assy.		B —41232	Escutcheon Lens
	—43081	L.H. Indicator Cont. Cable Assy.	Type	B —41233	Escutcheon Retaining Spring
	—40638	Hand Indic. Cont. Cable	A	B —41234	Lens Retaining Spring
	—41157	Drive Belt		—43134A	Escutcheon
	—40537	Flexible Coupling	Type	C —42044	Escutcheon Lens
42	B —33906A	Power Cord and Plug	B	C —42043	Escutcheon Rubber Ring
43	G 2—37918	Speaker Cable		—7570	Escutcheon Mtg. Screw
44	—36760	Resistor, 20,000 Ohm 1/4 W.	W —37339	W —40192B	Knob, V. C. and Station Sel.
45	—33390	Resistor, 30,000 Ohm 1/4 W.	W —42490	W —42490	Knob, Band Sel. and Phantom
46AB	—35928	Resistor, 60,000 Ohm 1/4 W.	W —26117	W —26117	Knob, Fidelity Control Cont.
47	—34019	Resistor, 75,000 Ohm 1/4 W.	W —40230B	W —40230B	Rubber Mtg. Foot
48AB	—35600	Resistor, 100,000 Ohm 1/4 W.	W —32620	W —32620	Emblem
CDE	—6705	Resistor, 3,500 Ohm 1W.	—6-Q	—6-Q	Nut, Emblem Mtg.
49	—35930	Resistor, 200,000 Ohm 1/4 W.			Cabinet
50	—35601	Resistor, 300,000 Ohm 1/4 W.			
51					

CROSLY RADIO CORP.

MODEL 1336
 Socket, Trimmers
 Chassis, Voltage
 Resonance Curves
 Phono Pickup, Not

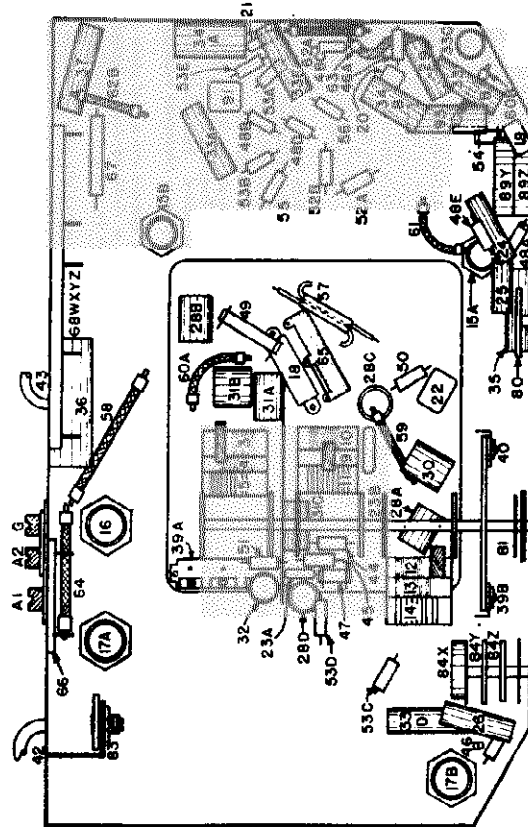


Fig. 3 Bottom View-1336

Tube	Function	H	F ₁	F ₂	S	Su	K	Ca	Co
6K7	R-F Amplifier	6.3	285	---	106	2.2	2.2	---	---
6X6	Oscillator-Modulator	6.3	285	---	106	2.2	2.2	---	---
6AV6	I-F Amplifier	6.3	140	---	137	6.7	2.7	140	-6 to -12
6B7	I-F Amplifier	6.3	225	---	100	2.7	2.7	---	---
6R7	A-F Detector	6.3	225	---	---	---	---	---	---
6R7	Diode and 1st A-F Amplifier	6.3	85	---	---	---	0.1	---	---
6C5	A-F Driver	6.3	150	340	---	---	5.0	---	---
6N6	(2) Output	6.3	235	---	---	---	5.2	---	---
6S2	Tuning Indicator Amplifier	6.3	100-200	---	---	---	0	---	---
6V7	Rectifier	5.0	---	100-200	150	---	350	---	---
W42419A	Tuning Indicator Tube	Varies with power output.	---	---	---	---	---	---	---
W41187	Expander Tube	Varies with power output.	---	---	---	---	---	---	---

Power consumption approximately 135 watts.
 All readings taken on 117.5 volt power supply.

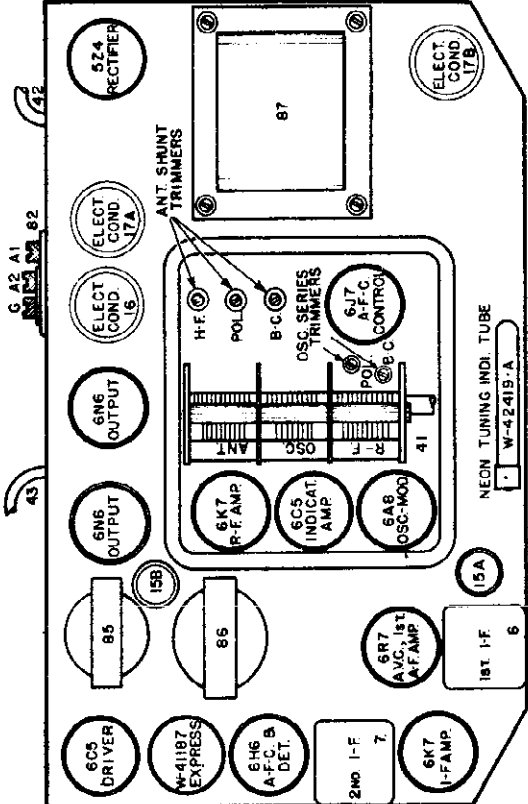


Fig. 2 Top View-1336

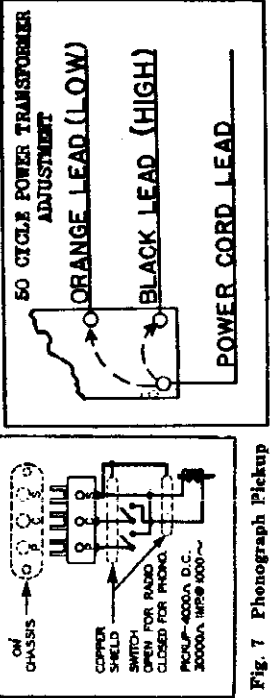


Fig. 7 Phonograph Pickup

AUTO-EXPRESSIONATOR

The Auto-Expressionator tube, item No. 77, Fig. 1, is connected across the voice coil of the speaker. When it is operating its resistance varies so as to increase the volume of loud tones, thus giving a wider volume range to reproduced music, which tends to compensate for the electrical limitations of broadcasting equipment.

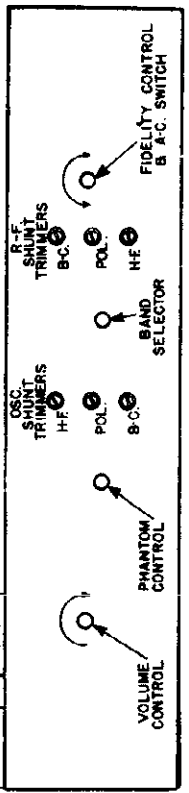


Fig. 4 Front View-1336

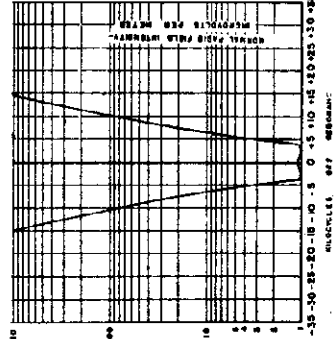


Fig. 5

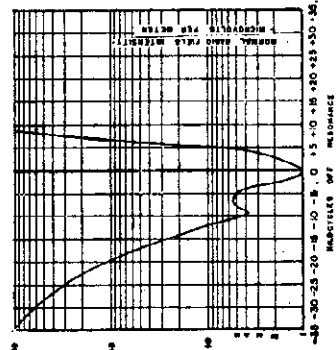


Fig. 6

MODEL 1336

Alignment, Notes

CROSLEY RADIO CORP.

Each band should first be shut aligned and then series aligned, where provision is made for series alignment (BLUE and RED bands). The band selector switch should be set for the band being aligned and the signal generator should be set to the frequency indicated in "C" below for each adjustment.

(a) Adjust the "OSC", "R-F", and "ANT" shunt trimmers in the order given for maximum output. Re-adjust the station selector slightly so that the generator signal is tuned-in with maximum output and then check in the order given. **DO NOT READJUST THE "OSC" TRIMMER.**

NOTE: When shut aligning the RED and GREEN bands care must be exercised so that the circuits will be aligned on the fundamental frequency rather than on the image frequency which is approximately 900 kilocycles less than the fundamental. To check on this, increase the output of the signal generator ten times or more and try to tune-in the signal both at the generator frequency as indicated on the station selector dial and at approximately 900 kilocycles less than the correct frequency. If the circuits have been properly aligned the signal can be tuned-in at both positions but much stronger at the correct position.

(b) To align the series trimmers, "osc. series" Fig. 7, set the signal generator to the frequency indicated below and then tune-in this signal with the station selector for maximum output. At the time that any series trimmer is being adjusted, rotate the station selector back and forth slightly until no further improvement in output is obtained.

50 CYCLE POWER TRANSFORMER ADJUSTMENT

Receivers equipped with a 50 cycle power transformer have a "high" and "low" voltage tap on the under side of the chassis. The "high" voltage lead (BLACK) and the "low" voltage lead (ORANGE) are connected to a terminal strip near the transformer.

The voltage range of the "low" tap of the 95-130 volt transformer is from 95 to 112½ volts and of the "high" tap is from 112½ to 130 volts. The range of the "low" tap of the 190-260 volt transformer is from 190 to 225 volts and of the "high" tap is from 225 to 260 volts.

The accompanying illustration shows the connections for changing from high to low or low to high line voltage. Note the "jumper" wire which is attached to the terminal at which one side of the power cord is attached. The other end of this jumper wire should be connected to the ORANGE or BLACK lead of the transformer primary, according to the line voltage the receiver is to be used on.

NOTE: Any change made in the power supply circuit of the receiver should be plainly stamped or otherwise permanently recorded on the rear of the chassis.

PHANTOM CONTROL

The Phantom Control permits the listener to use the Mystic Hand (Automatic Frequency Control) and the Auto-Expressionist as desired. The various positions of the control are shown on an illuminated indicator on the dial.

The receiver may be operated with normal power output and fidelity, such as would ordinarily be desired in the average home, with the control in the NORMAL position.

The Mystic Hand automatically tunes the receiver accurately to the strongest signal within a frequency range of approximately 10 kilocycles of the station selector setting.

tions within approximately plus or minus 10 kilocycles of the station selector setting with AFC "ON", the AFC is properly aligned. If distortion is noted and the receiver will not automatically tune-in stations as described, the AFC alignment should be rechecked.

II. Oscilloscope Method.
(a) Connect the output of a FREQUENCY MODULATED R-F signal generator through a .02 mfd. condenser to the top cap of the 6K7 I-F amplifier tube, leaving the tube's grid clip in place. KEEP THE GENERATOR LEAD AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Connect the vertical plates of the cathode ray oscilloscope to the receiver as follows: The "High" side should be connected to the plate of the 6R7 tube and the "Low" side should be connected to the receiver chassis. (Be sure the oscilloscope is protected from D.C. by connecting a condenser, .1 mfd. to .05 mfd., in series with the lead of the 6R7 tube.)

(c) Set the band selector switch to the Broadcast Band and rotate the station selector to approximately 60 on the dial. The exact setting should be at a position where no broadcast signal will be received. Turn the volume control to the right (clockwise), turn the fidelity control to HIGH FIDELITY and the Phantom Control to NORMAL.

(d) Set the signal generator to 450 kilocycles. See instructions supplied with signal generator and oscilloscope.

(e) Adjust the middle trimmer of the 2nd I-F transformer so that the nose of the selectivity curve is centered on the resonance axis (R) of the transparent scale supplied with the oscilloscope.

(f) Adjust the bottom trimmer of the 2nd I-F transformer for maximum amplitude of the selectivity curve on resonance axis (R).

(g) Transfer the output lead of the signal generator from the 6K7 tube to the top cap of the 6A8 oscillator-modulator tube, leaving the tube's grid clip in place.

(h) Open the middle trimmer of the 1st I-F transformer three or four turns of the adjustment screw. Care should be taken that the adjustment screw does not become dislodged from the nut.

(i) Increase the output of the signal generator and adjust the top trimmer of the 1st I-F transformer for maximum symmetry and amplitude.

(j) Adjust the bottom trimmer of the 1st I-F transformer for maximum amplitude.

(k) Reduce the output of the signal generator and adjust the middle trimmer of the 1st I-F transformer for maximum symmetry and amplitude.

(l) Carefully repeat operations (i) and (k) for more accurate adjustments.

ALIGNING R-F AMPLIFIER

The R-F amplifier can best be aligned in the conventional manner, using a modulated signal generator and output meter.

When aligning the R-F amplifier the output lead of the signal generator is connected to the antenna terminal "A1" of the receiver. For the BLUE and RED bands a .00025 mfd. condenser must be connected in series with the output lead of the signal generator and for the high frequency band a 400 ohm carbon resistor should be used in place of the condenser.

signal applied, by means of the variable control item, No. B3, Fig. 3.

(c) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 6K7 I-F amplifier tube, leaving the tube's grid clip in place. Connect the ground lead of the signal generator to the "G" terminal of the receiver chassis.

(d) Set the band selector switch to the Broadcast Band and rotate the station selector to approximately 60 on the dial. The exact setting should be at a position where no broadcast signal will be received. Turn the volume control all the way to the right (clockwise), turn the fidelity control to HIGH FIDELITY and the Phantom Control to NORMAL.

(e) Set the signal generator to 450 kilocycles.

(f) Adjust the middle trimmer and then the bottom trimmer of the 2nd I-F transformer for maximum reading on the output meter. Caution: do not attempt to adjust the top trimmer at this time. ALWAYS USE THE LOWEST GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

(g) Transfer the output lead of the signal generator from the 6K7 tube to the top cap of the 6A8 oscillator-modulator tube, leaving the tube's grid clip in place.

(h) Open the middle trimmer of the 1st I-F transformer three or four turns of the adjustment screw. (Care should be taken that the adjustment screw does not become dislodged from the nut.)

(i) Adjust the top trimmer and then the bottom trimmer of the 1st I-F transformer for maximum reading on the output meter.

(j) Adjust the middle trimmer of the 1st I-F transformer by closing until maximum reading is obtained on the output meter.

(k) Transfer the output lead of the signal generator from the 6A8 tube to the antenna terminal "A1" of the receiver and recheck the adjustment of the bottom trimmer of the 1st I-F transformer.

(l) To adjust the AFC system it will be necessary to transfer the output lead of the signal generator back to the top cap of the 6K7 I-F amplifier tube. The .02 mfd. condenser should still be connected in series with this lead.

(m) Insert a 0.5 millimeter in series with the cathode circuit of the 6J7 tube and with a strong 450 kilocycle signal from the signal generator, the reading of the cathode current should be recorded.

(n) Turn the Phantom Control to the MYSTIC HAND position and without changing the output of the signal generator, adjust the top trimmer condenser of the 2nd I-F transformer so that the reading of the 0.5 millimeter is the same as was recorded with the Phantom Control in the NORMAL position. This value of current will be obtained with the trimmer closed, with the trimmer open and at some intermediate position. A very slight adjustment while in the intermediate position will cause the meter to read from 0 to 1.5 milliamperes. This is the setting that should be used. An insulated screw driver should be used in adjusting the AFC trimmer condenser.

(o) As a final check on the AFC adjustment, disconnect the test equipment and tune-in a fairly weak broadcast station in the region of 1500 kilocycles. Turn the AFC "ON" and "OFF". If reception is the same in both positions and will automatically tune-in strong sta-

This model receiver should be turned-on and allowed to "warm-up" for about 15 minutes before aligning its circuits.

It is a High Fidelity receiver and in order to secure maximum performance the alignment should be done with precision instruments. The alignment condensers should not be readjusted to determine if they are properly tuned. Fig. 5 shows the selectivity curve of a receiver whose I-F amplifier was slightly mistuned while Fig. 6 shows a curve made from actual measurements of a receiver employing a triple-tuned I-F amplifier which was properly aligned with the use of a FREQUENCY MODULATED R-F signal generator and an oscilloscope.

The alignment of the AFC circuit may be checked by means of a modulated signal generator and output meter as follows:

(a) Connect one terminal of the output meter to P2 of one of the 6N6 Output tubes and the other terminal through a .1 mfd. or larger, condenser—not electrolytic to P2 of the other 6N6 Output tube.

(b) Connect the output of the signal generator through a .00025 mfd. condenser to the top cap of the 6A8 Oscillator-Modulator tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the "GND" terminal of the receiver chassis.

(c) Rotate the Phantom Control to the left-hand position (NORMAL).

(d) Adjust the frequency of the signal generator in the region of 450 kilocycles for maximum reading on the output meter.

(e) Without altering the connections or adjustments of the signal generator or output meter, connect an antenna to the antenna terminal "A1" and tune-in a local broadcasting station. Turn off modulation of signal generator. Adjust station selector slightly for zero beat.

(f) Rotate the Phantom Control to the MYSTIC HAND position and listen to the beat note. If the note is less than 200 cycles, or the equivalent of some tone below middle C on the piano, the AFC alignment is satisfactory.

(g) If the beat note is higher than middle C re-alignment is necessary.

(h) In cases where the beat note is not more than about two octaves above middle C or from 1000 to 1500 cycles the AFC circuit may be aligned for zero beat by making a slight adjustment of the top trimmer condenser on the 2nd I-F transformer. This circuit is very critical and a slight adjustment will produce a great change in the beat note.

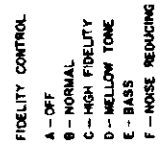
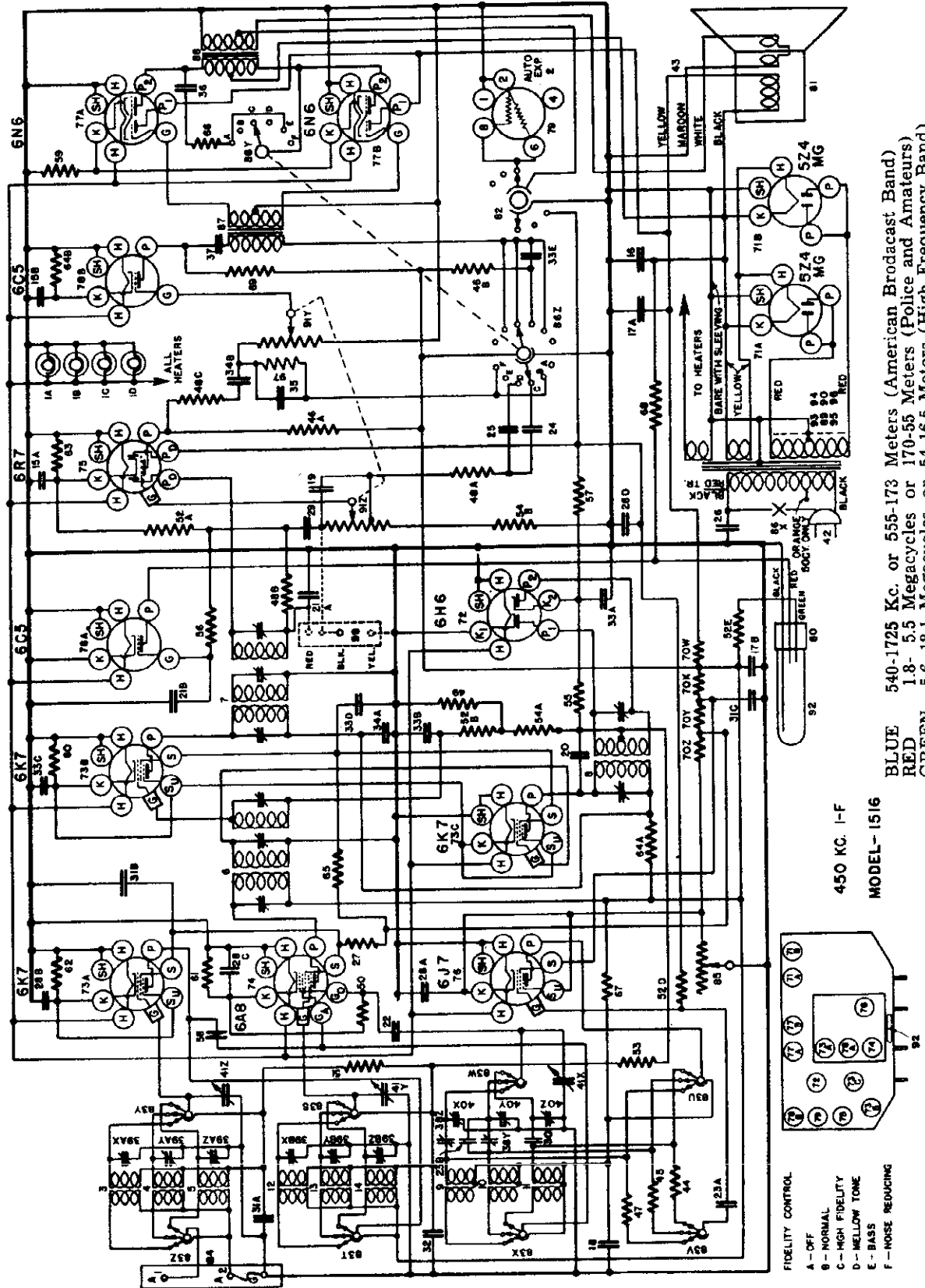
(i) Where the AFC is considerably out of alignment as evidenced by a beat note of higher than 1500 cycles the standard alignment procedure outlined below should be followed.

TUNING I-F AMPLIFIER
1. Conventional Method.

(a) Connect the output meter as outlined above in

(b) Adjust the 6J7 cathode bias to 6.5 volts with no

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FIDELITY CONTROL
 A - OFF
 B - NORMAL
 C - HIGH FIDELITY
 D - MELLOW TONE
 E - BASS
 F - NOISE REDUCING

450 KC. I-F
 MODEL - 1516

BLUE 540-1725 Kc. or 555-173 Meters (American Broadcast Band)
 RED 1.8- 5.5 Megacycles or 170-55 Meters (Police and Amateurs)
 GREEN 5.8- 18.1 Megacycles or 54-16.5 Meters (High Frequency Band)

MODEL 1516
Parts, Notes

CROSLLEY RADIO CORP.

SPECIFICATIONS

The Crosley Model 1516 radio is a fifteen-tube receiver featuring High Fidelity, Volume Expansion which is accomplished by the Auto-Expressionator tube and Automatic Frequency Control which is known as the Mystic Hand.

The tubes used are 6K7 R-F Amplifier, 6A8 Oscillator-Modulator, 6J7 AFC Control, 6K7 Signal I-F Amplifier, 6K7 AFC Diode and I-F Amplifier, 6H6 AFC Detector, 6R7 Diode and 1st A-F Amplifier, 6C5 A-F Driver, (2) 6N6 Output, (2) 5Z4 Rectifiers, 6C5 Tuning In-

icator Amplifier, W42419A Neon Tuning Indicator Tube and W-41187 Auto-Expressionator Tube.

AUTO-EXPRESSIONATOR

The Auto-Expressionator tube, item No. 79, Fig. 1, is connected across the voice coil of the speaker. When it is operating its resistance varies so as to increase the volume of loud tones, thus giving a wider volume range to reproduced music, which tends to compensate for the electrical limitations of broadcasting equipment.

PART LIST—MODEL 1516

Item No.	Part No.	Description	Item No.	Part No.	Description
1ABCD	W —37922	Dial Light Bulb	50	—35930	Resistor, 200,000 Ohm. ¼W.
	W —40570	Dial Light Shield	51	—35601	Resistor, 300,000 Ohm. ¼W.
2	W —41187	Auto-Expressionator Tube	52AB		
3	G 94—32000	Antenna Coil B. C. B.		—36322	Resistor, 500,000 Ohm. ¼W.
4	G108—32000	Antenna Coil Pol. B.	53	—38623	Resistor, 750,000 Ohm. ¼W.
5	G107—32000	Antenna Coil H. F. B.	54AB	—35602	Resistor, 1 Megohm. ¼W.
6	G107—32004	1st I-F Assembly	55	—36176	Resistor, 1.3 Megohm. ¼W.
7	G 91—32001	2nd I-F Assembly	56		NONE
8	G108—32004	A-F-C I-F Assembly	57	—36688	Resistor, 3 Megohm. ¼W.
9	G 97—32002	Oscillator Coil B. C. B.	58	G101—34403	R-F Neutralizing Cond.
10	G 96—32002	Oscillator Coil Pol. B.	59	W —23012A	Resistor, 40 Ohm. ¼W. Flex.
11	G 95—32002	Oscillator Coil H. F. B.	60	W —35467	Resistor, 220 Ohm. ½W. Flex.
12	G 68—32001	R-F Coil B. C. B.	61	W —25937	Resistor, 275 Ohm. ½W. Flex.
13	G 75—32001	R-F Coil Pol. B.	62	W —28589	Resistor, 350 Ohm. ½W. Flex.
14	G 74—32001	R-F Coil H. F. B.	63	W —28106	Resistor, 500 Ohm. ½W. Flex.
15AB	W —41598	Condenser, 50 Mf. 25V.	64AB	W —21452	Resistor, 1100 Ohm. ¾W. Flex.
16	W —36055	Condenser, 35 Mf. 400V.	65	W —23013	Resistor, 2000 Ohm. 1½W. Flex.
17AB	W —36057	Condenser, 40 Mf. 300V.	66	W —23907	Resistor, 750 Ohm. 1½W. Flex.
18	G 18—34000	Condenser, 5600 Mmf.	67	—4921C	Resistor, 10000 Ohm. 1W.
19	G 5—34002	Condenser, .00005 Mf. 200V.	68	W —42418	Resistor, 30000 Ohm. 4W.
20		NONE	69	—36952	Resistor, 30000 Ohm. 1W.
21AB	G2 —34002	Condenser, .0001 Mf. 200V.	70Z		Resistor, 4000 Ohm.
22	G6 —34002	Condenser, .000025 Mf. 200V.	70Y		Resistor, 1000 Ohm.
23AB	G3 —34002	Condenser, .0005 Mf. 200V.	70X	W —41966	Resistor, 3000 Ohm. } Candohm
24	W —35758	Condenser, .008 Mf. 400V.	70W		Resistor, 200 Ohm. }
25	W —41461	Condenser, .0014 Mf. 200V.	71AB	G154—36400	Socket Type 5Z4
26	W —30805	Condenser, .01 Mf. 400V.	72	G155—36400	Socket Type 6H6
27	—6705	Resistor, 3500 Ohm. 1W.	73ABC	G151—36400	Socket Type 6K7
28AB	W —36541	Condenser, .02 Mf. 160V.	74	G156—36400	Socket Type 6A8
CD	W —28621	Condenser, .02 Mf. 200V.	75	G164—36400	Socket Type 6R7
29	W —41209	Condenser, .048 Mf. 200V.	76	G157—36400	Socket Type 6I7
30	W —35936	Condenser, .05 Mf. 200V.	77AB	G165—36400	Socket Type 6N6
31ABC	W —32380	Condenser, .05 Mf. 200V.	78AB	G152—36400	Socket Type 6C5
32	W —27216	Condenser, .05 Mf. 200V.	79	G167—36400	Auto-Expressionator Socket
33AB	W —32780B	Condenser, .05 Mf. 400V.	80	G2 —42584	Tuning Indic. Socket
CDE	W —28904	Condenser, .004 Mf. 200V.	81	734CJ4 "M"	Speaker Spec. 1-D-437
34AB	W —22588	Condenser, .1 Mf. 400V.		—41603	Cone Assembly for above Speaker
35	W —42554	Condenser, .12 Mf. 160V.		—41601	Field Coil for above Speaker
36	—41218	B. C. Osc. Series Trimmer	82	W —41029B	Phantom Control Switch
37		Pol. Osc. Series Trimmer	83	—41235A	Band Selector Switch
38Z	W —37891	3 Section Shunt Trimmer	84	G27 —26719	Ant. and Gnd. Terminal Assembly
38Y	W —35951	3 Section Shunt Trimmer	85	W —41287	A-F-C Bias Control, 300 Ohm. ½W.
38AB	W —33002	3 Gang Var. Tuning Cond.	86	B —42295A	Fidelity and Line Switch
40	MG12—42425	Dial Drive Assembly	87	G2 —37995	A-F Driver Transformer
41	—42421	Dial Glass (Calibrated)	88	G62 —24628	Out-Put Transformer
	—42325B	Drive Unit only	89	G1 —37900	Power Transformer, 60 Cy. 110V.
	—42598A	Dial Mask (Paper Backing)	(93)	G5 —37900	Power Transformer, 25 Cy. 110V.
	—41144	Hand—Long Dial	(94)	G6 —37900	Power Transformer, 50 Cy. 220V.
	—42180	Hand—Short Dial	(95)	G7 —37900	Power Transformer, 50 Cy. 110V.
	W —40486	Screw—Hand Mounting	(96)	G8 —37900	Power Transformer, 25 Cy. 220V.
	E —13648	R. H. (Mystic Hand) Flipper	90	G2 —37900	Power Transformer, Universal
	E —13647	L. H. (Fidelity) Flipper	91Z		(Vol. Control, 3 Meg., Tap. .3 Meg.
	W —43080	Flipper Control Cable	91Y		(Vol. Control, 1 Meg.
	W —42308A	Flipper Cont. Cable Pulley	92	W —42419	Neon Tuning Indic. Tube
	—40638	Band Indic. Cont. Cable	97	—21237A	Resistor, 60,000 Ohm: ¼W.
	—40537	Flexible Coupling Unit	98	G37 —26719	Phono. Terminal Assembly
	—41157	Drive Belt		C —43134A	Escutcheon
42	B —33906A	Power Cord and Plug		C —42044	Lens, Escutcheon
43	G2 —37918	Speaker Cable		—42043	Escutcheon Rubber Mounting
44	—36760	Resistor, 20,000 Ohm. ¼W.	W —36117		Rubber Mounting Foot
45	—33390	Resistor, 30,000 Ohm. ¼W.	W —42490		Knob (Fidelity)
46AB	—36761	Resistor, 40,000 Ohm. ¼W.	W —37339		Knob (Station and Volume)
47	—34019	Resistor, 75,000 Ohm. ¼W.	W —40192		Knob (Band Sel. and A-F-C)
48ABC	—35600	Resistor, 100,000 Ohm. ¼W.	W —40230B		Emblem
49	—35929	Resistor, 150,000 Ohm. ¼W.	W —32620		Nut, Emblem Mounting
			W —35922		Grille Cloth
			—6-R		Cabinet

CROSLLEY RADIO CORP.

MODEL 1516
 Socket, Trimmers
 Chassis, Voltage
 Resonance Curves
 Photo Pickup

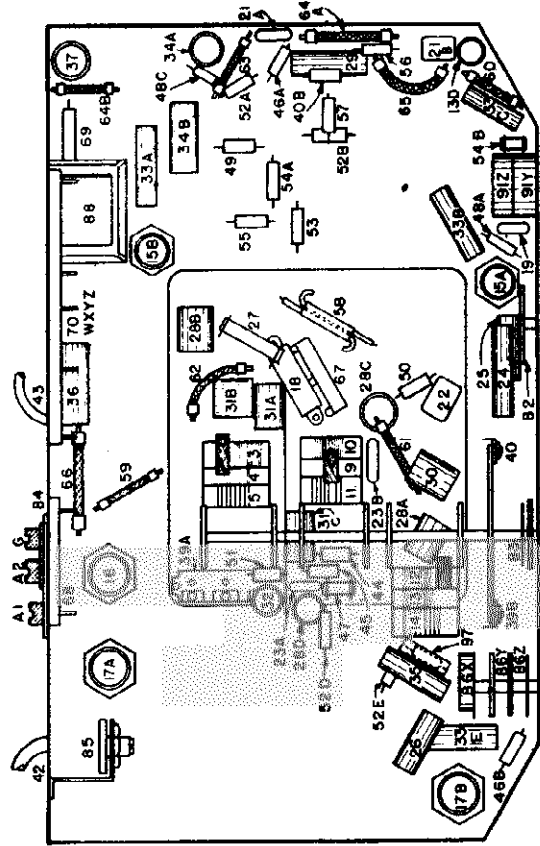


Fig. 3. Bottom View—1516

TUBE SOCKET VOLTAGE READINGS

Tube	Function	H	P ₁	P ₂	S	K	G _a	G _b
6K7	R-F Amplifier	238	---	---	105	2.5	---	---
6A8	Oscillator-Modulator	6.3	238	---	106	2.5	170	-6 to -12
6J7	AFC Control	6.3	170	---	130	5.8	---	---
6K7	I-F Amplifier	6.3	220	---	105	3.0	---	---
6K7	AFC Diode and I-F Amplifier	6.3	220	---	100	3.0	---	---
6H6	AFC Detector	6.3	---	---	---	---	---	---
6R7	Diode and 1st A-F Amplifier	6.3	80	---	---	2.0	---	---
6C5	A-F Driver	6.3	220	---	---	5.8	---	---
6N6	(2) Rectifiers	6.3	238	---	---	2.0	---	---
5Z4	(2) Output	5.0	360	---	---	2.0	---	---
6C5	(2) Rectifiers	6.3	150	---	---	2.0	---	---
W-42419A	Neon Tuning Tube	---	150	---	---	---	---	---
W-41167	Auto-Expression Tube	---	150	---	---	---	---	---

Power consumption approximately 142 watts.
 All readings taken on 117.5 volt power supply

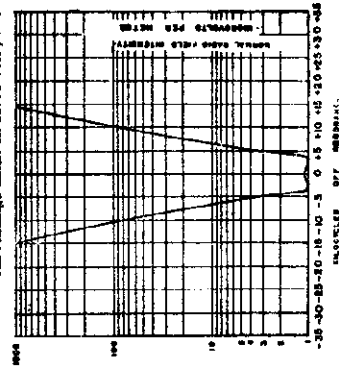


Fig. 6

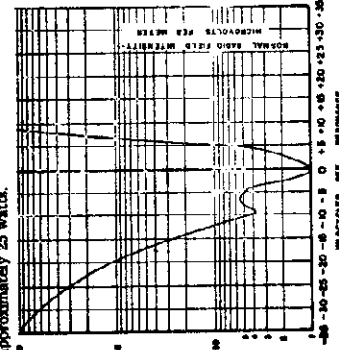


Fig. 5

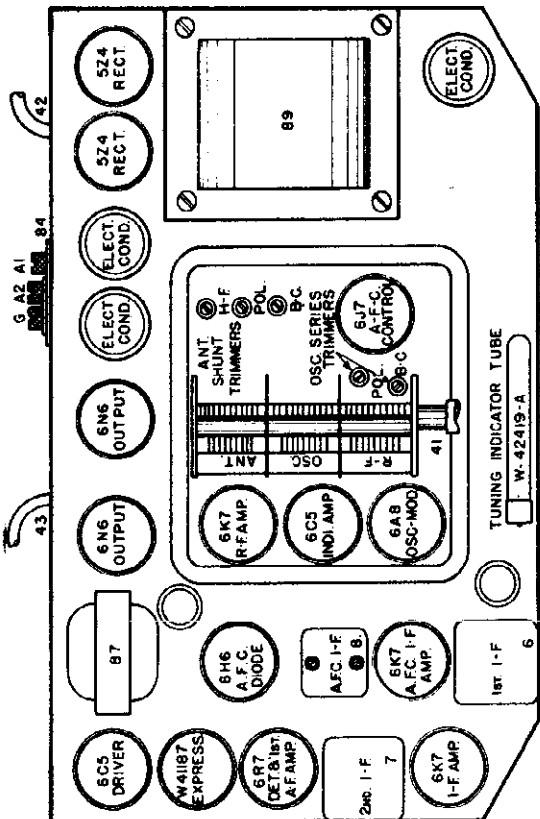


Fig. 2. Top View—1516

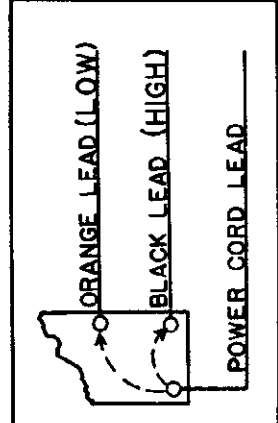
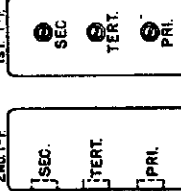


Fig. 7. Phonograph Pickup



50 CYCLE POWER TRANSFORMER ADJUSTMENT

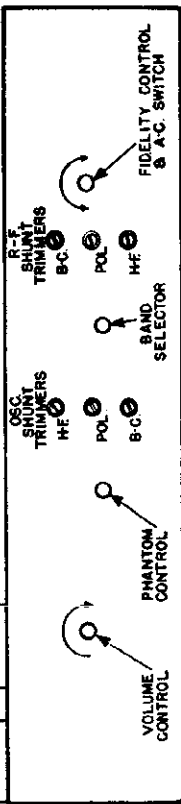


Fig. 4. Front View—1516

MODEL 1516

Alignment Notes

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should be used in place of the condenser.

Each band where provision is made for series alignment, should first be aligned and then the BLUE and RED bands. The band selector switch should be set for the band being aligned and the signal generator should be set to the frequency indicated in "C" below for each adjustment.

(a) Adjust the "OSC", "R.F." and "ANT." shunt trimmers in the order given for maximum output. Re-adjust the station selector slightly so that the generator signal is tuned in with maximum output and then check in the order given. DO NOT READJUST THE "OSC" TRIMMER.

NOTE: When shunt aligning the RED and GREEN bands care must be exercised so that the circuits will be aligned on the fundamental frequency rather than on the image frequency which is approximately 900 kilocycles less than the fundamental. To check on this, increase the output of the signal generator ten times or more and try to tune in the signal both at the generator frequency as indicated on the station selector dial and at approximately 900 kilocycles less than the correct frequency. If the circuits have been properly aligned the signal can be tuned in at both positions but much stronger at the correct position.

(b) To align the series trimmers, "osc. series" Fig. 2, set the signal generator to the frequency indicated below and then tune in this signal with the station selector for maximum output. At the time that any series trimmer is being adjusted, rotate the station selector back and forth slightly until no further improvement in output is obtained.

(c) SIGNAL INPUT FREQUENCIES

American Broadcast Band: BLUE 1,400 Kilocycles, 600 Kilocycles
Police and Amateur Band (RED) 5,000 Kilocycles, 2000 Kilocycles
High Frequency Band (GREEN) 18,000 Kilocycles

PHANTOM CONTROL

The Phantom Control permits the listener to use the Mystic Hand (Automatic Frequency Control) and the Auto-Expressionist as desired. The various positions of the control are shown on an illuminated indicator on the dial.

The receiver may be operated with normal power output and fidelity, such as would ordinarily be desired in the average home, with the control in the NORMAL position.

The Mystic Hand automatically tunes the receiver accurately to the strongest signal within a frequency range of approximately 15 kilocycles of the station selector setting.

50 CYCLE POWER TRANSFORMER

Receivers equipped with a 50 cycle power transformer have a "high" and "low" voltage tap on the under side of the chassis. The "high" voltage lead (BLACK) and the "low" voltage lead (ORANGE) are connected to a terminal strip near the transformer.

The voltage range of the "low" tap of the 95-130 volt transformer is from 95 to 112½ volts and of the "high" tap is from 112½ to 130 volts. The range of the "low" tap of the 190-250 volt transformer is from 190 to 225 volts and of the "high" tap is from 225 to 260 volts.

The accompanying illustration shows the connections for changing from high to low or low to high line voltage. Note the "jumper" wire which is attached to the terminal at which one side of the power cord is attached. The other end of this jumper wire should be connected to the ORANGE or BLACK lead of the transformer primary, according to the line voltage of the receiver is to be used on.

NOTE: Any change made in the power supply circuit of the receiver should be plainly stamped or otherwise permanently recorded on the rear of the chassis.

II. Oscilloscope Method.

(a) Connect the output of a FREQUENCY MODULATED R.F. signal generator through a .02 mf. condenser to the top cap of the 6K7 I.F. amplifier tube, leaving the tube's grid clip in place. Connect the ground lead of the signal generator to the antenna terminal of the antenna coil. LEAVE THE OTHER LEADS OF THE SCREEN GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Connect the vertical plates of the cathode ray oscilloscope to the antenna terminal of the antenna coil and the horizontal plates to the top cap of the 6K7 tube. The binding posts marked "GND" should be connected to the chassis and the other binding post should be connected to the antenna terminal of the antenna coil. Be sure the oscilloscope is connected from D.C. by connecting a condenser, 1 mf. to .05 mf. in series with the lead connected to the plate of the 6K7 tube.

(c) Set the band selector switch to the Broadcast Band and rotate the station selector to approximately 60 on the dial. The exact setting should be at a position where no broadcast signal will be received. Turn the volume control knob to the right (ON), turn the fidelity control to NORMAL and turn the phantom control to NORMAL.

(d) Set the signal generator to 450 kilocycles. See instructions supplied with signal generator and oscilloscope.

(e) Open the middle trimmer condenser on the 2nd I.F. transformer three or four turns of the adjustment screw. (Care should be taken that the adjustment screw does not become dislodged from the nut.)

(f) Adjust the top trimmer of the 2nd I.F. transformer so that the nose of the selectivity curve is centered on the resonance axis (R) of the transparent scale supplied with the oscilloscope.

(g) Adjust the bottom trimmer of the 2nd I.F. transformer for maximum amplitude of the selectivity curve on resonance line (R).

(h) Reduce the output of the signal generator and adjust the middle trimmer of the 2nd I.F. transformer for maximum amplitude and symmetry of the selectivity curve about the resonance line.

NOTE: Keep the base of the selectivity curve centered on the transparent scale from -15 to +15 and keep the signal generator output as low as possible in order to prevent AVC action in the receiver.

(i) Readjust the bottom trimmer of the 2nd I.F. transformer for maximum symmetry and amplitude.

(j) Transfer the output lead of the signal generator and modulator tube, leaving the tube's grid clip in place.

(k) Open the middle trimmer of the 1st I.F. transformer three or four turns of the adjustment screw from the closed position. (Care should be taken that the adjustment screw does not become dislodged from the nut.)

(l) Increase the output of the signal generator and adjust the top trimmer of the 1st I.F. transformer for maximum symmetry and amplitude.

(m) Adjust the bottom trimmer of the 1st I.F. transformer for maximum amplitude.

(n) Reduce the output of the signal generator and adjust the middle trimmer of the 1st I.F. transformer for maximum symmetry and amplitude.

(o) Carefully check the alignment (b), (i) and (n) for more accurate adjustment. (See Fig. 6).

Aligning R.F. Amplifier.

The R.F. amplifier can best be aligned in the conventional manner, using a modulated signal generator and output meter.

When aligning the R.F. amplifier the output lead of the signal generator is connected to the antenna terminal, "A1" of the receiver. For the BLUE and RED bands a .00025 mf. condenser must be connected in series with the output lead of the signal generator and for the high frequency band a 400-ohm carbon resistor

the adjustment screw does not become dislodged from the nut.)

(e) Adjust the top trimmer and then the bottom trimmer (See Fig. 2) of the 2nd I.F. transformer for maximum output. Do not readjust the middle trimmer. ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

(f) Transfer the output lead of the signal generator from the 6K7 tube to the top cap of the 6AB Osc. Mod. tube, leaving the tube's grid clip in place.

(g) Open the middle trimmer of the 1st I.F. transformer three or four turns of the adjustment screw, from the closed position. (Care should be taken that the adjustment screw does not become dislodged from the nut.)

(h) Adjust the top trimmer and then the bottom trimmer of the 1st I.F. transformer for maximum output.

(i) Transfer the output lead of the signal generator from the 6AB tube to the antenna terminal, "A1" of the receiver and increase the output of the signal generator if necessary.

(j) Adjust the middle trimmer of the 2nd I.F. transformer for maximum output. (Care should be taken that the adjustment screw does not become dislodged from the nut.)

(k) Adjust the top trimmer of the 1st I.F. transformer for maximum output.

(l) To adjust the AFC system it will be necessary to remove the signal generator lead from the receiver and adjust the 6J7 cathode bias to 6.5 volts by means of the variable control. (Illustration No. 95—Fig. 3) in this cathode circuit.

(m) Turn the phantom control to the left (NORMAL) and connect the signal output lead through a .02 mf. condenser to the top cap of the 6AB oscillator-modulator tube, leaving the tube's grid clip in place.

(n) Adjust the front trimmer (plate winding) of the AFC I.F. transformer for minimum reading on the output meter. It will be necessary to retard the volume control of the receiver in order to prevent AVC action. A fairly strong LF signal will be required. (An illuminated screw driver should be used for aligning the AFC amplifier system.)

(o) Insert an 0.5 millimeter in series with the lead to the cathode terminal of the 6J7 socket and note the current reading.

(p) Turn the phantom control to its middle position and increase the output of the signal generator to approximately 100,000 microvolts.

(q) Transfer the output lead of the signal generator from the 6AB tube to the top cap of the 6K7 AFC I.F. amplifier tube, leaving the tube's grid clip in place.

(r) Adjust the rear trimmer of the AFC I.F. transformer for the same value of cathode current as obtained in (p) above. This value of current will be obtained with the trimmer closed, with it open and at some intermediate position. A very slight adjustment while in the intermediate position will cause the meter to read from 0 to 1.5 milliamperes. This is the setting that should be used.

(s) To check on the AFC adjustment, disconnect the equipment and tune in a fairly weak broadcast station in the region of 1500 kilocycles. Turn the AFC ON and OFF. If reception is the same in both positions and will automatically tune-in strong stations within approximately plus or minus 15 kilocycles of the station selector setting with the AFC ON, the AFC is properly aligned. If distortion is noted and the set will not automatically tune-in stations as described, the AFC alignment should be rechecked.

ALIGNMENT PROCEDURE

This model receiver should be turned on and allowed to "warm-up" for about 15 minutes before aligning its circuits.

It is a High Fidelity receiver and in order to secure maximum performance the alignment should be done with precision instruments. The alignment condensers should not be readjusted just to determine if they are properly tuned. Fig. 5 shows the selectivity curve of a receiver whose I.F. amplifier was slightly mistuned while Fig. 6 shows a curve made from actual measurements which was properly aligned with the use of a FREQUENCY MODULATED R.F. signal generator and an oscilloscope.

The alignment of the AFC circuit may be checked by means of a modulated signal generator and output meter as follows:

(a) Connect one terminal of the output meter to P2 of one of the 6N6 Output tubes and the other terminal through a .1 mf. or larger, condenser—not electrolytic to P2 of the other 6N6 Output tube.

(b) Connect the output of the signal generator through a .00025 mf. condenser to the top cap of the 6AB Oscillator-Modulator tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the "GND" terminal of the receiver chassis.

(c) Rotate the Phantom Control to the left-hand position (NORMAL).

(d) Adjust the frequency of the signal generator in the region of 450 kilocycles for maximum reading on the output meter.

(e) Without altering the connections or adjustments of the signal generator or output meter, connect an antenna to the antenna terminal, "A1" and tune-in a local broadcasting station. Turn off modulation of signal generator. Adjust station selector slightly for zero beat.

(f) Rotate the Phantom Control to the Mystic Hand position and listen to the beat note. If the note is less than 200 cycles, or the equivalent of some one below middle C on the piano, the AFC alignment is satisfactory.

(g) If the beat note is higher than middle C re-aligning is necessary.

(h) In cases where the beat note is not more than about two octaves above middle C or from 1000 to 1500 cycles, the AFC circuit may be aligned for zero beat by making a slight adjustment of the rear trimmer condenser on the AFC I.F. transformer (Fig. 2, item No. 8).

This circuit is very critical and a slight adjustment will produce a great change in the beat note.

(i) Where the AFC is considerably out of alignment as evidenced by a beat note of higher than 1500 cycles the standard alignment procedure outlined below should be followed.

TUNING I.F. AMPLIFIER

The I.F. amplifier employs two triple-tuned signal I.F. transformers and one double-tuned AFC I.F. transformer.

I. Conventional Method

(a) Connect the output meter and signal generator as outlined in (b) except that the signal generator should be connected through a .02 mf. condenser to the top cap of the 6K7 I.F. amplifier tube, leaving the tube's grid clip in place.

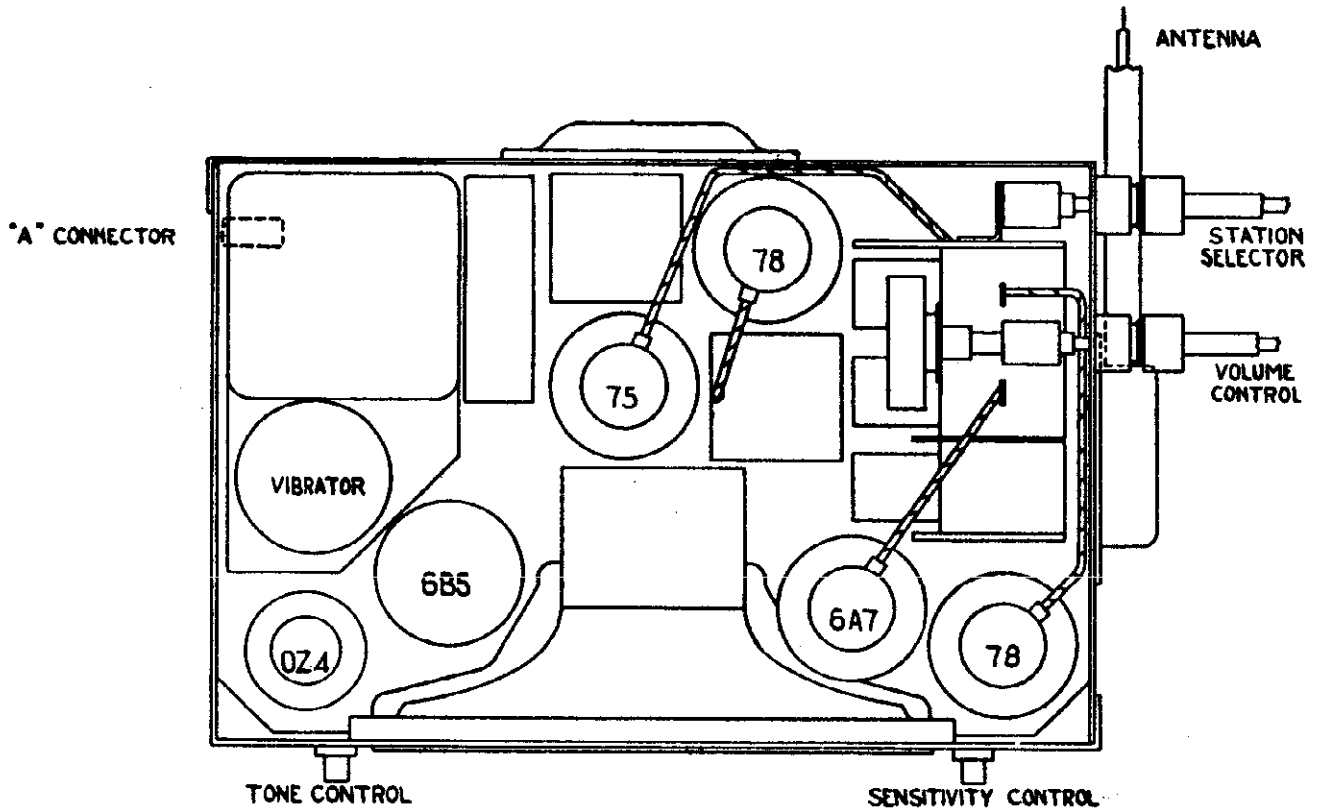
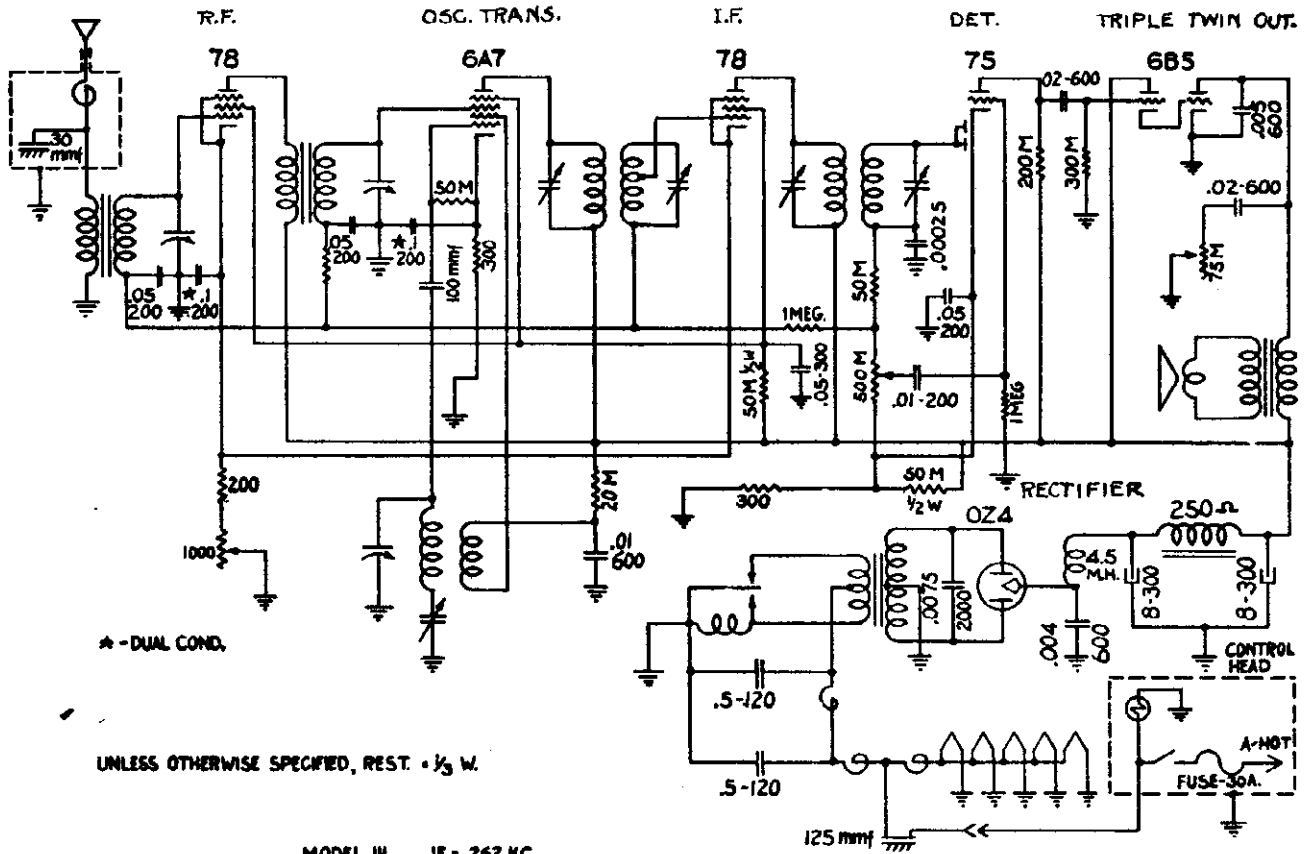
(b) Set the band selector switch to the Broadcast Band and rotate the station selector to approximately 60 on the dial. Turn the volume control knob to the right (ON). Turn the fidelity control to its middle position and turn the phantom control to the left (NORMAL).

(c) Set the signal generator to 450 kilocycles.

(d) Open the middle trimmer condenser of the 2nd I.F. transformer (Fig. 4) three or four turns of the adjustment screw. (Care should be taken that

DETROLA RADIO CORP.

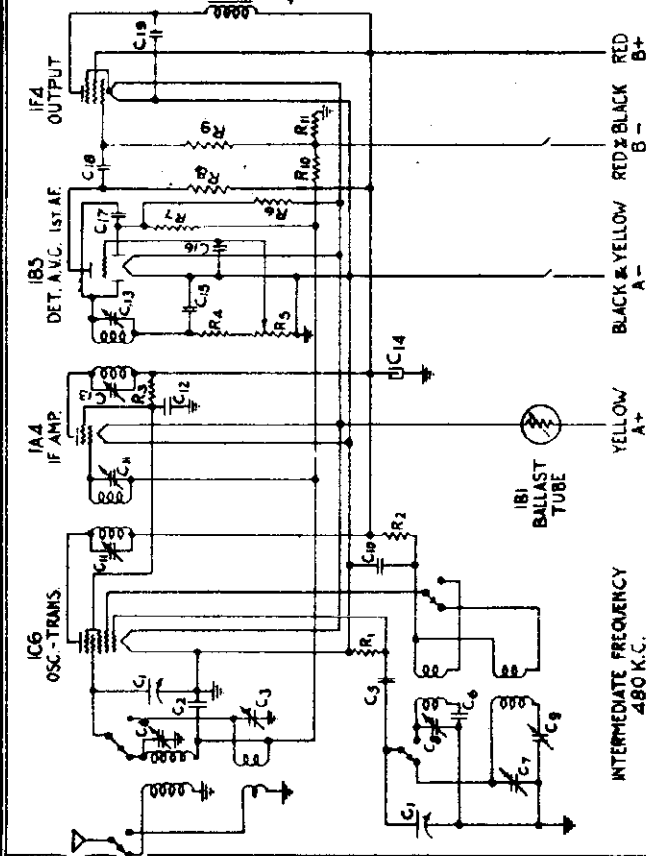
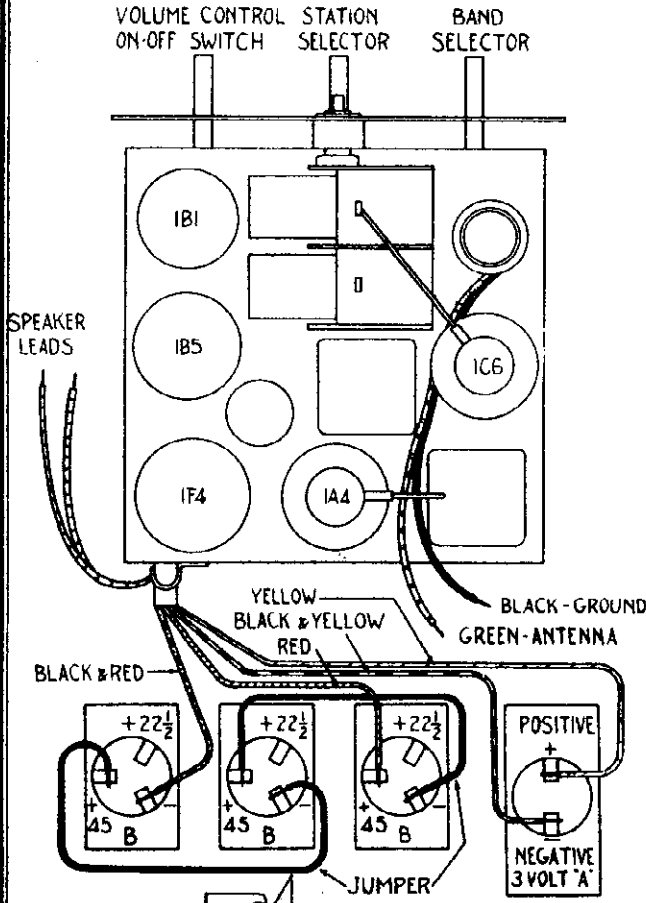
MODEL 111
Schematic
Socket



MODEL 117B
Schematic, Socket

DETROLA RADIO CORP.

Alignment, Parts



Batteries required for operation of this receiver are:

- 1— 3 Volt dry "A" pack.
- 3—45 Volt Standard "B" batteries.

No "C" batteries are necessary.

DO NOT USE A 6 VOLT BATTERY.

Connect a high impedance AC voltmeter across loud-speaker terminals. Volume control should be set a few degrees back of maximum volume position. Use a weak signal from generator. Strong signals tend to cause improper adjustments.

IF. Connect signal generator ground to receiver ground. Using .1 mfd condenser in series with "high" side of generator, apply 480 KC signal to grid of 1A4 and adjust second IF transformer; same for first IF transformer, applying signal to grid of IC6.

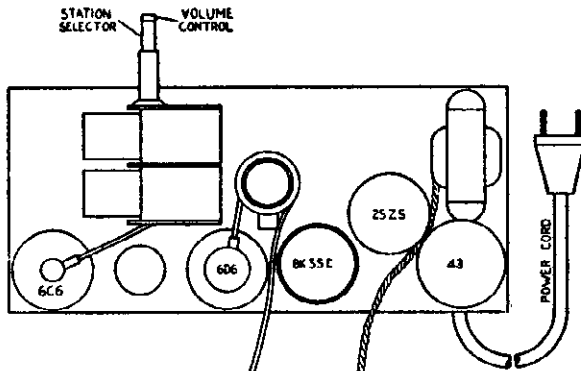
RF. Using 200 mmf condenser in series with generator, feed 1725 KC signal to antenna lead and adjust BC oscillator trimmer (located center under base). Set generator to 1400 KC. Tune receiver and adjust BC antenna trimmer (located on coil on top of base). Set generator to 600 KC. Tune receiver and adjust BC oscillator padder (located between variable and IB1 tube). The tuning condenser should be rocked back and forth through the signal while padder is being adjusted to obtain perfect alignment.

Using 400 ohm resistor in series with generator, set band selector in SW (right) position, and feed 15600 KC signal to antenna lead and adjust SW oscillator trimmer (on coil back of band selector switch); screw trimmer down tight and unscrew to SECOND peak. Set generator to 15000 KC and adjust SW antenna trimmer (on coil back of tuning control); screw trimmer down tight and unscrew to FIRST peak. Rocking tuning control back and forth through signal while adjusting screw. Above procedure for alignment at 15000 KC should be followed exactly to insure proper tracking. A "dead spot" at about 12000 KC will result if oscillator and antenna circuits are not set in proper relation to each other.

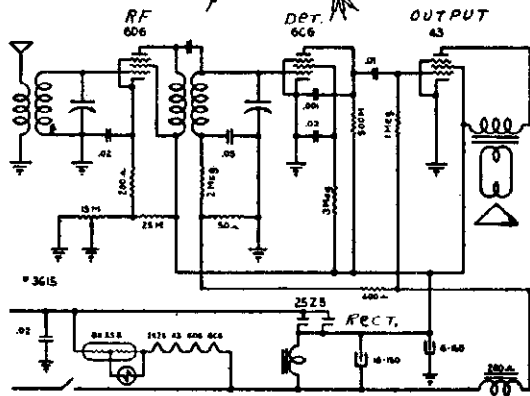
Symbol	Part No.	Description	Part No.	Description
R1, R4	631	50M 1/3 watt	1408	Pointer screw
R2	617	20M 1/3 watt	2364	Dial glass
R3	621	25M 1/3 watt	2365	Dial glass retainer
R5	2699	500M volume control with DPST switch	1151	Escutcheon screw
R6, R7	2599	1 meg ± 10% 1/3 watt	2707	First IF transformer
R8	602	250M 1/3 watt	2942	Second IF transformer
R9	624	1 meg 1/3 watt	2685	Broadcast antenna coil
R10	2693	2 meg ± 10% 1/3 watt	2686	Broadcast oscillator coil
R11	2946	400 ohms ± 10% 1/2 watt	2761	Short wave oscillator coil
C1	2664	350 mmf variable	2762	Short wave antenna coil
C2, C12	572	1 200V	2696	Band selector switch
C3, C7	1611	3-35 Trimmer	833	4-prong socket
C4, C8	2597	1-10 Trimmer	789	6-prong socket
C5	2780	50 mmf Mica	1489	5-prong socket
C6	2694	.005 ± 5%	2949	PM dynamic speaker
C9	2560	Variable padder	2378	Pointer
C10	2385	.02 200V		
C11, C13		IF trimmers		
C14	2698	16 MF electrolytic		
C15, C16				
C17	1286	250 mmf Mica		
C18	581	005 600V		
C19	2695	.003 600V		

DETROLA RADIO CORP.

MODEL 130
 MODEL 134X
 MODEL 141A
 MODEL 157A
 Schematics
 Sockets

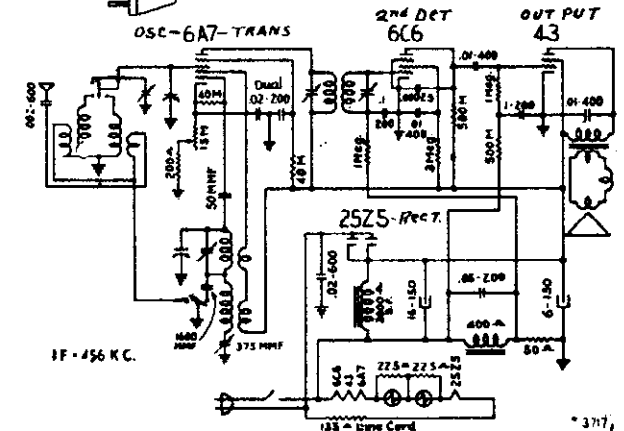
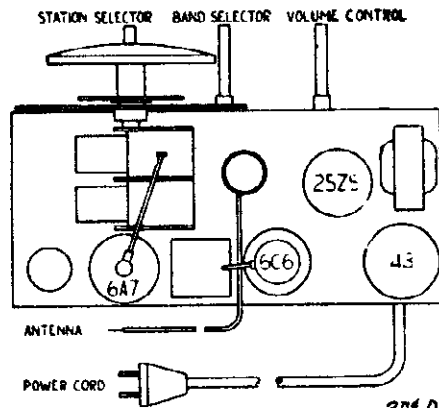


* 3616



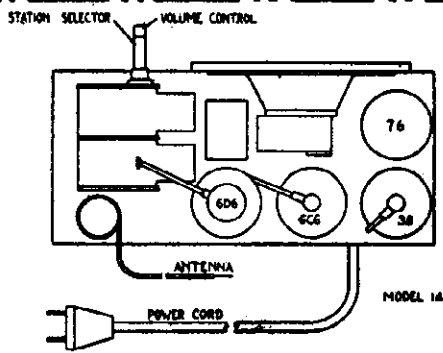
* 3615

MODEL 130

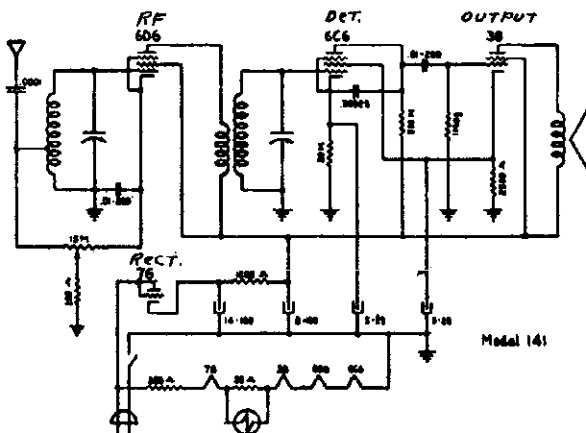


* 3717

MODEL 134-X

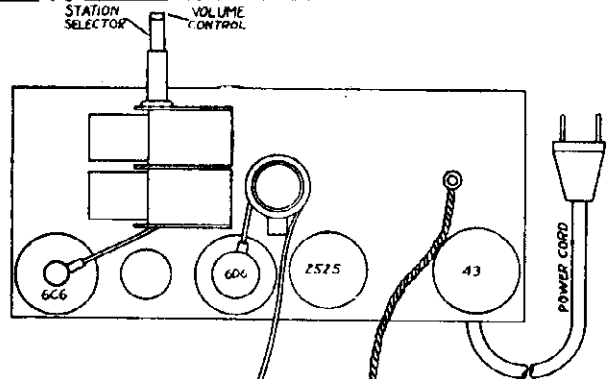


MODEL 141

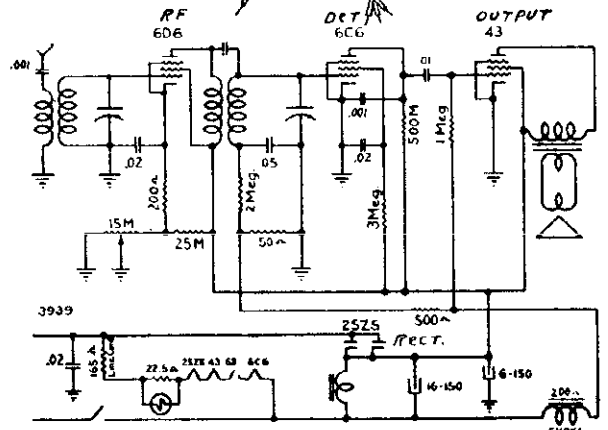


Model 141

MODEL 141-A



* 3940



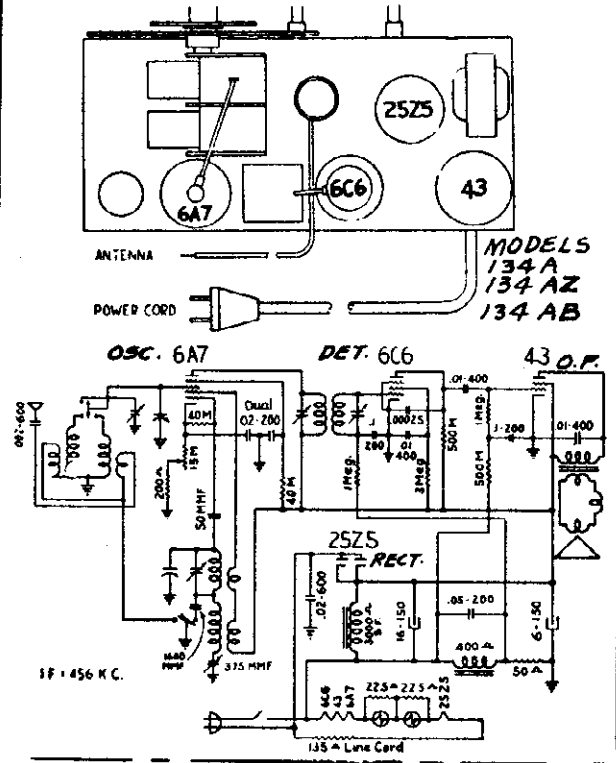
3939

MODEL 157-A

MODELS 134A, 134AZ, 134AB
MODELS 135, 135E

DETROLA RADIO CORP.

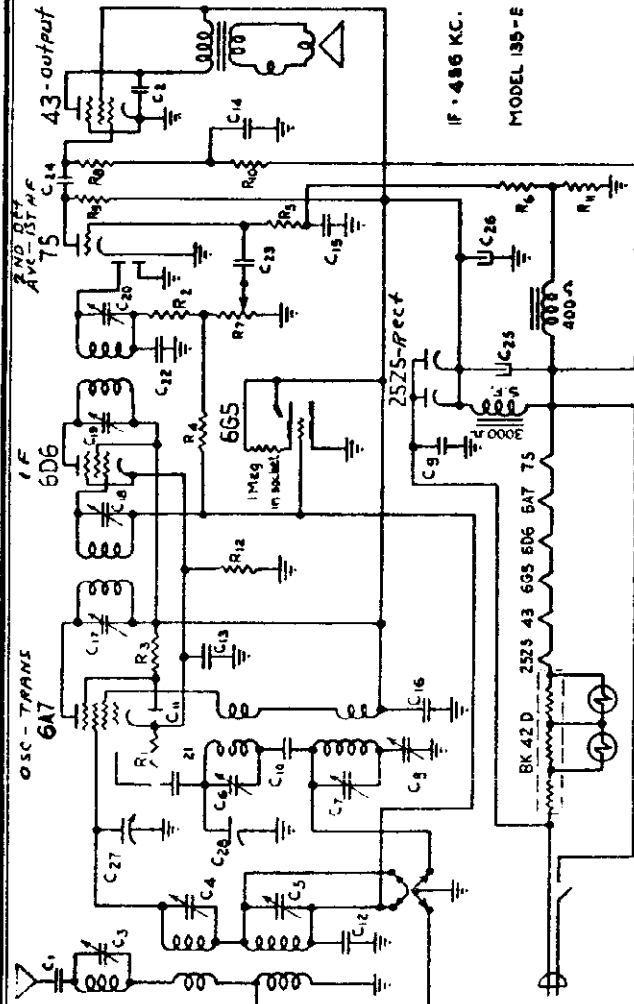
Schematics, Sockets



- 1- 43 Power Output
1- 25Z5 Rectifier
1- 6G5 Tuning Indicator
1- BK-42-D Voltage Regulator

PARTS LIST — MODEL 135

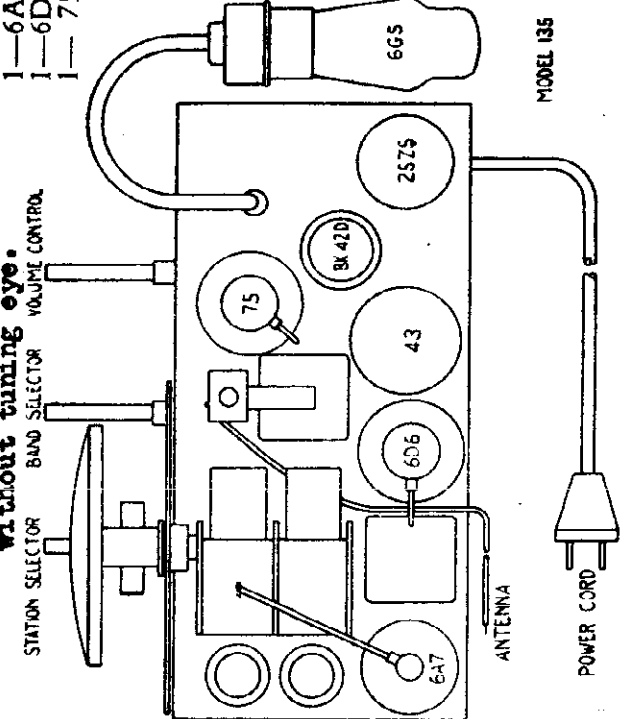
- C17, C18, C19, C20 R4, R5, R6 1 meg. 1/3 w.
100 - 125 trimmer
C21 50 mmf. mica
C22 250 mmf. mica
C23, C24 .01 - 600 v.
C25 16 mfd. 150 v.
C26 24 mfd. 150 v.
C27, C28 variable air
R1, R2, 50M 1/3 w.
R3 20M 1/3 w.
R7 500M volume control and switch
R8 500M 1/3 w.
R9 200M 1/3 w.
R10 300M 1/3 w.
R11 20 ohms. 1/2 w.
R12 100 ohms. 1/3 w.



MODEL 135 same as MODEL 135-E but without tuning eye.

- Tubes required are:
1- 6A7 Oscillator-Translator
1- 6D6 Intermediate Frequency Amplifier
1- 6G5 Detector-Automatic Volume Control
1- 43 First Audio

- C1, C2 .005 - 600 v.
C3 180 mmf. trimmer
C4, C5, C6, C7, 1 - 10 mmf. trimmer
C8 350 mmf. padder
C9 .02 - 600
C10 1150 mmf. mica
C11, C12 .05 - 200
C13, C14, C15, C16 1 - 200 v.



DETROLA RADIO CORP.

I. F. Alignment

The I.F. frequency of this receiver is 456 K.C. For realignment, use the following procedure.

It is necessary to use an accurately calibrated signal generator. Couple the signal generator to the grid of the 6A7 tube with a tenth microfarad condenser in series with the "high" lead of the signal generator. Connect the ground side of the signal generator to the chassis. Set the signal generator to 456 K.C. Be sure the wave switch of the set is in the broadcast position and the volume control set at maximum. Attenuate the signal generator so that the signal is just audible in the speaker. If an output meter is used, it should be connected across the voice coil terminals of the speaker. Use 1/2 volt as standard output.

Adjust the 2nd I.F. transformer first. Each screw should be adjusted for maximum output. After number two I.F. has been adjusted, number one I.F. should be adjusted for maximum output. After both transformers have been adjusted, it is necessary to recheck No. 2 transformer and then recheck No. 1.

See TUBE LAYOUT for location of I.F. and R.F. trimmers and padder.

R. F. Alignment

To align the broadcast band, proceed as follows: First, connect the ground side of the signal generator to the chassis. Connect the high side of the signal generator with a .00025 condenser, in series to the antenna lead of the set. Make sure the band switch of the set is in the broadcast position. Set the

volume control to maximum. Turn the station selector to the highest frequency (as far as it will go). Set the signal generator to 1720 K.C. Adjust the oscillator trimmer until the signal is heard. After the oscillator has been set at 1720 K.C., turn the station selector to 1400 K.C. Set the signal generator to 1400 K.C. When the signal is heard, adjust the first detector trimmer for maximum output.

When the set has been adjusted at 1400 K.C., turn the station selector dial to 600 K.C. Set the signal generator to 600 K.C. When the signal is heard, adjust the padder condenser by rocking the selector back and forth. While adjusting the padder screw, it is necessary to move the selector so that the signal may be kept in tune while adjusting the padder screw. This procedure should be followed until maximum output is obtained.

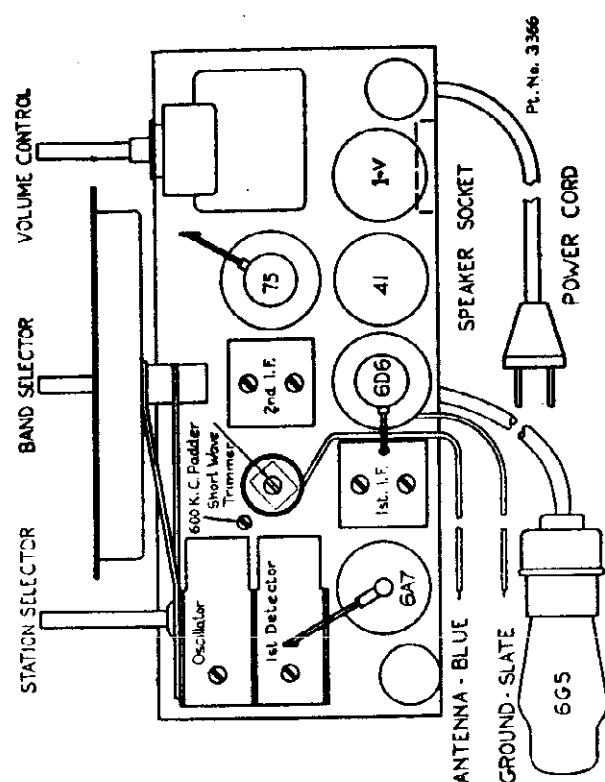
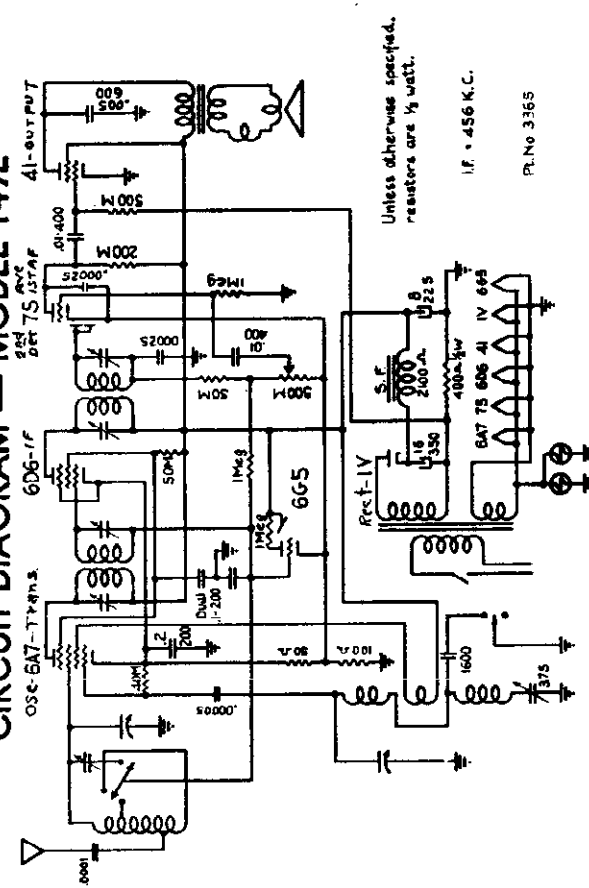
The foregoing procedure should be repeated. That is, the set is to be rechecked at 1720, 1400 and 600 K.C.

When aligning the R.F., use the same output standard as was used on the I.F. alignment.

Short Wave Alignment

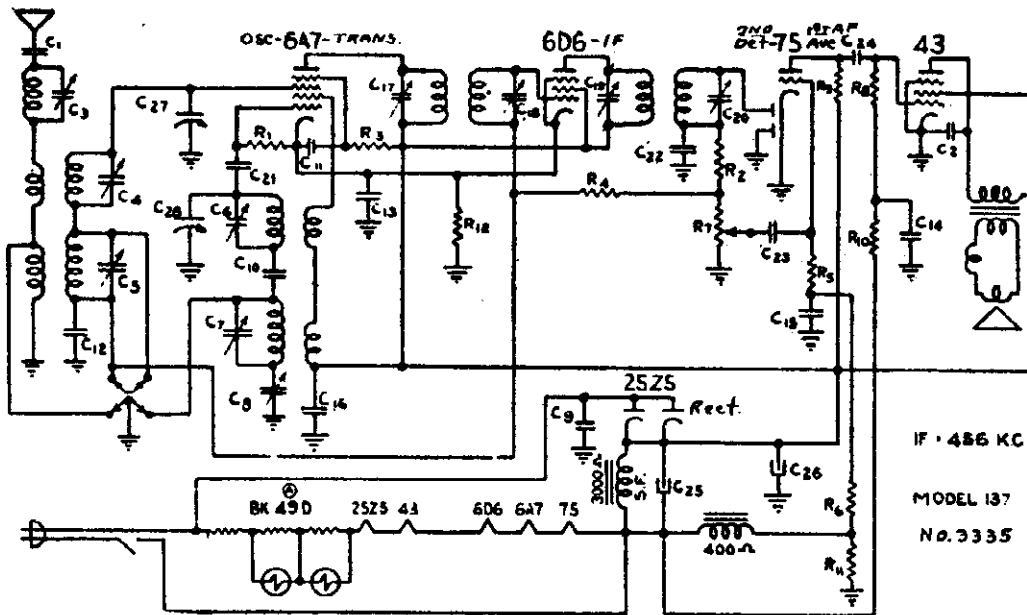
Turn the band selector switch of the set to short wave. Set the signal generator to 6000 K.C. Connect a 400 ohm resistor in series with the .00025 condenser. Tune the set until the signal is heard. If two signals are heard, always align to the highest frequency heard on the receiver. Adjust the small trimmer on the antenna coil for maximum output.

MODELS 136 & 149 are the same except that the 6G5 Tuning Tube is not used.
CIRCUIT DIAGRAM — MODEL 149E



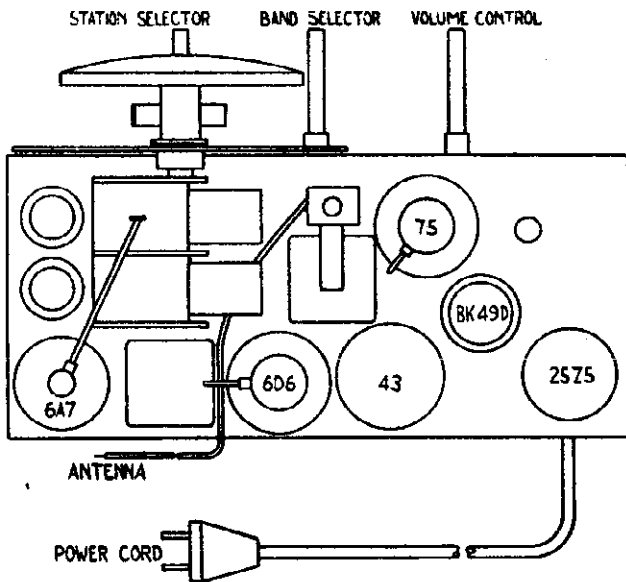
MODEL 137
Schematic, Socket
Parts

DETROLA RADIO CORP.



PARTS LIST — MODEL 137

- | | | |
|-------------------------------------|-----------------------|-----------------------------------|
| C1, C2 .005 - 600 v. | C17, C18, C19, C20 | R4, R5, R6 1 meg. 1/3 w. |
| C3 180 mmf. trimmer | 100 - 125 trimmer | R7 500M volume control and switch |
| C4, C5, C6, C7, 1 - 10 mmf. trimmer | C21 50 mmf. mica | R8 500M 1/3 w. |
| C8 350 mmf. padder | C22 250 mmf. mica | R9 200M. 1/3 w. |
| C9 .02 - 600 | C23, C24 .01 - 600 v. | R10 300M 1/3 w. |
| C10 1150 mmf. mica | C25 16 mfd. 150 v. | R11 20 ohms. 1/2 w. |
| C11, C12 .05 - 200 | C26 24 mfd. 150 v. | R12 100 ohms. 1/3 w. |
| C13, C14, C15, C16 .1 - 200 v. | R1, R2, 50M 1/3 w. | |
| | R3 20M 1/3 w. | |



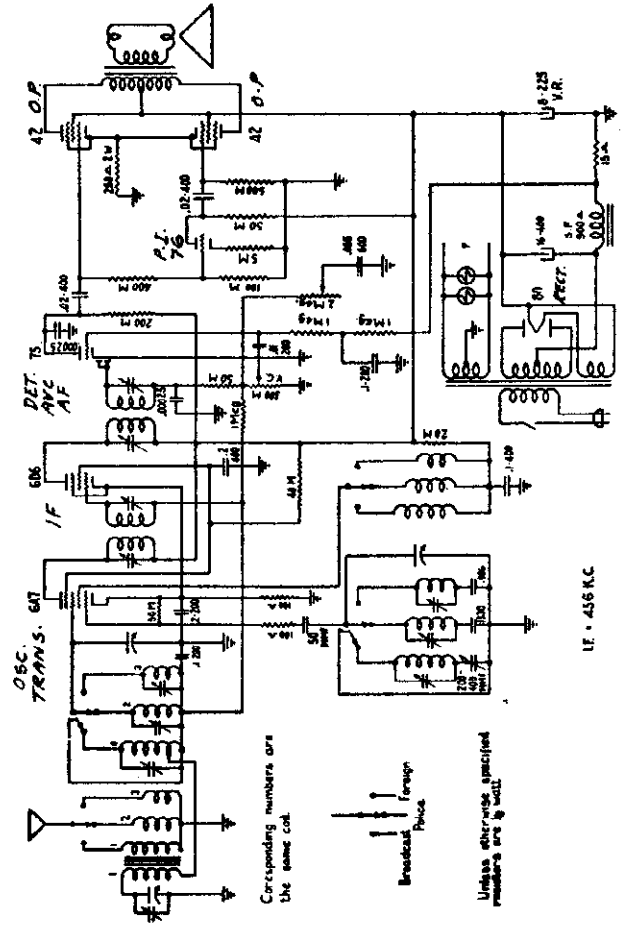
Tubes required are:

- 1—6A7 Oscillator-Translator
- 1—6D6 Intermediate Frequency Amplifier
- 1—75 Detector-Automatic Volume Control First Audio
- 1—43 Power Output
- 1—25Z5 Rectifier
- 1—BK-42-D Voltage Regulator

NO GROUND IS NECESSARY—Under no condition should a ground wire be attached to this receiver.

DETROLA RADIO CORP.

CIRCUIT DIAGRAM MODEL 147 A-B-CR

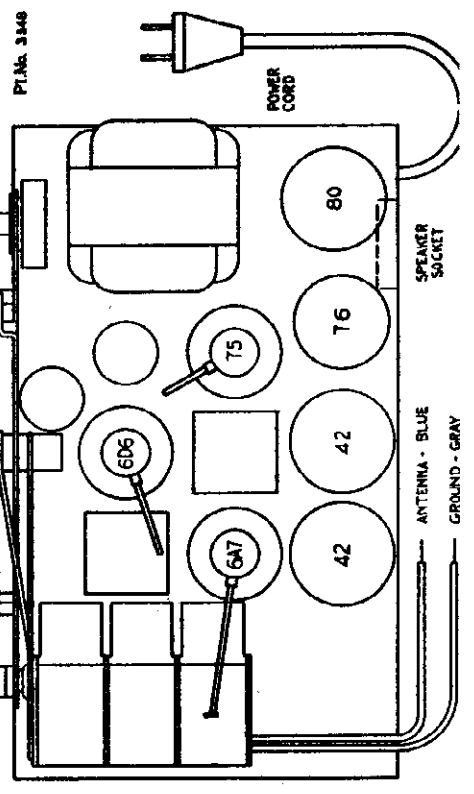


Corresponding numbers are the same col.

Breakdown Prices

Unless otherwise specified numbers are in ohms.

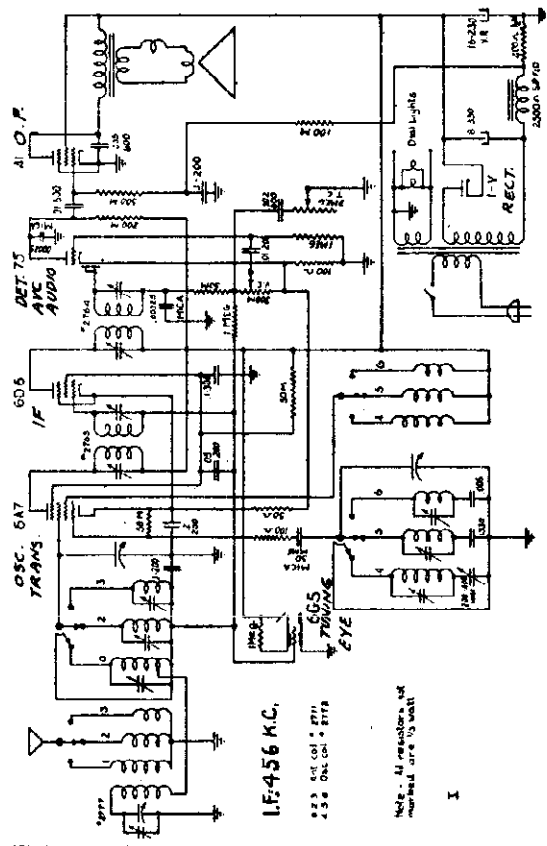
IF - 456 K.C.



Pl. No. 3146

CIRCUIT DIAGRAM—MODEL 139E

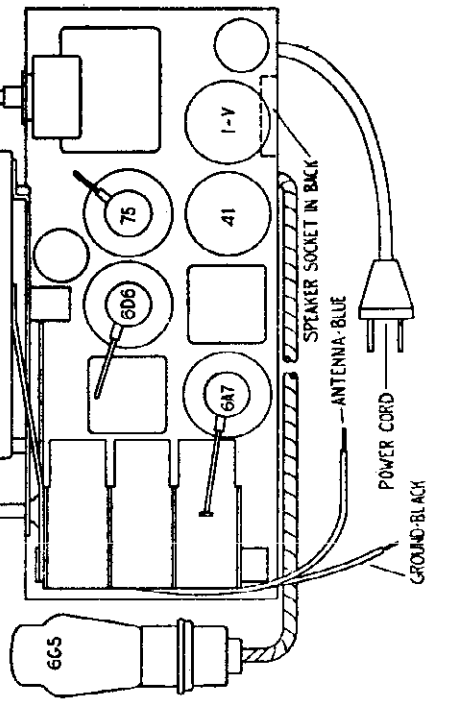
MODEL 139 is the same except that 6G5 Tuning Indicator is not used.



IF-456 K.C.

Note: All resistors are marked in ohms.

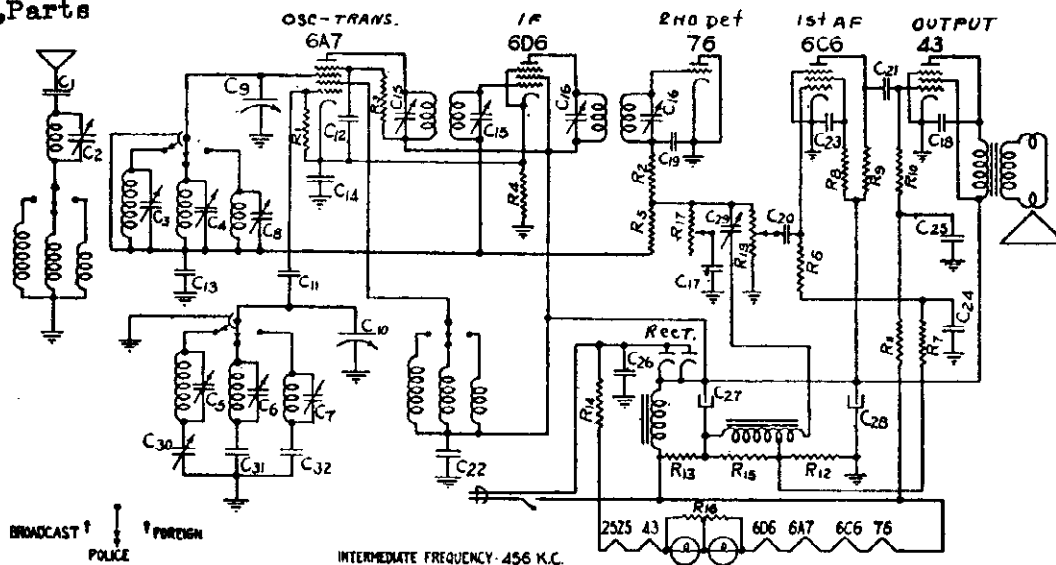
Station Selector
Band Selector
Volume Control
Tone Control
On-Off Switch



MODEL 140

Schematic
Socket, Parts

DETROLA RADIO CORP.



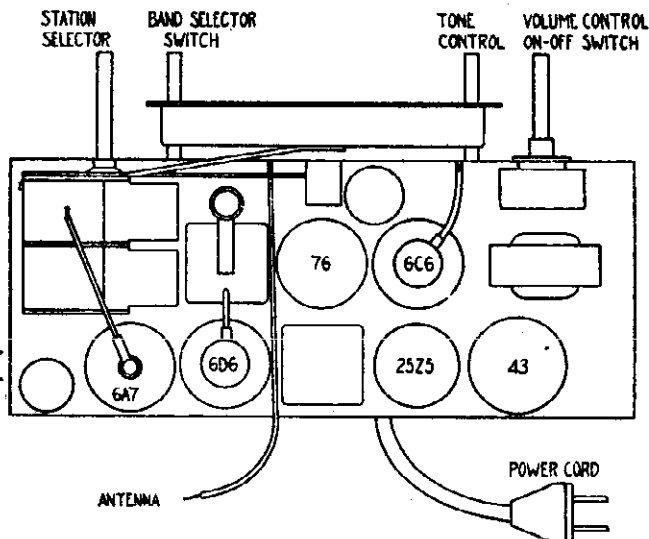
PARTS LIST — MODEL 140

- | | | |
|---|--|----------------------------|
| C1 .005 600 v. | C20 .01 200 v. | R1, R2 50M ohms |
| C2 180 mmf. trimmer | C21 .01 400 v. | R3 20M ohms |
| C3, C4, C5, C6, C7,
1 to 10 mmf. trimmer | C22, C23, C24 .1 200 v. | R4 200 ohms |
| C8 3 to 35 mmf. trimmer | C25 .2 200 v. | R5, R6, R7, R8 1 megohm |
| C9, C-10 350 mmf. air
variable | C26 .02 600 v. | R9 250M ohms |
| C11 50 mmf. mica | C27 16 mfd. 150 v. wet
electrolytic | R10 500M ohms |
| C12, C13, .05-200 v. | C28 24 mfd. 150 v. wet
electrolytic | R11 300M ohms |
| C14 .2 200 | C29 3 to 35 mmf. trimmer | R12, R13 35 ohms |
| C15, C16 120 mmf.
trimmer | C30 220 to 550 mmf.
padder | R14 100 ohms line cord |
| C17, C18 .003 600 v. | C31 1330 mmf. padder | R15 10M ohms |
| C19 250 mmf. mica | C32 3850 mmf. padder | R16 45 ohms center tapped |
| | | R17 2 megohms tone control |
| | | R18 500M ohms vol. control |

Tubes required are:

- 1—6A7 Oscillator-Translator
- 1—6D6 Intermediate Frequency Amplifier
- 1— 76 Detector-Automatic Volume Control
- 1—6C6 First Audio
- 1— 43 Power Output
- 1—25Z5 Rectifier

NO GROUND IS NECESSARY—Under no condition should a ground wire be attached to this receiver.

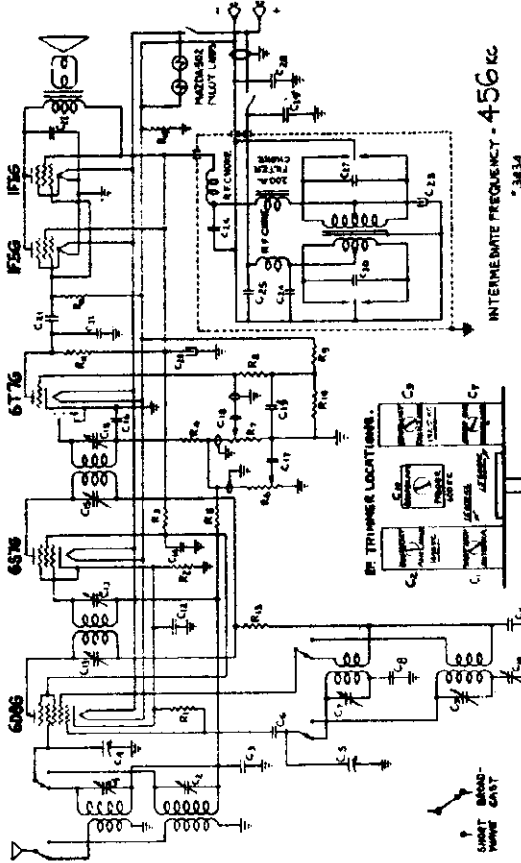


Alignment, Parts, Trimmers

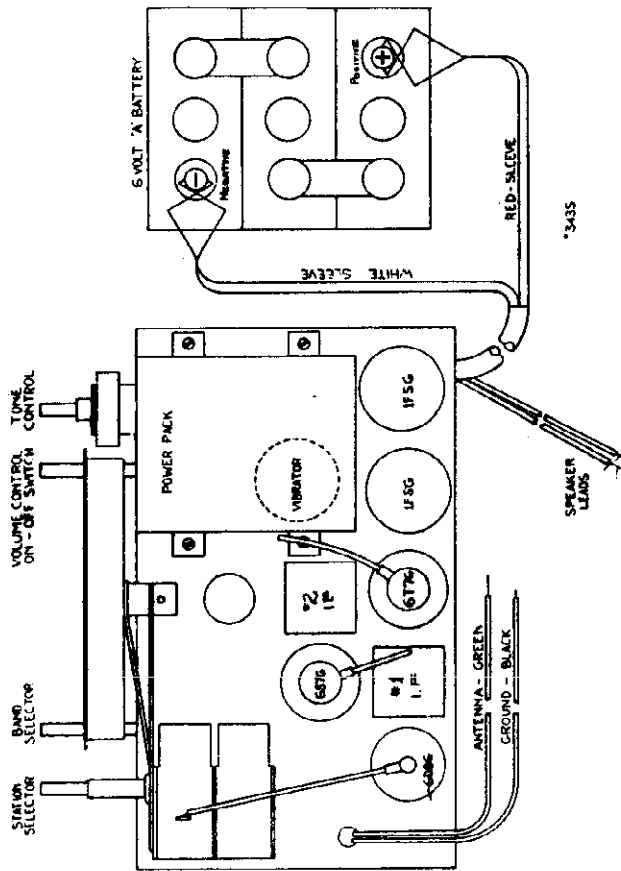
DETROLA RADIO CORP.

MODELS 144B, 144C
Schematic, Socket

Tubes required are:
 1—6D8G Oscillator-Translator.
 1—6S7G Intermediate frequency amplifier.
 1—6T7G Detector—automatic volume control—
 first audio amplifier.
 2—1F5G Power output.



TUBE LAYOUT and CONNECTION DIAGRAM



ALIGNMENT PROCEDURE

Connect a high impedance AC voltmeter across loud-speaker terminals. Volume control should be set a few degrees back of maximum volume position. Use a weak signal from generator, strong signals tend to cause improper adjustments.

IF. Connect generator ground to receiver ground. Using .1 mfd condenser in series with "high" side of generator, apply 456 kc signal to grid of 6S7G and adjust second IF transformer; same for first IF, applying signal to grid of 6D8G. (See above diagram for location of tubes and transformers.)

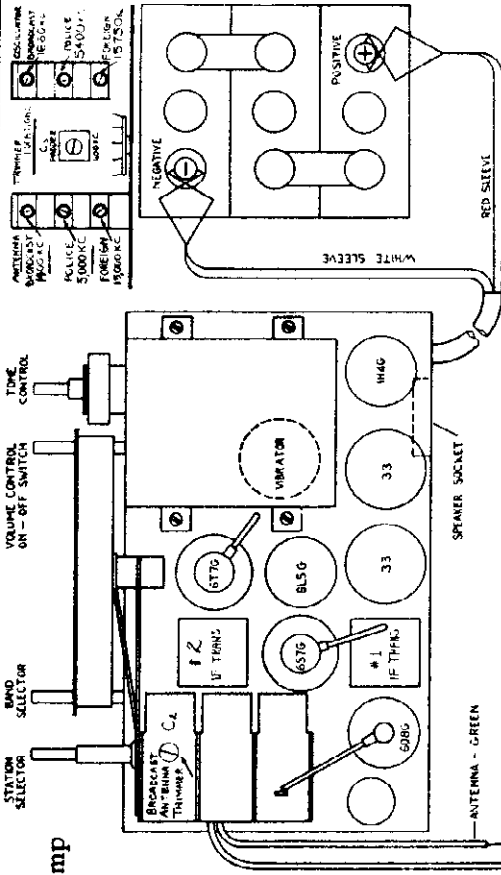
RF. (See circuit diagram for location of trimmers.) Using 200 mmf condenser in series with generator, feed 1725 kc signal to antenna lead and adjust oscillator top frequency. Set generator at 1400 kc, tune receiver to signal and adjust broadcast antenna trimmer. Set generator to 600 kc, tune receiver and adjust paddler. The tuning condenser should be rocked back and forth through the signal while the paddler is being adjusted in order to obtain perfect alignment.

Using 400 ohm resistor in series with generator, set band selector in short wave (right) position, feed 15,600 kc signal to antenna and adjust oscillator trimmer—screw trimmer down tight and unscrew to SECOND peak. Set generator to 15,000 kc, tune receiver and adjust antenna trimmer—screw trimmer down tight and unscrew to FIRST peak, rocking the condenser back and forth through the signal while the adjustment is being made. Above procedure for alignment at 15,000 kc must be followed exactly to insure proper tracking. A "dead spot" at about 12,000 kc will result if antenna and oscillator are not set in proper relation to each other.

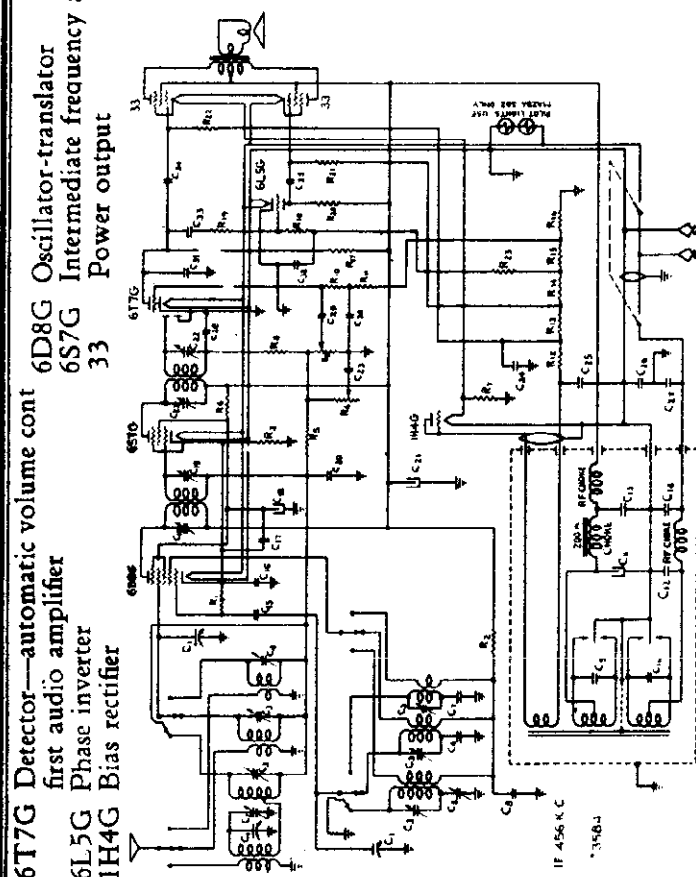
Symbol	Part No.	Description	Symbol	Part No.	Description
C1	1611	3-35 Trimmer	R7	3418	500 M VC with DPST Switch
C2, 7, 9	2597	1-10 Trimmer	R9	2693	2 Meg 1/3 W
C3, 12, 19	572	.1 200V	R11	599	150 M 1/3 W
C4, 5	2871	350 mmf Variable	R12	615	500 M 1/3 W
C6	2780	50 mmf Mica	R13	614	5 M 1/3 W
C8	2694	.005 + 5%	R14	3433	15 Ohms + 5% 1w
C10	2560	350 mmf Padder		3412	No. 1 IF Trans.
C11, 18	568	.01 400V		3413	No. 2 IF Trans.
C13, 15		IF Trimmers		3415	Power Transformer
C14, 28, 29	580	.05 200V		3416	Filter Choke
C16, 31	1286	250 mmf Mica		3570	Band Selector Switch
C17	581	.005 400V		3419	Antenna Coil
C20	2594	24 mf 150V		3420	Oscillator Coil
C21	576	.02 400V		3421	Vibrator
C22	3190	.001 Mica		2378	Pointer
C23	3417	8 mf 200V		1408	Pointer Screw
C24, 25, 30	3003	5, 160V		2163	Drive Cable
C26	824	.002 600V		3268	8 Prong Socket
C27	3432	.015 1200V		2165	7 Prong Socket
R1, 4	631	50 M 1/3 W		1489	5 Prong Socket
R2	3004	150 Ohms		3426	Pilot Lamp
R3	609	15 M 1/3 W		3431	Battery Connector
R5, 8, 10	624	1 Meg 1/3 W		3436	PM Dynamic Speaker
R6	3571	2 Meg TC			

MODELS 145B, 145CR
Schematic, Socket
Trimmers, Alignment, Parts

DETROLA RADIO CORP.



Symbol	Part No.	Description	Symbol	Part No.	Description
C1	2872	350 MMF Variable	R9	3418	500M VC with DPST Switch
C2,3	2597	1-10 trimmer	R12	2688	60M 1/3 w + 10%
C4	1611	3-35 trimmer	R13,16	3581	3M 1/3 w + 10%
C5	2560	360 MMF padder	R17	602	250M 1/3 w + 10%
C6	2741	1330 MMF padder	R18	3582	75M 1/3 w + 10%
C7	2793	.006 +5%	R19	2599	1 Meg. + 10%
C8,17	565	.01 200V	R20	603	100M 1/3 w
C9	3579	.01 1600V	R21,22	615	500M 1/3 w
C10,12,14	3003	.5 160V	3465-1	3412	#1 IF transformer
C11	3575	8 MF 250WV	3573	3416	#2 IF transformer
C13	563	.05 400V	3416	2724	Power transformer
C15	2780	50 MMF mica	2724	2771	Filter choke
C16	2792	.2 200V	2771	2772	Band switch
C18	3574	8 MF 150WV	2772	L-1020	Antenna coil
C19,22	572	IF trimmers	2772	2845	Oscillator coil
C20,10,32	574	.1 200V	2845	3421	Choke coil
C21	3574	16 MF 200 WV	3421	2378	B.C. Antenna coil
C22	581	.005 600V	2378	1408	Vibrator
C23	566	.5 200V	1408	2163	Pointer
C24	566	.5 200V	2163	3268	Pointer screw
C25	579	.25 200V	3268	2165	Drive cable
C26,27	680	.05 200V	2165	2221	8 Prong socket
C28	1286	250 MMF mica	2221	1489	7 Prong socket
C29,31,34,35	576	.02 400V	1489	833	6 Prong socket
C31	1285	100 MMF mica	833	3426	5 Prong socket
R1	631	50M 1/3 w	3426	3431	4 Prong socket
R2	617	20M 1/3 w	3431	3586	Pilot lamp
R3	2689	100 ohms + 10%	3586	3660	Battery connector
R4	609	15M 1/3 w	3660		8" PM Dynamic speaker
R5,10,11,23	624	1 Meg.			6" PM Dynamic speaker
R6	3571	2 Meg. TC			
R7	3580	10 ohms + 5%			
R8	631	50M 1/3 w			



ALIGNMENT PROCEDURE

Connect a high impedance AC voltmeter across loud-speaker terminals. Volume control should be set a few degrees back of maximum volume position. Use a weak signal from generator, strong signals tend to cause improper adjustments.

IF. Connect generator ground to received ground. Using .1 mfd condenser in series with "high" side of generator, apply 456 kc signal to grid of 6S7G and adjust second IF transformer; same for first IF, applying signal to grid of 6D8G. (See above diagram for location of tubes and transformers.)

RF. (See above diagram for location of trimmers.) Using 200 mmf condenser in series with the generator, feed 1660 kc to antenna lead and adjust broadcast oscillator trimmer for top frequency. Set generator to 1400 kc, tune receiver and adjust the two antenna trimmers. Set generator to 600 kc, tune receiver to signal and adjust padder. The tuning condenser should be rocked back and forth through the signal while the padder is being set in order to secure perfect alignment.

Using 400 ohm resistor in series with generator, set band selector in center position, set generator to 5400 kc and adjust oscillator trimmer for top frequency. Set generator to 5000 kc, tune receiver to signal and adjust antenna trimmer.

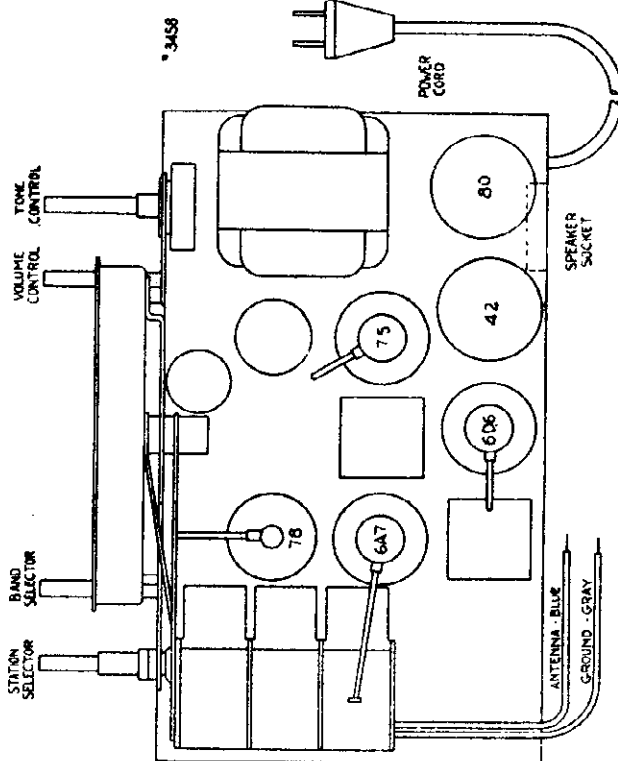
Turn band selector to extreme clockwise position. Using 400 ohm resistor in series with generator, set oscillator top frequency for 15,750 kc—screw trimmer down tight, then unscrew to second peak. Set generator to 15,000 kc, tune receiver to signal and adjust antenna trimmer—Screw trimmer down tight, then unscrew to first peak, rocking the tuning condenser back and forth through the signal while the adjustment is being made. Above procedure for alignment at 15,000 kc must be followed exactly to insure proper tracking. A dead spot at about 12,000 kc will result if antenna and oscillator circuits are not set in proper relation to each other.

Schematics, Sockets

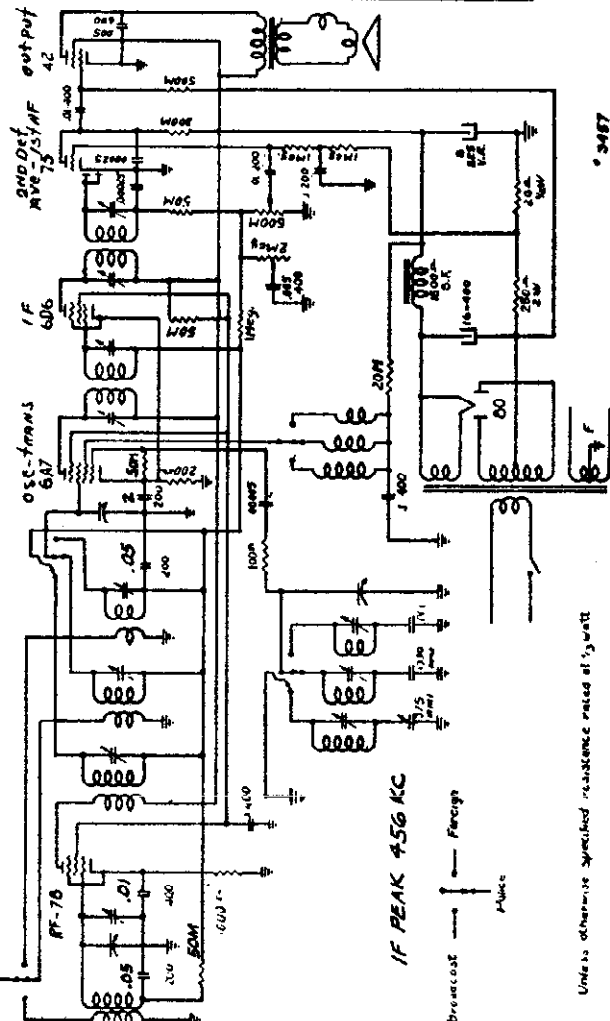
DETROLA RADIO CORP.

MODEL 146
MODEL 158A
MODEL 162

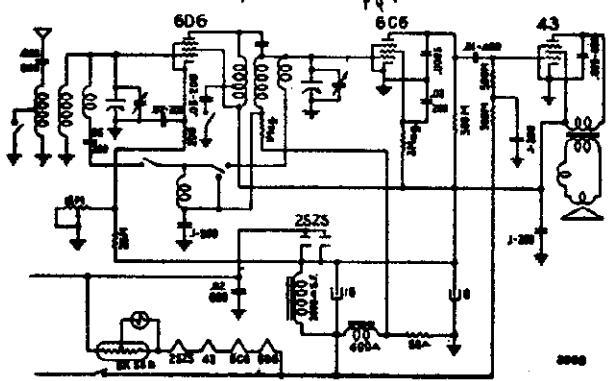
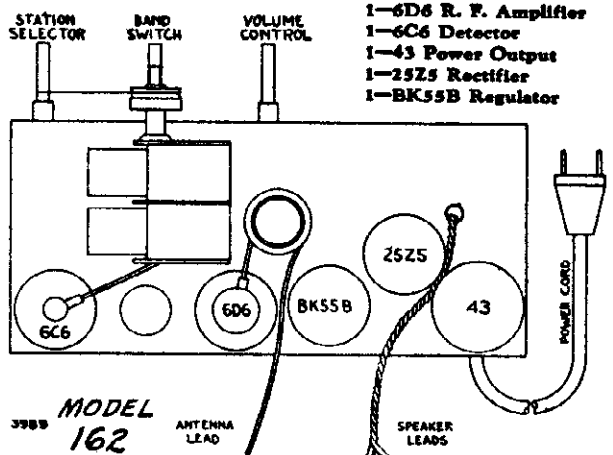
TUBE LAYOUT MODEL 146



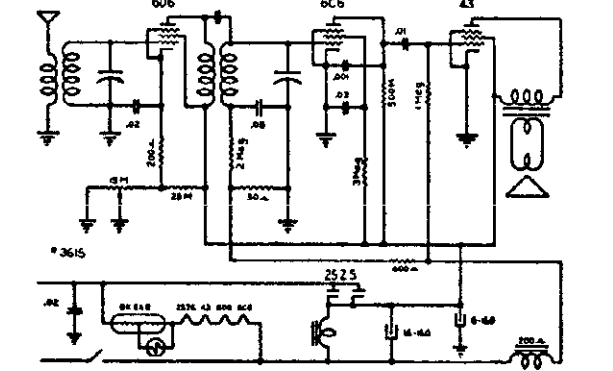
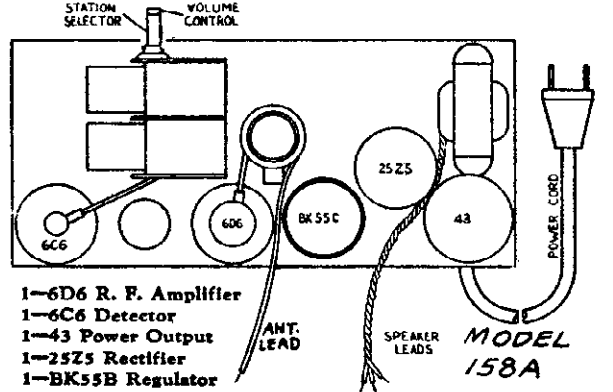
CIRCUIT DIAGRAM MODEL 146



Unless otherwise specified resistance values are in ohms



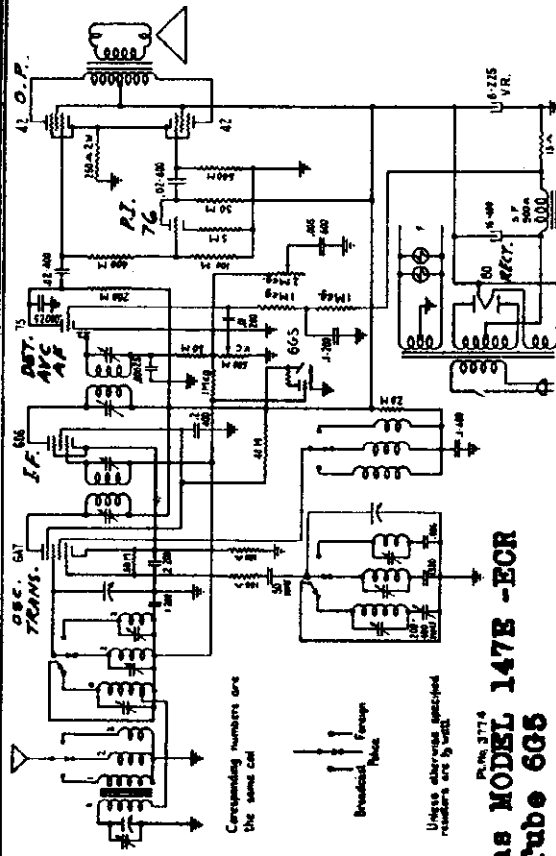
ALIGN AT 1500 KC



ALIGN AT 1500 KC

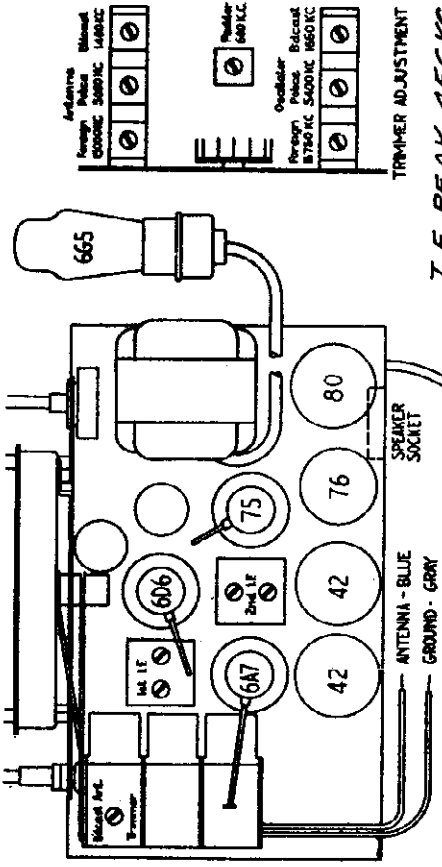
MODELS 147, 147E, 147SOR
Schematic, Socket, Parts
Alignment, Trimmers

DETROLA RADIO CORP.



Part No.	Req.	Description
2163	1	Cable, Drive, Approx. 20'
3351	1	Cond. 8 MF., 225 V., Reg. Wet El.
3774		Schematic Diagram
3775		Tube Sticker
2560	1	Condenser, Padder
2597	4	Condenser, Trimmer, 1-10
1611	1	Condenser, Trimmer, 5-35
3157	1	Condenser, Trimmer
1286	1	Condenser, Mica, .00025
2741	1	Condenser, Mica, .00005
2741	1	Condenser, Mica, 1330
2872	1	Variable Condenser
576	2	Condenser, .02, 400 V., Paper
572	2	Condenser, .1, 200 V., Paper
565	1	Condenser, .01, 200 V., Paper
581	1	Cond., .005, 600 V., Paper
2792	1	Condenser, .2, 200 V., Paper
2793	1	1 Cond., .006, 600 V., Paper
3352	1	Condenser, .2, 400 V., Paper
575	1	Condenser, .1, 400 V., Paper
624	2	Resistor, 1/3 W., 1 Meg.
2731	1	Resistor, 1/3 W., 500 M.
2730	1	Resistor, 1/3 W., 200 M.
631	2	Resistor, 1/3 W., 50 M.
617	1	Resistor, 1/3 W., 20 M.
3353	1	Resistor, 2 W., 250 Ohm
2689	2	Resistor, 1/3 W., 100 Ohm
2883	1	Resistor, 1/3 W., 5 M.
2882	1	Resistor, 1/3 W., 15 Ohm
2881	1	Resistor, 1/3 W., 400 M.
2880	1	Resistor, 1/3 W., 100 M.
636	1	Resistor, 1/3 W., 40 M.
2724	1	Switch, Band
2837	1	Coil, Antenna
2772	1	Coil, Oscillator
2845	1	Coil, B. C. Antenna
3343	1	Transformer, Power
3344	1	Transformer, 1st I. F.
3345	1	Transformer, 2nd I. F.
3375	1	Cond. Elec. 16 MF., 400 V
2908	1	Spring, Drive Cable
3374	1	Indicator
2378	1	Pointer
2726	1	Control, Vol. & Switch
2737	1	Control, Tone
1732	1	A. C. Cord
3778	1	Book, Instruction
2897	1	Escutcheon Tuning Tube
2981	1	Tuning Tube Cable
3710	1	Speaker, 8"
3377	1	Escutcheon

made. Above procedure for alignment at 15,000 kc must be followed exactly to insure proper tracking. A dead spot at about 12,000 kc will result if antenna and oscillator circuits are not set in proper relation to each other.



I. F. PEAK 456KC
MODEL 147-the same as MODEL 147E -ECR
except that Tuning Tube 6G5

I. F. Alignment
is not used.

The I.F. frequency of this receiver is 456 K.C. For realignment, use the following procedure.
 It is necessary to use an accurately calibrated signal generator. Couple the signal generator to the grid of the 6A7 tube with a tenth microfarad condenser in series with the "high" lead of the signal generator. Connect the ground side of the signal generator to the chassis. Set the signal generator to 456 K.C. Be sure the wave switch of the set is in the broadcast position and the volume control set at maximum. Attenuate the signal generator so that the signal is just audible in the speaker. If an output meter is used, it should be connected across the voice coil terminals of the speaker. Use 1/2 volt as standard output.

Adjust the 2nd I.F. transformer first. Each screw should be adjusted for maximum output. After number two I.F. has been adjusted, number one I.F. should be adjusted for maximum output. After both transformers have been adjusted, it is necessary to recheck No. 2 transformer and then recheck No. 1.

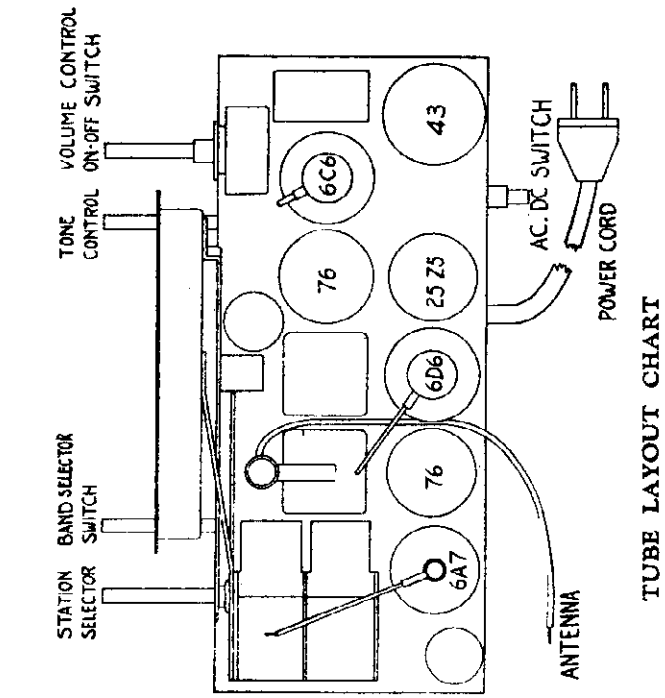
See TUBE LAYOUT for location of I.F. and R.F. trimmers and padder.
 RF. (See above diagram for location of trimmers.) Using 200 mmf condenser in series with the generator, feed 1660 kc to antenna lead and adjust broadcast oscillator trimmer for top frequency. Set generator to 1400 kc, tune receiver and adjust the two antenna trimmers. Set generator to 600 kc, tune receiver and adjust padder. The tuning condenser should be rocked back and forth through the signal while the padder is being set in order to secure perfect alignment.

Using 400 ohm resistor in series with generator, set band selector in center position, set generator to 5400 kc and adjust oscillator trimmer for top frequency. Set generator to 5000 kc, tune receiver to signal and adjust antenna trimmer.

Turn band selector to extreme clockwise position. Using 400 ohm resistor in series with generator, set oscillator top frequency for 15,750 kc—screw trimmer down tight, then unscrew to second peak. Set generator to 15,000 kc, tune receiver to signal and adjust antenna trimmer—Screw trimmer down tight, then unscrew to first peak, rocking the tuning condenser back and forth through the signal while the adjustment is being

DETROLA RADIO CORP.

MODEL 148
Schematic, Socket
Parts



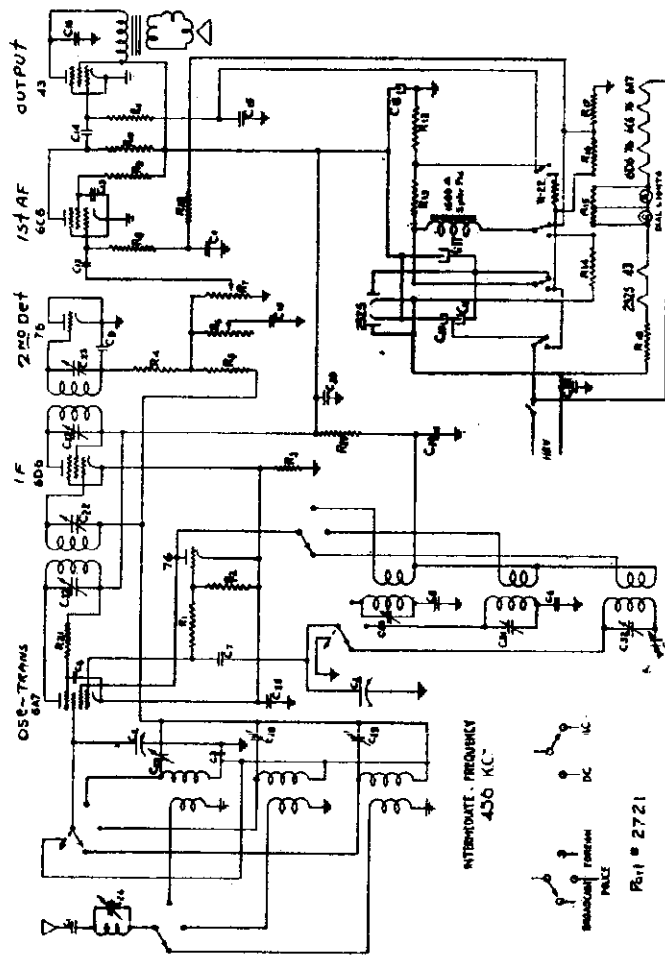
TUBE LAYOUT CHART

NO GROUND IS NECESSARY—Under no condition should a ground wire be attached to this receiver.

Tubes and Connections

Tubes required are:

- 1—6A7 Translator.
- 1—76 Oscillator.
- 1—6D6 Intermediate frequency amplifier.
- 1—76 Detector-Automatic volume control.
- 1—6C6 First audio.
- 1—43 Power output.
- 1—25Z5 Rectifier. Voltage Doubler.



PARTS LIST - - MODEL 148

- C1 .005 600 v.
- C2 .00035 variable air
- C3 .05 200 v.
- C4 .05 200 v.
- C5 350 mmf. variable mica
- C6 1330 mmf.
- C7 50 mmf. mica
- C8 3850 mmf.
- C9 250 mmf. mica
- C10 .01 200 v.
- C11 .1 200 v.
- C12 .01 400 v.
- C13 .1 200 v.
- C14 .01 400 v.
- C15 .25 200 v.
- C16 .005 600 v.
- C17 8 mfd. 250 w.v. wet el.
- C18 24 mfd. 150 w.v. wet el.
- C19 8/8 mfd. 175 p.v. dry
- C20 .1 200 v.
- C21 .02 600 v.
- C22 120 mmf. trimmer
- C23 120 mmf. trimmer
- C24 .02 200 v.
- C25 .05 200 v.
- C26 180 mmf. trimmer
- C27 5 to 35 mmf. trimmer
- C28, C29, C30, C31, C32, C33 1 to 10 mmf. trimmer
- R1 200 ohms, 1/3 watt
- R2 50M ohms, 1/3 watt
- R3 200 ohms, 1/3 watt
- R4 50M ohms, 1/3 watt
- R5 1 meg., 1/3 watt
- R6 2 meg. tone control
- R7 500M ohms, vol. con. and line switch
- R8 1 meg., 1/3 watt
- R9 1 meg., 1/3 watt
- R10 250M ohms, 1/3 watt
- R11 500M ohms, 1/3 watt
- R12 200M ohms, 1/3 watt
- R13 500M ohms, 1/3 watt
- R14 1200 ohms, 3 watt
- R15 45 ohms, center tapped
- R16 370 ohms, 1 watt
- R17 35 ohms, 1/3 watt
- R18 82 ohms, line cord
- R19 1 meg., 1/3 watt
- R20 5M ohms, 1/3 watt
- R21 20M ohms, 1/3 watt
- R22 500M ohms, 1/3 watt

MODEL 150
Schematic, Socket
Notes

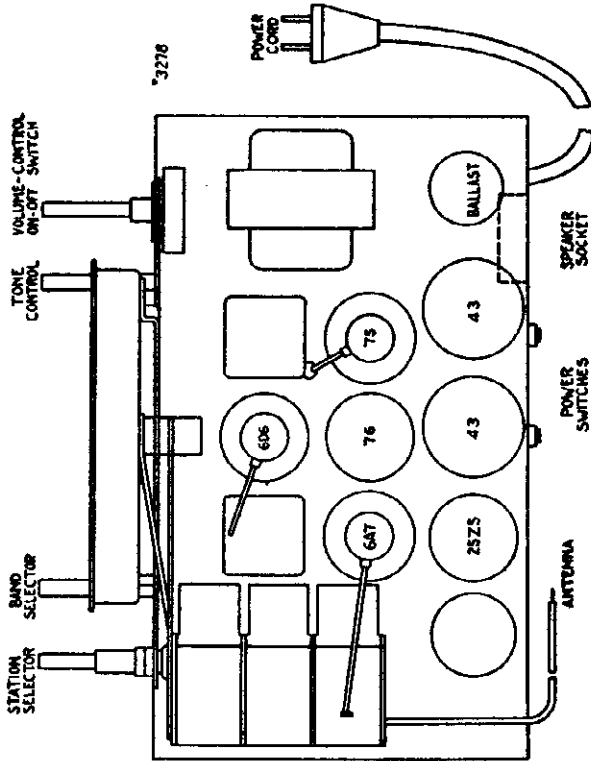
DETROLA RADIO CORP.

Tubes required are:

- 1—6A7 Oscillator Translator
- 1—6D6 I. F. Amplifier

- 1—75 Detector A. V. C. Audio Amplifier
- 1—76 Phase Inverter
- 2—43 Output
- 1—25Z5 Rectifier

TUBE LAYOUT



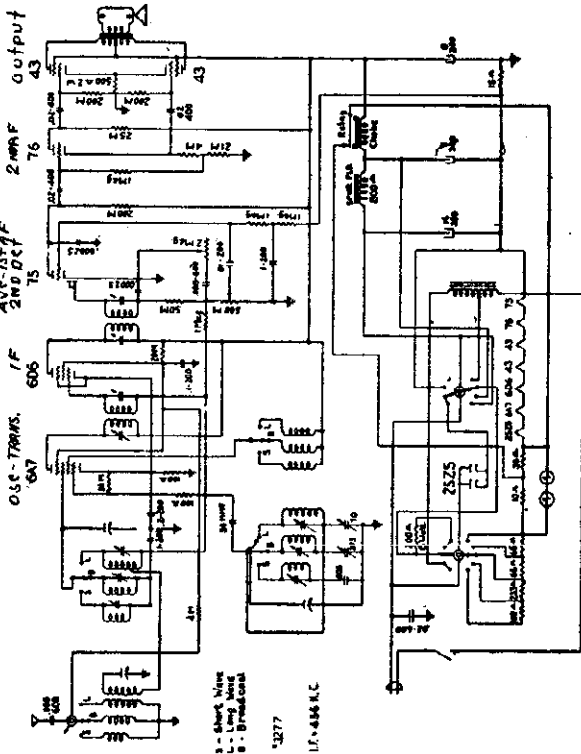
Do not attach a ground to this receiver.

FOR DIRECT CURRENT ONLY

Voltage of Mains	Set Switch B to position marked	Set Switch A to position marked
100 to 120	110	DC 100 to 150
120 to 140	130	DC 100 to 150
140 to 160	150	DC 150 to 250
210 to 230	220	DC 150 to 250
240 to 260	250	DC 150 to 250

FOR ALTERNATING CURRENT ONLY

Voltage of Mains	Set Switch B to position marked	Set Switch A to position marked
100 to 120	110	AC 100 to 130
120 to 130	130	AC 100 to 130
140 to 160	150	AC 130 to 250
210 to 230	220	AC 130 to 250
240 to 260	250	AC 130 to 250



WARNING: READ THESE INSTRUCTIONS BEFORE CONNECTING THIS RECEIVER TO THE ELECTRIC MAINS

This receiver may be adjusted to operate on any current, either direct or alternating of any frequency from 25 cycles to 150 cycles, and at any voltage from 100 volts to 260 volts. The adjustments of the receiver to any voltage or current is accomplished by means of two switches located on the rear panel of the receiver.

Before connecting the receiver to the electric mains, ascertain from your power company the voltage of the mains in your home, and whether it is alternating current or direct current.

When this information has been obtained, the following procedure should be used to set the electrical circuits of the receiver to the line voltage in your home:

Below is a table of main voltage for both direct and alternating currents. Opposite each main voltage in the table, is a designation of the proper setting for each switch. There is a plate on the rear of the chassis that is graduated in the main voltage settings. The switches are adjustable by means of a screw driver. The slot in the switches is also used as an indicator which should point to graduation to be used.

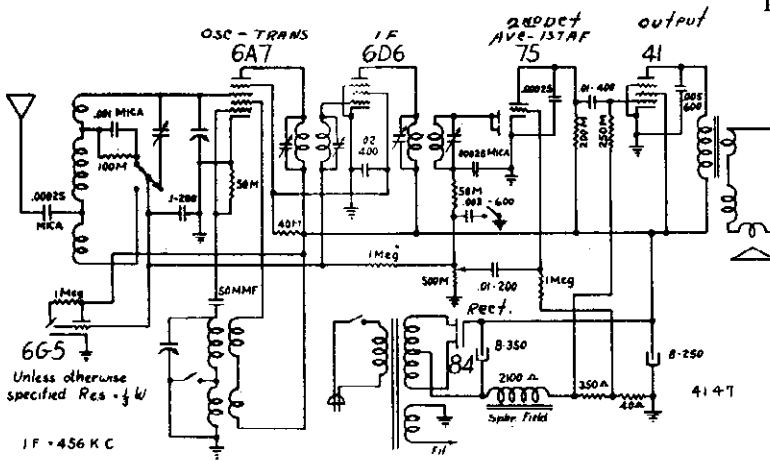
Each switch must be set according to the table. They must not be changed on the set while it is connected to the mains. Unless these instructions are properly carried out serious harm to the electrical parts in the receiver will result.

DETROLA RADIO CORP.

MODEL 164E
Schematic, Socket
Trimmers, Alignment
Parts

Tubes required are:

- 1—6A7 Oscillator-Translator
- 1—6D6 I. F. Amplifier
- 1—75 Detector-A.V.C., Audio Amplifier
- 1—41 Output
- 1—84 Rectifier
- 1—6G5 Tuning Eye



Part No.	Req.	Description	Part No.	Req.	Description
3873	1	Transformer—Power	624	1	Resistor— $\frac{1}{3}$ W—1 Meg.
3356	1	Transformer—1st I.F.	602	1	Resistor— $\frac{1}{3}$ W—250M
3465	2	Transformer—2nd I.F.	2730	1	Resistor— $\frac{1}{3}$ W—200M
3874	1	Coil—Antenna	603	1	Resistor— $\frac{1}{3}$ W—100M
3875	1	Coil—Oscillator	631	1	Resistor— $\frac{1}{3}$ W—50M
3876	1	Condenser—Variable	636	1	Resistor— $\frac{1}{3}$ W—40M
3877	1	Condenser—Dry Elec.	3893	1	Resistor— $\frac{1}{3}$ W—350 oms
3878	1	Speaker	3402	1	Resistor—1W—40 ohms
4147		Schematic Diagram			Flexohm
4148		Tube Sticker	4145	1	Indicator
530	2	Bulbs—Pilot Light	3889	1	Gasket—Glass
2163	1	Drive Cable	3890	1	Glass
2908	1	Spring—Drive Cable	3891	1	Pointer
2597	1	Condenser—Trimmer	565	1	Condenser—Paper .01-200V
1286	2	Condenser—Mica .00025	568	1	Condenser—Paper .01-400V
3190	1	Condenser—Mica .001	576	1	Condenser—Paper .02-400V
3066	1	Switch—Band	572	1	Condenser—Paper .1-200V
3883	1	Control—Tone—Switch	581	1	Condenser—Paper .005-600V
3361	1	Control—Volume and Switch	2695	1	Condenser—Paper .003-600V

R. F. Alignment

First, connect the ground side of the signal generator to the chassis. Connect the high side of the signal generator with a .00025 condenser, in series, to the antenna lead of the set. Make sure the band switch of the set is in the broadcast position. Set the volume control to maximum. Turn the station selector to the highest frequency (as far as it will go). Set the signal generator to 1720 K.C. Adjust the oscillator trimmer until the signal is heard. After the oscillator has been set at 1720 K.C., turn the station selector to 1400 K.C. Set the signal generator to 1400 K.C. When the signal is heard, adjust the first detector trimmer for maximum output.

When aligning the R.F., use the same output standard as was used on the I.F. alignment.

Short Wave Alignment

Turn the band selector switch of the set to short wave. Set the signal generator to 6000 K.C. Connect a 400 ohm resistor in series with the .00025 condenser. Tune the set until the signal is heard. If two signals are heard, always align to the highest frequency heard on the receiver. Adjust the small trimmer on the antenna coil for maximum output.

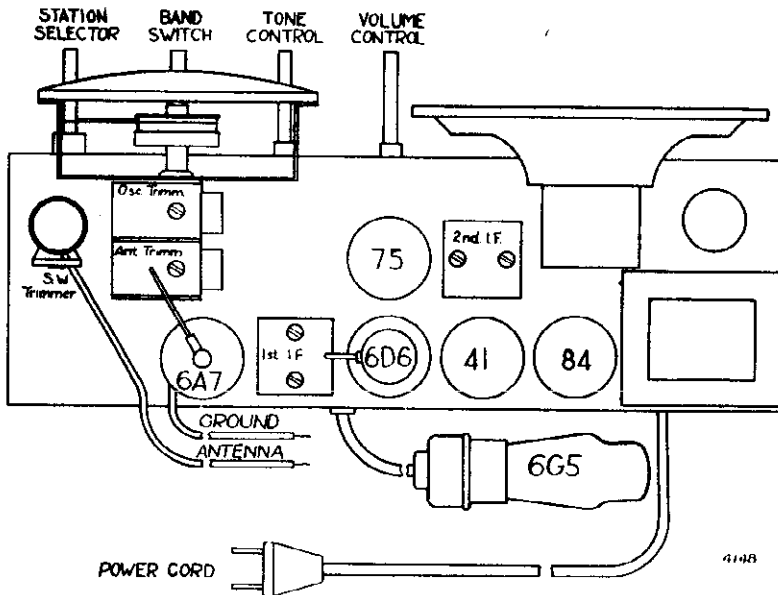
I. F. Alignment

The I.F. frequency of this receiver is 456 K.C. For realignment, use the following procedure.

It is necessary to use an accurately calibrated signal generator. Couple the signal generator to the grid of the 6A7 tube with a tenth microfarad condenser in series with the "high" lead of the signal generator. Connect the ground side of the signal generator to the chassis. Set the signal generator to 456 K.C. Be sure the wave switch of the set is in the broadcast position and the volume control set at maximum. Attenuate the signal generator so that the signal is just audible in the speaker. If an output meter is used, it should be connected across the voice coil terminals of the speaker. Use $\frac{1}{2}$ volt as standard output.

Adjust the 2nd I.F. transformer first. Each screw should be adjusted for maximum output. After number two I.F. has been adjusted, number one I.F. should be adjusted for maximum output. After both transformers have been adjusted, it is necessary to recheck No. 2 transformer and then recheck No. 1.

See TUBE LAYOUT for location of I.F. and R.F. trimmers and padder.

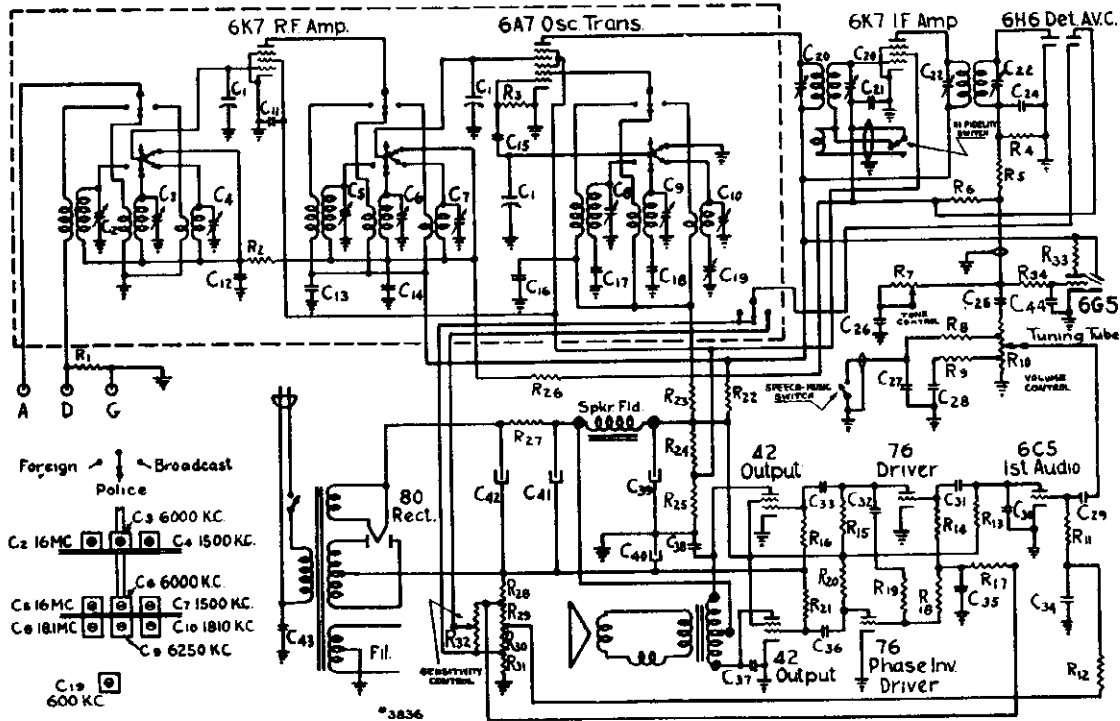


MODEL 165X
Schematic, Parts

DETROLA RADIO CORP.

Tubes

- Tubes required are:
- 1—6K7 Radio frequency amplifier
 - 1—6A7 Oscillator—translator
 - 1—6K7 Intermediate frequency amplifier
 - 1—6H6 Detector—automatic volume control
 - 1—6C5 First audio amplifier
 - 1—6G5 Cathode ray tuning tube (on models equipped with "eye" tuning indicator)
 - 1—76 Driver
 - 1—76 Driver-phase inverter
 - 2—42 Power output
 - 1—80 Rectifier



IF PEAK 456 KC

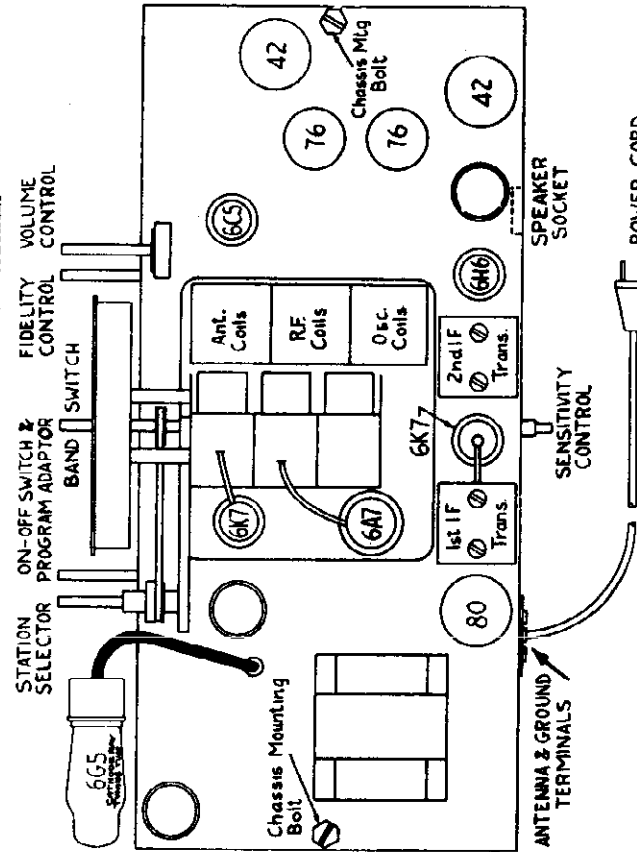
Symbol	Part No.	Description	Symbol	Part No.	Description
C1	3814	9-400 mmf Variable	R9,23	617	20 M 1/3 W.
C2,3,4	3822	2-35 triple trimmer	R10	3800	3 meg volume control
C5,6,7	3822	2-35 triple trimmer	R11,12	624	1 meg 1/3 W.
C8,9,10	3822	2-35 triple trimmer	R18	2688	60 M 1/3 W. 10%
C11,21,34	572	.1—200 V.	R19	2731	500 M 1/3 W. 10%
C12,14	580	.05 200 V.	R22	2421	1 M 1/3 W.
C13	575	.1 400 V.	R24	3805	7 M 3.5 W.
C15,24	2780	50 mmf mica	R25	3805	8 M 1.5 W.
C16	568	.01 400 V.	R27	3809	100 ohms 2 W. 10%
C17	2694	.005 5% tolerance	R28	3806	120 ohms 1.5 W. 10%
C18	2741	1330 mmf 5% tolerance	R29	3808	50 ohms .75 W. 10%
C19	2560	350 mmf variable padder	R30	3807	35 ohms .5 W. 10%
C20,22		IF Trimmers	R31	3870	15 ohms .5 W. 10%
C25,28	2385	.02 200 V.	R32	3801	2 M Variable
C26	2695	.003 600 V.	3796		Power transformer
C27	824	.002 600 V.	3797		No. 1 IF transformer
C29	576	.02 400 V.	3798		No. 2 IF transformer
C30	1286	250 mmf mica	2981		Tuning tube cable
C31,33,36	2600	.02 600 V.	3838		12" Speaker
C32	563	.05 400 V.	2898		Tuning tube clamp
C35	579	.25 200 V.	3815		RF coil
C37,38	3138	.001 800 V.	3943		Oscillator coil
C39	3113	16 MF regulating	3817		Antenna coil
C40	3136	20 MF 25 V.	3825		Planetary drive
C41	3112	16 MF 450 V.	3826		Drive belt
C42	3111	16 MF 500 V.	3198		Idler pulley
C43	3135	.003 800 V.	3199		Idler spring
R1,5,15,20,26	603	100 M 1/3 W.	3831		Minute pointer
R2,3,13	631	50 M 1/3 W.	3832		Tuning pointer
R4,14,16,21	615	500 M 1/3 W.	3802		On-off switch
R6	2693	2 meg 1/3 W.	3818		RF and Antenna switch
R7	3799	2 meg tone control	3819		Oscillator switch
R8,17	2568	300 M 1/3 W.			

DETROLA RADIO CORP.

MODEL 155X
MODEL 163
Sockets, Trimmer
Alignment

MODEL 155 X

TUBE LAYOUT and CONNECTION DIAGRAM



Connect a high impedance AC voltmeter across the loudspeaker terminals. Volume control should be set a few degrees back of maximum volume position. Use a weak signal from the generator, strong signals tend to cause improper adjustments.

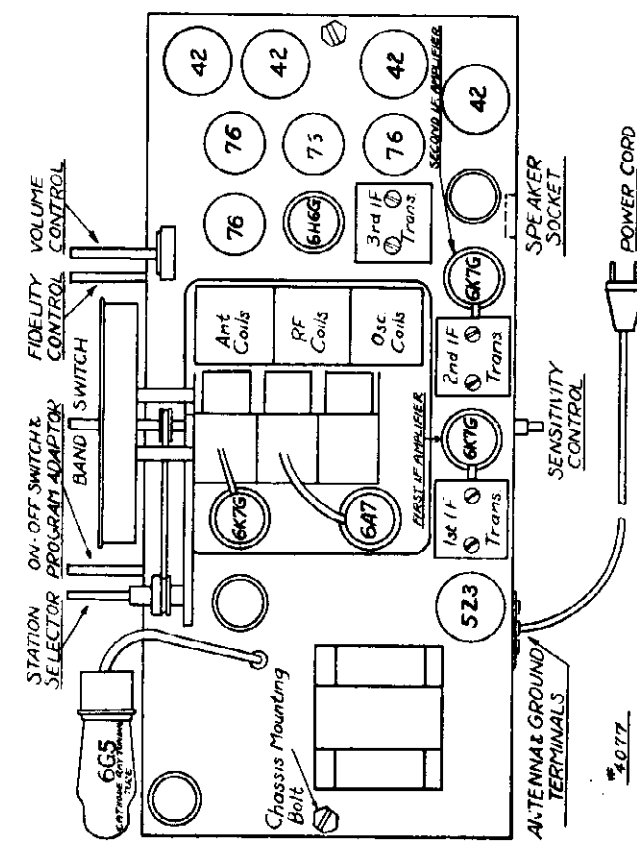
Be sure that the fidelity control is NOT in the HIGH FIDELITY position. It will not be possible to properly align the receiver unless this control is turned part way toward its "bass" position.

IF. Connect the generator ground to receiver chassis. Using .1 mfd. condenser in series with high side of the generator, apply 456 kc. signal to the grid of the 6K7 IF amplifier tube and align second IF transformer trimmers. Repeat for first IF transformer, applying signal to grid of the 6A7 tube. (See above diagram for location of tubes and transformers.)

RF. (See circuit diagram for location of trimmers.) Using a 200 mmf. condenser in series with the high side of the generator, turn band selector switch all the way to the left, tuning condenser to minimum capacity, feed 1810 kc. signal to antenna terminal and adjust broadcast oscillator trimmer for top frequency. Set generator frequency at some point around 1500-1600 kc., and adjust broadcast antenna and RF trimmers. Set generator for 600 kc., tune receiver to signal and adjust the paddler. The tuning condenser should be rocked back and forth through the signal while varying the paddler in order to assure perfect alignment.

A 400 ohm resistor must be used in series with the generator as a "dummy" antenna for proper alignment of the two short wave bands. Set the band selector switch in the center position, adjust the oscillator top frequency for 6250 kc., then align the antenna and RF trimmers at about 6000 kc. With the band selector in the extreme right position, adjust the top frequency of the high frequency to 18,100 kc., and align the antenna and RF trimmers at about 16,000 kc. In order to make sure that the top end of the last band is set properly, it is best to screw the oscillator trimmer down tight, then unscrew to the second peak. The antenna and RF trimmers should be screwed down tight, then unscrew to the first peak. This procedure must be followed in order that the oscillator and RF circuits will be set in the correct relation to each other, otherwise a "dead" spot at a lower frequency will result, and the dial calibration will not be correct. Usually, it is best to rock the tuning condenser back and forth slightly while making these adjustments at high frequencies.

MODEL 163



Connect a high impedance AC voltmeter across the loudspeaker terminals. Volume control should be set a few degrees back of maximum volume position. Use a weak signal from the generator, strong signals tend to cause improper adjustments.

Be sure that the fidelity control is NOT in the HIGH FIDELITY position. It will not be possible to properly align the receiver unless this control is turned part way toward its "bass" position.

IF. Connect the generator ground to receiver chassis. Using .1 mfd. condenser in series with high side of generator, apply 456 kc. signal to grid of 6K7G second IF amplifier and align transformer No. 3. Repeat for transformer No. 2, applying signal to grid of 6K7G first IF amplifier. Repeat for transformer No. 1, applying signal to grid of 6A7 transformer. (See above diagram for location of tubes and transformers.)

RF. (See circuit diagram for location of trimmers.) Using a 200 mmf. condenser in series with the high side of the generator, turn band selector switch all the way to the left, tuning condenser to minimum capacity, feed 1810 kc. signal to antenna terminal and adjust broadcast oscillator trimmer for top frequency. Set generator frequency at some point around 1500-1600 kc., and adjust broadcast antenna and RF trimmers. Set generator for 600 kc., tune receiver to signal and adjust the paddler. The tuning condenser should be rocked back and forth through the signal while varying the paddler in order to assure perfect alignment.

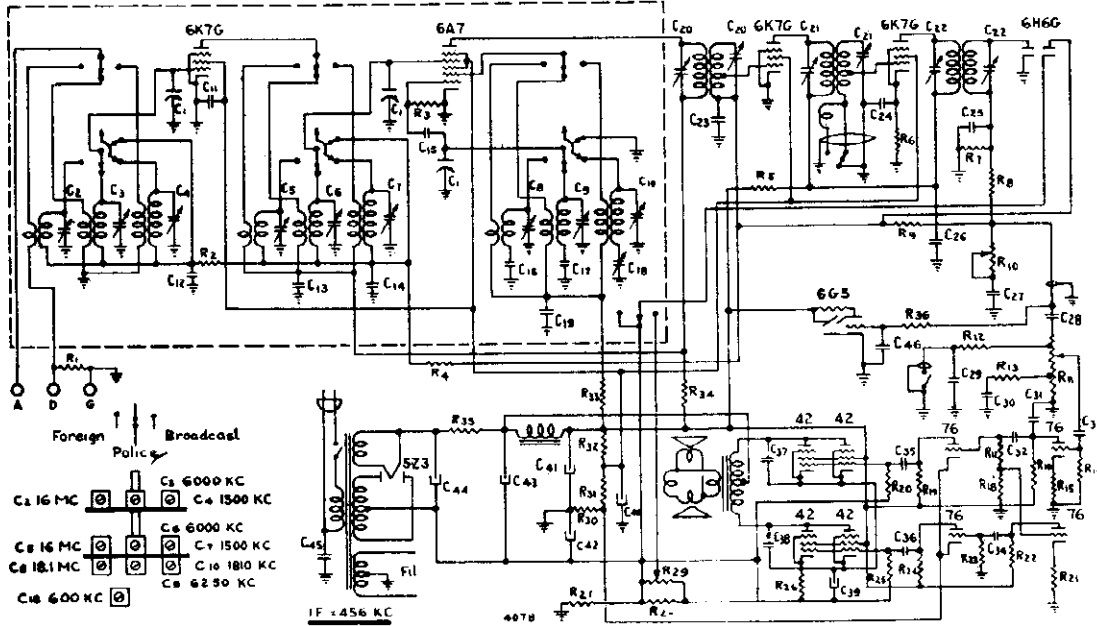
A 400 ohm resistor must be used in series with the generator as a "dummy" antenna for proper alignment of the two short wave bands. Set the band selector switch in the center position, adjust the oscillator top frequency for 6250 kc., then align the antenna and RF trimmers at about 6000 kc. With the band selector in the extreme right position, adjust the top frequency of the high frequency to 18,100 kc., and align the antenna and RF trimmers at about 16,000 kc. In order to make sure that the top end of the last band is set properly, it is best to screw the oscillator trimmer down tight, then unscrew to the second peak. The antenna and RF trimmers should be screwed down tight, then unscrew to the first peak. This procedure must be followed in order that the oscillator and RF circuits will be set in the correct relation to each other, otherwise a "dead" spot at a lower frequency will result, and the dial calibration will not be correct. Usually, it is best to rock the tuning condenser back and forth slightly while making these adjustments at high frequencies.

MODEL 163
Schematic
Parts

DETROLA RADIO CORP.

Tubes

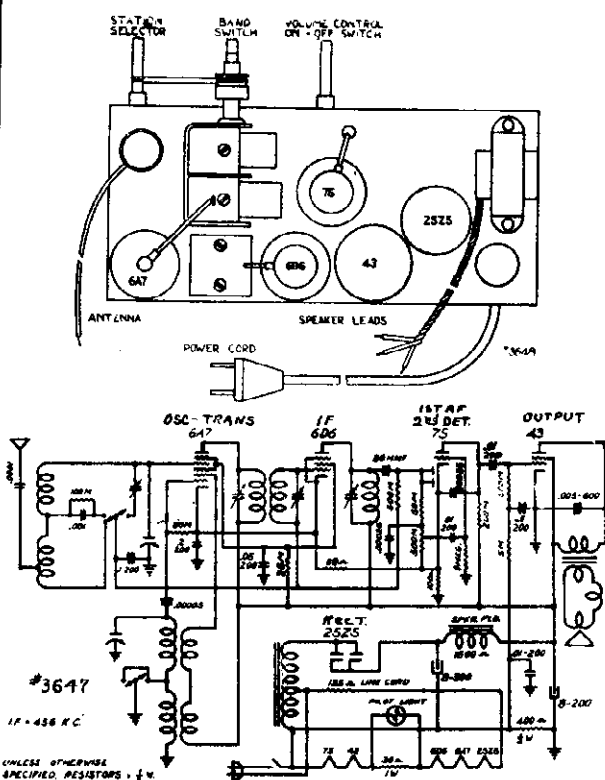
- Tubes required are:
- | | |
|--|----------------------------|
| 1—6K7G Radio frequency Amplifier | 1—76 First Audio Amplifier |
| 1—6A7 Oscillator—Translator | 1—76 Phase Inverter |
| 2—6K7G Intermediate frequency Amplifiers | 2—76 Drivers |
| 1—6H6G Detector—AVC—Bias control | 4—42 Power Output |
| 1—6G5 Cathode ray tuning tube (on models equipped with "eye" tuning indicator) | 1—5Z3 Rectifier |



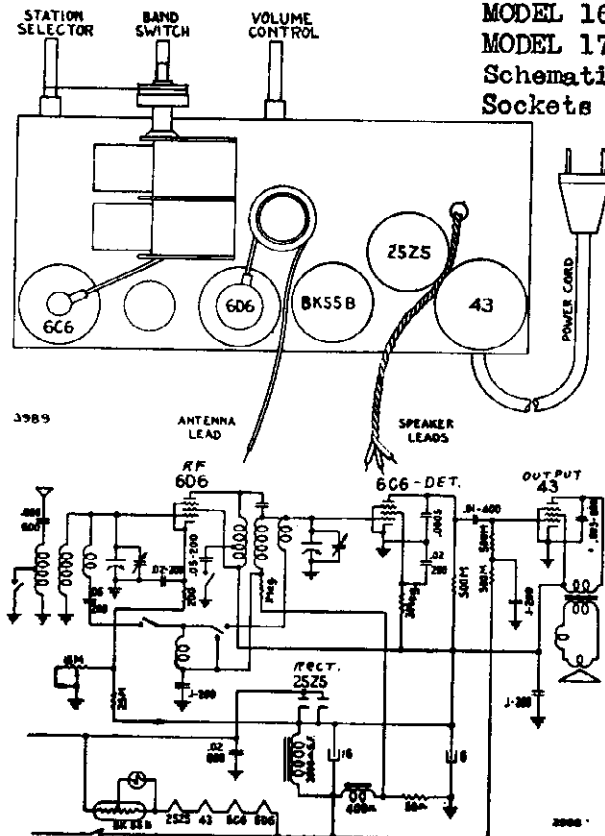
Symbol	Part No.	Description	Symbol	Part No.	Description
C1	3814	9-400 mmf variable	R12,20,25	2568	300 M 1/3 W.
C2,3,4	3822	2-35 triple trimmer	R13,33	617	20 M 1/3 W.
C5,6,7	3822	2-35 triple trimmer	R14	624	1 meg 1/3 W.
C8,9,10	3822	2-35 triple trimmer	R15,21	614	5 M 1/3 W.
C11,23	572	.1 200V.	R17	2731	500 M 10% 1/3 W.
C12,14,46	580	.05 200V.	R18	2880	100 M 10% 1/3 W.
C13	575	.1 400V.	R26	4068	300 ohm 10% 3 W. flex.
C15,25	2780	50 mmf mica	R27	3808	50 ohm 10% 3/4 W. flex.
C16	2694	.005 5% tolerance	R28	4069	200 ohm 10% 2 W. flex.
C17	2741	1330 mmf 5% tolerance	R29	3801	2 M variable
C18	2560	350 mmf variable padder	R30	639	750 ohm 1/3 W.
C19,24	568	.01 400V.	R31	3805	8 M 1.5 W.
C20,21,22		IF trimmers	R32	3805	7 M 3.5 W.
C26	563	.05 400V.	R35	4070	100 ohm 10% 3 W. flex.
C27	2695	.003 600V.	4058		Power transformer
C28,33	576	.02 200V.	4061		No. 1 IF transformer
C29	824	.002 600V.	4060		No. 2 IF transformer
C30	4072	.03 200V.	3968		No. 3 IF transformer
C31	1286	250 mmf mica	2981		Tuning tube cable
C32,34,35,36	2600	.02 600V.	4082		12" Dynamic speaker
C37,38	3138	.001 800V.	4079		12" P.M. speaker
C39,42	4071	20 MF 35 WV.	2898		Tuning tube clamp
C40	3079	8 MF 150V.	3815		RF coil
C41	4062	30 MF 275V. Reg.	3943		Oscillator coil
C43	3112	16 MF 450V.	3817		Antenna coil
C44	3111	16 MF 500V.	3825		Planetary drive
C45	3135	.003 800V.	3826		Drive belt
R1,4,8,16,19,22,24	603	100 M 1/3 W.	3198		Idler pulley
R2,3	631	50 M 1/3 W.	3199		Idler spring
R5,6,34	2421	1 M 1/3 W.	3831		Minute pointer
R7,23	615	500 M 1/3 W.	3832		Tuning pointer
R9	2693	2 meg 1/3 W.	3802		On-off switch
R10	3799	2 meg tone control	3818		RF and antenna switch
R11	3800	3 meg volume control	3819		Oscillator switch

DETROLA RADIO CORP.

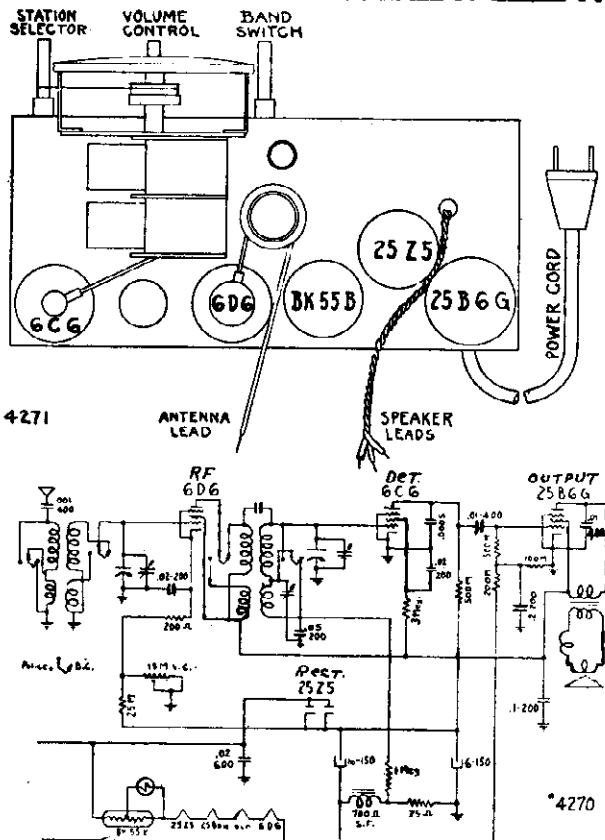
MODEL 15
 MODEL 16
 MODEL 16
 MODEL 17
 Schematic
 Sockets



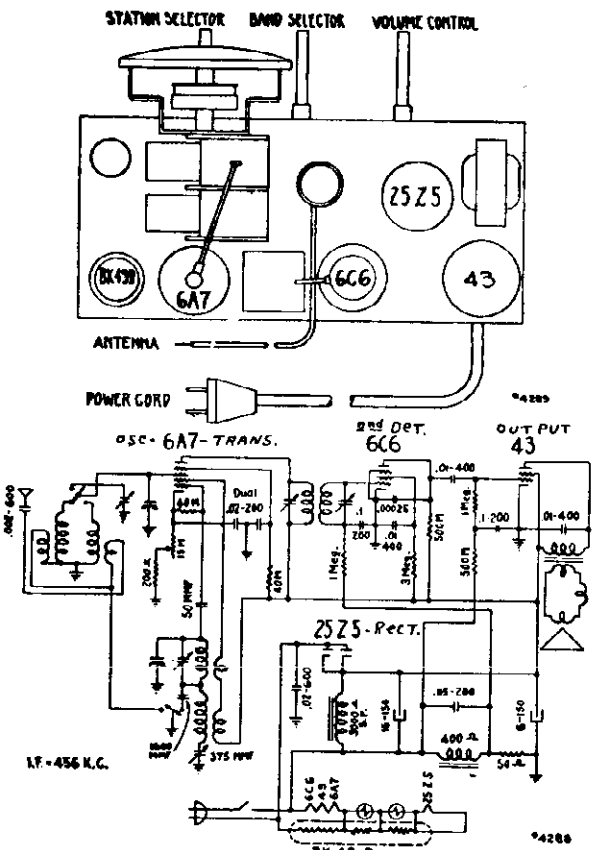
MODEL 169



MODEL 162-A



MODEL 168

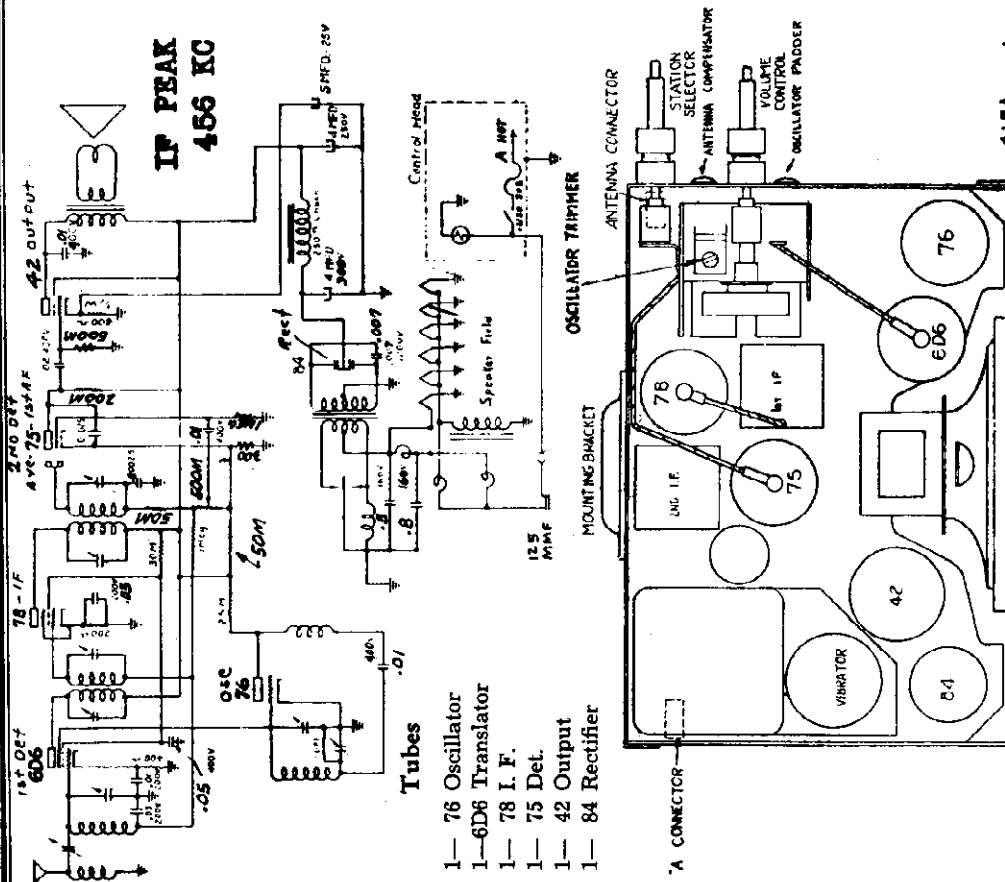


MODEL 172

MODEL 166

Schematic, Socket Trimmers, Alignment, Parts

DETROLA RADIO CORP.



**IF PEAK
456 KC**

- Tubes**
- 1— 76 Oscillator
 - 1— 6D6 Transformer
 - 1— 78 I. F.
 - 1— 75 Det.
 - 1— 42 Output
 - 1— 84 Rectifier

I. F. Alignment

The I.F. frequency of this receiver is 456 K.C. For realignment, use the following procedure.

It is necessary to use an accurately calibrated signal generator. Couple the signal generator to the grid of the 6A7 tube with a tenth microfarad condenser in series with the "high" lead of the signal generator. Connect the ground side of the signal generator to the chassis. Set the signal generator to 456 K.C. Be sure the volume control is set at maximum. Attenuate the signal generator so that the signal is just audible in the speaker. If an output meter is used, it should be connected across the voice coil terminals of the speaker. Use 1/2 volt as standard output.

Adjust the 2nd I.F. transformer first. Each screw should be adjusted for maximum output. After number two I.F. has been adjusted, number one I.F. should be adjusted for maximum output. After both transformers have been adjusted, it is necessary to recheck No. 2 transformer and then recheck No. 1.

R. F. Alignment

To align the broadcast band, proceed as follows:

First, connect the ground side of the signal generator to the chassis. Connect the high side of the signal generator with a .00025 condenser, in series, to the antenna lead of the set. Set the volume control to maximum. Turn the station selector to the highest frequency (as far as it will go). Set the signal generator to 1570 K.C. Adjust the oscillator trimmer until the signal is heard. After the oscillator has been set at 1570 K.C., turn the station selector to 1400 K.C. Set the signal generator to 1400 K.C. When the signal is heard, adjust the antenna trimmer for maximum output.

When the set has been adjusted at 1400 K.C., turn the station selector dial to 600 K.C. Set the signal generator to 600 K.C. When the signal is heard, adjust the padder condenser by rocking the selector back and forth. While adjusting the padder screw, it is necessary to move the selector so that the signal may be kept in tune while adjusting the padder screw. This procedure should be followed until maximum output is obtained.

The foregoing procedure should be repeated. That is, the set is to be rechecked at 1570, 1400 and 600 K.C.

When aligning the R.F., use the same output standard as was used on the I.F. alignment.

No. Req.	Description	No. Req.	Description
624	1 Resistor—1 Meg.—1/2 W.	3298	1 Speaker
615	1 Resistor—500 M.—1/2 W.	3299	1 Grille Screen
2730	1 Resistor—200 M.—1/2 W.	4156	1 Grille Cloth
631	1 Resistor—50 M.—1/2 W.	4157	1 Condenser—Variable
621	1 Resistor—25 M.—1/2 W.	4169	1 Condenser—Ant. Trimmer
2692	1 Resistor—300 ohm.—1/2 W.	4170	1 Condenser—Osc. Padder
2268	1 Resistor—200 ohm.—1/2 W.	4167	1 Antenna Cable
2572	1 Resistor—400 ohm.—1/2 W.	4187	1 Steering Post Control Head
629	1 Resistor—50 M.—1/2 W.	1286	1 Condenser—00025 Mica
2784	1 Resistor—400 ohm.—1/2 W.	3002	1 Condenser—0075-1200 V.

3583	Resistor—30 M.—1/2 W.	3061	2 Cables Control. Includes Cas-
3012	1 Transformer—Vibrator	ing Tips and Flex. Shafts	
3052	1 Cover—Transformer	580	3 Condenser—05—200 V. Paper
3042	1 Adapter—Variable Condenser	565	2 Condenser—01—200 V. Paper
2293	1 Choke—Iron Core	2601	2 Condenser—01—600 V. Paper
4158	1 Coil—Antenna	2600	1 Condenser—02—600 V. Paper
4159	1 Coil—Oscillator	4171	1 Condenser—2—160 V. N.I.—
3000	1 Vibrator—With Ground Ring	Paper	
2860	1 Transformer—1st I.F.	3003	1 Condenser—5—160 V. N.I.—
2916	1 Transformer—2nd I.F.	Paper	
4165	1 Condenser—Dry Elec.		

DETROLA RADIO CORP.

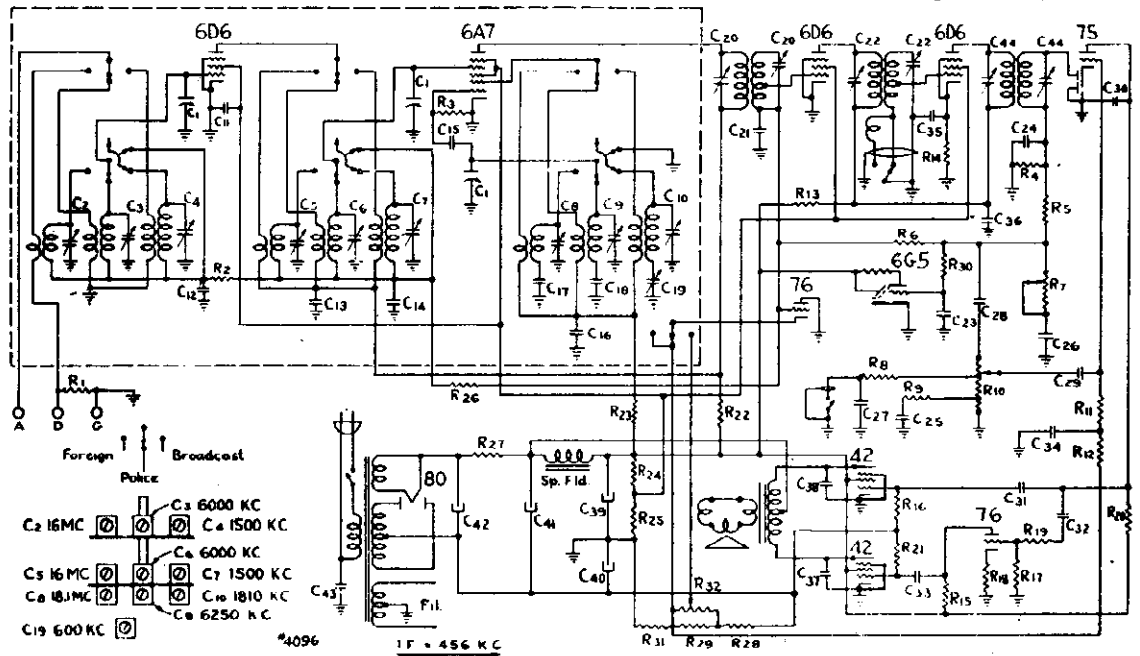
MODEL 165
Schematic, Part
Trimmers

Tubes

Tubes required are:

- 1—6D6 Radio Frequency Amplifier
- 1—6A7 Oscillator-translator
- 2—6D6 Intermediate Frequency Amplifiers
- 1—76 Automatic Bias Control
- 1—75 Detector AVC—First Audio Amplifier

- 1—76 Driver—Phase Inverter
- 2—42 Power Output
- 1—80 Rectifier
- 1—6G5 Cathode Ray Tuning Tube (on models equipped with "eye" tuning indicator)



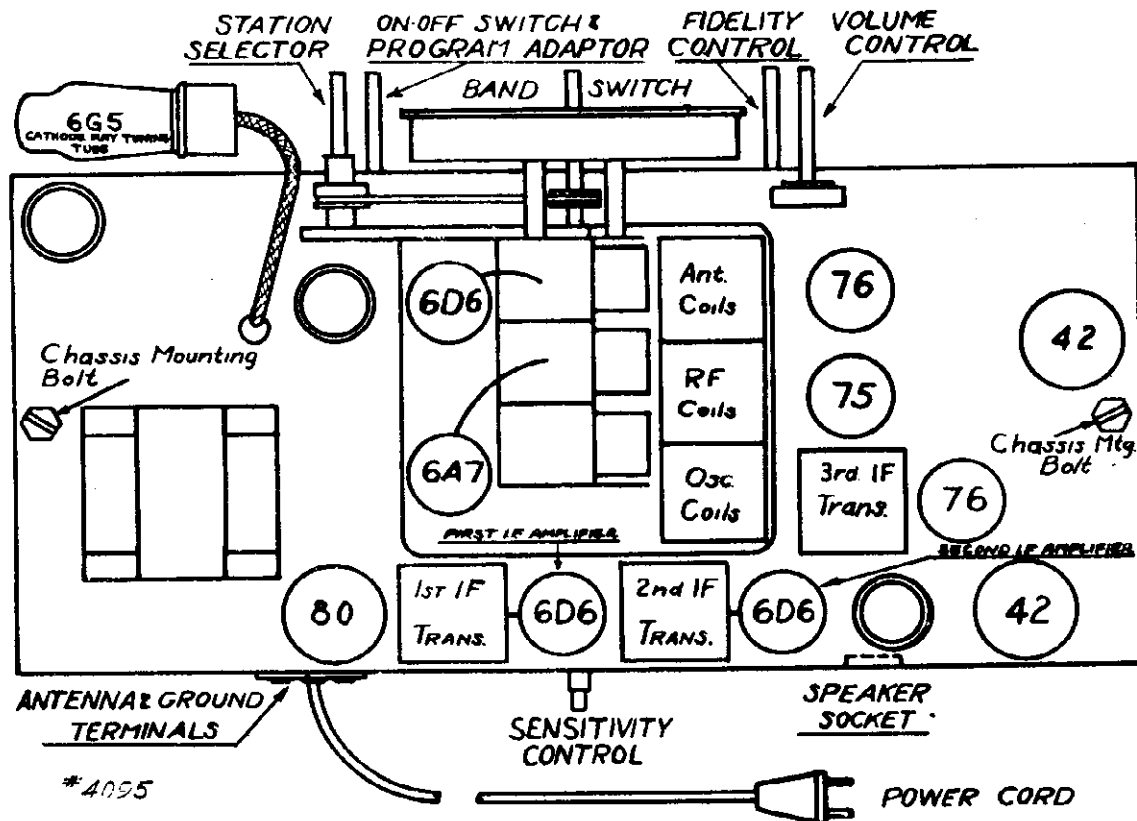
Symbol	Part No.	Description	Symbol	Part No.	Description
C1	3814	9-400 mmf variable	R11,12	624	1 meg 1/3 W.
C2,3,4	3822	2-35 triple trimmer	R13,14,22	2421	1 M 1/3 W.
C5,6,7	3822	2-35 triple trimmer	R17	2880	100 M 1/3 W. 10%
C8,9,10	3822	2-35 triple trimmer	R18	614	5 M 1/3 W.
C11,21,34	572	.1-200 V.	R19	2731	500 M 1/3 W. 10%
C12,14,23	580	.05-200 V.	R20	598	200 M 1/3 W.
C13	575	.1-400 V.	R24	3805	7 M 3.5 W.
C15,24	2780	50 mmf mica	R25	3805	8 M 1.5 W.
C16,35	568	.01-400 V.	R27	3809	100 ohms 2 W. 10%
C17	2694	.005 5% tolerance	R28	3806	120 ohms 1.5 W. 10%
C18	2741	1330 mmf 5% tolerance	R29	4111	85 ohms 1.0 W. 10%
C19	2560	350 mmf variable padder	R30	2106	3 meg 1/3 W.
C20,22,44		IF Trimmer	R31	3870	15 ohms .5 W. 10%
C25	4072	.03-200 V.	R32	3801	2 M variable
C26	2695	.003-600 V.		3796	Power transformer
C27	824	.002-600 V.		4061	No. 1 IF transformer
C28,29	576	.02-400 V.		4060	No. 2 IF transformer
C30	1286	250 mmf mica		3968	No. 3 IF transformer
C31,33	2600	.02-600 V.		2981	Tuning tube cable
C32,36	563	.05-400 V.		3838	12" Speaker
C37,38	3138	.001-800 V.		2898	Tuning tube clamp
C39	3113	16 MF regulating		3815	RF coil
C40	3136	20 MF 25 V.		3943	Oscillator coil
C41	3112	16 MF 450 V.		3817	Antenna coil
C42	3111	16 MF 500 V.		3826	Drive belt
C43	3135	.003-800 V.		3198	Idler pulley
R1,5,15,26	603	100 M 1/3 W.		3199	Idler spring
R2,3	631	50 M 1/3 W.		3831	Minute pointer
R4,16,21	615	500 M 1/3 W.		4113	Tuning pointer
R6	2693	2 meg 1/3 W.		3802	On-off switch
R7	3799	2 meg tone control		3818	RF and Antenna switch
R8	2558	300 M 1/3 W.		3819	Oscillator switch
R9,23	617	20 M 1/3 W.		3825	Planetary drive
R10	3800	3 meg volume control			

MODEL 165

Socket

Alignment

DETROLA RADIO CORP.



Tubes must be in proper position and connected as shown.

ALIGNMENT PROCEDURE

Warning! This information is to be used by a *Competent Service Man only* and not by an untrained person.

Connect a high impedance AC voltmeter across the loudspeaker terminals. Volume control should be set a few degrees back of maximum volume position. Use a weak signal from the generator. Strong signals tend to cause improper adjustments.

Be sure that the fidelity control is NOT in the HIGH FIDELITY position. It will not be possible to properly align the receiver unless this control is turned part way toward its "bass" position.

IF. Connect the generator ground to receiver chassis. Using .1 mfd condenser in series with high side of generator, apply 456 kc signal to grid of 6D6 second IF amplifier and align transformer No. 3. Repeat for transformer No. 2, applying signal to grid of 6D6 first IF amplifier. Repeat for transformer No. 1, applying signal to grid of 6A7 translator. (See above diagram for location of tubes and transformers.)

RF. (See circuit diagram for location of trimmers.) Using a 200 mmf. condenser in series with the high side of the generator, turn band selector switch all the way to the left, tuning condenser to minimum capacity, feed 1810 kc. signal to antenna terminal and adjust broadcast oscillator trimmer for top frequency. Set generator frequency at some point around 1500-1600 kc., and adjust broadcast antenna and RF trimmers. Set generator for 600 kc., tune receiver to signal and adjust the padder. The tuning condenser should be rocked back and forth through the signal while varying the padder in order to assure perfect alignment.

A 400 ohm resistor must be used in series with the generator as a "dummy" antenna for proper alignment of the two short wave bands. Set the band selector switch in the center position, adjust the oscillator top frequency for 6250 kc., then align the antenna and RF trimmers at about 6000 kc. With the band selector in the extreme right position, adjust the top frequency of the high frequency to 18,100 kc., and align the antenna and RF trimmers at about 16,000 kc. In order to make sure that the top end of the last band is set properly, it is best to screw the oscillator trimmer down tight, then unscrew to the second peak. The antenna and RF trimmers should be screwed down tight, then unscrewed to the first peak. This procedure must be followed in order that the oscillator and RF circuits will be set in the correct relation to each other, otherwise a "dead" spot at a lower frequency will result, and the dial calibration will not be correct. Usually, it is best to rock the tuning condenser back and forth slightly while making these adjustments at high frequencies.

DETROLA RADIO CORP.

MODEL 167
Schematic, Socket
Trimmers, Alignment, Par

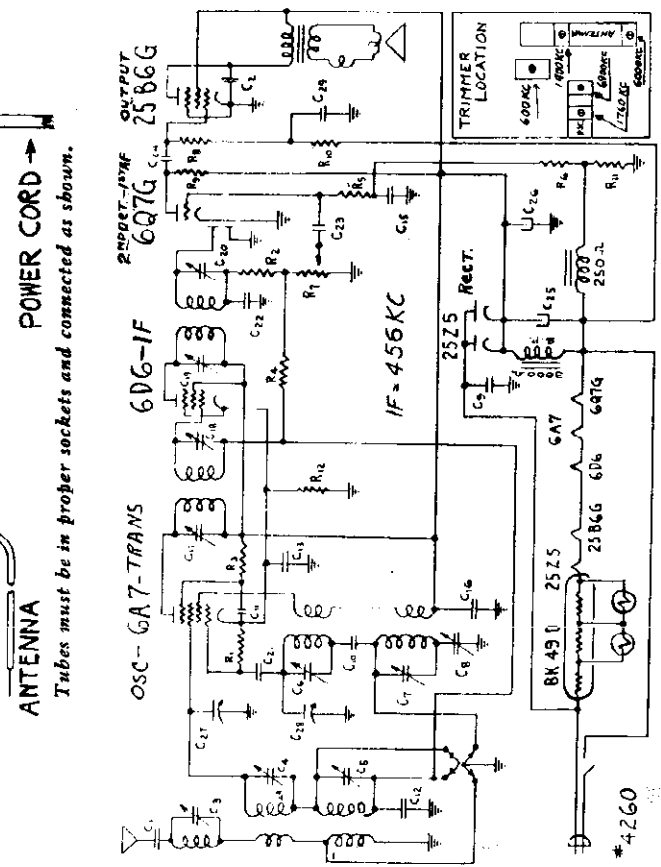
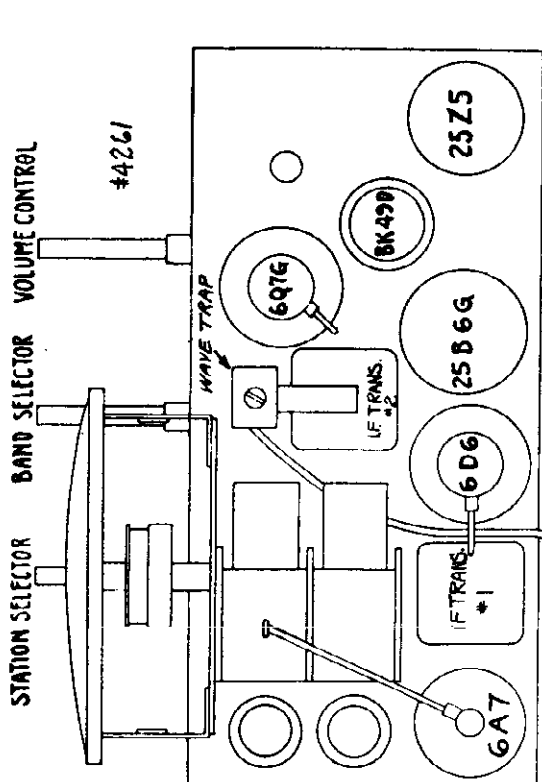
ALIGNMENT PROCEDURE—WARNING! This information is to be used by a COMPETENT SERVICE MAN ONLY and not by an untrained person.
Connect a high impedance A.C. voltmeter across the loud-speaker terminals. Volume control should be set a few degrees back of maximum volume position. Use a weak signal from the generator, strong signals tend to cause improper adjustments.
I.F.: Connect the generator ground to receiver chassis. Using .1 mfd. condenser in series with high side of generator, apply 456 kc. signal to grid of 6D6 I.F. amplifier tube, and align transformer No. 2. Connect generator to grid of 6A7 tube and align transformer No. 1.

SHORT WAVE: A 400 ohm resistor must be used in a series with the generator as a "dummy" antenna for proper alignment of the short wave band. Set the band selector switch in the right hand position; adjust the oscillator top frequency to 6900 kc. then align antenna trimmer at about 6000 kc.

BROADCAST: Using a 100 mmf. condenser in series with the high side of the generator turn band selector switch to left hand position and the tuning condenser to about 600 kc. Feed a 456 kc. signal to the antenna and adjust wave trap trimmer for minimum response. With the tuning condenser at minimum capacity feed 1760 kc. signal to the antenna and adjust broadcast oscillator trimmer for top frequency. Set generator frequency at about 1400 kc. Adjust broadcast antenna trimmer. Set generator for 600 kc., tune receiver to signal and adjust the paddler. The tuning condenser should be rocked back and forth through the signal while varying the paddler in order to assure perfect alignment.

Antenna: This receiver requires very little antenna for proper operation, provided the installation is made correctly. The average length of antenna, including lead-in should be about fifty feet. In locations near powerful broadcast stations, this length should be shortened to thirty-five feet. In more favorable locations, seventy-five feet may be used. Regardless of length, the antenna and lead-in should be spaced well away from the roof, sides of building, trees, power lines, etc. Indoor antennae will give good broadcast reception except in steel frame buildings. However, foreign reception will not be satisfactory unless a good, well insulated, outdoor antenna is used.

NO GROUND IS NECESSARY—UNDER NO CONDITION SHOULD A GROUND WIRE BE ATTACHED TO THIS RECEIVER.



Symbol	Part. No.	Description	Symbol	Part. No.	Description
C1, C2	DR581	.005-.600 V.	C29	DR579	.25-200 V.
C3	DR2559	180 mmf. Tr.	R1-2	DR631	50M 1/2 W.
C4-5-6-7	DR2597	1-10 mmf. Tr.	R3	DR617	20M 1/2 W.
C8	DR2560	350 mmf. Pad.	R4-5-6	DR624	1 Meg. 1/2 W.
C9	DR2600	.02-.600 V.	R7	DR4255	500M V. C.
C10	DR2469	1150 mmf. 5 1/2	R8	DR615	500M 1/2 W.
C11-12	DR580	.05-200 V.	R9	DR2730	200M 1/2 W.
C13-15-16	DR572	.1-200 V.	R10	DR602	250M 1/2 W.
C17 to 20		I.F. Trimmers	R11	DR2965	20 Ohms 1/2 W.
C21	DR2780	50 mmf. Mica	R12	DR2689	100 Ohms 1/2 W.
C22	DR1286	250 mmf. Mica		DR4254	Band Switch
C23-24	DR2601	.01-.600 V.		DR2976	Antenna Coil
C25	DR2698	16 mfd. X150 V.		DR2977	Oscillator Coil
C26	DR2594	24 mfd. X150 V.		DR2972	1st I.F. Trans.
C27-28	DR4251	410 mmf. Var.		DR2969	2nd I.F. Trans.

MODEL 169

**Schematic, Socket
Trimmers, Alignment, Parts**

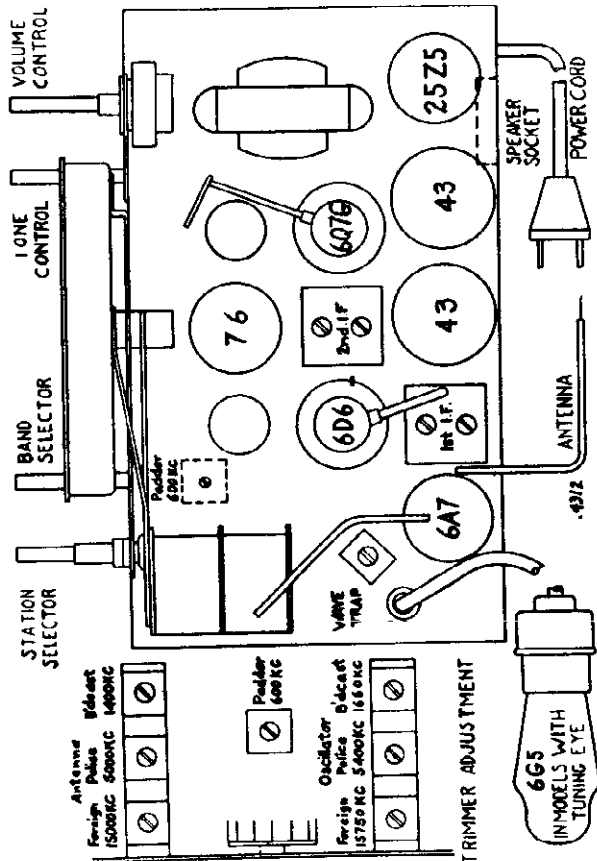
DETROLA RADIO CORP.

ALIGNMENT PROCEDURE

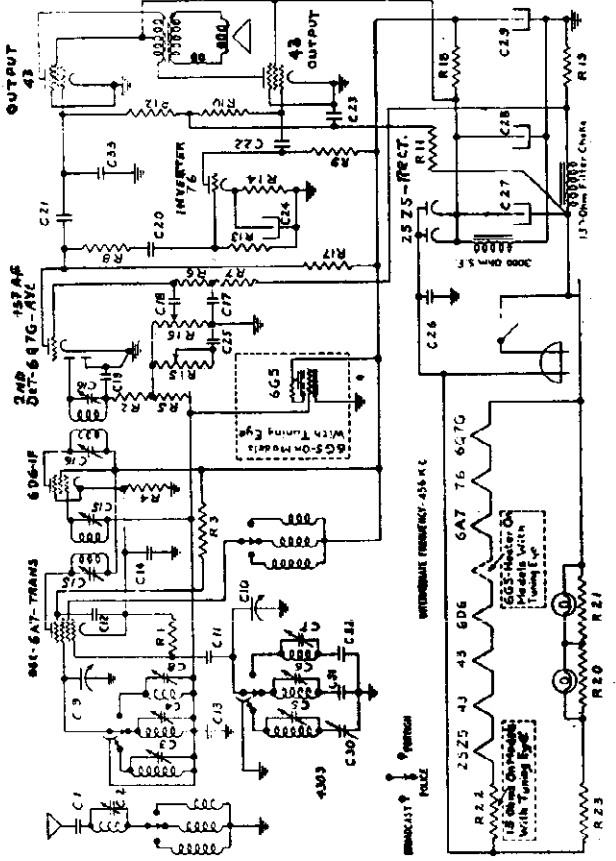
Connect a high impedance AC voltmeter across loud-speaker terminals. Volume control should be set a few degrees back of maximum volume position. Use a weak signal from generator, strong signals tend to cause improper adjustments. I.F.: Connect the generator ground to receiver chassis. Using .1 mfd. condenser in series with high side of generator, apply 456 kc. signal to grid of 6D6 I.F. amplifier tube and align transformer No. 2. Connect generator to grid of 6A7 tube and align transformer No. 1.

RF: (See above diagram for location of trimmers.) Using a 200 MMF. condenser in series with the high side of the generator, turn band selector switch to left hand position and the tuning condenser to about 600 kc. Feed a 456 kc. signal to the antenna and adjust wave trap trimmer for minimum response. With the tuning condenser at minimum capacity feed 1660 kc. signal to the antenna and adjust broadcast oscillator trimmer for top frequency. Set generator frequency at about 1400 kc. Adjust broadcast antenna trimmer. Set generator for 600 kc. tune receiver to signal and adjust the paddler. The tuning condenser should be rocked back and forth through the signal while varying the paddler in order to assure perfect alignment.

Using 400 ohm resistor in series with generator, set band selector in center position. Set generator to 5000 kc. tune receiver to signal and adjust antenna trimmer to 5000 kc. Tune band selector to extreme clockwise position. Using 400 ohm resistor in series with generator, set oscillator top frequency for 15,750 kc.—screw trimmer down tight, then unscrew to second peak. Set generator to 15,000 kc. tune receiver to signal and adjust antenna trimmer.—Screw trimmer down tight, then unscrew to first peak, rocking the tuning condenser back and forth through the signal while the adjustment is being made. Above procedure for alignment at 15,000 kc must be followed exactly to insure proper tracking. A dead spot at about 12,000 kc will result if antenna and oscillator circuits are not set in proper relation to each other.



Tubes must be in proper position and connected as shown.



Symbol	Part No.	Description	Part No.	Description
R-10, 12	2731	500 M- $\frac{1}{2}$ W.-10%	R-11	2568 300 M- $\frac{1}{2}$ W.-10%
R-11	2568	300 M- $\frac{1}{2}$ W.-10%	R-13	2880 100 M- $\frac{1}{2}$ W.-10%
R-15	2737	2 Meg. Tone Control	R-16	2726 500 MV Volume Control
R-17	2730	200 M- $\frac{1}{2}$ W.-10%	R-18	2886 500 OHM-1 W.-10%
R-19	3580	100 OHM-5 W.	R-20, 21	4296 32 OHM 3 W.
R-22	4304	15 OHM—On Eye Models		
R-23	4301	35 OHM—4 W—Wire Wound		
	802	300 OHM Line Cord		
	2755	Antenna Coil		
	2724	Band Switch		
	2857	Oscillator Coil		
	2860	1st IF Transformer		
	2859	2nd IF Transformer		
	4295	Filter Choke		
	1489	5 Prong Socket		
	789	6 Prong Socket		
	2165	7 Prong Socket		
	2557	7 Prong Octal Socket		
	530	Pilot Lamp		
	2378	Pointer		
	1408	Pointer Screw		
	2981	Tuning Eye Cable		
	4307	Speaker—10"		
	4306	Speaker—8"		
C-1	3137	.001-.400 V.		
C-2	2559	180 MMF Trimmer		
C-3, 4, 5, 6, 7	2597	1-10 MMF Trimmer		
C-8	1611	3-35 MMF Trimmer		
C-9, 10	2871	350 MMF Variable		
C-11, 33	2780	50 MMF Mica		
C-12, 13	580	.05-200 V.		
C-14, 17	572	.1-200 V.		
C-15, 16	2445	IF Trimmer		
C-18, 20, 21, 22	576	.02-400 V.		
C-19	1286	250 MMF Mica		
C-23	566	5-200 V.		
C-25	581	.005-600 V.		
C-26	2600	.02-600 V.		
C-27	4297	20 MF-150 V.		
C-24	4298	4 MF-18 V.		
C-28	4298	30 MF-150 V.		
C-29	4298	10 MF-150 V.		
C-30	2560	220-550 MMF Padder		
C-31	2741	1330 MMF 5%		
C-32	2740	3850 MMF 5%		
R-1, 2	631	50 M- $\frac{1}{2}$ W.		
R-3, 14	4302	20 M- $\frac{1}{2}$ W. 10%		
R-4	2689	100 OHM- $\frac{1}{2}$ W.		
R-5, 6, 7	624	1 Meg- $\frac{1}{2}$ W.		
R-8	2599	1 Meg- $\frac{1}{2}$ W.-10%		
R-9	4300	250 M- $\frac{1}{2}$ W.-10%		

DEWALD RADIO

MODELS 200, 202M
Electroca.
Connections, Dat.

SERVICE NOTES

MODEL 200 ELECTROCALL

Failure to Function:

- A. Defective tube (loose screen grid Cap.)
- B. Open resistor line cord.
- C. Defective filter condenser:-

If unit does not operate and voltages check O.K., suggest adding 8 mfd. 200 V condenser in parallel with filter in unit. If unit operates, replace filter condenser.

- D. Defective "Talk-Listen" switch:-

Remove set from cabinet - loosen set screws and remove lever arm - open retainer washer on shaft - remove rotor of switch - clean contacts with Carbona - bend rotor arms to increase tension - assemble switch making certain lever arm is in original position.

- E. Open 1700 ohm resistor or discolored:

Replace both resistor and seven prong tube (seven prong tube has developed internal short).

- F. Reverse Line plug if connected to Direct Current.

Failure of Pilot Light:

- A. Pilot lamp burned out or making poor contact.
- B. Defective tube or open line cord.
- C. Pilot lamp socket opened, shorted, or grounded.
- D. Open 25 ohm wire wound resistor.

Excess Hum:

- A. Defective 6 prong tube.
- B. Defective Filter Condenser:-

To check -- connect 8 mfd. 200 volt condenser in parallel with filter in unit. If hum ceases, replace filter condenser.

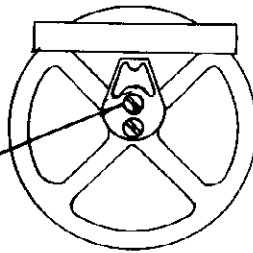
Weak Response:

- A. Check second section of filter cond.
- B. Check speaker adjustment.
- C. Check tubes.

Speaker Rattles or Poor Quality:

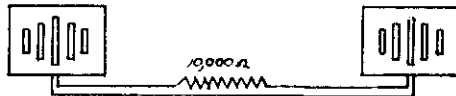
This may be remedied by adjusting screw as indicated, also check for loose pilot lamp or bracket.

ADJUST THIS SCREW ONLY (NEAREST MAGNET)



If Unit "A" rattles when speaking into Unit "B" - recheck adjustments on both speakers as it may be either the microphone unit or speaker.

If voice is audible through "A" when speaking into "B" but not vice-versa, then "A's" unit is defective.



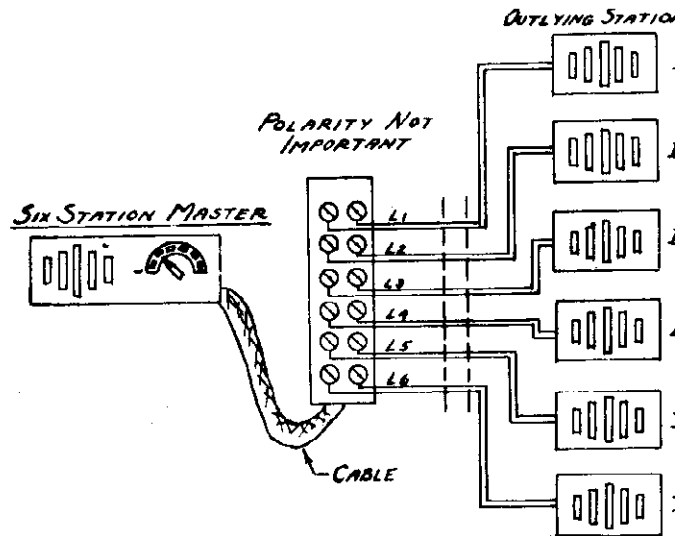
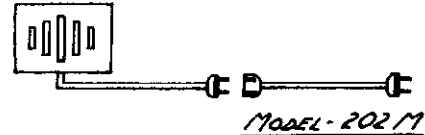
If units howl or squeal due to close proximity, insert 10,000 ohm resistor in series with one side of the cable, as illustrated.

Voltages - taken with 1000 ohm per Volt meter:

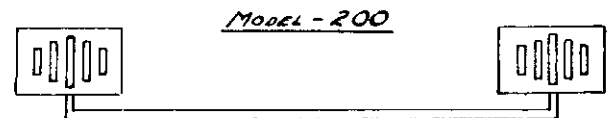
- Across 1700 ohm resistor 12 to 16 Volts
- Across 3500 ohm resistor 1/2 to 1 Volt
- Across B plus to B minus 125 to 150 Volts.

DO NOT SHORTEN LINE CORD UNDER ANY CONDITIONS.

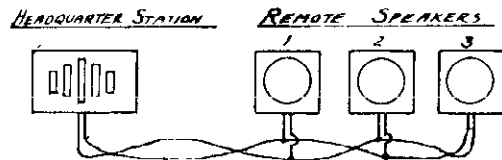
Connect conventional extension cord, should it be necessary to extend length of line cord furnished with units.



METHOD OF CONNECTING 6 STATIONS



METHOD OF CONNECTING TWO SINGLE UNITS



METHOD OF CONNECTING REMOTE SPEAKERS
MODEL-203-206

MODELS 200A, 202A, 202M, 203A
Schematic, Installation, Notes

DEWALD RADIO

GENERAL INSTRUCTIONS

202-M MASTER UNIT

TO TALK:

This device is of a multiple system type, designed to operate on 25-60 cycles A.C. or D.C. 110-120 volts.

The master station may select and hold two way conversation with any one remote station and yet may not be overheard by any other station. Any remote station may also call the master and not be overheard by other stations.

INSTALLATION:

After locating the units the cables should be run in the most convenient manner. These cables carry no power, but care should be taken that they do not come in contact with electrical or telephone lines. It is also advisable not to run them parallel. (If they have to be run parallel, keep them as far apart as possible.)

TO OPERATE:

Snap middle switch to "ON" position and wait from ten to twenty seconds for tubes to heat. When operating instrument from direct supply line, it may be necessary to reverse the current plug at the calling stations if instrument at other end of line fails to respond and vice versa.

CALLING SIGNAL:

Turn Station Selector Switch to station desired, press "Call Listen" lever down and pull out.

Press "Talk-Listen" switch down. This switch must be held down all the while when talking. Each instrument is normally in a position to receive calls regardless of whether the switch is turned on or off. It is only necessary to turn on the instrument when calling.

TO RECEIVE CALLS:

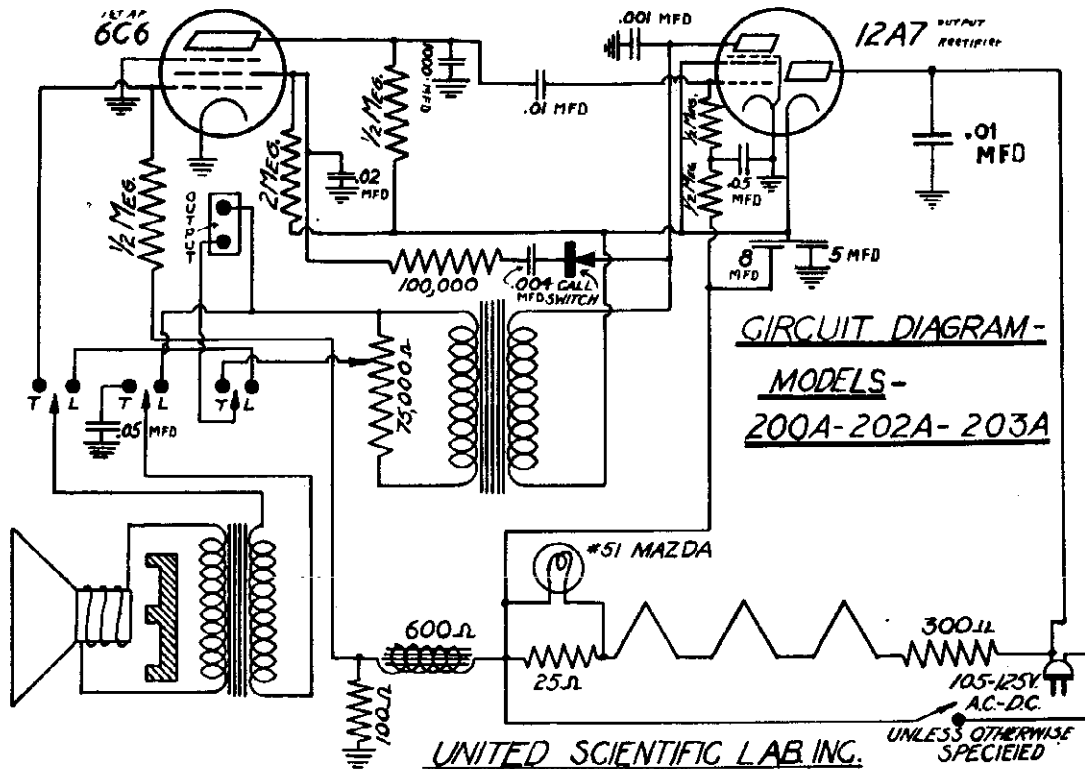
To signal master station from individual outlying station, most convenient practice is to adapt a call system corresponding with the numerals on the master terminal board. That is, if the outlying station is attached to #5 on terminal board, then this station should depress the "Talk-Listen" key five times, when desiring to converse through the master unit.

It is advisable to set station selector switch to a neutral position, which is indicated by the small arrow head between station numerals, when master instrument is not in use.

When operating Electrocall, the user should talk about an arm's length away from the grill and in an ordinary conversational tone. Talking loudly into the grill will result in greater amplification at the receiving end.

Both units must be turned "ON" when holding two way conversation. When continuous service is desired, it is necessary to keep all units turned "ON"

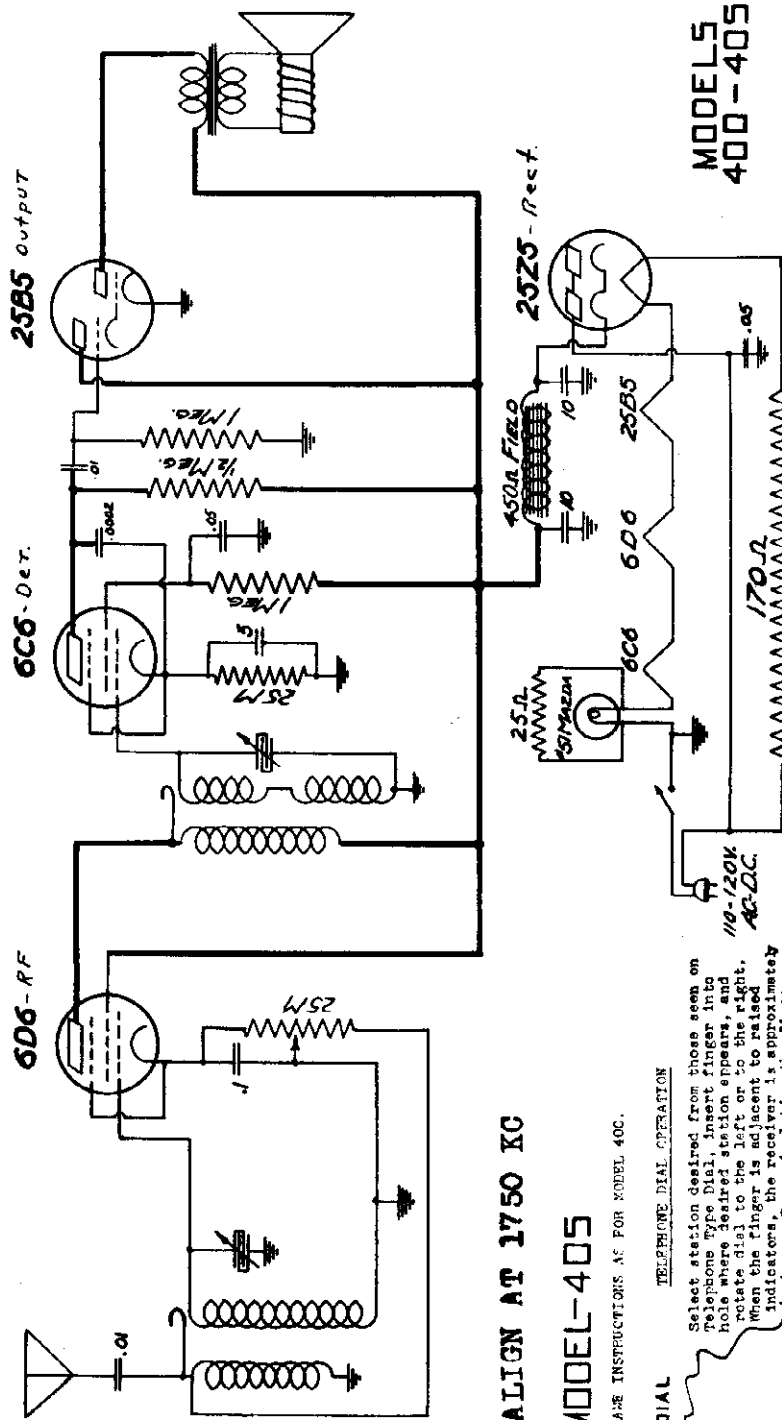
The tubes used for the Electrocall are especially designed for this system and can only be obtained directly from the manufacturer or through any Electrocall distributor. These tubes carry our regular ninety day guarantee.



UNITED SCIENTIFIC LAB. INC.

DEWALD RADIO

PRICES SUBJECT TO CHANGE
WITHOUT NOTICE



MODELS
400-405

ALIGN AT 1750 KC

MODEL-405

FOLLOW THE SAME INSTRUCTIONS AS FOR MODEL 400.

TELEPHONE DIAL

TELEPHONE DIAL OPERATION

Select station desired from those seen on Telephone Type Dial. Insert finger into hole where desired station appears, and rotate dial to the left or to the right. When the finger is adjacent to raised indicators, the receiver is approximately in tune. By manipulating the finger within the range of indicator, station may be tuned perfectly.

Some stations must be tuned by turning the dial plate clockwise, and some counter-clockwise. The station name should always appear upright when brought to raised indicators. By this, one can tell which direction the dial should be turned to tune in a station.

NOTE: If one prefers to use the knob the kilocycle scale on top is used.

This receiver is a 4 tube T.R.F. and designed to operate on 110-120 Volts - 60-80 cycles, alternating current or direct current unless otherwise specified on rear of chassis.

RANGE: The tuning range of this receiver is from 540 to 1750 Kilocycles. This range covers all of the standard American broadcast stations and some Police Calls.

ANTENNA: Unwind reel of brown wire and place same along the base-board. In shielded buildings, it is advisable to hang the wire out of the window or connect it to an outside antenna. No ground is necessary with this receiver.

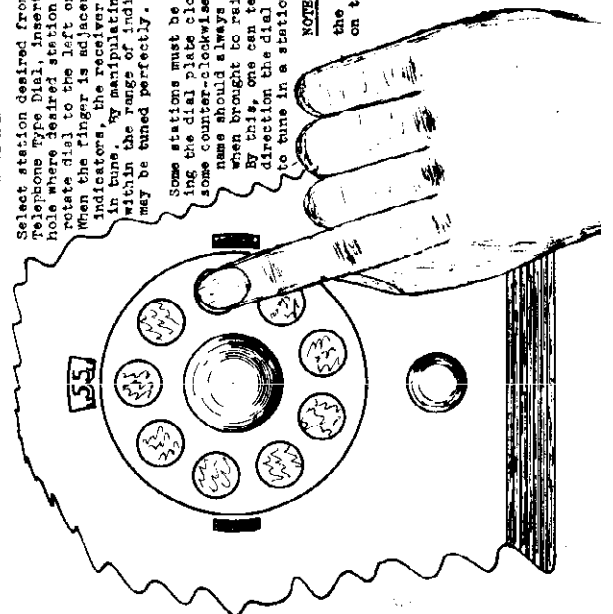
TUBES: 1-606, 1-606, 1-25B5, 1-25B5.

CONTROLS: The upper control is the station selector knob. The lower one is the On-Off Switch and the volume control.

IMPORTANT: DO NOT CONNECT A GROUND WIRE TO THE CHASSIS. DO NOT CHANGE THE LENGTH OF THE LINE COIL.

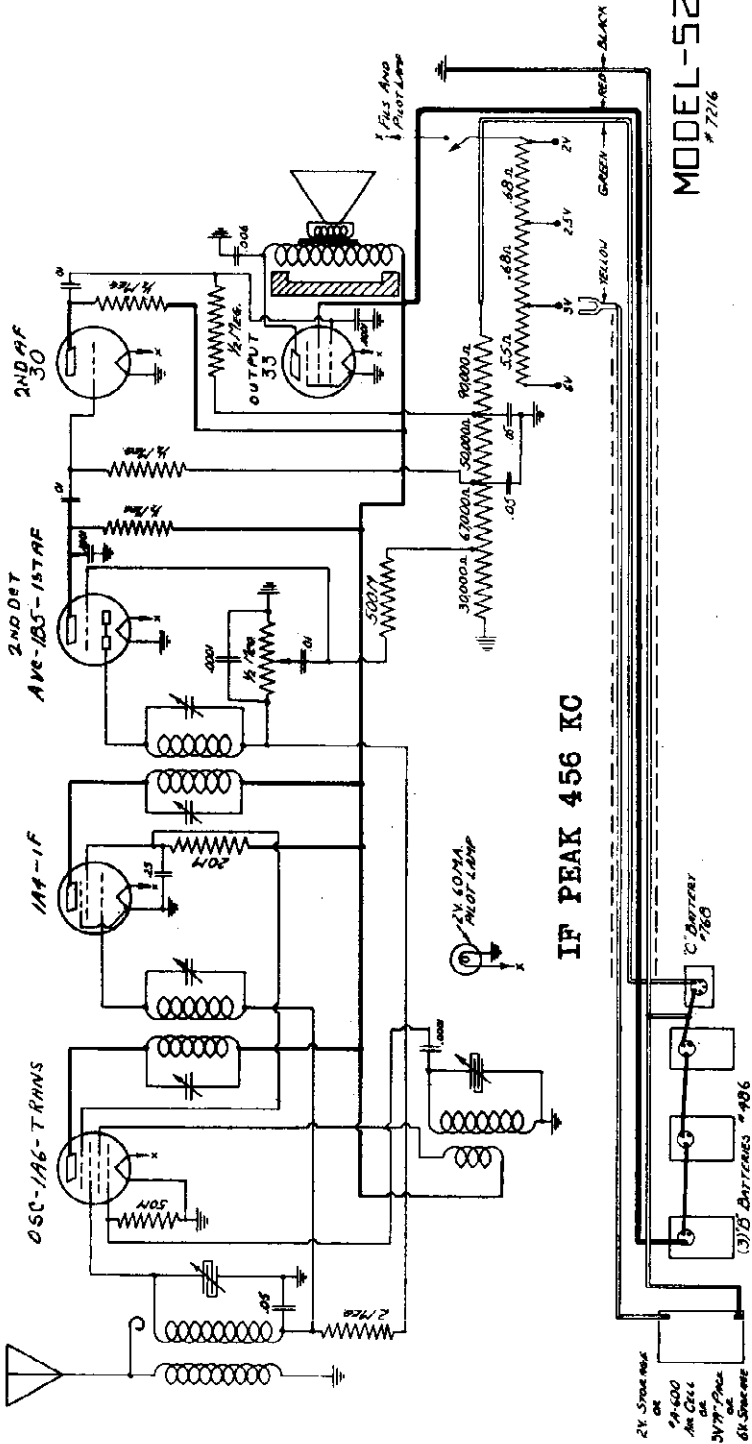
DEWALD LIST PRICES OF REPLACEMENT PARTS.

Part No.	Part	Price	Part No.	Part	Price
1443	Antenna Coil	\$.50	8785	Selector Knob	\$.20
1444	Detector Coil	\$.50	8777	Volume Control Knob	\$.10
2374	Variable Cond.	2.00	8837	Telephone Dial	\$.25
2375	Electrolytic Cond.	1.15	8051	Scale	\$.35
3368	Volume Control	1.00	8787	Knob	\$.15



MODEL 522
Schematic
Notes
Alignment

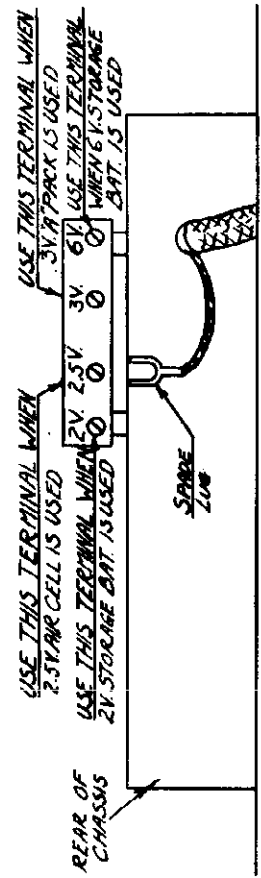
DEWALD RADIO



FOR SERVICING TO CALIBRATE:
Set service oscillator to 456 K.C. and connect "EO" lead to grid of 1A6 tube and connect stator of rear (oscillator) section of variable condenser. Turn volume control for maximum output and peak intermediate frequency trimmers for maximum gain.
Remove short from variable condenser. Remove service oscillator lead from grid of 1A6 tube and connect same to red lead on rear of set. Adjust service oscillator and the receiver to 1500 K.C. and peak trimmers on variable condenser for maximum gain. All the other frequencies are automatically calibrated when receiver is peaked at 1500 K.C. due to the construction of the cut section of variable condenser.

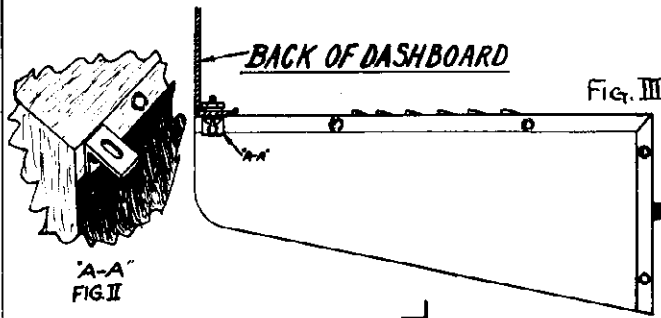
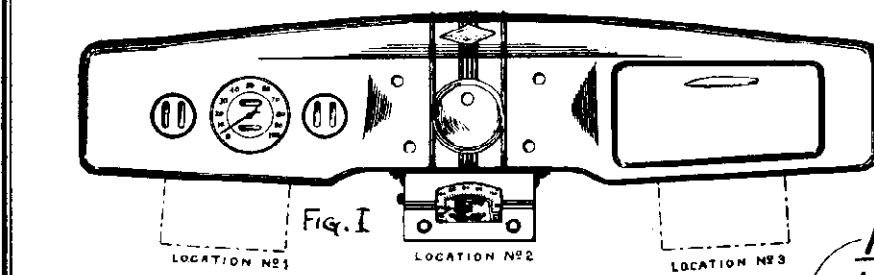
BATTERY SUPPLY: This receiver is designed to operate from a 2-volt storage battery, 2.5 volt "air cell" battery, 3-volt "A" pack or a 6-volt storage battery.

IMPORTANT:
1. Before operating this receiver, make certain that the spade lug which is attached to the yellow lead extending through rear of chassis is fastened to the proper terminal on the battery terminal strip. See Sketch.
2. See circuit drawing for battery connections.
3. Be certain all battery wires and plugs are properly connected.



DEWALD RADIO

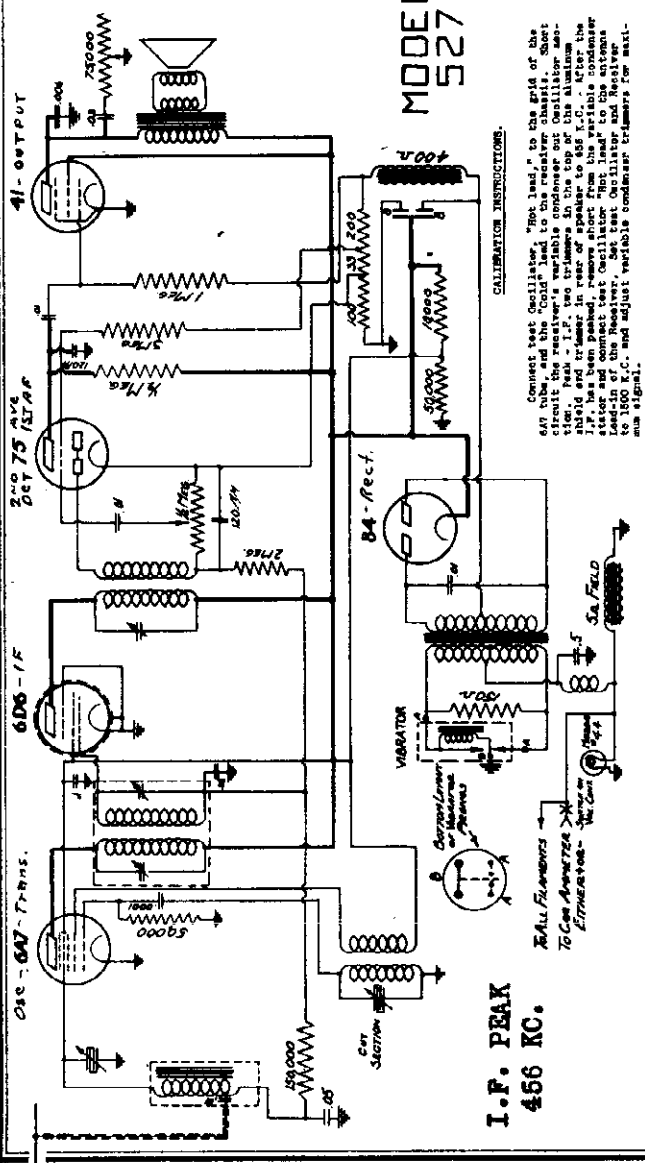
MODEL 527
Schematic
Socket, Chassis
Installation, Note



**FIRE BOARD
LOCATING STOP-NUT
MOUNTING WASHER
MOUNTING NUT
MOUNTING STUD**

**METHOD OF MOUNTING
MODEL N° 527
UNDER THE DASHBOARD OF CAR
DOTTED LINE OF RECEIVER ON DASH
SHOWS OTHER LOCATIONS THAN CENTER**

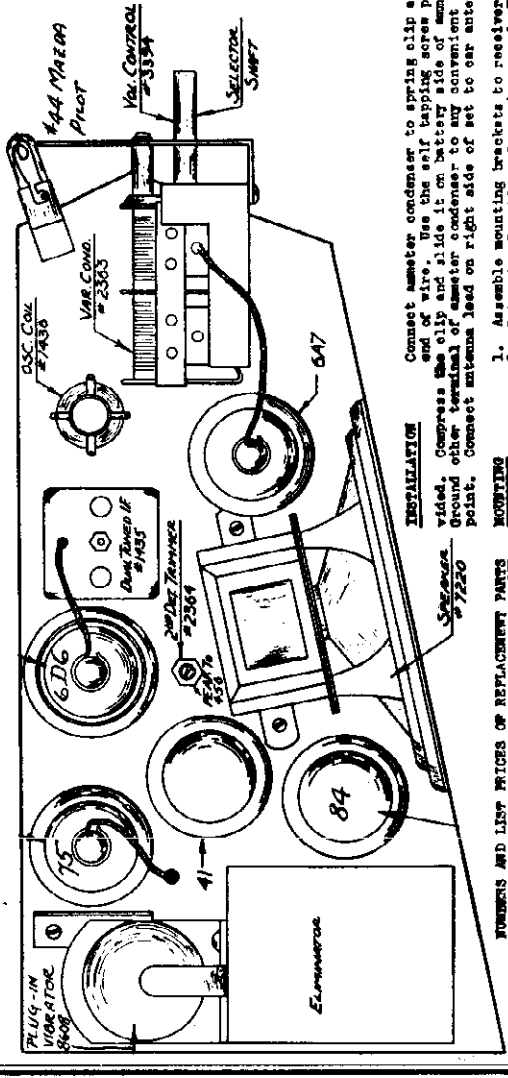
1. Screw the short threaded section of mounting bolt into mounting hole in rear of receiver.
2. Push mounting bracket through the fire board.
3. Push mounting bracket through the mounting washer.
4. Push mounting bracket through the mounting nut.
5. Push mounting bracket through the mounting stud.
6. Push mounting bracket through the mounting washer.
7. Install distributor suppressor in Distributor.



MODEL 527

CALIBRATION INSTRUCTIONS:

Connect test coil, "hot lead" to the grid of the 6A7 tube, and the "cold" lead to the receiver chassis. Short the antenna terminals to the chassis. Turn the antenna switch to I.F. two trimmers on the top of the aluminum slide and trimmer in rear of speaker to 456 K.C. After the trimmer has been set, remove short from the variable condenser and connect the antenna to the receiver. Set oscillator and Receiver Load-in of the Receiver. Set test oscillator and Receiver to 1600 K.C. and adjust variable condenser trimmer for maximum signal.



1. Assemble mounting brackets to spring clip at end of wire. Use the self-tapping screw provided, compress the clip and install on battery side of antenna.
2. Connect antenna lead on right side of set to ear antenna.
3. Assemble mounting brackets to receiver.
4. Determine location of receiver as in Figure I. Spot and drill two 1/8" holes in the lower section of the dash-board to correspond with the two holes in the mounting brackets.
5. Drill a 3/8" hole in fire board to line up with tapped hole in rear of receiver. (See Figure II)

PRICES SUBJECT TO CHANGE

UNIVERSAL MOTOR MOUNTING

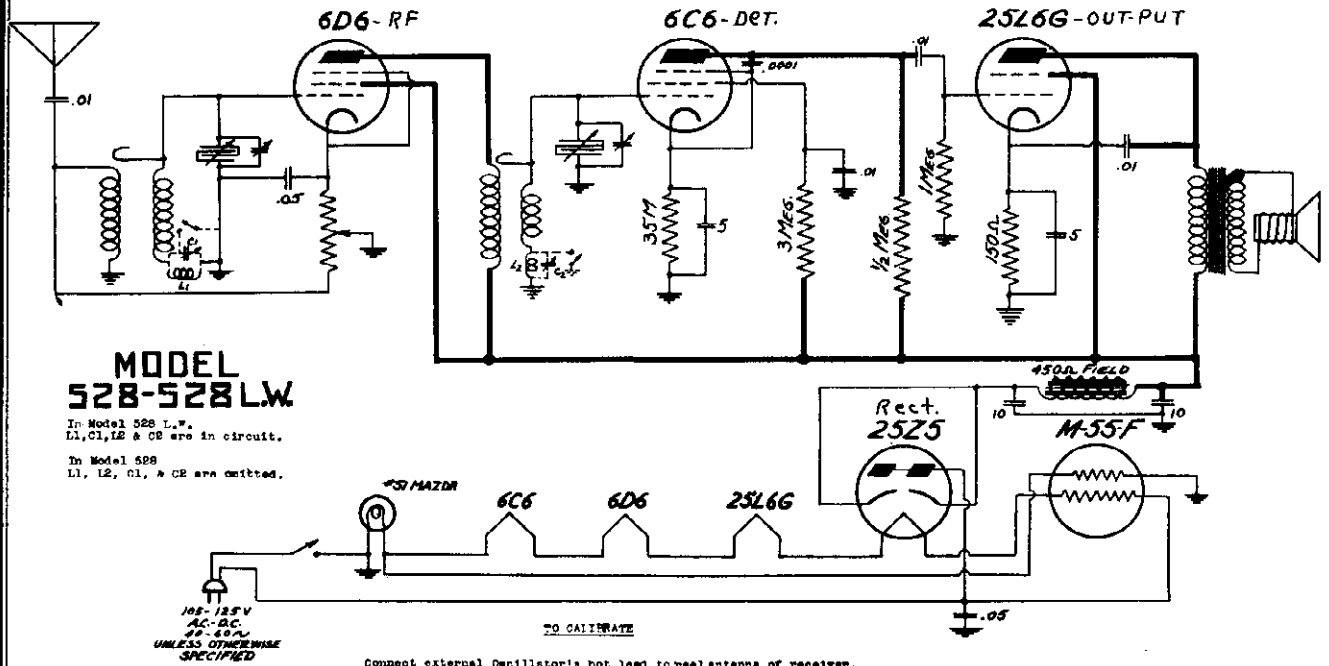
INSTALLATION
Connect ammeter condenser to spring clip at end of wire. Use the self-tapping screw provided, compress the clip and install on battery side of antenna. Connect antenna lead on right side of set to ear antenna.

REPLACEMENT PARTS

Part No.	Part	Part No.	Part	LIST PRICE
1379	2nd Det. I.F.	85	2862 Electrolytic Cond.	\$1.25
1434	Antenna Coil	90	3364 Volume Control	.85
1435	Diode Tuned I.F.	1.25	3390 Tone Control	.75
1436	Oscillator coil	.45	5107 Antenna Cable	.80
1437	Choke	.45	5108 Battery Cable	.50
1438	"B" Choke	.75	7220 1/2" Brass Str.	3.50
1439	"E" Choke	5.00	8408 1/2" Brass Str.	3.50

MODELS 528, 528LW
 MODEL 1200
 Schematics

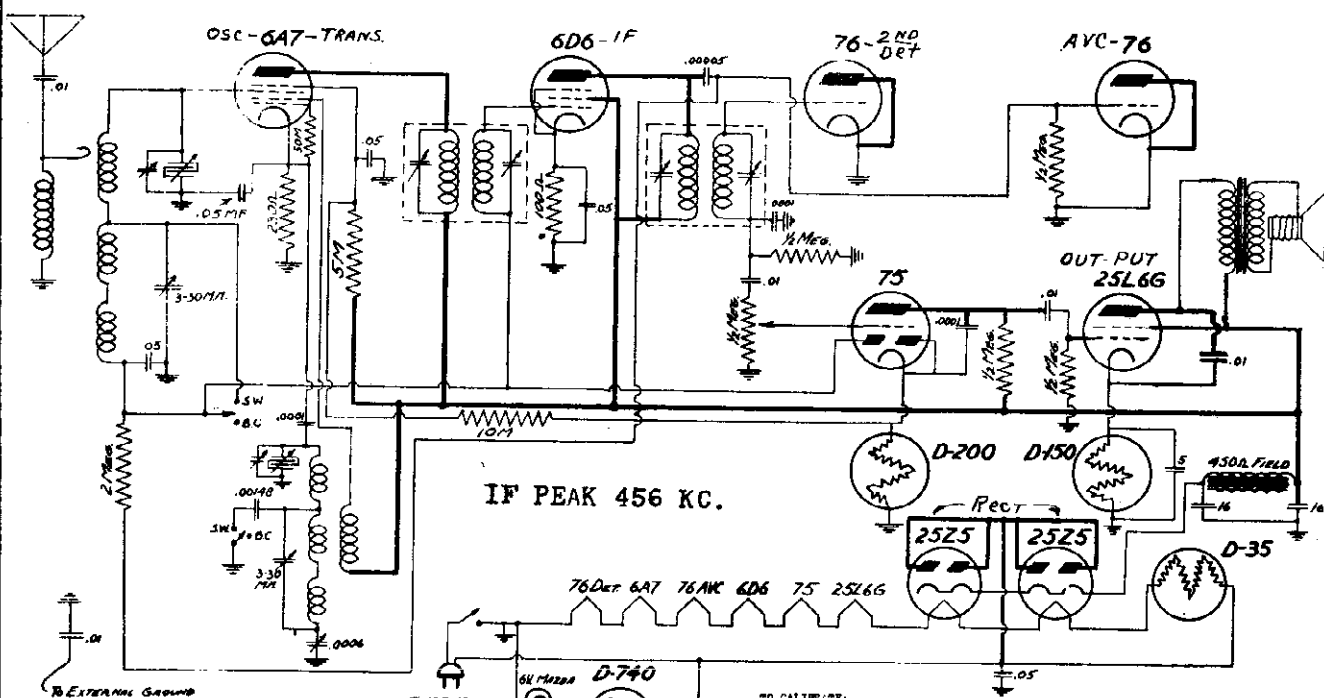
DEWALD RADIO



MODEL 528-528LW

In Model 528 L.W.,
 L1, C1, L2 & C2 are in circuit.
 In Model 528
 L1, L2, C1, & C2 are omitted.

Connect external Oscillator's hot lead to reel antenna of receiver.
 Connect oscillator cold lead in series with a 4 or .1 μ F condenser
 to receiver chassis. Set oscillator at 1800KC and peak Variable Con-
 denser trimmers for Maximum signal with condenser set approximately
 where 1500 comes in on scale.

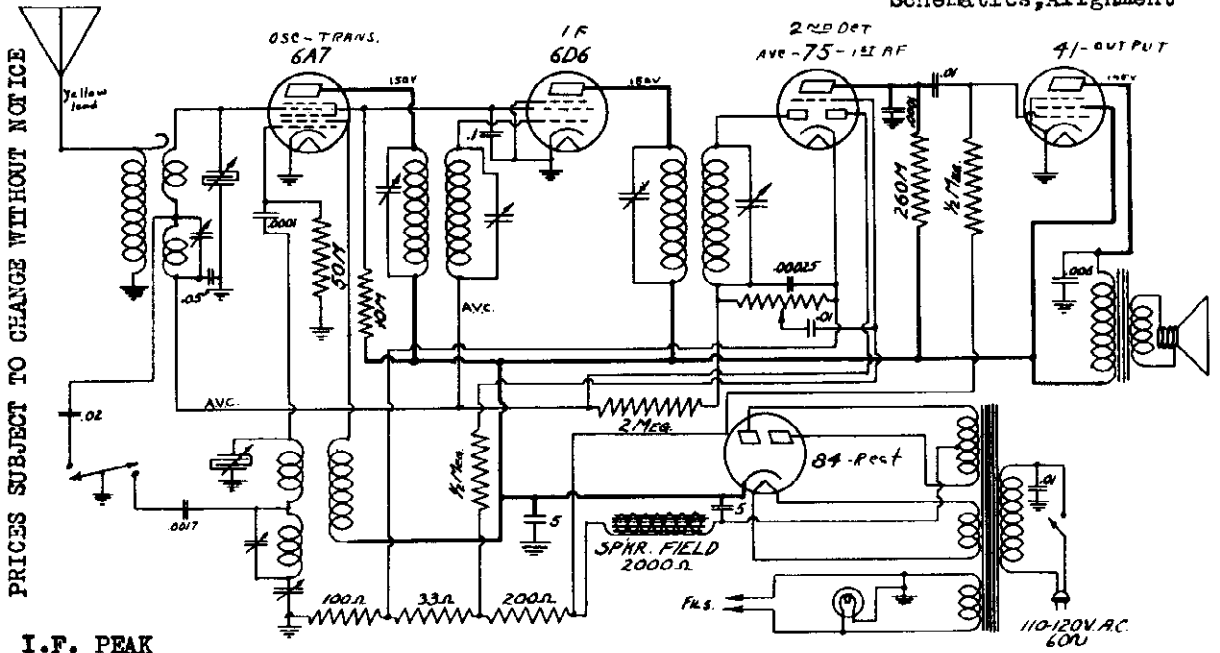


MODEL 1200

TO CALIBRATE:
 Set service oscillator to 456 K.C. and connect "HOT"
 lead to grid of 6A7 tube. Ground stator of front
 (oscillator) section of variable condenser. Turn vol-
 ume control for maximum output and peak intermediate
 frequency trimmers for maximum gain. Turn wave band
 switch knob toward right. Adjust service oscillator
 and receiver to 7 megacycles and peak variable con-
 denser trimmers for maximum gain. Turn wave band
 switch toward left and adjust oscillator (service)
 and receiver to 1500 K.C. Peak both trimmers under-
 neath chassis for maximum gain. Then adjust service
 oscillator and receiver to 600 K.C. and "peak" the variable
 condenser and adjust the padder (near front of chassis
 on top) at the same time for maximum gain.

DEWALD RADIO

MODELS 529, 529LW
MODELS 629, 629LW, 703, 703LW
Schematics, Alignment



PRICES SUBJECT TO CHANGE WITHOUT NOTICE

**I.F. PEAK
456 KC.**

These receivers are dual wave superheterodynes with automatic volume control. The 529 covers the following ranges: 1650-550 K.C. and 7-2.4 M.C. The 529-LW covers the following ranges: 1650-550 K.C. and 340-150 K.C.

**MODEL-529
529 LW.**

LONG WAVE OPERATION

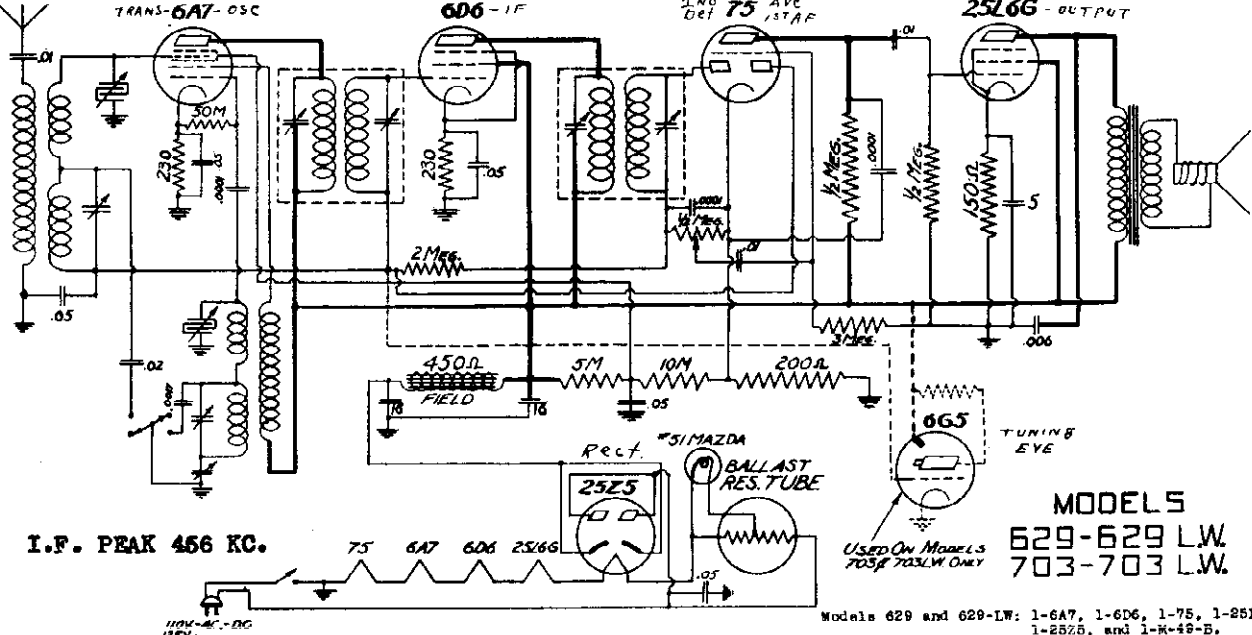
The Model 529-LW has a long-wave band in place of the Sh.Wave band. Follow same instructions for tuning as for the Sh.Wave band operation.

LIST PRICES OF REPLACEMENT PARTS.

1440 Power Transformer	\$2.50	5382 comb. bias resistor	.35
1423A 1st dual I.P.	1.25	7212 Speaker	4.00
1424A 2nd "	1.25	8660 Comb. vol. control	1.00
1435 Ant. coil	.70	8662 knobs	.10
1439 Osc. coil	.75	8041 Scale	1.10
2369 2 Gang var. cond.	2.00	9823 Pointer	.10
2372 Electrolytic cond.	1.10	9818 Shaft	.10
8779 Pilot socket	.10	9799 Drum	.05

TO CALIBRATE:

Set service oscillator to 456 K.C. and connect "HOT" lead to grid of 6A7 tube. Ground stator of front (oscillator) section of variable condenser. Turn volume control for maximum output and peak intermediate frequency trimmers for maximum gain. Turn wave band switch knob toward left. Adjust service oscillator and receiver to 7 megacycles and peak variable condenser trimmers for maximum gain. Turn wave band switch toward right and adjust service oscillator and receiver to 1500 K.C. Peak the trimmer next to the variable condenser and the one underneath chassis for maximum gain. Then adjust service oscillator and receiver to 600 K.C. and "rock" the variable condenser and adjust the padder (near front of chassis) at the same time for maximum gain.



I.F. PEAK 456 KC.

**MODELS
629-629 LW.
703-703 LW.**

LIST PRICES OF REPLACEMENT PARTS

1438 Antenna coil	.70	8662 knobs	.10
1439 Oscillator Coil	.65	8627A Wave Band Switch	.35
1423A Dns1 tuned I.P.	1.25	8660 Comb. volume control	1.00
1424A 2nd det. coil	1.25	8041 Scale	1.10
2369 Variable condenser	2.00	9823 Pointer	.10
2376 Comb. electrolytic	1.00	9818 Shaft	.10
7222 Speaker	4.00	9799 Drum	.05

These receivers are dual wave superheterodynes with the automatic volume control features. The frequency ranges are as follows:
Models 629 and 703 - 1650-550 K.C. and 7-2.4 M.C.
Models 629-LW and 703-LW - 1650-550 K.C. and 340-150 K.C.

TO CALIBRATE:

Set service oscillator to 456 K.C. and connect "HOT" lead to grid of 6A7 tube. Ground stator of front (oscillator) section of variable condenser. Turn volume control for maximum output and peak intermediate frequency trimmers for maximum gain. Turn wave band switch knob toward left. Adjust service oscillator and receiver to 7 megacycles and peak variable condenser trimmers for maximum gain. Turn wave band switch toward right and adjust oscillator (service) and receiver to 1500 K.C. Peak both trimmers underneath chassis for maximum gain. Then adjust service oscillator and receiver to 600 K.C. and "rock" the variable condenser and adjust the padder (near front of chassis) at the same time for maximum gain.

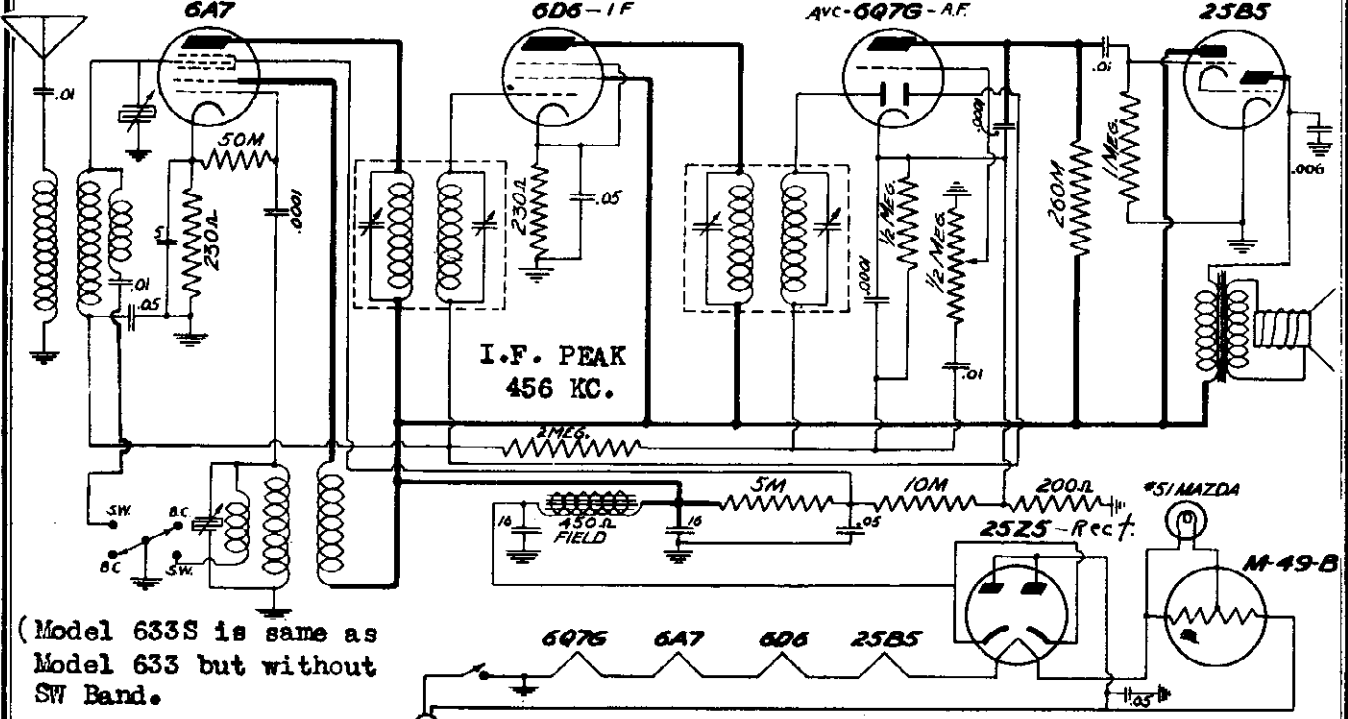
Models 629 and 629-LW: 1-6A7, 1-6D6, 1-75, 1-25L6, 1-25Z5, and 1-M-42-B.
Models 703 and 703-LW: 1-6A7, 1-6D6, 1-75, 1-25L6, 1-25Z5, 1-M-42-B, and 1-605

MODELS 633, 633LW, 633S
 MODELS 635, 635LW
 Schematics, Alignment
 OSC-TRANS

DEWALD RADIO

MODEL 633, 633LW, 633S 2ND DET
 6D6-1F AVC-6Q7G-AF

OUTPUT
 25B5



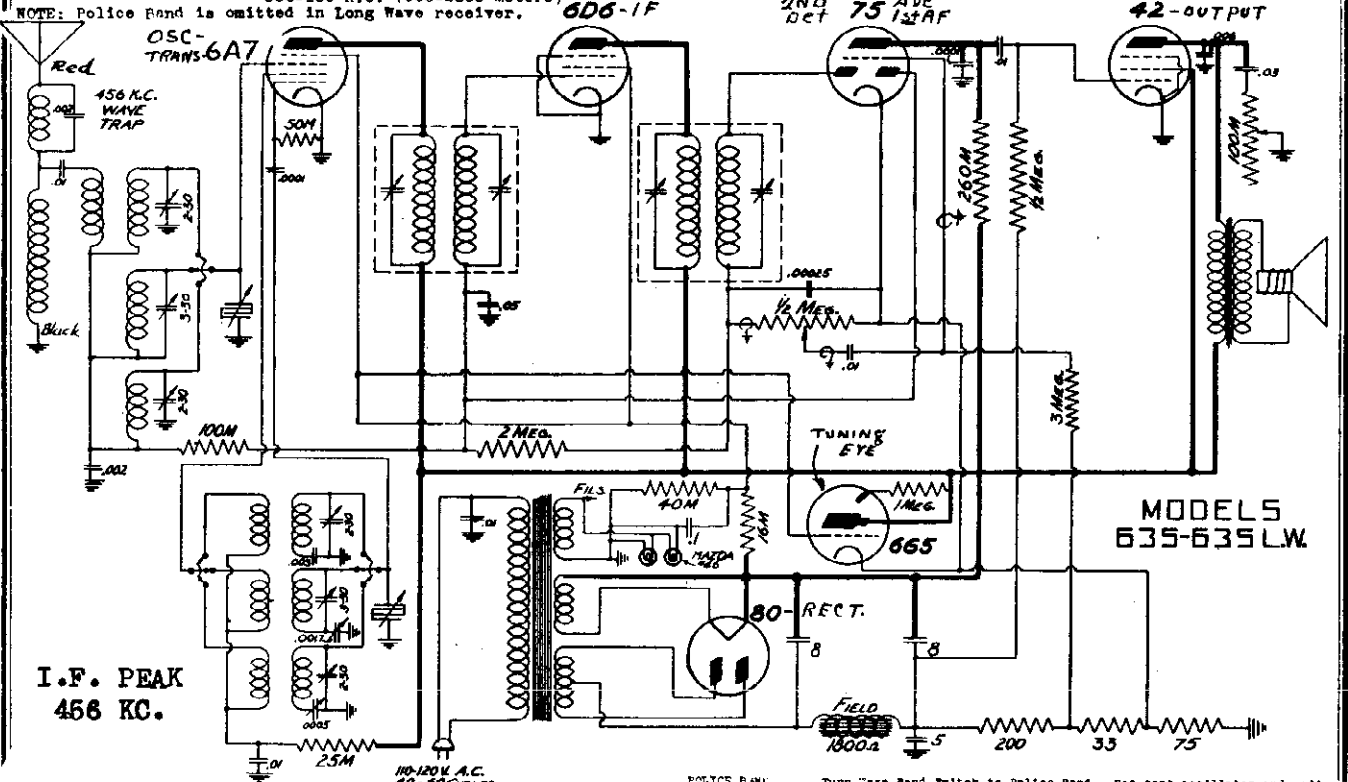
(Model 633S is same as Model 633 but without SW Band.)

The Model 635 has the following ranges:
 550-1700 K.C. (550-175 meters)
 1700-4800 K.C. (175-62 meters)
 5.7-16 M.C. (18-52 meters)

The Model 635LW has the following additional range:
 330-150 K.C. (900-2000 meters)

NOTE: Police Band is omitted in Long Wave receiver.

TO CALIBRATE: Set Service Oscillator to 456 K.C. and connect "HOT" lead to grid of 6A7, Ground stator of rear (oscillator) section of variable condenser. Turn Volume Control for maximum output and peak intermediate frequency trimmer for maximum gain. Remove Variable Condenser short. Adjust service oscillator and receiver to 1500 K.C. and peak variable condenser trimmers for maximum gain.



I.F. PEAK
 456 KC.

MODELS
 635-635LW

I. F. ALIGNMENT: Intermediate frequency peaked at 456 K.C. Connect test oscillator and grid of 6A7 and chassis. Short circuit stator of front section of variable condenser during this operation. Then peak I.F. trimmers for maximum signal.

V. V. ALIGNMENT: Remove short from stator of variable condenser. Turn Wave Band Switch to Broadcast. Connect test oscillator to antenna and chassis. Set test oscillator and radio dial to 1500 K.C. and peak two trimmers underneath chassis, (toward rear) for maximum signal. Set test oscillator at 800 K.C. and adjust ladder condenser (nut side) in front of chassis for maximum signal. During this operation, the variable condenser must be rocked. Readjust 1500 K.C.

POLYCS PANEL ALIGNMENT:

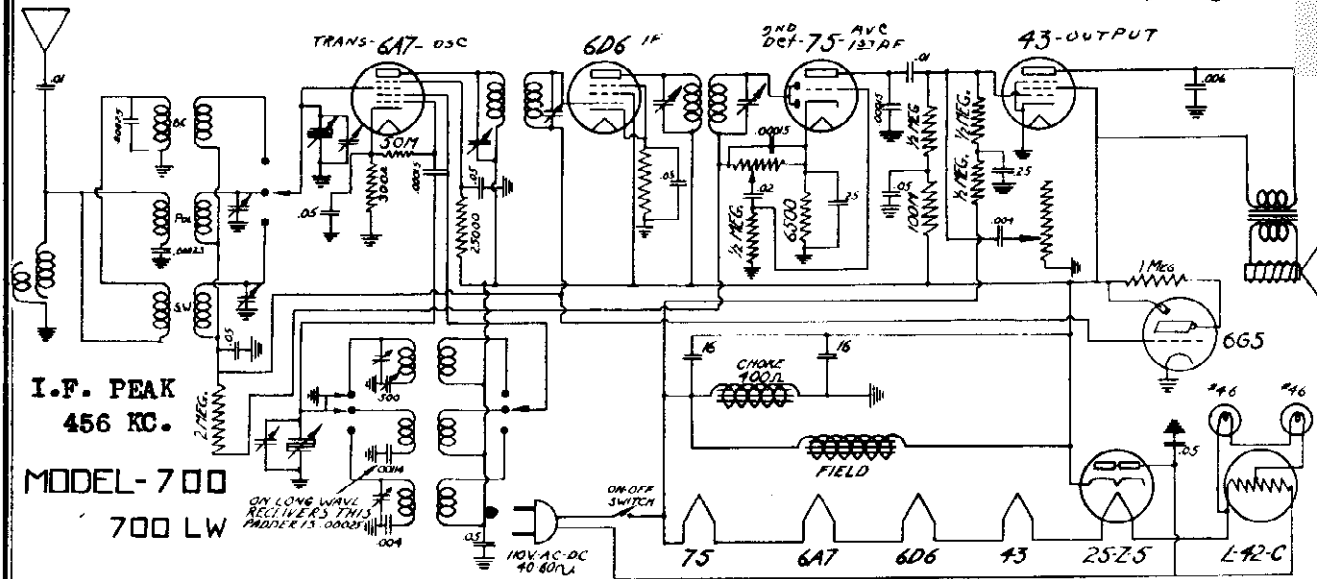
Turn "Wave Band Switch" to Police Band. Set test oscillator and radio dial to 4000 K.C. and peak two trimmers on coil on top of chassis. Set test oscillator and radio to 1700 K.C. and adjust pecker (screw side) for maximum signal. The variable condenser must be rocked during the operation. If receiver has long wave instead of police band, calibrate same trimming condenser as on Police Band, but set oscillator and receiver at 500 K.C. for alignment.

SHORT WAVE ALIGNMENT:

Turn Wave band switch to short wave. Set test oscillator and radio dial to 10 Megacycles and peak trimmers on bottom of chassis (toward front) for maximum signal. Low frequency setting is automatically taken care of by short wave coils which are carefully matched for this setting by a fixed calibrated capacitor.

DEWALD RADIO

MODELS 700, 700LW
MODELS 700A, 700A-LW
Schematics, Alignment

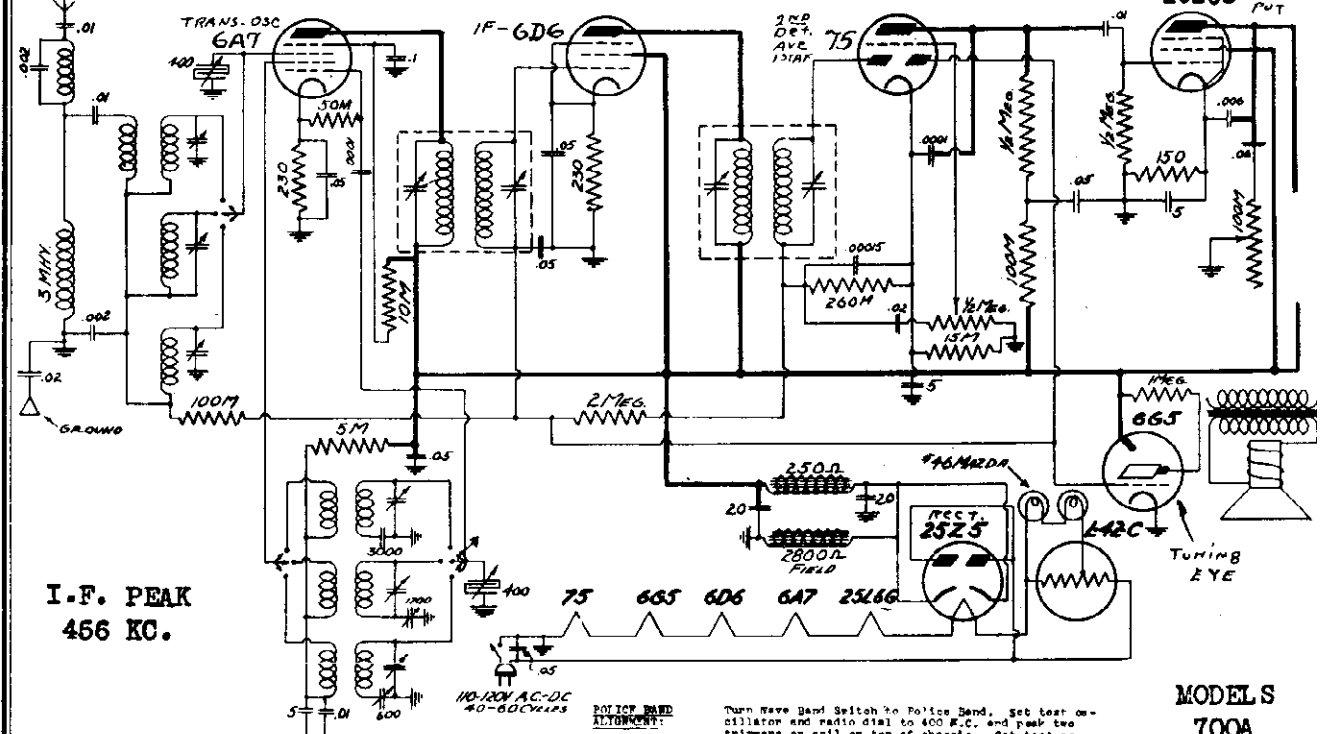


I.F. ALIGNMENT - INTERMEDIATE FREQUENCY PEAKED AT 456 KC. CONNECT TEST OSCILLATOR TO GRID OF 6A7 AND CHASSIS SHORT CIRCUIT STATOR OF FRONT SECTION OF VARIABLE CONDENSER DURING THIS OPERATION. THEN PEAK I.F. TRIMMER FOR MAXIMUM SIGNAL.

B.F. ALIGNMENT - REMOVE SHORT FROM STATOR OF VARIABLE CONDENSER. TURN WAVE BAND SWITCH TO BROADCAST. CONNECT TEST OSCILLATOR TO ANTENNA AND CHASSIS. SET TEST OSCILLATOR AND RADIO DIAL TO 1500 KC. AND PEAK VAR. COND. TRIMMERS FOR MAXIMUM SIGNAL. SET TEST OSC. AT 600 KC. AND ADJUST PADDER CONDENSER IN FRONT OF CHASSIS FOR MAX. SIG. DURING THIS OPERATION THE VAR. COND. MUST BE KEPT READING 1500 KC.

POLICE BAND ALIGNMENT - TURN WAVE BAND SWITCH TO POLICE BAND. SET TEST OSC. AND RADIO DIAL TO 400 KC. AND PEAK 2 TRIMMERS NEAR FRONT OF CHASSIS FOR MAX. SIG. THIS LOW FREQ. SETTING IS AUTOMATICALLY ADJUSTED BY A FIXED CALIBRATED PADDER. IF RECEIVER HAS LONG WAVES INSTEAD OF POLICE BAND CALIBRATE SAME TRIMMING COND. AS ON POLICE BAND BUT SET OSCILLATOR AND RECEIVER AT 300 KC. FOR ALIGNMENT.

SHORT WAVE ALIGNMENT - TURN W.B. SWITCH TO SHORT WAVE. SET TEST OSC. AND RADIO DIAL TO 15M. HERTZES AND PEAK TRIMMERS NEAR CENTER OF CHASSIS FOR MAX. SIG. LOW FREQ. SETTING IS AUTOMATICALLY TAKEN CARE OF BY SHORT WAVE COILS WHICH ARE CAREFULLY MATCHED FOR THIS SETTING BY A FIXED CALIBRATED PADDER.



I. F. ALIGNMENT - Intermediate frequency peaked at 456 K. C. Connect test oscillator to grid of 6A7 and chassis. Short circuit stator of front section of variable condenser during this operation. Then peak I.F. trimmer for maximum signal.

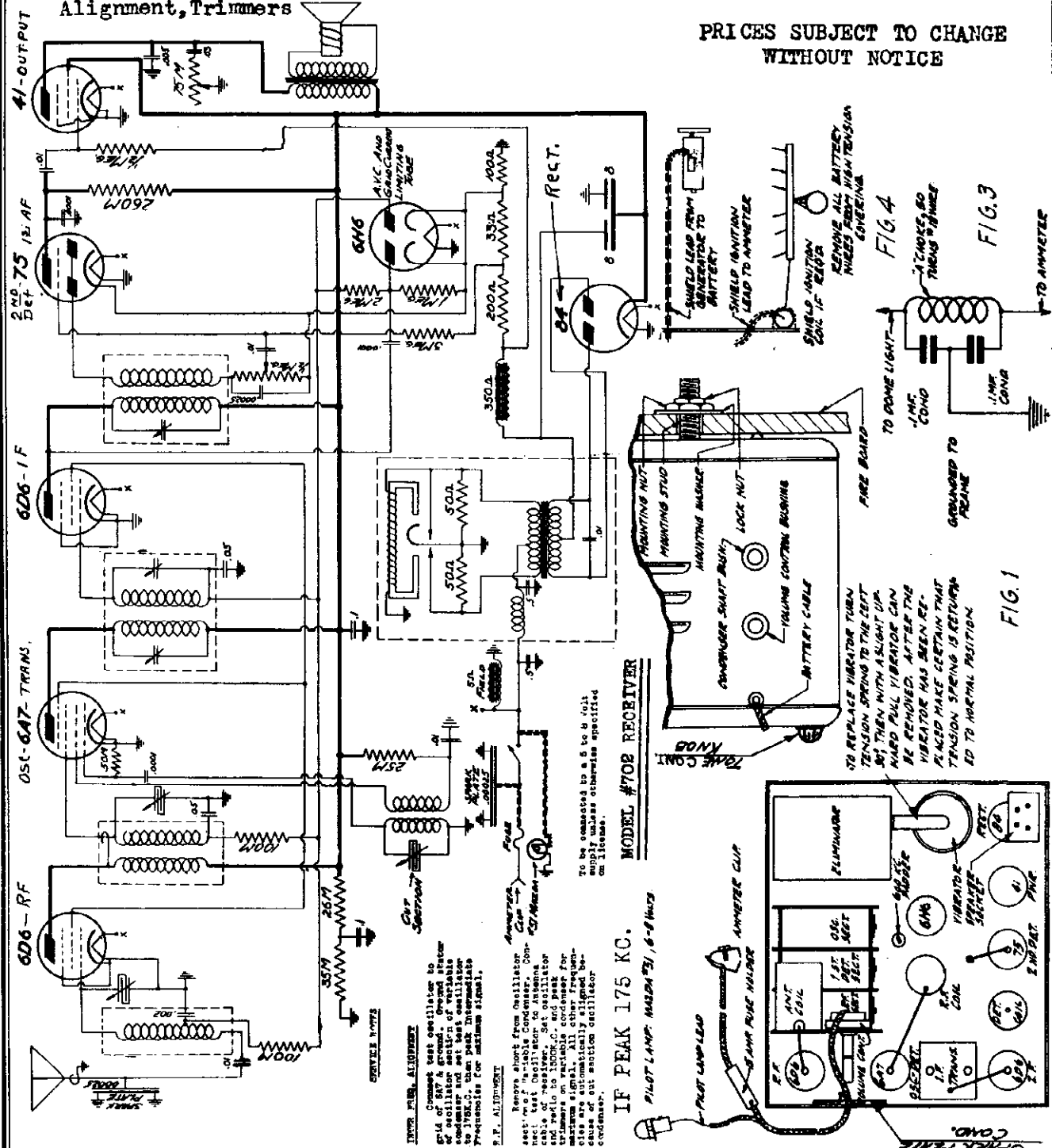
B. F. ALIGNMENT - Remove short from stator of variable condenser. Turn Wave Band Switch to Broadcast. Connect test oscillator to antenna and chassis. Set test oscillator and radio dial to 1500 K.C. and peak two trimmers underneath chassis, (toward rear) for maximum signal. Set test oscillator at 600 K.C. and adjust padder condenser (nut side) in front of chassis for maximum signal. During this operation, the variable condenser must be rocked. Read just 1500 K. C.

POLICE BAND ALIGNMENT - Turn Wave Band Switch to Police Band. Set test oscillator and radio dial to 400 K.C. and peak two trimmers on coil on top of chassis. Set test oscillator and radio to 1700 K.C. and adjust padder (screw side) for maximum signal. The variable condenser must be rocked during the operation. If receiver has long waves instead of police band, calibrate same trimming condenser as on Police Band, but set oscillator and receiver at 300 K.C. for alignment.

SHORT WAVE ALIGNMENT - Turn Wave Band switch to short wave. Set test oscillator and radio dial to 15 MegaCycles and peak trimmers on bottom of chassis (toward front) for maximum signal. Low frequency setting is automatically taken care of by short wave coils which are carefully matched for this setting by a fixed calibrated padder.

MODEL 702
Schematic, Socket, Parts
Alignment, Trimmers
DEWALD RADIO

PRICES SUBJECT TO CHANGE
WITHOUT NOTICE



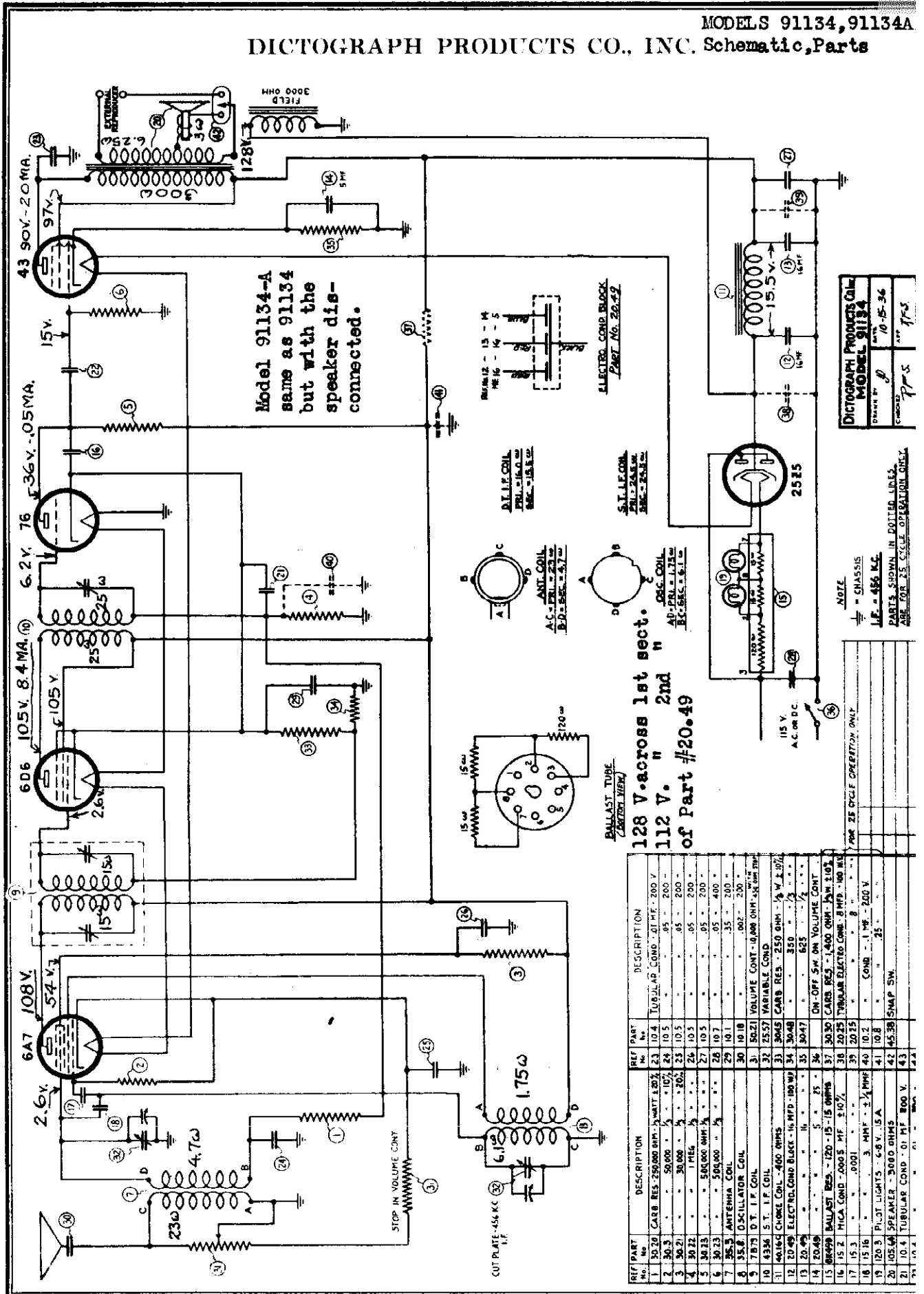
MODEL #702 RECEIVER

IF PEAK 175 KC.
PILOT LAMP: MASON 71, 6-8 HUES

NUMBERS AND LIST PRICES OF REPLACEMENT PARTS

1431A.....Power Transformer.....	3.00	3407.....Volume Control.....	1.10
1432A.....A Choke.....	.30	5077B.....Antenna Coil.....	.85
1433.....B Choke.....	.95	5094.....Combination A Cable.....	.50
1488.....Antenna Coil.....	.90	7194.....Speaker.....	5.50
1308D.....1st Detector Coil.....	.95	3608.....Vibrator.....	5.00
1309A.....Dual I.F. Transformer.....	1.50	8399.....Fuse Retainer.....	.20
1310.....2nd Detector Coil.....	1.30	8400.....15 Ampere Fuse.....	.05
1454.....Oscillator Coil.....	.75	8777.....Knob.....	.20
2317.....3 Gang Variable Condenser.....	4.50	8792.....Remote Control.....	5.75
2362.....Dual 8 Electrolytic Condenser.....	2.05	9850.....Cable and Sheath.....	1.50
2390.....Spark Plate Condenser (Chassis).....	.25	9517.....Mounting Stud.....	.05
2391.....Spark Plate Condenser (Can).....	.25	7/16 Hexagon Nut.....	.05
3390A.....Tone Control.....	.80	Pilot Lamps.....	.10

MODELS 91134, 91134A
 DICTOGRAPH PRODUCTS CO., INC. Schematic, Parts



MODELS 91134, 91134A
 MODELS 91168, 91175

DICTOGRAPH PRODUCTS CO., INC.

Socket, Trimmers
 Alignment

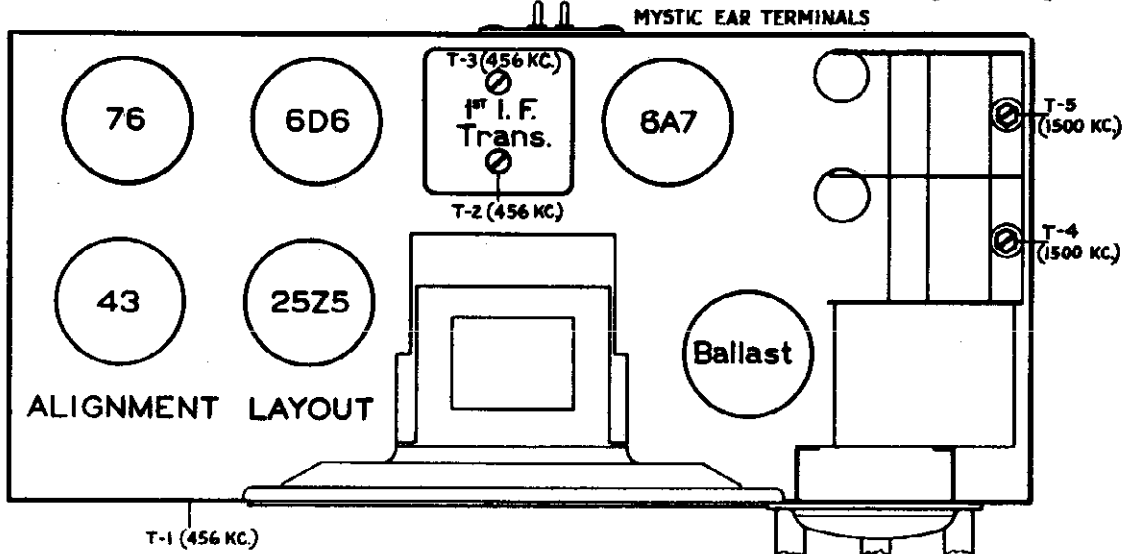
This receiver is equipped with an automatic overload control which necessitates setting the manual volume control of the receiver to its maximum position to insure accuracy in alignment. To control the signal output of the receiver it will be necessary to use the attenuator control of the signal generator. Connect the low potential side of the signal generator to the metal chassis through a .1 mfd. (400 volt) condenser for the following adjustments.

ADJUSTMENT OF I.F. CONDENSERS

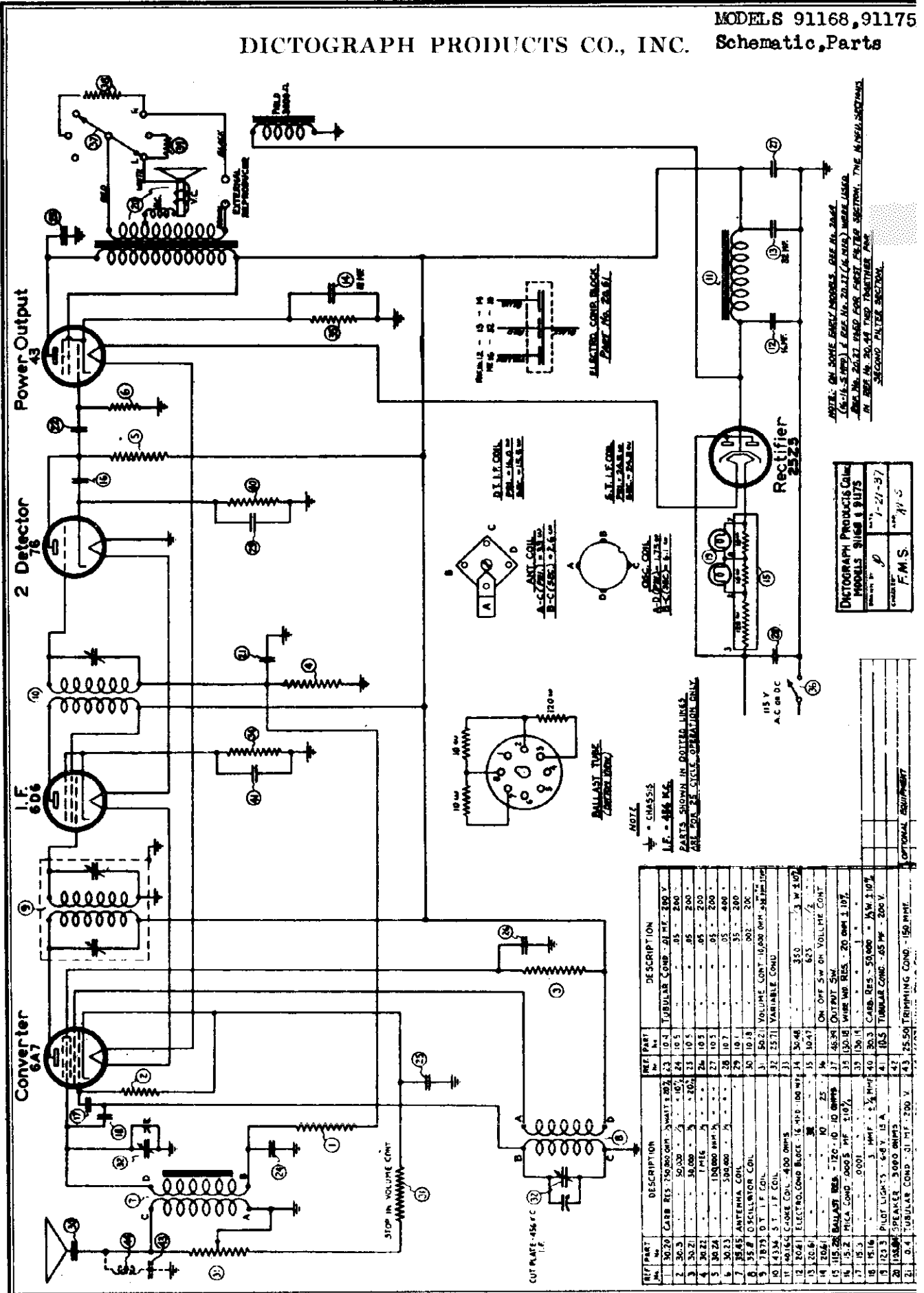
- (a) - Remove the control grid lead of the 6A7 tube and insert a 50,000 ohm (carbon type 1/3 watt) resistor in series with same. Then connect the high potential lead of the signal generator through a .001 mfd. condenser (paper tubular 400 volt type), directly to the control grid of the 6A7 tube.
- (b) - Turn the rotor plates of the ganged variable condenser where no broadcast station carrier is heard (approximately 1000 KC). If this is not possible connect a .1 mfd. condenser (paper tubular) from the oscillator stator section (see sketch) of the ganged variable condenser to chassis.
- (c) - Place an output meter (copper oxide type) across the mystic ear terminals with the speaker control switch in a clockwise position so that variations in signal output can be noted.
- (d) - Place the signal generator in operation, adjust the carrier frequency to 456 KC and regulate the attenuator control of the signal generator so that the output signal is low enough to insure accuracy in adjusting the I.F. condenser.
- (e) - Adjust trimmers T-1, T-2 and T-3 (see alignment layout) to resonance as indicated by the greatest swing on the output meter.

ADJUSTMENT OF THE GANGED VARIABLE CONDENSERS

- (a) - Remove the signal generator connection from the control grid of the 6A7 tube and replace the control grid lead. Then connect the antenna wire of the receiver to the high potential lead of the signal generator through a 200 mmfd. condenser (mica type).
- (b) - Set the dial pointer directly at the last long line at the right hand side of the dial with the ganged variable condenser fully meshed. Then rotate the receiver dial to 1,500 KC.
- (c) - Adjust the carrier frequency of the signal generator to 1,500 KC and, starting with trimmer T-4 and then T-5, adjust each for maximum signal output.



MODELS 91168, 91175
 DICTOGRAPH PRODUCTS CO., INC. Schematic, Parts

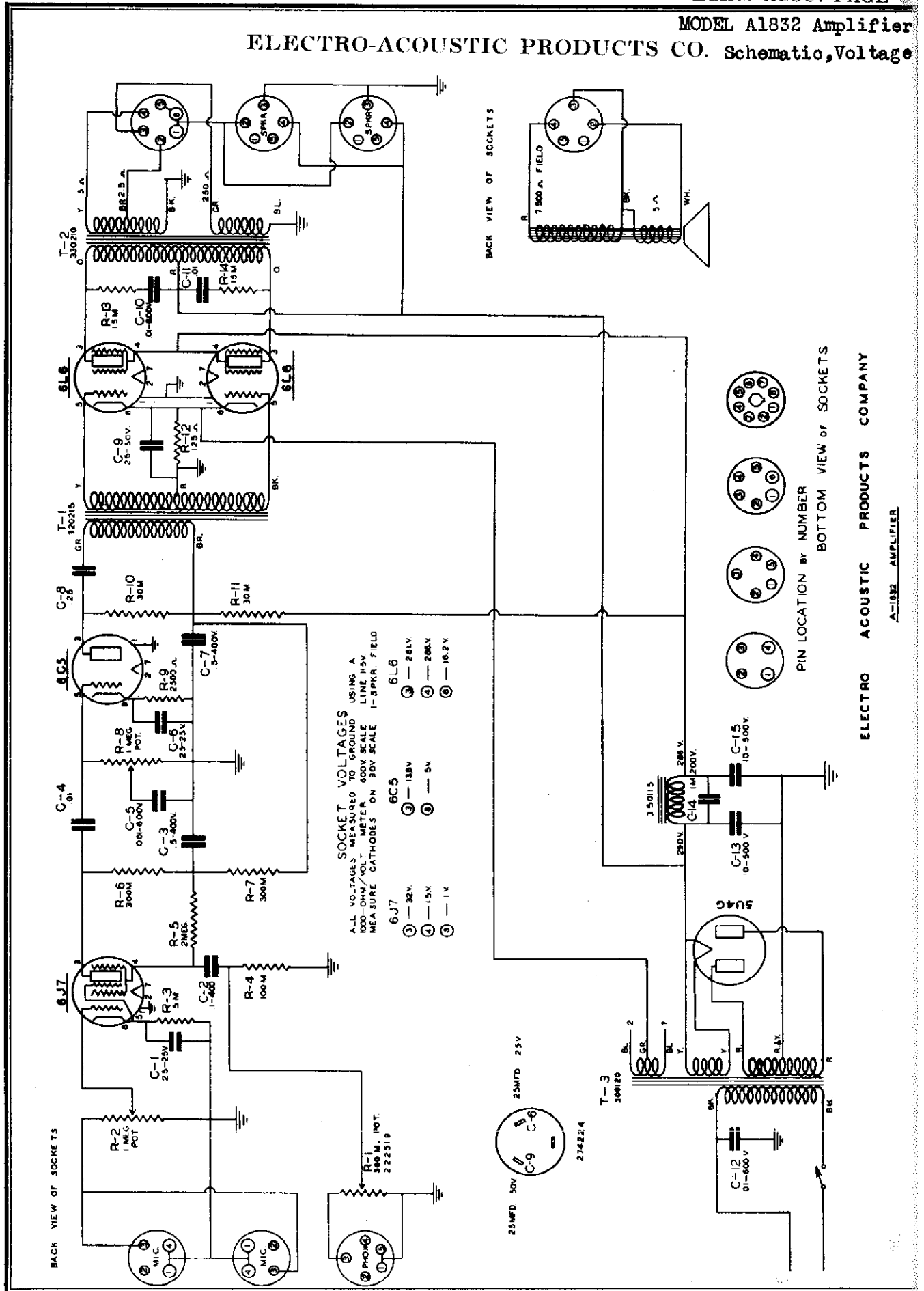


NOTE:
 * = GROUND
 I.F. = 456 KC.
 PARTS SHOWN IN DOTTED LINES
 ARE FOR 25 CYCLE OPERATION ONLY.

RFT PART No.	DESCRIPTION	RFT PART No.	DESCRIPTION
1	30-20 CARB RES - 750,000 OHM - 5WATT'S 20%	10-4	TUBULAR COND. - 21 MF. - 200 V.
2	30-20 CARB RES - 50,000 OHM - 10% 24	10-5	-.05 - 200
3	30-21 CARB RES - 38,000 OHM - 10% 24	10-6	-.05 - 200
4	30-22 CARB RES - 1 MEG. - 5 - 10% 24	10-7	-.05 - 200
5	30-24 CARB RES - 100,000 OHM - 5% - 27 10% 24	10-8	-.05 - 200
6	30-25 CARB RES - 500,000 OHM - 5% - 27 10% 24	10-9	-.05 - 200
7	15-15 ANTENNA COIL	10-10	-.005 - 200
8	15-16 OSCILLATOR COIL	10-11	-.005 - 200
9	15-17 I.F. COIL	10-12	VOLUME CONT. - 10,000 OHM - 500 OHM
10	43-34 5 T. I.F. COIL	10-13	VARIABLE COND.
11	40-15 CARB COIL - 450 OHMS	10-14	350
12	20-11 ELECTRO. COND BLOCK - 16-410 100 MF 14	10-15	625
13	20-6	10-16	ON OFF SW ON VOLUME CONT.
14	20-6	10-17	OUTPUT SW.
15	115-20 BALLAST RES. - 120 - 10 - 10 OHMS	10-18	WIRE WID RES. - 20 OHM 1.10%
16	15-2 RICA COND. - 0.005 MF 310%	10-19	35 100-18
17	15-3	10-20	35 100-18
18	15-16	10-21	35 100-18
19	15-16	10-22	35 100-18
20	15-16	10-23	35 100-18
21	15-16	10-24	35 100-18
22	15-16	10-25	35 100-18
23	15-16	10-26	35 100-18
24	15-16	10-27	35 100-18
25	15-16	10-28	35 100-18
26	15-16	10-29	35 100-18
27	15-16	10-30	35 100-18
28	15-16	10-31	35 100-18
29	15-16	10-32	35 100-18
30	15-16	10-33	35 100-18
31	15-16	10-34	35 100-18
32	15-16	10-35	35 100-18
33	15-16	10-36	35 100-18
34	15-16	10-37	35 100-18
35	15-16	10-38	35 100-18
36	15-16	10-39	35 100-18
37	15-16	10-40	35 100-18
38	15-16	10-41	35 100-18
39	15-16	10-42	35 100-18
40	15-16	10-43	35 100-18
41	15-16	10-44	35 100-18
42	15-16	10-45	35 100-18
43	15-16	10-46	35 100-18
44	15-16	10-47	35 100-18
45	15-16	10-48	35 100-18

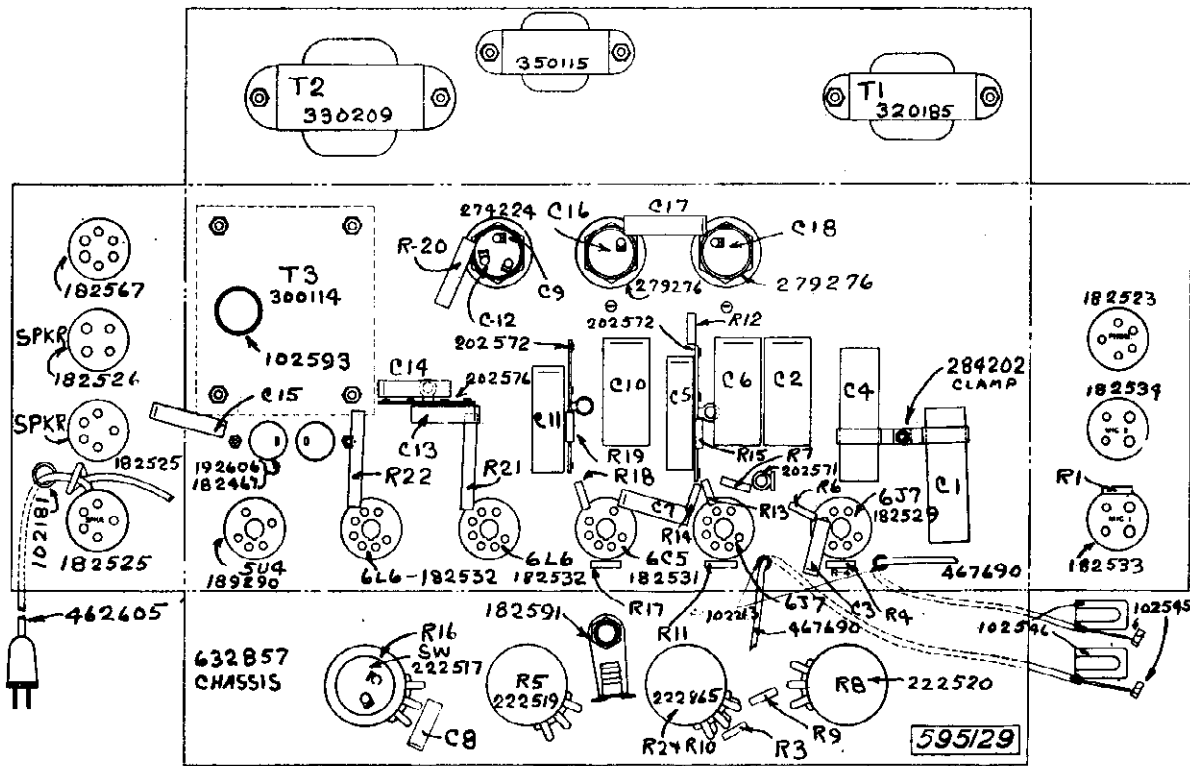
ELECTRO-ACOUSTIC PRODUCTS CO. Schematic, Voltage

MODEL A1832 Amplifier

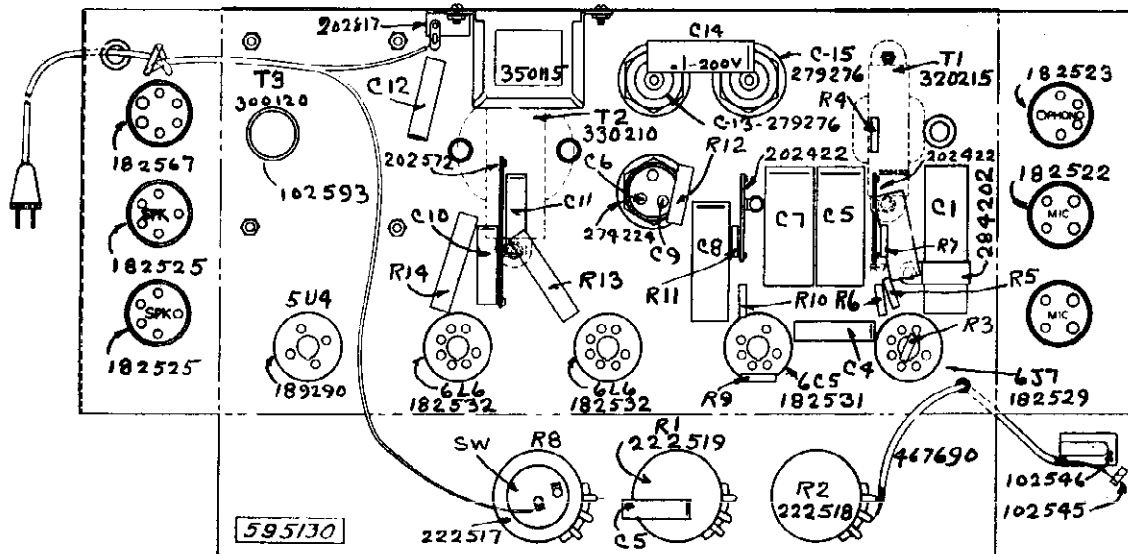


MODEL A1832 Amplifier
 MODEL A2023 Amplifier
 Chassis Layouts

ELECTRO-ACOUSTIC PRODUCTS CO.



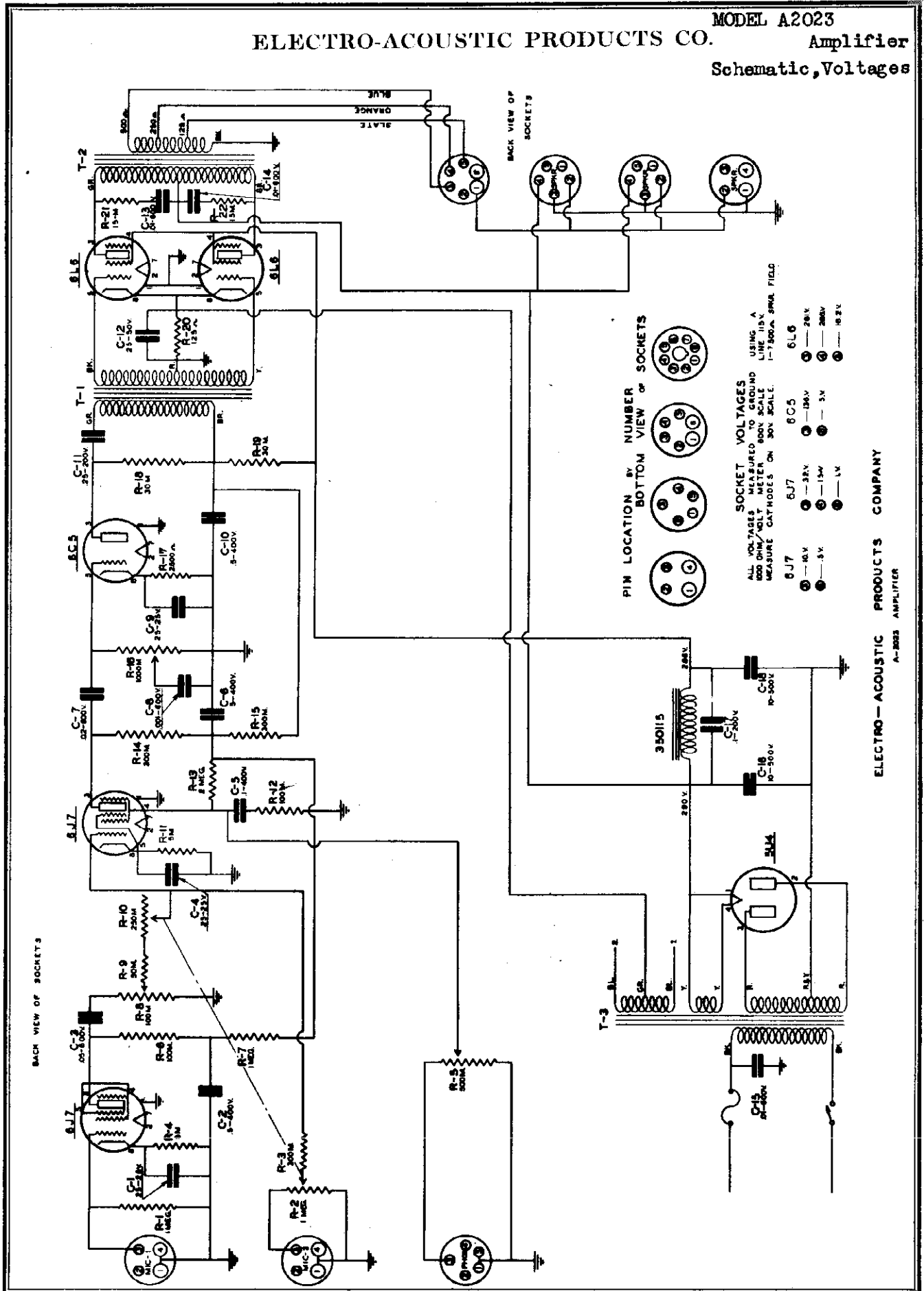
CHASSIS LAYOUT - MODEL A2023



CHASSIS LAYOUT - MODEL 1832

ELECTRO-ACOUSTIC PRODUCTS CO.

MODEL A2023
Amplifier
Schematic, Voltages

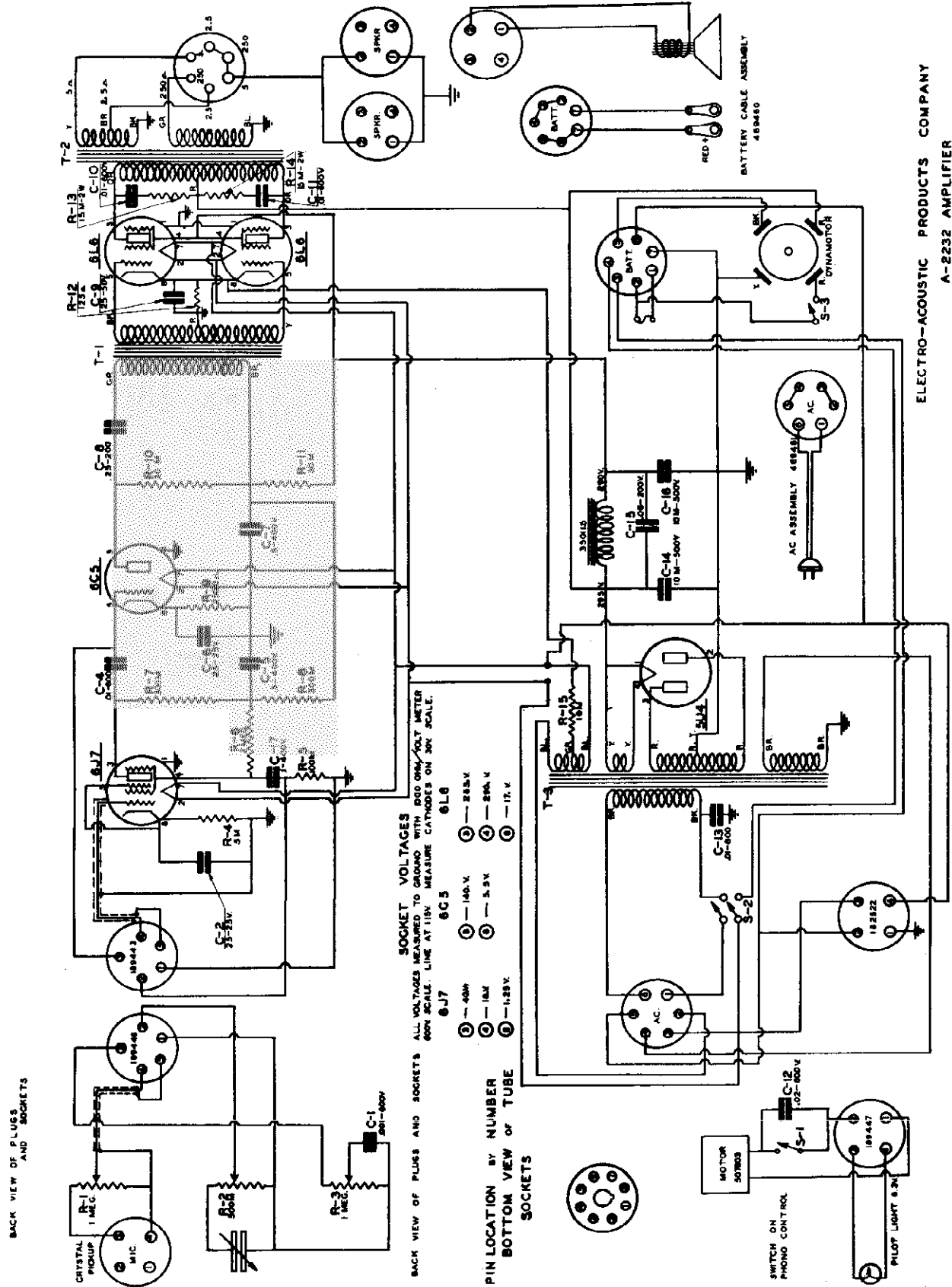


ELECTRO-ACOUSTIC PRODUCTS COMPANY
A-2023 AMPLIFIER

MODEL A2232 Amplifier
Schematic, Voltage

ELECTRO-ACOUSTIC PRODUCTS CO.

ELECTRO-ACOUSTIC PRODUCTS COMPANY
A-2232 AMPLIFIER



SOCKET VOLTAGES
ALL VOLTAGES MEASURED TO GROUND WITH RED OHM/VOLT METER
500K SCALE. LINE AT 10V. MEASURE CATHODES ON 30K SCALE.

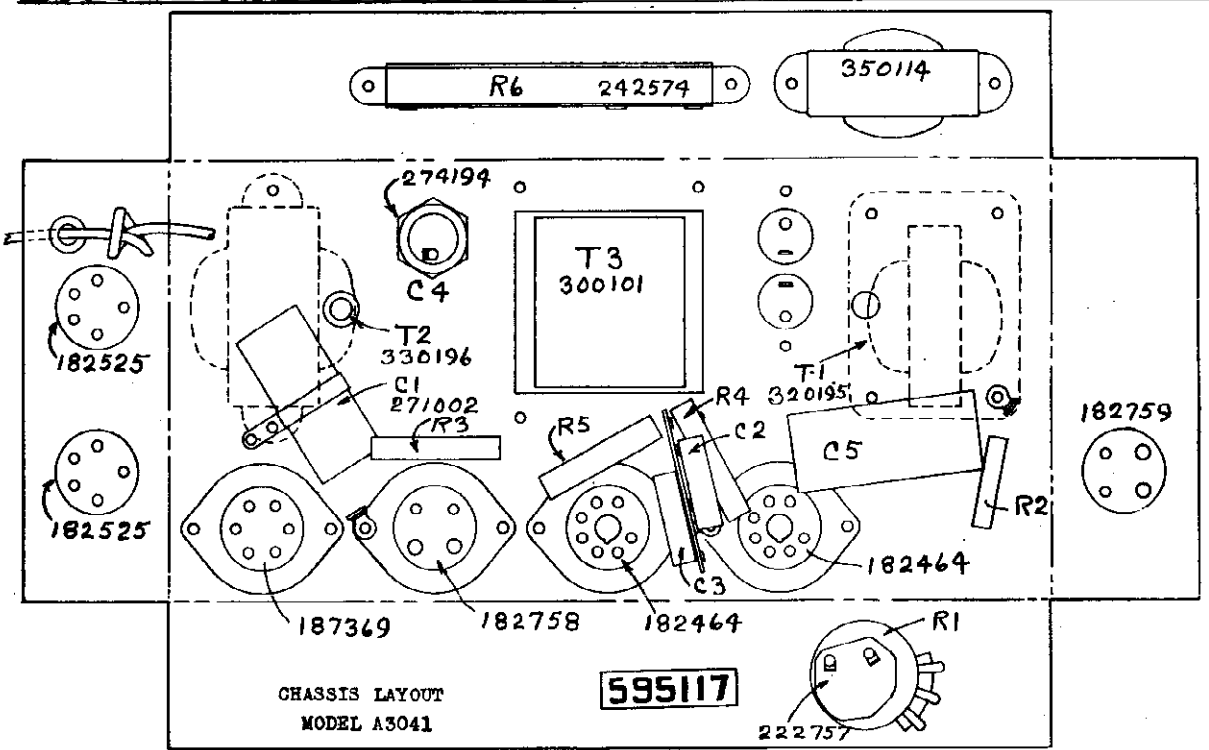
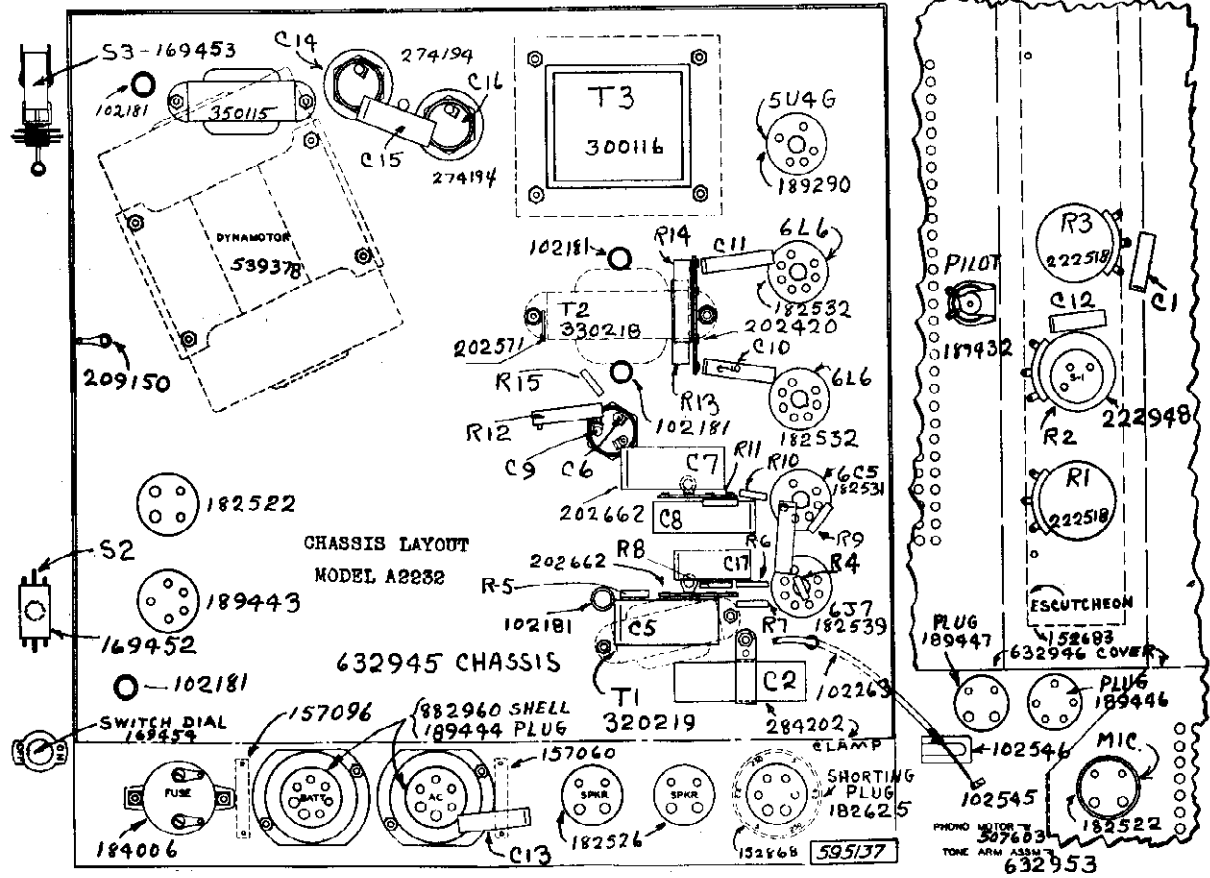
6J7	① - 400V	② - 140V	③ - 285V
6C5	① - 1MΩ	② - 5.5V	③ - 284V
6L6	① - 17.5V		

BACK VIEW OF PLUGS AND SOCKETS

PIN LOCATION BY NUMBER
BOTTOM VIEW OF TUBE SOCKETS

ELECTRO-ACOUSTIC PRODUCTS

MODEL A2232 Amplifier
MODEL A3041 Amplifier
Chassis Layouts

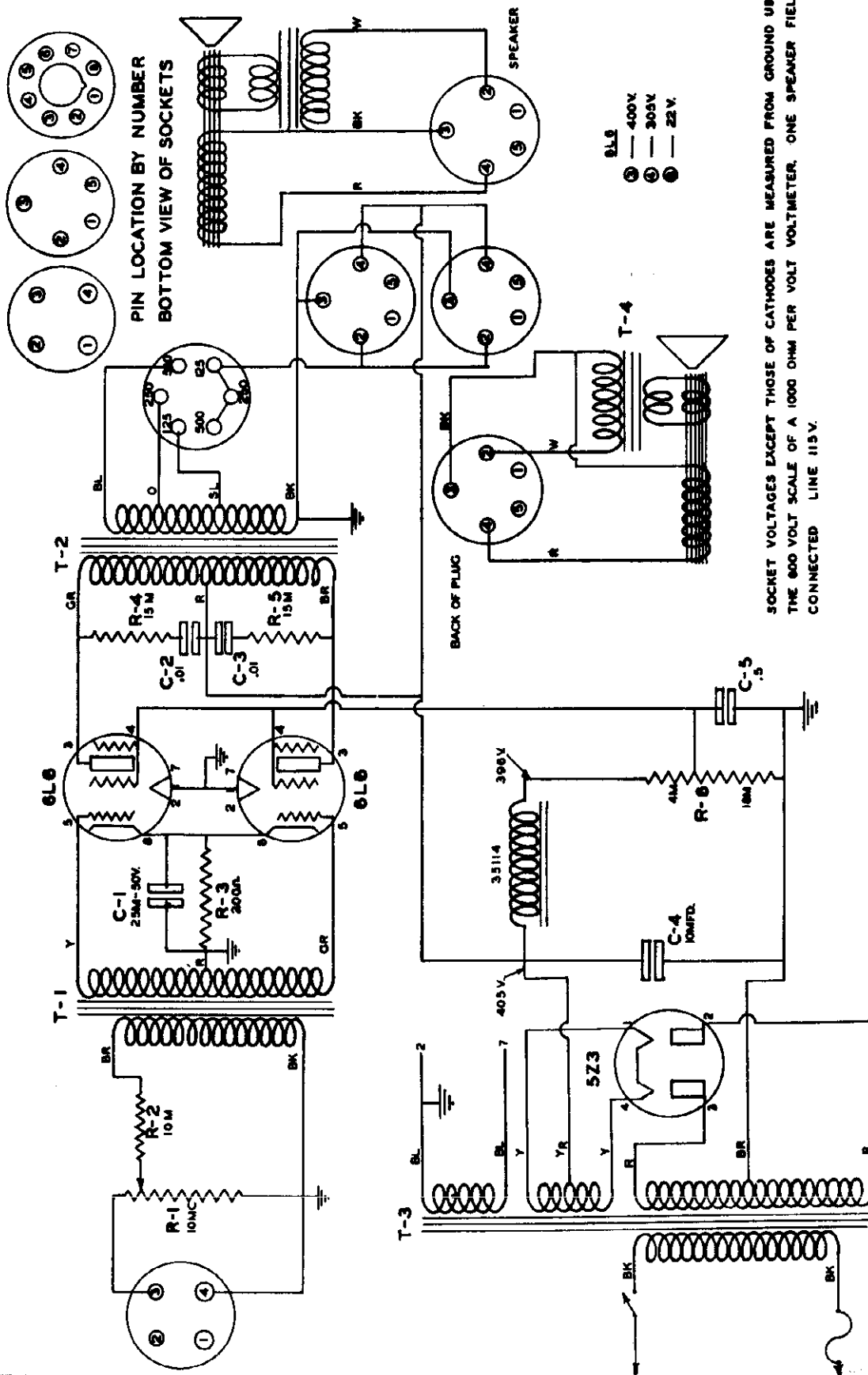


MODEL A3041 Amplifier
Schematic, Voltage

ELECTRO-ACOUSTIC PRODUCTS CO.

ELECTRO ACOUSTIC PRODUCTS COMPANY

A-3041 AMPLIFIER



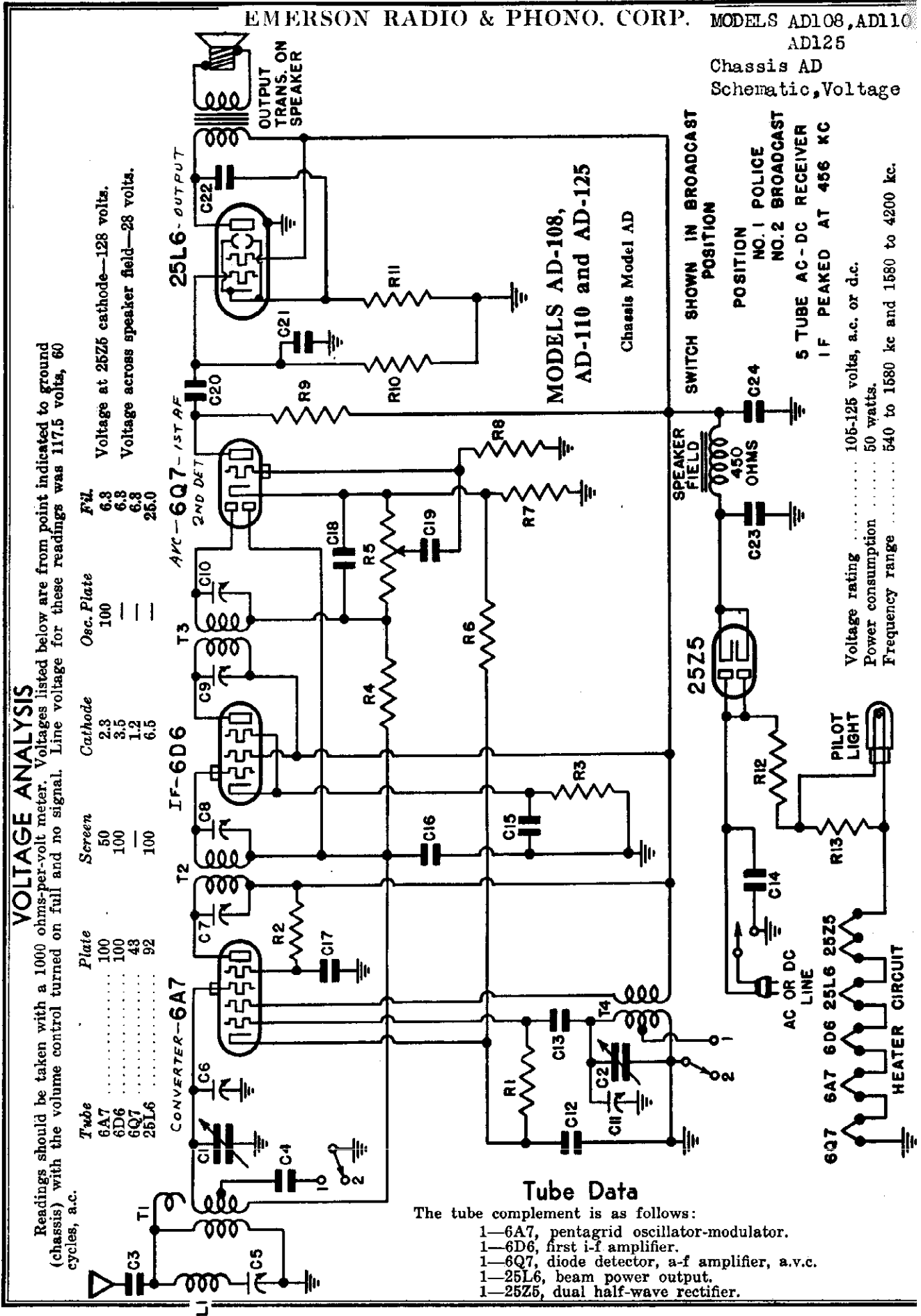
SOCKET VOLTAGES EXCEPT THOSE OF CATHODES ARE MEASURED FROM GROUND USING THE 500 VOLT SCALE OF A 1000 OHM PER VOLT VOLTMETER. ONE SPEAKER FIELD CONNECTED LINE 115V.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	100	50	2.3	100	6.3
6D6	100	100	3.5	—	6.3
6Q7	43	—	1.2	—	6.3
25L6	92	100	6.5	—	25.0

Voltage at 25Z5 cathode—128 volts.
Voltage across speaker field—28 volts.



Tube Data

- The tube complement is as follows:
- 1—6A7, pentagrid oscillator-modulator.
 - 1—6D6, first i-f amplifier.
 - 1—6Q7, diode detector, a-f amplifier, a.v.c.
 - 1—25L6, beam power output.
 - 1—25Z5, dual half-wave rectifier.

SWITCH SHOWN IN BROADCAST POSITION

POSITION NO. 1 POLICE
POSITION NO. 2 BROADCAST

5 TUBE AC-DC RECEIVER
IF PEAKED AT 456 KC

Voltage rating 105-125 volts, a.c. or d.c.
Power consumption 50 watts.
Frequency range 540 to 1680 kc and 1580 to 4200 kc.

MODELS AD108, AD110
AD125

EMERSON RADIO & PHONO. CORP.

Chassis AD

Alignment, Notes, Parts

REPLACEMENT PARTS

ADJUSTMENTS

An oscillator with frequencies of 455 and 1400 kc is required. An output meter should be used across the voice coil or output transformer for observing maximum response. Always use as weak a test signal as possible when aligning the receiver.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck beside the speaker. The trimmers are accessible through holes in the top of the chassis.
The second i-f transformer is mounted underneath the chassis in the right hand front corner. The trimmers are accessible through holes in the top of the chassis directly in front of the first i-f transformer.
The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the antenna coil.
The 455 kc wave-trap is mounted on the metal strip at the rear of the chassis directly behind the variable condenser. The trimmer for the 455 kc wave-trap is mounted on the coil and is accessible from the bottom of the chassis.

I-f and Wave-trap Alignment

Rotate the wave-hand switch (located at the rear of the chassis) to the broadcast position, clockwise, and swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid-cap of the 6A7 tube and adjust the four i-f trimmers for maximum response. Feed 455 kc through a dummy antenna (a .0002 mf condenser may be used as a substitute) to the antenna lead and adjust the wave-trap trimmer for minimum response. (See General Notes, paragraph No. 7.)

R-f Alignment

With the wave-band switch in the broadcast position, clockwise, set the dial pointer at 140. Feed 1400 kc through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) to the antenna lead and adjust first the oscillator trimmer (on the chassis) and then the antenna trimmer (on the antenna section) for maximum response. The police band is self-tracking and does not require any adjustment.

GENERAL NOTES

1. If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully realigned.
2. One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to come in contact with any metal part of the receiver.
3. The filament dropping resistor (R-12—see schematic) is a resistance wire in the special line cord. The cord will therefore, become warm under normal operating conditions. To insure good heat radiation stretch out the line cord to its full length. Do not attempt to shorten it by cutting.
4. In operating the receiver on d.c. it may be necessary to reverse the line plug for correct polarity.
5. The color coding of the i-f transformer leads is as follows:
Grid—green
Plate—blue
B plus—red
Grid return—black
6. In congested areas where the installation of a large antenna is not desirable we recommend the use of the Emerson Flexible Mast Antenna, Model W-82. Instructions for the installation of this compact and efficient antenna are supplied with each kit.
Where the Flexible Mast is installed permanently, it is urgently recommended that the receiver antenna wire be cut. Leave just enough of this wire to reach from the receiver to the window strip connector.
7. The wave-trap in the receiver has been adjusted for maximum signal rejection at 455 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.

List Prices as of
Aug. 1st, 1937
(Subject to change without notice)

Part No.	DESCRIPTION	PRICE
4DT-343	455 kc adjustable wave-trap	.60
3RT-313	Two-band antenna coil	.10
3RT-320B	455 kc first i-f transformer	.35
4DT-352	455 kc second i-f transformer	1.10
3RT-319A	Two-band oscillator coil	.10
4DC-344	Two-gang variable condenser	.25
3HC-274	0.002 mf, 600 volt tubular condenser	.20
AAG-114	0.001 mf, mica condenser	.20
	Trimmer, part of 455 kc wave-trap.	
	Trimmer, part of variable condenser.	
	Trimmer, part of i-f coil assembly.	
AC-5	0.1 mf, 200 volt tubular condenser	.20
AAC-106A	0.00005 mf mica condenser	.20
2VC-242A	0.1 mf, 400 volt molded paper condenser	.20
BC-12	0.05 mf, 200 volt tubular condenser	.20
NC-70A	0.0002 mf mica condenser	.20
CCG-127	0.01 mf, 200 volt tubular condenser	.20
LC-45	0.02 mf, 400 volt tubular condenser	.20
4DC-345	0.04 mf, 400 volt tubular condenser	.20
4DC-346	Dual 16 mf, 150 volt tubular dry electrolytic condenser	1.50
KR-53	50,000 ohm 1/4 watt carbon resistor	.16
ZR-196	80,000 ohm 1/4 watt carbon resistor	.16
3CR-295	410 ohm 1/2 watt wire-wound resistor	.16
HR-42	2 megohm 1/4 watt carbon resistor	.16
2DR-169A	Volume control with line switch—500,000 ohm	1.20
3CE-294	240 ohm 1/2 watt wire-wound resistor	.16
KR-55	250,000 ohm 1/4 watt carbon resistor	.16
KR-56	500,000 ohm 1/4 watt carbon resistor	.16
3FR-293	140 ohm, 1/2 watt wire-wound resistor	.16
	145 ohm, 1/2 watt resistor wire in line cord.	
2DR-218	40 ohm wire-wound metal clad resistor	.30
3QS-257B	5" dynamic speaker	4.85
4DS-264	Wave-band switch	.35
XL-9	Pilot light 6.3 volt, .25 amp., Mazda No. 46	.20
2DW-52	Line cord with built-in resistor wire—R12	.50

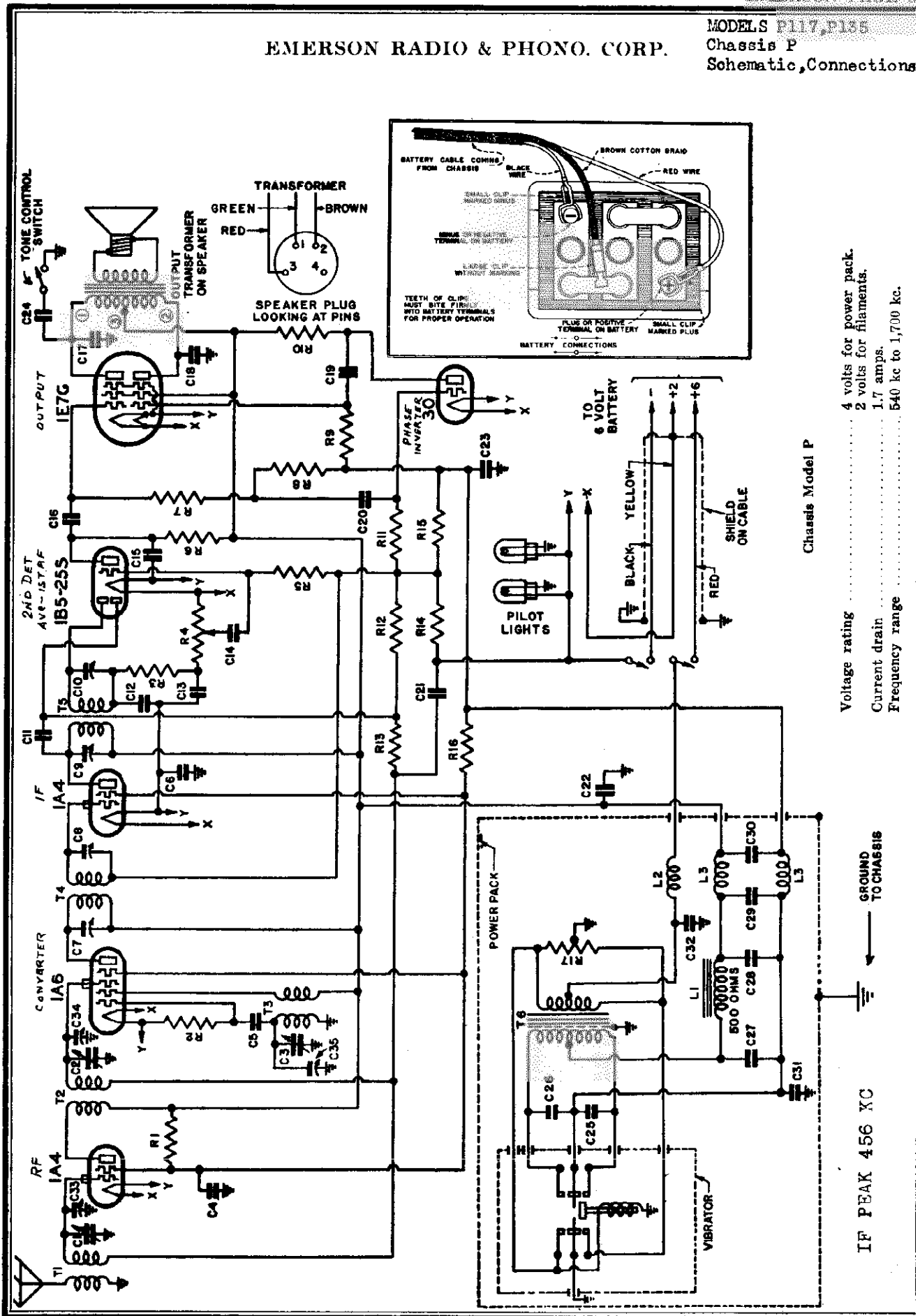
DIAL ASSEMBLY CONSISTS OF:

Dial scale and bracket	.90
Pyralin drive disc	.30
Dial crystal	.16
Dial pointer	.10
Vernier friction drive	.50

*Item number locates the article on the schematic diagram.
†These trimmer condensers are part of the variable condenser and can not be supplied separately.
‡These trimmer condensers are part of the coil assemblies and can not be supplied separately.

EMERSON RADIO & PHONO. CORP.

MODELS P117, P135
Chassis P
Schematic, Connections



MODELS P117, P135
Chassis P
Voltage, Alignment
Notes, Parts

EMERSON RADIO & PHONO. CORP.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to chassis with volume control turned on full and no signal. Battery voltage for these readings was 6.1 volts.

Tube	Plate	Screen	Occ. Plate
1A4 r-f	137	83	137
1A4 i-f	137	83	137
1B5/2A5	95	55	—
30	55	—	—
1E7G	135	137	—

Voltage across filaments—2 volts.

To check the bias of the 1E7G tube, measure the voltage from the filament terminal, closest to the screen, of the 30 tube to the negative side of the 20 mf tubular electrolytic condenser. This reading should be 7.6 volts.

To check the bias of the other tubes, measure the voltage from the filament terminal, closest to the screen, of the 30 tube to the grid cap of the 1A4 i-f tube. This reading should be 3 volts.

Six-Tube Battery-Operated Superheterodyne
MODELS P117 and P135
ADJUSTMENTS

An oscillator with frequencies of 466 kc and 1600 kc should be used. An output meter should be used across the voice coil or output transformer for observing maximum response.

Location of I-f Transformers and Trimmers

The first i-f transformer, part number 3HT-287A is in an oblong coil can located on the top of the chassis to the right of the variable condenser. The two trimmers for this i-f are accessible through holes in the top of the coil can.

The second i-f transformer, part number 3HT-288A, is in an oblong coil can located on the top of the chassis directly behind the first i-f tube. The two trimmers for this i-f are accessible through holes in the top of the coil can.

The oscillator, antenna, and r-f trimmers are located on the top of the chassis. The oscillator trimmer is on the rear section of the variable condenser, the antenna trimmer is on the front section of the variable condenser and the r-f trimmer is on the center section of the variable condenser.

Alignment Procedure

1. Rotate the variable condenser to the minimum capacity position.
2. Feed 466 kc to the grid cap of the 1A4 tube.
3. Adjust the four i-f trimmers, repeating for maximum response.
4. Set dial pointer to 1600 kc to the antenna lead through a standard broadcast dummy antenna (a .0002 mf mica condenser may be used as a substitute).
5. Adjust the oscillator trimmer (on rear section of variable condenser) for maximum response.
6. Adjust the r-f trimmer (on center section of variable condenser) for maximum response.
7. Adjust the antenna trimmer (on front section of variable condenser) for maximum response.

GENERAL NOTES

1. The large, oblong metal box on the top of the chassis deck contains the power pack. The function of this power pack is to convert the 4 volt direct current from the storage battery into 140 volt direct current. The vibrator used is of the synchronous type.
2. The illustration on the right indicates the correct battery connections. Three battery clips are attached to the leads emerging from the top of the chassis. One of the two small clips is connected to the positive terminal of the battery. The small clip with the larger terminal should be attached to the negative side of the battery.

Tube Data

The tube complement is as follows:
1—1A4, r-f amplifier
1—1A4, oscillator-modulator
1—1B5/2A5, 2A5 r-f amplifier
1—30, 2A5 filament
1—30, A5 filament
1—30, A5 filament
1—1E7G, push-pull pentode output.

Note that the battery is made up of three cells. The large battery clip should be attached to the positive side of the same cell to which the negative clip is attached. It is important that these battery connections be made correctly. Before turning the receiver on check the connections with the illustration.
3. The color coding of the leads of the i-f transformers is as follows:
P117—blue
Grid—green
B plus—black
Grid return—black
4. With few exceptions the color coding of the general wiring is as follows:
Cathode—white or yellow
Grid—green
Filament and ground—black
Common neg.—black.
5. The color coding of the leads of the power pack is as follows:
A plus—yellow
B plus—red
6. An efficient antenna system (aerial) is necessary to enable a full realization of the merits of the receiver. The Emerson All-Wave Antenna is especially designed for high efficiency and reduction of noise on all frequency ranges. Complete instructions for the installation of this antenna are supplied with each kit.

REPLACEMENT PARTS LIST

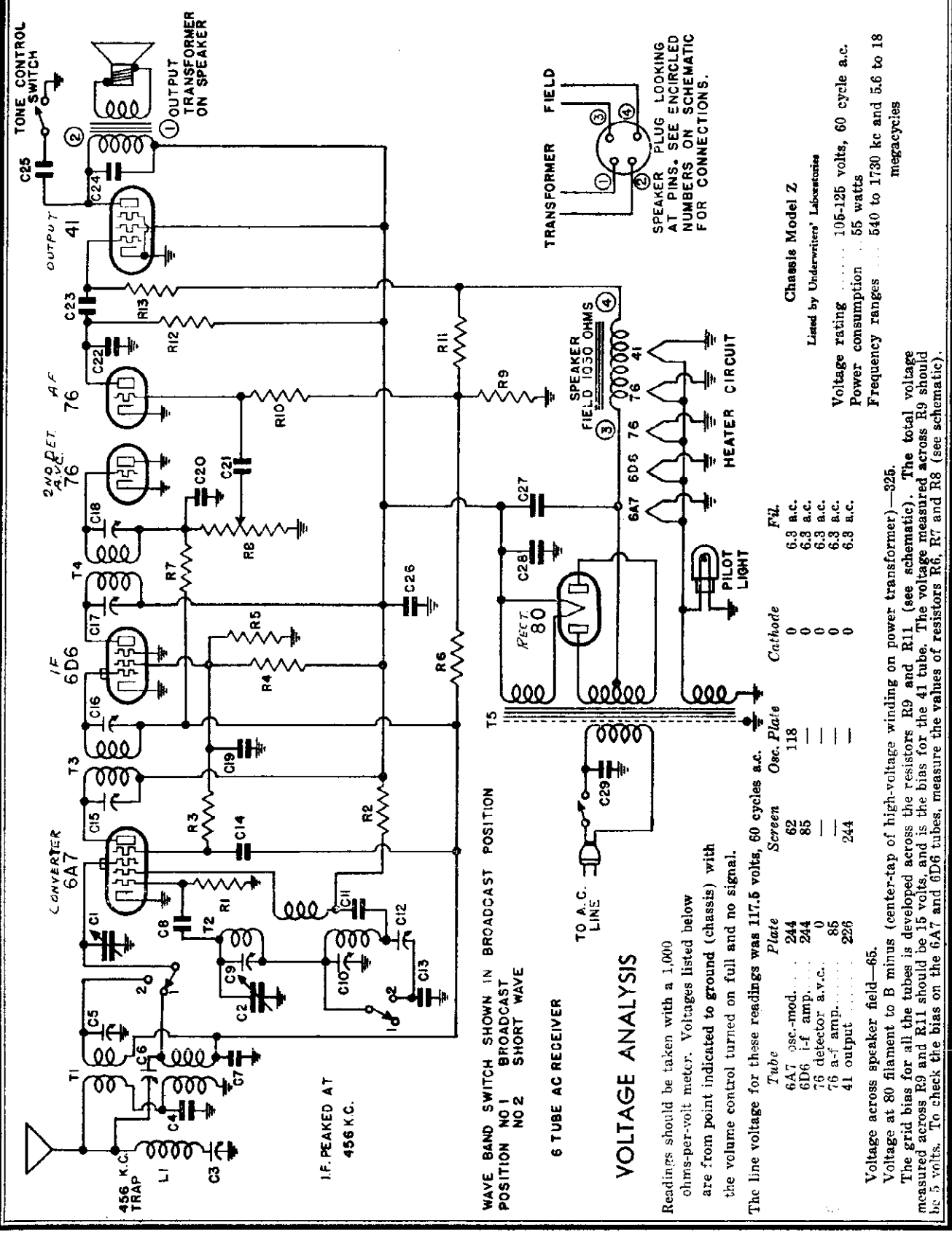
*ITEM	PART NO.	DESCRIPTION	Price as of Aug. 15, 1936
T1	3PT-309	Antenna coil	.85
T2	3HT-288	r-f interstage coil	.75
T3	3HT-287	oscillator coil	1.25
T4	3HT-287A	466 kc first i-f transformer	1.35
T5	3HT-288A	466 kc second i-f transformer	1.35
T6	3PT-310	Power transformer	2.00
L1	2KT-289	Iron-core filter choke (500 ohms)	1.20
L2	2ET-240	Layer-wound "A" choke	.55
L3	3FT-311	Dual r-f choke assembly (170 microhenries each section)	1.50
R1	LR-40	20,000 ohm, 1/4 watt carbon resistor	.16
R2	KR-43	50,000 ohm, 1/4 watt carbon resistor	.16
R3	3PR-268	Volume control (250,000 ohms)	.75
R4	KR-56	500,000 ohm, 1/4 watt carbon resistor	.16
R5	KR-54	100,000 ohm, 1/4 watt carbon resistor	.16
R6	R10	50,000 ohm, 1/4 watt carbon resistor	.16
R7	7K-310	50,000 ohm, 1/4 watt carbon resistor	.16
R8	KR-55	250,000 ohm, 1/4 watt carbon resistor	.16
R9	KR-37	1 megohm, 1/4 watt carbon resistor	.16
R10	IR-120	150 ohm, 1/2 watt wire-wound resistor	.16
R11	3FR-360	200 ohm, 1/2 watt wire-wound resistor	.16
R12	3BR-347	400,000 ohm, 1/4 watt carbon resistor	.16
R13	3BR-106	200 ohm wire-wound center-tapped resistor	.16
C1, C2	RFC-304	Three-range variable condenser	4.15
C3	AC-5	0.1 mf, 200 volt tubular condenser	.30
C4, C21	AC-6	0.0001 mf mica condenser	.20
C5, C11	EC-24A	0.9 mf, 200 volt tubular condenser	.80
C6, C12	BBC-181	Trimmers, part of 3HT-287A, first i-f transformer assembly. (Trimmers can not be supplied separately.)	
C7, C8	BBC-181	Trimmers, part of 3HT-288A, second i-f transformer assembly. (Trimmers can not be supplied separately.)	
C9, C10	AC-7A	0.00025 mf mica condenser	.20
C12, C13, C15	FC-59	0.02 mf, 200 volt tubular condenser	.20
C14, C20	LC-55	0.02 mf, 400 volt tubular condenser	.20
C16, C19, C30	LC-55	0.002 mf, 600 volt tubular condenser	.20
C17, C18	3FC-374	20 mf, 25 volt tubular dry electrolytic condenser	.80
C22	3FC-310	0.25 mf, 200 volt tubular condenser	.20
C23	HC-13	0.01 mf, 500 volt tubular condenser	.20
C24	3TC-377	0.01 mf, 500 volt tubular condenser	.20
C25	3TC-377	0.01 mf, 500 volt tubular condenser	.20
C26	3PC-307	Dial 8 mf, 300 volt air electrolytic condenser	3.00
C27	KPC-123	0.1 mf, 400 volt air electrolytic condenser	.20
C28	KPC-123	0.5 mf, 120 volt tubular condenser	.50
C29	2KC-236	Trimmers on three-range variable condenser. (Trimmers can not be supplied separately.)	
C31, C32	3PB-214	5/4 permanent magnet dynamic speaker (for Model P-117)	8.25
C33	3PB-222	10 permanent magnet dynamic speaker (for Model P-135)	11.00
C34, C35	3TS-145F	Tone control switch	.85
C36	3PS-215	Power switch	.75
C37	3PW-31	Battery cable	1.35
C38	AL-2	Pilot light 2.5 volt, 0.5 amp Mazda No. 41	.20
C39	3PZ-452	Dial face	.75
C40	3PZ-456	Dial drive belt	.20
C41	3CZ-387	Dial drive shaft and pulley	.40
C42	3CZ-387	Dial drive spring	.05
C43	3CZ-340	Idler spring	.05
C44	3CZ-341	Condenser shaft pulley	.10
C45	3PZ-363	Dial pointer	.10
C46	3CZ-350	Electrochone with crystal	1.05

*Item number locates the article on the schematic diagram.

EMERSON RADIO & PHONO. CORP.

MODELS Z117, Z122, Z133
Z141, Z150, Z159
Z160 Z135

Chassis Z
Schematic, Voltage



I.F. PEAKED AT
456 K.C.

WAVE BAND SWITCH SHOWN IN BROADCAST POSITION
POSITION NO 1 BROADCAST
POSITION NO 2 SHORT WAVE

6 TUBE AC RECEIVER

VOLTAGE ANALYSIS

Readings should be taken with a 1,000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal.

The line voltage for these readings was 117.5 volts, 60 cycles a.c.

Tube	Plate	Screen	Osc. Plate	Cathode	Fil.
6A7	244	62	118	0	6.3 a.c.
6D6	244	85	—	0	6.3 a.c.
76	0	—	—	0	6.3 a.c.
76	85	—	—	0	6.3 a.c.
41	228	244	—	0	6.3 a.c.

Voltage across speaker field—65.
Voltage at 80 filament to B minus (center-tap of high-voltage winding on power transformer)—326.
The grid bias for all the tubes is developed across the resistors R9 and R11 (see schematic). The total voltage measured across R9 and R11 should be 15 volts, and is the bias for the 41 tube. The voltage measured across R9 should be 5 volts. To check the bias on the 6A7 and 6D6 tubes, measure the values of resistors R6, R7 and R8 (see schematic).

TRANSFORMER FIELD
SPEAKER PLUG LOOKING AT PINS. SEE ENCIRCLED NUMBERS ON SCHEMATIC FOR CONNECTIONS.

Chassis Model Z
Listed by Underwriters' Laboratories

Voltage rating 105-125 volts, 60 cycle a.c.
Power consumption 55 watts
Frequency ranges 540 to 1730 kc and 5.6 to 18 megacycles

MODELS Z117, Z122, Z133, Z141, Z150, Z159, Z160, Z136 EMERSON RADIO & PHONO. CORP.

Chassis Z Alignment, Changes, Notes Parts

Tube Data

The tube complement is as follows: 6A7, pentagrid oscillator-modulator; 6X6, audio detector and a.v.c. (behind second I.F. transformer); 6AR5, audio amplifier output; 6AV6, full-wave rectifier.

REPLACEMENT PARTS

Table with columns: Part No., Description, Price. Lists various electronic components like capacitors, resistors, transformers, and tubes with their respective prices.

Six-Tube, A.C., Dual-Wave Superheterodyne MODELS Z117, Z122, Z133, Z135, Z141, Z150, Z159, and Z160 ADJUSTMENTS

An oscillator with frequencies of 466, 900, 1800 and 3600 kc. should be used. An output meter should be used across the voice coil or output transformer for observing maximum response. If the circuit is at all disturbed, both the broadcast and short-wave bands must be aligned.

Location of Coils and Trimmer Adjustments

The two I.F. transformers are located on top of the chassis deck. The second I.F. is the one directly behind the variable condenser. The four trimmers are located as follows: 6A7 trimmer is located in the top of the chassis deck near the antenna trimmer.

I.F. and Wave-trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 466 kc. through a 0.02 mf. paper condenser to the grid tap of the 6A7 tube (clockwise).

Short-Wave Alignment

Use a 400 ohm dummy antenna (a 400 ohm non-inductive resistor in series with the test oscillator antenna lead) when aligning the short-wave bands. Feed 16,000 kc. to the antenna and adjust the short-wave oscillator trimmer (nearest the front board variable condenser) for maximum response, and then adjust the short-wave antenna trimmer (nearest the front board variable condenser) for maximum response.

Broadcast Alignment

Use a standard dummy antenna in aligning the broadcast coils. (A .0002 condenser may be substituted.) Rotate the wave-band switch to the broadcast (clockwise) position. Set the dial pointer at 60 and feed 600 kc. Adjust the broadcast antenna trimmer (in corner next 6A7 tube) for maximum response. Move the dial pointer to 160 and feed 1600 kc. Adjust the broadcast oscillator trimmer (farthest from front board variable condenser) for maximum response.

GENERAL NOTES

- 1. The wave-trap in the receiver has been adjusted for maximum signal rejection at 466 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.
2. The receiver should never be turned on with either the speaker plug or the 41 tube out of their sockets, since the rapid rise in rectifier voltage would damage the electrolytic condensers.
3. The pilot light may be replaced by plugging the push-on socket of the dial and uncracking the bulb. It is not necessary to remove either the dial or chassis from cabinet.
4. In replacing chassis in cabinet do not tighten mounting screws so much that chassis will not flex freely, and do not allow any part of the dial assembly to touch the cabinet. If not properly mounted, the receiver may become microphonic.
5. The color coding of the 82T-345 power transformer leads is as follows: (See production changes for color coding of power transformer previously used.)
Primary—two black, two red leads
Secondary—two black, two red leads
High voltage sec. center tap—red and yellow
6. An efficient antenna system is necessary to enable a full realization of the merits of the receiver. The Emerson All-Antenna is especially designed for high efficiency and reduction of noise on all frequency ranges. Complete instructions for the installation of this antenna are supplied with each kit.

PRODUCTION CHANGES

Early Model Z-150 receivers differed from the schematic diagram as follows:

- a. C27 is a 2 mf. 450 volt dry electrolytic condenser.
b. C28 is a 8 mf. 450 volt dry electrolytic condenser.
c. A 80,000 ohm 1/2 watt carbon resistor (R12) of the 75 W type.
d. A 8 mf. 150 volt dry electrolytic condenser is connected from the screen-grid of the 6D6 I.F. amplifier to ground.

Later Model Z-150 receivers differ from the schematic diagram as follows:

- a. C27 is a 2 mf. 450 volt dry electrolytic condenser.
b. C28 is a 24 mf. 400 volt dry electrolytic condenser.
c. A .25 mf. 250 volt condenser is connected from the screen-grid of the 6D6 I.F. amplifier to ground.
In receiver bearing serial numbers below 1,072,957:
a. The power transformer is part No. Z11-258. The color coding of this transformer is as follows:
Primary—two black, two red leads
Secondary—two black leads
High voltage secondary—two black leads
High voltage secondary center tap—yellow lead.

41500 number besides the article on the schematic diagram.

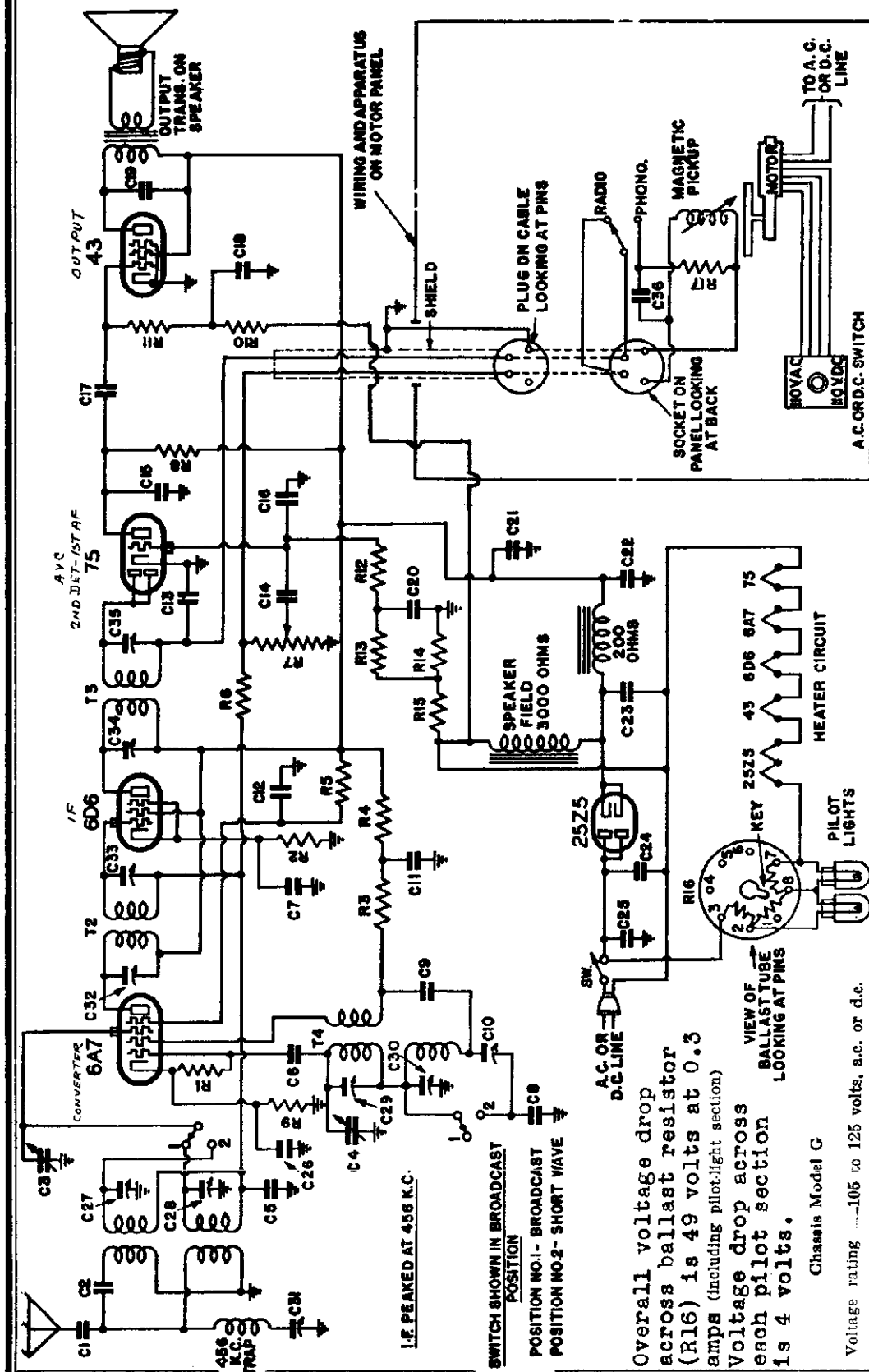
41500 production changes.

41500 items number besides the article on the schematic diagram.

41500 items number besides the article on the schematic diagram.

EMERSON RADIO & PHONO. CORP.

MODEL G127
Chassis G
Schematic, Voltage



VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

Tube	Plate	Screen	Cathode	Osc. Plate	FIL.
6A7	100.0	42	2.0	60	6.3 a.c.
6D6	100.0	100	2.0	—	6.3 a.c.
75	39.5	0	0	—	6.3 a.c.
43	87.0	100	0	—	25 a.c.

Voltage at 25Z5 cathode—110 volts.

Voltage rating ---105 to 125 volts, a.c. or d.c.
Current drain ---0.42 amperes for receiver and 0.2 amperes for motor.
Frequency ranges ---540 to 1625 kc, ---5.6 to 18.0 megacycles.

MODEL G127

Chassis G
Alignment, Notes
Changes, Parts

EMERSON RADIO & PHONO. CORP.

Tube Data

The tube complement is as follows:
1-6A7, pentagrid oscillator-modulator
1-4D6, first I-F amplifier
1-6BE6, second I-F amplifier, automatic volume control
1-5Y4, motor speed motor, ac-operated
1-3X7, motor speed motor, ac-operated
1-3Z5, dual half-wave rectifier
1-8CR241, ballast tube (E-16 on schematic).

REPLACEMENT PARTS

PLEASE SUBJECT TO CHANGE WITHOUT NOTICE

Part No.	DESCRIPTION	PRICE
801-280	Two-band antenna coil	2.40
801-281	466 kc. first I-F transformer	1.60
801-282	466 kc. second I-F transformer	1.60
801-283	Two-band oscillator coil	1.10
801-284	5000 ohm. grid leak resistor	1.15
801-285	5000 ohm. grid leak resistor	1.15
801-286	5000 ohm. grid leak resistor	1.15
801-287	5000 ohm. grid leak resistor	1.15
801-288	5000 ohm. grid leak resistor	1.15
801-289	5000 ohm. grid leak resistor	1.15
801-290	5000 ohm. grid leak resistor	1.15
801-291	5000 ohm. grid leak resistor	1.15
801-292	5000 ohm. grid leak resistor	1.15
801-293	5000 ohm. grid leak resistor	1.15
801-294	5000 ohm. grid leak resistor	1.15
801-295	5000 ohm. grid leak resistor	1.15
801-296	5000 ohm. grid leak resistor	1.15
801-297	5000 ohm. grid leak resistor	1.15
801-298	5000 ohm. grid leak resistor	1.15
801-299	5000 ohm. grid leak resistor	1.15
801-300	5000 ohm. grid leak resistor	1.15
801-301	5000 ohm. grid leak resistor	1.15
801-302	5000 ohm. grid leak resistor	1.15
801-303	5000 ohm. grid leak resistor	1.15
801-304	5000 ohm. grid leak resistor	1.15
801-305	5000 ohm. grid leak resistor	1.15
801-306	5000 ohm. grid leak resistor	1.15
801-307	5000 ohm. grid leak resistor	1.15
801-308	5000 ohm. grid leak resistor	1.15
801-309	5000 ohm. grid leak resistor	1.15
801-310	5000 ohm. grid leak resistor	1.15
801-311	5000 ohm. grid leak resistor	1.15
801-312	5000 ohm. grid leak resistor	1.15
801-313	5000 ohm. grid leak resistor	1.15
801-314	5000 ohm. grid leak resistor	1.15
801-315	5000 ohm. grid leak resistor	1.15
801-316	5000 ohm. grid leak resistor	1.15
801-317	5000 ohm. grid leak resistor	1.15
801-318	5000 ohm. grid leak resistor	1.15
801-319	5000 ohm. grid leak resistor	1.15
801-320	5000 ohm. grid leak resistor	1.15
801-321	5000 ohm. grid leak resistor	1.15
801-322	5000 ohm. grid leak resistor	1.15
801-323	5000 ohm. grid leak resistor	1.15
801-324	5000 ohm. grid leak resistor	1.15
801-325	5000 ohm. grid leak resistor	1.15
801-326	5000 ohm. grid leak resistor	1.15
801-327	5000 ohm. grid leak resistor	1.15
801-328	5000 ohm. grid leak resistor	1.15
801-329	5000 ohm. grid leak resistor	1.15
801-330	5000 ohm. grid leak resistor	1.15
801-331	5000 ohm. grid leak resistor	1.15
801-332	5000 ohm. grid leak resistor	1.15
801-333	5000 ohm. grid leak resistor	1.15
801-334	5000 ohm. grid leak resistor	1.15
801-335	5000 ohm. grid leak resistor	1.15
801-336	5000 ohm. grid leak resistor	1.15
801-337	5000 ohm. grid leak resistor	1.15
801-338	5000 ohm. grid leak resistor	1.15
801-339	5000 ohm. grid leak resistor	1.15
801-340	5000 ohm. grid leak resistor	1.15
801-341	5000 ohm. grid leak resistor	1.15
801-342	5000 ohm. grid leak resistor	1.15
801-343	5000 ohm. grid leak resistor	1.15
801-344	5000 ohm. grid leak resistor	1.15
801-345	5000 ohm. grid leak resistor	1.15
801-346	5000 ohm. grid leak resistor	1.15
801-347	5000 ohm. grid leak resistor	1.15
801-348	5000 ohm. grid leak resistor	1.15
801-349	5000 ohm. grid leak resistor	1.15
801-350	5000 ohm. grid leak resistor	1.15
801-351	5000 ohm. grid leak resistor	1.15
801-352	5000 ohm. grid leak resistor	1.15
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801-355	5000 ohm. grid leak resistor	1.15
801-356	5000 ohm. grid leak resistor	1.15
801-357	5000 ohm. grid leak resistor	1.15
801-358	5000 ohm. grid leak resistor	1.15
801-359	5000 ohm. grid leak resistor	1.15
801-360	5000 ohm. grid leak resistor	1.15
801-361	5000 ohm. grid leak resistor	1.15
801-362	5000 ohm. grid leak resistor	1.15
801-363	5000 ohm. grid leak resistor	1.15
801-364	5000 ohm. grid leak resistor	1.15
801-365	5000 ohm. grid leak resistor	1.15
801-366	5000 ohm. grid leak resistor	1.15
801-367	5000 ohm. grid leak resistor	1.15
801-368	5000 ohm. grid leak resistor	1.15
801-369	5000 ohm. grid leak resistor	1.15
801-370	5000 ohm. grid leak resistor	1.15
801-371	5000 ohm. grid leak resistor	1.15
801-372	5000 ohm. grid leak resistor	1.15
801-373	5000 ohm. grid leak resistor	1.15
801-374	5000 ohm. grid leak resistor	1.15
801-375	5000 ohm. grid leak resistor	1.15
801-376	5000 ohm. grid leak resistor	1.15
801-377	5000 ohm. grid leak resistor	1.15
801-378	5000 ohm. grid leak resistor	1.15
801-379	5000 ohm. grid leak resistor	1.15
801-380	5000 ohm. grid leak resistor	1.15
801-381	5000 ohm. grid leak resistor	1.15
801-382	5000 ohm. grid leak resistor	1.15
801-383	5000 ohm. grid leak resistor	1.15
801-384	5000 ohm. grid leak resistor	1.15
801-385	5000 ohm. grid leak resistor	1.15
801-386	5000 ohm. grid leak resistor	1.15
801-387	5000 ohm. grid leak resistor	1.15
801-388	5000 ohm. grid leak resistor	1.15
801-389	5000 ohm. grid leak resistor	1.15
801-390	5000 ohm. grid leak resistor	1.15
801-391	5000 ohm. grid leak resistor	1.15
801-392	5000 ohm. grid leak resistor	1.15
801-393	5000 ohm. grid leak resistor	1.15
801-394	5000 ohm. grid leak resistor	1.15
801-395	5000 ohm. grid leak resistor	1.15
801-396	5000 ohm. grid leak resistor	1.15
801-397	5000 ohm. grid leak resistor	1.15
801-398	5000 ohm. grid leak resistor	1.15
801-399	5000 ohm. grid leak resistor	1.15
801-400	5000 ohm. grid leak resistor	1.15

When number located in the schematic diagram, the article on the schematic diagram.

Early receivers differed from the schematic diagram as follows:

- A 50,000 ohm resistor, by-passed with a 0.1 mf. 200 volt condenser, was used in the plate circuit of the 7B tube as an A-C filter.
- The motor of C28 was returned to ground instead of the coil, as shown on the schematic.
- The motor of C28 was 2000 ohm carbon resistor.
- The 6A7 and 6D6 ballast tubes, R2 was a 150 ohm, 1/2 watt wire-wound resistor, and C7 was 0.15 mf. 200 volt condenser. C28 and C26 were not in the circuit.
- C1 was an 0.61 mf. 200 volt condenser.

PRODUCTION CHANGES

The tube complement is as follows:
1-6A7, pentagrid oscillator-modulator
1-4D6, first I-F amplifier
1-6BE6, second I-F amplifier, automatic volume control
1-5Y4, motor speed motor, ac-operated
1-3X7, motor speed motor, ac-operated
1-3Z5, dual half-wave rectifier
1-8CR241, ballast tube (E-16 on schematic).

Combination Phonograph and
A.C.-D.C. Dual-Wave Superheterodyne
SIX TUBES, INCLUDING BALLAST TUBE

Model G-127
RECEIVER ADJUSTMENTS

An oscillator with frequencies of 456, 690, 1416 and 15,000 kc should be used. In addition an output meter should be used across the voice coil or output transformer for observing maximum response.

Location of Coils and Trimmer Adjustments

The broadcast antenna coil, the short-wave antenna coil and the 456 kc wave trap are one assembly mounted under the chassis deck to the right of the variable condenser. The trimmers for these coils are accessible through three holes in the top of the chassis deck. The trimmer for the antenna coil is located at the right-hand corner of the wave trap. The trimmer for the broadcast antenna coil and the trimmer farthest from the chassis front is for the 456 kc wave trap.

The broadcast oscillator and short-wave oscillator coils are wound on one tubing and mounted on the inside of the rear chassis wall. The trimmers for these coils are accessible through two holes in the rear chassis wall. The left-hand trimmer (looking at the rear wall) is for the short-wave oscillator coil and the right-hand trimmer is for the broadcast oscillator coil.

The 6A7 and 6D6 ballast tubes are in oblong coil cans located on the top of the chassis. The first I-F transformer is the one behind the variable condenser. The trimmers for these transformers are accessible through holes in the top of the chassis.

The broadcast series loading condenser is located on the rear wall of the chassis below the 6A7 tube.

I-F Transformer and Wave-Trap Alignment

Turn the switch clockwise to the broadcast position and rotate the variable condenser to the minimum capacity position. Feed 456 kc to the grid cap of the 6A7 tube and adjust the first I-F trimmer for maximum response. Feed 456 kc to the antenna and adjust the wave-trap trimmer (rear screw beside variable condenser) for minimum response.

Short-Wave Alignment

Use a dummy antenna (400 ohm resistor) when aligning the short-wave coils. Rotate the wave-band switch counter-clockwise to the short-wave position and set the dial pointer to 13 megacycles. Feed 15 megacycles through the dummy antenna and adjust the trimmer for maximum response. Repeat this procedure for maximum response. The variable condenser should be rotated while adjusting the antenna trimmer. (Rotate variable condenser rotor shaft back and forth through a small arc).

Broadcast Alignment

Rotate the wave-band switch to the broadcast position, clockwise, and set the dial pointer at 64. Feed 640 kc through a standard dummy antenna (a 4000 ohm resistor may be used as a substitute). Adjust the broadcast series loading condenser (on rear chassis wall, below 6A7 tube) for maximum response. Move pointer to 1416, feed 1416 kc and adjust the broadcast oscillator trimmer (right-hand screw on rear chassis wall) for maximum response. Repeat this procedure for 1416 kc and readjust the series loading condenser reading the variable condenser for maximum response. Repeat this procedure for 640 kc and readjust the series loading condenser reading the variable condenser for maximum response.

GENERAL INSTRUCTIONS

The set's oscillator is higher in frequency than the signal, so images should be observed on the low frequency side of the signal. Always choose the minimum capacity peak on oscillator trimmer and maximum capacity peak on antenna trimmer. Always use as weak a test signal as possible during alignment. Never leave a trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely.

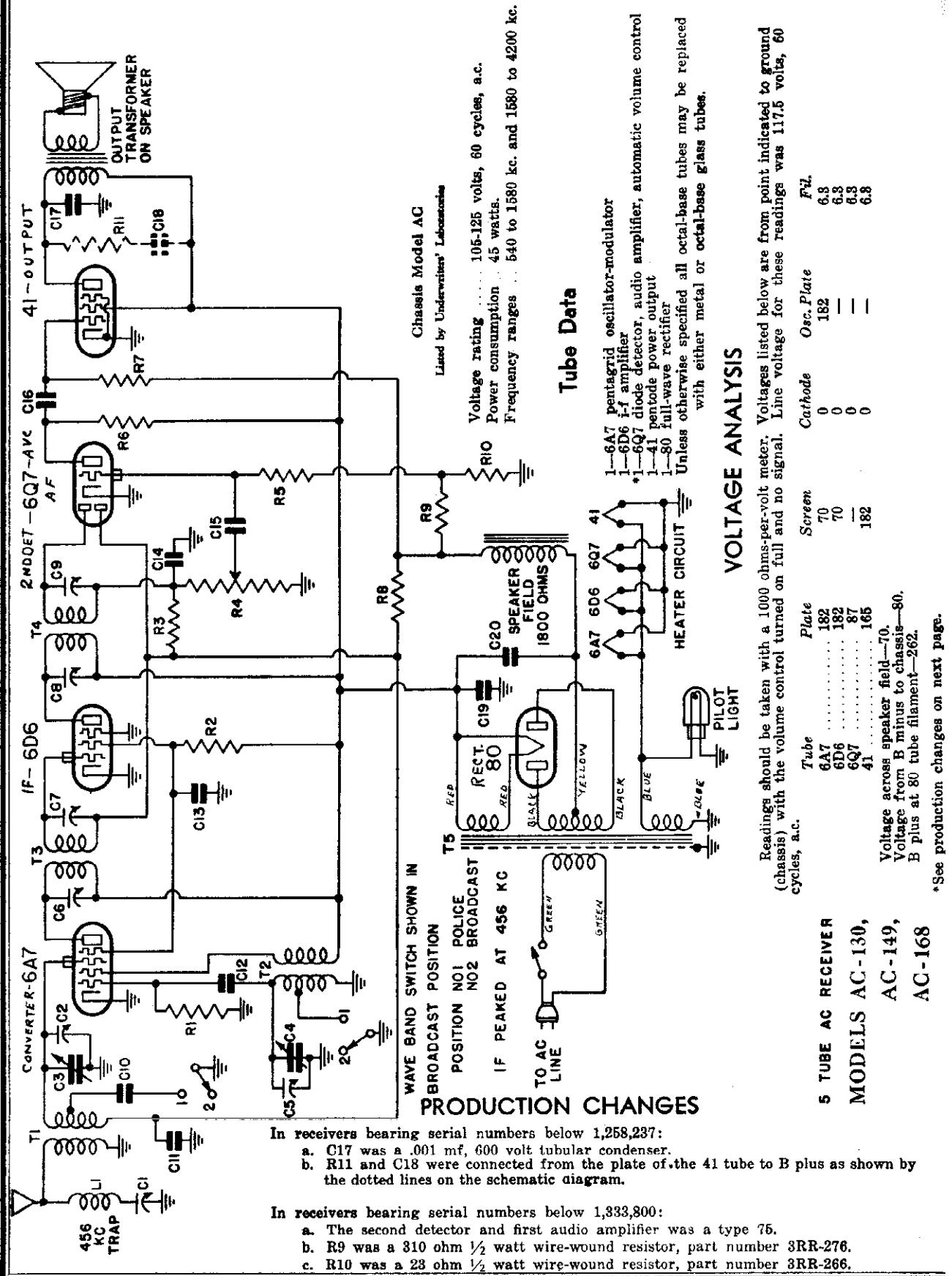
GENERAL NOTES

- If replacements are made or the wiring described in the rf portion of the circuit, the receiver should be carefully re-aligned.
- One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to connect in contact with any metal part of the receiver.
- The filament dropping resistor (R14 on schematic) is in a special metal tube at the rear of the chassis. This tube will become quite hot under normal operating conditions. For voltage drop specifications, see below.
- When operating the receiver on d.c. it may be necessary to reverse the line plug to obtain the correct polarity.
- The two I-F transformers are held to the chassis by snap-on fasteners. To remove an I-F transformer all the leads under the chassis, punch together the prongs of the snap-on fastener and lift the I-F can from the chassis.
- The color coding of the I-F transformer leads is as follows:
Plate—blue
Grid—green
B plus—red

- The phonograph motor has been adjusted at the factory to turn at a speed of 78 r.p.m. The speed may be checked by counting the turns per minute or by using a stroboscope disc and a neon light (the stroboscope method will only work when the neon bulb is lighted from a 60 cycle a.c. supply).
- An a.c.-d.c. switch is provided to switch the motor for a.c. or d.c. power supply. It is important that this switch be in the proper position for the power supply available.

EMERSON RADIO & PHONO. CORP. Chassis AC
 Schematic, Voltage, Change

MODELS AC130, AC149, AC168



MODELS AC130, AC149, AC168

Chassis AC

EMERSON RADIO & PHONO. CORP.

Alignment, Notes, Parts

GENERAL NOTES

1. The wave-trap in the receiver has been adjusted for maximum signal rejection at 456 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.
2. The receiver should never be turned on with the 41 tube out of its socket since the rapid rise in rectifier voltage would damage the electrolytic condensers.
3. The two i-f transformers are held to the chassis by snap-on fasteners. To remove an i-f, unsolder all the leads under the chassis, pinch together the prongs of the snap-on fastener and lift the i-f can from the chassis.
4. The color coding of the leads of the i-f transformers, is as follows:

Grid—green	Plate—blue
Grid return—black	B plus—red
5. The color coding of the power transformer leads is as follows:

Primary—two green leads	6.3 v. sec.—two heavy blue leads
High voltage sec.—two black leads	5 v. sec.—two heavy red leads
High voltage sec. center tap—yellow	
6. With a few exceptions, the color coding of the general wiring is as follows:

Plate—blue	A.v.c. and cathode—white or yellow
B plus—red	Grid—green
Screen—brown	Filament and ground—black
7. An efficient antenna system is necessary to enable a full realization of the merits of the receiver. For reduction of noise and achievement of high efficiency on all frequency ranges the Emerson All-Wave High-Fidelity Antenna, Model W-78, and the Emerson All-Wave Antenna System, Model W-89, are recommended. Instructions for the installation of these antennas are supplied with each kit.
 In congested areas where the installation of a large antenna is not desirable we recommend the use of the Emerson Flexible Mast Antenna, Model W-82. Instructions for the installation of this compact and efficient antenna are supplied with each kit.

ADJUSTMENTS

An oscillator with frequencies of 456 and 1400 kc is required.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Always use as weak a test signal as possible when aligning the receiver.

Location of Coils and Trimmer Adjustments

The two i-f transformers are located on top of the chassis deck. The first i-f transformer is the one directly behind the variable condenser. The trimmers for the two i-f transformers are available through holes in the tops of the cans.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the antenna coil.

The 456 kc wave-trap is mounted on the front chassis wall beneath the variable condenser. The trimmer for the 456 kc wave-trap is mounted on the coil and is accessible from the bottom of the chassis.

I-f and Wave-Trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 456 kc, through a 0.02 mf paper condenser, to the grid cap of the 6A7 tube (do not remove the grid clip from the tube). Adjust the four i-f trimmers for maximum response. Feed 456 kc to the antenna through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) and adjust the wave-trap trimmer for minimum response. (See General Notes.)

R-f Alignment

With the wave-band switch in the broadcast position, clockwise, set the dial pointer at 140. Feed 1400 kc through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response. The police band is self-tracking and does not require any adjustment.

REPLACEMENT PARTS LIST

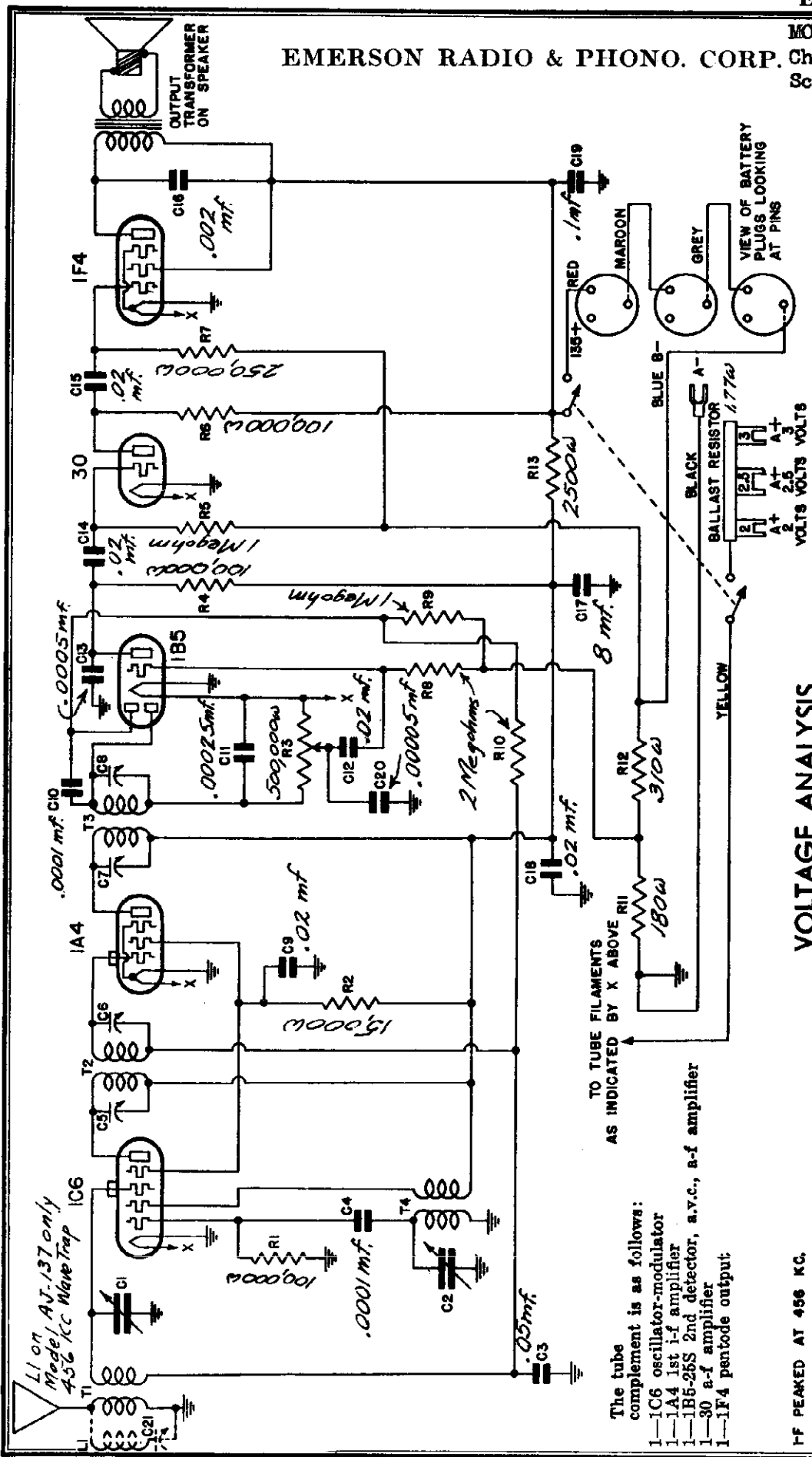
*Item	Part No.	DESCRIPTION	PRICE
L1	MMT-149A	456 kc wave-trap	.80
T1	3ET-484	Two-band antenna coil	.85
T2	3ET-319A	Two-band oscillator coil	.80
T3	3ET-320B	456 kc first i-f transformer	1.10
T4	3ET-321S	456 kc second i-f transformer	1.10
T5	3ET-322A	Power transformer	3.80
R1	KE-53U	50,000 ohm 1/2 watt carbon resistor	.16
R2	3LR-245U	40,000 ohm 1/2 watt carbon resistor	.16
R3	HR-42U	2 megohm 1/4 watt carbon resistor	.16
R4	3FR-265B	Volume control with switch—250,000 ohms	1.00
R5	3ER-274U	5 megohm 1/4 watt carbon resistor	.16
R6	KE-55	250,000 ohm 1/4 watt carbon resistor	.16
R7	KE-56U	500,000 ohm 1/4 watt carbon resistor	.16
R8	3RR-275U	10 megohm 1/4 watt carbon resistor	.16
R9	4CR-221	290 ohm 1/2 watt wire-wound resistor	.16
R10	4CR-230	35 ohm 1/2 watt wire-wound resistor	.16
R11	LR-45U	10,000 ohm 1/4 watt carbon resistor	.16
+C1		Trimmer, part of 456 kc wave-trap assembly.	
+C2, C5		Trimmer, part of variable condenser.	
+C3, C4	4CC-360A	Two-gang variable condenser	2.60
+C6, C7		Trimmer, part of first i-f transformer.	
+C8, C9		Trimmer, part of second i-f transformer.	
C10	AA-C-114	0.001 mf mica condenser	.20
C11, C13			
C18	BC-12	0.05 mf, 200 volt tubular condenser	.20
C12	AA-C-106A	0.00005 mf mica condenser	.20
C14	IC-47A	0.0005 mf mica condenser	.20
C15, C17	HC-34	0.004 mf, 600 volt tubular condenser	.20
C16	KC-58	0.01 mf, 400 volt tubular condenser	.20
C19, C20	3RC-318A	Dual 5 mf, 300 volt dry electrolytic condenser	1.00
	3RS-281	Wave-band switch	.25
	4CS-269	5 1/4" dynamic speaker	4.75
	XL-9	Pilot light, 6.3 volt, .25 amp., Mazda No. 46	.25
	4LZ-562	Dial face	.75
	3CZ-336	Drive belt for dial assembly	.10
	3CZ-337B	Drive shaft and pulley for dial assembly	.10
	3CZ-335	Idler pulley for dial assembly	.05
	3CZ-340	Idler spring for dial assembly	.05
	3CZ-341	Condenser shaft pulley	.10
	4MZ-588	Dial pointer	.25
	3FZ-351	Eacutcheon with crystal (for Models AC-130 and AC-168)	1.05
	3FZ-398A	Dial crystal (for Model AC-149)	.50
	3FZ-399	Clip for dial crystal (for Model AC-149)	.01

NOTE: The Model AC-149 should be aligned with the chassis bottom plate in place.

†These trimmers are part of coil assemblies and can not be supplied separately.
‡These trimmers are part of variable condenser and can not be supplied separately.

When ordering replacement parts specify part numbers.
*Item number locates the article on the schematic diagram.

EMERSON RADIO & PHONO. CORP.



The tube complement is as follows:
 1—1C6 oscillator-modulator
 1—1A4 1st i-f amplifier
 1—1B5-26S 2nd detector, a.v.c., a-f amplifier
 1—30 a-f amplifier
 1—1F4 pentode output

TO TUBE FILAMENTS
 AS INDICATED BY X ABOVE RII

VOLTAGE ANALYSIS

Readings should be taken with a 1,000 ohms-per-volt meter. The voltages listed below are from point indicated to A minus with volume control turned on full and no signal. The battery voltages for these readings were as follows: "A" battery 3 volts, "B" battery 135 volts.

Tube	Plate	Screen	Osc. Plate	Fil.
1C6	106	106	57	2.0
1A4	106	57	—	2.0
1B5-26S	75	—	—	2.0
30	90	—	—	2.0
1F4	127	18K	—	5.0

6 TUBE BATTERY RECEIVER

IF PEAKED AT 456 KC.

MODELS AJ130, AJ137, AJ149

Chassis AJ

Alignment, Notes

EMERSON RADIO & PHONO. CORP.

MODELS AJ-130, AJ-137, and AJ-149

CHASSIS MODEL AJ

Current drain "A" battery—42 amps.
 "B" battery—.016 amps. with no signal
 Frequency range 540 to 1730 kc.

GENERAL NOTES

1. The battery complement should be as follows:

Type	No. Req.	Portable (Small Batteries)		
		Eversady Part No.	Burgess Part No.	Ray-o-vac Part No.
1½ volt "A"	2	7111	4FA	6 Railroad
45 volt "B"	3	762 (plug-in type)	5308 (plug-in type)	5308 (plug-in type)

Home (Heavy Duty Batteries)

3 volt "A"	1	X-125	20F2	P9403
45 volt "B"	3	385 (plug-in type)	22308 (plug-in type)	P3303 (plug-in type)

The batteries indicated above for portable use are chosen for size so that the entire complement can be housed by the portable cabinet. In general, it will be found that the "B" batteries will last somewhat longer than the "A" batteries.

2. The receiver is designed for an "A" supply of 2 to 3 volts. If a 2 volt storage battery is used, its positive terminal should be connected to the terminal marked "2" on the metal clad ballast resistor. If a 2½ volt air-cell battery is used, it should be connected to the terminal marked "2.5". A 3 volt supply should be connected to the terminal marked "3".
3. The i-f transformers are of the snap-on type. To remove, unsolder all leads under the chassis, pinch together the prongs of the snap-on fastener and lift out.
4. The color coding of the i-f transformer leads is as follows:
- | | |
|-------------------|------------|
| Grid—green | Plate—blue |
| Grid return—black | B plus—red |
5. An efficient antenna system is necessary to enable a full realization of the merits of the receiver. For reduction of noise and achievement of high efficiency on all frequency ranges the Emerson All-Wave High-Fidelity Antenna, Model W-78, and the Emerson All-Wave Antenna System, Model W-89, are recommended. Instructions for the installation of these antennas are supplied with each kit.

ADJUSTMENTS

An oscillator with frequencies of 456 and 1600 kc should be used.

An output meter should be used across the voice coil or output transformer for observing maximum response. If the circuit is at all disturbed, the receivers must be realigned.

The set's oscillator is higher in frequency than the signal, so images should be observed on the low frequency side of the signals.

Always choose the minimum capacity peak on the oscillator trimmer and the maximum capacity peak on the antenna trimmer. The last motion in adjusting trimmers should always be a tightening one, not a loosening one.

Never leave a trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely.

Always use as weak a test signal as possible during alignment.

Location of Coils and Trimmer Adjustments

The two i-f transformers are located on top of the chassis deck. The first i-f is the one directly behind the variable condenser. The four trimmers, two for each transformer, are accessible through holes in the tops of the cans.

The antenna and oscillator trimmers are located on the right hand side of the variable condenser. The rear trimmer is the oscillator trimmer.

On portable model AJ-137, the 456 kc wave-trap is located below the chassis deck, directly underneath the variable condenser. Its trimmer is accessible through a hole in the bottom plate.

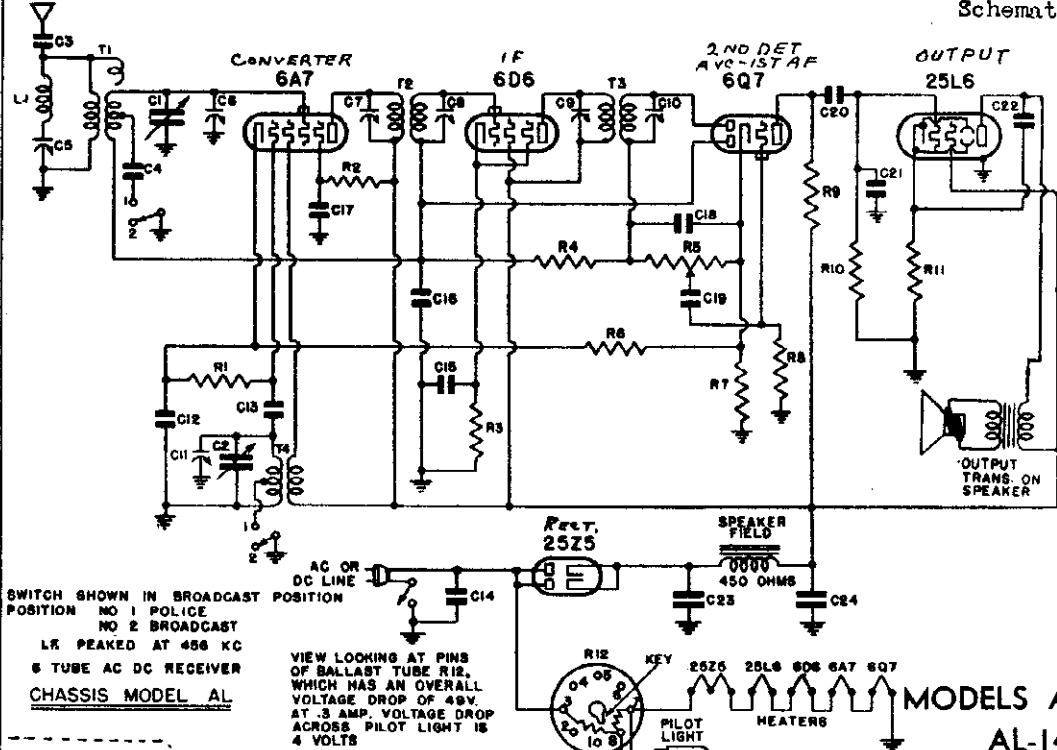
Alignment Procedure

1. Rotate the variable condenser to the minimum capacity position.
2. Feed 456 kc to the grid cap of the 1C6 tube.
3. Adjust the four i-f trimmers, repeating for maximum response.
4. If the receiver is portable model AJ-137, feed 456 kc to the antenna through a standard dummy antenna (a .0002 mf mica condenser may be substituted) and adjust the wave-trap trimmer for minimum response.
5. Set dial pointer to 1600 and feed 1600 kc to the antenna lead through a standard broadcast dummy antenna (a .0002 mf mica condenser may be used as a substitute).
6. Adjust the oscillator trimmer (on rear section of variable condenser) for maximum response.
7. Adjust the r-f trimmer (on front section of variable condenser) for maximum response.

MODELS AL130, AL132
AL149, AL168
Chassis AL

EMERSON RADIO & PHONO. CORP.

MODELS ALLW130, ALLW13
ALLW149, ALLW16
Chassis ALLW
Schematics, Voltage

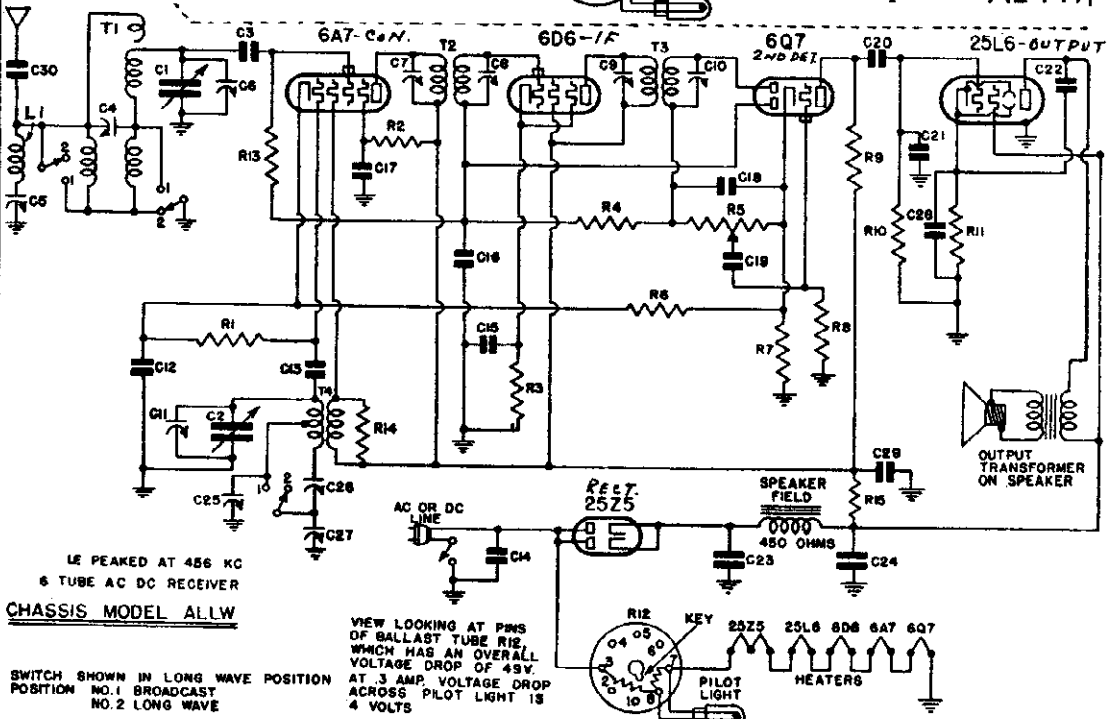


SWITCH SHOWN IN BROADCAST POSITION
POSITION NO. 1 POLICE
NO. 2 BROADCAST
LX PEAKED AT 486 KC
6 TUBE AC DC RECEIVER
CHASSIS MODEL AL

VIEW LOOKING AT PINS OF BALLAST TUBE R12, WHICH HAS AN OVERALL VOLTAGE DROP OF 49V. AT 3 AMP. VOLTAGE DROP ACROSS PILOT LIGHT IS 4 VOLTS

Tube Data
The tube complement is as follows:
1—6A7 pentagrid oscillator-modulator.
1—6D6 first i-f amplifier.
1—6Q7 diode detector, a.f. amplifier, a.v.c.
1—25L6 beam power output.
1—25Z5 dual half-wave rectifier.
1—2UR-224 ballast tube (R12 on schematic).

MODELS AL-130, AL-13
AL-149, AL-168



LX PEAKED AT 486 KC
6 TUBE AC DC RECEIVER
CHASSIS MODEL ALLW

SWITCH SHOWN IN LONG WAVE POSITION
POSITION NO. 1 BROADCAST
NO. 2 LONG WAVE

VIEW LOOKING AT PINS OF BALLAST TUBE R12, WHICH HAS AN OVERALL VOLTAGE DROP OF 49V. AT 3 AMP. VOLTAGE DROP ACROSS PILOT LIGHT IS 4 VOLTS

Chassis Model AL
and
Chassis Model ALLW
Voltage rating 105 to 125 volts, a.c. or d.c.
Power consumption 43 watts.
Frequency range Model A.T. 540 to 1680 kc and 1580 to 4200 kc.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	100	50	2.3	100	6.3
6D6	100	100	3.5	—	6.3
6Q7	43	0	1.2	—	6.3
25L6	92	100	6.5	—	25.0

Voltage at 25Z5 cathode—180 volts.
Voltage across speaker field—28 volts.
Voltage drop across ballast tube (pins Nos. 3, 7)—49 volts.
Voltage drop across pilot light section (pins Nos. 8 and 7)—4 volts.

MODELS ALLW-130, ALLW-13;
ALLW-149, ALLW-168

MODELS AL130,AL132
AL149,AL168
Chassis AL

EMERSON RADIO & PHONO. CORP.

MODELS ALLW130,ALLW132
ALLW149,ALLW168
Alignment,Parts,Notes

(on rear section of gang) for maximum response. Return pointer to 60, feed 600 kc and readjust padding condenser while using variable condenser.

Long-Wave Alignment for Model ALLW

Rotate the dummy antenna and adjust the long-wave oscillator trimmer for maximum response and then adjust the long-wave antenna trimmer. Move the pointer to 172.5 kc. Adjust the long-wave series paddler (hammer-nut on dual unit) for maximum response. Return the pointer to 345 kc and adjust the long-wave oscillator and antenna trimmer. Check at 600 kc on broadcast band and readjust if necessary.

REPLACEMENT PARTS LIST

Table with columns: Part No., Description, Price. Lists various electronic components like capacitors, resistors, coils, and trimmers for models AL130, AL132, AL149, AL168, ALLW130, ALLW132, ALLW149, ALLW168.

When ordering replacement parts specify part numbers.

GENERAL NOTES

- 1. If replacements are made or the wiring disturbed in the r-f portion of the circuit, the receiver should be carefully re-aligned.
2. One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to connect to the chassis base.
3. The dummy antenna should be used for alignment purposes. It is a special metal tube at the rear of the chassis. This tube will become quite hot under normal operating conditions. For voltage drop specifications, see below.
4. When operating the receiver on i.c. it may be necessary to fasten the line plug to obtain the correct polarity.
5. The two i-f transformers are held to the chassis by snap-on fasteners. To remove an i-f transformer all the leads under the chassis, pinch together the spring contact and lift the top can from the chassis.
6. The color coding: Grid-green; Grid-return-black; B plus-red.

The receiver is shipped with an attached antenna wire. In some locations (especially local stations) the addition of a very large dummy antenna will improve the receiver's performance. The Emerson Flexible dummy antenna for Model W-30 has been especially designed for Emerson receivers, featuring compactness and portability while at the same time retaining a high efficiency from the standpoint of performance. Since it functions as an outside antenna the Flexible Mast will substantially improve the receiver performance. Where the Flexible Mast is installed permanently, it is urgently recommended that the receiver be aligned with the dummy antenna in place. This will prevent outside antenna wire from being supplied with each kit connector. Instructions for the installation of this compact dummy antenna are included in the receiver's manual.
8. The wave-trap in the receiver has been adjusted for maximum signal rejection at 466 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.

ADJUSTMENTS

An oscillator with frequencies of 172, 345, 466, 600 and 1400 kc should be used. An output meter should be used across the output terminals of the oscillator. The voltage across the output terminals should be 100 volts. The wave oscillator is higher in frequency than the signal, so images should be observed on the low frequency side of the signals. The last motion in adjusting trimmers should always be a tightening one, not a loosening one. Never leave a trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up a ways or use a weak last signal as possible during alignment. Use a standard dummy antenna for aligning either of the bands. A .0001 mf condenser may be used for either the broadcast or long-wave band dummy antennas.

CHASSIS MODEL AL

Location of Coil and Trimmer Adjustments on the Model AL

The two i-f transformers are in oblong coil cans located on top of the chassis deck. The first i-f transformer is the one behind the variable condenser; the trimmers for these transformers are accessible through holes in the tops of the cans. The 466 kc wave-trap is mounted on the right side of the front chassis wall. Its trimmer is accessible through a hole in the bottom plate. The broadcast antenna and oscillator coils are wound on one form and are mounted underneath the chassis. The antenna coils are accessible through holes in the front chassis wall. The trimmer for the broadcast antenna and oscillator coils are located on the rear wall of the chassis deck near the variable condenser. The trimmer for the broadcast antenna and oscillator coils are located on the front section of the chassis deck. The trimmer for the broadcast antenna and oscillator coils are located on the front section of the chassis deck. The trimmer for the broadcast antenna and oscillator coils are located on the front section of the chassis deck. The trimmer for the broadcast antenna and oscillator coils are located on the front section of the chassis deck.

CHASSIS MODEL ALLW

Location of Coils and Trimmer Adjustments on the Model ALLW

The two i-f transformers are in oblong coil cans located on top of the chassis deck. The first i-f transformer is the one behind the variable condenser. The trimmers for these transformers are accessible through holes in the tops of the cans. The broadcast antenna coil, the long-wave antenna coil and the 466 kc wave-trap are on one assembly mounted underneath the chassis deck to the right of the variable condenser. The trimmers for these coils are accessible through three holes in the top of chassis deck. The trimmer for the wave-trap is on the central trimmer. The trimmer for the broadcast antenna and oscillator coils are wound on one form and are mounted underneath the chassis below the variable condenser. The trimmers for the broadcast antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the antenna coil; the trimmer on the left side of the rear chassis wall. The hexagon nut is the adjustment for the long-wave band and the screw in the center of this nut is for the broadcast band.

i-f Transformer and Wave-Trap Alignment for ALLW

Turn the switch clockwise to the broadcast position and rotate the variable condenser to the minimum capacity position. Feed 466 kc to the grid cap of the 6AV tube and adjust the four i-f trimmers for maximum response. Feed 1400 kc to the antenna and adjust the wave-trap trimmer for minimum response.

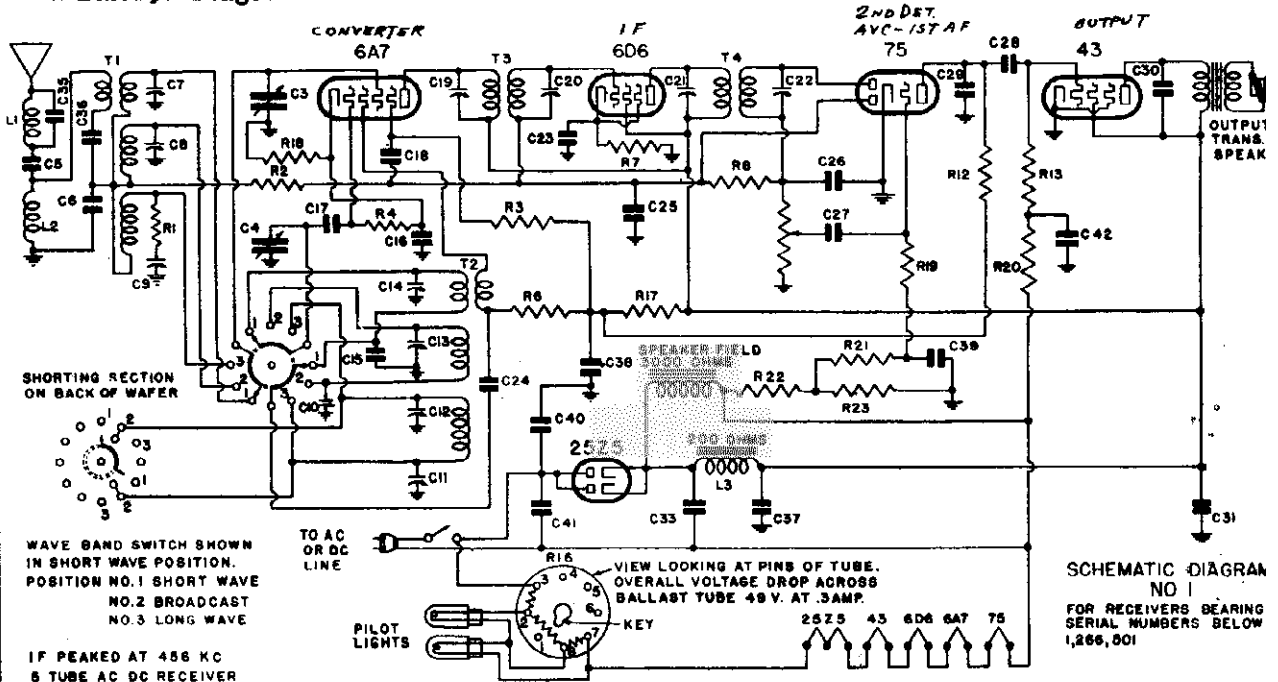
Broadcast Alignment for Model ALLW

Rotate the wave-band switch clockwise to the broadcast position and set dial pointer to 60. Feed 600 kc through a .0001 mf condenser. Adjust padding condenser (slotted screw on dual unit) for maximum response. Move pointer to 1400. Feed 1400 kc and adjust broadcast oscillator trimmer (on front section of gang) and broadcast antenna trimmer.

Below and Above
Serial 1266501
Schematics, Voltages

EMERSON RADIO & PHONO. CORP.

MODEL AAL13
Chassis AA

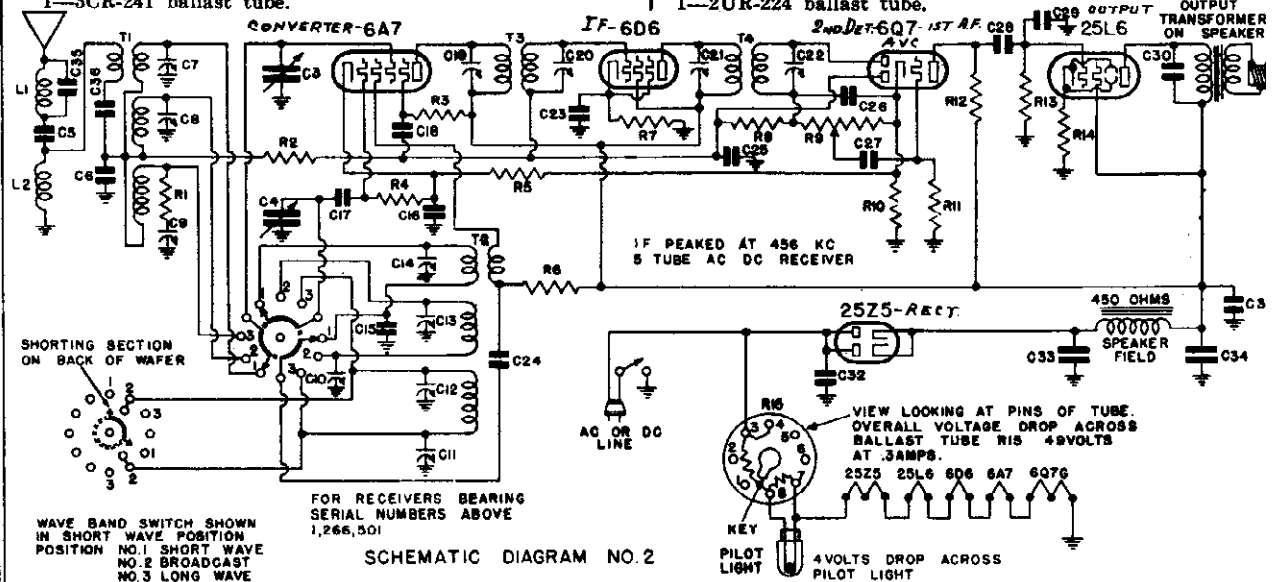


The tube complement for receivers bearing serial numbers below 1,266,501 is as follows:

- 1-6A7 pentagrid oscillator-modulator
- 1-6D6 first i-f amplifier
- 1-75 diode detector, a.v.c., audio amplifier
- 1-43 pentode power output
- 1-25Z5 dual half-wave rectifier
- 1-3CR-241 ballast tube.

The tube complement for receivers bearing serial numbers above 1,266,501 is as follows:

- 1-6A7 pentagrid oscillator-modulator
- 1-6D6 first i-f amplifier
- 1-6Q7 diode detector, a.v.c., audio amplifier
- 1-25L6 beam power output
- 1-25Z5 dual half-wave rectifier
- 1-2UR-224 ballast tube.



Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

The following are voltages for receivers bearing serial numbers below 1,266,501:

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	96	35	0.6	57	6.3
6D6	96	78	2	—	6.3
75	35	—	0	—	6.3
43	85	96	0	—	24

Voltage across speaker field—125
Voltage across filter choke—11.1

The bias for the 75 and 43 is developed across resistors R22 and R23 (see schematic diagram). The voltage across R22 is 11 volts and the voltage across R23 is 1 volt.

The voltage drop across the ballast resistor (R16—see schematic) is 49 volts between pins 3 and 7.

The following are voltages for receivers bearing serial numbers above 1,266,501:

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	100	42	1.6	75	6.3
6D6	100	100	3.6	—	6.3
6Q7	36	—	0.8	—	6.3
25L6	95	100	6.7	—	24

Voltage across speaker field—27.5

The voltage drop across the ballast resistor (R16—see schematic) is 49 volts between pins 3 and 7.

MODEL AA131

Chassis AA

Below and Above

Serial 1266501

Alignment, Notes, Parts

EMERSON RADIO & PHONO. CORP.

REPLACEMENT PARTS LIST

NOTE: Schematic No. 1 applies to receivers bearing serial numbers below 1266501. Schematic No. 2 applies to receivers bearing serial numbers above 1266501.

Table with columns: Part No., Schematic No. 1, Schematic No. 2, Description, Price. Lists various electronic components like capacitors, resistors, and coils.

When ordering replacement parts specify part numbers.

*Item number locates the article on the schematic diagram. †These trimmers are part of the coil assembly and are not to be supplied separately. ‡When ordering pointer specify if screw-on or push-on type.

MODEL AA-131

Chassis Model AA

- Voltage rating 105-125 volts, a.c. or d.c.
Power consumption 50 watts
Frequency range 150 to 375 kc, 640 to 1600 kc, 5.7 to 37.5 mc.

GENERAL NOTES

- 1. If replacements are made or the wiring disturbed in the r-f portion of the circuit, the receiver should be carefully re-aligned.
2. One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a...

ADJUSTMENTS

An oscillator with frequencies of 150, 350, 450, 600, 1500 and 16,000 kc should be used. An output meter should be used across the voice coil or output transformer for checking maximum response.

Location of Coils and Trimmers

The antenna coils for the three bands are wound on one form and mounted underneath the chassis deck to the right of the variable condenser. The trimmers for these coils are accessible through three holes in the top of the chassis.

I-f Alignment

Rotate the wave-band switch to the medium-wave (central) position and set the variable condenser to minimum. Feed 450 kc to the grid cup of the 6A7 tube through a .02 mf paper condenser, (do not remove the grid clip from the tube). Adjust the four I-F trimmers for maximum response.

Long-Wave Alignment

With the wave-band switch at long-wave (clockwise) position set the dial pointer at 15 and feed 150 kc to antenna. Adjust the long-wave series pecker (hex nut on dial pointer) for maximum response. Move pointer to 35 and feed 850 kc to antenna.

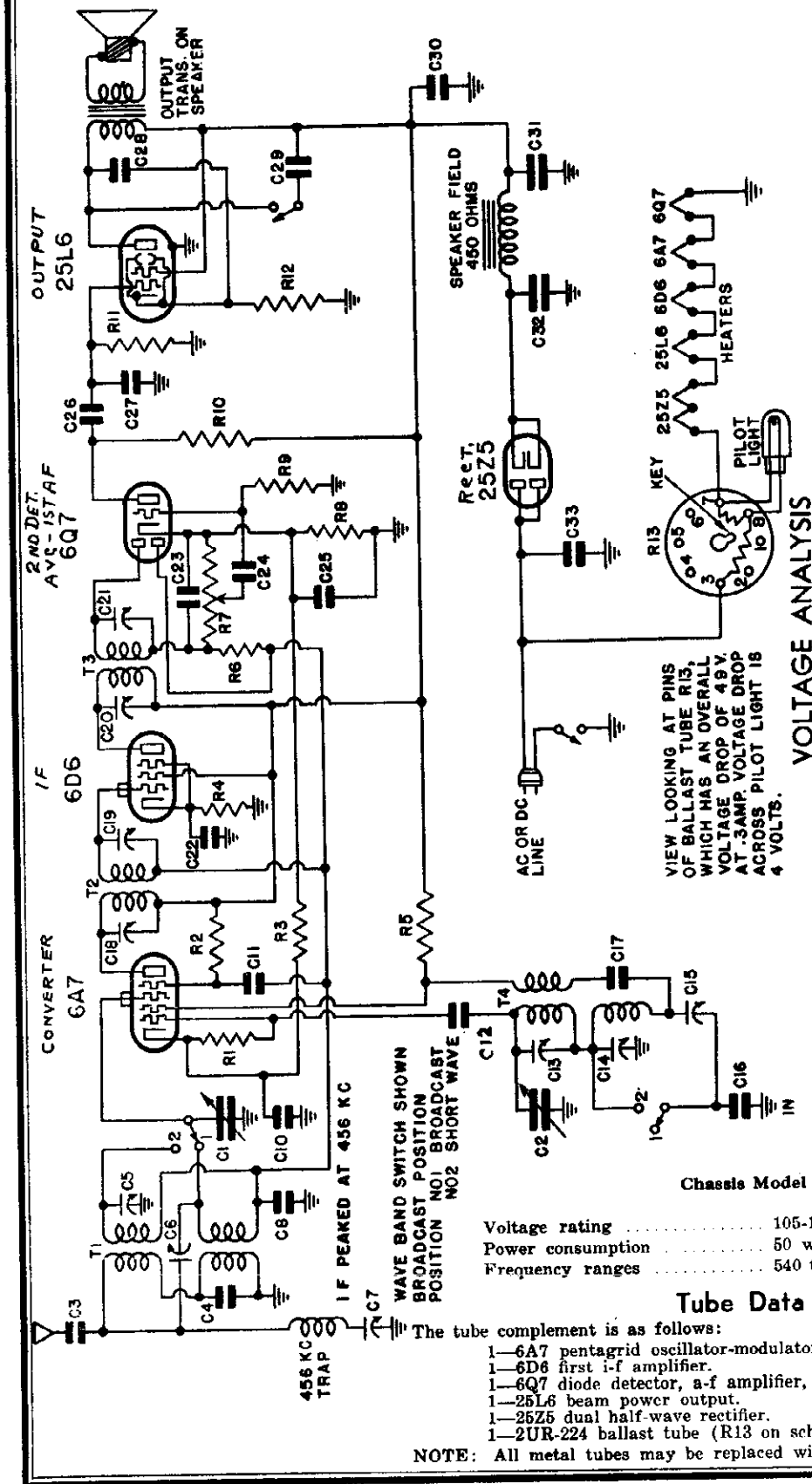
Medium-Wave Alignment

Set switch at medium-wave (central) position and dial pointer at 80. Feed 600 kc to antenna and adjust medium-wave series pecker (slotted screw on dial pointer) for maximum response. Move pointer to 150 and feed 1500 kc to antenna.

Short-Wave Alignment

Set wave-band switch at short-wave (counter-clockwise) position. Set pointer at 15, feed 15 megacycles to antenna and adjust short-wave oscillator trimmer and then short-wave antenna trimmer for maximum response.

EMERSON RADIO & PHONO. CORP. MODELS AM131, AM169, AM187
 Chassis AM
 Schematic, Voltage, Changes



PRODUCTION CHANGES
 In receivers bearing serial numbers below 1,184,290:

The variable condenser was part number 3CC-275. The dial pointer was part number 4MZ-590.

SIX TUBES, INCLUDING BALLAST TUBE MODELS AM-131, AM-169 and AM-187

Chassis Model AM

Voltage rating 105-125 volts, a.c. or d.c.
 Power consumption 50 watts.
 Frequency ranges 540 to 1,730 kc, and 5.6 to 18.0 megacycles.

Tube Data

The tube complement is as follows:
 1—6A7 pentagrid oscillator-modulator.
 1—6D6 first i-f amplifier.
 1—6Q7 diode detector, a-f amplifier, a.v.c.
 1—25L6 beam power output.
 1—25Z5 dual half-wave rectifier.
 1—2UR-224 ballast tube (R13 on schematic).

NOTE: All metal tubes may be replaced with equivalent octal base glass tubes.

MODELS AM131, AM169, AM187

Chassis AM EMERSON RADIO & PHONO. CORP.
Alignment, Notes, Parts

GENERAL NOTES

1. If replacements are made or the wiring disturbed in the r-f portion of the circuit, the receiver should be carefully re-aligned.
2. One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a standard dummy antenna (a 5000 ohm resistor) be used as a substitute.
3. The filament dropping resistor (R13 on schematic) is in the metal part of the chassis. For voltage drop specifications, see below.
4. When operating the receiver on d.c. it may be necessary to reverse the line plug to obtain the correct polarity.
5. The two i-f transformers are held to the chassis by snap-on fasteners. To remove an i-f, unscrew all the leads under the chassis, pinch together the prongs of the snap-on fastener and lift the i-f can from the chassis.
6. The color coding of the i-f transformer leads is as follows:
 Plate—blue
 Grid—green
 B plus—red
7. An efficient antenna system is necessary to enable a full realization of the merits of the receiver. For reduction of wiring and achievement of high efficiency on all frequency ranges, the Emerson All-Wave High Fidelity Antenna, Model W-86, is recommended. Instructions for the installation of these antennas are supplied with each kit.
8. The wave-trap in the receiver has been adjusted for maximum signal rejection at 466 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.

ADJUSTMENTS

An oscillator with frequencies of 454, 600, 1428 and 15,000 kc should be used. In addition an output meter should be used across the voice coil or output transformer for observing maximum response. The set's oscillator is higher in frequency than the signal, so no change should be observed on the low frequency side of the signal. Always choose the minimum capacity peak on oscillator trimmers and maximum capacity peaks on antenna trimmers. The last method in adjusting trimmers should always be a tightening one, not a loosening one. Always use as weak a test signal as possible during alignment. Never leave a trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely.

Location of Coils and Trimmer Adjustments

The broadcast antenna coil, the short-wave antenna coil and the 466 kc wave trap are on assembly mounted under the chassis deck to the right of the variable condenser. The trimmers for these coils are accessible through three holes in the top of the chassis. The trimmer closest to the front of the chassis is for the short-wave antenna coil. The central trimmer is for the broadcast antenna coil and the trimmer farthest from the chassis front is for the 466 kc wave trap. The broadcast oscillator and short-wave oscillator coils are wound on one form and mounted on the inside of the rear chassis wall. The trimmers for these coils are accessible through two holes in the rear chassis wall. The set's broadcast oscillator coil, the rear wall is for the short-wave oscillator coil and the right-hand trimmer is for the broadcast oscillator coil. The two i-f transformers are in oblong coil cans located on the top of the chassis. The first i-f transformer is the one behind the variable condenser. The trimmers for these transformers are accessible through holes in the tops of the cans. The broadcast series padding condenser is located on the rear wall of the chassis below the 6A7 tube.

i-f Transformer and Wave-Trap Alignment

Turn the set, clockwise to the broadcast position and rotate the variable condenser to the minimum capacity. Feed 15 megacycles through the dummy antenna and adjust the short-wave oscillator trimmer (left-hand screw on rear chassis wall) for minimum response. The variable condenser should be rotated while adjusting the antenna trimmer. (Rotate variable condenser rotor shaft back and forth through a small arc.)

Short-Wave Alignment

Use a dummy antenna (500 ohm resistor) when aligning the short-wave coils. Rotate the wave-band switch counter-clockwise to the short-wave position and set the dial pointer to 15 megacycles. Feed 15 megacycles through the dummy antenna and adjust the short-wave oscillator trimmer (left-hand screw on rear chassis wall) for minimum response. The variable condenser should be rotated while adjusting the antenna trimmer. (Rotate variable condenser rotor shaft back and forth through a small arc.)

Broadcast Alignment

Rotate the wave-band switch to the broadcast position, clockwise, and set the dial pointer at 60. Feed 600 kc through a standard dummy antenna (a 5000 ohm resistor) and adjust the broadcast antenna trimmer (right-hand screw on rear chassis wall) for maximum response. Return pointer to 90, feed 600 kc and readjust the series padding condenser rotating the variable condenser for maximum response.

REPLACEMENT PARTS LIST

Part No.	DESCRIPTION	Price
4CT-299A	Two-band antenna coil	\$1.50
4CT-299B	466 kc second i-f transformer	1.50
4CT-299C	466 kc second i-f transformer	1.50
4CT-299A	Two-band oscillator coil	1.50
4CT-299B	50,000 ohm 1/2 watt carbon resistor	.15
4CT-299C	50,000 ohm 1/2 watt carbon resistor	.15
4CT-299D	410 ohm 1/2 watt wire-wound resistor	.15
4CT-299E	410 ohm 1/2 watt wire-wound resistor	.15
4CT-299F	10,000 ohm 1/2 watt carbon resistor	.15
4CT-299G	1 neoholm 1/2 watt carbon resistor	.15
4CT-299H	Volume control with line switch—250,000 ohms	1.50
4CT-299I	250,000 ohm 1/2 watt wire-wound resistor	.15
4CT-299J	250,000 ohm 1/2 watt wire-wound resistor	.15
4CT-299K	500,000 ohm 1/2 watt carbon resistor	.15
4CT-299L	140 ohm 1/2 watt wire-wound resistor	.15
4CT-299M	Plug-in type ballast resistor	.25
4CT-299N	Two-gang variable condenser (see production changes)	2.50
4CT-299O	0.0005 mf mica condenser	.20
4CT-299P	Trimmer, part of antenna coil assembly	.20
4CT-299Q	0.05 mf, 200 volt tubular condenser	.20
4CT-299R	0.1 mf, 200 volt tubular condenser	.20
4CT-299S	Trimmer, part of oscillator coil assembly	.20
4CT-299T	Single adjustable padding condenser. Range: 500 to 800 mmf.	.20
4CT-299U	0.01 mf, 200 volt tubular condenser	.20
4CT-299V	0.01 mf, 200 volt tubular condenser	.20
4CT-299W	Trimmer, part of first i-f transformer	.20
4CT-299X	Trimmer, part of second i-f transformer	.20
4CT-299Y	0.0005 mf mica condenser	.20
4CT-299Z	0.05 mf, 200 volt tubular condenser	.20
4CT-300A	40 mf, 150 volt wet electrolytic condenser	.50
4CT-300B	20 mf, 150 volt wet electrolytic condenser	.50
4CT-300C	0.1 mf, 400 volt tubular condenser	.20
4CT-300D	Tone control switch	.20
4CT-300E	Wave-band switch	.20
4CT-300F	500 ohm 1/2 watt carbon resistor	.15
4CT-300G	500 ohm 1/2 watt carbon resistor	.15
4CT-300H	500 ohm 1/2 watt carbon resistor	.15
4CT-300I	500 ohm 1/2 watt carbon resistor	.15
4CT-300J	500 ohm 1/2 watt carbon resistor	.15
4CT-300K	500 ohm 1/2 watt carbon resistor	.15
4CT-300L	500 ohm 1/2 watt carbon resistor	.15
4CT-300M	500 ohm 1/2 watt carbon resistor	.15
4CT-300N	500 ohm 1/2 watt carbon resistor	.15
4CT-300O	500 ohm 1/2 watt carbon resistor	.15
4CT-300P	500 ohm 1/2 watt carbon resistor	.15
4CT-300Q	500 ohm 1/2 watt carbon resistor	.15
4CT-300R	500 ohm 1/2 watt carbon resistor	.15
4CT-300S	500 ohm 1/2 watt carbon resistor	.15
4CT-300T	500 ohm 1/2 watt carbon resistor	.15
4CT-300U	500 ohm 1/2 watt carbon resistor	.15
4CT-300V	500 ohm 1/2 watt carbon resistor	.15
4CT-300W	500 ohm 1/2 watt carbon resistor	.15
4CT-300X	500 ohm 1/2 watt carbon resistor	.15
4CT-300Y	500 ohm 1/2 watt carbon resistor	.15
4CT-300Z	500 ohm 1/2 watt carbon resistor	.15

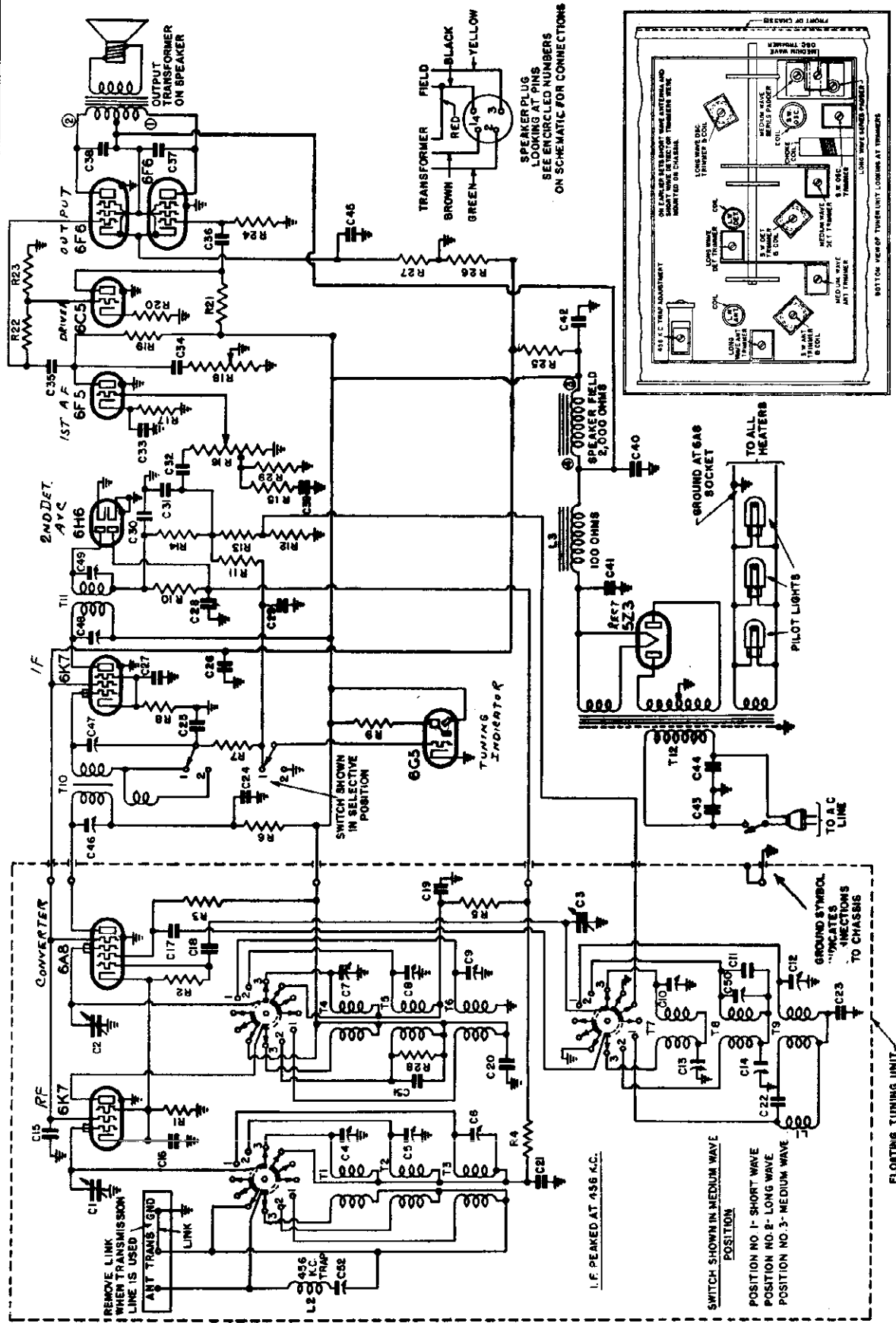
When ordering replacement parts specify part numbers.

When number brackets the article on the schematic diagram. (These trimmers cannot be supplied separately.)

Chassis DLW
Schematic, Trimmers

EMERSON RADIO & PHONO. CORP.

MODELS D134LW, D136LW, D138LW,
D139LW, D140LW, D142LW,
D146LW



MODEL S D134LW, D136LW, D139LW, D140LW, D142LW, D146LW

EMERSON RADIO & PIANO. CORP.

Chassis DLW Alignment, Voltage Notes, Changes, Parts

Ten-Tube, A. C., Long, Medium and Short-Wave Superheterodyne

VOLTAGE ANALYSIS table with columns for Tube No., Pin No., Voltage across, etc.

REPLACEMENT PARTS LIST

REPLACEMENT PARTS LIST table with columns for Description, Part No., and Price.

Prices Subject to Change Without Notice

Readings should be taken with a 1000 ohm-per-volt meter. Voltages listed below are from point indicated to ground...

When number below the part is in parenthesis, it can not be supplied separately. These components are parts of the chassis assembly...

ADJUSTMENTS The receiver was carefully aligned and checked to the factory by means of an oscillograph, and it is strongly recommended...

Tube Data The tube complement is as follows: 6X7-5C amplifier (on tuner), 6X4 detector and antenna vibrator, 6B6 pentode (IF amplifier), 6BE5 full-wave rectifier, 6AV6 detector and antenna vibrator, 6AV6 pentode (IF amplifier), 6BE5 full-wave rectifier, 6AV6 detector and antenna vibrator, 6BE5 full-wave rectifier, 6AV6 detector and antenna vibrator, 6BE5 full-wave rectifier, 6AV6 detector and antenna vibrator.

GENERAL INSTRUCTIONS Use as weak a test signal as possible during alignment... Always choose the minimum capacity peak on oscillator trimmer and maximum capacity peak on antenna and 1/2 trimmer...

GENERAL NOTES The wave-trap in the receiver has been adjusted for maximum signal rejection at 460 kc. If, however, persistent interference is from the interfering station is at a minimum...

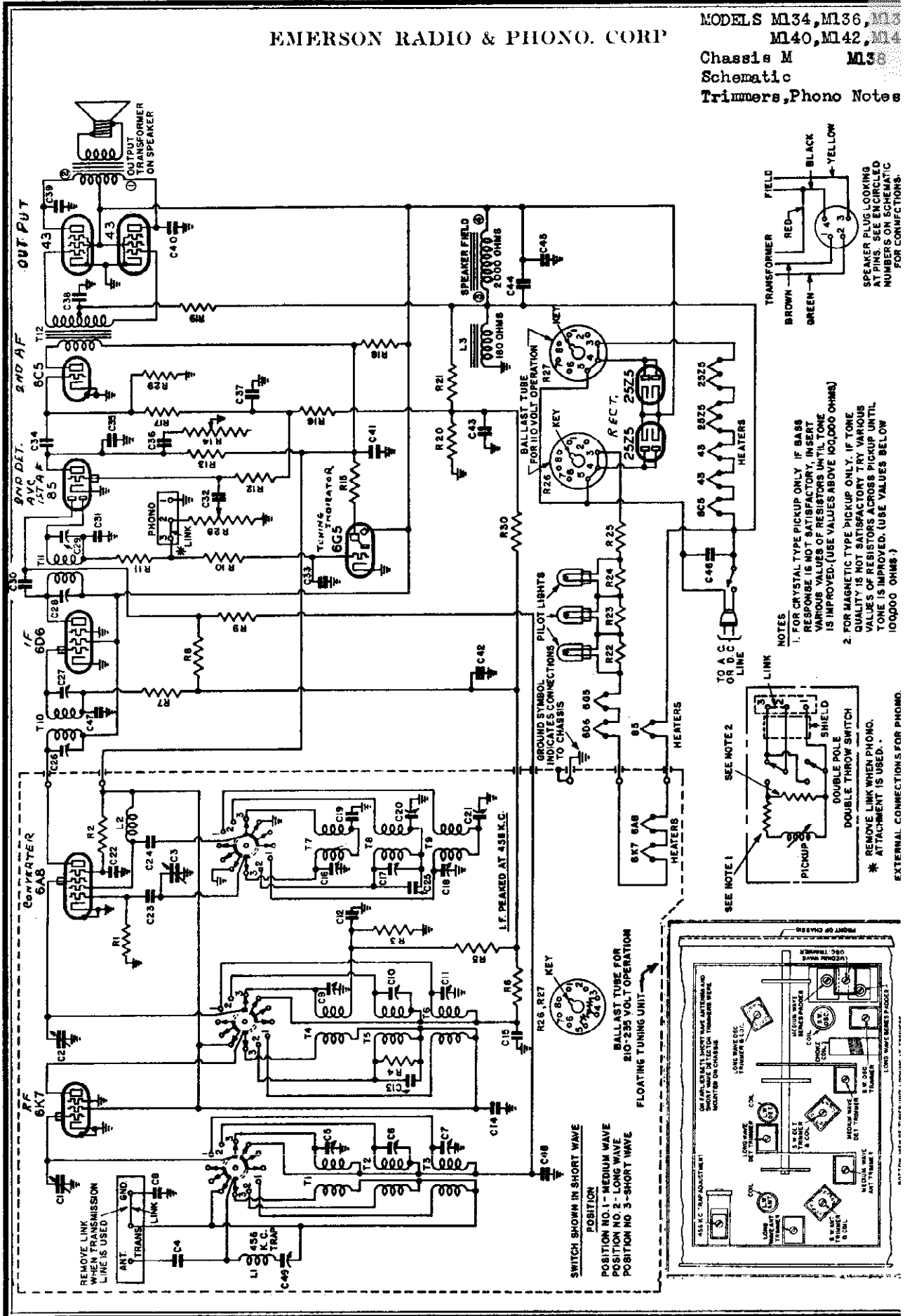
Alignment Set the wave-band switch at the medium-wave (clockwise) position and the variable condenser at the minimum capacity position. Feed 400 kc to the grid cap of the 6X4 tube. Adjust the antenna and antenna trimmer for maximum response...

High Voltage sec.—two red leads High voltage secondary center tap—two red and yellow leads High voltage secondary outer tap—two red and yellow leads...

Block—black Lead—yellow Blue—plate Black—target Blue—cathode Blue—target Blue—cathode

EMERSON RADIO & PHONO. CORP

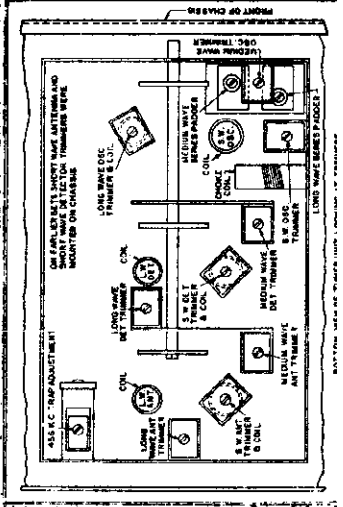
MODELS M134, M136, M138, M140, M142, M144
 Chassis M135
 Schematic
 Trimmers, Phono Notes



TRANSFORMER FIELD
 BROWN GREEN RED YELLOW
 SPEAKER PLUG LOOKING AT THIS. SEE ENCLOSED NUMBERS ON SCHEMATIC FOR CONNECTIONS.

NOTES
 1. FOR CRYSTAL TYPE PICKUP ONLY IF BASS RESPONSE IS NOT SATISFACTORY, INSERT VARIOUS VALUES OF RESISTORS UNTIL TONE IS IMPROVED. (USE VALUES ABOVE 100,000 OHMS)
 2. FOR MAGNETIC TYPE PICKUP ONLY. IF TONE QUALITY IS NOT SATISFACTORY TRY VARIOUS VALUES OF RESISTORS ACROSS PICKUP UNTIL TONE IS IMPROVED. (USE VALUES BELOW 100,000 OHMS.)

SEE NOTE 1
 SEE NOTE 2
 TO A.C. OR D.C. LINE
 LINK
 PICKUPS
 DOUBLE POLE SHIELD
 DOUBLE THROW SWITCH
 REMOVE LINK WHEN PHONO ATTACHMENT IS USED.
 EXTERNAL CONNECTIONS FOR PHONO.



MODELS M134, M136 M138, M139 M140, M142 M146

EMERSON RADIO & PHONO. CORP. Chassis M Alignment, Voltage Changes, Notes, Parts

A.C. - D.C., Long, Medium and Short-Wave Superheterodyne 12 Tubes Including Ballast Tubes

MODELS M-134, M-136, M-138, M-139, M-140, M-142, and M-146 Chassis Model M

VOLTAGE ANALYSIS

Table with columns for Tube, DC Voltage, AC Voltage, and Description. Includes notes on how to take readings and target voltages for various components like the antenna coil and detector coil.

REPLACEMENT PARTS

Table listing replacement parts with columns for Part No., Description, and Price. Includes items like resistors, capacitors, coils, and trimmers.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

PRODUCTION CHANGES

OS and OS trimmers were supplied separately and have incorporated as part of the short-wave antenna and detector coil assembly.

ADJUSTMENTS

An oscillator with frequencies of 150, 345, 465, 690, 1000 and 1600 kc should be used. Instructions for adjusting antenna trimmers and oscillator trimmers.

TUBE DATA

The tube complement is as follows: 1-6A5, 1-6X4, 1-6AR5, 1-6BE6, 1-6BE7, 1-6BE8, 1-6BE9, 1-6BE10, 1-6BE11, 1-6BE12, 1-6BE13, 1-6BE14, 1-6BE15, 1-6BE16, 1-6BE17, 1-6BE18, 1-6BE19, 1-6BE20, 1-6BE21, 1-6BE22, 1-6BE23, 1-6BE24, 1-6BE25, 1-6BE26, 1-6BE27, 1-6BE28, 1-6BE29, 1-6BE30, 1-6BE31, 1-6BE32, 1-6BE33, 1-6BE34, 1-6BE35, 1-6BE36, 1-6BE37, 1-6BE38, 1-6BE39, 1-6BE40, 1-6BE41, 1-6BE42, 1-6BE43, 1-6BE44, 1-6BE45, 1-6BE46, 1-6BE47, 1-6BE48, 1-6BE49, 1-6BE50, 1-6BE51, 1-6BE52, 1-6BE53, 1-6BE54, 1-6BE55, 1-6BE56, 1-6BE57, 1-6BE58, 1-6BE59, 1-6BE60, 1-6BE61, 1-6BE62, 1-6BE63, 1-6BE64, 1-6BE65, 1-6BE66, 1-6BE67, 1-6BE68, 1-6BE69, 1-6BE70, 1-6BE71, 1-6BE72, 1-6BE73, 1-6BE74, 1-6BE75, 1-6BE76, 1-6BE77, 1-6BE78, 1-6BE79, 1-6BE80, 1-6BE81, 1-6BE82, 1-6BE83, 1-6BE84, 1-6BE85, 1-6BE86, 1-6BE87, 1-6BE88, 1-6BE89, 1-6BE90, 1-6BE91, 1-6BE92, 1-6BE93, 1-6BE94, 1-6BE95, 1-6BE96, 1-6BE97, 1-6BE98, 1-6BE99, 1-6BE100.

Medium-Wave Alignment

Both pointers on the dial should coincide vertically at 930 kc. For adjustment, the gold pointer may be slipped across the dial.

Long-Wave Alignment

Set the wave-band switch at the long-wave (central) position and the pointer to 160. Feed 160 kc through a standard dummy antenna.

Short-Wave Alignment

Set the wave-band switch at the short-wave (counter-clockwise) position. Move pointer to 15, feed 16000 kc to antenna (using a 400 ohm dummy antenna).

GENERAL INSTRUCTIONS

The set's oscillator is higher in frequency than the signal on all three bands. Images, therefore, should be observed on Always observe the frequency of the signal.

GENERAL NOTES

1. An electrical photograph pick-up may be connected to this receiver for playing records. Connections to the receiver may be made at the "phono" terminal strip which is located on the rear wall of the receiver chassis.

2. The tuning indicator (6G5 tube) is mounted on the table type receiver. It is necessary to remove the speaker from the baffles, in order to remove the tuning indicator tube assembly.

3. Pilot lights may be replaced by slipping the push-on sockets off the dial and unscrewing the bulbs. It is not necessary to remove either the dial or chassis from cabinet.

4. Always observe the frequency of the signal on all three bands. Images, therefore, should be observed on Always observe the frequency of the signal.

5. One side of the power line is connected to the chassis through the filter chokes L3 (see schematic). Under no condition, the power line should be connected to the chassis through the filter chokes L3 (see schematic).

6. The tuning indicator (6G5 tube) is mounted on the table type receiver. It is necessary to remove the speaker from the baffles, in order to remove the tuning indicator tube assembly.

7. An official alignment is necessary to enable a 6H modification of the receiver. The Emerson Alignment Wave Antenna is supplied in kit form and reduction of noise on all three frequency ranges. Consult the instructions for the installation of this antenna as supplied with each kit.

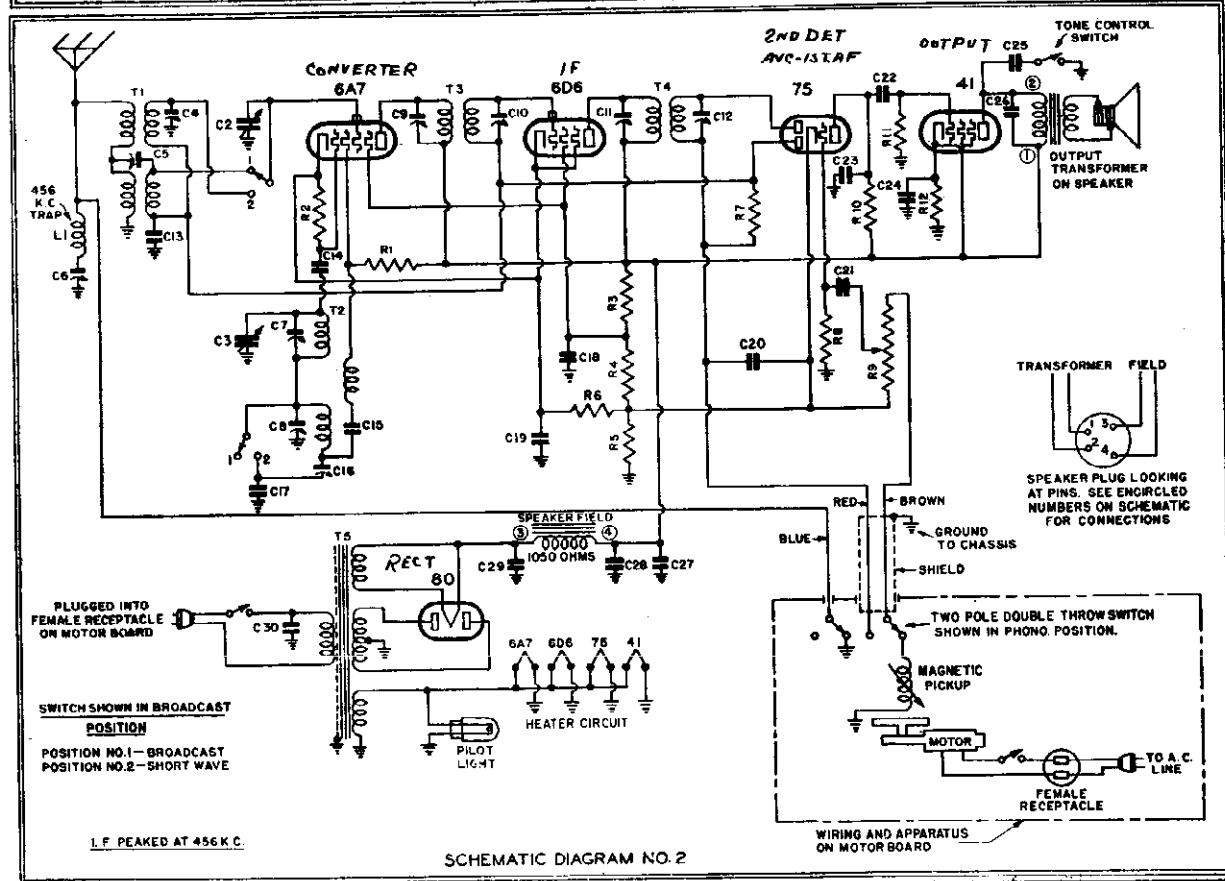
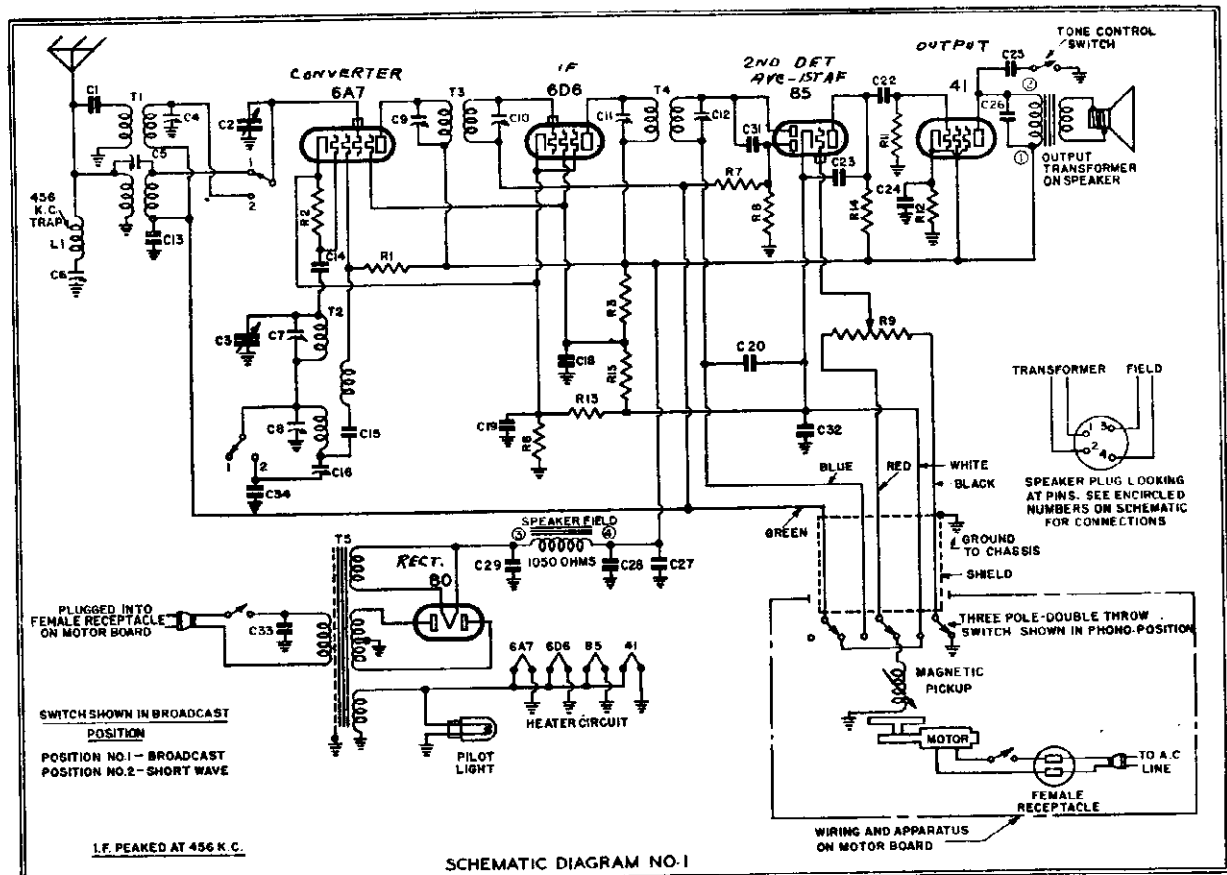
8. The wave-trap in the receiver has been adjusted for maximum signal rejection at 485 kc. If, however, persistent interference from the underwriting station is experienced, it is recommended that the wave-trap be adjusted to reject the station.

9. The receivers for 105-125 volt operation may be easily converted for 210-250 volt operation by substituting ballast tubes part no. 3MR-253 for ballast tubes part no. 3MR-249.

Below and Above Ser. 895962
Schematics,

EMERSON RADIO & PHONO. CORP.

MODEL L143
Chassis L



MODEL L143

Chassis L

EMERSON RADIO & PHONO. CORP.

Below and Above #895962

Alignment, Voltage, Parts

Notes, Changes

Combination Phonograph and Five-Tube, A.C., Dual-Wave Superheterodyne

MODEL L143
Chassis Model L

Voltage rating 105 to 135 volts, a.c.
Current drain 0.2 amp, for receiver.
Frequency range 50 to 1750 kc, 2500 to 7500 kc.

Tube Data

- The tube complement is as follows:
- 1-6A7, oscillator-oscillator
- 1-6D6, I-F amplifier
- 1-6X5, tube detector, a.v.c., a-f amplifier
- 1-50, 500 cycle transformer
- 1-50, full-wave rectifier

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohm-per-volt meter. Voltage listed below are from point indicated to ground (chassis). Line voltage for these readings was 117.5 volts, 40 cycles, a.c.

Point	Volts	Res.	Cap.
1-6A7	90	—	—
1-6D6	50	—	—
1-6X5	50	—	—
1-50	130	—	—
1-50	240	—	—
1-50	255	—	—

Resonance bearing serial numbers below 895,962 used a type 95 second detector. The voltage readings at the 50 socket are as follows: Plate 67, Cathode 5.5, Fil. 0.5 a.c.

REPLACEMENT PARTS LIST

Schematic No. 1	Schematic No. 2	Part No.	DESCRIPTION	Price
L1	L1	MMT-149	454 kc adjustable wave-trap	\$.30
L2	L2	ZNT-205	Two-band antenna coil	1.35
L3	L3	ZNT-210	500 ohm resistor	1.20
L4	L4	ZNT-220	400 ohm resistor	1.15
L5	L5	ZNT-230	448 kc second I-F transformer	1.15
L6	L6	ZNT-240	448 kc second I-F transformer	1.15
L7	L7	ZNT-250	Power transformer	4.05
L8	L8	ZNT-260	500 ohm 1/2 watt carbon resistor	1.6
L9	L9	ZNT-270	25,000 ohm 1/2 watt carbon resistor	1.8
L10	L10	ZNT-280	40,000 ohm 1/2 watt carbon resistor	1.6
L11	L11	ZNT-290	150 ohm 1/2 watt carbon resistor	1.6
L12	L12	ZNT-300	1 megohm 1/2 watt carbon resistor	1.6
L13	L13	ZNT-310	50 ohm control with line switch—250,000 ohm	1.50
L14	L14	ZNT-320	500,000 ohm 1/2 watt carbon resistor	1.8
L15	L15	ZNT-330	500 ohm 1/2 watt wire-wound resistor	1.6
L16	L16	ZNT-340	450 ohm 1/2 watt wire-wound resistor	1.6
L17	L17	ZNT-350	40,000 ohm 1/2 watt carbon resistor	1.6
L18	L18	ZNT-360	0.00045 mf mica condenser	1.6
L19	L19	ZNT-370	Two-range variable condenser	1.35
L20	L20	ZNT-380	Trimmer part of ZNT-387 oscillator coil assembly	1.35
L21	L21	ZNT-390	Trimmer part of ZNT-387 oscillator coil assembly	1.35
L22	L22	ZNT-400	Trimmer part of ZNT-387 oscillator coil assembly	1.35
L23	L23	ZNT-410	0.05 mf, 300 volt tubular condenser	30
L24	L24	ZNT-420	Single adjustable padding condenser—Range 500 to 600 meg	30
L25	L25	ZNT-430	0.00025 mf mica condenser	30
L26	L26	ZNT-440	0.00050 mf mica condenser	30
L27	L27	ZNT-450	0.00075 mf mica condenser	30
L28	L28	ZNT-460	5 mf, 25 volt tubular dry electrolytic condenser	40
L29	L29	ZNT-470	0.015 mf, 1000 volt tubular condenser	30
L30	L30	ZNT-480	0.1 mf, 400 volt tubular condenser	30
L31	L31	ZNT-490	15 mf, 405 volt wet electrolytic condenser	1.30
L32	L32	ZNT-500	15 mf, 405 volt wet electrolytic condenser	1.30
L33	L33	ZNT-510	0.1 mf, 250 volt a.c. tubular condenser in metal container	30
L34	L34	ZNT-520	0.00135 mf mica condenser	30

*Item number bracketed in the schematic diagram.
†These condensers are part of coil assemblies and will not be supplied separately.
‡See Production Changes, paragraph 1. **PRICES SUBJECT TO CHANGE WITHOUT NOTICE**

1. Schematic No. 1 applies to receivers bearing serial numbers below 895,962.
2. In receivers bearing serial numbers below 895,962:
a. The two trimmers of the antenna coil, L1, were in parallel from antenna to ground and a 0.00005 mf mica condenser was connected to the antenna coil and the short-wave primary.
b. L17 was an 0.00135 mf mica condenser.

ADJUSTMENTS

An oscillator with frequencies of 456, 604, 1800 and 6040 kc should be used. An antenna coil should be used across the top of the chassis of the oscillator transformer for observing maximum response. If this circuit is to be observed, both the broadcast and short-wave bands must be receiving.

Location of Coils and Trimmer Adjustments

The top of the chassis deck. The second I-F is the one directly behind the variable condenser. The four trimmers are accessible through holes in the top of the chassis.

The 456 kc wave trap is located on top of the chassis deck, in the center near the 6A7 tubes with the screw adjustment accessible through a hole in the top of the chassis.

The adjustable padding condenser for the broadcast band is mounted underneath the chassis in the top of the chassis. The trimmers for these coils are accessible through holes in the top of the chassis.

The oscillator coils for the broadcast and short-wave bands are wound on one form and mounted underneath the chassis in the top of the chassis. The trimmers for these coils are accessible through holes in the top of the chassis.

The antenna coils for the broadcast and short-wave bands are wound on one form and mounted underneath the chassis in the top of the chassis.

I-F and Wave-trap Alignment

Rotate the wave-band switch to the broadcast position, clockwise. Set the variable condenser at the minimum capacity position and feed 456 kc to the grid cap of the 6A7 tube. Adjust the four I-F trimmers for maximum response. (See paragraph 4 under General Notes.)

Short-wave Alignment (Alignment of the short-wave band should precede broadcast alignment)

Use a 400 ohm dummy antenna (a 400 ohm resistor is satisfactory) for the oscillator antenna (see) in aligning the short-wave coils. Rotate the wave-band switch to the short-wave position, counter-clockwise, and adjust the broadcast series padder (in corner near 6A7 tube) for maximum response. Move the dial pointer to 1600 and feed 6000 kc. Adjust the broadcast oscillator trimmer (farthest from front beside the variable condenser) for maximum response. Adjust the antenna trimmer (closest to front beside the variable condenser) for maximum response. Adjust the antenna trimmer (left side of top of chassis). Rotate potentiometer for maximum response. Adjust the broadcast series padder, rotating the variable condenser (rotate the variable condenser shaft, back and forth through a small arc) for maximum response.

Broadcast Alignment

Use a standard dummy antenna in aligning the broadcast coils (A 1000 ohm resistor may be used as a substitute). Rotate the wave-band switch to the broadcast position, clockwise. Set the dial pointer to 1000 and feed 6040 kc. Adjust the broadcast oscillator trimmer (farthest from front beside the variable condenser) for maximum response. Adjust the antenna trimmer (right side of chassis). Rotate potentiometer for maximum response. Adjust the broadcast series padder, rotating the variable condenser (rotate the variable condenser shaft, back and forth through a small arc) for maximum response.

GENERAL INSTRUCTIONS

The set's oscillator is higher in frequency than the signal, so image should be observed on the low frequency side of the signal.

Always choose the minimum capacity peak on oscillator trimmers and maximum capacity peaks on antenna trimmers. Never leave a trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely.

Always use as weak a test signal as possible during alignment.

GENERAL NOTES

1. The receiver should never be turned on with either the speaker plug or the 41 tube out of its respective socket, since this will damage the radio tubes.

2. When replacing the chassis in the cabinet take care to keep any part of the dial and condenser assembly from touching the cabinet, otherwise microphonics will result.

3. The color coding of the I-F transformer is as follows: Grid—green; Plate—blue; Fil and ground—black.

4. The color coding of the power transformer is as follows: Primary—two black leads; High-voltage secondary—two red leads; 6.3-volt filament secondary—red and yellow lead; 5-volt filament secondary—two yellow leads.

5. The adjustable padding condenser for the broadcast band is mounted underneath the chassis (in the corner near the wave-band switch) with the screw adjustment accessible through a hole in the top of the chassis. The short-wave bands are adjustable through holes in the top of the chassis. When replacing this fixed padding capacitor use a condenser which has a capacity within 2% of the specified value.

6. With a few exceptions, the color coding of the general wiring is as follows: Grid—green; Plate—blue; Fil and ground—black; Cathode—white or yellow.

7. The wave-trap in the receiver has been adjusted for maximum signal rejection at 456 kc. If, however, persistent interference is experienced from some particular telegraph station, the wave-trap trimmer may be readjusted until the response from the interfering station is at a minimum.

8. Complete instructions for the installation of the receiver are given in the instruction booklet.

9. The phonograph motor has been adjusted at the factory to the speed of 78 r.p.m. (The speed may be checked by counting the turns per minute of a stroboscope disc and a moon light.) (This stroboscope may be checked by work on moon balls in lighted from a 90 cycle a.c. supply.) To readjust the speed of the motor, part No. B1134, of the speed adjusting screw is located near the turntable shaft.) A clockwise rotation of the screw increases the speed. The speed should be adjusted near the middle of the adjusting range. (The speed of the motor, part No. B1134, may be checked by counting the turns per minute of a stroboscope disc and a moon light.)

10. The speed of the motor is adjustable through a hole in the top of the chassis. The speed of the motor is adjustable through a hole in the top of the chassis. The speed of the motor is adjustable through a hole in the top of the chassis.

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17. The speed of the motor is adjustable through a hole in the top of the chassis. The speed of the motor is adjustable through a hole in the top of the chassis.

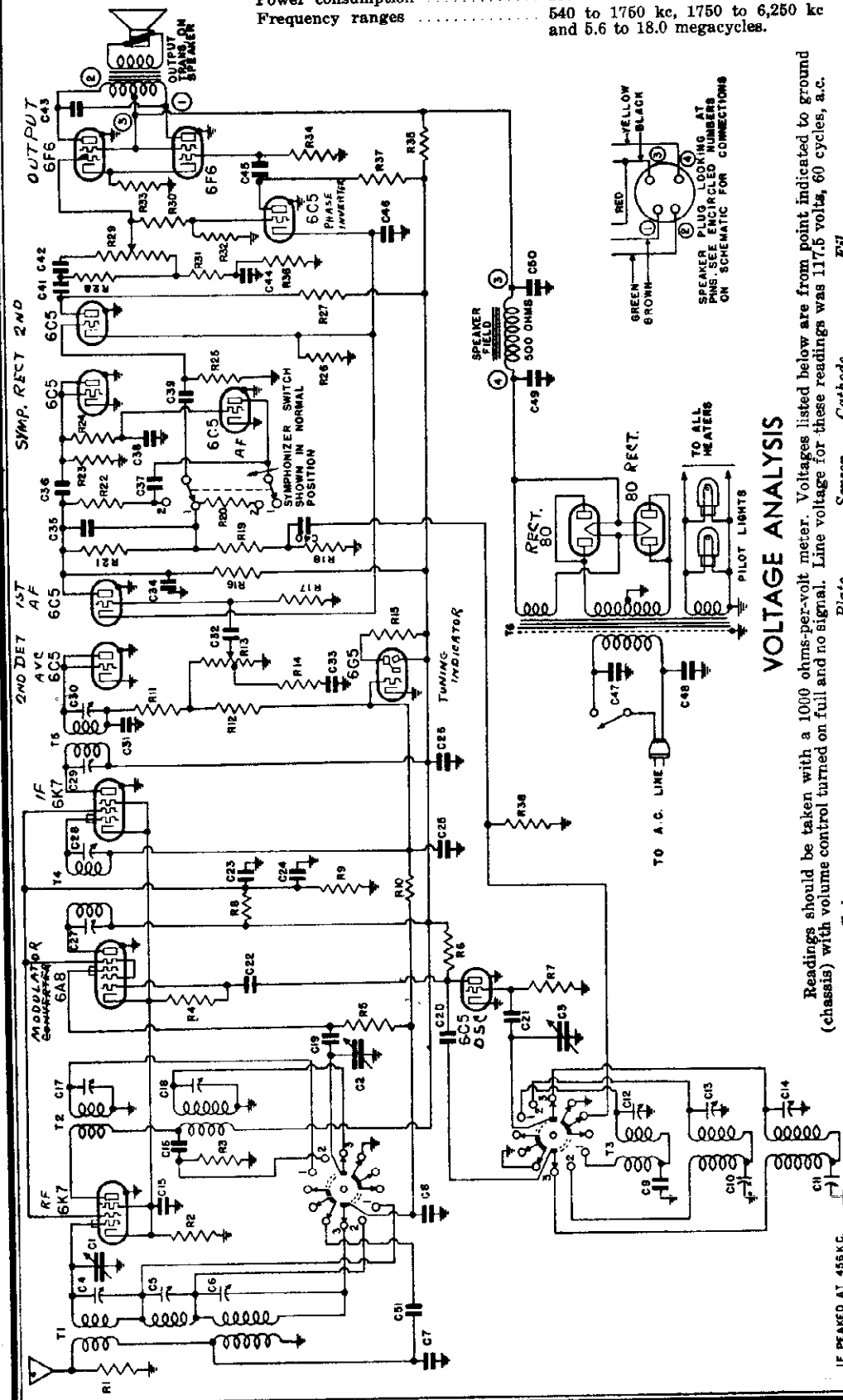
18. The speed of the motor is adjustable through a hole in the top of the chassis. The speed of the motor is adjustable through a hole in the top of the chassis.

19. The speed of the motor is adjustable through a hole in the top of the chassis. The speed of the motor is adjustable through a hole in the top of the chassis.

EMERSON RADIO & PHONO. CORP.

MODEL X146
Chassis X
Schematic, Voltage

Voltage rating 105-125 volts, 60 cycles, a.c.
Power consumption 130 watts at 117.5 volts.
Frequency ranges 540 to 1750 kc, 1750 to 6,250 kc
and 5.6 to 18.0 megacycles.



VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

Tube	Plate	Screen	Cathode	Fil.
6K7 r-f amplifier	240	90	2	6.8 a.c.
6A8 modulator	240	90	2	6.8 a.c.
6C5 oscillator	80	—	—	6.8 a.c.
6K7 i-f amplifier	240	90	2	6.8 a.c.
6C5 diode detector	125	—	5.6	6.8 a.c.
6C5 1st a-f amplifier	140	—	5.6	6.8 a.c.
6C5 2nd a-f amplifier	140	—	5.6	6.8 a.c.
6F6 output	280	300	18	6.8 a.c.
6F6 output	280	300	18	6.8 a.c.
6C5 symphonizer rectifier	—	—	—	6.8 a.c.
6C5 symphonizer amplifier	40	—	—	6.8 a.c.

Voltage across speaker field—75

Voltage at 80 filament—975

Chassis Model X

WAVE BAND SWITCH SHOWN IN
BROADCAST POSITION
NO. 1 SHORT WAVE
POSITION
NO. 2 POLICE
NO. 3 BROADCAST

MODEL XL46

**Chassis X
Alignment, Notes
Parts**

EMERSON RADIO & PHONO. CORP.

TUBE DATA

The tube complement is as follows:
 1-57-E Rectifier (inside front section of variable condenser)
 1-57-F Rectifier (outside rear section of variable condenser)
 1-606-O Oscillator (opposite rear section of variable condenser)
 1-606-L Oscillator (behind variable condenser)
 1-57-C 1-2 amplifier (between 1-2 transformers)
 1-57-D 1-3 amplifier (left side of chassis nearest front)
 1-57-E 1-4 amplifier (left side of chassis nearest front)
 1-605-S Symphonizer amplifier (left side of chassis fourth from front)
 1-605-T Symphonizer amplifier (left side of chassis fourth from front)
 1-605-U Symphonizer amplifier (left side of chassis fourth from front)
 1-605-V Symphonizer amplifier (left side of chassis fourth from front)
 1-605-W Symphonizer amplifier (left side of chassis fourth from front)
 1-605-X Symphonizer amplifier (left side of chassis fourth from front)
 1-605-Y Symphonizer amplifier (left side of chassis fourth from front)
 1-605-Z Symphonizer amplifier (left side of chassis fourth from front)

REPLACEMENT PARTS

Part No.	DESCRIPTION	Quantity	Price
32T-585	Three-band antenna coil	1.00	
32T-586	Three-band interstage coil	1.50	
32T-587	Three-band tuning eye	1.50	
32T-588	486 kc first L-I transformer	2.50	
32T-589	486 kc second L-I transformer	1.50	
32T-590	Power transformer	6.00	
32T-591	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-592	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-593	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-594	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-595	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-596	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-597	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-598	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-599	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-600	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-601	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-602	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-603	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-604	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-605	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-606	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-607	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-608	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-609	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-610	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-611	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-612	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-613	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-614	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-615	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-616	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-617	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-618	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-619	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-620	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-621	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-622	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-623	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-624	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-625	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-626	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-627	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-628	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-629	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-630	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-631	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-632	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-633	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-634	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-635	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-636	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-637	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-638	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-639	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-640	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-641	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-642	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-643	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-644	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-645	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-646	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-647	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-648	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-649	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-650	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-651	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-652	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-653	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-654	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-655	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-656	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-657	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-658	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-659	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-660	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-661	30,000 ohm, 1/2 watt carbon resistor	1.00	
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32T-664	30,000 ohm, 1/2 watt carbon resistor	1.00	
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32T-673	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-674	30,000 ohm, 1/2 watt carbon resistor	1.00	
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32T-677	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-678	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-679	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-680	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-681	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-682	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-683	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-684	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-685	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-686	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-687	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-688	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-689	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-690	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-691	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-692	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-693	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-694	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-695	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-696	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-697	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-698	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-699	30,000 ohm, 1/2 watt carbon resistor	1.00	
32T-700	30,000 ohm, 1/2 watt carbon resistor	1.00	

ADJUSTMENTS

An oscillator with frequencies of 465, 600, 1800, 3000, 6000 and 16,000 kc should be used.
 An output meter should be used across the voice coil or speaker output transformer for observing maximum response.
 Use a standard dummy antenna for aligning any of the three bands. A 0.002 mf condenser may be used for broad-
 cast for the short-wave band dummy antenna.
 Always use as weak a test signal as possible during alignment.
 Always align the antenna in frequency than the signal on all three bands, as images should be observed on the
 low frequency side of the signal.
 Always choose the minimum capacity peak on oscillator trimmer and maximum capacity peak on antenna trim-
 mer.
 The last motion in adjusting trimmers should always be a tightening one, not a loosening one.
 Never use a trimmer with the outside plate to loose that there is no position on the screw.
 Always align antenna trimmers on the high-frequency signals there is always a tendency for the oscillator to drift,
 due to interlocking. To compensate for this always keep tuning the variable condenser as the trimmer are being ad-
 justed.

Location of Coils and Trimmer Adjustments

The L-I transformers are located on the left-hand side of the top of the chassis. The first L-I transformer is the one
 nearest the rear of the chassis. The four trimmers for the L-I adjustment are available through holes in the top of the
 chassis.
 The antenna coils for the three bands are wound on one form, located on the front wall of the chassis with the
 trimmer coil on the right-hand side. The form is located on the broadcast band, the right-hand trim-
 mer is for the short-wave band and the central trimmer is for the police band.
 The L-I interstage coils are also wound on one form and mounted underneath the chassis on the right-hand side of
 the variable condenser. The trimmers are accessible through holes in the top of the chassis. The trimmer clear to the
 coil. The trimmer clear to the coil. The trimmer clear to the coil. The trimmer clear to the coil. The trimmer clear to the coil.
 The trimmer coils are wound on one form and mounted underneath the chassis directly behind the L-I interstage
 coil. The trimmers are accessible through holes in the top of the chassis. The trimmer clear to the variable condenser.
 for the broadcast band, the trimmer farthest from the variable is for the short-wave band and the central trimmer is
 for the police band.
 The oscillator series paddler for the broadcast and police bands are mounted underneath the chassis near the cap-
 acitor coils. The adjusting screws are available through holes in the top of the chassis. The paddler nearest the front of
 chassis is for the broadcast band. The paddler for the short-wave band is a .0008 fixed mica condenser. If this condenser
 is to be replaced use a condenser with 1% of that specified.
 The antenna coils are wound on one form and mounted underneath the chassis directly behind the L-I interstage
 position. Feed 450 kc to the grid cap of the 6AG tube through a .02 mf condenser and adjust the four L-I trimmers for
 maximum response. (Do not remove the grid clip from the tubes).
 The three bands should be aligned in the following order: Short-wave band first, police-band second, and broadcast-band last.

Short-Wave Alignment

Both pointers on the dial should coincide vertically at 890 kc. (For adjustment the gold pointer may be slipped
 around on its shaft).
 Set the wave-band switch at the short-wave (counter-clockwise) position. Move the dial pointer to 15 and feed
 18,000 kc to the antenna (using a dummy antenna) and adjust the short-wave oscillator trimmer for maximum
 response. If the antenna is not being used, adjust the short-wave oscillator trimmer for maximum
 response. If two peaks are obtained choose the maximum response peak.

Police Alignment

Set the wave-band switch at the police-band (central) position and the dial pointer at 1.8. Feed 1,800 kc to the an-
 tenna (using a dummy antenna) and adjust the oscillator trimmer for maximum response. Move the
 dial pointer to 6.0 and adjust the oscillator trimmer for maximum response. Move the
 dial pointer to 1.8, feed 1,800 kc to the antenna and adjust the oscillator trimmer for maximum response. Move
 the dial pointer to 6.0 and adjust the oscillator trimmer for maximum response. Return to 1.8, feed 1,800 kc to the antenna
 and check alignment. If readjustment is necessary return to 1,800 kc and repeat
 entire procedure.

Broadcast Alignment

Set the wave-band switch at the broadcast (clockwise) position, and the dial pointer at 60. Feed 600 kc to the an-
 tenna (using a dummy antenna) and adjust the broadcast-band series paddler for maximum response. Move
 the dial pointer to 600 kc and adjust the oscillator trimmer for maximum response. Move the
 dial pointer to 1.8, feed 1,800 kc to the antenna and adjust the oscillator trimmer for maximum response. Move
 the dial pointer to 600 kc and adjust the oscillator trimmer for maximum response. Return to 1,800 kc and repeat
 entire procedure.

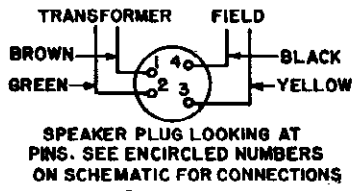
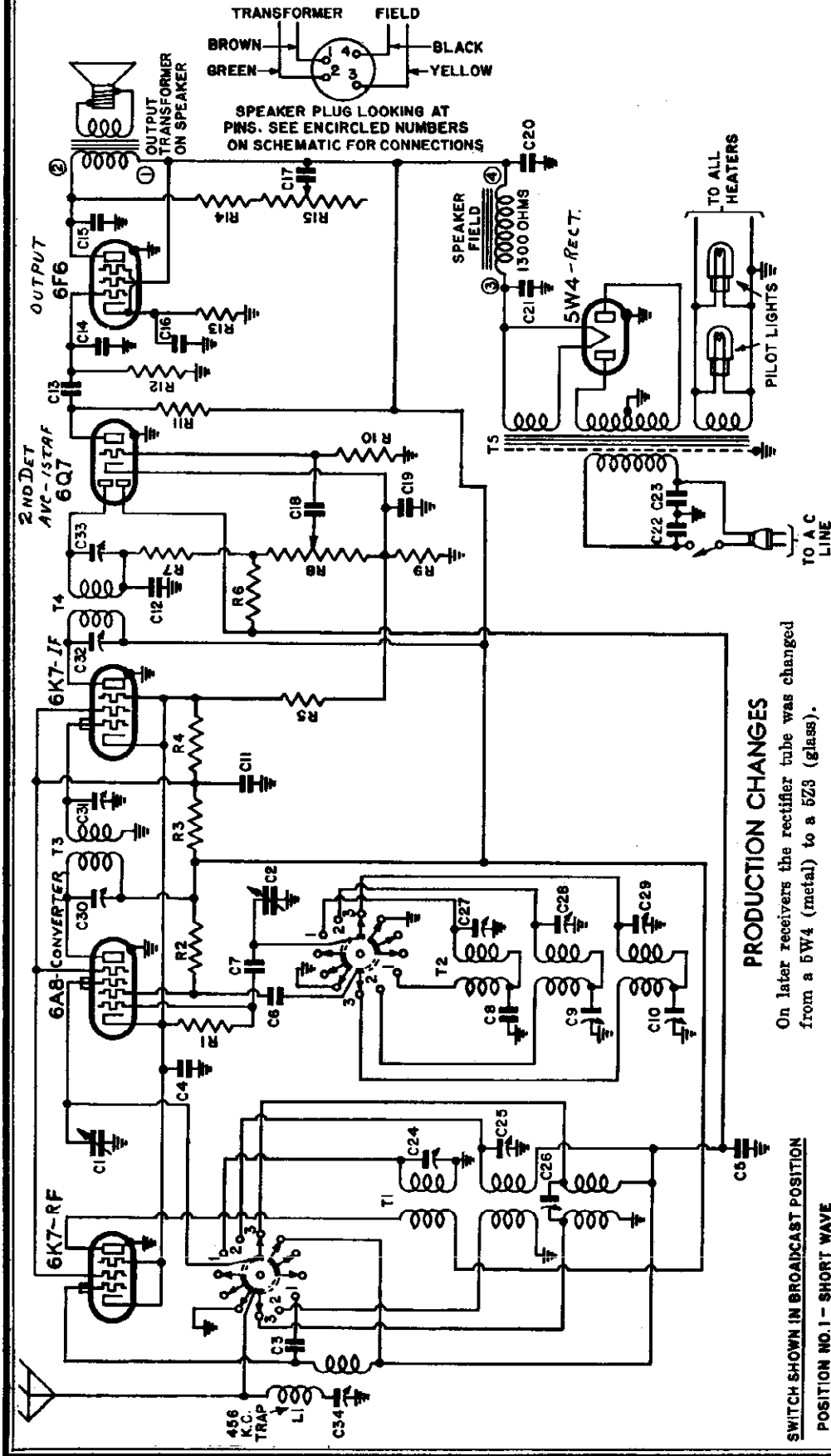
GENERAL NOTES

1. The power source should never be turned on with either the speaker plug or the 69K tubes out of their sockets, since the
 rapid rise in rectifier voltage would damage the electrolytic condensers.
2. Pilot lights may be replaced by slipping the push-on sockets off the dial and unscrewing the bulbs. It is not necessary
 to remove either the dial or chassis from cabinet.
3. In replacing chassis in cabinet do not tighten mounting screws so much that chassis will not seat freely, and do not
 tighten screws so much that dial will not seat properly. To insure that chassis is seated properly, the cabinet
 front panel. If these precautions are not observed the receiver may become microphonic.
4. The color coding of the power transformer leads is as follows:
 Primary—two black leads
 High voltage sec.—two red leads
 High voltage secondary center tap—red and yellow lead
 by sec.—two heavy green leads
 by sec.—two heavy yellow leads
5. The tuning indicator (665 tube) is mounted in the cabinet above the dial. The color coding of the tuning indicator
 tube cable is as follows:
 Shield—black
 Shield—white
 Grid—green
 Wad—orange
6. An efficient antenna system is necessary to enable a full realization of the merits of the receiver. The Emerson All-
 Wave Antenna is especially designed for high efficiency and reduction of noise on all frequency ranges. Complete in-
 structions for the installation of this antenna are supplied with each kit.

*Item number locates the article on the schematic diagram.
 †These trimmer condensers are part of the coil assemblies and can not be supplied separately.

EMERSON RADIO & PHONO. CORP.

MODELS S147, S151
Chassis S
Schematic, Voltage
Changes



PRODUCTION CHANGES

On later receivers the rectifier tube was changed from a 5W4 (metal) to a 5Z8 (glass).

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground, with no signal. Line voltage for these readings was 117.5 volts, 60 cycles.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6K7—R-f amp.	280	90	2.8	—	8.8 a.c.
6A8—Osc.-mod.	280	90	2.8	140	8.8 a.c.
6K7—I-f amp.	280	90	2.8	—	8.8 a.c.
6Q7—2nd det.	118	—	1.4	—	8.8 a.c.
6F6—Output	215	280	14	—	8.8 a.c.

Voltage across speaker field—80 volts.
Voltage from 5W4 filament to ground—310 volts.

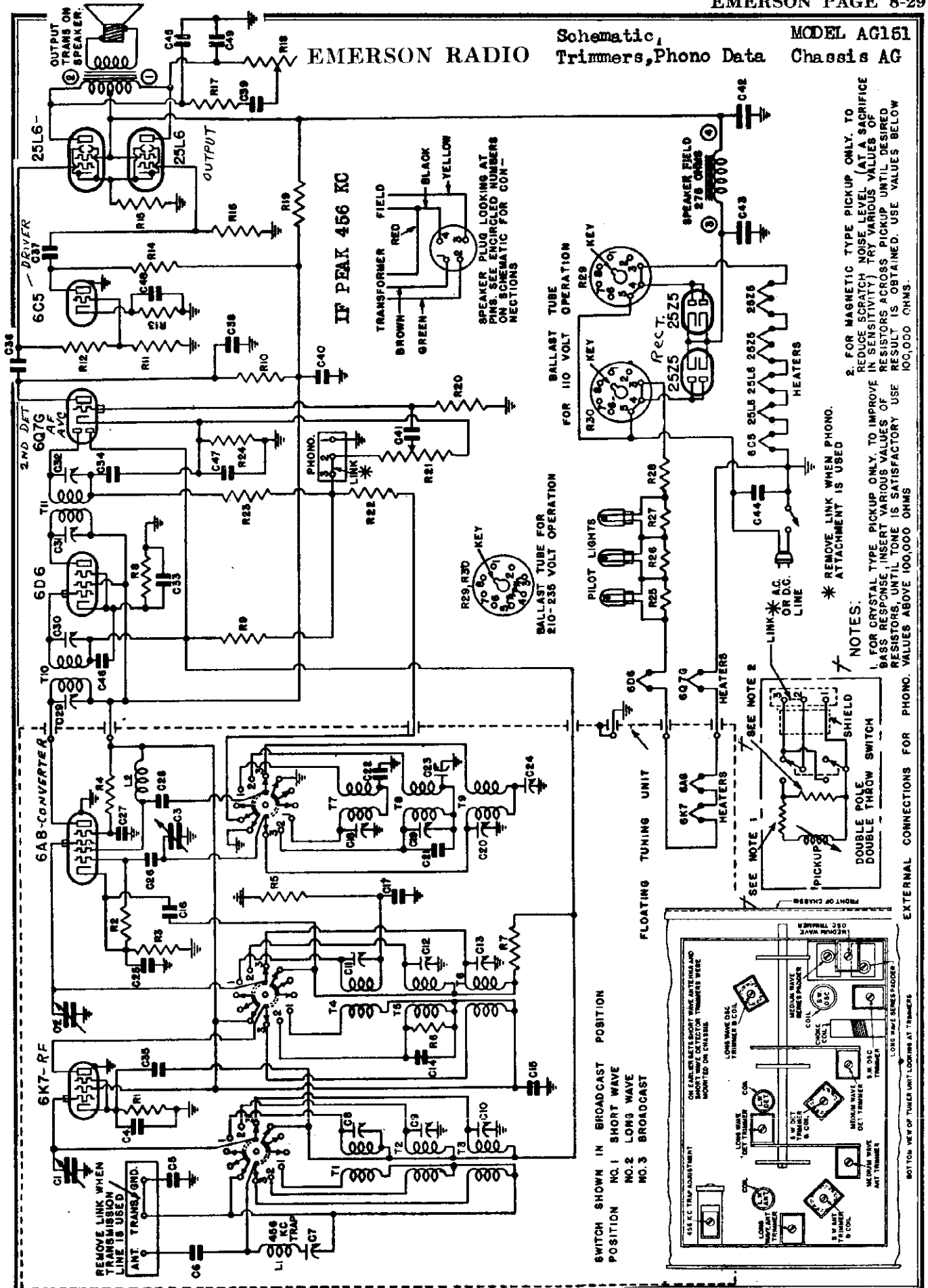
Chassis Model S

Voltage rating 105-125 volts a.c.
Current drain 0.55 amps.
Frequency ranges ... 550 to 1750 kc.,
1760 to 5500 kc.,
5.7 to 18.0 megacycles.

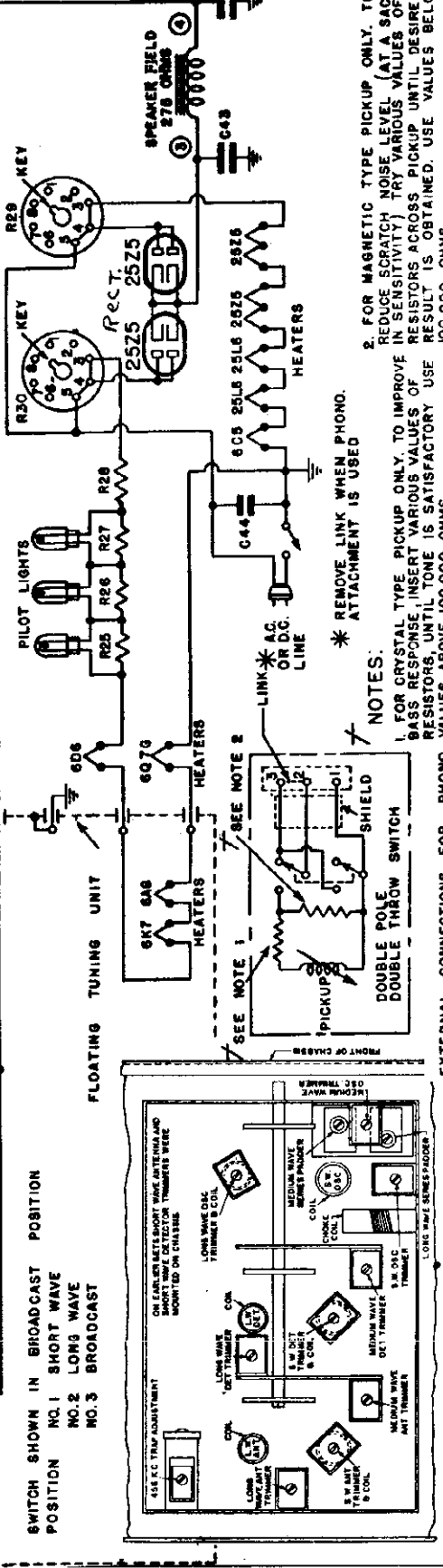
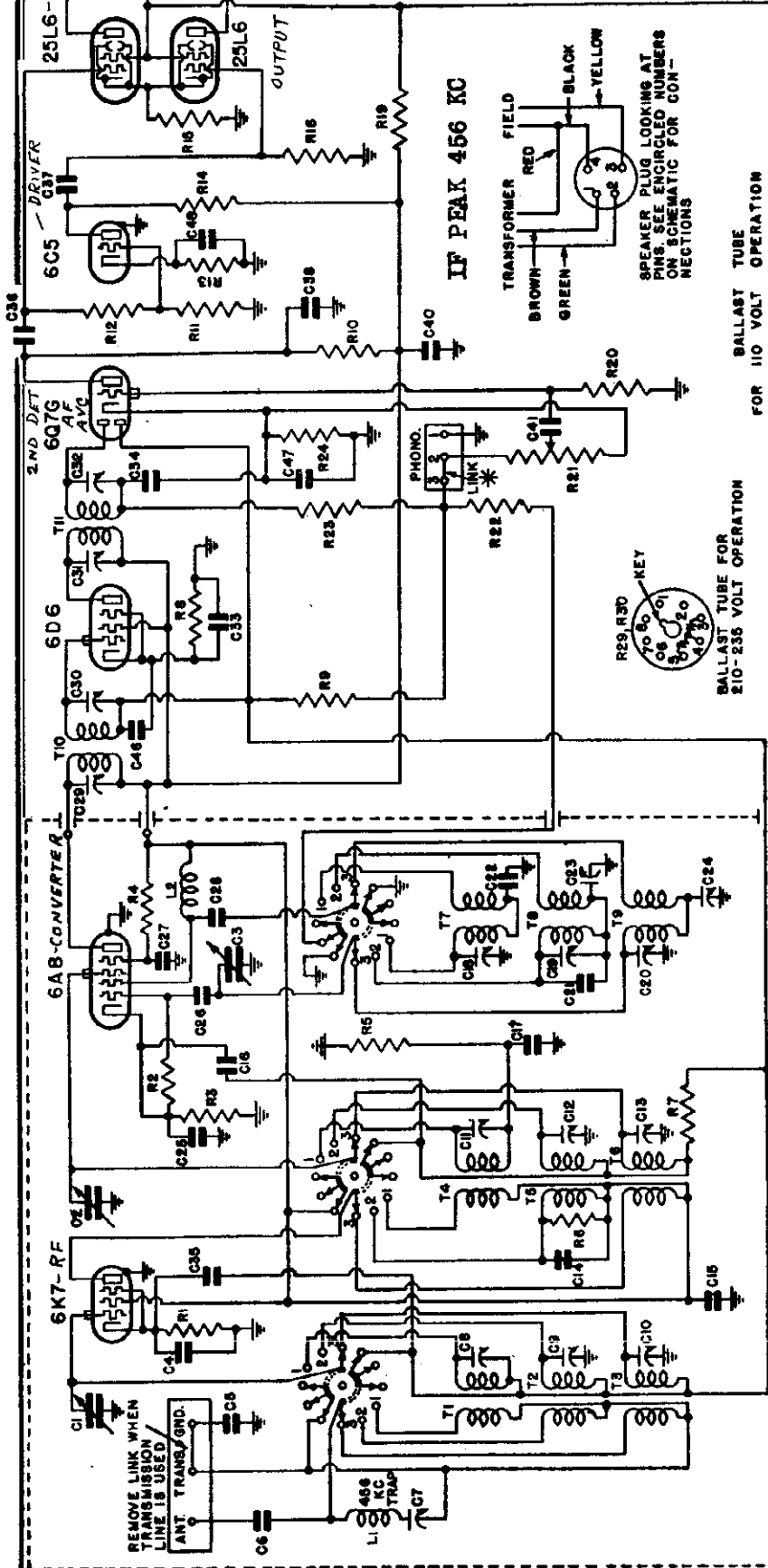
IF PEAKED AT 456 K.C.

SWITCH SHOWN IN BROADCAST POSITION

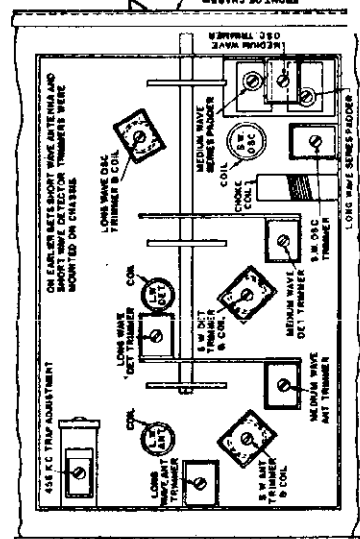
- POSITION NO. 1—SHORT WAVE
- POSITION NO. 2—POLICE
- POSITION NO. 3—BROADCAST



EMERSON RADIO Schematic, Trimmers, Phono Data MODEL AG151 Chassis AG



SWITCH SHOWN IN BROADCAST POSITION
 NO. 1 SHORT WAVE
 NO. 2 LONG WAVE
 NO. 3 BROADCAST



NOTES:
 1. FOR CRYSTAL TYPE PICKUP ONLY, TO IMPROVE IN SENSITIVITY, TRY VARIOUS VALUES OF BASS RESPONSE, UNTIL TONE IS SATISFACTORY. USE RESISTORS UNTIL TONE IS SATISFACTORY. USE VALUES ABOVE 100,000 OHMS.
 2. FOR MAGNETIC TYPE PICKUP ONLY, TO REDUCE SCRATCH NOISE LEVEL (AT A SACRIFICE IN SENSITIVITY) TRY VARIOUS VALUES OF BASS RESPONSE, UNTIL TONE IS SATISFACTORY. USE RESISTORS UNTIL TONE IS SATISFACTORY. USE VALUES ABOVE 100,000 OHMS.

* REMOVE LINK WHEN PHONO. ATTACHMENT IS USED

MODEL AG151

Chassis AG

Alignment, Notes

Parts

EMERSON RADIO & PHONO. CORP.

REPLACEMENT PARTS

Part No.	Description	Price
2PT-258	Adjustable 455 kc wave-trap	.40
2PT-259	R-F choke wound on wooden dowel	.40
3AT-350	Short-wave antenna coil	.60
3AT-351	Long-wave antenna coil	1.05
3AT-352	Short-wave detector coil	.70
3AT-353	Short-wave detector coil	1.05
3AT-354	Broadcast detector coil	.55
3AT-355	Short-wave oscillator coil	.55
3AT-356	Broadcast oscillator coil	.75
3AT-357	Double-tuned 455 kc first I-F transformer	2.00
3AT-358	Double-tuned 455 kc second I-F transformer	1.60
3AT-359	410 ohm 1/2 watt wire-wound molded resistor	.15
3AT-360	50,000 ohm 1/4 watt carbon resistor	.15
3AT-361	100,000 ohm 1/4 watt carbon resistor	.15
3AT-362	20,000 ohm 1/4 watt carbon resistor	.15
3AT-363	10,000 ohm 1/4 watt carbon resistor	.15
3AT-364	5,000 ohm 1/4 watt carbon resistor	.15
3AT-365	75 ohm 1/2 watt wire-wound molded resistor	.15
3AT-366	1,000 ohm 1/4 watt carbon resistor	.15
3AT-367	100,000 ohm 1/4 watt carbon resistor	.15
3AT-368	Volume control—250,000 ohm molded resistor	.75
3AT-369	100,000 ohm 1/4 watt carbon resistor	.15
3AT-370	5,000 ohm 1/4 watt carbon resistor	.15
3AT-371	815 ohm wire-wound tapped resistor	.40
3AT-372	R24—40 ohms; R25—195 ohms	.40
3AT-373	Ballast tube for 105-125 volt operation	1.10
3AT-374	Ballast tube for 210-250 volt operation	7.40
3AT-375	Three-gang variable condenser	.20
3AT-376	0.05 mf, 200 volt roll type condenser	.30
3AT-377	0.0005 mf mica condenser	.20
3AT-378	0.0085 mf mica condenser	.20
3AT-379	0.05 mf, 200 volt roll type condenser	.30
3AT-380	Trimmer, part of oscillator coil	.60
3AT-381	0.0005 mf mica condenser	.20
3AT-382	Dual adjustable padding condenser	.60
3AT-383	Trimmer, part of 455 kc first I-F transformer	.20
3AT-384	Trimmer, part of 455 kc second I-F transformer	.20
3AT-385	0.00025 mf mica condenser	.20
3AT-386	0.05 mf, 400 volt roll type condenser	.20
3AT-387	8 mf, 150 volt wet electrolytic condenser	.25
3AT-388	50 mf, 150 volt wet electrolytic condenser	1.45
3AT-389	0.1 mf, 400 volt ac. roll type condenser	.20
3AT-390	0.006 mf, 500 volt, roll type condenser	.20
3AT-391	Dual 5 mf, 25 volt electrolytic condenser	1.95
3AT-392	Wet dynamic speaker	2.25
3AT-393	On-off switch	.45
3AT-394	Pilot light, 6.3 volt, 20 amp, Mazda No. 46	2.20
3AT-395	Dial assembly with band-indicator mechanism	1.20
3AT-396	Idle pulley	.40
3AT-397	Idle pulley spring	.40

GENERAL NOTES

- As electrical photograph pick-up may be connected to this receiver for playing records. Connections to the receiver may be made at the "Phono" terminal strip which is located on the rear wall of the receiver chassis. A double-pole, double-throw switch is necessary in addition to the photograph pick-up and motor. The receiver volume control may be used to control the photograph pick-up and terminal strip so that in the photograph position the switch should short terminals 1 and 3 and at the same time connect the high side of the pick-up to a lead from terminal 2. (The ground side of the pick-up may be permanently wired to terminal 1.) When the switch is in the radio position terminals 2 and 3 should be shorted together and the pick-up disconnected from terminal 1. A matching input transformer must be used if the pick-up is of the impedance matching type. (See schematic diagram.)
- The receiver should never be turned on with the speaker plug out of its socket, since the rapid rise in rectifier voltage would damage the electrolytic condenser.
- Pilot lights may be replaced by slipping the push-on sockets off the dial and unscrewing the bulbs. It is not necessary to remove either the dial or cabinet as the bulbs do not touch mounting screws so much that chassis will not float freely, and do not allow any part of the dial assembly to touch the cabinet. Do not push control knobs on so far that they touch the cabinet front panel. If these precautions are not observed the receiver may become microphonic.
- One side of the power line is connected to the chassis. Under no condition, therefore, should a ground wire be allowed to connect to the chassis.
- A sufficient antenna system is necessary to enable a full realization of the merits of the receiver. For reduction of W-2L, or the Emerson All-Wave Antenna System, Model W-38, are recommended. Complete instructions for the installation of these antennas are supplied with each set.
- When a weak station signal is received, antenna signal rejection at 455 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until this response from the interfering station is at a minimum.
- The receiver for 105-125 volt operation may be easily converted for 210-250 volt operation by substituting ballast tubes part no. 3MR-253 for ballast tubes part no. 3MZ-419.

ADJUSTMENTS

An oscillator with frequencies of 150, 345, 455, 600, 1600 and 16000 kc should be used. Use a standard dummy antenna for aligning any of the three bands. A .0002 mf condenser may be used for the medium-wave band and the on-wave band dummy antenna and a 400 ohm non-inductive resistor for the short-wave dummy antenna.

Always use as weak a test signal as possible when aligning the receiver.

Always align the oscillator at a higher frequency than the signal on all three bands. In cases, therefore, should be observed on the low-frequency side of the signal.

Always choose the minimum capacity peak on oscillator trimmer and maximum capacity peaks on antenna and I-F trimmers. The last motion in adjusting trimmers should always be a tightening one.

Never leave a trimmer with the outside plate of the high-frequency signal there in usually a tendency for the oscillator to drift, or re-aligning antenna trimmers on this always keep re-tuning the variable condenser as you align.

MODEL AG - 151

Chassis Model AG
Voltage rating 105-125 volts, a.c. or d.c. (with ballast tubes part no. 3MZ-419).
210-250 volts, a.c. or d.c. (with ballast tubes part no. 3MR-253).

TUBE DATA

- 6X4—R-F amplifier (on tuner unit)
- 6D6—I-F amplifier
- 6D7—Second detector, a.v.c., and A-F amplifier
- 6C7—A-F amplifier
- 2-257G—Push-pull pentode output
- 2-3MZ-419—Ballast tubes for 105-125 volt operation
- 2-3MR-253—Ballast tubes for 210-250 volt operation

Medium-Wave Alignment

Both pointers on the dial should coincide vertically at 690 kc. For adjustment, the gold pointer may be slipped around the dial until it coincides with the antenna terminal and adjust the long-wave series paddler for maximum response. Move the antenna terminal and adjust the long-wave series paddler for maximum response. Move the pointer to 160 kc and readjust the long-wave series paddler for maximum response. Then adjust detector and antenna trimmers. Reset the pointer to 60 kc, feed 600 kc to antenna and rock the variable condenser (rotate the condenser back and forth through a small arc) while resetting the oscillator paddler for maximum response. Return to 1500 and check alignment. If readjustment is necessary, return to 600 and repeat entire procedure.

Long-Wave Alignment

Set the wave-band switch at the long-wave (center) position and the pointer to 150. Feed 150 kc through a standard dummy antenna and adjust the long-wave series paddler for maximum response. Move the antenna terminal and adjust the long-wave series paddler for maximum response. Return to 345 kc and readjust all three trimmers. Return again to 150 and check the alignment. Repeat the entire procedure until no appreciable re-adjustment is required.

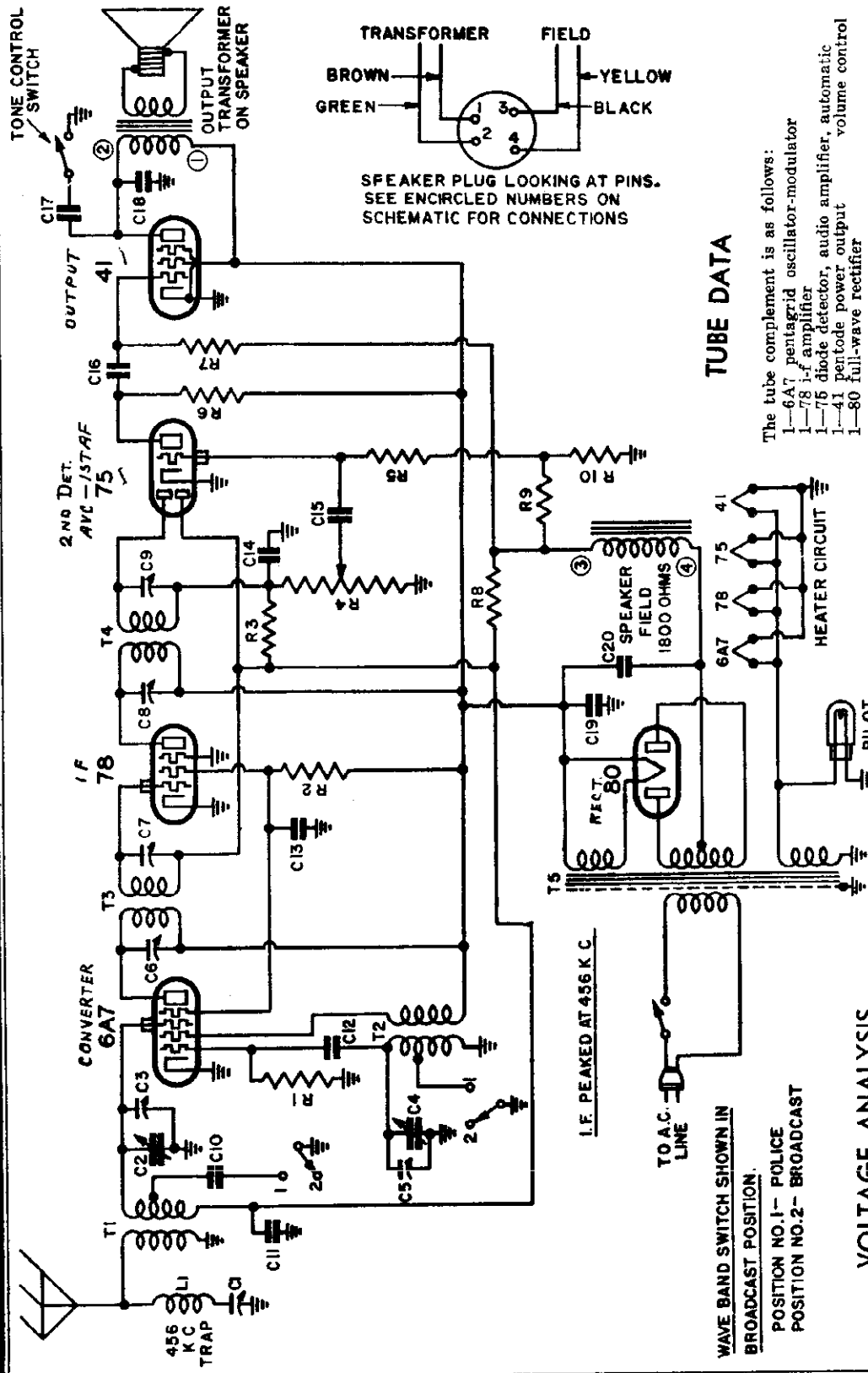
Short-Wave Alignment

Set the wave-band switch at the short-wave (counter-clockwise) position. Move pointer to 15. Feed 16000 kc to antenna (using a 400 ohm dummy antenna) and adjust the short-wave oscillator for maximum response. If two peaks are obtained choose minimum capacity peak. Then adjust the detector and antenna trimmers for maximum response. If two peaks are obtained choose the maximum capacity peak.

*Then number locates the article on the schematic diagram.
†These trimmers cannot be supplied separately.

EMERSON RADIO & PHONO. CORP.

MODELS R152, R153, R156
R158
Chassis R
Schematic, Voltage



TUBE DATA

The tube complement is as follows:
 1-6A7 pentagrid oscillator-modulator
 1-78 i-f amplifier
 1-75 diode detector, audio amplifier, automatic volume control
 1-41 pentode power output
 1-80 full-wave rectifier

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	182	70	0	182	6.3
78	182	70	0	—	6.3
75	87	182	0	—	6.3
41	166	307	182	—	6.3

VOLTAGE ANALYSIS

Voltage across speaker field—70.
 Voltage from B minus to chassis—80.

WAVE BAND SWITCH SHOWN IN BROADCAST POSITION.
 POSITION NO. 1— POLICE
 POSITION NO. 2— BROADCAST

Chassis Model R
 Listed by Underwriters Laboratories

Voltage rating 105-125 volts a.c.
 Power consumption 45 watts
 Frequency ranges 540 to 1580 kc. and 1580 to 4200 kc.

B plus at 80 filament—262.

MODELS R152, R153
R156, R158

EMERSON RADIO & PHONO. CORP.

Chassis R
Alignment, Changes
Notes, Parts

REPLACEMENT PARTS

Part No.	DESCRIPTION	List Price in Dollars and Cents (Subject to change without notice)
MMT-149A	456 kc wave-trap	.80
BRT-318	Two-band antenna coil	.86
BRT-319A	Two-band oscillator coil	.80
BRT-320	456 kc first i-f transformer	1.10
BRT-321	456 kc second i-f transformer	1.10
BRT-322	Power transformer	3.20
KFL-53U	50,000 ohm 1/4 watt carbon resistor	.16
SLR-266U	40,000 ohm 1/2 watt carbon resistor	.16
NNR-220U	3 megohm 1/4 watt carbon resistor	.16
3FR-256A	Volume control with switch—500,000 ohms	1.00
3RR-274U	5 megohm 1/4 watt carbon resistor	.16
KR-55U	250,000 ohm 1/4 watt carbon resistor	.16
KR-56U	500,000 ohm 1/4 watt carbon resistor	.16
3RR-275U	10 megohm 1/4 watt carbon resistor	.16
3RR-276	20 ohm 1/2 watt wire-wound resistor	.16
3RR-276	20 ohm 1/2 watt wire-wound resistor	.16
3RC-317	Trimmer, part of 456 kc wave-trap assembly	2.40
	Two-gang variable condenser	
	Trimmers, part of variable condenser	
	Trimmers, part of first i-f transformer assembly	
	Trimmers, part of second i-f transformer assembly	
AAAC-114	0.001 mf mica condenser	.20
BC-12	0.05 mf, 200 volt tubular condenser	.20
AAAC-106A	0.0005 mf mica condenser	.20
IC-47A	0.0005 mf mica condenser	.20
HC-34	0.006 mf, 600 volt tubular condenser	.20
KC-58	0.01 mf, 400 volt tubular condenser	.20
QC-173	0.015 mf, 600 volt tubular condenser	.20
3RC-318	Dual 5 mf, 300 volt dry electrolytic condenser	1.00
3RS-230	5" dynamic speaker	4.55
3RS-248A	6" dynamic speaker	4.85
3RS-231	Wave-band switch	.35
2TS-145F	Tone control switch	.35
3RM-270	Pointer shaft bearing plate	.05
3RM-269	Dial plate	.20
XL-9	Pilot light, 6.3 volt, 2B amp, Mazda No. 46	.20
3RB-33	Pilot light socket	.10
3RZ-477	Dial face	.75
3RZ-473	Condenser pulley	.15
3RZ-479	Pointer pulley	.15
3RZ-480	Drive cord spring	.02
3FZ-553	Dial pointer	.10
3CZ-350	Bronze escutcheon with crystal	1.05
3CZ-360A	Brass escutcheon with crystal	1.05

When ordering replacement parts specify part numbers.

*Item number locates the article on the schematic diagram.
†These trimmers are part of coil assemblies and can not be supplied separately.
‡These trimmers are part of variable condenser and can not be supplied separately.

ADJUSTMENTS

An oscillator with frequencies of 456 and 1400 kc is required.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Location of Coils and Trimmer Adjustments

The two i-f transformers are located on top of the chassis deck. The first i-f transformer is the one directly behind the 5A7 tube. The trimmers for the two i-f transformers are available through holes in the top of the case.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the antenna coil.

The 456 kc wave-trap is mounted on the rear chassis wall directly beneath the wave-band switch. The trimmers for the 456 kc wave-trap is mounted on the coil and is accessible from the bottom of the chassis.

i-f and Wave-Trap Alignment

Rotate the wave-band switch (located on the rear wall of the chassis) to the broadcast position, clockwise, and swing the variable condenser to the maximum capacity position. Feed 456 kc to the grid-cap of the 6A7 tube and adjust the trimmer for maximum response. Feed 456 kc through a dummy antenna (a .0002 mf condenser may be used as a substitute) to the antenna lead and adjust the wave-trap trimmer for maximum response. (See General Notes, paragraph No. 1.)

Broadcast Alignment

With the wave-band switch in the broadcast position, clockwise, set the dial pointer at 140. Feed 1400 kc through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response. The police band is self-tracking and does not require any adjustment.

GENERAL NOTES

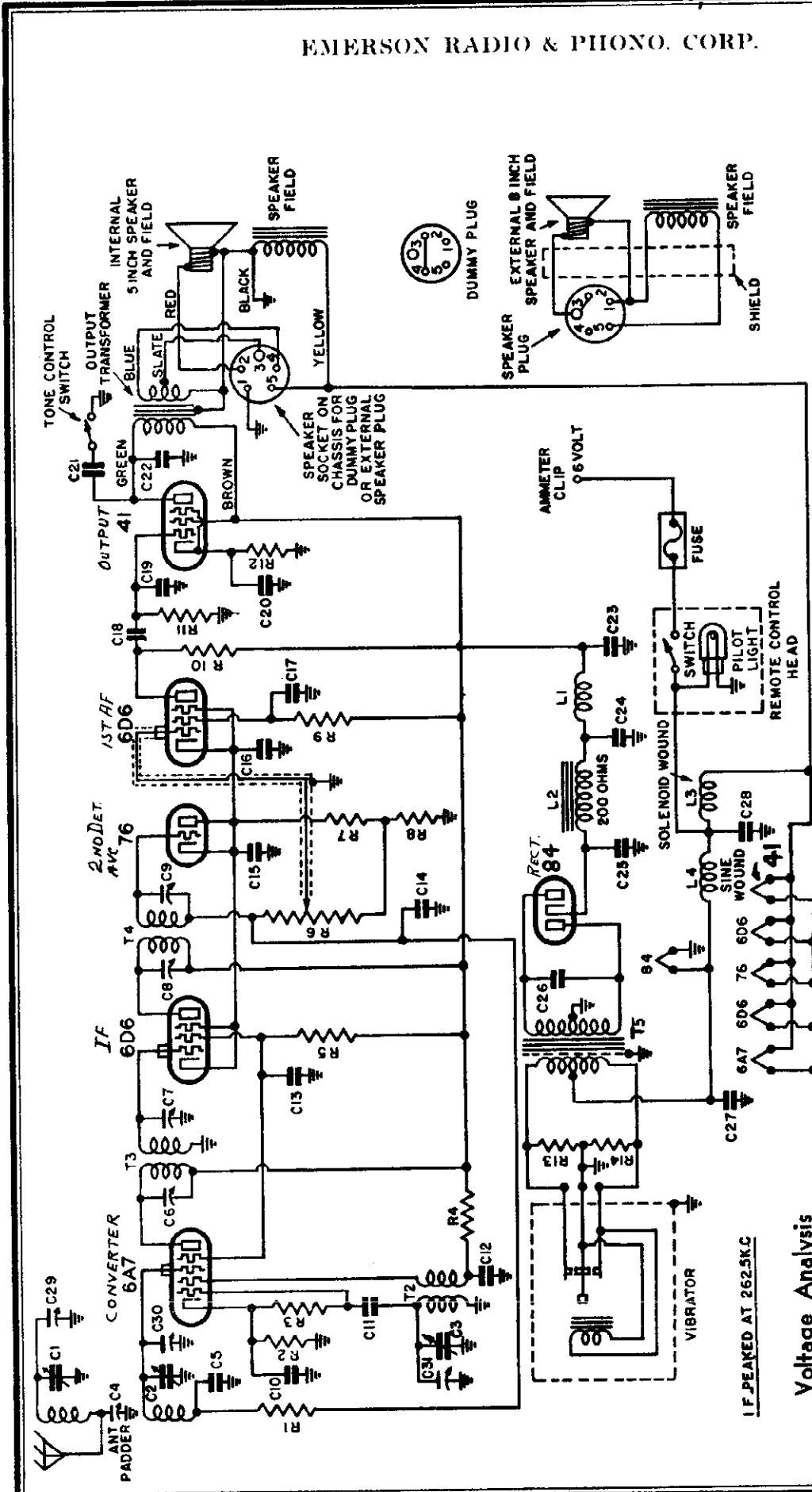
- The wave-trap in the receiver has been adjusted for maximum signal rejection at 456 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.
- The receiver should never be turned on with either the speaker plug or the 41 tube out of their sockets, since the rapid rise in rectifier voltage would damage the electrolytic condensers.
- The pilot light may be replaced by removing the snap-on socket from the dial and unscrewing the bulb. It is not necessary to remove either the dial or chassis from the cabinet.
- The color coding of the leads of the i-f transformers, is as follows:
Grid—green
Grid return—black
Plate—blue
B plus—red
- The color coding of the power transformer leads is as follows:
Primary—two green leads
6.3 v. sec.—two heavy blue leads
High voltage sec.—two black leads
5 v. sec.—two heavy red leads
High voltage sec. center tap—yellow
- With a few exceptions, the color coding of the general wiring is as follows:
Plate and cathode—white or yellow
Grid—blue
B plus—red
Filament and ground—black
- An efficient antenna system (aerial) is necessary to enable a full realization of the merits of the receiver. The Emerson All-Wave Antenna is especially designed for high efficiency and reduction of noise on all three frequency ranges. Complete instructions for the installation of this antenna are supplied with each kit.

PRODUCTION CHANGES

On early receivers the oscillator coil was part number 3RT-319. When replacing this coil with the new coil, part number 3RT-319A, it will be necessary to remove the short length of shielding over the white lead (lead from wave-band switch to tap on coil).

EMERSON RADIO & PHONO. CORP.

MODEL U154
Chassis U
Schematic, Voltage



All voltages should be measured with a 1000 ohms-per-volt meter. Voltages measured from the point indicated to ground (chassis) with no signal and volume control turned on full. Readings taken with battery voltage of 6.3 volts. Voltage across heaters—6.0. Voltage across speaker field—6.0.

Voltage Analysis

Tube	Plate	Screen	Cathode	Osc. Plate
6A7	230	60	5.1	155
6D6 i-f (in corner)	230	60	3.4	—
76	3.4	—	3.4	—
6D6 a-f	20	20	3.4	—
41	235	230	14.5	—

Voltage rating . . . 6.3 volts
(6 volt storage battery).
Current drain . . . 6.1 amps.
Frequency range 540 to 1530 kc.

MODEL U154
Chassis U
Alignment, Notes
Parts

EMERSON RADIO & PHONO. CORP.

Tube Data

The tube complement is as follows:

- 1—6A7 pentagrid oscillator-modulator
- 1—6D6 i-f amplifier (in corner of chassis)
- 1—76 diode detector, a.v.c.
- 1—6D6 a-f amplifier
- 1—41 power output pentode
- 1—84 full-wave thermionic rectifier
- 1 primary type vibrator.

The function of the vibrator is to convert the direct current from the battery into alternating current to actuate the power transformer. The stepped-up voltage is then rectified into direct current by the 84 tube for use as plate supply.

REPLACEMENT PARTS

PART NO.	DESCRIPTION
3UT-331	Presselector coil
3UT-325	Oscillator coil
3UT-332	262 kc first i-f transformer
3UT-333	262 kc second i-f transformer
3UT-334	Power transformer
00T-164	1 millihenry r-f choke
3VT-223	Iron-core filter choke
00T-167B	"A" choke solenoid
3VT-325	"A" choke sine wound
HR-42	2 megohm 1/4 watt carbon resistor
3UR-252	860 ohm 1/2 watt wire-wound resistor
3VR-273	60,000 ohm 1/4 watt carbon resistor
LR-60	20,000 ohm 1/4 watt carbon resistor
3VR-164	75,000 ohm 1/4 watt carbon resistor
3UR-257	Volume control—1 megohm
3UR-258	250 ohm 1/2 watt wire-wound resistor
3UR-273	150 ohm 1/2 watt wire-wound resistor
XR-57	1 megohm 1/4 watt carbon resistor
LLR-152	150,000 ohm 1/2 watt carbon resistor
KB-56	510 ohm 1/2 watt wire-wound resistor
3VR-271	90 ohm 1/2 watt wire-wound resistor
3VR-270	These range variable condenser
3VC-319	Padder condenser; part of 3UT-331 presselector coil assembly
FC-29	0.02 mf 200 volt tubular condenser
	Trimmer part of 3UT-332 first i-f coil assembly
	Trimmer part of 3UT-333 second i-f transformer assembly
	0.00025 mf mica condenser
	0.05 mf 200 volt tubular condenser
	5 mf, 25 volt electrolytic condenser
	0.02 mf 400 volt electrolytic condenser
	Dr. electrolytic condenser block
	C24 20 mf—35 volt C24, 8 mf—350 volt C25, 8 mf—350 volt
	0.015 mf 600 volt tubular condenser with mounting strap
	0.003 mf 600 volt tubular condenser
	0.1 mf 400 volt tubular condenser
	0.0075 mf 2000 volt condenser
	0.5 mf 50 volt tubular condenser
	Special 0.5 mf generator condenser
	5" dynamic speaker
	8" dynamic speaker
	Tone control switch
	Shielded antenna lead
	Distributor suppressor
	Non-synchronous vibrator
	Tuning control cable
	Volume control cable
	Trimmer, part of variable condenser
3DC-279	
3VC-324	
REC-152	
3VC-225	
3VC-222	
00C-164	
00C-165	
SUS-235	
8VS-247	
00S-108A	
00W-53A	
00Z-165	
3VV-10	
3VZ-540	
3VZ-541	
IC29, IC30, IC31	

*Item number locates the article on the schematic diagram.

†These trimmer condensers are part of coil assemblies and cannot be supplied separately.

‡These trimmer condensers cannot be supplied separately.

ALIGNMENT PROCEDURE

The receiver was carefully adjusted and tested at the factory, and should reach the customer in perfect condition. Under no circumstances should these adjustments be disturbed unless it is absolutely necessary, as in the repairing of a damaged set. This should be done by an experienced auto radio service man only.

I-f Alignment

To align the intermediate frequency transformers, use a good modulated oscillator set for 262.5 kc. Rotate the variable condenser to the minimum capacity position, turn the volume control on full and ground the antenna to the chassis.

Connect the test oscillator lead, through a paper condenser (.02 mf or larger), to the grid cap of the 6A7 tube. Do not remove the grid clip from the tube. Connect an output meter across the primary of the speaker transformer or across the voice coil. Using the *smallest output* from the test oscillator that will give a definite reading on the meter, adjust the two i-f transformers for maximum response. Use a non-metallic screw driver if possible.

Radio Frequency and Oscillator Alignment

Connect the test oscillator lead through a standard dummy antenna (a .0002 mf condenser may be substituted) to the antenna connector of the receiver. Rotate the variable condenser to the minimum capacity position. Feed 1530 kc and adjust the oscillator trimmer (earlier) on the variable condenser for maximum response. Set the test oscillator to some frequency near 1400 kc and swing the variable until this signal is heard. Adjust the two r-f trimmers (front and rear) on the variable condenser for maximum response. Set the test oscillator for 600 kc and swing the variable until this signal is heard. Adjust the antenna padder (on chassis wall below the variable condenser) for maximum response. Reset the test oscillator to some frequency near 1400 kc and readjust the two r-f trimmers for maximum response. Reduce the output of the test oscillator and repeat this adjustment.

Note: The antenna padder should be readjusted when the receiver is installed in the car. (See paragraph (g) under installation instructions.)

Suppression of Ignition Interference

If, when the receiver is in operation, and the motor is running, the ignition interference is excessive the following suggestions should help to reduce it to a satisfactory level.

- By-pass dome light wire at instrument panel with a 1/2 mf condenser.
 - By-pass the low tension lead to the ignition coil with a 1/2 mf condenser.
 - Shield high tension lead from coil and ground to fire wall.
 - Shield low tension leads to ignition coil.
 - Try grounding antenna shield at various points, and also try leaving shield ungrounded, except at point where it is automatically grounded at receiver by means of the metal connector. Move all adjacent wiring slightly and note if it may be coupling to the battery lead to receiver.
 - Bond steering column to fire wall.
 - Try bonding exhaust pipe, particularly if interference is increased with passengers in car.
 - Bond metal cables or pipes coming through fire wall, connecting them to the fire wall. If car has wooden floor boards, place a screen underneath floor mat and note if interference is decreased, particularly with passengers in car.
 - Check antenna wiring, making sure it is shielded completely.
 - Try bonding windshield wiper pipe.
 - Check ignition system for defects.
 - When condensers are used for by-passing ignition interference, their leads should be as short as possible, since often a condenser with leads a fraction of an inch long will be very effective in places where the same condenser with longer leads would be useless.
- Note:** It is recommended that the charging rate of the car generator be increased slightly to compensate for the added drain of the receiver.

General Notes

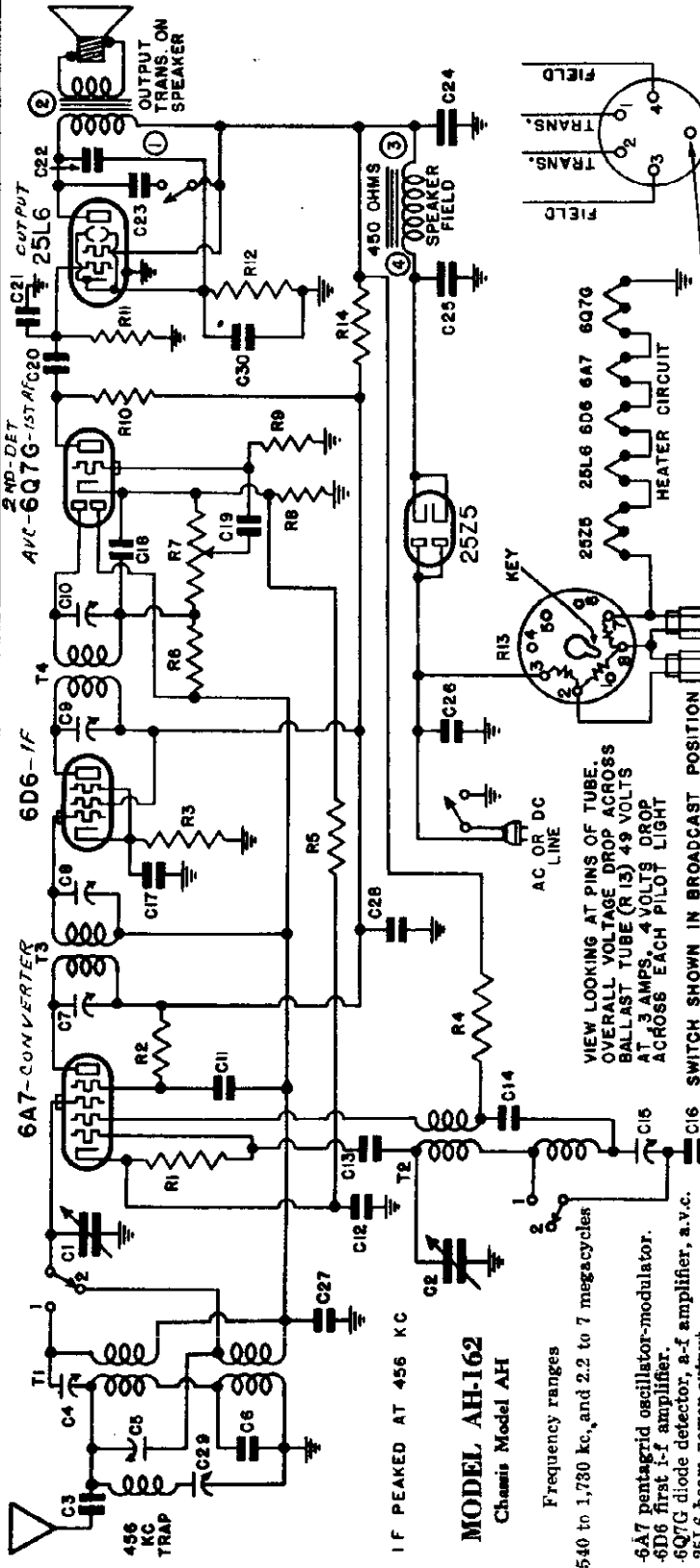
1. To remove the chassis from the case it will be necessary to unsolder the speaker leads.
2. It should be noted that one side of the speaker field is grounded to the speaker frame.
3. A 10 ampere fuse is located in a small tubular holder in the battery lead. The fuse is intended to protect the receiver and in no case should one larger than 10 amperes be used.

EMERSON RADIO & PHONO. CORP.

MODEL AH162
Chassis AH
Schematic, Change
Parts

PRODUCTION CHANGES

In receivers bearing serial numbers below 1, 102, 142, C11 was an .01 mf, 400 volt tubular condenser.
In receivers bearing serial numbers below 1, 149, 148, C22 was connected from plate to B plus.



ITEM	PART No.	PRICE
T1	4HT-360	Two-band antenna coil with 456 kc wave trap... \$1.70
T2	4HT-361	Two-band oscillator coil... 1.10
T3	4ET-360A	Double-tuned 456 kc first i-f transformer... 1.10
T4	4ET-351A	Double-tuned 456 kc second i-f transformer... 1.15
R1	KR-54	100,000 ohm 1/4 watt carbon resistor... .16
R2	ZZR-196	30,000 ohm 1/4 watt carbon resistor... .16
R3	3CR-295	410 ohm 1/2 watt wire-wound molded resistor... .16
R4	JR-55	10,000 ohm 1/4 watt carbon resistor... .16
R5	3RR-276	310 ohm 1/2 watt wire-wound molded resistor... .16
R6	HR-42	2 megohm 1/4 watt carbon resistor... .16
R7	3ZR-288	Volume control with line switch—500,000 ohms... 1.05
R8	3CR-294	240 ohm 1/2 watt wire-wound molded resistor... .16
R9	KR-57	1 megohm 1/4 watt carbon resistor... .16
R10	KR-55	250,000 ohm 1/4 watt carbon resistor... .16
R11	KR-56	500,000 ohm 1/4 watt carbon resistor... .16
R12	3FR-293	140 ohm 1/2 watt wire-wound molded resistor... .16
R13	3CR-241	Plug-in ballast resistor... .80
C1	4HC-343	Two-gang variable condenser... 3.35
C2	3HC-274	0.002 mf, 600 volt tubular condenser... .20
C3, C4, C5		Trimmer, part of antenna coil assembly... .20
C6	IIC-133A	0.000025 mf mica condenser... .20
C7, C8		Trimmer, part of first i-f transformer... .05
C9, C10		Trimmer, part of second i-f transformer... .05
C14	KC-58	0.01 mf, 400 volt tubular condenser... .10
C12, C28		VIEW LOOKING AT PINS OF TUBE. OVERALL VOLTAGE DROP ACROSS BALLAST TUBE (R13) 49 VOLTS AT 3 AMPS. 4 VOLTS DROP ACROSS EACH PILOT LIGHT
C13		PILOT LIGHTS
C15		AC OR DC LINE
C16		SWITCH SHOWN IN BROADCAST POSITION
C17, C19		POSITION NO. 1 SHORT WAVE
C18, C21		POSITION NO. 2 BROADCAST
C20		KEY
C22		ANCHORAGE HOLE
C23		HEATER CIRCUIT
C24		SPEAKER PLUG LOOKING AT PINS. SEE ENCIRCLED NUMBERS ON SCHEMATIC FOR CONNECTIONS
C25		FIELD
C26		TRANS.
C27		TRANS.
C29		FIELD
C30		FIELD
C31		FIELD
C32		FIELD
C33		FIELD
C34		FIELD
C35		FIELD
C36		FIELD
C37		FIELD
C38		FIELD
C39		FIELD
C40		FIELD
C41		FIELD
C42		FIELD
C43		FIELD
C44		FIELD
C45		FIELD
C46		FIELD
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C80		FIELD
C81		FIELD
C82		FIELD
C83		FIELD
C84		FIELD
C85		FIELD
C86		FIELD
C87		FIELD
C88		FIELD
C89		FIELD
C90		FIELD
C91		FIELD
C92		FIELD
C93		FIELD
C94		FIELD
C95		FIELD
C96		FIELD
C97		FIELD
C98		FIELD
C99		FIELD
C100		FIELD

MODEL AH162

Chassis AH

Voltage, Alignment

Notes

EMERSON RADIO & PHONO. CORP.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	100	55	2.0	77	6.3
6D6	100	100	3.3	—	6.3
6Q7G	38	—	1.0	—	6.3
25L6	96	108	6.7	—	25.0

Voltage at 25Z5 cathode—130 volts.

Voltage across speaker field—28 volts.

Voltage drop across ballast tube (pins Nos. 3, 7)—49 volts.

Voltage drop across each pilot light section (pins Nos. 2, 8 and Nos. 8, 7)—4 volts

1. If replacements are made or the wiring disturbed in the r-f portion of the circuit, the receiver should be carefully re-aligned.
2. One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to come in contact with any metal part of the receiver.
3. The filament dropping resistor (R13 on schematic) is in a special metal tube at the rear of the chassis. This tube will become quite hot under normal operating conditions. For voltage drop specifications, see below.
4. When operating the receiver on d.c. it may be necessary to reverse the line plug to obtain the correct polarity.
5. The color coding of the i-f transformer leads is as follows:

Grid—green	Plate—blue
Grid return—black	B plus—red
6. An efficient antenna system is necessary to enable a full realization of the merits of the receiver. For reduction of noise and achievement of high efficiency on all frequency ranges the Emerson All-Wave High-Fidelity Antenna, Model W-78, and the Emerson All-Wave Antenna System, Model W-89, are recommended. Instructions for the installation of these antennas are supplied with each kit.

In congested areas where the installation of a large antenna is not desirable we recommend the use of the Emerson Flexible Mast Antenna, Model W-82. Instructions for the installation of this compact and efficient antenna are supplied with each kit.
7. The wave-trap in the receiver has been adjusted for maximum signal rejection at 456 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.

An oscillator with frequencies of 456, 600, 1600 and 6,000 kc should be used.

An output meter should be used across the voice coil or output transformer for observing maximum response. If the circuit is at all disturbed, both the broadcast and short-wave bands must be realigned.

The set's oscillator is higher in frequency than the signal, so images should be observed on the low frequency side of the signals.

Always choose the minimum capacity peak on oscillator trimmers and maximum capacity peaks on antenna trimmers. The last motion in adjusting trimmers should always be a tightening one, not a loosening one.

Never leave a trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely.

Always use as weak a test signal as possible during alignment.

Use a standard dummy antenna for aligning either of the bands. A .0002 mf condenser may be used for the broadcast band dummy antenna and a 400 ohm non-inductive resistor for the short-wave dummy antenna.

Location of Coils and Trimmer Adjustments

The two i-f transformers are located on top of the chassis deck. The second i-f is the one directly behind the variable condenser. The four trimmers, two for each transformer, are accessible through holes in the tops of the cans.

The adjustable padding condenser for the broadcast band is mounted underneath the chassis (in the corner near the 6A7 tube) with the screw adjustment accessible through a hole in the top of the chassis.

The antenna coils for the broadcast and short-wave bands and the 456 kc wave trap are wound on one form and mounted underneath the chassis deck directly behind the adjustable padding condenser. The trimmers for these coils are accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is the short-wave antenna trimmer. The central trimmer is the broadcast antenna trimmer. The trimmer nearest the rear of the chassis is the 456 kc wave trap.

The oscillator coils for the broadcast and short-wave bands are wound on one form and mounted underneath the chassis deck near the variable condenser. The trimmers for these coils are accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is for the short-wave oscillator coil and the trimmer farthest from the front is for the broadcast oscillator coil.

I-f and Wave-trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 456 kc, through a 0.02 mf paper condenser, to the grid cap of the 6A7 tube (do not remove the grid clip from the tube). Adjust the four i-f trimmers for maximum response. Feed 456 kc to the antenna through a standard dummy antenna and adjust the wave-trap trimmer for *minimum* response. (See General Notes.)

Short-Wave Alignment (Alignment of the short-wave band should precede broadcast alignment)

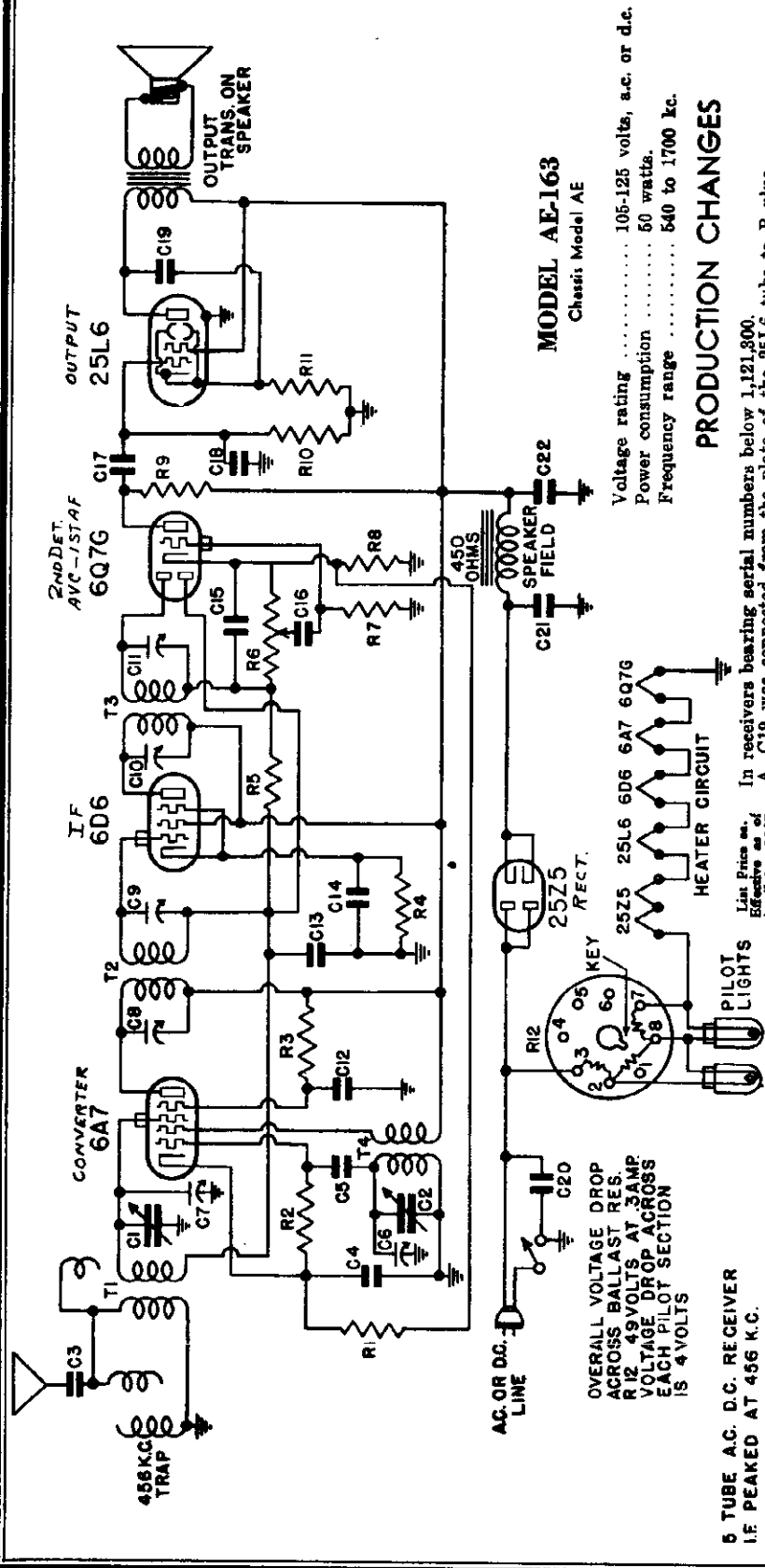
Rotate the wave-band switch to the short-wave (counter-clockwise) position, and set the dial pointer exactly at 6 megacycles. Feed 6,000 kc to the antenna and adjust the short-wave oscillator trimmer for maximum response, and then adjust the short-wave antenna trimmer for maximum response. Be very careful to choose the minimum capacity peak on the oscillator trimmer.

Broadcast Alignment

Rotate the wave-band switch to the broadcast position (clockwise) and set the dial pointer at 60. Feed 600 kc through a standard dummy antenna. Adjust the broadcast series padding condenser for maximum response. Move pointer to 160, feed 1600 kc and adjust the broadcast oscillator trimmer for maximum response and then adjust the broadcast antenna trimmer for maximum response. Return pointer to 60, feed 600 kc and readjust the series padding condenser rocking the variable condenser for maximum response.

EMERSON RADIO & PHONO. CORP.

MODEL AE163
Chassis AE
Schematic, Changes
Parts



Voltage rating 105-125 volts, a.c. or d.c.
Power consumption 50 watts.
Frequency range 540 to 1700 kc.

PRODUCTION CHANGES

5 TUBE A.C. D.C. RECEIVER
I.F. PEAKED AT 456 K.C.

*ITEM	PART No.	DESCRIPTION	PRICE
T1	3FT-280	Antenna coil with 456 kc wave trap.....	\$1.10
T2	4ET-350	456 kc first i-f transformer.....	1.15
T3	4ET-351	456 kc second i-f transformer.....	1.15
T4	3FT-281	Oscillator coil.....	.50
R1	3RR-276	310 ohm 1/2 watt wire-wound molded resistor.....	.16
R2	KR-53	50,000 ohm 1/2 watt carbon resistor.....	.16
R3	ZZR-196	30,000 ohm 1/2 watt carbon resistor.....	.16
R4	3CR-295	410 ohm 1/2 watt wire-wound molded resistor.....	.16
R5	HR-42	2 megohm 1/2 watt carbon resistor.....	.16
R6	ZZR-190A	Volume control—500,000 ohms.....	1.10
R7	3CR-294	240 ohm 1/2 watt wire-wound molded resistor.....	.16
R8	KR-55	250,000 ohm 1/2 watt carbon resistor.....	.16
R9	3CR-293	300,000 ohm 1/2 watt carbon resistor.....	.16
R10	3CR-241	140 ohm 1/2 watt wire-wound molded resistor.....	.16
R11	4EC-340	Plug-in type ballast resistor.....	.80
C1, C2	3HC-376	Two-gang variable condenser.....	3.06
C3	3HC-274	0.002 mf 600 volt tubular condenser.....	.20
C4, C12	AC-6	0.1 mf 200 volt tubular condenser.....	.10
C5, C15, C18 NC-70A		0.0002 mf mica condenser.....	.10
†C6, C7		Trimmer, part of variable condenser.....	1.05
		Trimmer, part of first i-f transformer.....	
		Trimmer, part of second i-f transformer.....	
	BC-12	0.06 mf 200 volt tubular condenser.....	.20
	FC-29	0.02 mf 200 volt tubular condenser.....	.20
	CCC-127	0.01 mf 200 volt tubular condenser.....	.20
	LC-65	0.02 mf 400 volt tubular condenser.....	.20
	2YC-242A	0.1 mf 400 volt molded type paper condenser.....	.20
	3CC-261	20 mf 150 volt wet electrolytic condenser.....	.90
	4ES-258	5 1/2" dynamic speaker.....	5.00
	XL-9	Pilot light, 6.3 volt, .25 amp, Mazda No. 46.....	.20
	4EZ-551	Dial face.....	.80
	4EZ-551	Dial drive belt.....	.15
	4EZ-553	Dial drive shaft.....	.10
	3JZ-375	Dial drive shaft bushing.....	.10
	3CZ-389	Dial drive shaft pulley.....	.10
	3CZ-389	Idler pulley.....	.06
	3SZ-467	Idler pulley spring.....	.05
	3CZ-341	Condenser shaft pulley.....	.10
	3FZ-353	Dial pointer.....	.10
	3CZ-350B	Escutcheon with crystal.....	1.05

In receivers bearing serial numbers below 1,121,800, A. C19 was connected from the plate of the 25L6 tube to B plus.

List Price as of April 14, 1937 (Subject to change without notice)

MODEL AE163

Chassis AE

Voltage, Alignment

Notes

EMERSON RADIO & PHONO. CORP.

GENERAL NOTES

1. If replacements are made or the wiring distributed in the r-f section of the circuit, the receiver should be carefully re-aligned.
2. One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to come in contact with any metal part of the receiver.
3. The filament dropping resistor (R12—see schematic) is in a special metal tube at back of the chassis. This tube will, therefore, become quite hot under normal operating conditions. For voltage drop see below.
4. When operating the receiver on d.c. it may be necessary to reverse the line plug for correct polarity.
5. The color coding of the i-f transformer leads is as follows:

Grid—green	Plate—blue
Grid return—black	B plus—red

Tube Data

The tube complement is as follows:

- 1—6A7 pentagrid oscillator-modulator.
- 1—6D6 first i-f amplifier.
- 1—6Q7G diode detector, audio amplifier, automatic volume control.
- 1—25L6 pentode power output.
- 1—25Z5 dual half-wave rectifier.
- 1—3CR-241 ballast tube.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

Tube	Plate	Screen	Osc. Plate	Cathode	Fil.
6A7	100	50	100	2.4	6.3
6D6	100	100	—	3.8	6.3
6Q7G	45	—	—	1.1	6.3
25L6	95	100	—	6.4	25.0

Voltage across speaker field—30 volts.

Overall voltage drop across ballast tube, (See R12, schematic)—49 volts at .3 amps.

Voltage drop across the pilot light section of ballast tube—4 volts, a.c.

ADJUSTMENTS

An oscillator with frequencies of 456 kc and 1500 kc should be used.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Always use as weak a test signal as possible.

Location of I-f Transformers and Trimmers

The first i-f transformer, part number 4ET-350, is in an oblong coil can located on the top of the chassis directly behind the 6A7 tube. The two trimmers for this i-f are accessible through holes in the top of the coil can.

The second i-f transformer, part number 4ET-351 is in an oblong coil can located on top of the chassis directly behind the speaker. The two trimmers for this i-f are accessible through holes in the top of the coil can.

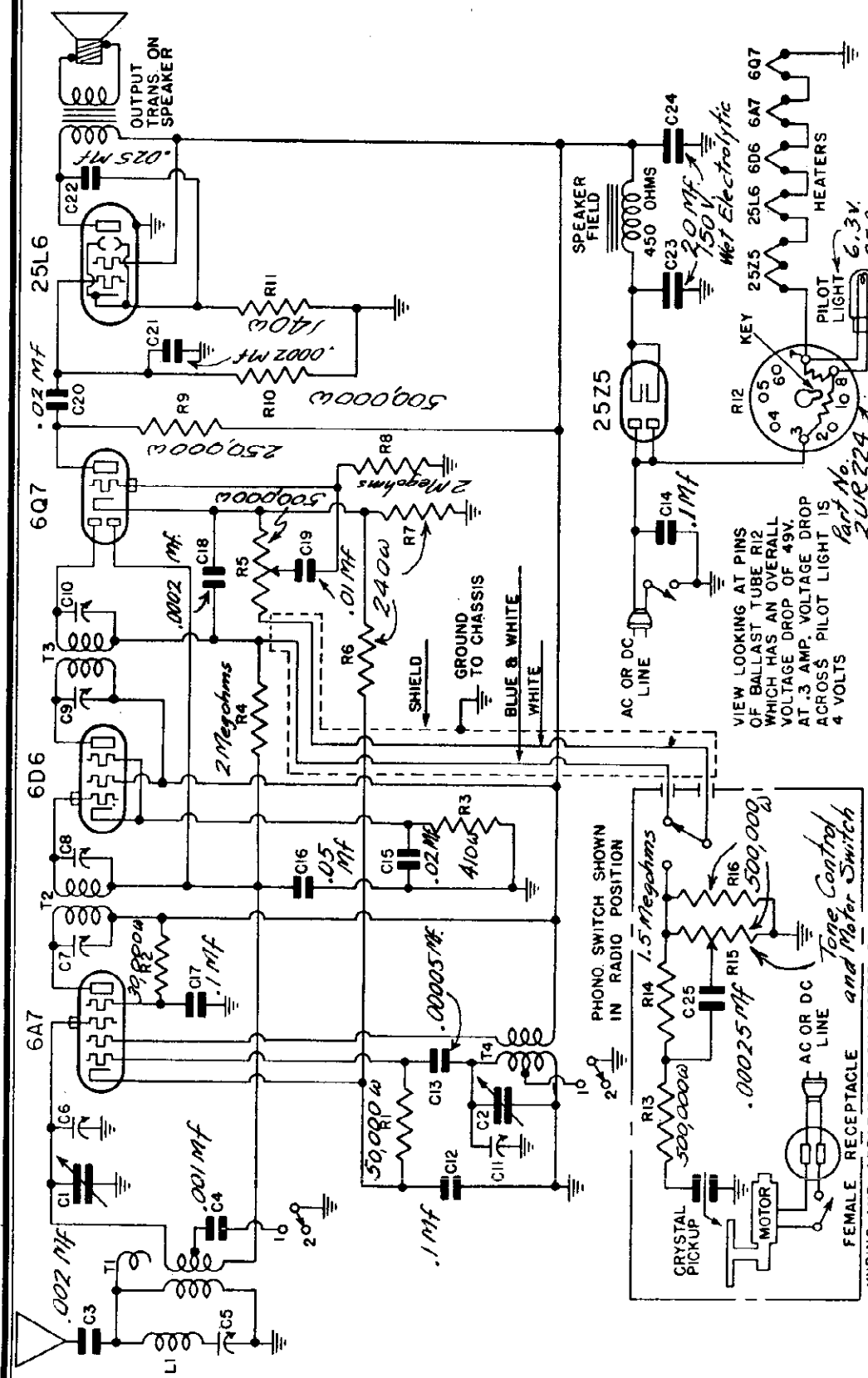
The oscillator and antenna trimmers are located on the variable condenser. The oscillator trimmer is on the rear section of the variable condenser and the antenna trimmer is on the front section of the variable condenser.

Alignment Procedure

1. Rotate the variable condenser to the minimum capacity position.
2. Feed 456 kc to the grid cap of the 6A7 tube, through a .02 mf paper condenser.
3. Adjust the i-f trimmers, repeating for maximum response.
4. Set the dial pointer to 1500 and feed 1500 kc to the antenna lead through a standard dummy antenna. (A .0001 mf mica condenser may be used as a substitute.)
5. Adjust the oscillator trimmer (on rear section of variable condenser) for maximum response.
6. Adjust the antenna trimmer (on front section of variable condenser) for maximum response.

EMERSON RADIO & PHONO. CORP.

MODEL AL164
Chassis AL
Schematic, Voltag



IF PEAKED AT 456 KC

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

WAVE BAND SWITCH SHOWN IN BROADCAST POSITION	NO 1 POLICE	NO 2 BROADCAST	Tubes	Plate	Screen	Cathode	Osc. Plate	Fil.
1-6A7 pentagrid oscillator-modulator.	1-6D6 first i-f amplifier.	1-6Q7 diode detector, a-f amplifier, a.v.c.	6A7	100	50	2.8	100	6.8
1-25L6 beam power output.	1-25Z5 dual half-wave rectifier.	1-25L6 ballast tube (pins Nos. 3, 7) - 49 volts.	6D6	100	100	3.5	---	6.8
1-25L6 ballast tube (pins Nos. 8 and 7) - 4 volts.			6Q7	48	---	1.2	---	6.8
			25L6	92	100	6.5	---	25.0

MODEL AL164
Chassis AL
Notes, Alignment

EMERSON RADIO & PHONO. CORP.

Model AL-164

CHASSIS MODEL AL

Voltage rating 105 to 125 volts a.c. or d.c.
Power consumption 43 watts for receiver and 26 watts for motor
Frequency range 540 to 1580 kc (See paragraph 11 in General Notes below).

GENERAL NOTES

1. If replacements are made or the wiring disturbed in the r-f portion of the circuit, the receiver should be carefully re-aligned.
2. One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to come in contact with any metal part of the receiver.
3. The filament dropping resistor (R12 on schematic) is in a special metal tube at the rear of the chassis. This tube will become quite hot under normal operating conditions. For voltage drop specifications, see below.
4. When operating the receiver on d.c. it may be necessary to reverse the line plug to obtain the correct polarity.
5. The two i-f transformers are held to the chassis by snap-on fasteners. To remove an i-f, unsolder its leads under the chassis, pinch together the prongs of the snap-on fastener and lift the i-f can from the chassis.
6. The color coding of the i-f transformer leads is as follows:

Grid—green	Plate—blue
Grid return—black	B plus—red
7. The receiver is shipped with an attached antenna wire. In some locations near powerful local stations the addition of a very large antenna may be detrimental to reception, because of the resulting interference. The Emerson Flexible Mast Antenna, Model W-32, has been especially designed for Emerson receivers, featuring compactness and portability while at the same time retaining a high efficiency from the standpoint of performance. Since it functions as an outside antenna the Flexible Mast will substantially improve the receiver performance. Where the Flexible Mast is installed permanently, it is urgently recommended that the receiver antenna wire be cut. Leave just enough of this wire to reach from the receiver to the window strip connector. Instructions for the installation of this compact and efficient outside antenna are supplied with each kit.
8. The wave-trap in the receiver has been adjusted for maximum signal rejection at 456 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.
9. The phonograph motor has been adjusted at the factory, to turn at a speed of 78 r.p.m. The speed may be checked by counting the turns per minute or by using a stroboscope disc and a neon light (the stroboscope method will only work when the neon bulb is lighted from a 60 cycle a.c. supply).
10. An a.c.-d.c. switch is provided to switch the motor for a.c. or d.c. power supply. It is important that this switch be in the proper position for the power supply available.
11. The receiver in this combination is designed to cover two frequency ranges, but since it is represented as a single band receiver only, the short-wave band, although available, may be ignored.

ADJUSTMENTS

An oscillator with frequencies of 456, 600 and 1400 kc should be used.

An output meter should be used across the voice coil or output transformer for observing maximum response.

The set's oscillator is higher in frequency than the signal, so images should be observed on the low frequency side of the signals.

The last motion in adjusting trimmers should always be a tightening one, not a loosening one.

Never leave a trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely.

Always use as weak a test signal as possible during alignment.

Use a .0001 mf mica condenser as a dummy antenna during alignment.

Location of Coils and Trimmer Adjustments

The two i-f transformers are in oblong coil cans located on top of the chassis deck. The first i-f transformer is the one behind the variable condenser. The trimmers for these transformers are accessible through holes in the tops of the cans.

The 456 kc wave-trap is mounted on the right side of the front chassis wall. Its trimmer is accessible at the bottom of the chassis.

The antenna coils for the broadcast and police bands are wound on one form and are mounted underneath the chassis deck below the variable condenser.

The oscillator coils for the broadcast and police bands are wound on one form and are mounted on the rear wall of the chassis deck near the variable condenser.

The trimmers for the broadcast antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the antenna coil.

I-f Transformer and Wave-Trap Alignment

Turn the switch clockwise to the broadcast position and rotate the variable condenser to the minimum capacity position. Feed 456 kc to the grid cap of the 6A7 tube and adjust the four i-f trimmers for maximum response. Feed 456 kc to the antenna and adjust the wave-trap trimmer for *minimum* response.

R-f Alignment

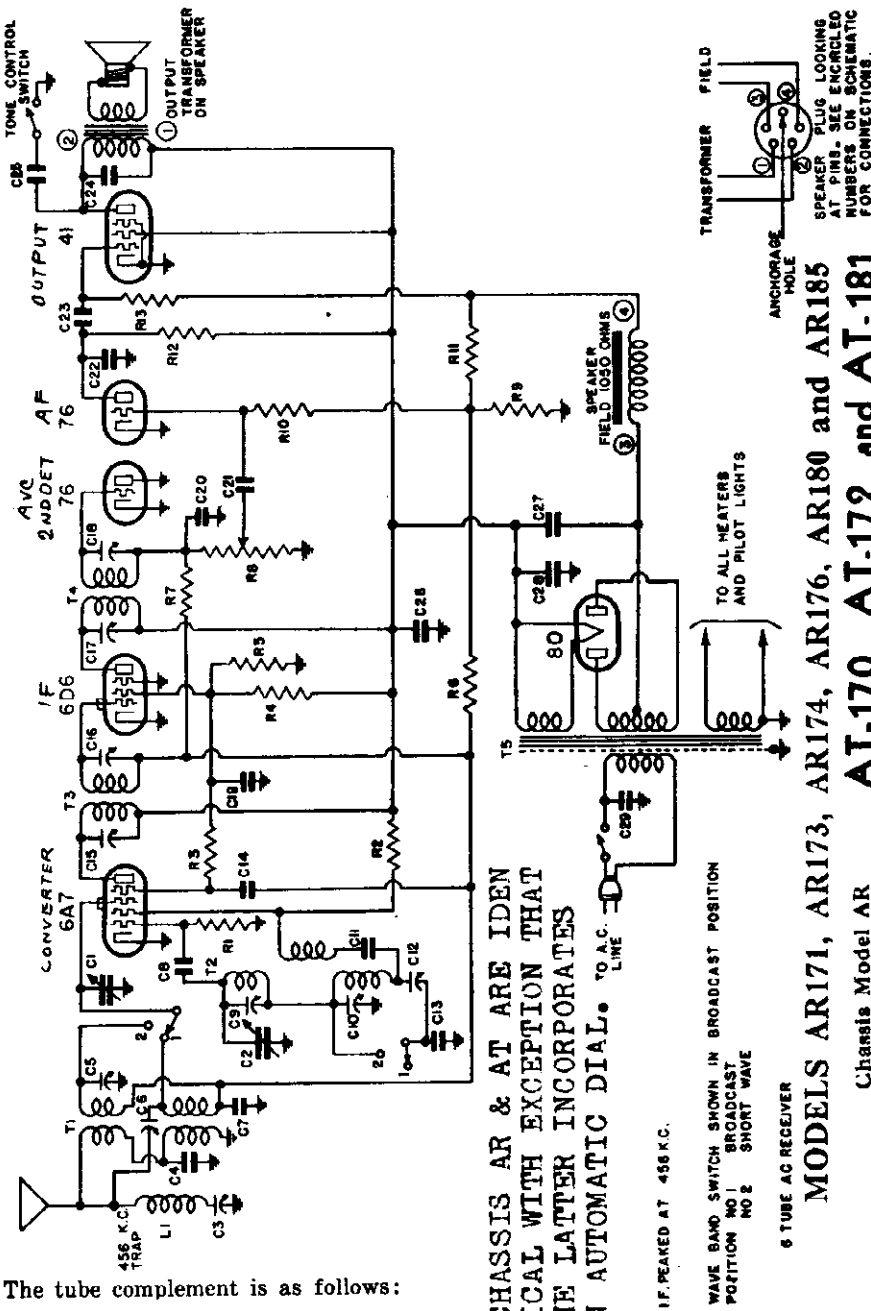
With the wave-band switch in the broadcast position, clockwise, set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna lead and adjust first the oscillator trimmer on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response. The police band is self-tracking and does not require any adjustment.

MODELS AT170, AT172
AT181
Chassis AT

EMERSON RADIO & PHONO. CORP.

MODELS AR171, AR173
AR174, AR176
AR180, AR181

Chassis AR
Schematic, Change
Voltage



CHASSIS AR & AT ARE IDENTICAL WITH EXCEPTION THAT THE LATTER INCORPORATES AN AUTOMATIC DIAL.

MODELS AR171, AR173, AR174, AR176, AR180 and AR185
AT-170, AT-172 and AT-181
Chassis Model AR

VOLTAGE ANALYSIS

Readings should be taken with a 1,000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. The line voltage for these readings was 117.5 volts, 60 cycles a.c.

Tube	Plate	Screen	Osc. Plate	Cathode	Fil.
6A7 osc.-mod.	244	62	118	0	6.3 a.c.
6D6 i-f amp.	244	85	—	0	6.3 a.c.
76 detector a.v.c.	0	—	—	0	6.3 a.c.
76 a-f amp.	85	—	—	0	6.3 a.c.
41 output	226	244	—	0	6.3 a.c.

Voltage across speaker field—65.

Voltage at 80 filament to B minus (center-tap of high-voltage winding on power transformer)—925. The grid bias for all the tubes is developed across the resistors R9 and R11 (see schematic). The total voltage measured across R9 and R11 should be 15 volts, and is the bias for the 41 tube. The voltage measured across R9 should be 5 volts. To check the bias on the 6A7 and 6D6 tubes, measure the values of resistors R6, R7 and R8 (see schematic).

- The tube complement is as follows:
- 1—6A7, pentagrid oscillator-modulator.
 - 1—6D6, i-f amplifier.
 - 1—76, diode detector and a.v.c. (behind second i-f transformer).
 - 1—76, audio amplifier.
 - 1—41, pentode power output.
 - 1—80, full-wave rectifier.

Voltage rating 105-125 volts, 60 cycle a.c.
Power consumption 55 watts
Frequency ranges 540 to 1730 kc and 5.6 to 18 megacycles

PRODUCTION CHANGES

- Model AR-174 receivers differ from the schematic diagram as follows:
- a. C27 is a 12 mf, 450 volt dry electrolytic condenser, part no. 3LC-314.
 - b. C28 is a 24 mf, 400 volt dry electrolytic condenser, part no. 3ZC-341.
 - c. A .25 mf, 200 volt condenser is connected from the screen-grid of the 6D6 i-f amplifier to ground.

In receivers bearing serial numbers below 1,200,100:
a. C1 and C2 was a two-gang variable condenser, part no. 4HC-343B and the dial face used with this condenser was part no. 4RZ-580.

MODELS AT170, AT172
AT181

EMERSON RADIO & PHONO. CORP. Automatic Dial Details
Chassis AT

CHASSIS AR - SEE INDEX FOR SCHEMATIC
Models AT-170, AT-172 and AT-181

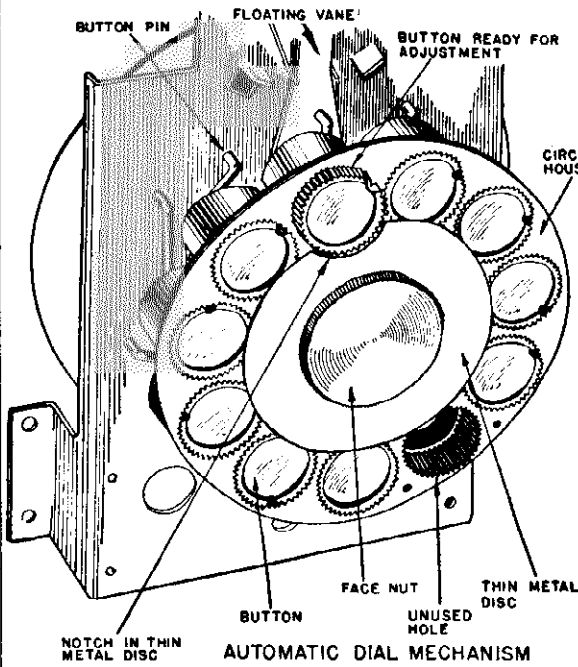


FIGURE 2

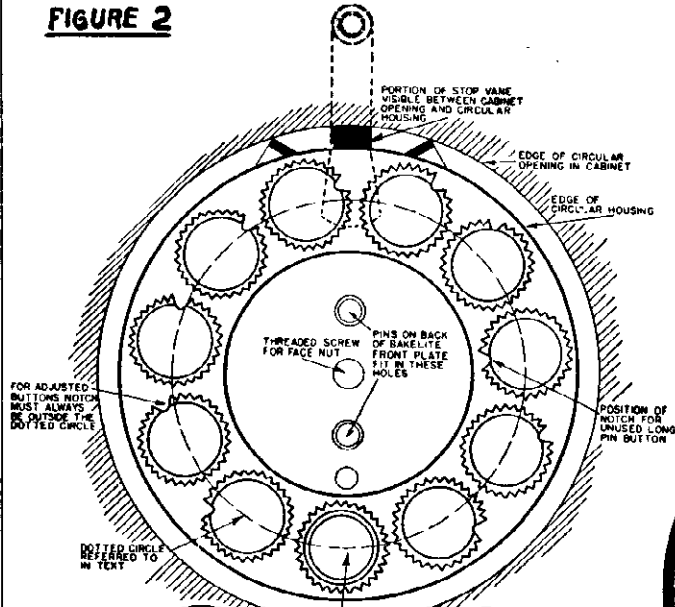


FIGURE 3

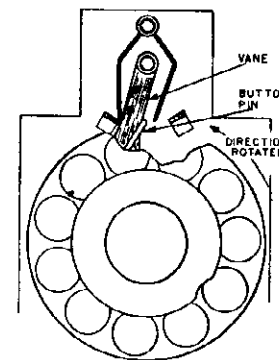
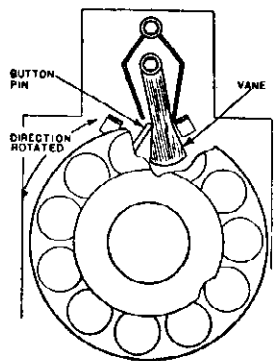
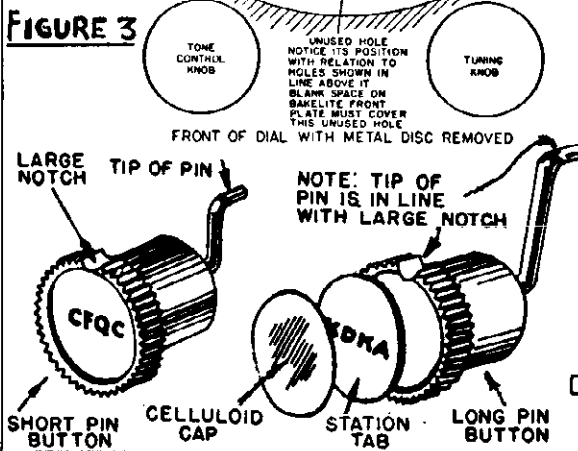
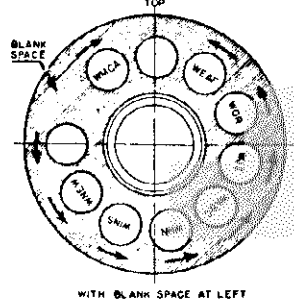
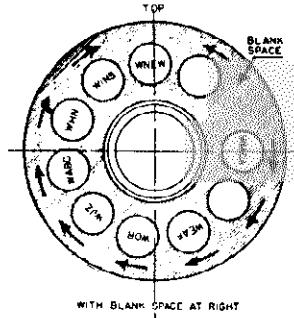
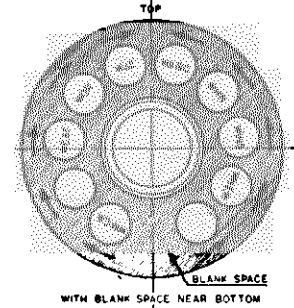
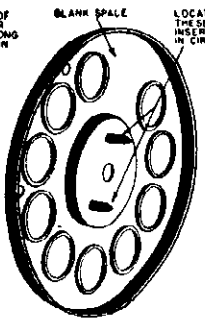


FIGURE 5
SHOWING TIP OF PIN HITTING VANE FROM EITHER SIDE WHEN STATION IS TUNED IN



ARROWS INDICATE DIRECTION DIAL IS TO BE TURNED FOR ANY PARTICULAR BUTTON

FIGURE 1



REAR VIEW OF BAKELITE FRONT PLATE
FIGURE 7

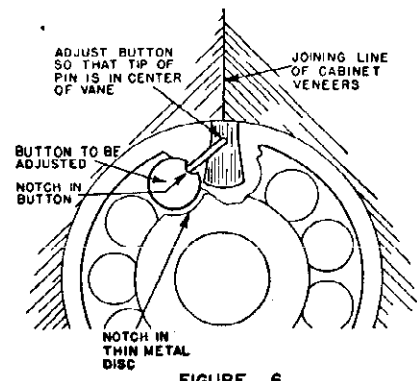


FIGURE 6

DETAILS OF BUTTONS
FIGURE 4

EMERSON RADIO & PHONO. CORP.

MODELS AT170, AT172

AT181

Chassis AT

Automatic Dial Notes

AUTOMATIC DIAL Models AT-170, AT-172 and AT-181

CHASSIS AR - SEE INDEX FOR SCHEMATIC

Automatic Dial Tuning

Insert the line plug into the electric outlet. Turn the receiver on by rotating the volume control knob clockwise until the switch is heard to click. Wait about a minute for the tubes to warm up.

Be sure the wave-band switch is in the broadcast position, clockwise.

(Complete information relative to the pre-setting of the Automatic Dial appears on pages 6 to 7 inclusive in this booklet.)

Tuning with the Automatic Dial is very similar to dialing a telephone except that only one turn of the dial is necessary. Merely push in the button bearing the call letters of the desired station, and, keeping the button pressed in firmly, rotate the dial until it stops with the button near the top. The button may then be released. This procedure automatically tunes in the desired station.

The illustrations, Fig. 1, indicate the proper rotation of the dial for a particular button. Note that the button must always stop near the top of the disc. If the button for the desired station is already at the top, rotate the dial in either direction about a quarter turn and then push the button in and rotate the dial back again until it stops with this button near the top.

Broadcast Reception

Broadcast stations may be tuned in the regular manner by means of the station selector knob on the front of the cabinet.

STATION PRE-SETTING OF AUTOMATIC DIAL

The bakelite front plate for the dial will be found in the knob envelope. This plate is to be assembled after following the procedure described below. Eight cards of station call letter tabs for the buttons are in a separate envelope packed with the receiver.

The illustrations at the right, Fig. 2 and Fig. 3, show the major parts of the automatic dial. Ten buttons are supplied with each dial. Note that there are eleven button holes in the circular housing. One of these button holes is not to be used. (See Fig. 3). Each of the buttons may be set for a particular station. The stations chosen should be the popular local broadcast stations. The dial cannot be used for automatic tuning of short-wave stations. Each button is adjustable in that it can be rotated in its hole in the housing. This rotation is the means of adjustment for any particular station.

First turn the receiver on. The adjustments should be made with the receiver warmed up. Of the possible ten selected local stations choose five of the more desirable and determine their frequencies. Station frequencies will usually be found listed in newspapers. The station with the lowest frequency of the first five chosen should be adjusted first. Compare the frequency of this station with the frequency markings on the tab inserts in the buttons. The station frequency will be between the frequency limits marked on one of the buttons and that button should be adjusted for that particular station.

The following procedure should be observed in adjusting the buttons:

1. Do not remove the thin metal disc which holds the buttons in the housing until this entire procedure is completely finished. Merely loosen the face nut slightly and rotate the disc until its semi-circular notch falls below the first button to be adjusted. See Fig. 2. (When rotating this disc it is necessary to successively hold each button in place with a finger as the notch in the disc moves past these buttons.) Tighten the face nut again to prevent the disc from falling off. Take out this button and remove the celluloid cap and tab insert by prying with a sharp instrument at the large notch on the side of the button.

Tune in the desired station by means of the selector knob on the front of the cabinet.

3. The large notch on the side of the button will indicate the position of the stop pin on the back of the button, see Fig. 4. The tip portion of the stop pin in this drawing is the part that stops against the floating vane. This tip portion in stopping against the vane is the action that locates the station once the button is adjusted, see Fig. 5. The vane is visible between the edge of the button housing and the edge of the hole in the cabinet, see Fig. 3.

4. With the station tuned in and without moving the circular housing partially insert the button, lining up the tip portion of the stop pin by eye with the center of the floating vane, and then push the button in, engaging the teeth. See Fig. 6. The center joint of the veneer on the cabinet may be used to assist in this lining up since the joint is approximately at the center of the floating vane.

Hold the button in and rotate the thin metal disc a small fraction of a turn, just enough so that it holds the button in place.

It is important that when the stop pin is lined up it is either horizontal or pointing at some angle away from the hub of the housing. This precaution may be observed by locating the large notch of the button (which is in line with the tip of the stop pin) outside the dotted circle through the buttons as shown in Fig. 3.

5. To check if the button has been properly adjusted rotate the entire housing first in clockwise direction so that the button stop pin is clear of the floating vane. Push the button all the way in with a finger and rotate the housing so that the pin travels toward and stops against the floating vane. The desired station should then be heard. Repeat this procedure on the counter-clockwise side of the vane. The station should again be heard.

6. If the station tunes in perfectly on each side of the vane no further adjustment is necessary. If it does not tune in perfectly, further adjustment should be made by carefully pulling out the button and rotating it one notch in the housing in the direction which will bring in the station more accurately. Check the tuning again by following the procedure outlined in paragraph No. 5. Find the station call letters for this button on one of the cards supplied. Remove the tab from the card and insert in the button by pressing in firmly. Replace the clear celluloid cap over the call letter tab, snapping it firmly in place.

7. Adjust four buttons for the other four selected stations following the procedure outlined above. In adjusting these buttons care should be taken, when rotating the thin metal disc, to keep the other buttons from falling.

8. The remaining buttons, five in number, may be adjusted for any other local stations easily obtainable, or left in reserve for future settings.

9. After the buttons are all adjusted the thin metal disc should be removed carefully by unscrewing the face nut and replaced by the bakelite front plate. Be very careful in removing the thin metal disc that the buttons do not spring out from the housing. The cabinet should be tilted or placed on its back, when placing the bakelite plate on the dial, to make sure that the buttons do not fall out.

Check carefully the drawings in Fig. 3 and Fig. 7 for aligning the bakelite front plate with the circular housing.

The plate must fit in easily and snugly. Care should be taken not to damage the locating pins on the back of the front plate.

The following additional precautions must be observed when adjusting the buttons:

The long pin buttons, when adjusted, should have the long length of the pin nearly horizontal. If these long pins, after the button is adjusted, interfere with any other part of the mechanism when the housing is rotated the buttons cannot be used in these holes.

If no special use is found for the two long pin buttons it is preferable to insert these in unused holes with the pins pointing directly toward the hub of the housing.

When loosening the thin metal disc be sure the face nut is unscrewed only enough to allow the disc to turn. During adjustments check this nut frequently to make sure it is in no danger of falling off. It cannot be emphasized too strongly that the utmost care must be taken to prevent this metal disc or the bakelite front plate from falling off and allowing the adjusted buttons to spring out from the housing. When making adjustments, rotate the thin metal disc very carefully to be sure that the adjusted buttons do not fall out of the housing past the notch in the disc.

After replacing the thin metal disc with the bakelite plate, the disc should not be discarded but should be reserved for future use in resetting buttons or in the event the receiver is reshipped. The receiver should never be transported with the bakelite plate assembled.

Note:—Two of the ten buttons supplied with the dial have long pins. In rare cases a particular station cannot be reached with a short pin button. The two long pin buttons are available for this purpose.

MODELS AR171, AR173
AR174, AR176
AR180, AR185

EMERSON RADIO & PHONO. CORP.

MODELS AT170, AT172
AT181
Chassis AT

Chassis AR
Alignment, Notes, Parts

Use a standard dummy antenna in aligning the broadcast coils. (A .0002 condenser may be substituted.) Rotate the wave-trap in the receiver section. Set the dial pointer at 60 and feed 600 kc. Adjust the oscillator trimmer (farthest from front) for maximum response. Move the dial pointer to 160 and feed 1600 kc. Adjust the broadcast antenna trimmer (nearest front) for maximum response. Return pointer to 60, feed 600 kc and readjust the broadcast antenna trimmer (central trimmer at left side of chassis). Return pointer to 60, feed 600 kc and readjust the broadcast series pecker, rocking the variable condenser (rotate the variable condenser shaft back and forth through a small arc) for maximum response.

REPLACEMENT PARTS

Table with columns: Part No., Description, Price. Includes items like two-band antenna coil, 466 kc wave-trap, 456 kc first i-f transformer, power transformer, resistors, capacitors, trimmers, etc.

GENERAL NOTES
1. The receiver should never be turned on with either the speaker plug or the 41 tube out of its respective socket, since the rapid rise in rectifier voltage will damage the electrolytic condenser.
2. When replacing the chassis in the cabinet take precautions to keep any part of the dial and condenser assembly from touching the cabinet, otherwise microphonism may result.
3. The color coding of the components is as follows:
Grid—green
Grid return—black
B plus—red
Plate—blue
4. The color coding of the power transformer is as follows:
Primary—two black leads
High-voltage secondary—two red and yellow lead
Low-voltage secondary—two green leads
5. The adjustable peaking condenser for the broadcast band is mounted underneath the chassis (in the corner near the wave-band switch) with the screw adjustment accessible through a hole in the top of the chassis. The short-wave band has a fixed pecker, C13 on schematic. When using the short-wave coils, make sure the short-wave condenser which has capacity within the color coding of the general wiring is as follows:
6. With a few exceptions, the color coding of the general wiring is as follows:
Plate—blue
B plus—red
Screen—brown
Grid—green
Grid return—black
Cathode—white or yellow
7. The wave-trap in the receiver has been adjusted for maximum response at 456 kc. If, however, persistent interference is experienced from a particular telegraph station, the wave-trap trimmer may be readjusted until interference from the interfering station is at a minimum.
8. An efficient antenna system is necessary to enable a full realization of the merits of the receiver. For reduction of noise and achievement of high efficiency on all frequency ranges the Emerson All-Wave High-Fidelity Antenna, Model W-18, and the Emerson All-Wave Antenna System, Model W-39, are recommended. Instructions for the installation of these antennas are supplied with each station of a large antenna is not desirable we recommend the use of the Emerson All-Wave Antenna, Model W-32. Instructions for the installation of this compact and efficient antenna are supplied with each kit.

ADJUSTMENTS

An oscillator with frequencies of 456, 600, 1600 and 15,000 kc should be used.
An output meter should be used across the voice coil or output transformer for observing maximum response.
If the circuit is at all disturbed, both the broadcast and short-wave bands must be realigned.
The set's oscillator is higher in frequency than the signal, so images should be observed on the low frequency side of the signal.
Always choose the minimum capacity peak on oscillator trimmers and maximum capacity peaks on antenna trimmers.
The last motion in adjusting trimmers should always be a tightening one, not a loosening one.
Never leave a trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely.
Always use as weak a test signal as possible during alignment.

Location of Coils and Trimmer Adjustments

The two i-f transformers are located on top of the chassis deck. The second i-f is the one directly behind the variable condenser. The four trimmers, two for each transformer, are accessible through holes in the top of the cans.
The adjustable peaking condenser for the broadcast band is mounted underneath the chassis (in the corner near the 6A7 tube) with the screw adjustment accessible through a hole in the front of the chassis.
The antenna coils for the broadcast and short-wave bands and the 456 kc wave trap are wound on one form and mounted underneath the chassis deck directly behind the adjustable peaking condenser.
The trimmer nearest the antenna trimmer is the broadcast antenna trimmer. The trimmer nearest the rear of the chassis is the 456 kc wave trap.
The oscillator coils for the broadcast and short-wave bands are wound on one form and mounted underneath the chassis deck near the rear of the chassis. The trimmers for these coils are accessible through holes in the top of the chassis.
The trimmer nearest the front of the chassis is for the short-wave oscillator coil and the trimmer farthest from the front is for the broadcast oscillator coil.

I-f and Wave-Trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 456 kc through a .002 mf paper condenser, to the grid top of the 6A7 tube. The short-wave band clip from the tube). Adjust the four i-f trimmers for maximum response. Feed 15,000 kc to the antenna through a standard dummy antenna (a .0002 mica condenser may be substituted) and adjust the wave-trap trimmer (farthest from front on left side of the chassis) for maximum response. (See General Notes.)

Short-Wave Alignment

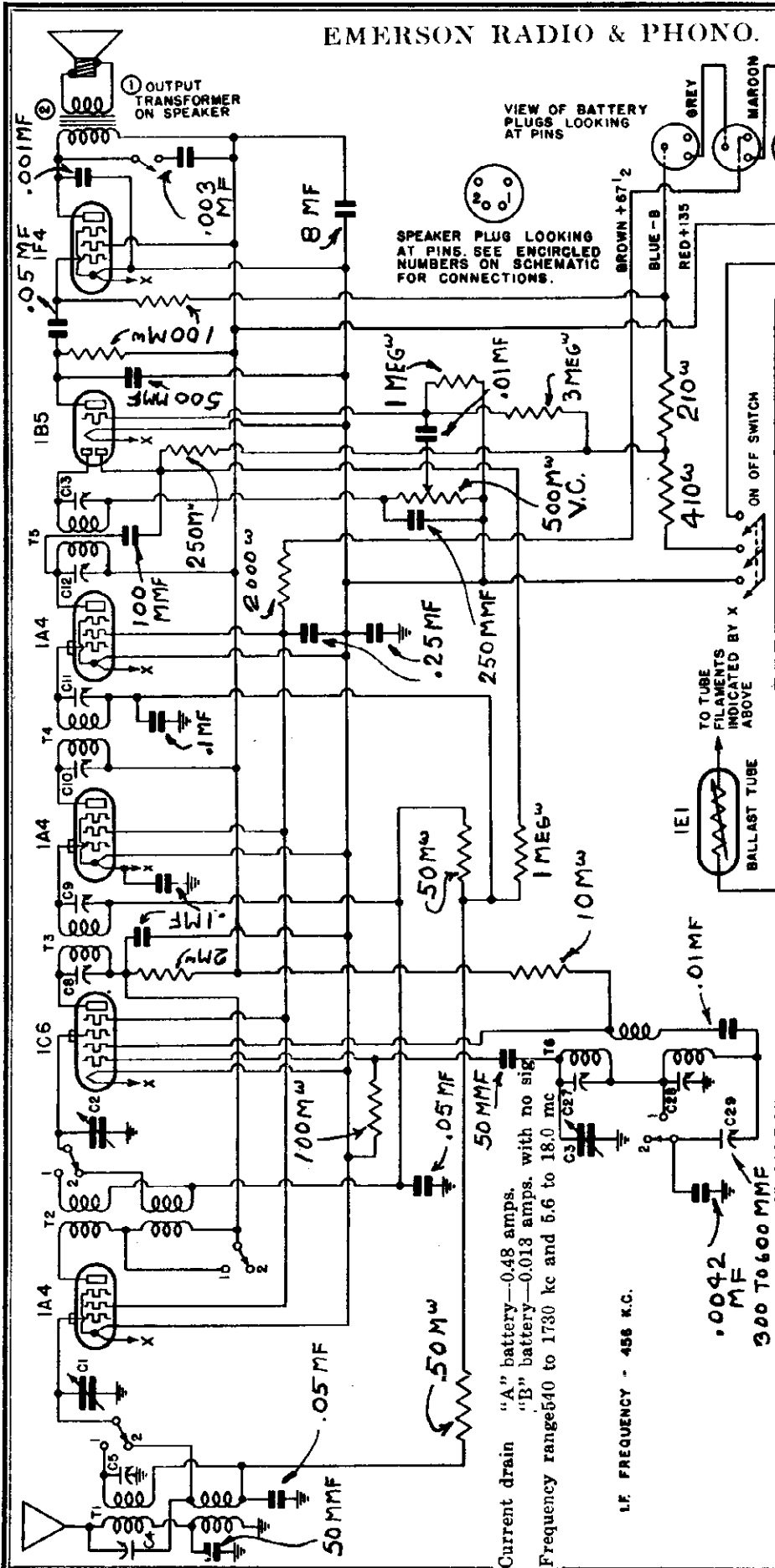
Alignment of the short-wave band should precede broadcast alignment)
Use a 400 ohm dummy antenna (a 400 ohm non-inductive resistor in series with the test oscillator antenna lead) when aligning short-wave coils. Rotate the wave-band switch to the short-wave (counter-clockwise) position, and set the dial pointer exactly at 15 megacycles. Feed 15,000 kc to the antenna and adjust the short-wave oscillator trimmer (nearest the front beside variable condenser) for maximum response, and then adjust the antenna trimmer (farthest from front on left side of the chassis) for maximum response. Be very careful to choose the minimum capacity peak on the oscillator trimmer.

When ordering replacement parts specify part numbers.

- *Item number locates the article on the schematic diagram.
†See production changes.
‡These trimmer condensers are part of the coil assemblies and can not be supplied separately.

EMERSON RADIO & PHONO. MODELS AF171, AF173, AF179, AF180, AF

Chassis AF Voltage Schematic



VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to A neg. with volume control turned on full and no signal. The battery voltages for these readings were: "A" 3 volts, "B" 135 volts.

Tube	Plate	Screen	Osc. Plate	Fil.
1A4 r-f	130	57	—	2.0
IC6	130	57	100	2.0
1A4 1st i-f	130	57	—	2.0
1A4 2nd i-f	130	57	—	2.0
IB5-26S	65	—	—	2.0
1F4	130	130	—	2.0

Tube Data

- 1A4, r-f amplifier (to right of variable cond)
- IC6, oscillator-modulator
- 1A4, 1st i-f amplifier (to left of variable cond)
- 1A4, 2nd i-f amplifier (behind variable cond)
- IB5-26S, 2nd detector, a.v.c., a-f amplifier
- 1F4, pentode output
- IE1, ballast tube.

Bias for the three 1A4 and the IC6 tubes is obtained across the resistor R10. The voltage drop across this resistor should be 5 volts. Bias for the output tube (1F4) is obtained across resistors R10 and R14 in series. Voltage drop across

MODELS AF171, AF173, AF176

AF179, AF180, AF185 EMERSON RADIO & PHONO. CORP.

Chassis AF

Alignment, Notes

ADJUSTMENTS

An oscillator with frequencies of 456, 600, 1600 and 15,000 kc should be used.

An output meter should be used across the voice coil or output transformer for observing maximum response.

If the circuit is at all disturbed, both the broadcast and short-wave bands must be realigned.

The set's oscillator is higher in frequency than the signal, so images should be observed on the low frequency side of the signals.

Always choose the minimum capacity peak on oscillator trimmers and maximum capacity peaks on antenna trimmers. The last motion in adjusting trimmers should always be a tightening one, not a loosening one.

Never leave a trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely.

Always use as weak a test signal as possible during alignment.

Use a standard dummy antenna for aligning either of the bands. A .0002 mf condenser may be used for the broadcast band dummy antenna and a 400 ohm non-inductive resistor for the short-wave dummy antenna.

Location of Coils and Trimmer Adjustments

The three i-f transformers are in oblong coil cans located on top of the chassis deck.

The first i-f transformer, part number 4ET-350B, is located to the left of the variable condenser.

The second i-f transformer, part number 4ET-350B, is located behind the variable condenser.

The third i-f transformer, part number 4FT-382, is located to the right of the variable condenser. The trimmers, two for each transformer, are accessible through holes in the top of the cans.

The broadcast series padder is located underneath the chassis (in the corner near the 1C6 tube). The screw adjustment is accessible through a hole in the top of the chassis.

The antenna coil for the two bands is wound on one coil form and mounted underneath the chassis to the right of the variable condenser. The trimmers are accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is for the short-wave antenna coil.

The r-f interstage coils for the two bands are wound on one form and mounted underneath the chassis to the left of the first i-f transformer. The trimmers are accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is for the short-wave interstage coil.

The oscillator coils for the two bands are wound on one coil form and mounted underneath the chassis to the left of the variable condenser. The trimmers are accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is for the short-wave oscillator coil.

i-f Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 456 kc through a 0.02 mf paper condenser, to the grid cap of the 1C6 tube (do not remove the grid clip from the tube). Adjust the six i-f trimmers for maximum response.

Short-Wave Alignment (Short-wave alignment should precede broadcast alignment.)

Set the wave-band switch at the short-wave (counter-clockwise) position. Move pointer to 15, feed 15,000 kc to antenna (using a 400 ohm dummy antenna) and adjust the short-wave oscillator for maximum response. If two peaks are obtained choose minimum capacity peak. Then adjust the interstage and antenna trimmers for maximum response. If two peaks are obtained choose the maximum capacity peak.

Broadcast Alignment

With the wave-band switch at the broadcast (clockwise) position, set the pointer at 600, feed 600 kc through the antenna (using a standard dummy antenna), and adjust the broadcast series padder for maximum response. Move pointer to 1600, feed 1600 kc to the antenna and adjust the oscillator trimmer for maximum response, then adjust interstage and antenna trimmers. Reset the pointer to 600, feed 600 kc to antenna and rock the variable condenser (rotate the condenser back and forth through a small arc) while resetting the oscillator padder for maximum response. Return to 1600 and check alignment. If readjustment is necessary, return to 600 and repeat entire procedure.

1. The battery complement should be as follows:

Type	No. Required	Eveready Part No.	Battery Manufacturer Burgess Part No.	Ray-o-vac Part No.
3 volt "A".....	1	X-125 or A-600	20F2	P9403
45 volt "B".....	3	385 (plug-in type)	22308 (plug-in type)	P9803 (plug-in type)

2. The receiver is designed for an "A" supply of 2 to 3 volts. A 2 volt storage battery may be used, in which case the 1E1 (ballast) tube, in the chassis becomes unnecessary and may be eliminated as follows:

If it is definitely known that a 2 volt storage battery will always be used it is permissible and advisable to short-circuit the two heavy prongs on the 1E1 tube by connecting them with a short piece of bare wire. Be sure that the two small prongs on the tube are free of this bare wire.

3. The color coding of the i-f transformer leads is as follows:

Grid—green	Plate—blue
Grid return—black	B plus—red

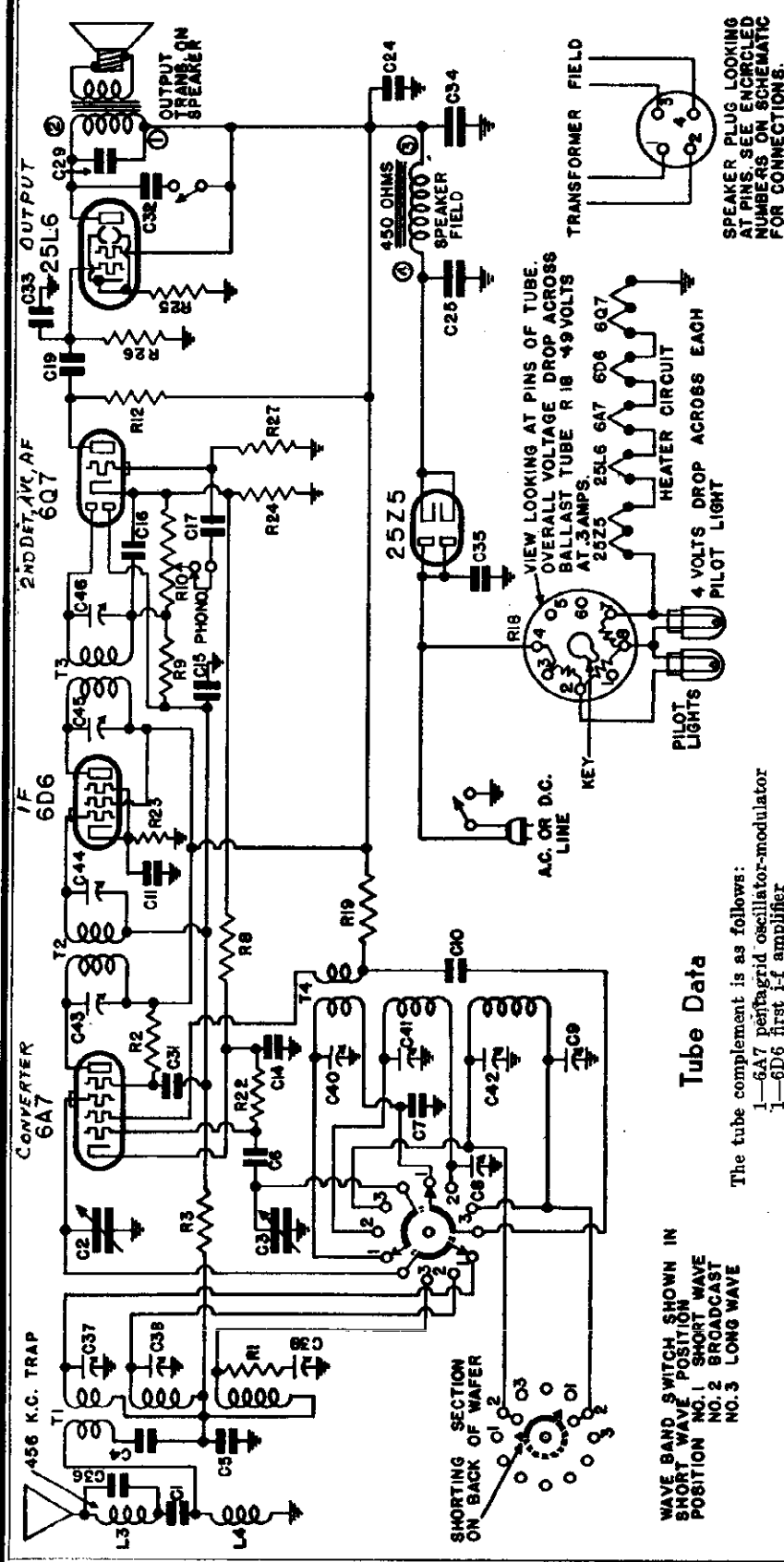
4. Note that all leads in the battery cable are color coded. The two "A" leads are tagged with small metal markers giving the polarity. The battery cable is equipped with three plugs for "B" battery connections. These plugs are all alike and may be inserted in any order in the sockets of the three "B" batteries. The color coding of the battery cable is as follows:

Red	B plus 135
Brown	B plus 67.5
Blue	B neg.
Yellow	A plus 3
Black	A neg.

5. If replacements are made in the r-f section of the circuit, the receiver should be carefully re-aligned.
6. Be very careful not to remove any of the tubes from their sockets with the power switch turned on, as the rapid rise in filament voltage will damage the remainder of the tubes.

EMERSON RADIO & PHONO. CORP

MODELS AP171, AP173, AP174, AP176, AP180, AP185
 Chassis AP
 Schematic, Voltage



WAVE BAND SWITCH SHOWN IN SHORT WAVE POSITION
 NO. 1 SHORT WAVE
 NO. 2 BROADCAST
 NO. 3 LONG WAVE

IF PEAKED AT 456 KC.
 6 TUBE A.C. D.C. RECEIVER

Tube Data

The tube complement is as follows:
 1-6A7 pentagrid oscillator-modulator
 1-6D6 first i.f. amplifier
 1-6Q7 diode detector, a.v.c., audio amplifier
 1-25L6 beam power output
 1-25Z5 dual half-wave rectifier
 1-3CR-241 ballast tube.

NOTE: Octal-base tubes may be replaced with either metal or octal-base glass tubes.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	110	34	2.4	67	6.8
6D6	110	110	4.2	—	6.8
6Q7	45	—	1.2	—	6.8
25L6	100	110	7.0	—	25
25Z5	—	—	195.0	—	25

Voltage across speaker field—25 volts.
 The overall voltage drop across the resistors in the ballast tube is 49 volts.
 The voltage drop across each pilot light section in the ballast tube is 4 volts.

CHASSIS MODEL AP
 Voltage rating 105-125 volts, a.c. or d.c.
 Current drain 0.4 amp.
 Frequency range 150 to 375 kc, 540 to 1600 kc, 5.7 to 17.5 mc.

MODELS AP-171, AP-173, AP-174,
 AP-176, AP-180 and AP-185

SPEAKER PLUG LOOKING AT PINS. SEE ENCIRCLED NUMBERS ON SCHEMATIC FOR CONNECTIONS.

VIEW LOOKING AT PINS OF TUBE. OVERALL VOLTAGE DROP ACROSS BALLAST TUBE R 18 49 VOLTS AT 3 AMPS. 25Z5 25L6 6A7 6D6 6Q7 HEATER CIRCUIT 4 VOLTS DROP ACROSS EACH PILOT LIGHT

MODELS AP171, AP173 AP174, AP176 AP180, AP185

EMERSON RADIO & PHONO. CORP. Alignment, Notes, Parts

Chassis AP

Short-Wave Alignment

Set wave-band switch at short-wave (center-lockwise) position. Set pointer at 16, feed 15 megacycles to antenna and adjust short-wave oscillator trimmer and then short-wave antenna trimmer for maximum response.

GENERAL NOTES
1. If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully re-aligned.
2. One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a second wire be permitted to come in contact with any metal part of the receiver.

REPLACEMENT PARTS LIST

Table with columns: Part No., Description, Price. Lists various electronic components like capacitors, resistors, coils, and trimmers with their respective part numbers and prices.

When ordering replacement parts specify part numbers.

*When number locates the article on the schematic diagram.
†These condensers are part of coil assemblies and cannot be supplied separately.

3. When operating the receiver on d.c., it may be necessary to reverse the line plug for correct polarity.
4. When applying the external speaker microphone will result.
5. The color coding of the transformers is as follows:
Grid return—black
B plus—green
B plus—red
Plate—blue

6. An electrical phonograph pick-up may be connected to this receiver for playing records. Connections to this receiver may be made at the "phonograph" jack which is located on the rear wall of the receiver chassis. A separate volume control of the potentiometer type is necessary in addition to the phonograph pick-up. The two pick-up lead wires should be connected to the two outside terminals of this volume control. A lead from the center terminal should be plugged into the other hole in the phone jack. The leads to be plugged in the jack should be fitted with tips. The volume control in the receiver should be turned down to the zero volume position when operating the phonograph. The required over-all resistance of the separate volume control will, of course, depend on the type of phonograph pick-up to be used. A matching input transformer must be used if the pick-up is of the low impedance type. In this case the volume control is connected to the secondary of the transformer. It is important that the phonograph leads be removed from the jack when it is desired to operate the receiver for ordinary radio reception.

7. An efficient antenna system is necessary to enable a full realization of the merits of the receiver. For reduction of noise and achievement of high efficiency on all frequency ranges the Emerson All-Wave High-Fidelity Antenna, Model W-84, an antenna system which is built into the receiver chassis, is recommended. Instructions for the installation of this antenna are supplied with each kit. In congested areas where the installation of a large antenna is not desirable we recommend the use of the Emerson Flexible Mast Antenna, Model W-82. Instructions for the installation of this compact and efficient antenna are supplied with each kit.

ADJUSTMENTS

An oscillator with frequencies of 150, 360, 465, 600, 1500 kc should be used. An output meter should be used across the voice coil or output transformer for observing maximum response. Use a standard dummy antenna when aligning either the long-wave or medium-wave bands. A .0025 ohm resistor in series with antenna lead. Always choose the minimum capacity peak on oscillator trimmers and maximum capacity peaks on antenna trimmers. The best motion in adjusting trimmers should always be a tightening one, not a loosening one. Always use as weak a test signal as possible during alignment. Never leave a trimmer with its outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely.

Location of Coils and Trimmers

The two i-f transformers are located on top of the chassis deck. The second i-f transformer is the one directly behind the variable condenser. The four trimmers, two for each transformer, are accessible through holes in the top of the cans. The dual adjustable padding condenser is mounted on the left side of the front chassis wall. The antenna coils for the three bands are wound on one form and mounted underneath the chassis deck directly behind the adjustable padding condenser. The trimmers for these coils are accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is the medium-wave antenna trimmer. The central trimmer is the short-wave antenna trimmer. The trimmer farthest from the front of the chassis is the long-wave antenna trimmer. The oscillator coils for the three bands are wound on one form and mounted underneath the chassis deck near the variable condenser. The trimmers for these coils are also accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is the medium-wave oscillator trimmer. The central trimmer is the short-wave oscillator trimmer. The trimmer farthest from the front of the chassis is the long-wave oscillator trimmer.

I-F Alignment

Rotate the wave-band switch to the medium-wave (central) position and set the variable condenser to minimum. Feed 466 kc to the grid cap of the 6AV tube. Adjust the four i-f trimmers for maximum response.

Long-Wave Alignment

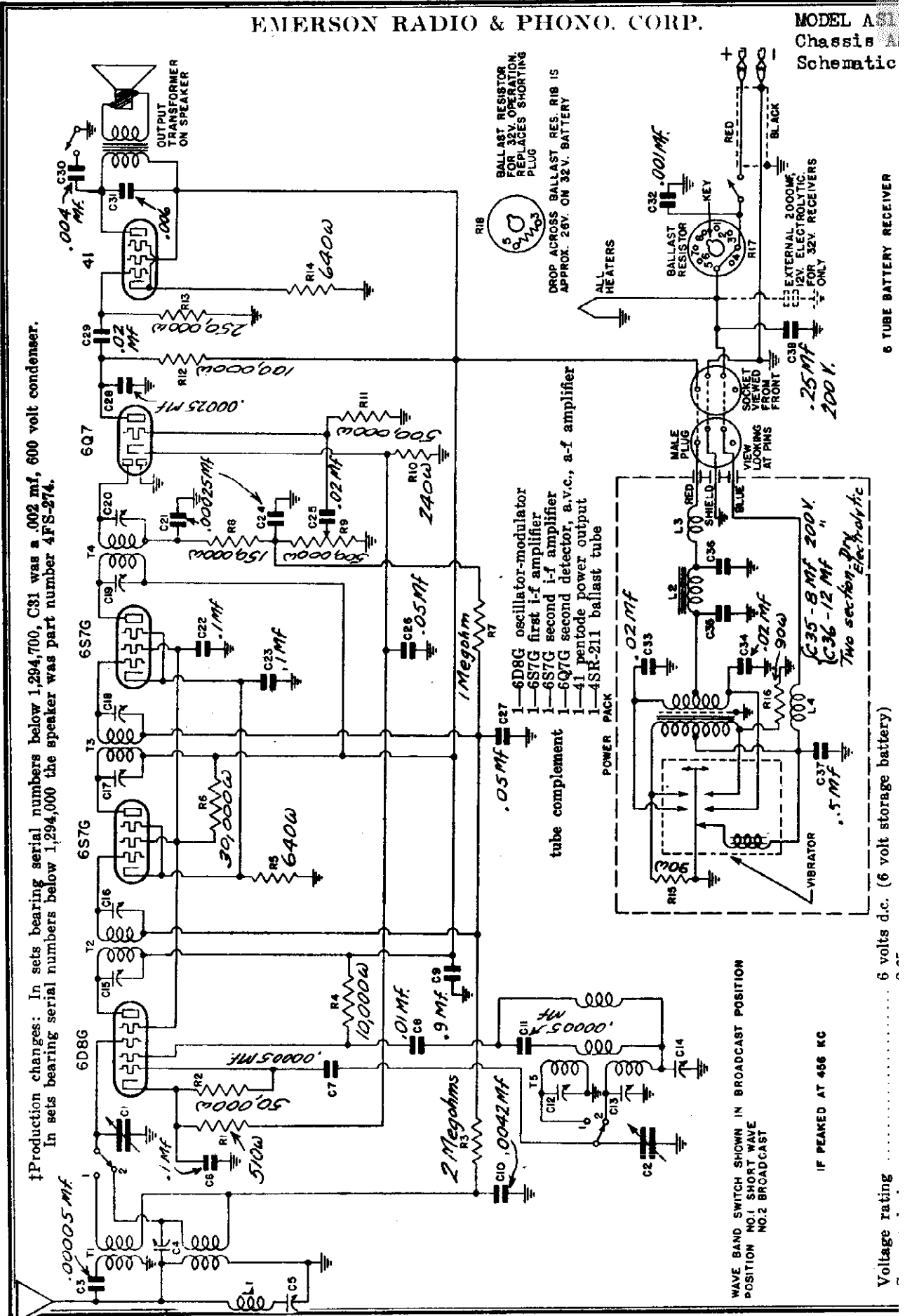
With the wave-band switch at long-wave (clockwise) position set the dial pointer at 150 and feed 150 kc to antenna. Adjust the long-wave series paddler (hex nut on dial paddler) for maximum response. Move pointer to 350 and feed 350 kc to antenna. Adjust the long-wave oscillator trimmer then the long-wave antenna trimmer for maximum response. Reset pointer to 150, feed 150 kc and rock (point back and forth through a small arc) the variable condenser while adjusting long-wave series paddler for maximum response. Reset pointer to 350, feed 350 kc and check alignment. If readjustment is necessary return to 100 kc and repeat entire procedure.

Medium-Wave Alignment

Set switch at medium-wave (central) position and dial pointer at 600. Feed 600 kc to antenna and adjust medium-wave series paddler (slotted screw on dial paddler) for maximum response. Move pointer to 1500, feed 1500 kc and adjust medium-wave oscillator trimmer and then the medium-wave antenna trimmer for maximum response. Reset pointer to 600 feed 600 kc and rock variable condenser while readjusting medium-wave series paddler for maximum response. Reset pointer to 1500, feed 1500 kc and check alignment. If readjustment is necessary return to 600 and repeat entire procedure.

EMERSON RADIO & PHONO. CORP.

MODEL A 51
Chassis
Schematic

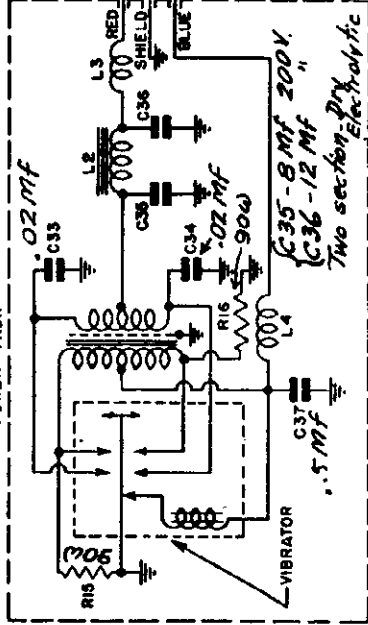


†Production changes: In sets bearing serial numbers below 1,294,700, C31 was a .002 mf, 600 volt condenser.
 In sets bearing serial numbers below 1,294,000 the speaker was part number 4FS-274.

BALLAST RESISTOR FOR 32V OPERATION. REPLACES SHORTING PLUG

DROP ACROSS BALLAST RES. R18 IS APPROX. 26V. ON 32V. BATTERY

- 1-6D8G oscillator-modulator
- 1-6S7G first i-f amplifier
- 1-6S7G second i-f amplifier
- 1-6Q7G second detector, a.v.c., a-f amplifier
- 1-41 pentode power output
- 1-4SR-211 ballast tube



WAVE BAND SWITCH SHOWN IN BROADCAST POSITION
 POSITION NO.1 SHORT WAVE
 POSITION NO.2 BROADCAST

IF PEAKED AT 486 KC

6 Tube Battery Receiver
 Voltage rating 6 volts d.c. (6 volt storage battery)

MODEL AS179

Chassis AS

Alignment, Notes, Voltage

EMERSON RADIO & PHONO. CORP.

ADJUSTMENTS

An oscillator with frequencies of 456, 600, 1600 and 15,000 kc should be used.

An output meter should be used across the voice coil or output transformer for observing maximum response.

If the circuit is at all disturbed, both the broadcast and short-wave bands must be realigned.

Never leave a trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely.

Always use as weak a test signal as possible during alignment.

Use a standard dummy antenna for aligning either of the bands. A .0002 mf condenser may be used for the broadcast band dummy antenna and a 400 ohm non-inductive resistor for the short-wave dummy antenna.

Location of Coils and Trimmer Adjustments

The first i-f transformer, part number 4ET-350C, is located on top of the chassis to the left of the variable condenser.

The second i-f transformer, part number 4ET-350A is located on top of the chassis behind the variable condenser.

The third i-f transformer, part number 4FT-382B, is located on top of the chassis to the right of the variable condenser.

The trimmer condensers, two for each transformer, are accessible through holes in the top of the cans.

The adjustable padding condenser for the broadcast band is mounted underneath the chassis (in the corner near the 6D8G tube) with the screw adjustment accessible through a hole in the front of the chassis.

The antenna coils for the broadcast and short-wave bands and the 456 kc wave-trap are wound on one form and mounted underneath the chassis deck directly behind the adjustable padding condenser. The trimmers for these coils are accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is the broadcast antenna trimmer. The central trimmer is the short-wave antenna trimmer. The trimmer nearest the rear of the chassis is the 456 kc wave-trap.

The oscillator coils for the broadcast and short-wave bands are wound on one form and mounted underneath the chassis deck near the variable condenser. The trimmers for these coils are accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is for the short-wave oscillator coil and the trimmer farthest from the front is for the broadcast oscillator coil.

I-f and Wave-trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 456 kc through a 0.02 mf paper condenser to the grid cap of the 6D8G tube (do not remove the grid clip from the tube). Adjust the six i-f trimmers for maximum response. Feed 456 kc to the antenna through a standard dummy antenna and adjust the wave-trap trimmer for *minimum* response. (See General Notes.)

Broadcast Alignment

Rotate the wave-band switch to the broadcast position (clockwise) and set the dial pointer at 600. Feed 600 kc through a standard dummy antenna. Adjust the broadcast series padding condenser for maximum response. Move pointer to 1600, feed 1600 kc and adjust the broadcast oscillator trimmer for maximum response and then adjust the broadcast antenna trimmer for maximum response. Return pointer to 600, feed 600 kc and readjust the series padding condenser, rocking the variable condenser for maximum response.

The set's oscillator is higher in frequency than the signal on the broadcast band, so images should be observed on the low-frequency side of the signals.

Short-Wave Alignment

Rotate the wave-band switch to the short-wave (counter-clockwise) position, and set the dial pointer exactly at 15 megacycles. Feed 15,000 kc to the antenna through a 400 ohm non-inductive resistor and adjust the short-wave oscillator trimmer for maximum response, and then adjust the short-wave antenna trimmer for maximum response. Be very careful to choose the maximum capacity peak on the oscillator trimmer.

The set's oscillator is lower in frequency than the signal (on the short-wave band only), so images should be observed on the high frequency side of the signal.

1. The large, oblong metal box behind the speaker contains the power pack. The function of this power pack is to convert the 6 volt direct current from the storage battery into 150 volt direct current. The vibrator used is of the synchronous type.
2. The wave-trap in the receiver has been adjusted for maximum signal rejection at 456 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.
3. Particular care should be taken in connecting the battery to the receiver. The heavy battery cable emerging from the rear of the receiver terminates in two separate leads with clips attached. Note that the clip at the end of the red rubber covered lead is marked with a plus sign (+). This clip should be attached to the *positive* terminal of the six-volt storage battery. The other clip, on the braid covered lead should be attached to the *negative* terminal of the storage battery. It is important to observe the proper polarity in connecting the battery. Reversed connections with the receiver turned on will result in serious damage to the receiver.
4. Make certain that all battery connections make good contact, otherwise the receiver may be noisy. The positive terminal of an unmarked battery may be distinguished by a deposit of green corrosion, which usually collects on this terminal. On most batteries the positive terminal is larger than the negative terminal.
5. The color coding of the leads of the i-f transformers is as follows:

Grid—green	Plate—blue
Grid return—black	B plus—red
6. With few exceptions the color coding of the general wiring is as follows:

Plate—blue	Cathode—white or yellow
B plus—red	Grid—green
Screen—brown	Filament and ground—black
7. The color coding of the leads of the power pack is as follows:

A plus—blue	B plus—red	Common neg.—shield
-------------	------------	--------------------

The receiver may be quickly and easily adapted for operation from a 32 volt power supply. A complete kit, Model W-95, containing the additional parts required for this conversion may be purchased through Emerson dealers. Complete instructions for attaching these additional parts are supplied with each kit.

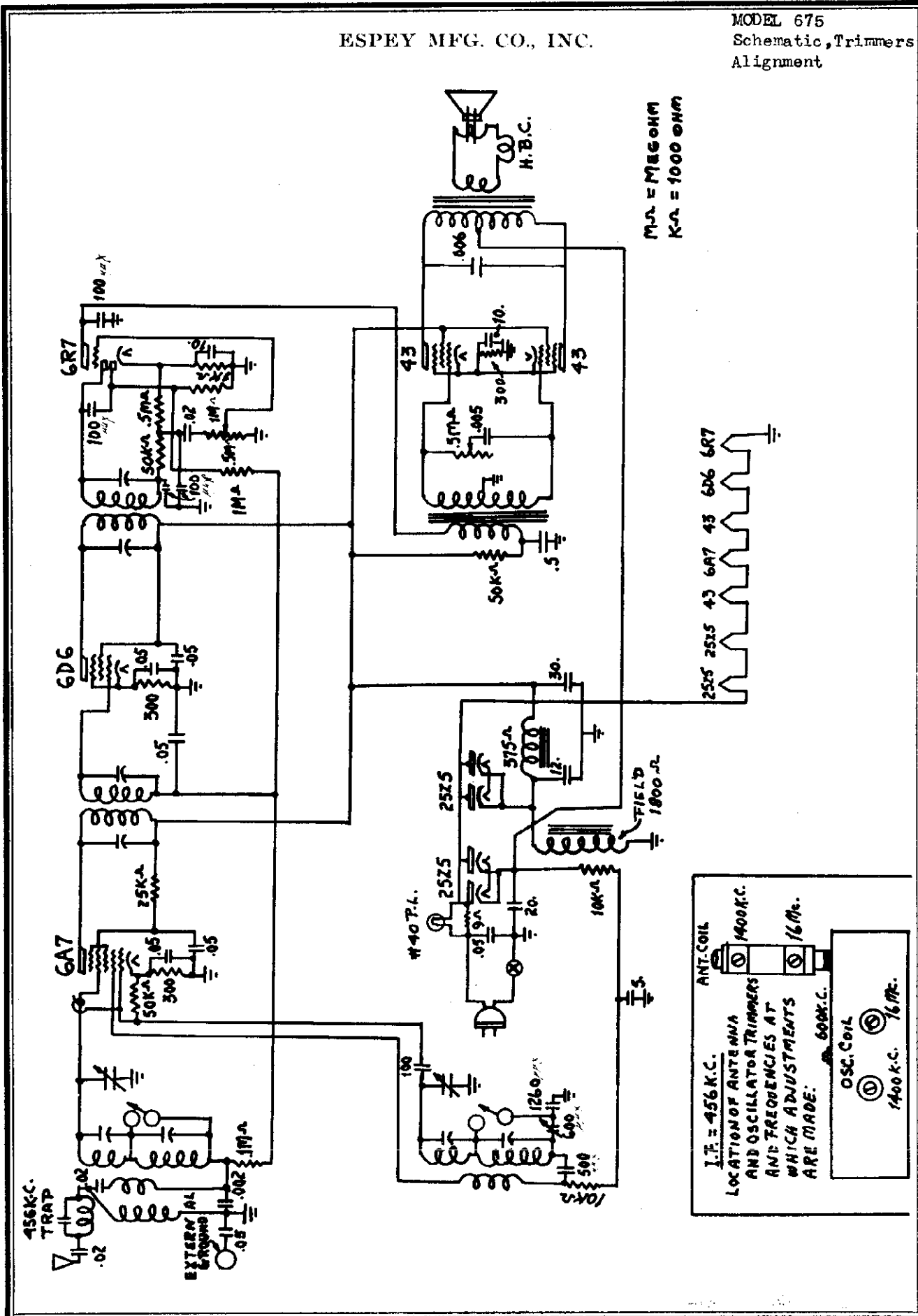
Readings should be taken with a 1,000 ohms-per-volt meter. Voltages listed below are from point indicated to chassis with volume control turned on full and no signal. Battery voltage for these readings was 6.1 volts.

Tube	Plate	Screen	Cathode	Osc. Plate
6D8G osc.-mod.	150	60	4	120
6S7G 1st i-f	150	60	4	—
6S7G 2nd i-f	150	60	4	—
6Q7G 2nd detector	95	—	1.4	—
41 output	145	150	10.5	—

VOLTAGE ANALYSIS

ESPEY MFG. CO., INC.

MODEL 675
Schematic, Trimmers
Alignment



MΩ = MEGOHM
KΩ = 1000 OHM

ANT. COIL
1400K.C.

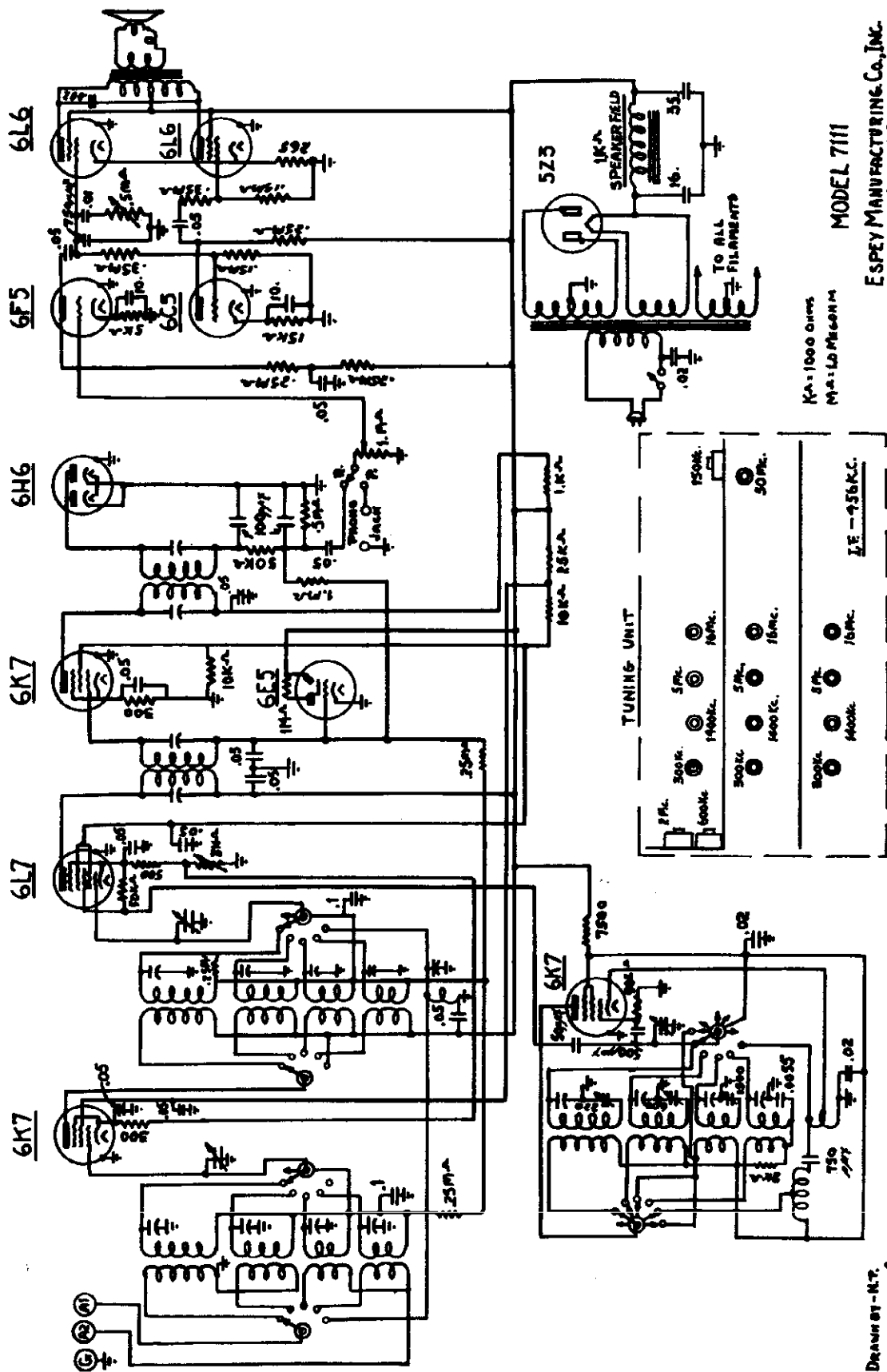
OSC. COIL
600K.C.

LOCATION OF ANTENNA AND OSCILLATOR TRIMMERS AND FREQUENCIES AT WHICH ADJUSTMENTS ARE MADE:

- 1400 K.C.
- 16 Mc.
- 1400 K.C.
- 16 Mc.

ESPEY MFG. CO., INC.

MODEL 7111
Schematic
Trimmers, Alignment



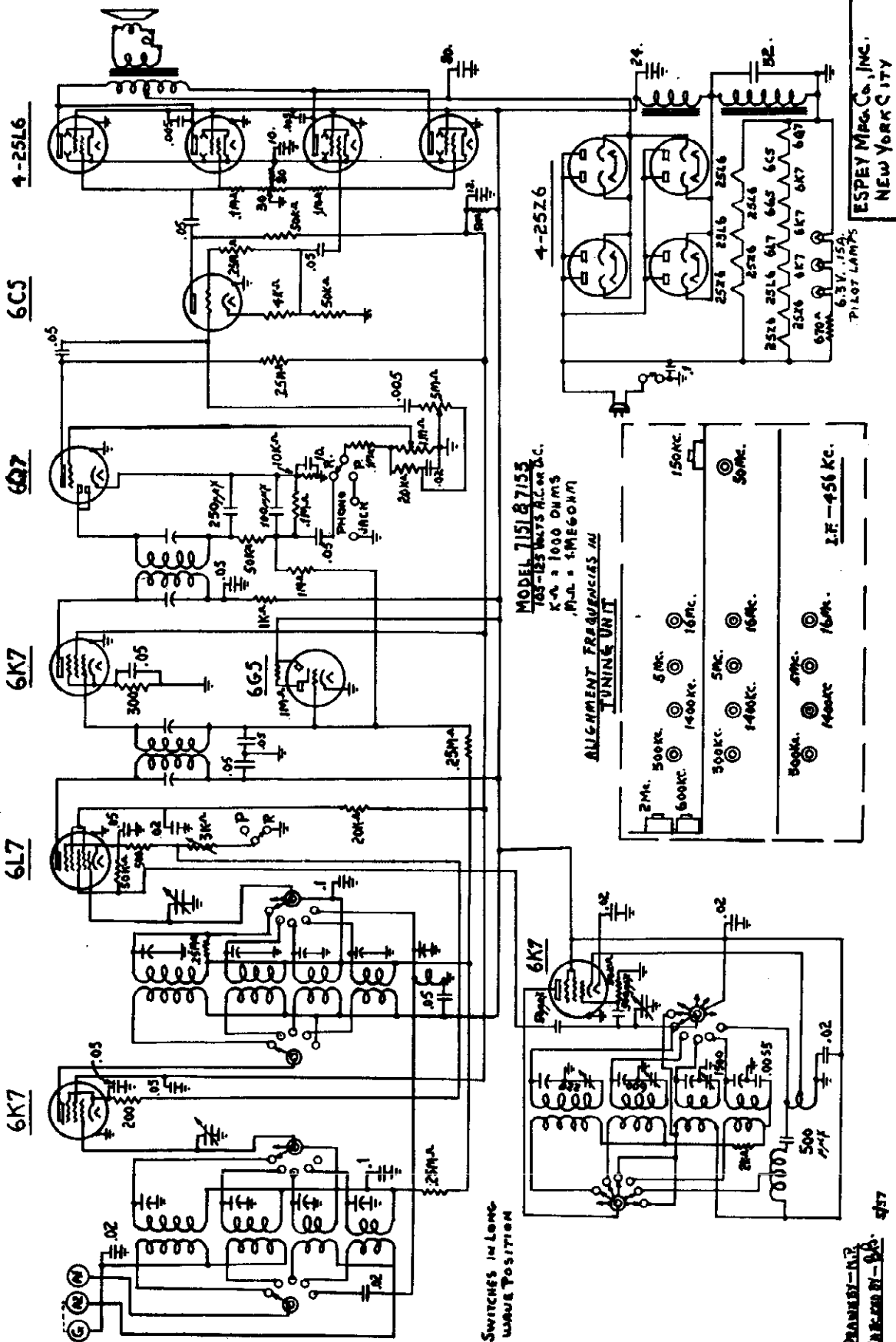
MODEL 7111
ESPEY MANUFACTURING CO., INC.
NEW YORK CITY

KA-1000 0-1000
MA-10 0-1000

DRAWN BY - R.T.
CHECKED BY - G.B.

MODELS 7151, 7153
Schematic, Trimmers
Alignment

ESPEY MFG. CO., INC.

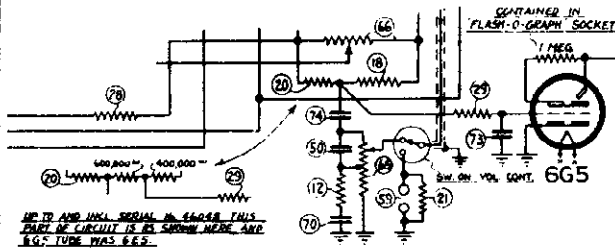


SWITCHES IN LOW
WAVE POSITION

DRAWING-NL7
CAGE NO. 81-86.
477

FADA RADIO & ELECTRIC CO

MODEL 211(Late)
Alignment, Changes
Socket, Trimmers



The Schematic of the EARLY model on page 7-3 is the same as the latest model with the exception, Ref.No.54 was .00093 Mf, changed to .0007 MF, MICA, the latter value shunted by Ref.No. 89, Padding Condenser of 110 to 250 MMF.

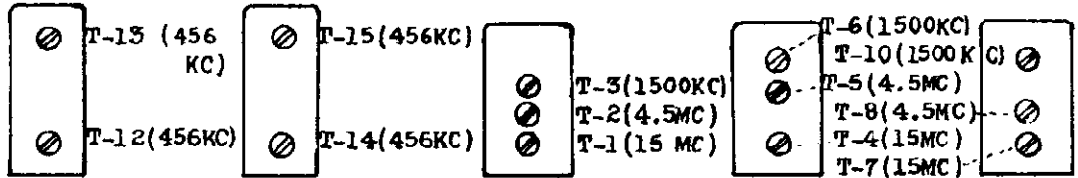
The changes in the Flash-o-graph circuit is given in the insert to the left.

FLASH-O-GRAPH CIRCUIT CHANGES

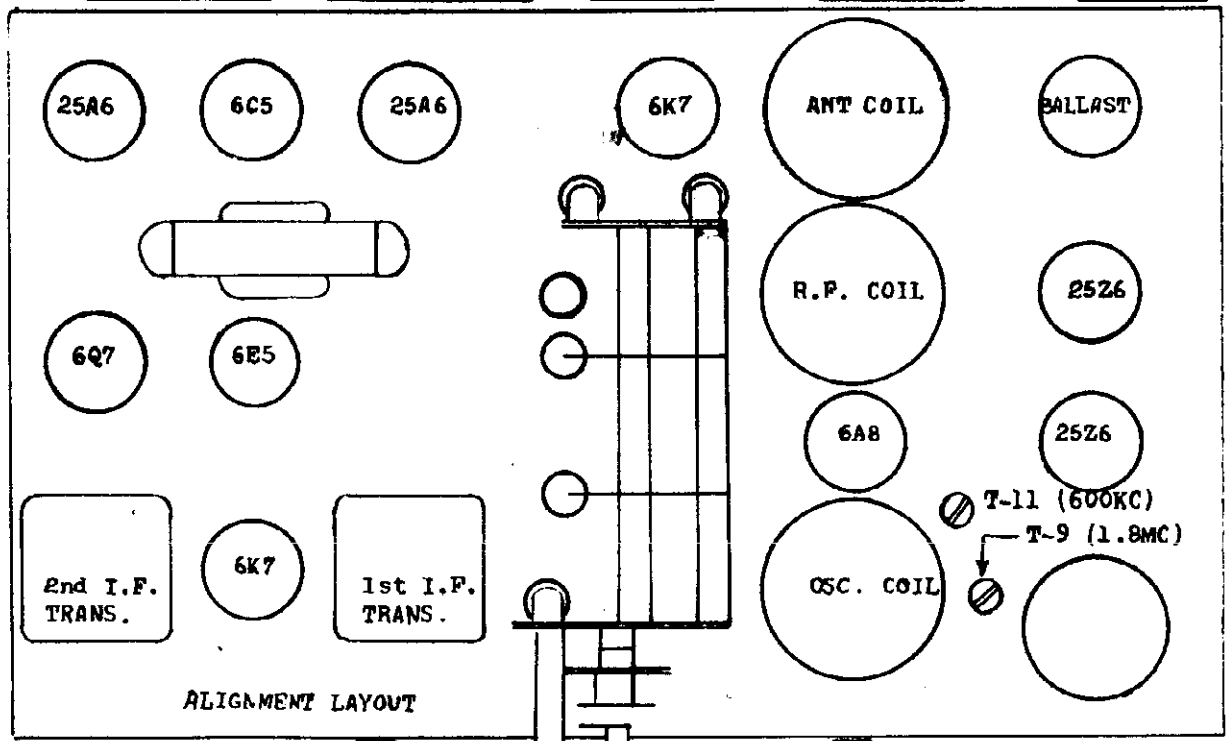
ALIGNMENT TABLE

WAVE BAND	DIAL FRE.	GEN. FRE.	IMAGE FRE.	DUMMY ANTENNA	GENERATOR CON. TO	ADJUST TRIMMER
BC	---	456KC	- -	.001 MF 50 M	CG of IF	T15, T14
BC	- -	456KC	- -	Same	CG of 6A8	T13, T12
A	15 MC	15 MC	15.9MC	400	"Y" Ant.	T7, T4, T1
A	6 MC	6 MC	- -	Same	Same	Chk. Sen.
B	4.5MC	4.5MC	- -	Same	Same	T8, T5, T2
B	1.8MC	1.8MC	- -	Same	Same	T9(Rock V.C.)
C	1500KC	1500KC	- -	200 MMF	Same	T10, T6, T3
C	600KC	600KC	- -	Same	Same	T11(Rock VC)

All adjustments made with selectivity control in the "S" Position



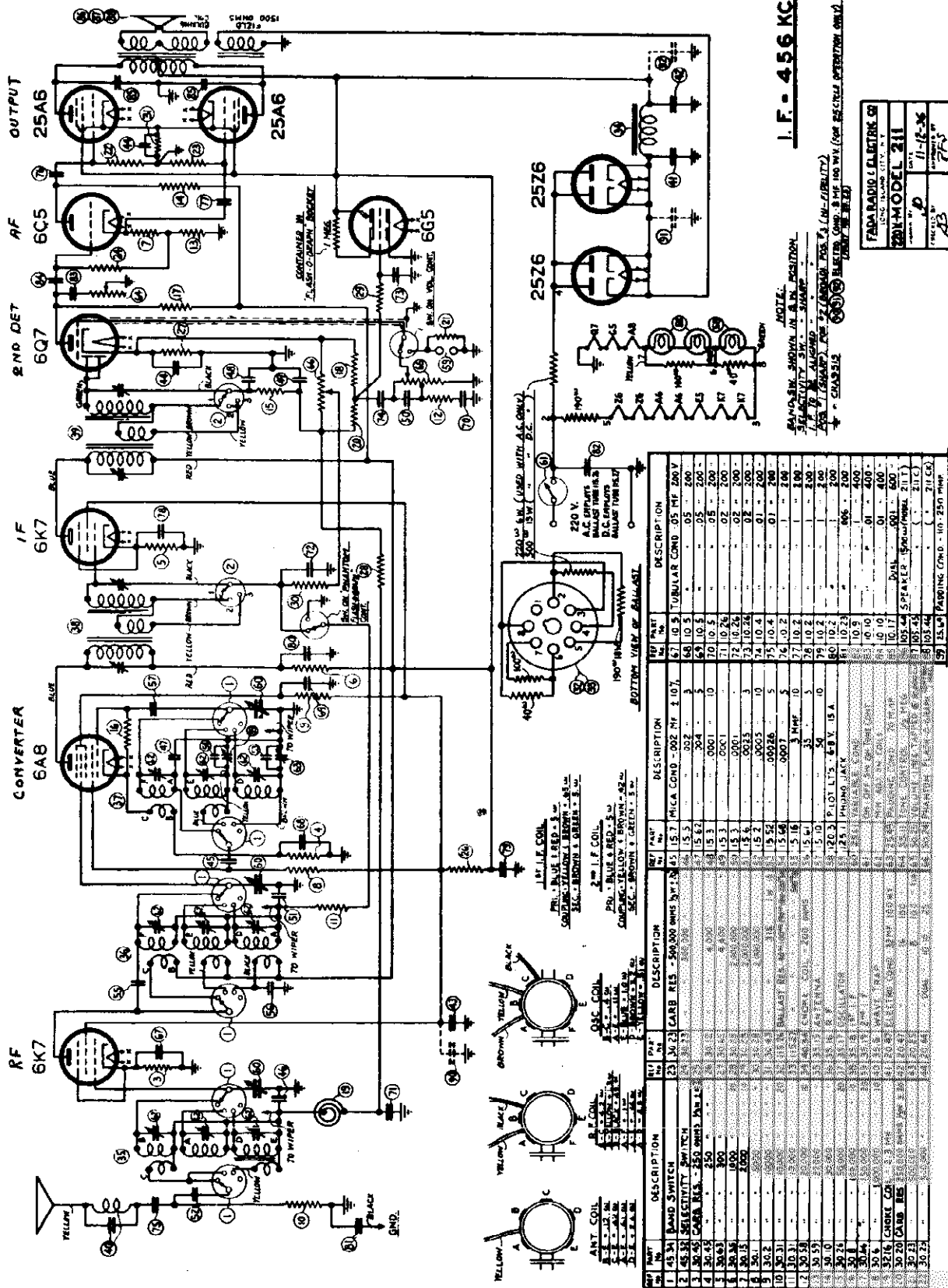
1st I.F. Trans. 2nd I.F. Trans. Ant. Coil R. F. Coil Osc. Coil



ALIGNMENT LAYOUT

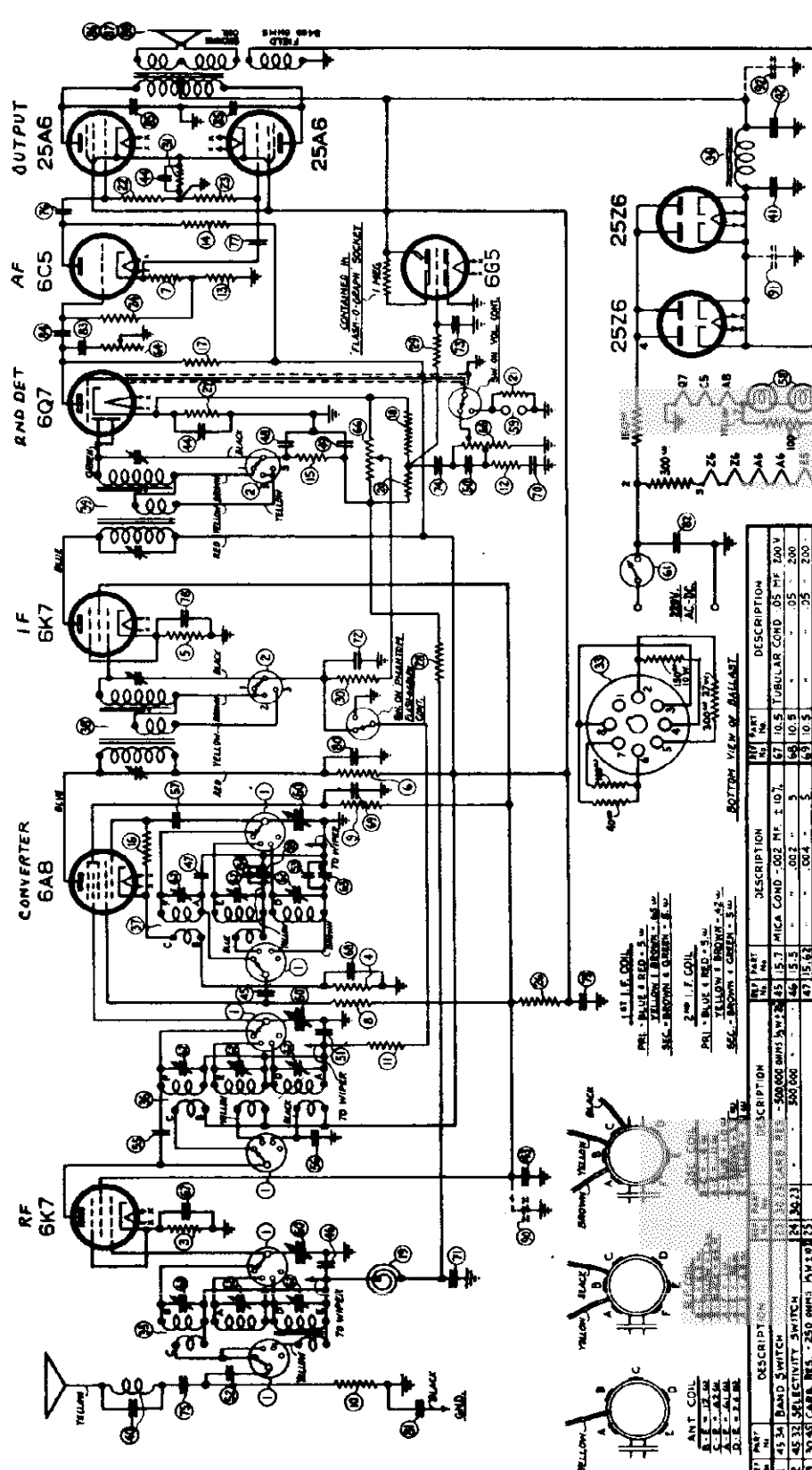
MODEL 211(220V)
Schematic, Parts

FADA RADIO & ELECTRIC CO.



FADA RADIO & ELECTRIC CO.

MODEL 211B(220V)
Schematic, Parts



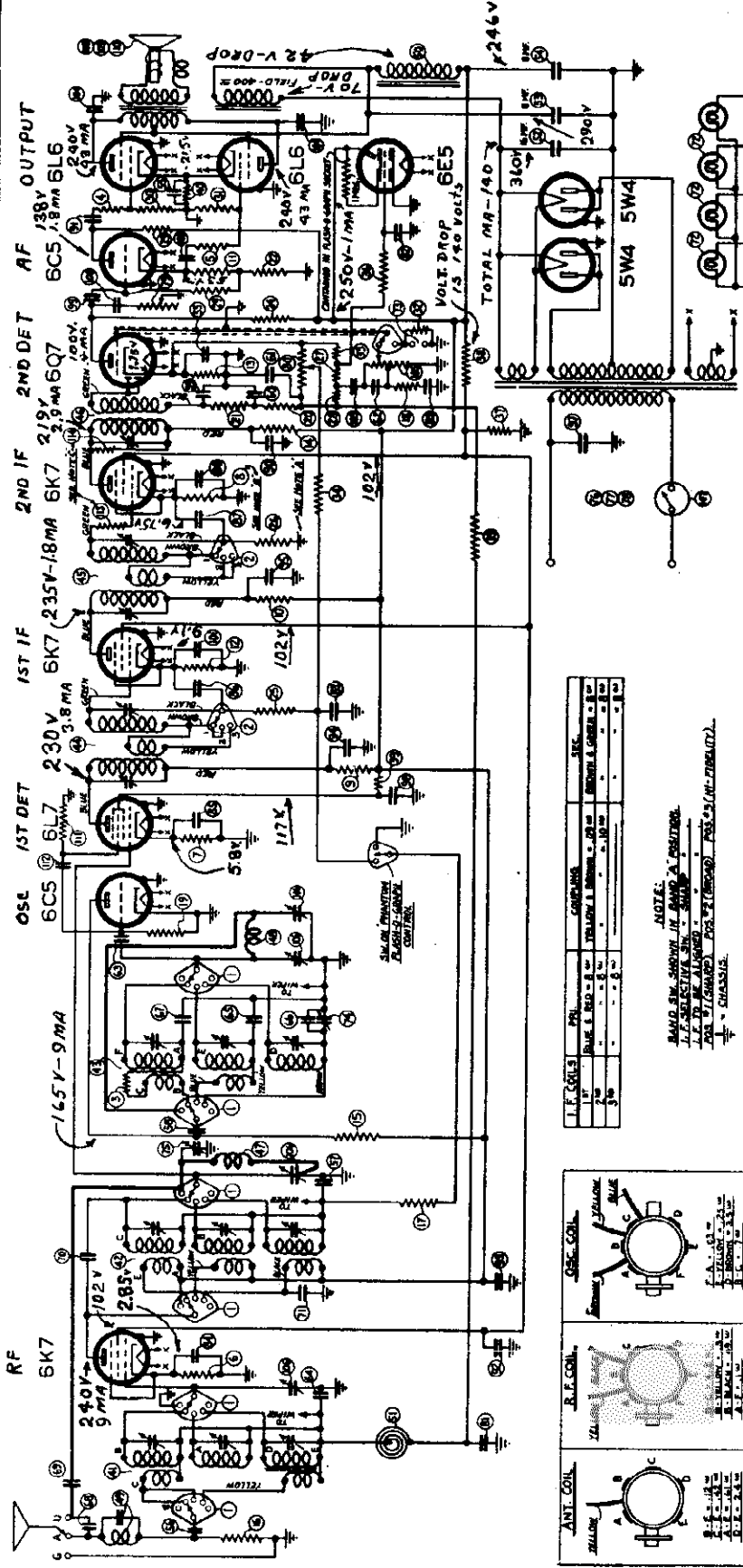
PT. NO.	DESCRIPTION	PT. NO.	DESCRIPTION
1	ANT. COIL	11	100K
2	50,000	12	50K
3	50,000	13	10K
4	50,000	14	50,000
5	50,000	15	50,000
6	50,000	16	50,000
7	50,000	17	50,000
8	50,000	18	50,000
9	50,000	19	50,000
10	50,000	20	50,000
11	50,000	21	50,000
12	50,000	22	50,000
13	50,000	23	50,000
14	50,000	24	50,000
15	50,000	25	50,000
16	50,000	26	50,000
17	50,000	27	50,000
18	50,000	28	50,000
19	50,000	29	50,000
20	50,000	30	50,000
21	50,000	31	50,000
22	50,000	32	50,000
23	50,000	33	50,000
24	50,000	34	50,000
25	50,000	35	50,000
26	50,000	36	50,000
27	50,000	37	50,000
28	50,000	38	50,000
29	50,000	39	50,000
30	50,000	40	50,000
31	50,000	41	50,000
32	50,000	42	50,000
33	50,000	43	50,000
34	50,000	44	50,000
35	50,000	45	50,000
36	50,000	46	50,000
37	50,000	47	50,000
38	50,000	48	50,000
39	50,000	49	50,000
40	50,000	50	50,000

I. F. = 456 KC.

FADA RADIO & ELECTRIC CO.
220 V. MODEL 211 B
MADE IN U.S.A.
SERIAL NO. 1-15-36

MODEL 212
Schematic
Voltage, Parts

FADA RADIO & ELECTRIC CO



FOR ALIGNMENT, SEE INDEX

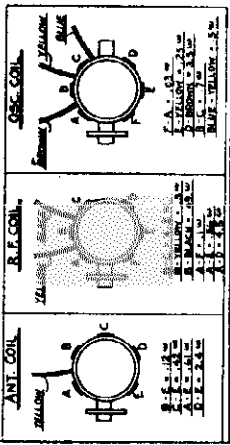
I.F. - 456 KC.

FADA RADIO ELECTRIC CO
175 W. 42nd St., N. Y. C.
MODEL 212
9-15-34
J.M.S.

PART NO.	DESCRIPTION	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
1	ANT. COIL	107	TUBULAR COND. .05 MF 450V	108	100V 500 MA
2	R.F. COIL	109	100V 500 MA	109	100V 500 MA
3	OSC. COIL	110	100V 500 MA	110	100V 500 MA
4	6K7	111	100V 500 MA	111	100V 500 MA
5	6L7	112	100V 500 MA	112	100V 500 MA
6	6K7	113	100V 500 MA	113	100V 500 MA
7	6Q7	114	100V 500 MA	114	100V 500 MA
8	6CS	115	100V 500 MA	115	100V 500 MA
9	6S6	116	100V 500 MA	116	100V 500 MA
10	5W4	117	100V 500 MA	117	100V 500 MA
11	240V	118	100V 500 MA	118	100V 500 MA
12	250V-100V	119	100V 500 MA	119	100V 500 MA
13	5W4	120	100V 500 MA	120	100V 500 MA
14	600 Ohm 100W	121	100V 500 MA	121	100V 500 MA
15	2V-DROP	122	100V 500 MA	122	100V 500 MA
16	100V	123	100V 500 MA	123	100V 500 MA
17	500 MA	124	100V 500 MA	124	100V 500 MA
18	100V	125	100V 500 MA	125	100V 500 MA
19	500 MA	126	100V 500 MA	126	100V 500 MA
20	100V	127	100V 500 MA	127	100V 500 MA
21	500 MA	128	100V 500 MA	128	100V 500 MA
22	100V	129	100V 500 MA	129	100V 500 MA
23	500 MA	130	100V 500 MA	130	100V 500 MA
24	100V	131	100V 500 MA	131	100V 500 MA

I.F. COILS

1ST	6K7	100V 500 MA
2ND	6K7	100V 500 MA
3RD	6Q7	100V 500 MA



NOTE:
BAND SW. SHOWN IN BAND A POSITION.
IF BAND SW. IS IN BAND B POSITION,
FOR WIRING SEE PARTS LIST.
= CHANGE.

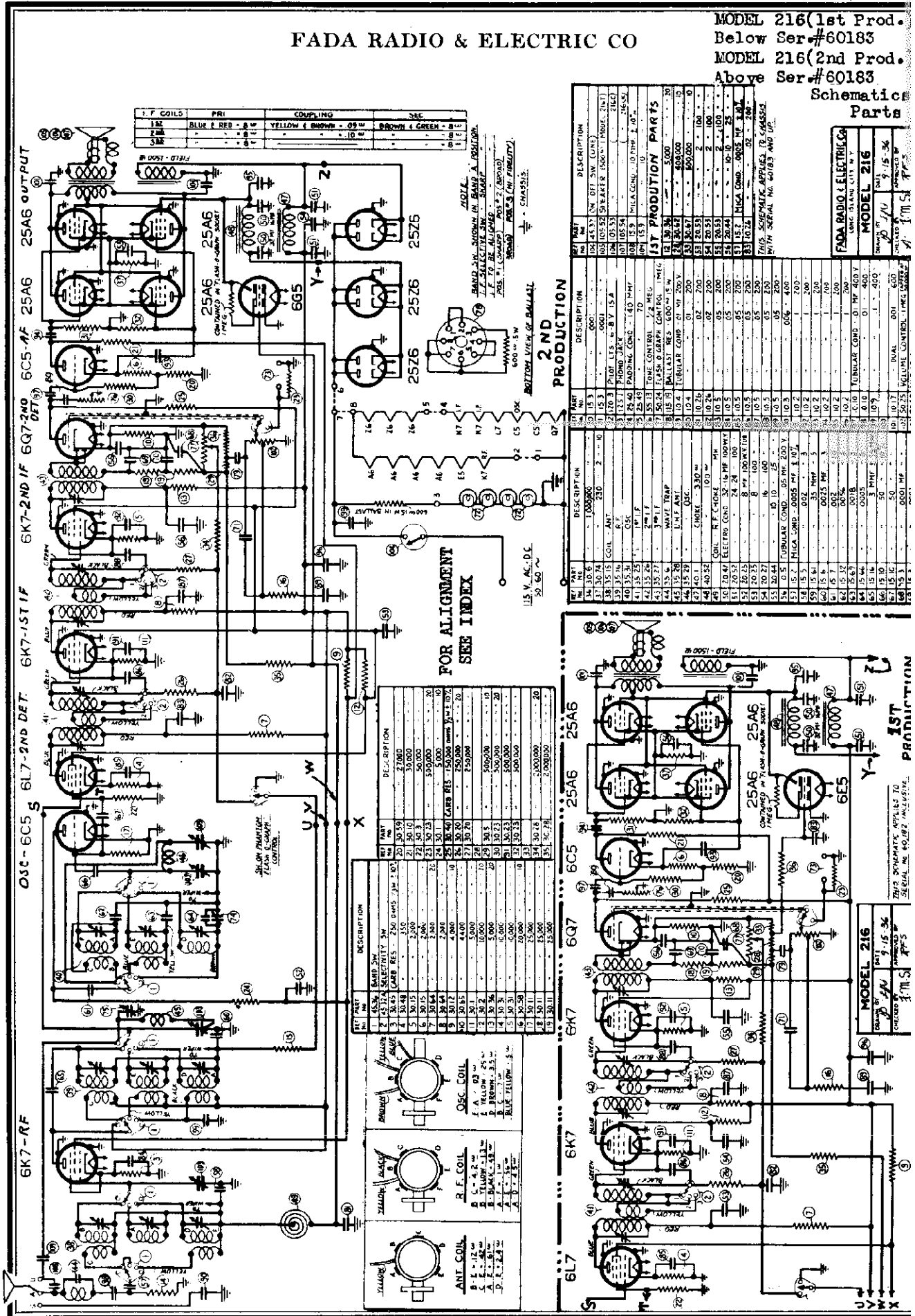
NOTE: A-17C FLASH W/ 117
W/ 200V-100V TRANSFORMER
W/ 500 MA 100V TRANSFORMER
W/ 118 V 118
ADDED ON LATE MODELS

FIELD OUTPUT
COIL
400 W 500 MA
400 W 400 V 1/2

FADA RADIO & ELECTRIC CO

MODEL 216 (1st Prod. Below Ser #60183)
 MODEL 216 (2nd Prod. Above Ser #60183)

Schematic Parts



1. F. COILS	PRI	COUPLING	SEC
1st	BLUE & RED - A	YELLOW & BROWN - 09 W	BROWN & GREEN - B
2nd	BLUE & RED - A	YELLOW & BROWN - 09 W	BROWN & GREEN - B
3rd	BLUE & RED - A	YELLOW & BROWN - 09 W	BROWN & GREEN - B

NOTE:
 BAND SW. SHOWN IN BAND A. POSITION.
 I.F. SELECTIVE SW. SHOWN
 IN BAND A. POSITION.
 THIS SCHEMATIC APPLIES TO CASSES
 WITH SERIAL NO. 40183 AND UP.

PT. NO.	DESCRIPTION	QTY.
101	110V. AC-DC	1
102	110V. AC-DC	1
103	110V. AC-DC	1
104	110V. AC-DC	1
105	110V. AC-DC	1
106	110V. AC-DC	1
107	110V. AC-DC	1
108	110V. AC-DC	1
109	110V. AC-DC	1
110	110V. AC-DC	1
111	110V. AC-DC	1
112	110V. AC-DC	1
113	110V. AC-DC	1
114	110V. AC-DC	1
115	110V. AC-DC	1
116	110V. AC-DC	1
117	110V. AC-DC	1
118	110V. AC-DC	1
119	110V. AC-DC	1
120	110V. AC-DC	1

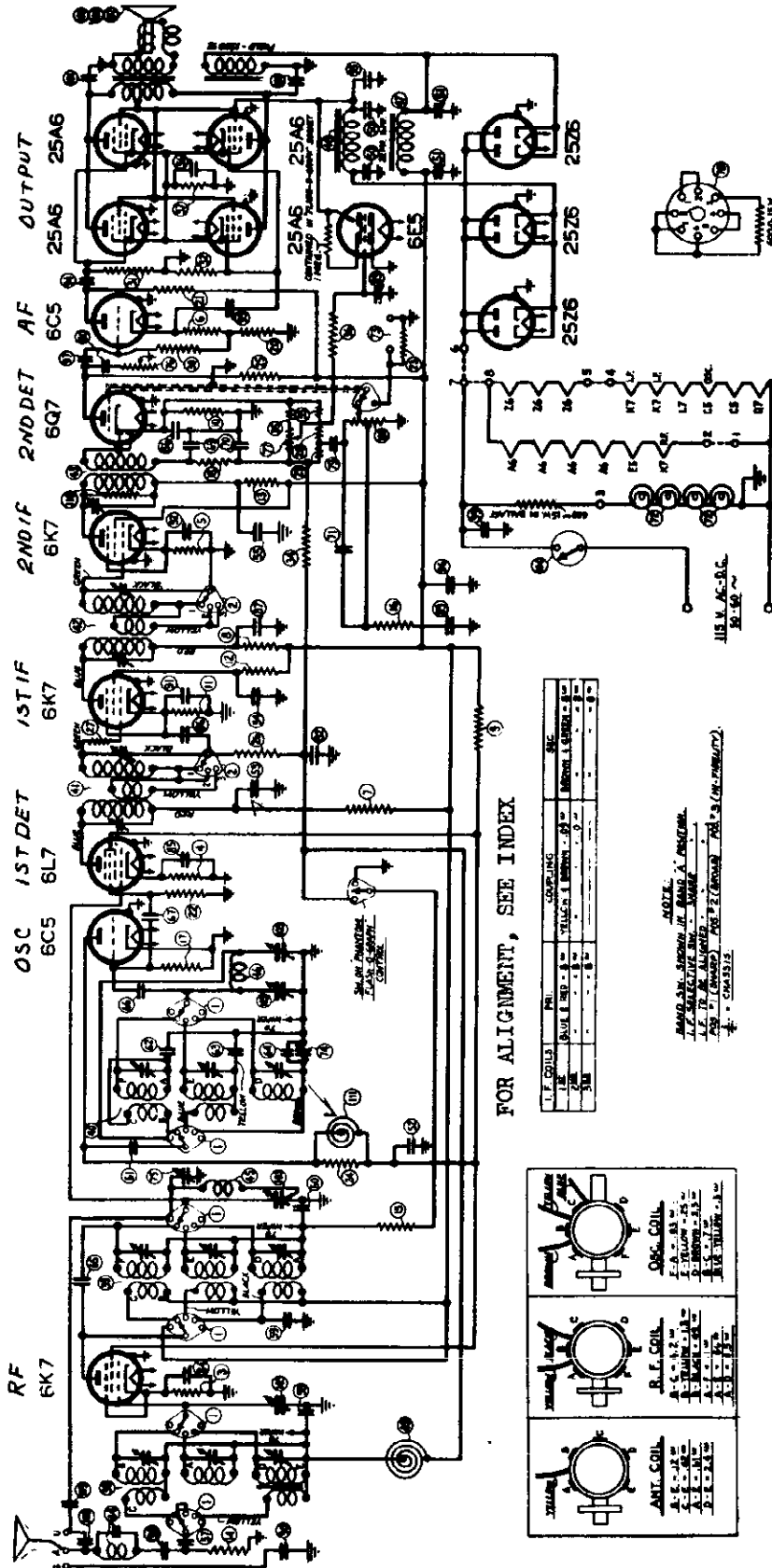
FOR ALIGNMENT
 SEE INDEX

2ND PRODUCTION

1ST PRODUCTION

MODEL 216(3rd Prod.)
Schematic, Parts

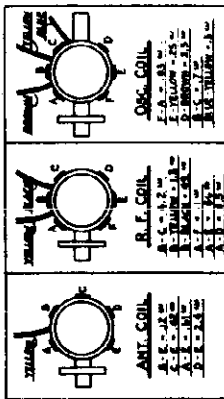
FADA RADIO & ELECTRIC CO.



FOR ALIGNMENT, SEE INDEX

L.F. COILS	PHI	COUPLING	SEC.
1	1	1	1
2	2	2	2
3	3	3	3

NOTE:
SPEAKER SHIPPED IN SEPARATE BOX.
L.F. COILS SHIPPED IN SEPARATE BOX.
ANT. COIL SHIPPED IN SEPARATE BOX.
R.F. COIL SHIPPED IN SEPARATE BOX.
OSC. COIL SHIPPED IN SEPARATE BOX.



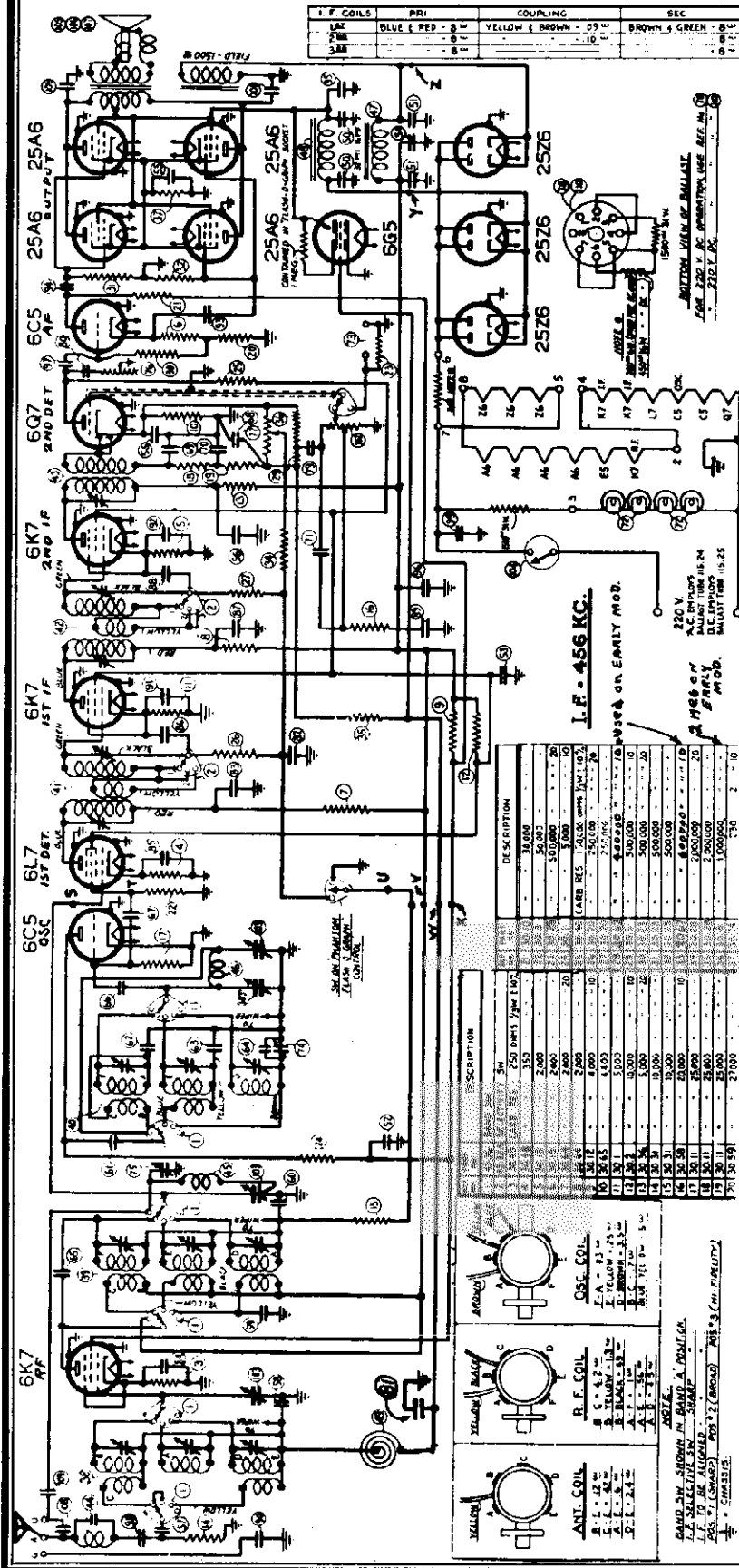
NO.	QTY.	DESCRIPTION	NO.	QTY.	DESCRIPTION
1	1	ANT. COIL	10	1	10K RES.
2	1	R.F. COIL	11	1	100K RES.
3	1	OSC. COIL	12	1	1M RES.
4	1	100K RES.	13	1	100K RES.
5	1	100K RES.	14	1	100K RES.
6	1	100K RES.	15	1	100K RES.
7	1	100K RES.	16	1	100K RES.
8	1	100K RES.	17	1	100K RES.
9	1	100K RES.	18	1	100K RES.
10	1	100K RES.	19	1	100K RES.
11	1	100K RES.	20	1	100K RES.
12	1	100K RES.	21	1	100K RES.
13	1	100K RES.	22	1	100K RES.
14	1	100K RES.	23	1	100K RES.
15	1	100K RES.	24	1	100K RES.
16	1	100K RES.	25	1	100K RES.
17	1	100K RES.	26	1	100K RES.
18	1	100K RES.	27	1	100K RES.
19	1	100K RES.	28	1	100K RES.
20	1	100K RES.	29	1	100K RES.
21	1	100K RES.	30	1	100K RES.
22	1	100K RES.	31	1	100K RES.
23	1	100K RES.	32	1	100K RES.
24	1	100K RES.	33	1	100K RES.
25	1	100K RES.	34	1	100K RES.
26	1	100K RES.	35	1	100K RES.
27	1	100K RES.	36	1	100K RES.
28	1	100K RES.	37	1	100K RES.
29	1	100K RES.	38	1	100K RES.
30	1	100K RES.	39	1	100K RES.
31	1	100K RES.	40	1	100K RES.
32	1	100K RES.	41	1	100K RES.
33	1	100K RES.	42	1	100K RES.
34	1	100K RES.	43	1	100K RES.
35	1	100K RES.	44	1	100K RES.
36	1	100K RES.	45	1	100K RES.
37	1	100K RES.	46	1	100K RES.
38	1	100K RES.	47	1	100K RES.
39	1	100K RES.	48	1	100K RES.
40	1	100K RES.	49	1	100K RES.
41	1	100K RES.	50	1	100K RES.
42	1	100K RES.	51	1	100K RES.
43	1	100K RES.	52	1	100K RES.
44	1	100K RES.	53	1	100K RES.
45	1	100K RES.	54	1	100K RES.
46	1	100K RES.	55	1	100K RES.
47	1	100K RES.	56	1	100K RES.
48	1	100K RES.	57	1	100K RES.
49	1	100K RES.	58	1	100K RES.
50	1	100K RES.	59	1	100K RES.
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52	1	100K RES.	61	1	100K RES.
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55	1	100K RES.	64	1	100K RES.
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58	1	100K RES.	67	1	100K RES.
59	1	100K RES.	68	1	100K RES.
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61	1	100K RES.	70	1	100K RES.
62	1	100K RES.	71	1	100K RES.
63	1	100K RES.	72	1	100K RES.
64	1	100K RES.	73	1	100K RES.
65	1	100K RES.	74	1	100K RES.
66	1	100K RES.	75	1	100K RES.
67	1	100K RES.	76	1	100K RES.
68	1	100K RES.	77	1	100K RES.
69	1	100K RES.	78	1	100K RES.
70	1	100K RES.	79	1	100K RES.
71	1	100K RES.	80	1	100K RES.
72	1	100K RES.	81	1	100K RES.
73	1	100K RES.	82	1	100K RES.
74	1	100K RES.	83	1	100K RES.
75	1	100K RES.	84	1	100K RES.
76	1	100K RES.	85	1	100K RES.
77	1	100K RES.	86	1	100K RES.
78	1	100K RES.	87	1	100K RES.
79	1	100K RES.	88	1	100K RES.
80	1	100K RES.	89	1	100K RES.
81	1	100K RES.	90	1	100K RES.
82	1	100K RES.	91	1	100K RES.
83	1	100K RES.	92	1	100K RES.
84	1	100K RES.	93	1	100K RES.
85	1	100K RES.	94	1	100K RES.
86	1	100K RES.	95	1	100K RES.
87	1	100K RES.	96	1	100K RES.
88	1	100K RES.	97	1	100K RES.
89	1	100K RES.	98	1	100K RES.
90	1	100K RES.	99	1	100K RES.
91	1	100K RES.	100	1	100K RES.

I.F. - 450 KC.
3 RD
PRODUCTION
FADA RADIO & ELECTRIC CO.
MODEL 216
2-9-37

SEE OTHER SIDE FOR CABINET DETAILS

FADA RADIO & ELECTRIC CO.

MODEL 216(220V.)
 1st Prod. Below Ser. #60182
 MODEL 216(220V.)
 2nd Prod. Above Ser. #60182



I.F. COILS	COUPLING	SEC.
PRI	YELLOW & BROWN - 09	BROWN & GREEN - 01
SEC	YELLOW & BROWN - 09	BROWN & GREEN - 01
1-1	0.1	0.1
2-2	0.1	0.1
3-3	0.1	0.1

DESCRIPTION	QTY
30,000	1
50,000	1
100,000	1
500,000	1
1,000,000	1
10,000	1
50,000	1
100,000	1
250,000	1
500,000	1
1,000,000	1
2,000	1
5,000	1
10,000	1
20,000	1
50,000	1
100,000	1
250,000	1
500,000	1
1,000,000	1
2,000	1
5,000	1
10,000	1
20,000	1
50,000	1
100,000	1
250,000	1
500,000	1
1,000,000	1

DESCRIPTION	QTY
30,000	1
50,000	1
100,000	1
500,000	1
1,000,000	1
10,000	1
50,000	1
100,000	1
250,000	1
500,000	1
1,000,000	1
2,000	1
5,000	1
10,000	1
20,000	1
50,000	1
100,000	1
250,000	1
500,000	1
1,000,000	1



ANT. COIL
 R.F. COIL
 OSC. COIL

220 V. BALLAST TUBE IN 24 D.C. IMPEDORS BALLAST TUBE IN 25

100,000

500,000

1,000,000

2,000

5,000

10,000

20,000

50,000

100,000

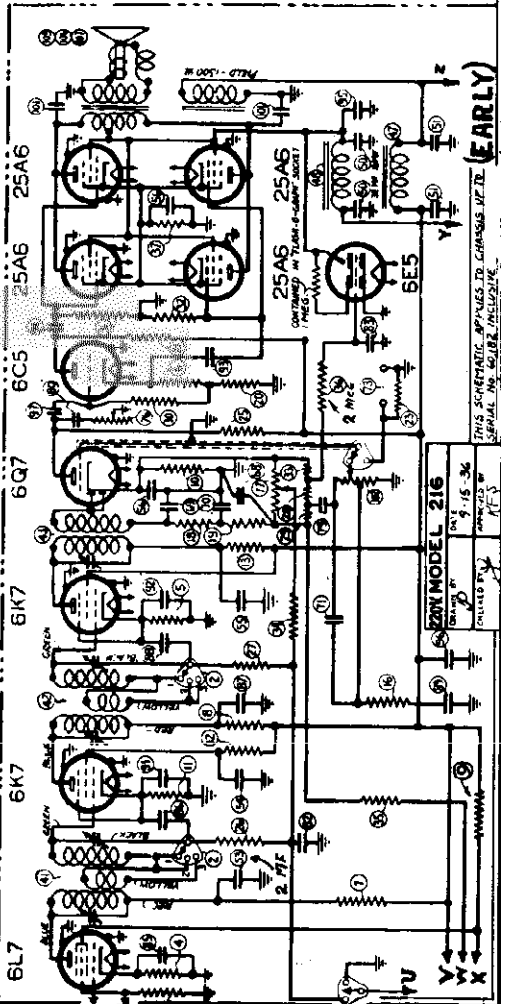
250,000

500,000

1,000,000

NO.	PART	DESCRIPTION
1	6K7	6K7 1ST I.F.
2	6L7	6L7 1ST DET.
3	6C5	6C5 83C
4	6K7	6K7 2ND I.F.
5	6Q7	6Q7 2ND DET.
6	6C5	6C5 83C
7	25A6	25A6 6UT-PT.
8	25A6	25A6 6UT-PT.
9	6S5	6S5 5A5
10	2576	2576 2576
11	2576	2576 2576

NO.	PART	DESCRIPTION
12	15	15 15
13	15	15 15
14	15	15 15
15	15	15 15
16	15	15 15
17	15	15 15
18	15	15 15
19	15	15 15
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96	15	15 15
97	15	15 15
98	15	15 15
99	15	15 15
100	15	15 15



MODEL 212
MODEL 216, All Prod. FADA RADIO & ELECTRIC CO
MODEL 216(220V)
 Alignment, Socket
 Trimmers

MODELS 216 and 216 (220 Volt) ALIGNMENT TABLE

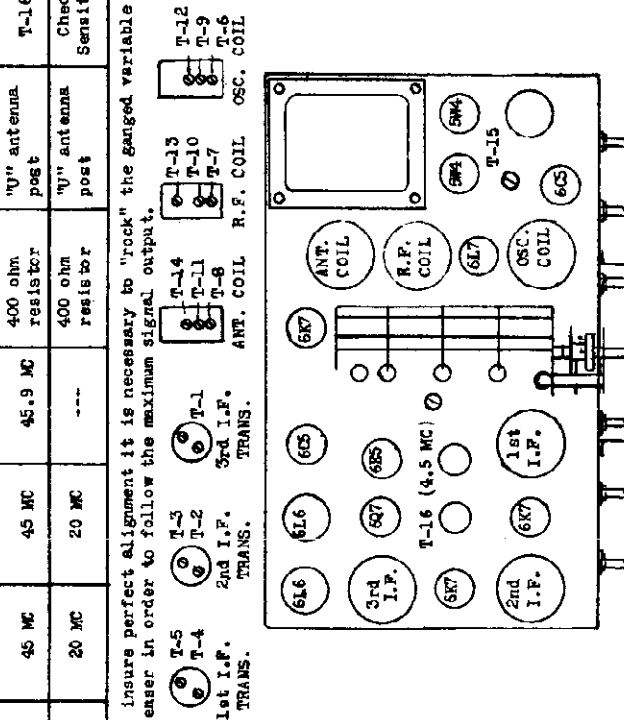
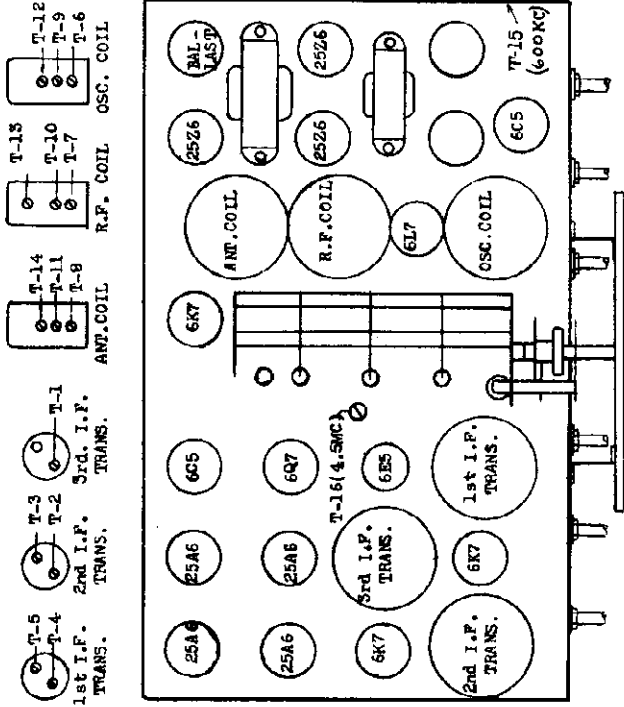
Wave Band	Dial Frequency	Generator Frequency	Image Frequency	Dummy Antenna	Generator connected to	Adjust Trimmer
C	1000 KC	456 KC	---	.001 MF & 50M control grid	1st I.F. Tube	T-1, T-2, T-3
C	1000 KC	456 KC	---	.001 MF & 50M control grid	5L7 Tube	T-4, T-5
A	15 MC	15 MC	15.9 MC	400 Ohm Res.	"A" Antenna Post	T-6, T-7, T-8
A	6 MC	6 MC	---	400 Ohm Res.	"A" Antenna Post	Check Sensitivity T-9, T-10, T-11
B	4.5 MC	4.5 MC	3.6 MC	400 Ohm Res.	"A" Antenna Post	Check Sensitivity T-12, T-13, T-14
B	1.8 MC	1.8 MC	---	400 Ohm Res.	"A" Antenna Post	Check Sensitivity T-15 (Rock)
C	1500 KC	1500 KC	---	200 MF Cond.	"U" Ant. Post	Check T-12, T-13
C	600 KC	600 KC	---	200 MF Cond.	"U" Ant. Post	Check T-14
U	45 MC	45 MC	45.9 MC	400 Ohm Res.	"U" Ant. Post	Check T-15
U	20 MC	20 MC	---	400 Ohm Res.	"U" Ant. Post	Check

* To insure perfect alignment it is necessary to "rock" the ganged variable condenser in order to follow the maximum signal output.

MODEL 212 ALIGNMENT TABLE

Wave Band	Dial Frequency	Generator Frequency	Image Frequency	Dummy Antenna	Generator Connected to	Adjust Trimmer
C	1000 KC	456 KC	---	.001 mfd., 50,000 ohms	1st I.F. tube control grid	T-1, T-2, T-3
C	1000 KC	456 KC	---	.001 mfd., 50,000 ohms	6L7 tube control grid	T-4, T-5
A	15 MC	15 MC	15.9 MC	400 ohm resistor	"A" antenna post	T-6, T-7, T-8
A	6 MC	6 MC	---	400 ohm resistor	"A" antenna post	Check Sensitivity T-9, T-10, T-11
B	4.5 MC	4.5 MC	3.6 MC	400 ohm resistor	"A" antenna post	Check Sensitivity T-12, T-13
B	1.8 MC	1.8 MC	---	400 ohm resistor	"A" antenna post	Check T-14
C	1500 KC	1500 KC	---	200 mfd. condenser	"A" antenna post	Check T-15*
C	600 KC	600 KC	---	200 mfd. condenser	"U" antenna post	Check T-16
U	45 MC	45 MC	45.9 MC	400 ohm resistor	"U" antenna post	Check Sensitivity
U	20 MC	20 MC	---	400 ohm resistor	"U" antenna post	Check

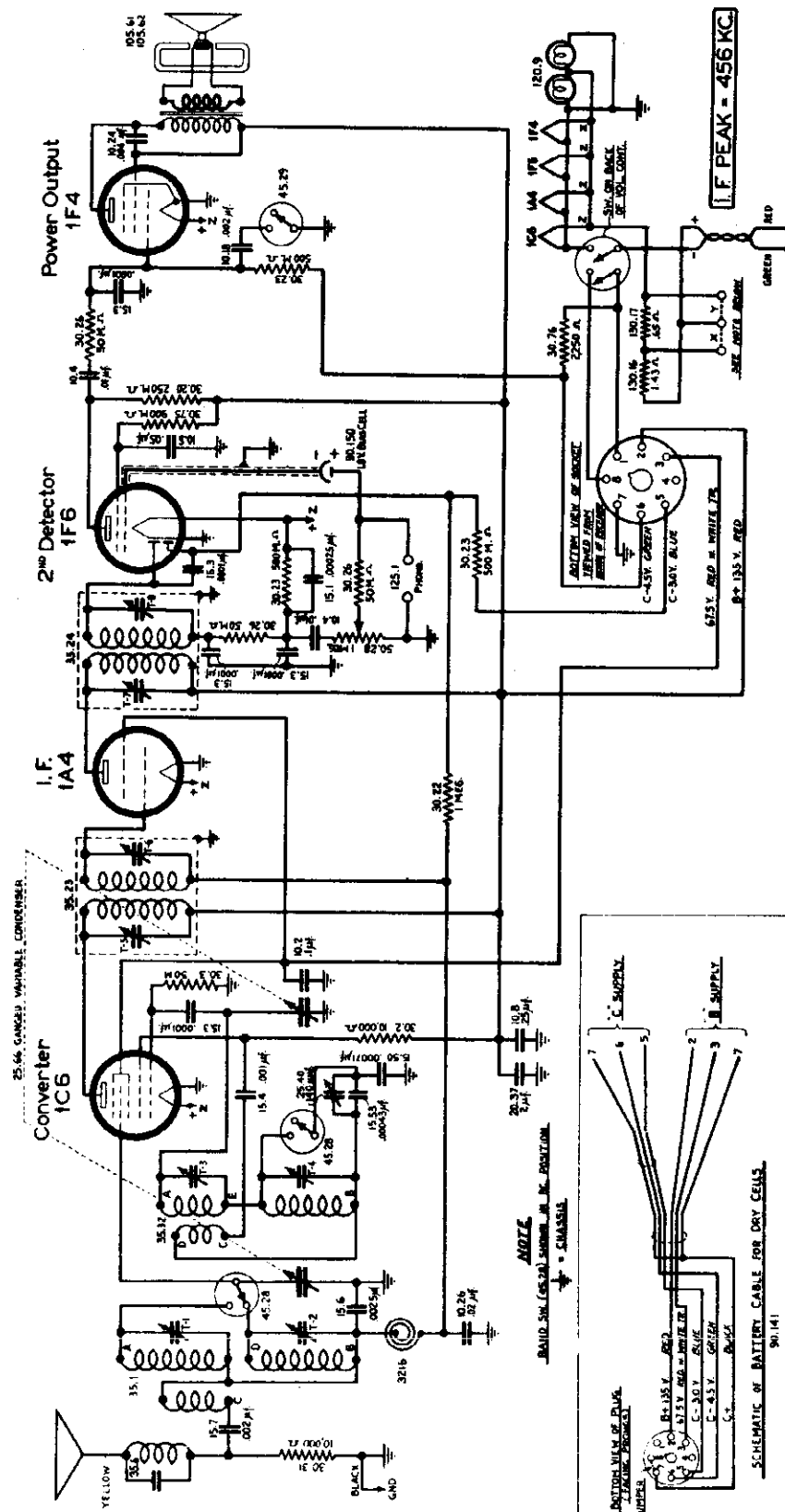
* To insure perfect alignment it is necessary to "rock" the ganged variable condenser in order to follow the maximum signal output.



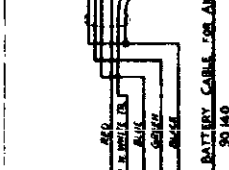
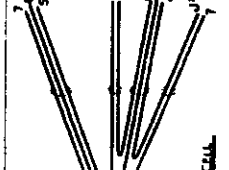
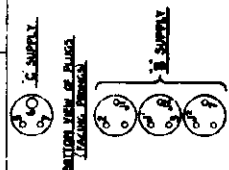
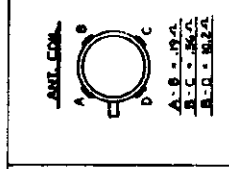
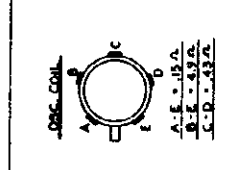
FADA RADIO & ELECTRIC CO

MODEL 242
Schematic

FOR ALIGNMENT, SEE INDEX



NOTE
X = CLOSE FOR AIR CALL OPERATION (Y OPEN)
Y = OPEN FOR STORAGE BATT.
X & Y = OPEN FOR DRY CELL
Z = CONNECT TO POS. (+) TERM. OF X SUPPLY.

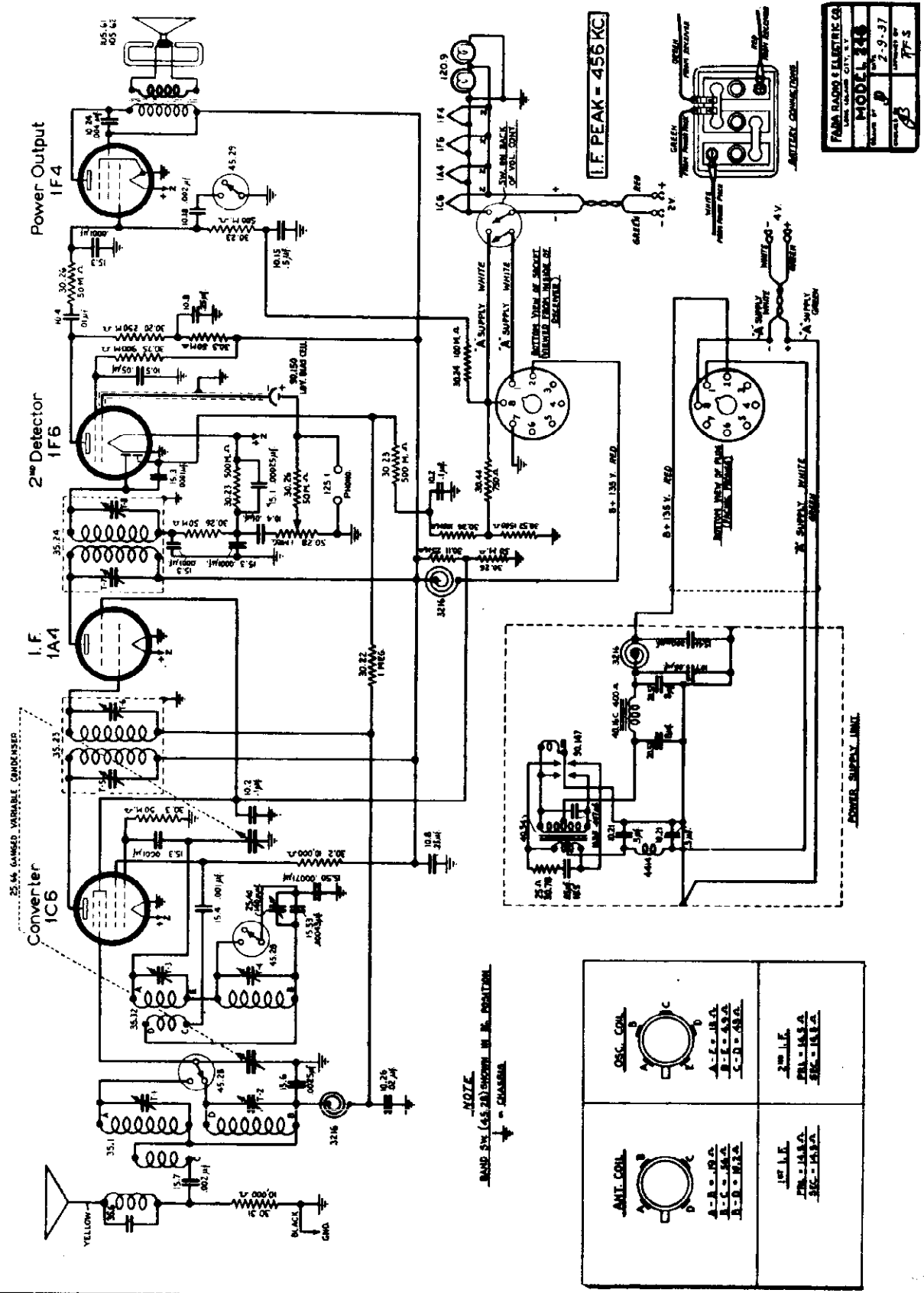


I.F. PEAK = 456 KC.

FADA RADIO & ELECTRIC CO. CINCINNATI, OHIO	
MODEL 242	
DATE	REV. 2-9-37
BY	375

MODEL 246
Schematic

FADA RADIO & ELECTRIC CO.



FADA RADIO ELECTRIC CO.
1000 W. WASHINGTON ST., CHICAGO, ILL. U.S.A.
MODEL 246
Designed by P
Patented 2-9-37
Copyright © 1937
Printed by TFS

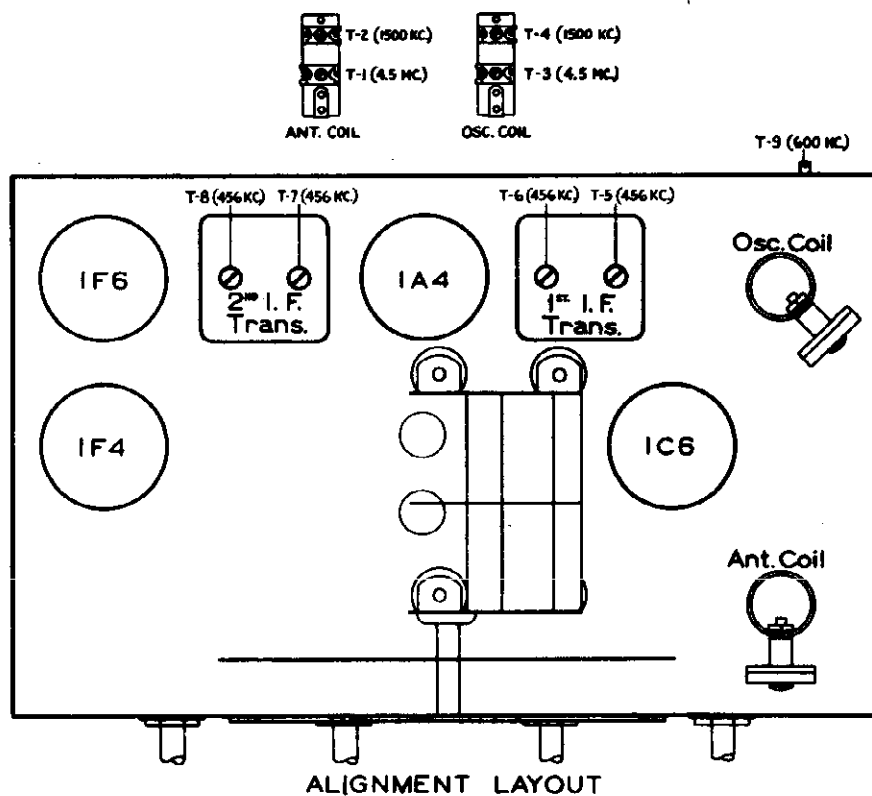
FADA RADIO & ELECTRIC CO.

MODEL 242
 MODEL 246
 Alignment
 Socket, Trimmers

ALIGNMENT TABLE

WAVE BAND	DIAL FREQUENCY	GENERATOR FREQUENCY	IMAGE FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTED TO	ADJUST TRIMMER
B.C.	1000 KC	456 KC	---	.001 mfd. 50,000 ohms	Control grid of 1A4 tube	T-8, T-7
B.C.	1000 KC	456 KC	---	.001 mfd. 50,000 ohms	Control grid of 1C6 tube	T-6, T-5
S.W.	4.5 MC	4.5 MC	3.6 MC	400 ohm resistor	Yellow antenna lead	T-3, T-1
S.W.	1.8 MC	1.8 MC	---	400 ohm resistor	Yellow antenna lead	Check Sensitivity
B.C.	1500 KC	1500 KC	---	200 mmfd. condenser	Yellow antenna lead	T-4, T-2
B.C.	600 KC	600 KC	---	200 mmfd. condenser	Yellow antenna lead	T-9*

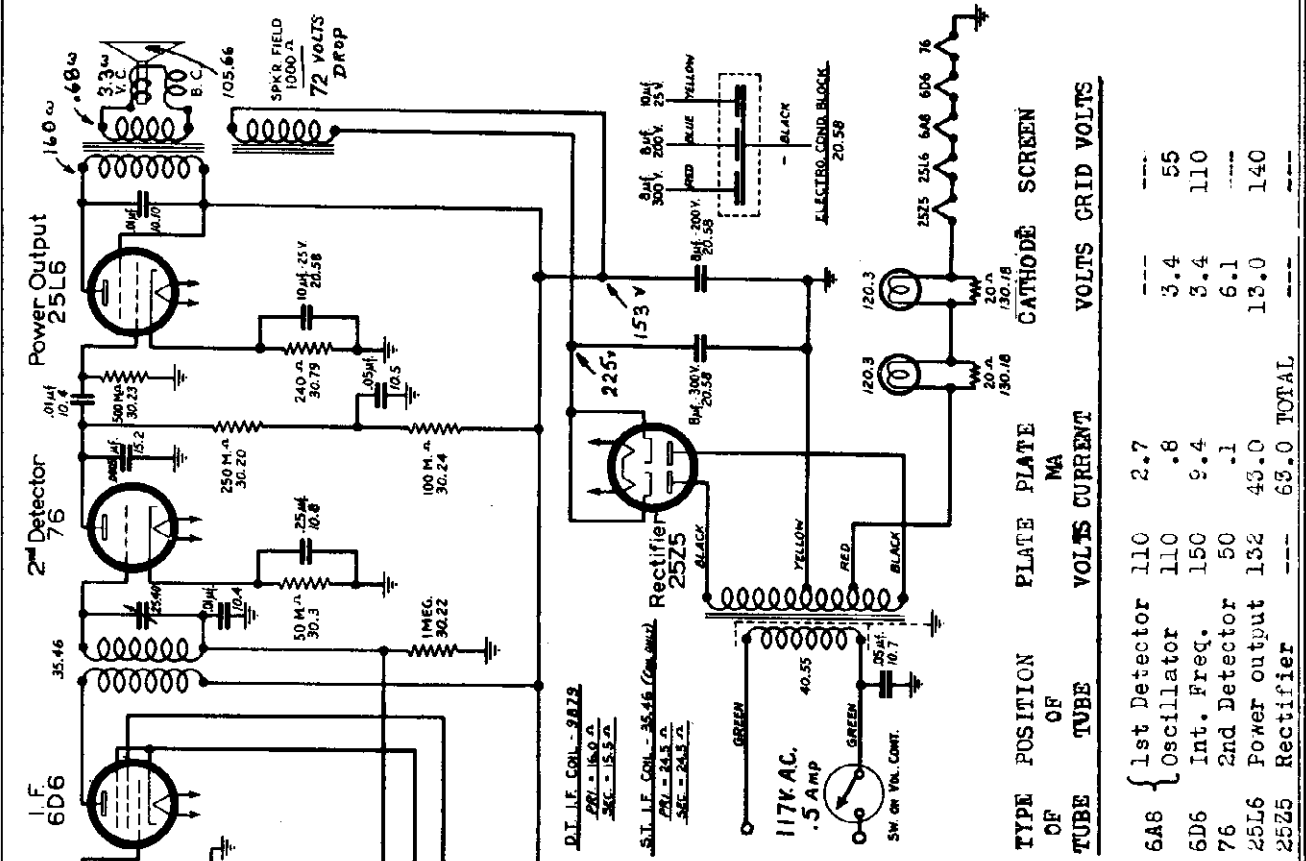
*To insure perfect alignment it is necessary to "rock" the ganged variable condenser in order to follow the maximum signal output.



MODEL 254

**Schematic, Voltage
Socket, Trimmers, Alignment**

FADA RADIO & ELECTRIC CO



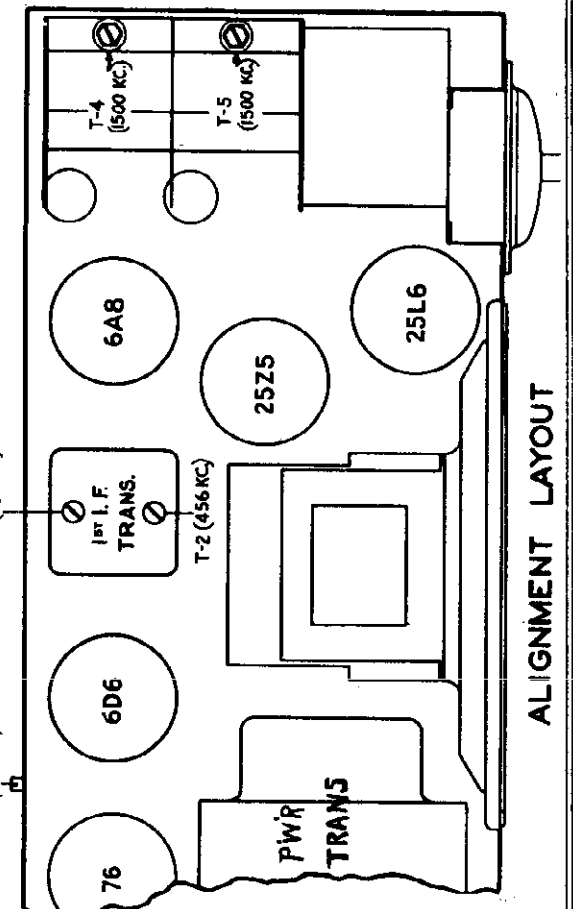
TYPE OF TUBE	POSITION OF TUBE	PLATE CURRENT MA	VOLTS GRID	VOLTS GRID VOLTS
6A8	1st Detector	110	2.7	---
6D6	Oscillator	110	.8	55
76	Int. Freq.	150	9.4	110
25L6	2nd Detector	50	.1	6.1
25Z5	Power output	132	43.0	140
25Z5	Rectifier	---	---	---
				63.0 TOTAL

I.F. Alignment, place 50000 ohm resistance in series with CG of 6A8, Signal Gen. connected to the CG of 6A8 thru .001 Mf cond., adjust 456 KC. For 1500 KC RF adjustment, Signal Generator is connected to ANT post thru 200 MFF Cond. Adjust T-4 trimmer first, then T-5 Trimmer to max. peak.

I.F. PEAK = 456 KC

NOTE A - (OPTIMAL WAVE TRAP ALIGNMENT)

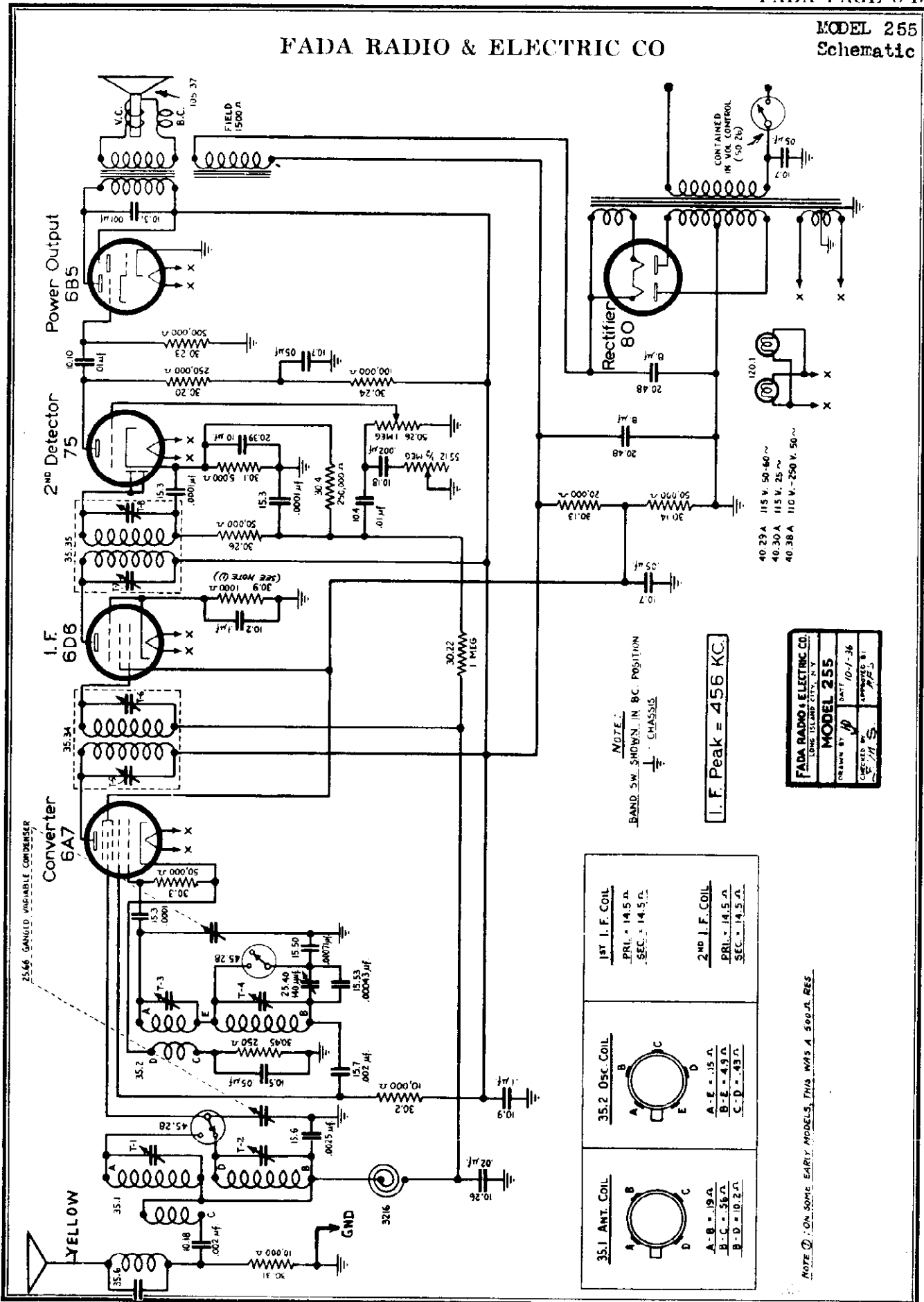
FADA RADIO & ELECTRIC CO
MODEL 254
DESIGNED BY
DATE
CHECKED BY
DATE



ALIGNMENT LAYOUT

FADA RADIO & ELECTRIC CO

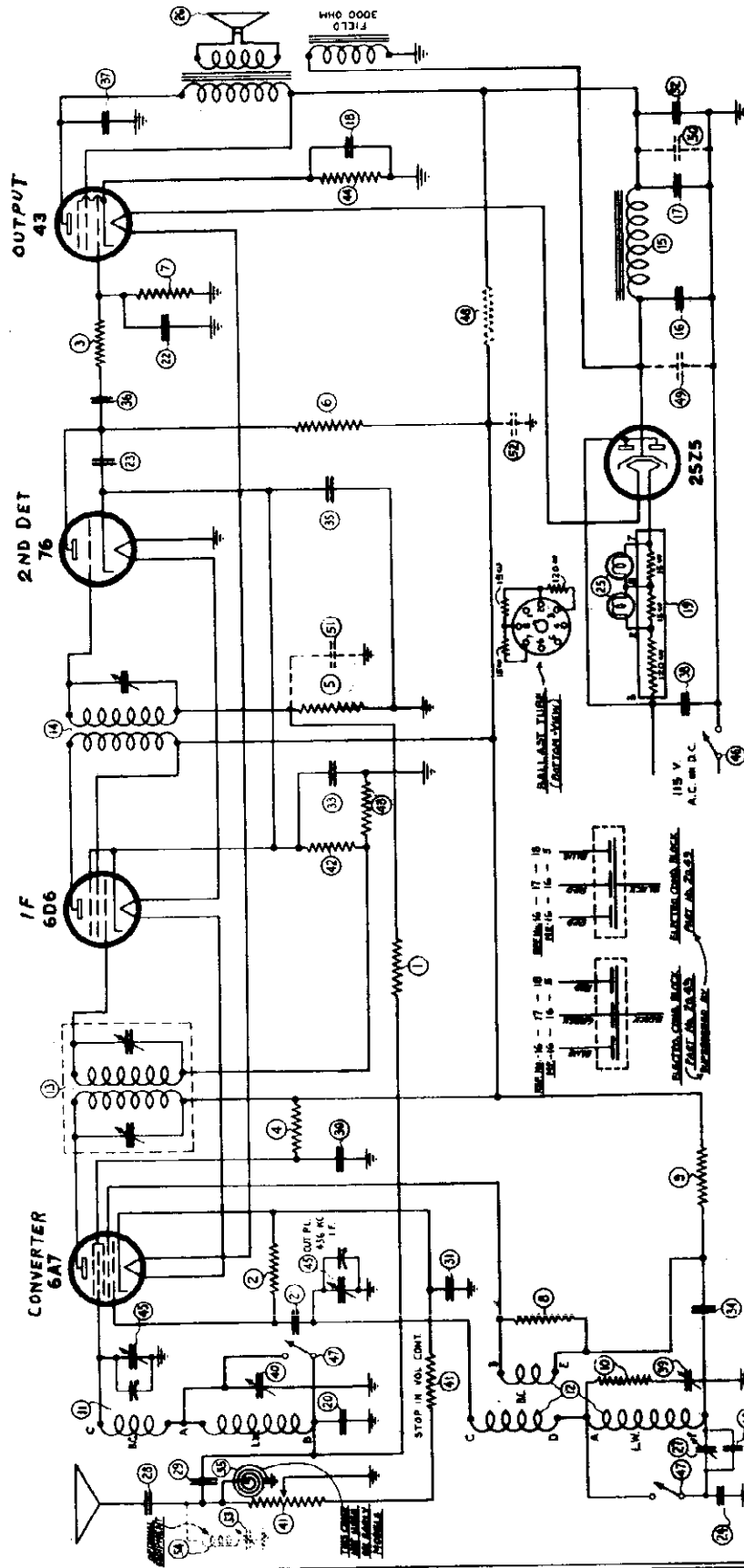
MODEL 255
Schematic



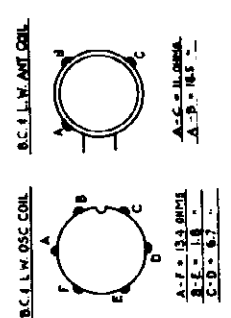
FADA RADIO & ELECTRIC CO.
LONG ISLAND CITY, N. Y.
MODEL 255
DRAWN BY [Signature] DATE 10-1-36
CHECKED BY [Signature] APPROVED BY [Signature]

MODEL 261
Schematic
Parts

FADA RADIO & ELECTRIC CO



I.F. = 456 KC.



FADA RADIO & ELECTRIC CO. LONG ISLAND CITY, N.Y.	
MODEL 261	REVISED BY P.F.F.
DATE 8-7-56	

NOTE:
AMPS. SHOWN IN L.M. POS.
CHECK SCHEMATIC IN ACTION MANUAL
FOR POS. OF COMPONENTS

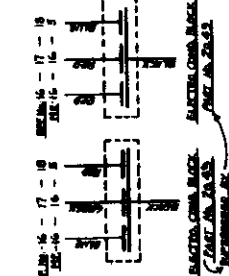
D.I.F. COIL
P.R.L. = 16.0 OHMS
SEC. = 18.5

B.C.I.W. OSC COIL
A-F = 13.5 MMIL
B-E = 1.8
C-D = 6.7

B.C.I.W. ANT COIL
A-C = 11.0 MMIL
A-B = 16.5

REF PART NO.	DESCRIPTION	REF PART NO.	DESCRIPTION
1	5000 OHM RES.	45	25Z5
2	5000 OHM RES.	46	VARIABLE COND.
3	5000 OHM RES.	47	ON-OFF SW ON VOLUME CONT.
4	5000 OHM RES.	48	45.31 BAND SWITCH
5	5000 OHM RES.	49	3000 OHM CARB. RES.
6	5000 OHM RES.	50	1500 OHM CARB. RES.
7	5000 OHM RES.	51	TOROIDAL ELECTRO. COND.
8	5000 OHM RES.	52	100 PF. COND.
9	5000 OHM RES.	53	250 PF. COND.
10	5000 OHM RES.	54	4697 TRIMMING COND.
11	5000 OHM RES.	55	3216 CHOKE COIL
12	5000 OHM RES.		
13	5000 OHM RES.		
14	5000 OHM RES.		
15	5000 OHM RES.		
16	5000 OHM RES.		
17	5000 OHM RES.		
18	5000 OHM RES.		
19	5000 OHM RES.		
20	5000 OHM RES.		
21	5000 OHM RES.		
22	5000 OHM RES.		
23	5000 OHM RES.		
24	5000 OHM RES.		
25	5000 OHM RES.		
26	5000 OHM RES.		
27	5000 OHM RES.		
28	5000 OHM RES.		
29	5000 OHM RES.		
30	5000 OHM RES.		
31	5000 OHM RES.		
32	5000 OHM RES.		
33	5000 OHM RES.		
34	5000 OHM RES.		
35	5000 OHM RES.		
36	5000 OHM RES.		
37	5000 OHM RES.		
38	5000 OHM RES.		
39	5000 OHM RES.		
40	5000 OHM RES.		
41	5000 OHM RES.		
42	5000 OHM RES.		
43	5000 OHM RES.		
44	5000 OHM RES.		
45	5000 OHM RES.		

FOR LE COIL
OPTIONAL
EQUIPMENT



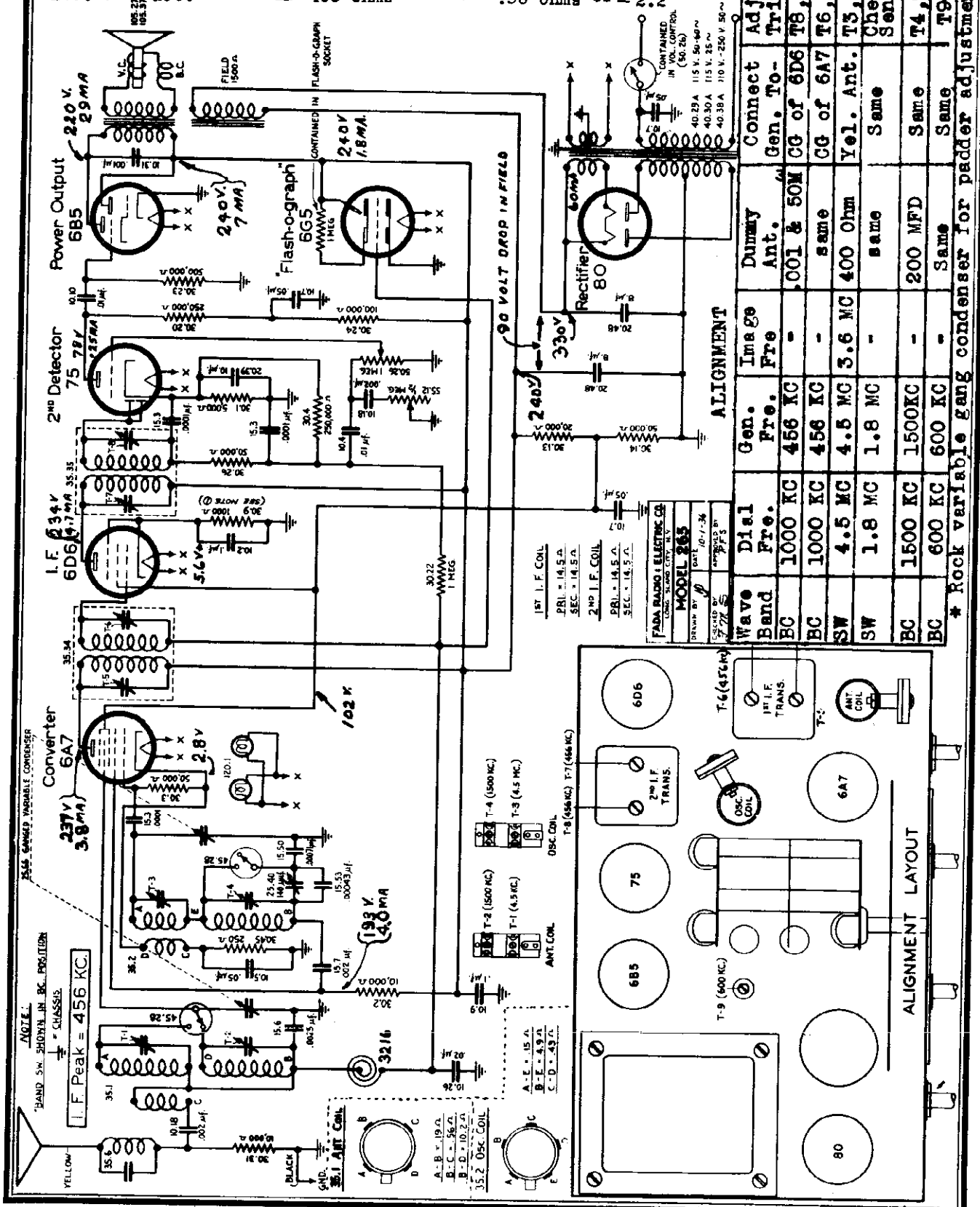
FADA RADIO & ELECTRIC CO

MODEL 265
Schematic, Socket
Trimmers, Alignment
Voltage

SPEAKER D.C. RESISTANCE VALUES

PART NO.-FIELD COIL-AUDIO TRANS. PRI.-AUDIO TRANS. SEC.-V.C.

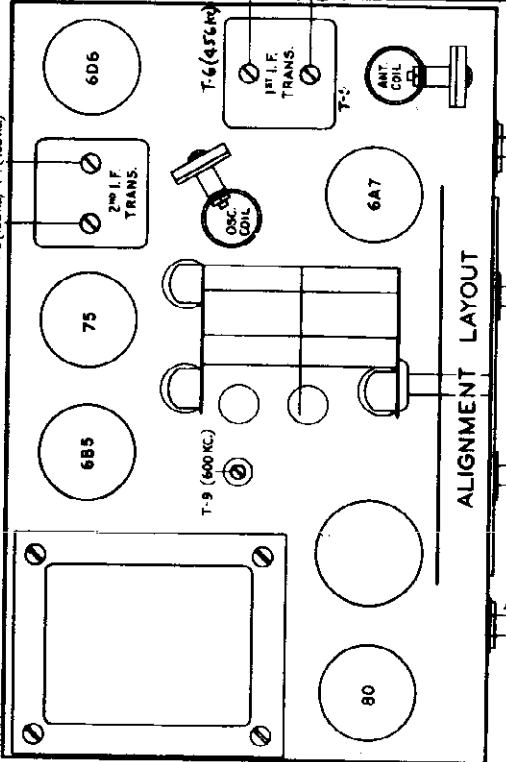
105.27	-	1500	*(COLD)	-	650 ohms	*	-	.4 ohms	**	-	1.8
105.37	-	1500	*	-	400 ohms	*	-	.58 ohms	**	-	2.2



ALIGNMENT

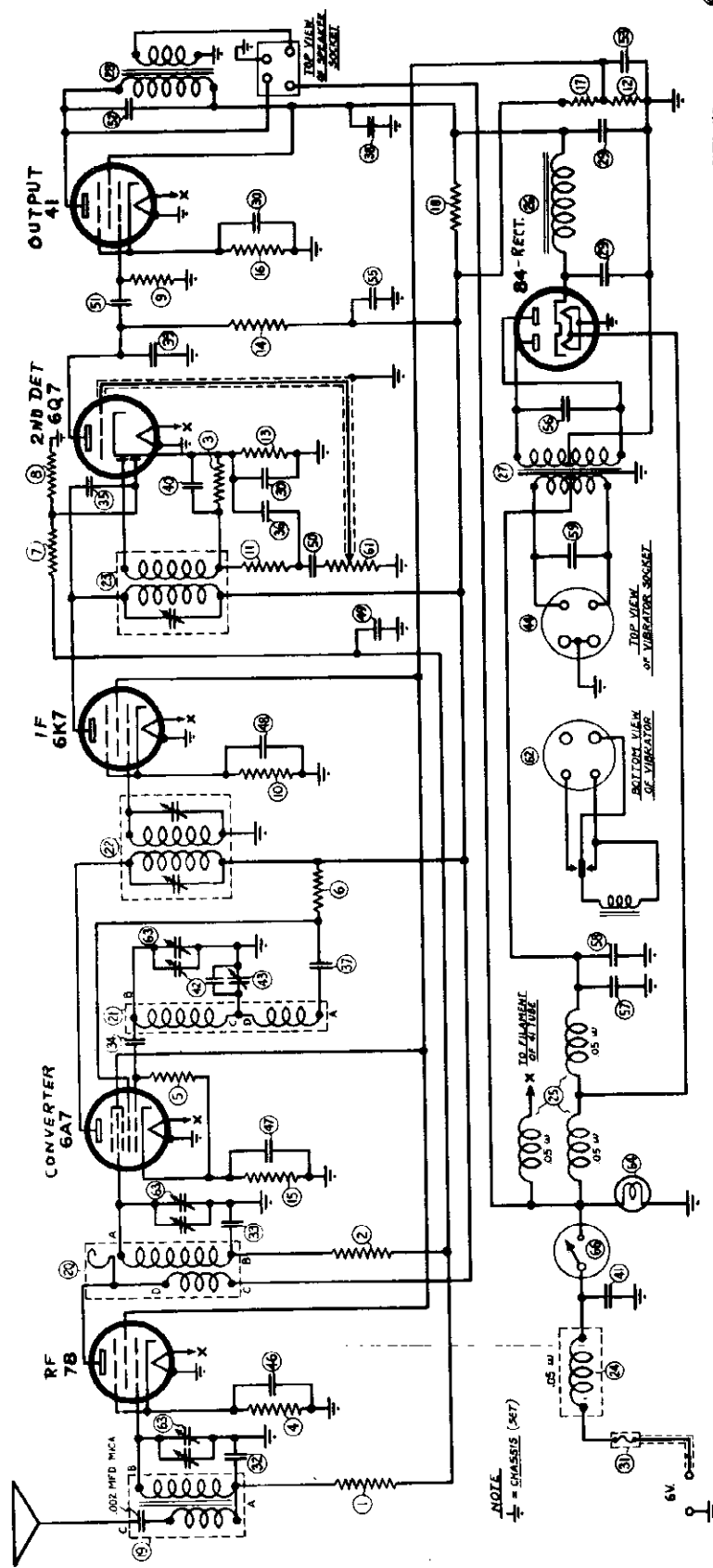
Wave Band	Dial Fre.	Gen. Pre.	Image Fre.	Dummy Ant.	Connect Gen. To	Adj. Trim.
BC	1000 KC	456 KC	-	COIL & 50M CG of 6D6	T8, T7	
BC	1000 KC	456 KC	-	same	CG of 6A7	T6, T5
SW	4.5 MC	4.5 MC	3.6 MC	400 Ohm	Yel. Ant. T3, T1	Check Sensi.
SW	1.8 MC	1.8 MC	-	same	Same	
BC	1500 KC	1500 KC	-	200 MFD	Same	T4, T2
BC	600 KC	600 KC	-	Same	Same	T9*

* Rock variable gang condenser for padder adjustment

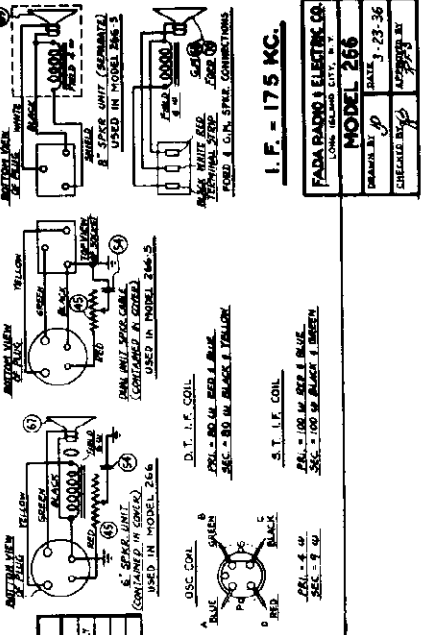


MODEL 266
Schematic
Parts

FADA RADIO & ELECTRIC CO



NOTE:
1/2" = CHASSIS (DET)



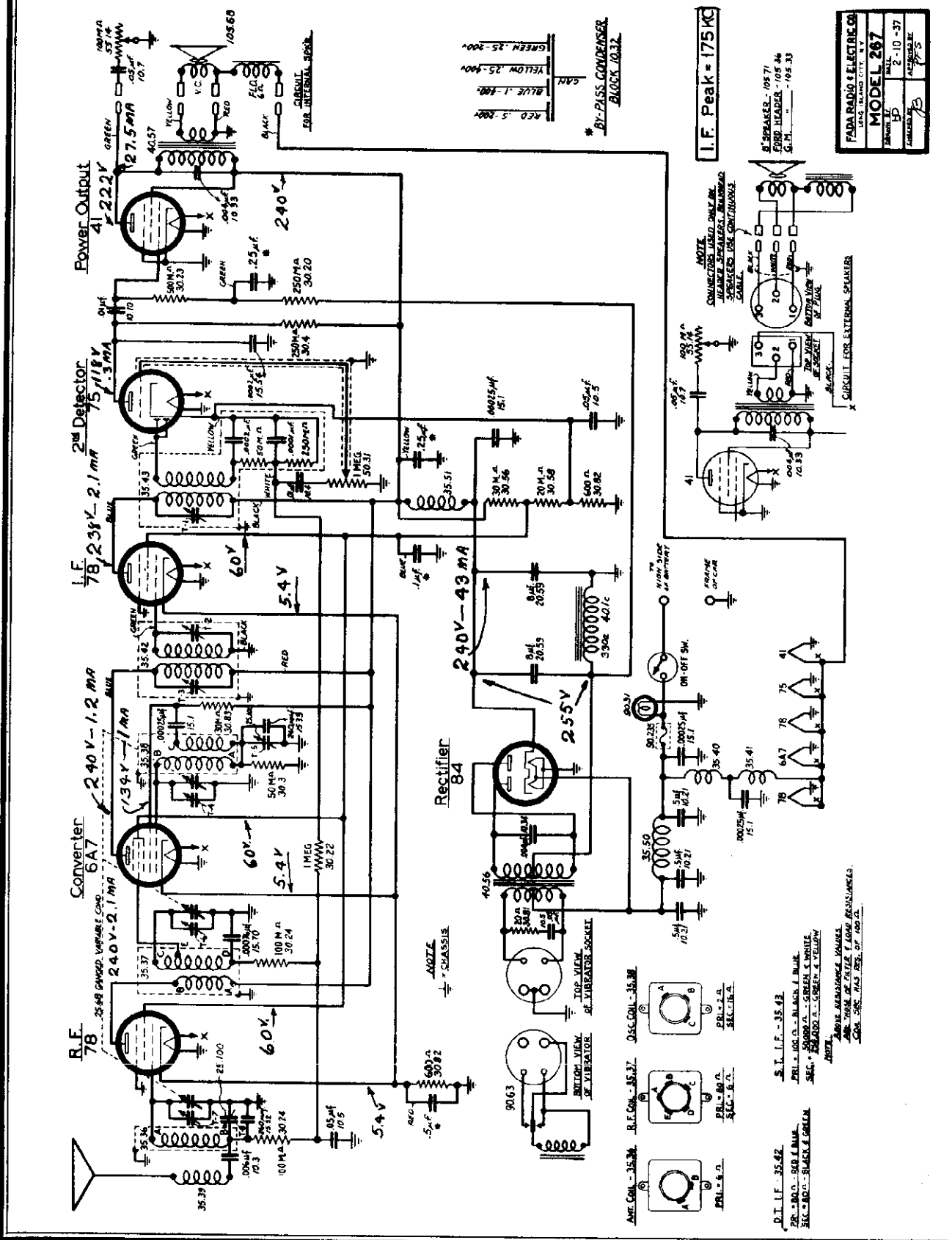
QTY	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION	
1	30.20	CARB. RES. 250,000 OHMS (A1)	43	55.4	100-35 SPEAKER - 8"
2	30.20	500,000	46	0.5	105-33 1/4" HEADER SPEAKER ASSEMBLY
3	30.20	250,000	47	0.5	105-34 DIAL UNIT B
4	30.15	2,000	48	0.5	70 105-36 FORD HEADER
5	30.3	50,000	49	0.5	
6	30.11	25,000	50	0.4	
7	30.23	500,000	51	0.10	
8	30.23	500,000	52	0.2	
9	30.23	500,000	53	0.1	
10	30.52	1,500	54	0.1	
11	30.76	50,000	55	0.14	
12	30.26	4,000	56	0.29	
13	30.12	200,000	57	0.21	
14	30.53	1,000	58	0.21	
15	30.47	1,000	59	0.21	
16	30.49	625	60	0.1	
17	30.13	20,000	61	50.8	VOL. CONT. - 1 MEG.
18	30.25	5,000	62	50.3	VIBRATOR
19	35.4	ANT. COIL (IRON CORE)	63	25.56	1/4" DIA. VIB. COND.
20	35.5	R.F. COIL	64	30.56	1/4" DIA. VIB. COND.
21	34.02	OSC. COIL	65	30.31	PLOT LIGHT - MARUDA #1
22	7.17	D.T. I.F. COIL	66	65.26	VIBRATOR SOCKET

I.F. = 175 KC.
FADA RADIO & ELECTRIC CO
LONG BEACH, CALIF., U.S.A.
MODEL 266
DRAWN BY J.P. DATE: 3-23-36
CHECKED BY [Signature]

FADA RADIO & ELECTRIC CO

MODELS 267, 267SD, 267SG
267SF Motostat

Schematic
Voltage



FADA RADIO & ELECTRIC CO	
174 E. 180th St., N.Y.	
MODEL 267	
PRINTED IN U.S.A.	2-10-37
DESIGNED BY	ASSEMBLED BY
B	

NOTE: ABOVE RESISTANCE VALUES ARE THOSE OF ENTER TAP RESISTANCES. COIL SIZE HAS RES. OF 100 Ω.

MODELS 267, 267SD
267SG, 267SF
Motostat
Socket, Trimmers
Alignment, Parts

FADA RADIO & ELECTRIC CO

PRICES SUBJECT TO CHANGE
WITHOUT NOTICE

MODEL 267 SF is a two unit speaker for installation behind the radio employing the same receiver header panel in 1936-37 Ford Cars. unit as above, but a separate

SEPARATE SPEAKERS: Model 267 MOTOSET is also available for use with separate speakers instead of the standard 6 1/2 inch speaker supplied with the standard set. These combinations are available as follows:

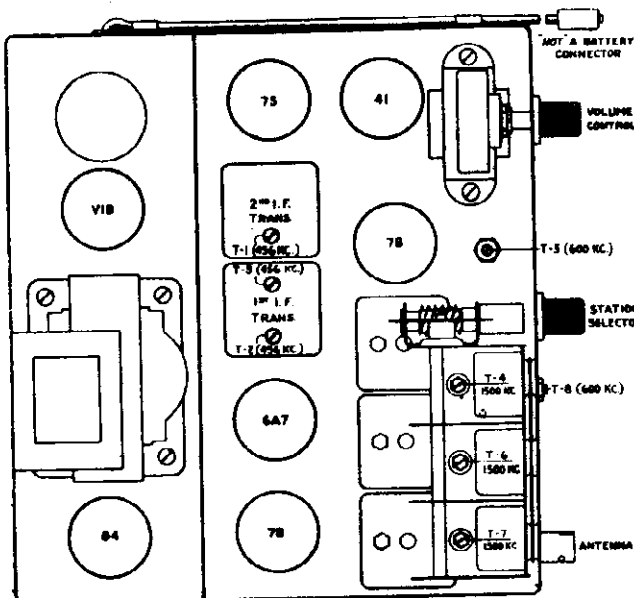
MODEL 267 SD is a two unit receiver in which the speaker is an 8 inch dynamic in a large housing of its own. This housing mounts on the bulkhead by a single large bolt, and plugs into the receptacle provided for this purpose on the side of the case, near the front.

MODEL 267 SG is a two unit receiver similar to 267 SF, with header speaker for installation in 1936 General Motor Cars.

ALIGNMENT TABLE

Dial Frequency	Generator Frequency	Dummy Antenna	Generator Connected To	Adjust Trimmer
1,000 KC	175 KC	.001 mfd. 50,000 ohms	Control grid of 6A7 tube	T-1, T-2 T-8
1,500 KC	1,500 KC	200 mmfd. condenser	Antenna lead socket	T-4, T-8, T-8
600 KC	600 KC	200 mmfd. condenser	Antenna lead socket	T-8* T-8

*To insure perfect alignment, it is necessary to "rock" the ganged variable condenser in order to follow the maximum signal output.



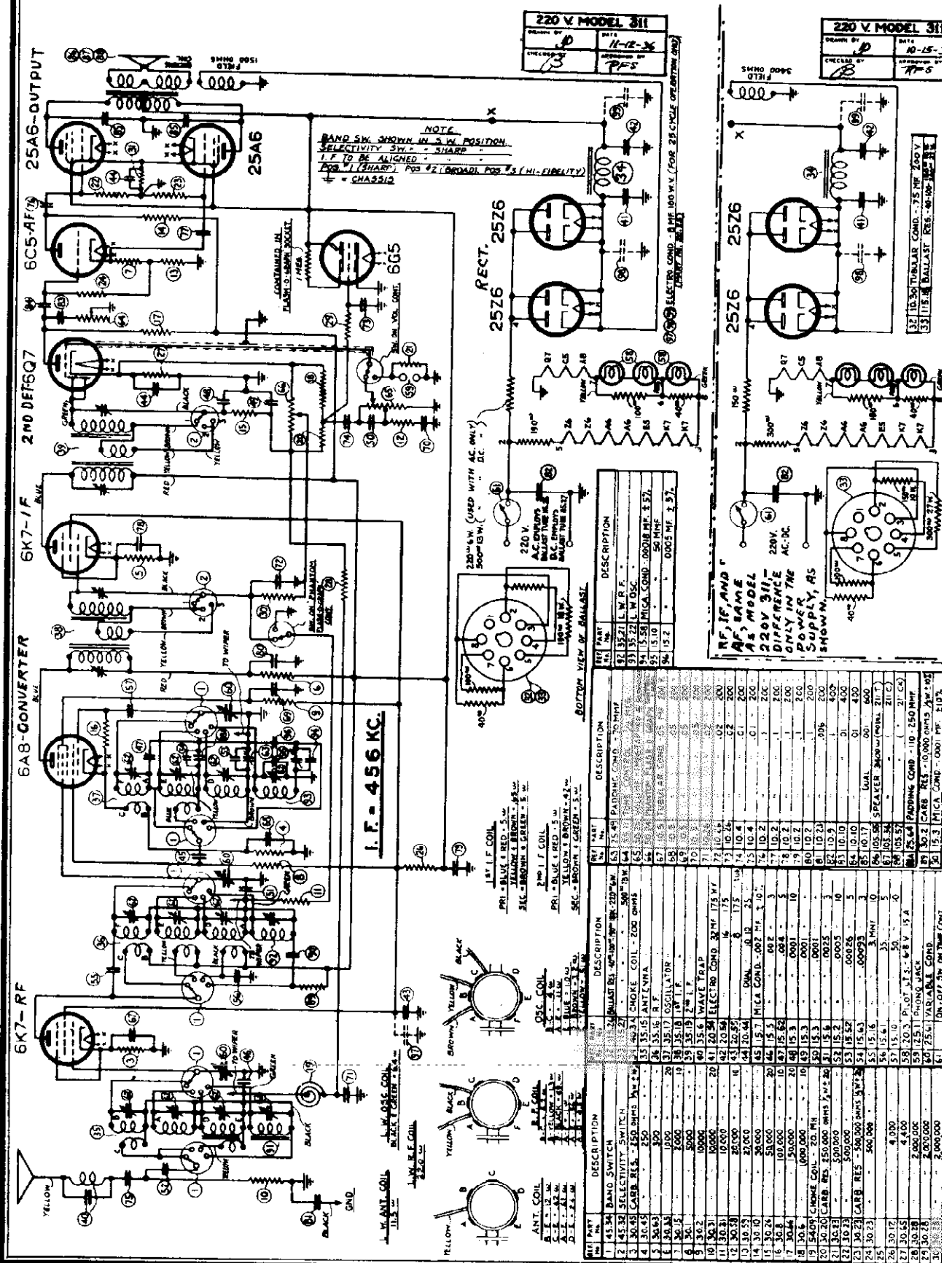
ALIGNMENT LAYOUT

PARTS PRICE LIST

PARTS PRICE LIST

PART NO.	DESCRIPTION	LIST PRICE
10.3	Capacitor - tubular - (.006 mfd. - 400 Volts)	.20
10.4	Capacitor - tubular - (.01 mfd. - 200 Volts)	.20
10.5	Capacitor - tubular - (.05 mfd. - 200 Volts)	.20
10.7	Capacitor - tubular - (.05 mfd. - 400 Volts)	.20
10.10	Capacitor - tubular - (.01 mfd. - 400 Volts)	.20
10.21	Capacitor - tubular - (.5 mfd. - 120 Volts)	.40
10.22	Capacitor - generator - (.5 mfd. - 120 Volts)	.50
10.32	Capacitor - block - (.25 mfd. 400 V., 1 mfd. 400 V., .5 mfd. 200 V., .25 mfd. 200 V.)	1.06
10.33	Capacitor - tubular - (.004 mfd. - 400 Volts)	.20
10.34	Capacitor - tubular - (.004 mfd. - 1,600 Volts)	.25
15.1	Capacitor - mica - (.00025 mfd. - 10%)	.25
15.33	Capacitor - mica - (.00024 mfd. - 5%)	.25
15.52	Capacitor - mica - (.00026 mfd. - 5%)	.25
15.54	Capacitor - mica - (.00026 mfd. - 10%)	.25
15.70	Capacitor - mica - (.00076 mfd. - 3%)	.25
20.59	Capacitor - electrolytic (Dual 8 mfd. 350 W. V.)	1.55
25.63	Capacitor - variable gang	4.10
25.100	Capacitor - padder	.30
30.3	Resistor - carbon - (50,000 ohms 1/3 W 10%)	.20
30.4	Resistor - carbon - (250,000 ohms 1/3 W 10%)	.20
30.20	Resistor - carbon - (250,000) ohms 1/3 W 20%	.20
30.22	Resistor - carbon - (1,000,000 ohms 1/3 W 20%)	.20
30.23	Resistor - carbon - (500,000 ohms 1/3 W 20%)	.20
30.24	Resistor - carbon - (100,000 ohms 1/3 W 20%)	.20
30.27	Resistor - distributor suppressor - (15,000 ohms)	.35
30.56	Resistor - carbon - (30,000 ohms 1 W 10%)	.25
30.58	Resistor - carbon - (20,000 ohms 1/3 W 10%)	.20
30.81	Resistor - carbon - (20 ohms 1/3 W 10%)	.20
30.82	Resistor - carbon - (600 ohms 1/3 W 10%)	.20
30.83	Resistor - carbon - (30,000 ohms 1/3 W 20%)	.20
30.87	Resistor - carbon - (650 ohms 1/3 W 10%)	.20
35.36	Coil - antenna	.80
35.37	Coil R. F.	1.15
35.38	Coil - oscillator	.75
35.39	Spark filter choke	.25
35.40	R. F. Choke Coil	.50
35.41	R. F. Choke Coil	.25
35.42	1st I. F. Transformer.	1.30

PART NO.	DESCRIPTION	LIST PRICE
35.43	2nd I. F. Transformer	1.50
35.50	"A" Choke	.50
35.51	R. F. Choke	.50
40.1C	Choke coil - filter (330 ohm)	.75
40.56	Power transformer	3.50
40.57	Output transformer	1.30
50.31	Volume control - (1 meg.)	.86
55.14	Tone control - (100,000 ohm)	.65
65.2	Socket - (6A7)	.15
65.4	Socket - (75)	.15
65.17	Socket - (78)	.15
65.18	Socket - (41)	.15
65.19	Socket - (84)	.10
65.46	Socket - (vibrator)	.10
65.61	Socket - (external speaker)	.12
75.119	Remote control cable - (station selector)	1.25
75.120	Remote control cable - (volume control)	1.25
75.122	Volume control unit - (with switch)	2.75
75.123	Tuning control unit	2.60
80.11	Tube shield - (two sections)	.09
80.13	Tube shield base	.04
80.14	Tube shield retaining ring	.02
80.16	Tube shield cap	.04
90.2	Cup washer	.05
90.3	Rubber grommet - (Dia. 11/16" Hole 13/32")	.05
90.15	Antenna cable	.60
90.18	Mounting bolt - (5/16" - 18 Thd. x 3/2" L.)	.04
90.31	Pilot light - (6 volt)	.20
90.54	Grid cap	.07
90.63	Vibrator	3.50
90.107	Washer - (7/8" x 1/16" x 11/32" Hole)	Net .01
90.108	Lockwasher - (11/16" O. D. x 3/32")	Net .01
90.110	Hex nut - (5/16" - 18 Thd.)	Net .02
90.153	Speaker cable	.35
90.160	Grounding clips - (per doz.)	.10
90.159	Vibrator grounding cup	.15
90.235	Fuse - 15 Amp	.10
105.68	Speaker - (Model 267)	5.95
140.14	Knob - (tone control)	.10



220 V MODEL 311

DESIGNED BY	DATE
11-12-34	
CHECKED BY	APPROVED BY
P.S.	

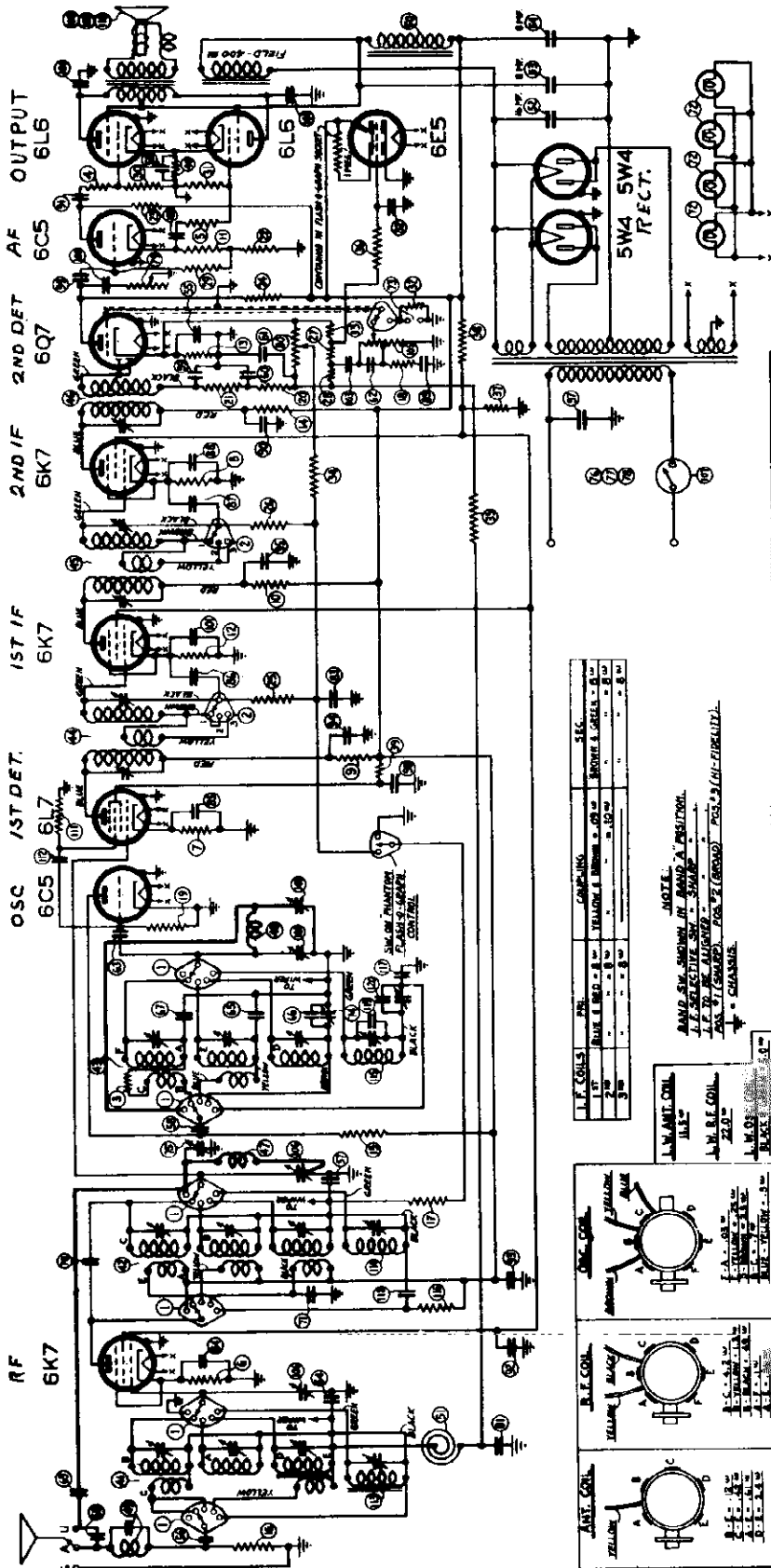
220 V MODEL 311

DESIGNED BY	DATE
10-15-34	
CHECKED BY	APPROVED BY
B	

REF. PART NO.	DESCRIPTION	QTY.
1	453-34 BAND SWITCH	1
2	453-32 SELECTIVITY SWITCH	1
3	130-45 CARB. RES. 450 OHMS 1/2 W.	2
4	130-45 CARB. RES. 250 OHMS 1/2 W.	2
5	130-45 CARB. RES. 100 OHMS 1/2 W.	2
6	130-45 CARB. RES. 50 OHMS 1/2 W.	2
7	130-45 CARB. RES. 25 OHMS 1/2 W.	2
8	130-45 CARB. RES. 10 OHMS 1/2 W.	2
9	130-45 CARB. RES. 5 OHMS 1/2 W.	2
10	130-45 CARB. RES. 2.5 OHMS 1/2 W.	2
11	130-45 CARB. RES. 1.5 OHMS 1/2 W.	2
12	130-45 CARB. RES. .75 OHMS 1/2 W.	2
13	130-45 CARB. RES. .45 OHMS 1/2 W.	2
14	130-45 CARB. RES. .25 OHMS 1/2 W.	2
15	130-45 CARB. RES. .15 OHMS 1/2 W.	2
16	130-45 CARB. RES. .075 OHMS 1/2 W.	2
17	130-45 CARB. RES. .045 OHMS 1/2 W.	2
18	130-45 CARB. RES. .025 OHMS 1/2 W.	2
19	130-45 CARB. RES. .015 OHMS 1/2 W.	2
20	130-45 CARB. RES. .0075 OHMS 1/2 W.	2
21	130-45 CARB. RES. .0045 OHMS 1/2 W.	2
22	130-45 CARB. RES. .0025 OHMS 1/2 W.	2
23	130-45 CARB. RES. .0015 OHMS 1/2 W.	2
24	130-45 CARB. RES. .00075 OHMS 1/2 W.	2
25	130-45 CARB. RES. .00045 OHMS 1/2 W.	2
26	130-17 4.000	1
27	130-17 4.400	1
28	130-17 4.800	1
29	130-17 5.200	1
30	130-17 5.600	1
31	130-17 6.000	1
32	130-17 6.400	1
33	130-17 6.800	1
34	130-17 7.200	1
35	130-17 7.600	1
36	130-17 8.000	1
37	130-17 8.400	1
38	130-17 8.800	1
39	130-17 9.200	1
40	130-17 9.600	1
41	130-17 10.000	1
42	130-17 10.400	1
43	130-17 10.800	1
44	130-17 11.200	1
45	130-17 11.600	1
46	130-17 12.000	1
47	130-17 12.400	1
48	130-17 12.800	1
49	130-17 13.200	1
50	130-17 13.600	1
51	130-17 14.000	1
52	130-17 14.400	1
53	130-17 14.800	1
54	130-17 15.200	1
55	130-17 15.600	1
56	130-17 16.000	1
57	130-17 16.400	1
58	130-17 16.800	1
59	130-17 17.200	1
60	130-17 17.600	1
61	130-17 18.000	1
62	130-17 18.400	1
63	130-17 18.800	1
64	130-17 19.200	1
65	130-17 19.600	1
66	130-17 20.000	1
67	130-17 20.400	1
68	130-17 20.800	1
69	130-17 21.200	1
70	130-17 21.600	1
71	130-17 22.000	1
72	130-17 22.400	1
73	130-17 22.800	1
74	130-17 23.200	1
75	130-17 23.600	1
76	130-17 24.000	1
77	130-17 24.400	1
78	130-17 24.800	1
79	130-17 25.200	1
80	130-17 25.600	1
81	130-17 26.000	1
82	130-17 26.400	1
83	130-17 26.800	1
84	130-17 27.200	1
85	130-17 27.600	1
86	130-17 28.000	1
87	130-17 28.400	1
88	130-17 28.800	1
89	130-17 29.200	1
90	130-17 29.600	1
91	130-17 30.000	1
92	130-17 30.400	1
93	130-17 30.800	1
94	130-17 31.200	1
95	130-17 31.600	1
96	130-17 32.000	1
97	130-17 32.400	1
98	130-17 32.800	1
99	130-17 33.200	1
100	130-17 33.600	1

MODEL 312
Schematic
Parts

FADA RADIO & ELECTRIC CO

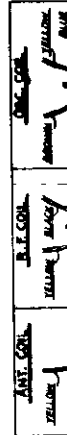


J.F. - 456 KC.

FADA RADIO & ELECTRIC CO
FADA MODEL 312
PARTS LIST
REVISED 4-15-34
DESIGNED BY
F. M. S.

RF COILS	PH.	COMPENS.	SEC.
1ST	BLUE	RED	BROWN
2ND	YELLOW	GREEN	BLACK
3RD	RED	WHITE	GREEN

NOTE:
AND SW. SHOWN IN WHITE POSITION.
J.F. TO BE ALLOWED.
SW. TO BE ALLOWED FOR 2 (GROUND) POS. IN CIRCUIT.
* CHANGE.

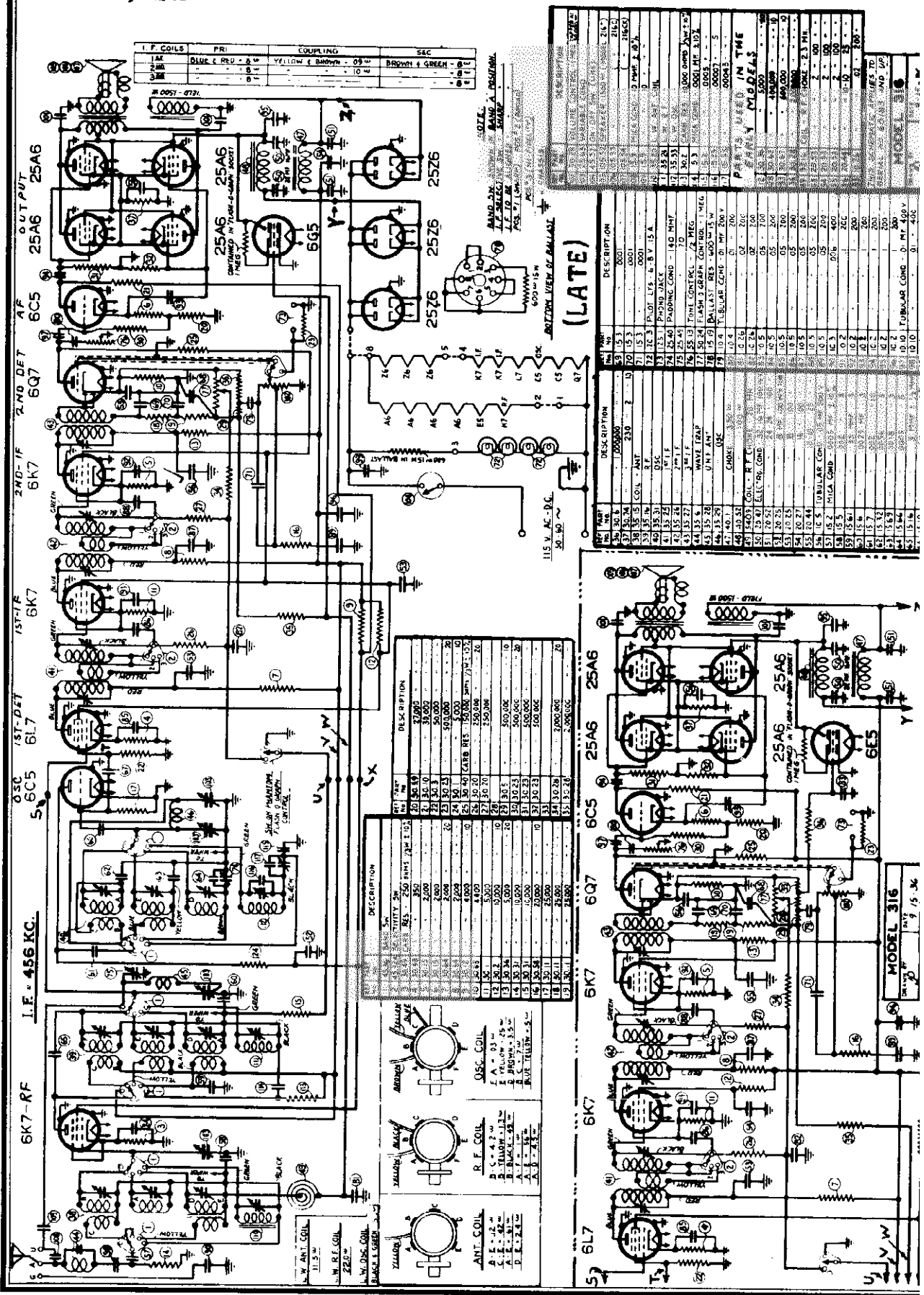


REF. PART NO.	DESCRIPTION	QUANTITY	DESCRIPTION	QUANTITY
1	ANT. COIL	1	PHONO JACK	1
2	R.F. COIL	1	PADDING COND. - 140 MF	1
3	5W4 5W4 RECT.	1	POWER TRANS. - 105 V 50	1
4	6L6	1	MP. TUNING	1
5	6K7	1	TONE CONTROL	1
6	6C5	1	CUSH. & SUP. COND.	1
7	6Q7	1	TUBULAR COND. - 100 PF	1
8	6L7	1	VARIABLE COND.	1
9	6K7	1	ON-OFF SW. (LINE)	1
10	6C5	1	SPLAKER 400" (MODEL 212)	1
11	6L6	1	212C	1
12	6K7	1	RES. - 50,000 OHMS 1/2 W	1
13	6C5	1	ANT. COIL	1
14	6L6	1	RES. - 10,000 OHMS 1/2 W	1
15	6K7	1	A COND. - 50 MMF. 2 U.F.	1
16	6C5	1	RES. - 10,000 OHMS 1/2 W	1
17	6Q7	1	RES. - 10,000 OHMS 1/2 W	1
18	6L6	1	RES. - 10,000 OHMS 1/2 W	1
19	6K7	1	RES. - 10,000 OHMS 1/2 W	1
20	6C5	1	RES. - 10,000 OHMS 1/2 W	1
21	6Q7	1	RES. - 10,000 OHMS 1/2 W	1
22	6L6	1	RES. - 10,000 OHMS 1/2 W	1
23	6K7	1	RES. - 10,000 OHMS 1/2 W	1
24	6C5	1	RES. - 10,000 OHMS 1/2 W	1

MODEL 316 Late
Above Ser.#60183
Schematics,Parts

FADA RADIO & ELECTRIC CO

MODEL 316 Ear!
Below Ser.#601



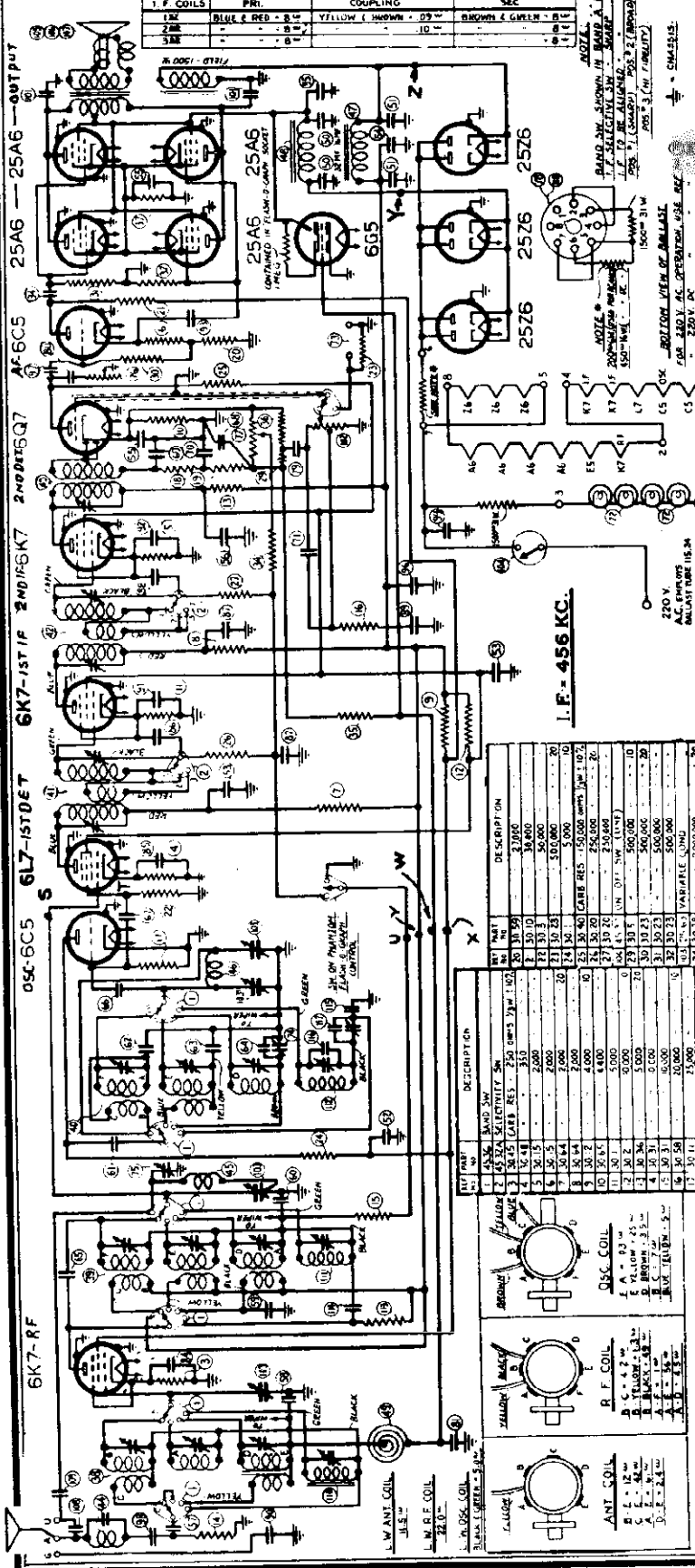
I.F. COILS	PRI	COUPLING	SEC
1A6	BLUE & RED - A	YELLOW & BROWN - 09	BROWN & GREEN - 10
2M	0 1 1	10 10	10 10
3M	0 1 1	10 10	10 10

REF PART NO	DESCRIPTION	QTY
100000	25A6	1
100001	6C5	1
100002	6K7	1
100003	6G5	1
100004	25Z6	1
100005	25Z6	1
100006	25Z6	1
100007	25Z6	1
100008	25Z6	1
100009	25Z6	1
100010	25Z6	1
100011	25Z6	1
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100014	25Z6	1
100015	25Z6	1
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100017	25Z6	1
100018	25Z6	1
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100037	25Z6	1
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100039	25Z6	1
100040	25Z6	1
100041	25Z6	1
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100043	25Z6	1
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100076	25Z6	1
100077	25Z6	1
100078	25Z6	1
100079	25Z6	1
100080	25Z6	1
100081	25Z6	1
100082	25Z6	1
100083	25Z6	1
100084	25Z6	1
100085	25Z6	1
100086	25Z6	1
100087	25Z6	1
100088	25Z6	1
100089	25Z6	1
100090	25Z6	1
100091	25Z6	1
100092	25Z6	1
100093	25Z6	1
100094	25Z6	1
100095	25Z6	1
100096	25Z6	1
100097	25Z6	1
100098	25Z6	1
100099	25Z6	1
100100	25Z6	1

(LATE)

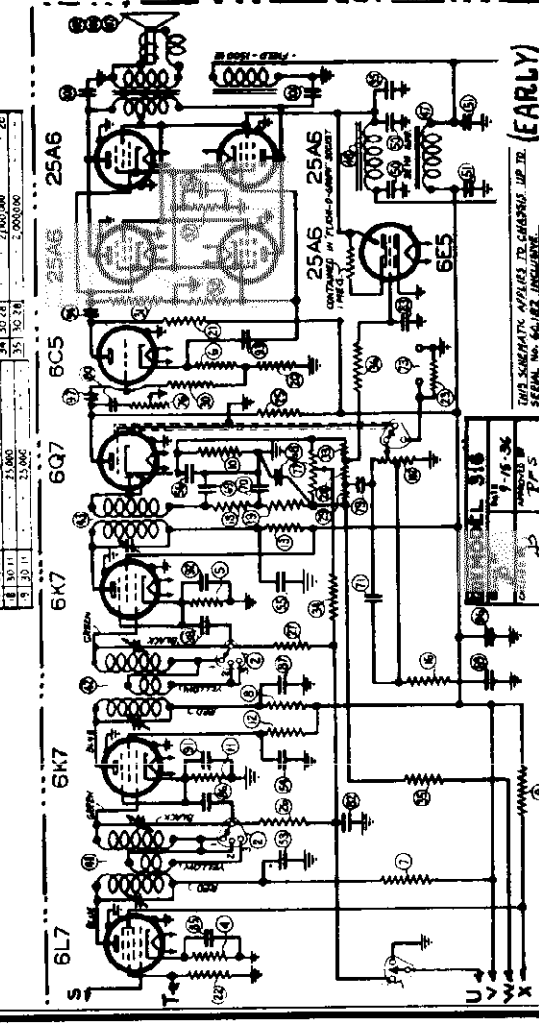
FADA RADIO & ELECTRIC CO

MODEL 316(220V)
 Early, Below Ser.#60183
 MODEL 316(220V)
 Late, Above Ser.#60183
 Schematics, Parts



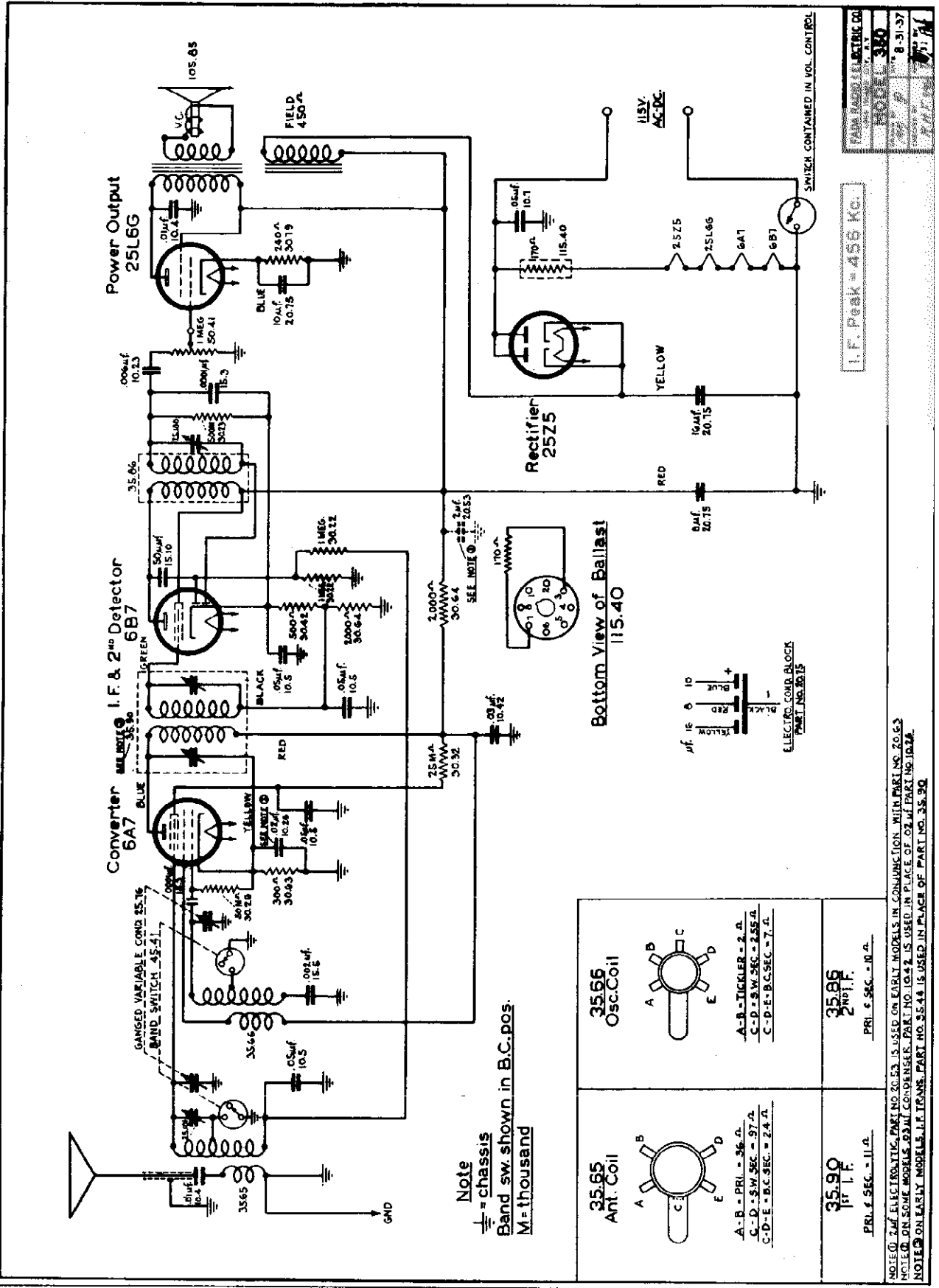
(LATE)

KT PART NO.	DESCRIPTION
1	2500000
2	2500000
3	2500000
4	2500000
5	2500000
6	2500000
7	2500000
8	2500000
9	2500000
10	2500000
11	2500000
12	2500000
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92	2500000
93	2500000
94	2500000
95	2500000
96	2500000
97	2500000
98	2500000
99	2500000
100	2500000



FADA RADIO & ELECTRIC CO

MODEL 350
Schematic, Changes



FADA RADIO & ELECTRIC CO
MODEL 350
8-31-37

I.F. Peak = 456 KC.

ELECTRO. COND. BLOCK
PART NO. 30.15

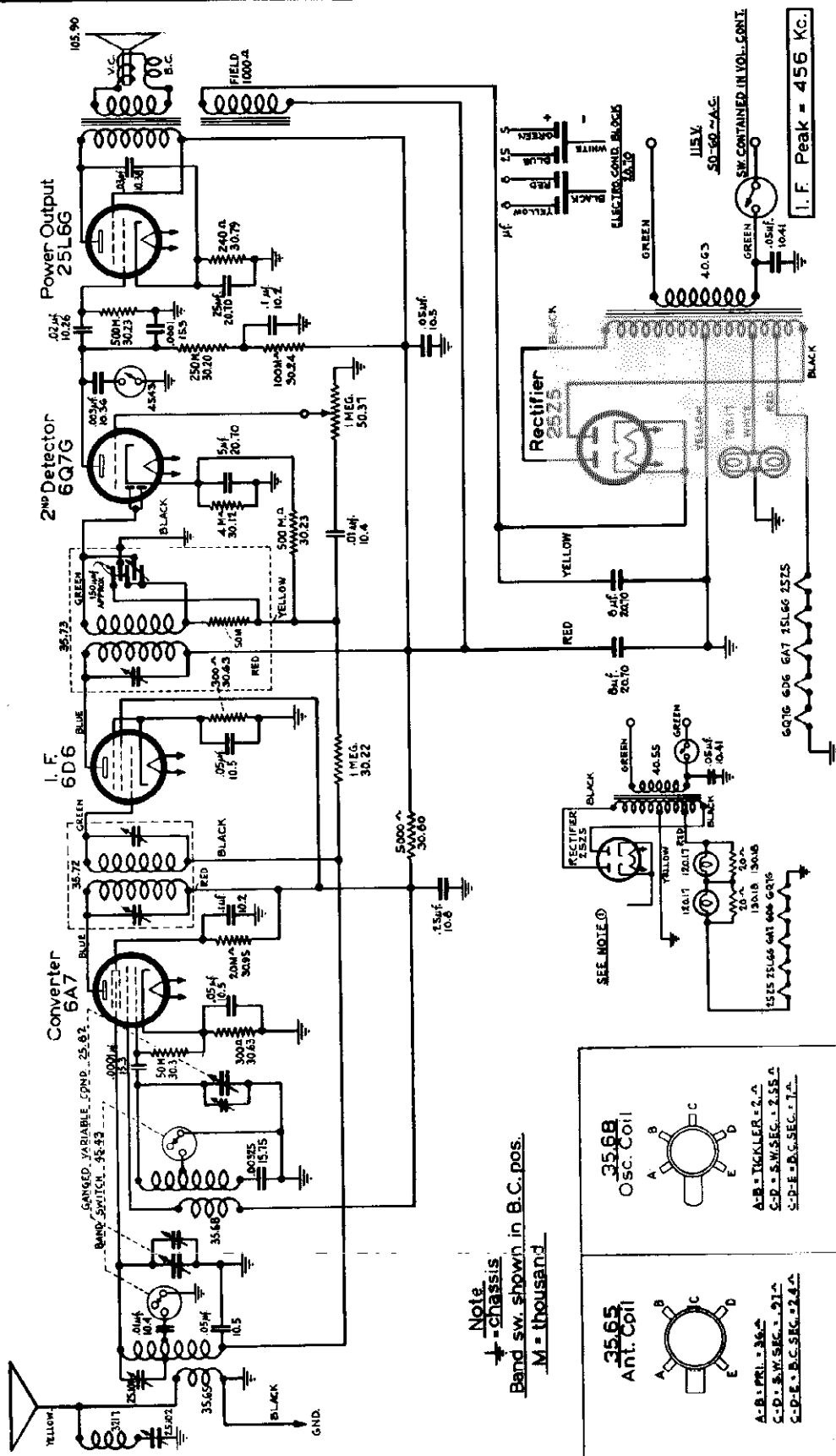
Note
= chassis
Band sw. shown in B.C. pos.
M = thousand

35.65 Ant. Coil	<p>A-B = PRI. = 36. Ω C-D = S.W. SEC. = 97. Ω C-D-E = B.C. SEC. = 7. Ω</p>	35.90 1st I.F.	PRI. SEC. = 11. Ω
35.66 Osc. Coil	<p>A-B = TICKLER = 2. Ω C-D = S.W. SEC. = 2.55. Ω C-D-E = B.C. SEC. = 7. Ω</p>	35.86 2nd I.F.	PRI. SEC. = 11. Ω

NOTE: 2Mf ELECTROSTATIC PART NO. 20.53 IS USED ON EARLY MODELS IN CONNECTION WITH PART NO. 20.63.
NOTE: IN SOME MODELS .03Mf CONDENSER PART NO. 10.42 IS USED IN PLACE OF .02Mf PART NO. 10.42.
NOTE: ON EARLY MODELS I.F. TRANS. PART NO. 35.44 IS USED IN PLACE OF PART NO. 35.90.

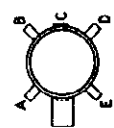
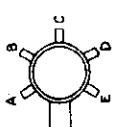
MODEL 351
Schematic

FADA RADIO & ELECTRIC CO



FADA RADIO & ELECTRIC CO
NEW YORK CITY, N. Y.
MODEL 351
PART No. 8-31-37
CHECKED BY: G. M. [Signature]

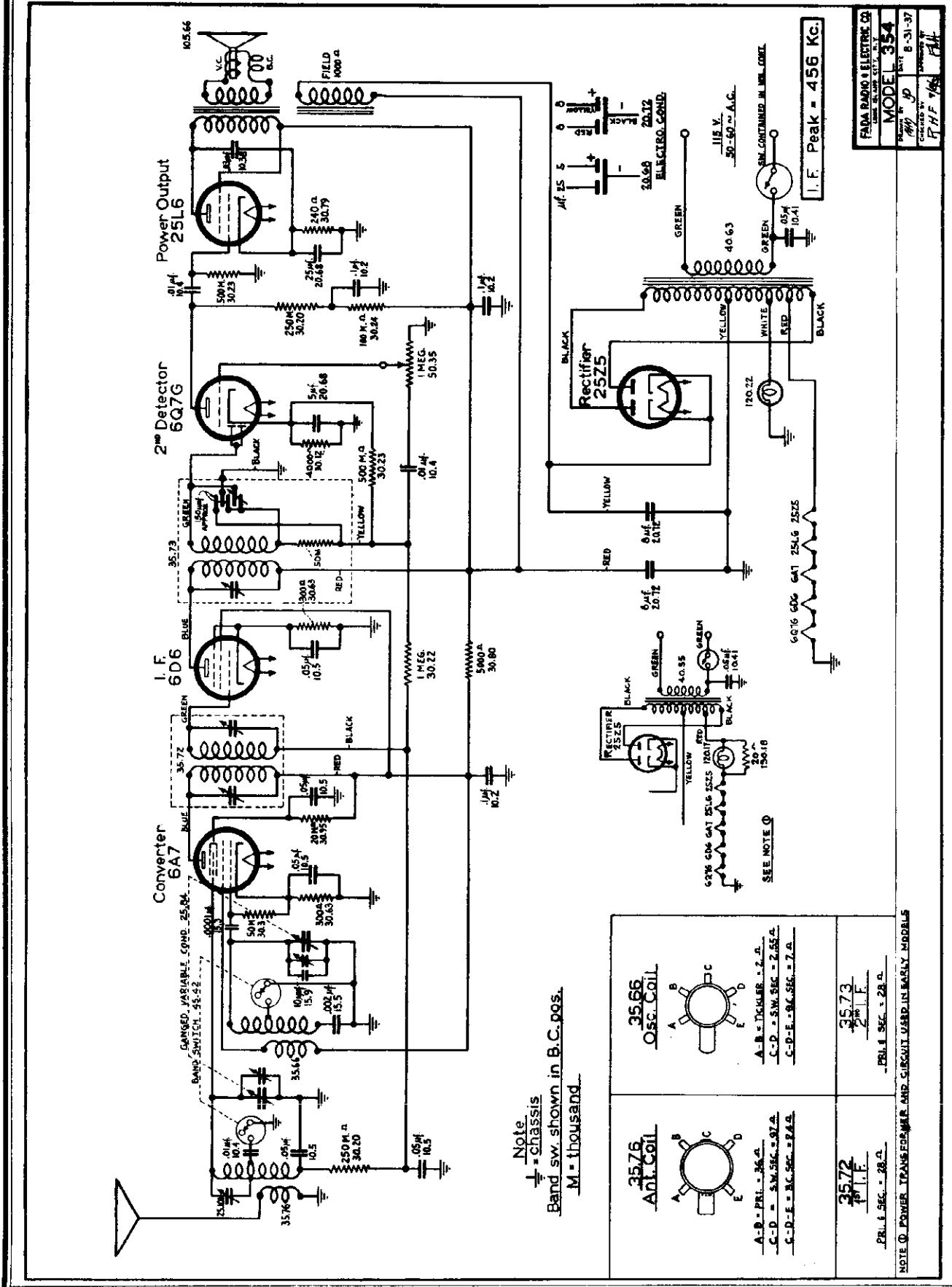
Note
+ = chassis
Band sw. shown in B.C. pos.
M = thousand

<p>35.65 Ant. Coil</p>  <p>A-B = PRI. - 36.Δ C-D = 1st SEC. - 21.Δ C-D-E = 2nd SEC. - 27.4.Δ</p>	<p>35.68 Osc. Coil</p>  <p>A-B = TCKLER - 2.Δ C-D = 1st SEC. - 2.15.Δ C-D-E = 2nd SEC. - 1.7.Δ</p>
<p>35.72 1st I.F.</p> <p>PR. 1 SEC. - 2.8.Δ</p>	<p>35.73 2nd I.F.</p> <p>PR. 1 SEC. - 2.8.Δ</p>

NOTE: POWER TRANSFORMER AND CIRCUIT USED IN EARLY MODELS.

FADA RADIO & ELECTRIC CORP.

MODEL 354
Schematic



FADA RADIO & ELECTRIC CO.
NEW YORK CITY, N. Y.
MODEL 354
Rev. 8-31-37
Checked by P.H.F. 1/48
Designed by P.H.F.

I.F. Peak = 456 Kc.

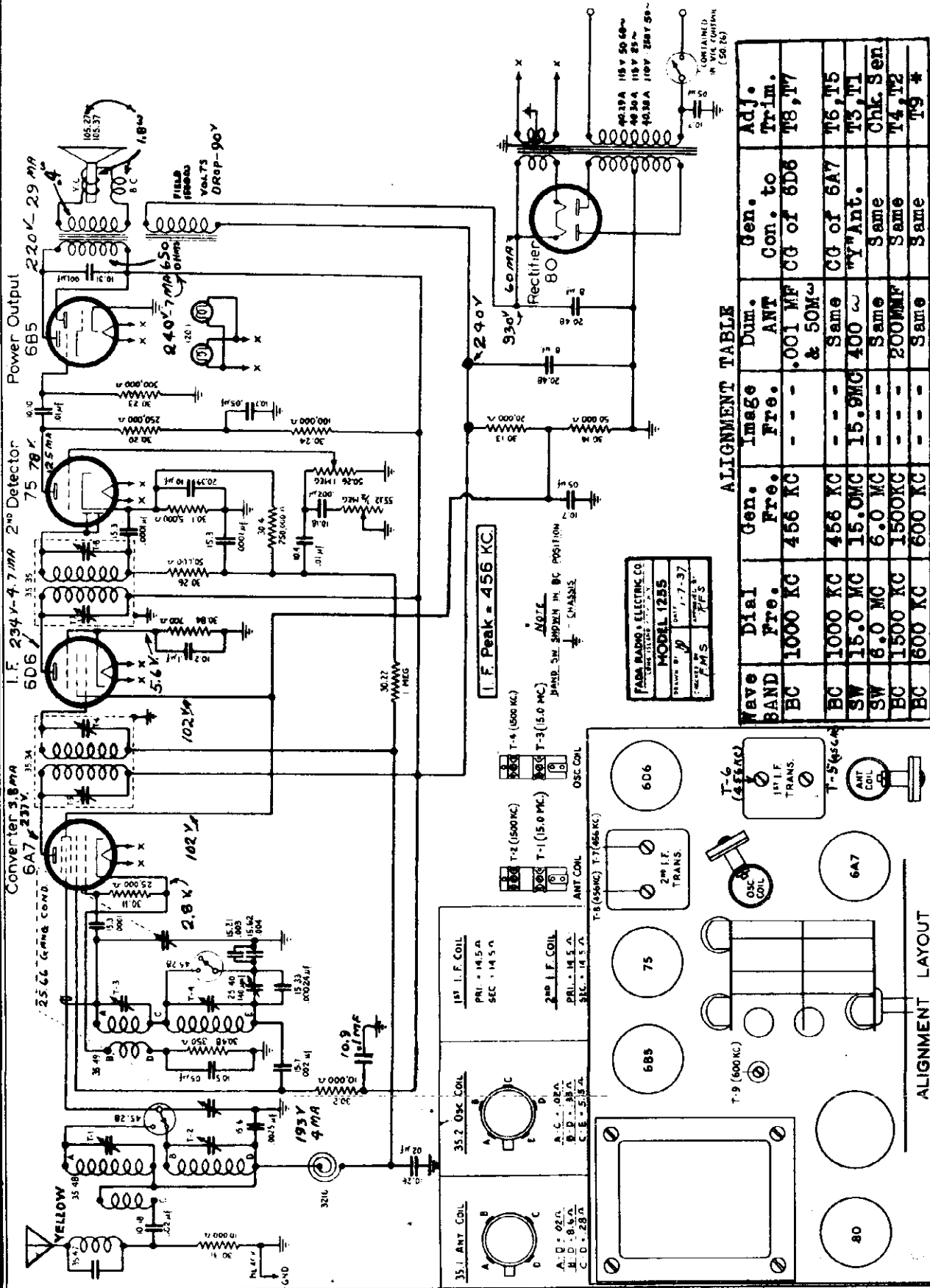
Note
⊥ = chassis
Band sw. shown in B.C. pos.
M = thousand.

<p>3576 Ant. Coil</p> <p>A-B - PRI. - 36 Ω. C-D - S.W. SEC. - 2.55 Ω. C-D-E - 8 C. SEC. - 7 Ω.</p>	<p>3576 P.I.F.</p> <p>PRI. SEC. - 28 Ω.</p>
<p>3566 Osc. Coil</p> <p>A-B - TRIMMER - 2 Ω. C-D - S.W. SEC. - 2.55 Ω. C-D-E - 8 C. SEC. - 7 Ω.</p>	<p>3573 P.I.F.</p> <p>PRI. SEC. - 28 Ω.</p>

NOTE: POWER TRANSFORMER AND CIRCUIT USED IN EARLY MODELS

MODEL 1256
Schematic, Socket
Alignment, Trimmers

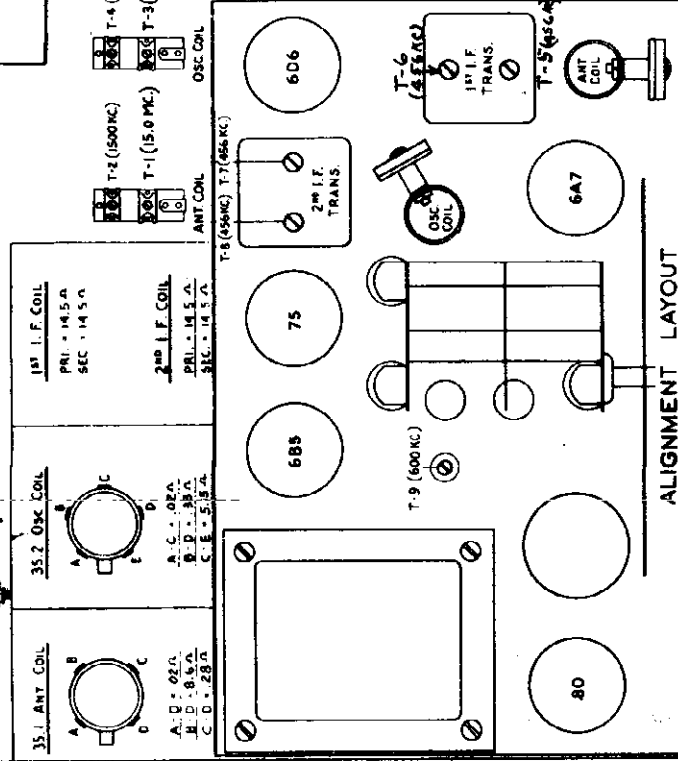
FADA RADIO & ELECTRIC CO



ALIGNMENT TABLE

Wave BAND	Dial Fre.	Gen. Fre.	Image Fre.	Dum. ANT	Gen. Con. to CG of 6D6	Adj. Trim.
BC	1000 KC	456 KC	- - -	.001 MF & 50MΩ	T8, T7	T8, T7
BC	1000 KC	456 KC	- - -	Same	T6, T5	T6, T5
SW	16.0 MC	15.0 MC	15.9 MC	400 Ω	"Y" Ant.	T3, T1
SW	6.0 MC	6.0 MC	- - -	Same	Same	Chk. Sen
BC	1500 KC	1500 KC	- - -	200MF	Same	T4, T2
BC	600 KC	600 KC	- - -	Same	Same	T9 *

* Rock during adjustment. (Check sensitivity at 6 MC)

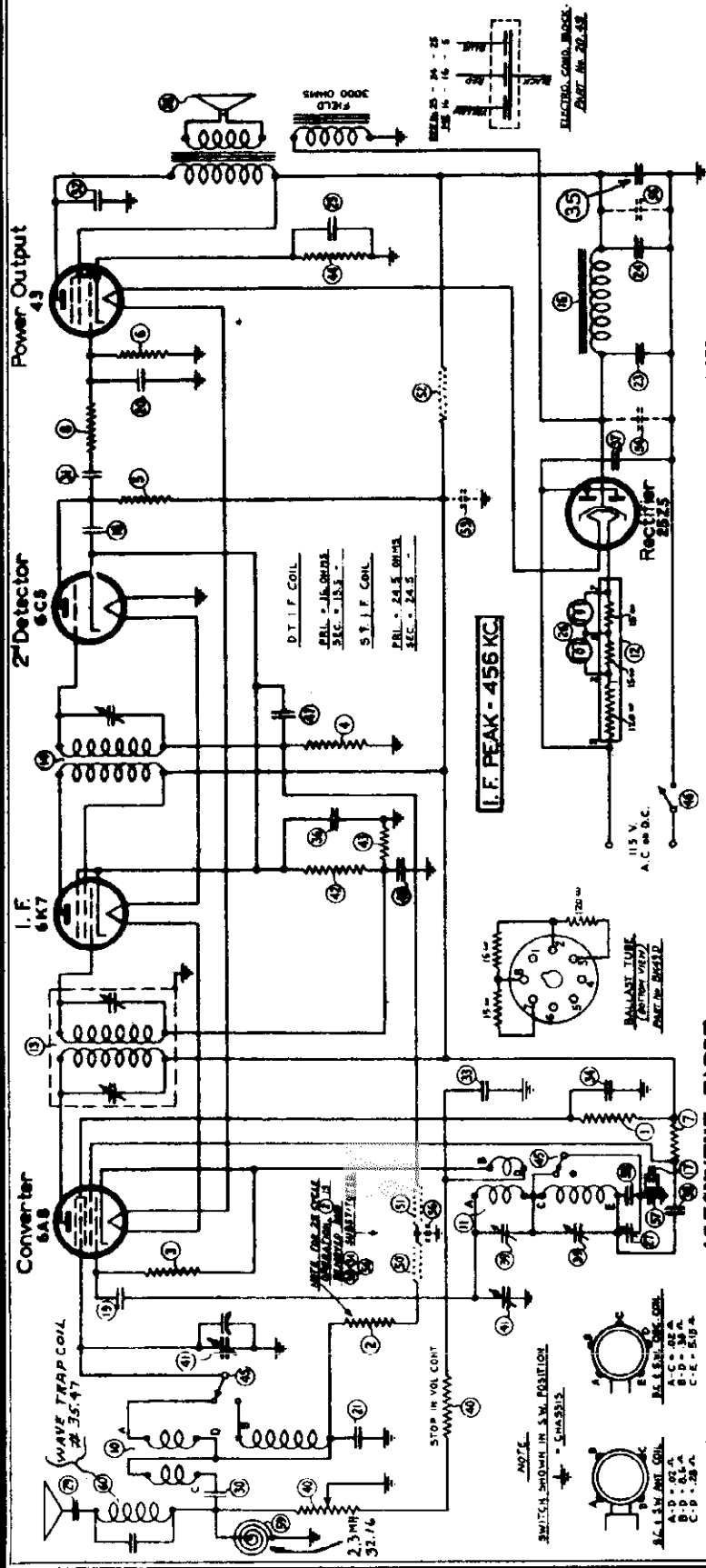


ALIGNMENT LAYOUT

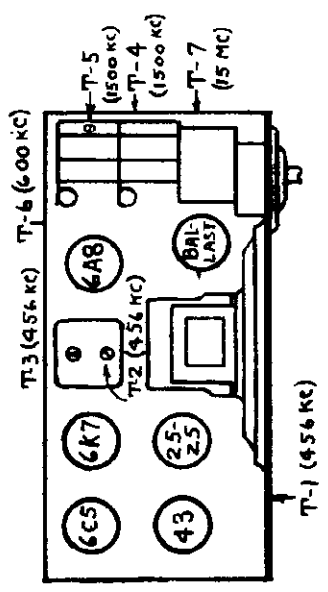
FADA RADIO & ELECTRIC CO
 MODEL 1256
 PRINTED IN U.S.A.

FADA RADIO & ELECTRIC CO

MODEL 1262
Schematic, Socket
Trimmers, Alignment
Parts



NOTE
SEE DRAWING 8-27 FOR I.F. PEAK ADJ.
RESISTOR 150 OHM VALUE
AND SEE DRAWING 8-27 FOR I.F. PEAK ADJ.
RESISTOR 150 OHM VALUE



FADA RADIO & ELECTRIC CO
MODEL 1262
DATE 1-7-37
DESIGNED BY P.F.S.

ALIGNMENT LAYOUT

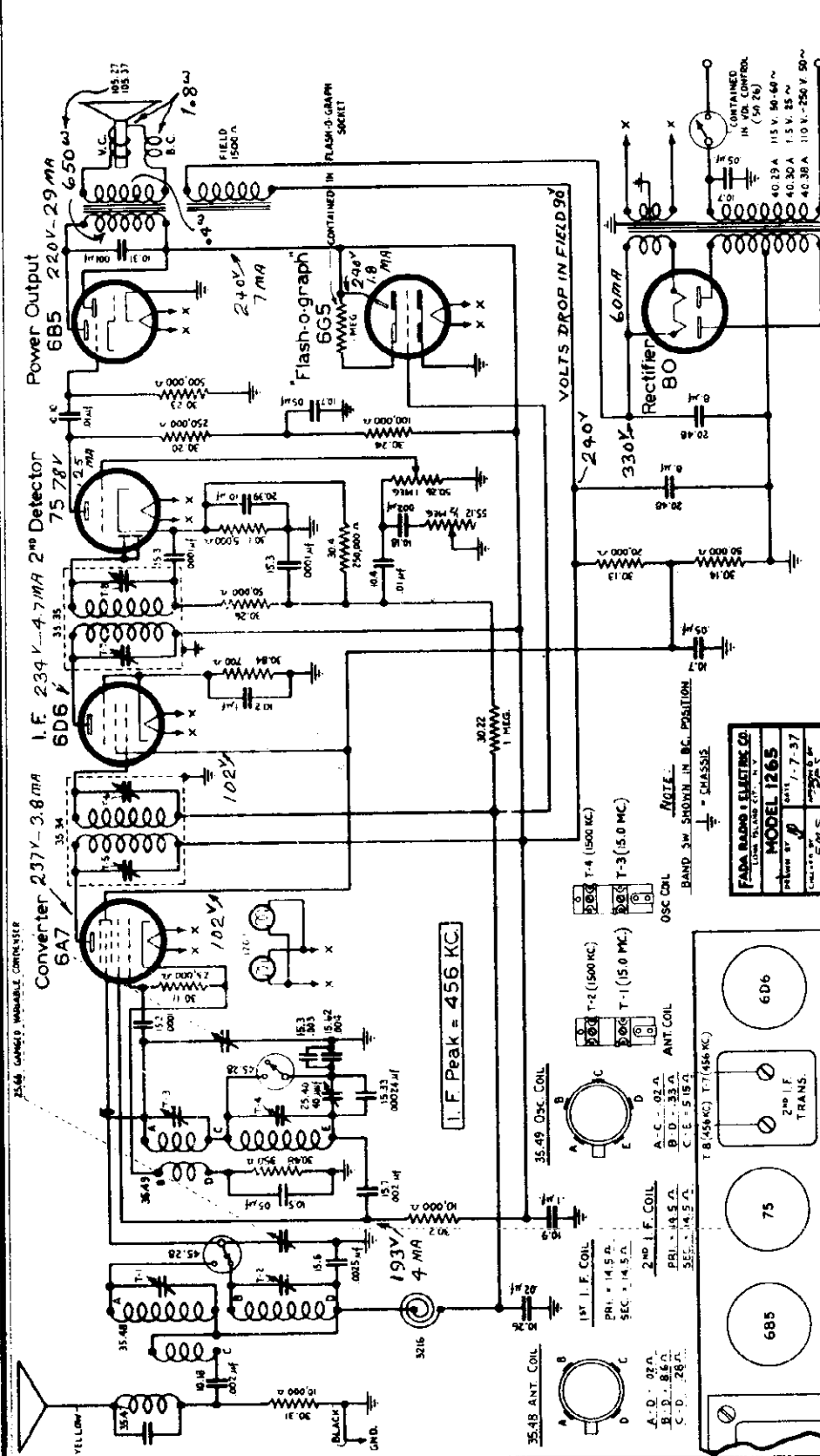
WAVE BAND	Dial Fre.	Gen. Fre.	Image Fre.	Dum. Ant.	Gen. Con. to CG of 6A8	Adj. Trim.
BC	1000KC	456 KC	- - -	.001 MF & 50MΩ	CG of 6A8	T1, T2, T3
BC	1500KC	1500KC	- - -	200 MΩ	Ant. lead	T4, T5
BC	600KC	600KC	- - -	Same	Same	T6*
SW	15 MC	15MC	- - -	400 Ω	Same	T7

* Rock variable condenser during alignment.

REF PART NO.	DESCRIPTION	REF PART NO.	DESCRIPTION
101	5000 OHM RES.	43	5000 OHM RES.
102	5000 OHM RES.	44	5000 OHM RES.
103	5000 OHM RES.	45	5000 OHM RES.
104	5000 OHM RES.	46	5000 OHM RES.
105	5000 OHM RES.	47	5000 OHM RES.
106	5000 OHM RES.	48	5000 OHM RES.
107	5000 OHM RES.	49	5000 OHM RES.
108	5000 OHM RES.	50	5000 OHM RES.
109	5000 OHM RES.	51	5000 OHM RES.
110	5000 OHM RES.	52	5000 OHM RES.
111	5000 OHM RES.	53	5000 OHM RES.
112	5000 OHM RES.	54	5000 OHM RES.
113	5000 OHM RES.	55	5000 OHM RES.
114	5000 OHM RES.	56	5000 OHM RES.
115	5000 OHM RES.	57	5000 OHM RES.
116	5000 OHM RES.	58	5000 OHM RES.
117	5000 OHM RES.	59	5000 OHM RES.
118	5000 OHM RES.	60	5000 OHM RES.
119	5000 OHM RES.	61	5000 OHM RES.
120	5000 OHM RES.	62	5000 OHM RES.
121	5000 OHM RES.	63	5000 OHM RES.
122	5000 OHM RES.	64	5000 OHM RES.
123	5000 OHM RES.	65	5000 OHM RES.
124	5000 OHM RES.	66	5000 OHM RES.
125	5000 OHM RES.	67	5000 OHM RES.
126	5000 OHM RES.	68	5000 OHM RES.
127	5000 OHM RES.	69	5000 OHM RES.
128	5000 OHM RES.	70	5000 OHM RES.
129	5000 OHM RES.	71	5000 OHM RES.
130	5000 OHM RES.	72	5000 OHM RES.
131	5000 OHM RES.	73	5000 OHM RES.
132	5000 OHM RES.	74	5000 OHM RES.
133	5000 OHM RES.	75	5000 OHM RES.
134	5000 OHM RES.	76	5000 OHM RES.
135	5000 OHM RES.	77	5000 OHM RES.
136	5000 OHM RES.	78	5000 OHM RES.
137	5000 OHM RES.	79	5000 OHM RES.
138	5000 OHM RES.	80	5000 OHM RES.
139	5000 OHM RES.	81	5000 OHM RES.
140	5000 OHM RES.	82	5000 OHM RES.
141	5000 OHM RES.	83	5000 OHM RES.
142	5000 OHM RES.	84	5000 OHM RES.
143	5000 OHM RES.	85	5000 OHM RES.
144	5000 OHM RES.	86	5000 OHM RES.
145	5000 OHM RES.	87	5000 OHM RES.
146	5000 OHM RES.	88	5000 OHM RES.
147	5000 OHM RES.	89	5000 OHM RES.
148	5000 OHM RES.	90	5000 OHM RES.
149	5000 OHM RES.	91	5000 OHM RES.
150	5000 OHM RES.	92	5000 OHM RES.
151	5000 OHM RES.	93	5000 OHM RES.
152	5000 OHM RES.	94	5000 OHM RES.
153	5000 OHM RES.	95	5000 OHM RES.
154	5000 OHM RES.	96	5000 OHM RES.
155	5000 OHM RES.	97	5000 OHM RES.
156	5000 OHM RES.	98	5000 OHM RES.
157	5000 OHM RES.	99	5000 OHM RES.
158	5000 OHM RES.	100	5000 OHM RES.

MODEL 1265
Schematic, Socket
Trimmers, Alignment
Voltage

FADA RADIO & ELECTRIC CO

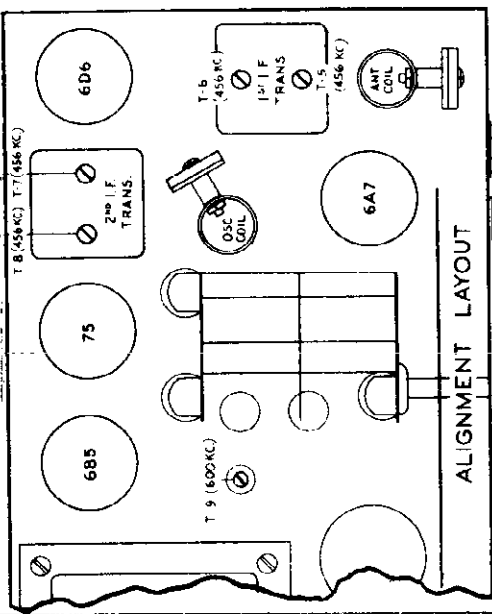


ALIGNMENT TABLE

WAVE BAND	DIAL Fre.	Gen. Fre.	Image Fre.	Dummy Antenna	Generator Con. to-	Adjust Trimmer
BC	1000KC	456KC	-	.001 MF & 50MΩ	CG of 6D6	T8, T7
BC	1000KC	456KC	-	Same	CG of 6A7	T6, T5
SW	15.0MC	15 MC	15.9MC	400 Ω	"Y" Ant. Ld.	T3, T1
SW	6 MC	6 MC	-	Same	Same	Chk. Sen.
BC	1500KC	1500KC	-	.002 MF	Same	T4, T2
BC	600KC	600KC	-	Same	Same	*T9 (Rock)

* Rock variable condenser during adjustment.

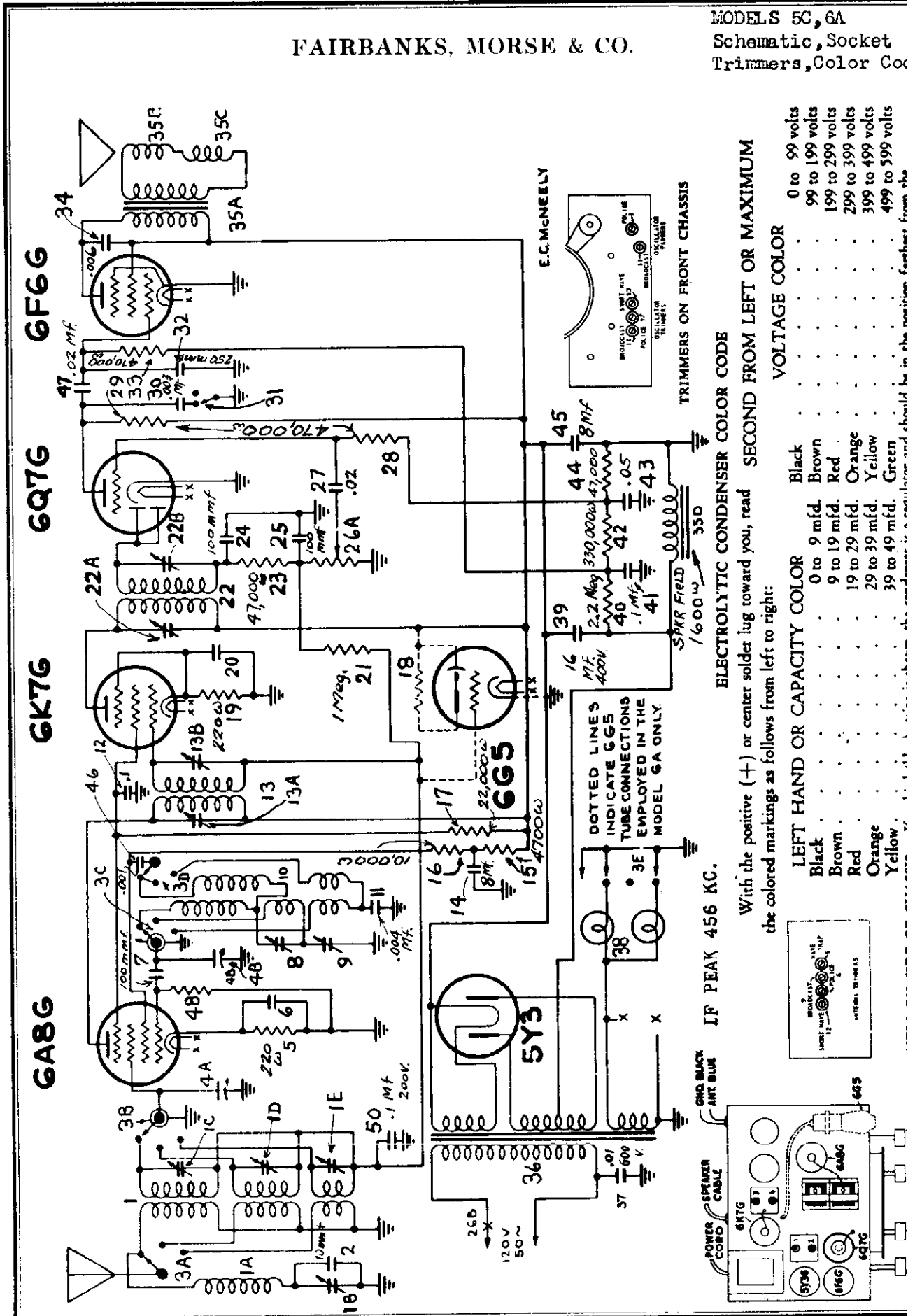
FADA RADIO & ELECTRIC CO
MODEL 1265
PARTS LIST
DATE 1-7-37
CIRCUIT F.M.S. T-3



ALIGNMENT LAYOUT

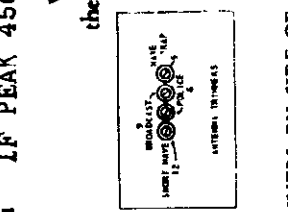
FAIRBANKS, MORSE & CO.

MODELS 5C, 6A
Schematic, Socket
Trimmers, Color Cox



With the positive (+) or center solder lug toward you, read SECOND FROM LEFT OR MAXIMUM the colored markings as follows from left to right:

LEFT HAND OR CAPACITY COLOR	VOLTAGE COLOR
Black	0 to 99 volts
Brown	99 to 199 volts
Red	199 to 299 volts
Orange	299 to 399 volts
Yellow	399 to 499 volts
Green	499 to 599 volts



MODELS 5C, 6A
Alignment, Voltage
Resistance

FAIRBANKS, MORSE & CO.

ALIGNMENT

The models 5C and 6A are AC operated, superheterodyne chassis with automatic volume control. These receivers operate on three bands—broadcast, police-amateur, and short wave, Figure 4. The 6A has the tuning eye, Figures 3 and 4; the 5C does not. Otherwise, the two chassis are identical.

Alignment procedure is given below in chart form, Figures 1 and 2. Make adjustments in the order given. The output meter may be any

low range AC voltmeter, preferably about 0-15 volts. It should be connected from the plate of the 6F6G tube to ground with a .1 mfd. condenser in series with one of the leads. When the hand tends to go off scale, reduce the input from the signal generator and keep the volume control at maximum. If too strong a signal is fed to the receiver and the volume control is used to keep the output meter hand on scale, the A. V. C. will operate and inaccurate alignment will result.

No.	Connect Generator To	Signal Generator Frequency	Dummy	Range Switch	Dial Setting	Stage	Trimmer No.	AFC Switch	Peak For	Special Instructions
1	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	2nd IF	1		Max.	
2	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	2nd IF	2		Max.	
3	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	1st IF	3		Max.	
4	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	1st IF	4		Max.	
5	Antenna	456 KC*	400 ohm Resistor	Broadcast	530 KC	Wave Trap	5		Min.	*Raise input until signal is heard.
6	Antenna	5.4 MC	400 ohm Resistor	Police Amateur	5.4 MC	Police Osc.	6		Max.	
7	Antenna	5.4 MC	400 ohm Resistor	Police Amateur	5.4 MC	Police Det.	7		Max.	
8	Antenna	1.8 MC	400 ohm Resistor	Police Amateur	1.8 MC	Police Osc.	8		*Max.	*While rocking—Repeat 6, 7 and 8 until no change is noted.
9	Antenna	1500 KC	200 mmfd. Condenser	Broadcast	1500 KC	B. C. Osc.	9		Max.	
10	Antenna	1500 KC	200 mmfd. Condenser	Broadcast	1500 KC	B. C. Det.	10		Max.	
11	Antenna	600 KC	200 mmfd. Condenser	Broadcast	600 KC	B. C. Osc.	11		*Max.	*While rocking—Repeat 9, 10 and 11 until no change is noted.
12	Antenna	18 MC	400 ohm Resistor	Short Wave	18 MC	S. W. Osc.	12		Max.	
13	Antenna	18 MC	400 ohm Resistor	Short Wave	18 MC	S. W. Det.	13		Max.	
14	Antenna	6 MC	400 ohm Resistor	Short Wave	6 MC					*Check calibration at 6 MC—Padder is fixed.

FIGURE 2
ALIGNMENT CHART

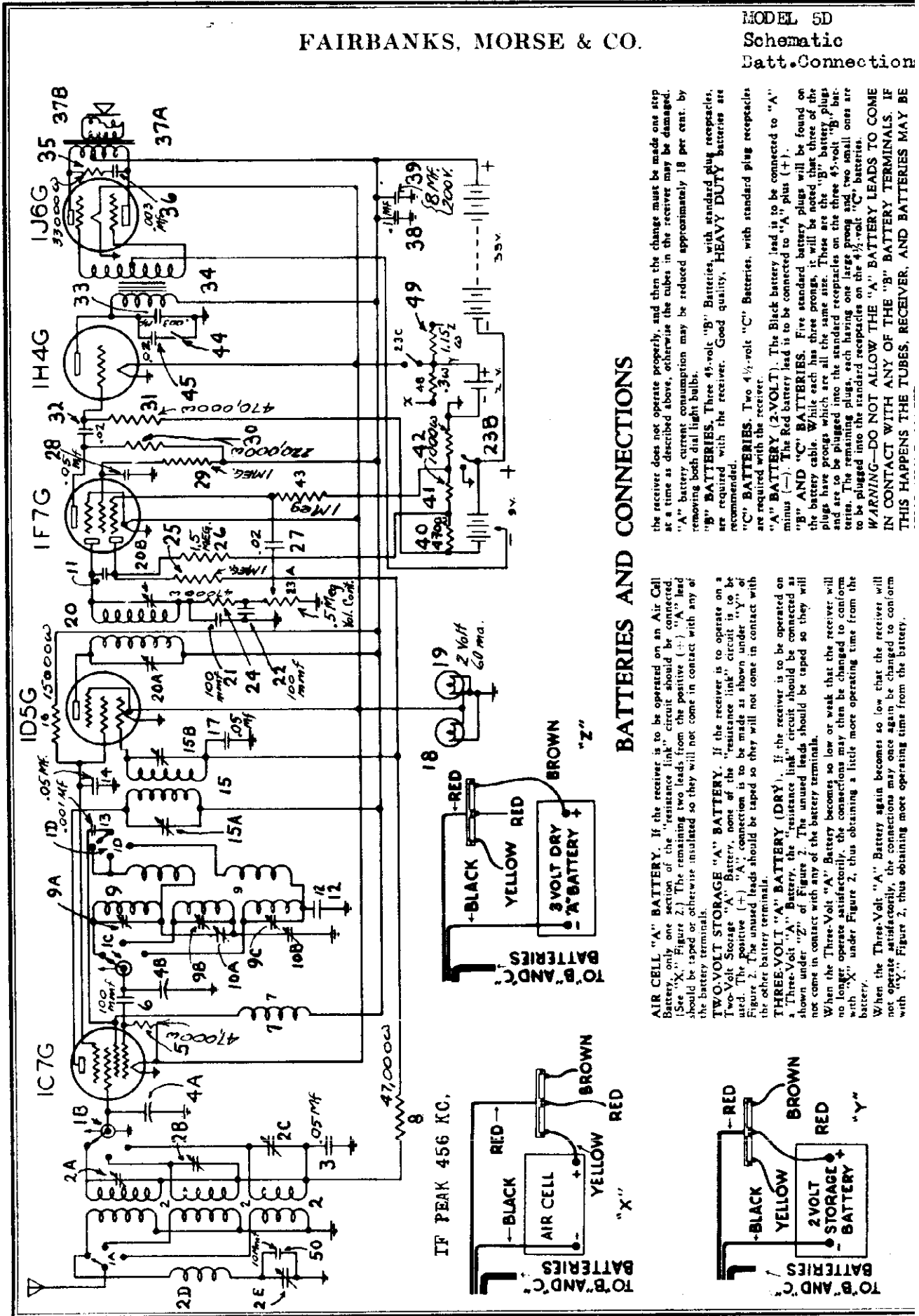
OHMS	VOLTS	6A8G	VOLTS	OHMS	OHMS	VOLTS	6F6G	VOLTS	OHMS	OHMS	VOLTS	6K7G	VOLTS	OHMS	
INF.	210		18.2	35M	INF.	255		.10	750M	INF.	108		2.15	210	
INF.	255		.13	125MEG	INF.	235		6.3	.5	INF.	253		.13	125MEG	.5
0	0		2.95	220	0	0		0	0	0	0		2.15	210	
500M	.05		.05	500M	125MEG	0		255	INF.	1650	138		138	1650	
INF.	83		.13	500M	0	68		0	0	INF.	255		255	INF.	
0	0		6.3	.5	0	.5		6.3	0	0	0		0	0	255	INF.

*CONNECTED TO TARGET THRU 1 MEGOHM RESISTOR ** 30 VOLT SCALE * 3 VOLT SCALE

VOLTAGE AND RESISTANCE ANALYSIS CHART

FAIRBANKS, MORSE & CO.

MODEL 5D
Schematic
Batt. Connection



BATTERIES AND CONNECTIONS

the receiver does not operate properly, and then the change must be made one step at a time as described above, otherwise the tubes in the receiver may be damaged. "A" Battery current consumption may be reduced approximately 18 per cent. by removing both dial light bulbs.

"B" BATTERIES. Three 4½-volt "B" Batteries, with standard plug receptacles, are required with the receiver. Good quality, HEAVY DUTY batteries are recommended.

"C" BATTERIES. Two ½-volt "C" Batteries, with standard plug receptacles are required with the receiver.

"A" BATTERY (2VOLT). The Black battery lead is to be connected to "A" minus (-). The Red battery lead is to be connected to "A" plus (+).

"B" AND "C" BATTERIES. Five standard battery plugs will be found on the battery cable. While each has three prongs, it will be noted that three of the plugs have prongs which are all the same size. These are the "B" battery plugs and are to be plugged into the standard receptacles on the three 4½-volt "B" batteries. The remaining plugs, each having one large prong and two small ones are to be plugged into the standard receptacles on the ½-volt "C" batteries.

WARNING—DO NOT ALLOW THE "A" BATTERY LEADS TO COME IN CONTACT WITH ANY OF THE "B" BATTERY TERMINALS. IF THIS HAPPENS THE TUBES, RECEIVER, AND BATTERIES MAY BE

AIR CELL "A" BATTERY. If the receiver is to be operated on an Air Cell Battery only one section of the "resistance link" circuit should be connected. (See "X," Figure 2.) The remaining two leads from the positive (+) "A" lead should be taped or otherwise insulated so they will not come in contact with any of the battery terminals.

TWO-VOLT STORAGE "A" BATTERY. If the receiver is to operate on a Two-Volt Storage "A" Battery, none of the "resistance link" circuit is to be used. The positive (+) "A" connection is to be made as shown under "Y" of Figure 2. The unused leads should be taped so they will not come in contact with the other battery terminals.

THREE-VOLT "A" BATTERY (DRY). If the receiver is to be operated on a Three-Volt "A" Battery, the "resistance link" circuit should be connected as shown under "Z" of Figure 2. The unused leads should be taped so they will not come in contact with any of the battery terminals.

When the Three-Volt "A" Battery becomes so low or weak that the receiver will no longer operate satisfactorily, the connections may then be changed to conform with "X" under Figure 2, thus obtaining a little more operating time from the battery.

When the Three-Volt "A" Battery again becomes so low that the receiver will not operate satisfactorily, the connections may once again be changed to conform with "Y," Figure 2, thus obtaining more operating time from the battery.

MODEL 5D
Alignment, Socket
Trimmers

FAIRBANKS, MORSE & CO.

The model 5D is a battery operated superheterodyne with automatic volume control. It receives signals on three bands—broadcast, police-amateur, and short wave.

Alignment procedure is given below in chart form, figures 1 and 2. Make adjustments in the order given. The output meter may be any low range AC voltmeter, preferably about 0-15 volts. It should be connected across the two plates of the 1J6G tube

with a .1 mfd. condenser in series with one of the leads. Set the volume at maximum during the alignment and as the meter hand tends to go off scale, decrease the output from the signal generator. If too strong a signal is fed to the receiver and the volume control is used to keep the output meter hand on scale, the AVC will operate and inaccurate alignment will result.

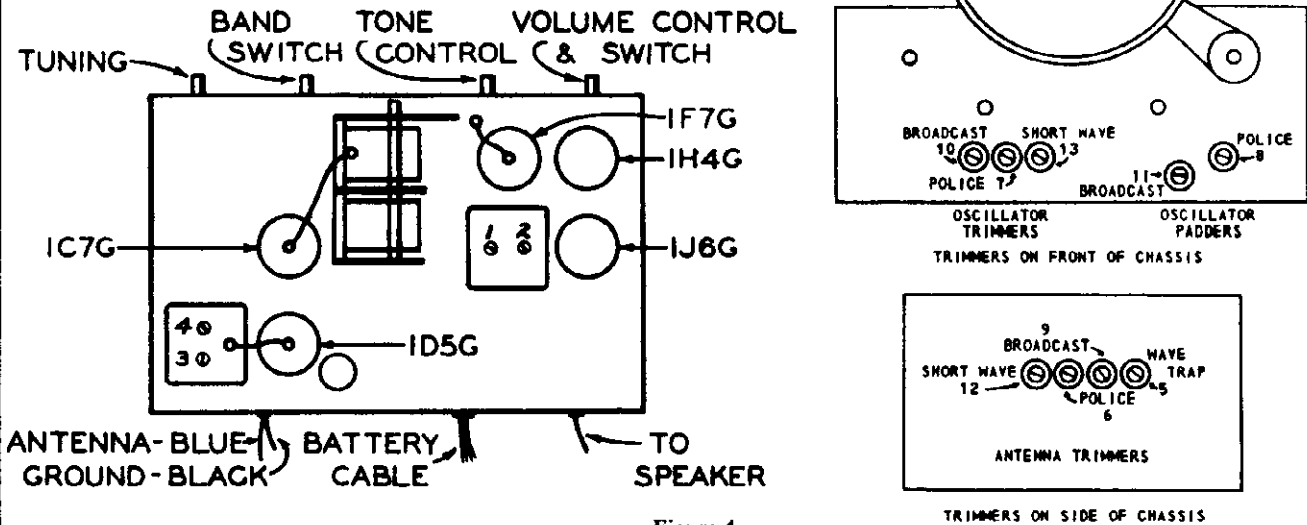


Figure 4

TOP, FRONT AND END VIEWS OF THE 5D CHASSIS SHOWING LOCATION OF TRIMMERS, CONTROLS AND COMPONENT PARTS

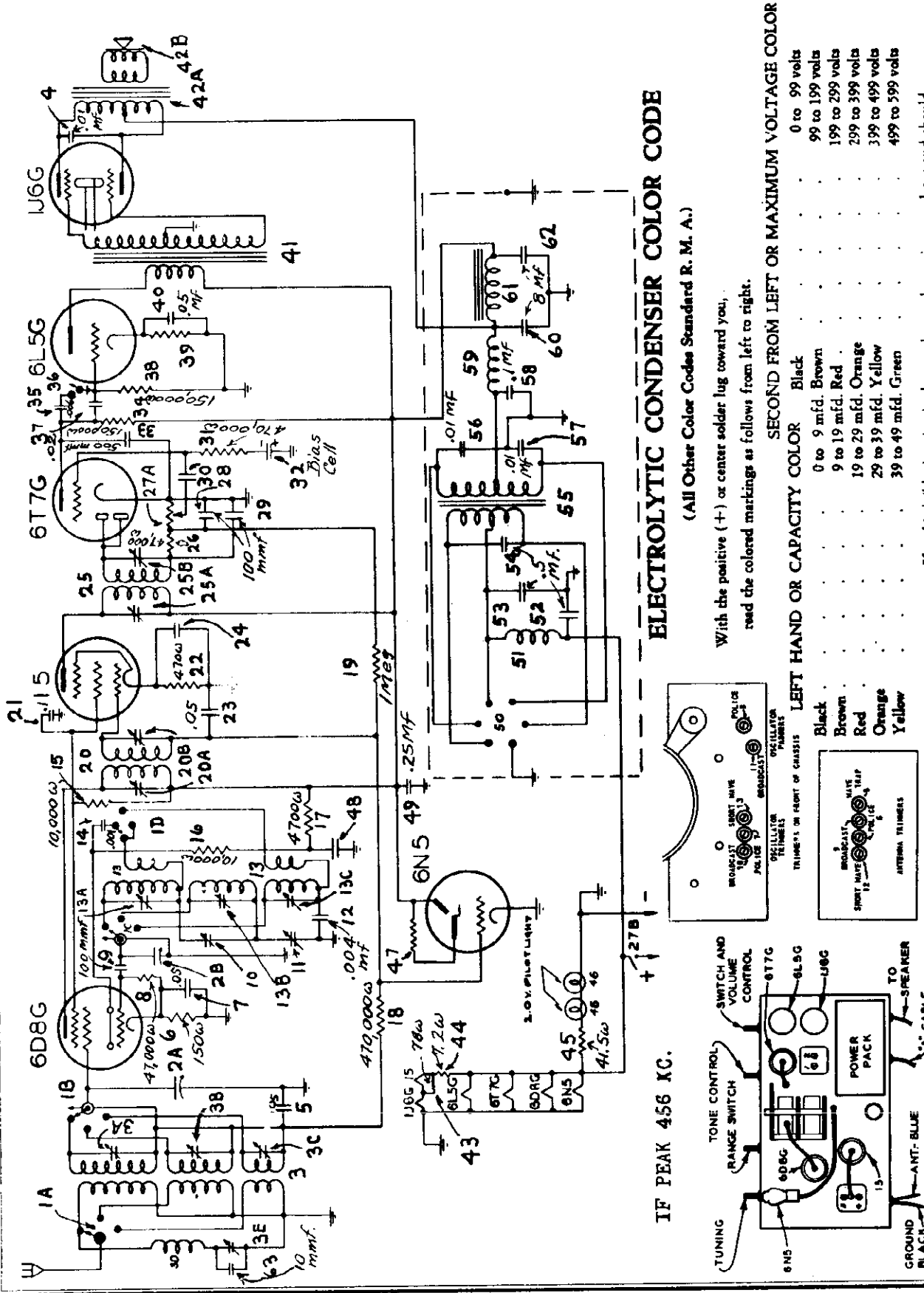
No.	Connect Generator To	Signal Generator Frequency	Dummy	Range Switch	Dial Setting	Stage	Trimmer No.	AFC Switch	Peak For	Special Instructions
1	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	2nd IF	1		Max.	
2	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	2nd IF	2		Max.	
3	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	1st IF	3		Max.	
4	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	1st IF	4		Max.	
5	Antenna	456 KC*	400 ohm Resistor	Broadcast	530 KC	Wave Trap	5		Min.	*Raise input until signal is heard.
6	Antenna	5.4 MC	400 ohm Resistor	Police Amateur	5.4 MC	Police Osc.	6		Max.	
7	Antenna	5.4 MC	400 ohm Resistor	Police Amateur	5.4 MC	Police Det.	7		Max.	
8	Antenna	1.8 MC	400 ohm Resistor	Police Amateur	1.8 MC	Police Osc.	8		*Max.	*While rocking — Repeat 6, 7 and 8 until no change is noted.
9	Antenna	1500 KC	200 mmf. Condenser	Broadcast	1500 KC	B. C. Osc.	9		Max.	
10	Antenna	1500 KC	200 mmf. Condenser	Broadcast	1500 KC	B. C. Det.	10		Max.	
11	Antenna	600 KC	200 mmf. Condenser	Broadcast	600 KC	B. C. Osc.	11		*Max.	*While rocking — Repeat 9, 10 and 11 until no change is noted.
12	Antenna	18 MC	400 ohm Resistor	Short Wave	18 MC	S. W. Osc.	12		Max.	
13	Antenna	18 MC	400 ohm Resistor	Short Wave	18 MC	S. W. Det.	13		Max.	
14	Antenna	6 MC	400 ohm Resistor	Short Wave	6 MC	S.W. Pad.	*			*Check calibration at 6 MC—Padder is fixed.

Figure 5

ALIGNMENT PROCEDURE CHART

FAIRBANKS, MORSE & CO.

MODEL 6C
Schematic, Socket
Trimmers



ELECTROLYTIC CONDENSER COLOR CODE

(All Other Color Codes Standard R. M. A.)

With the positive (+) or center solder lug toward you, read the colored markings as follows from left to right.

SECOND FROM LEFT OR MAXIMUM VOLTAGE COLOR	0 to 99 volts
Black	0 to 99 volts
Brown	99 to 199 volts
Red	199 to 299 volts
Orange	299 to 399 volts
Yellow	399 to 499 volts
Green	499 to 599 volts

LEFT HAND OR CAPACITY COLOR	0 to 9 mfd.
Black	0 to 9 mfd.
Brown	9 to 19 mfd.
Red	19 to 29 mfd.
Orange	29 to 39 mfd.
Yellow	39 to 49 mfd.

If a third (blue) stripe is shown, the condenser is a regulator and should be in the position farthest from the rectifier tube in the filter circuit.

TRIMMERS ON LINE OF CHASSIS

OSCILLATOR TRIMMERS

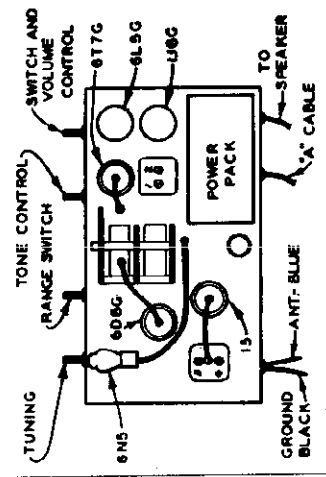
TRIMMERS IN FRONT OF CHASSIS

TRIMMER	COLOR
OSCILLATOR TRIMMERS	Black
OSCILLATOR TRIMMERS	Brown
OSCILLATOR TRIMMERS	Red
OSCILLATOR TRIMMERS	Orange
OSCILLATOR TRIMMERS	Yellow

ANTENNA TRIMMERS

TRIMMER	COLOR
ANTENNA TRIMMERS	Black
ANTENNA TRIMMERS	Brown
ANTENNA TRIMMERS	Red
ANTENNA TRIMMERS	Orange
ANTENNA TRIMMERS	Yellow

IF PEAK 456 KC.



MODEL 6C
Alignment, Voltage
Resistance

FAIRBANKS, MORSE & CO.

The model 6C is a six-volt battery operated superheterodyne with automatic volume control and tuning eye. It receives signals on three bands—broadcast, police-amateur, and short wave.

Alignment procedure is given below in chart form, figures 1 and 2. Make adjustments in the order given. The output meter may be any low range AC voltmeter, preferably about 0-15 volts. It should be connected across the two plates of the

1J6G tube with a .1 mfd. condenser in series with one of the leads. Set the volume at maximum during the alignment and as the meter hand tends to go off scale, decrease the output from the signal generator. If too strong a signal is fed to the receiver and the volume control is used to keep the output meter hand on scale, the AVC will operate and inaccurate alignment will result.

Figure 1

TOP VIEW, FRONT VIEW AND END VIEW OF THE CHASSIS SHOWING THE LOCATION OF TRIMMERS, CONTROLS, TUBES AND COMPONENT PARTS

No.	Connect Generator To	Signal Generator Frequency	Dummy	Range Switch	Dial Setting	Stage	Trimmer No.	AFC Switch	Peak For	Special Instructions
1	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	2nd IF	1		Max.	
2	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	2nd IF	2		Max.	
3	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	1st IF	3		Max.	
4	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	1st IF	4		Max.	
5	Antenna	456 KC*	400 ohm Resistor	Broadcast	530 KC	Wave Trap	5		Min.	*Raise input until signal is heard.
6	Antenna	5.4 MC	400 ohm Resistor	Police Amateur	5.4 MC	Police Osc.	6		Max.	
7	Antenna	5.4 MC	400 ohm Resistor	Police Amateur	5.4 MC	Police Det.	7		Max.	
8	Antenna	1.8 MC	400 ohm Resistor	Police Amateur	1.8 MC	Police Osc.	8		*Max.	*While rocking. Repeat 6, 7 and 8 until no change is noted.
9	Antenna	1500 KC	200 mmf. Condenser	Broadcast	1500 KC	B. C. Osc.	9		Max.	
10	Antenna	1500 KC	200 mmf. Condenser	Broadcast	1500 KC	B. C. Det.	10		Max.	
11	Antenna	600 KC	200 mmf. Condenser	Broadcast	600 KC	B. C. Osc.	11		*Max.	*While rocking. Repeat 9, 10 and 11 until no change is noted.
12	Antenna	18 MC	400 ohm Resistor	Short Wave	18 MC	S. W. Osc.	12		Max.	
13	Antenna	18 MC	400 ohm Resistor	Short Wave	18 MC	S. W. Det.	13		Max.	
14	Antenna	6 MC	400 ohm Resistor	Short Wave	6 MC		*			*Check calibration at 6 MC. Padder is fixed.

Figure 2

ALIGNMENT PROCEDURE CHART

OHMS	VOLTS	6086	VOLTS	OHMS	OHMS	VOLTS	15	VOLTS	OHMS	OHMS	VOLTS	6T7G	VOLTS	OHMS
INF.	83		.62 ⁺	41M				83	INF.	450M	-.15 ⁺		-.15 ⁺	450M
INF.	125		85	INF.				.05 ⁺	1MEG	INF.	58		.3 ⁺	350M
0	0		6.3	1.5	INF.	127		1.25 ⁺	450	0	0		6.3	1.5
			1.37 ⁺	135	1.5	2.2		4.1	2.5	0	0		0	0
OHMS	VOLTS	6L5G	VOLTS	OHMS	OHMS	VOLTS	6N5	VOLTS	OHMS	OHMS	VOLTS	1J6G	VOLTS	OHMS
			0	130M	1MEG	0		126	INF.	240	0		0	260
INF.	225		0	0				0	0	INF.	136		136	INF.
	6.3		4.2	1100	1.5	6.3		0	0					

*3 VOLT SCALE

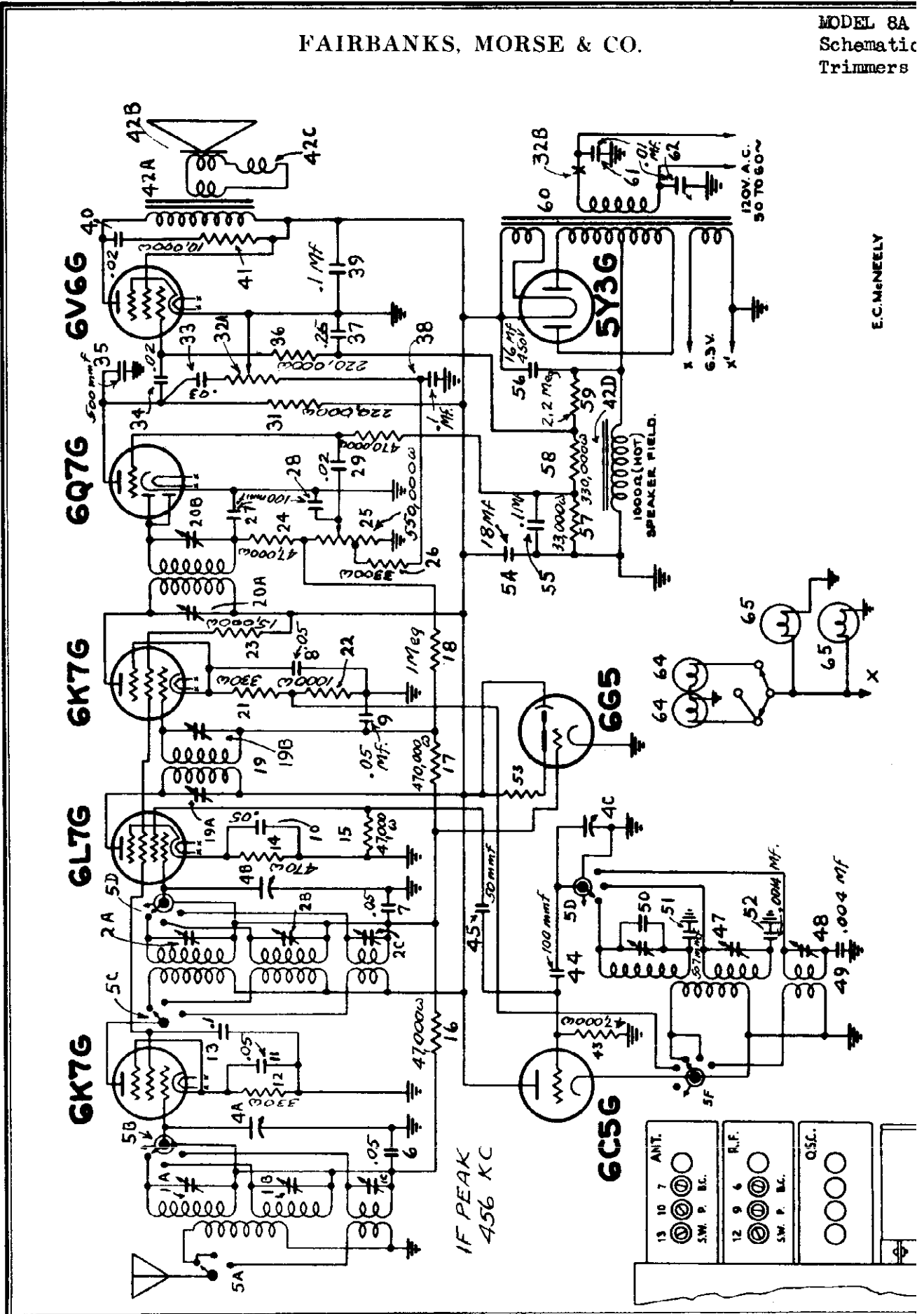
⊕ CONNECTED TO TARGET (T) THRU 1 MEGOHM. RESISTOR IN SOCKET

Figure 5

VOLTAGE AND RESISTANCE ANALYSIS CHART

FAIRBANKS, MORSE & CO.

MODEL 8A
Schematic
Trimmers

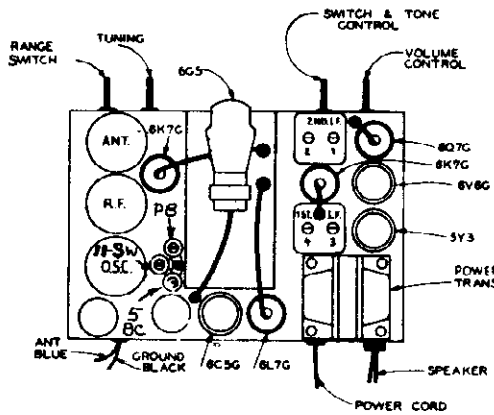


E.C. McNEELY

MODEL 8A

Alignment, Voltage
Resistance, Socket
Trimmers

FAIRBANKS, MORSE & CO.



No.	Connect Generator To	Signal Generator Frequency	Dummy	Range Switch	Dial Setting	Stage	Trimmer No.	AFC Switch	Peak For	Special Instructions
1	6L7G Grid	456 KC	1 mfd. Condenser	Broadcast	550 KC	2nd IF	1		Max.	
2	6L7G Grid	456 KC	1 mfd. Condenser	Broadcast	550 KC	2nd IF	2		Max.	
3	6L7G Grid	456 KC	1 mfd. Condenser	Broadcast	550 KC	1st IF	3		Max.	
4	6L7G Grid	456 KC	1 mfd. Condenser	Broadcast	550 KC	1st IF	4		Max.	
5	Antenna Lead	1500 KC	200 mmf. Condenser	Broadcast	1500 KC	BC Osc.	5		Max.	
6	Antenna Lead	1500 KC	200 mmf. Condenser	Broadcast	1500 KC	BC Det.	6		Max.	
7	Antenna Lead	1500 KC	200 mmf. Condenser	Broadcast	1500 KC	BC Ant.	7		Max.	Check calibration at 600 KC
8	Antenna Lead	5.4 MC	400 ohm Resistor	Police	5.4 MC	Police Osc.	8		Max.	
9	Antenna Lead	5.4 MC	400 ohm Resistor	Police	5.4 MC	Police Det.	9		Max.	
10	Antenna Lead	5.4 MC	400 ohm Resistor	Police	5.4 MC	Police Ant.	10		Max.	Check calibration at 1.8 MC
11	Antenna Lead	18 MC	400 ohm Resistor	Short Wave	18 MC	S.W. Osc.	11		Max.	Check for image at 17.1 MC. It should not be as strong as the signal at 18 MC
12	Antenna Lead	18 MC	400 ohm Resistor	Short Wave	18 MC	S.W. Det.	12		Max.	
13	Antenna Lead	18 MC	400 ohm Resistor	Short Wave	18 MC	S.W. Ant.	13		Max.	Check calibration at 6 MC

When aligning the police and short wave bands, care must be taken to see that the trimmers are set on the proper frequency and not on the image. The signal from the oscillator beating with the incoming signal in the mixer tube produces two 456 kilocycle heterodynes, one equal to the oscillator frequency minus the frequency of the incoming signal, and the other equal to the incoming signal minus the oscillator. The former is the one to which the RF and antenna trimmers must be tuned if the receiver is to work correctly over the entire band. The image falls 912 kilocycles below the fundamental signal, so at 18 megacycles the image should be heard at 18 megacycles minus .912 megacycles or 17.1 megacycles approximately.

After setting the oscillator trimmer, increase the input from the signal generator and make sure that the image comes in at the proper point. When you can hear one signal at the frequency to which your generator is set, and one at about 1 megacycle below it, you are ready to finish the alignment. Go back to the fundamental frequency and start peaking the RF trimmer, rocking the tuning condenser slightly as you do so. When you reach a peak, compare the strength of the fundamental signal and the image. If the image is the stronger, you have the wrong peak on the RF trimmer. Find the other peak and again compare the two signals. You will probably find it necessary to increase the generator input greatly in order even to hear the image when you have found the right peak. The antenna trimmer may be peaked in the same manner.

Extreme howling or motorboating on the short wave bands or dead spots near the high frequency end of the dial are good indications that the RF trimmer is improperly aligned and may easily be corrected by resetting it as described above.

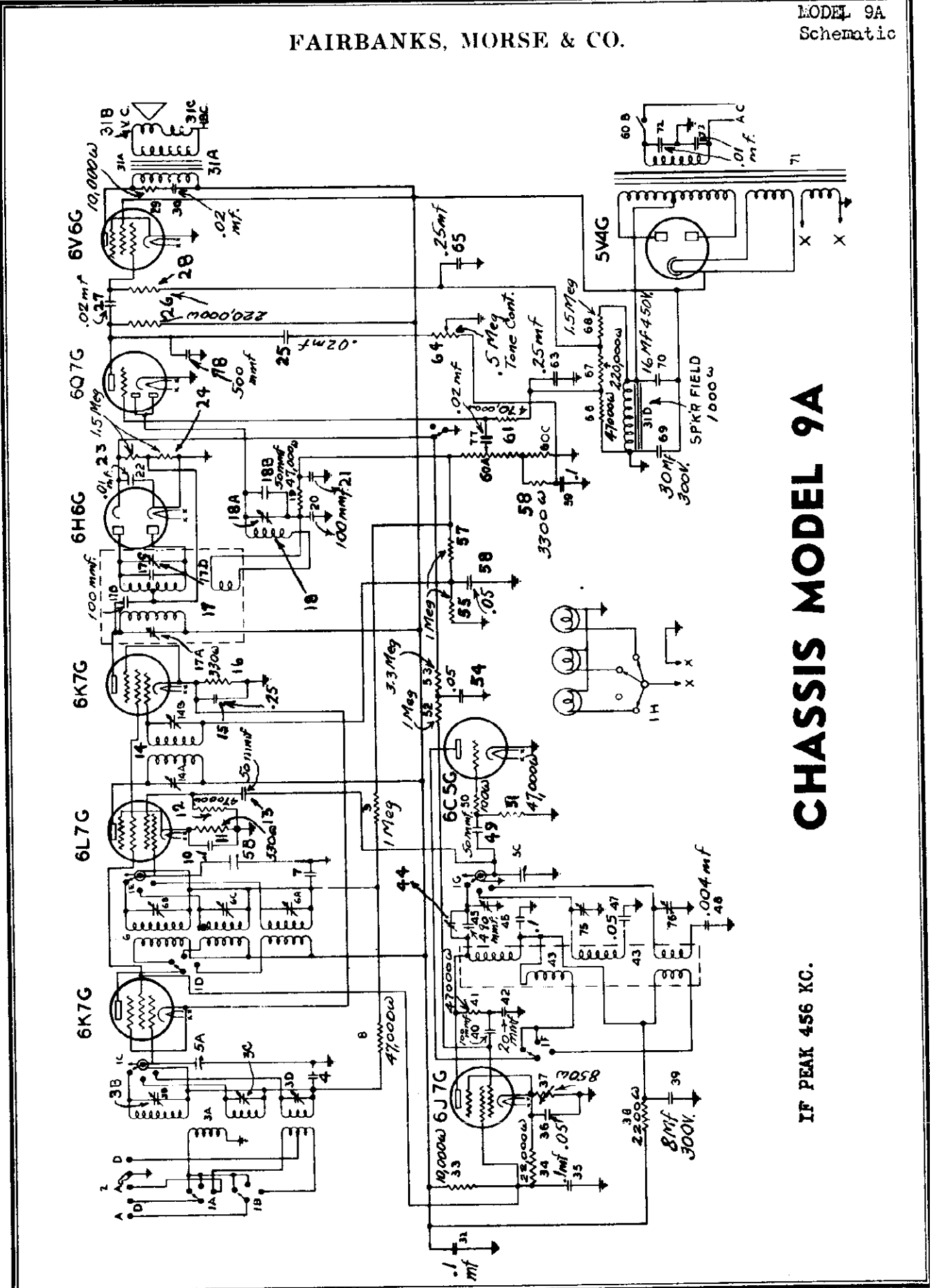
OHMS VOLTS	5Y3G	6Y3G	6V6	6B5	6Y3	6K7G	6V6	6B5
1000	95	12	245	240	105	245	240	105
INF.	245	INF.	230	INF.	240	240	INF.	240
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
OHMS VOLTS	6K7G	6L7G	6B5	6B5	6B5	6B5	6B5	6B5
INF.	107	53	26.0	26.0	26.0	26.0	26.0	26.0
INF.	240	0	240	240	240	240	240	240
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
OHMS VOLTS	6K7G	RF	RF	RF	RF	RF	RF	RF
INF.	105	2.58	340	340	340	340	340	340
INF.	238	0	INF.	INF.	INF.	INF.	INF.	INF.
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

CONNECTED TO TARGET THRU 1 MEGOHM RESISTOR

* 3 VOLT SCALE
** 30 VOLT SCALE

FAIRBANKS, MORSE & CO.

MODEL 9A
Schematic

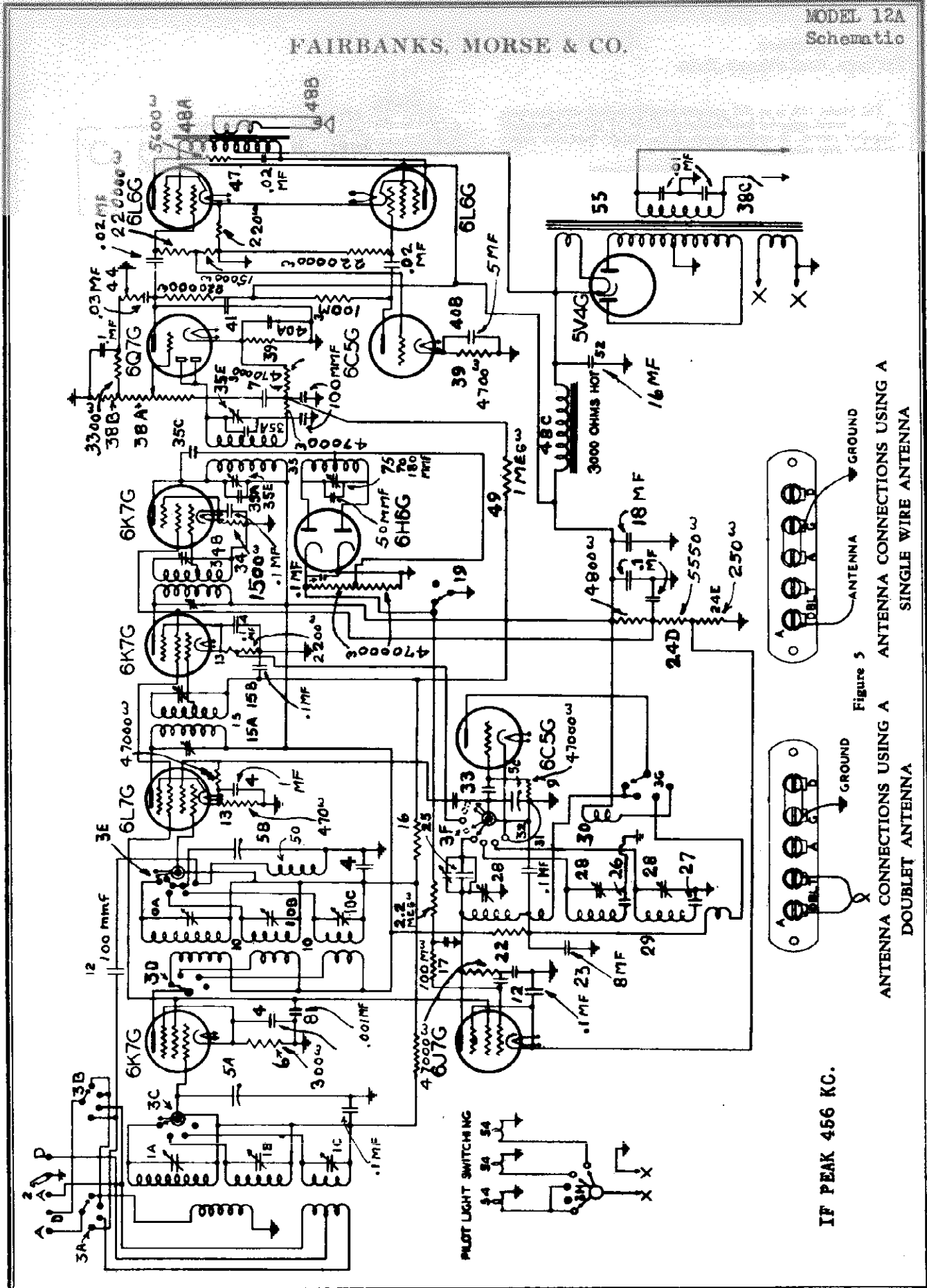


CHASSIS MODEL 9A

IF PEAK 456 KC.

FAIRBANKS, MORSE & CO.

MODEL 12A
Schematic



IF PEAK 456 KC.

Figure 5
ANTENNA CONNECTIONS USING A DOUBLET ANTENNA
ANTENNA CONNECTIONS USING A SINGLE WIRE ANTENNA

MODEL 12A

FAIRBANKS, MORSE & CO.

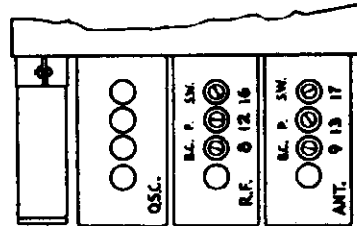
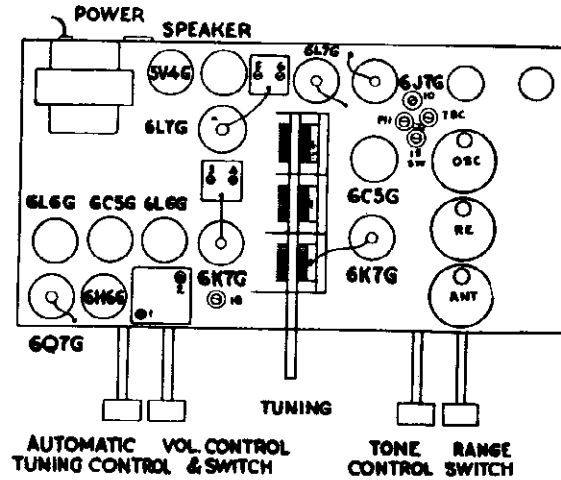
Socket, Trimmers
Voltage, Resistance, Data

The Model 12A is an AC operated superheterodyne with automatic volume control, signa-lite band indication, automatic dial and automatic frequency control. It receives signals on four bands—broadcast, police-amateur, short wave and ultra-short wave.

Alignment procedure is given in the following pages in chart form. Make adjustments in the order given. The output meter may be any low range AC voltmeter, preferably about 0-15 volts. It should be connected across the plates of the 6L6G tubes with a .1 mfd. condenser in series with one of the leads. The volume control should be set at maximum during the alignment, and as the meter hand tends to go off scale, the output from the signal generator should be decreased. If too strong a signal is fed to the receiver and the volume control is used to keep the hand on scale, the A.V.C. will operate and inaccurate alignment will result.

When aligning the police and short wave bands, care must be taken to see that the trimmers are set on the proper frequency and not on the image. The signal from the oscillator beating with the incoming signal in the mixer tube produces two 456 kilocycle heterodynes, one equal to the oscillator frequency minus the frequency of the incoming signal and the other equal to the incoming signal minus the oscillator. The former is the one to which the RF and antenna trimmers must be tuned if the receiver is to work correctly over the entire band. The image falls 912 kilocycles below the fundamental signal, so at 18 megacycles the signal should be heard at 18 minus .912 or 17.1 megacycles approximately.

After setting the oscillator trimmer, increase the input from the signal generator and make sure that the image comes in at the proper point. When one signal can be heard at the frequency to which the generator is set and one at about one megacycle below it the alignment is ready to be finished. Go back to the fundamental frequency and start peaking the RF trimmer, rocking the tuning condenser slightly at the same time. When a peak has been reached, compare the strength of the fundamental signal and the image. If the image is the stronger, the RF trimmer is at the wrong peak. Find the other peak and again compare the two signals. It will probably be necessary to increase the generator input greatly in order even to hear the image when the right peak has been found.



OHMS	VOLTS	6K7G	VOLTS	OHMS	OHMS	VOLTS	6L7G	VOLTS	OHMS	OHMS	VOLTS	6J7G	VOLTS	OHMS		
5700	100		3.7*	320	5700	100		.35**	42,500	5700	100		4.8*	250		
10,500	235		0	INF.	10,000	232		0	INF.	13,500	192		0	6.3	0	INF.
0	6.3		0	0	0	0		6.3	0	0	0		6.3	0	0	0
0	0		3.7*	320	0	0		5.2*	500	0	0		0	0	4.8*	250
OHMS	VOLTS	6C5G	VOLTS	OHMS	OHMS	VOLTS	6K7G	VOLTS	OHMS	OHMS	VOLTS	6K7G	VOLTS	OHMS		
			.05**	41,500	5700	100		8.3*	2,900	5700	100		3.2*	1,500		
13,500	200		0	0	10,500	232		0	INF.	10,500	232		0	7.50		
0	6.3		0	0	0	0		0	0	0	0		6.3	0		
0	0		0	0	0	0		8.3*	2,900	0	0		0	3.2*	1,500	
OHMS	VOLTS	6H6G	VOLTS	OHMS	OHMS	VOLTS	6C5G	VOLTS	OHMS	OHMS	VOLTS	6Q7G	VOLTS	OHMS		
0	0		.13**	230M				0	190M	500M	0		0	500M		
230M	.13**		0	0	13,000	108		0	0	190M	110		0	500M		
0	6.3		0	0	0	6.3		0	0	0	6.3		0	0		
0	0		0	0	0	0		4.8*	225	0	0		1.15**	4,500		
OHMS	VOLTS	6L6G	VOLTS	OHMS	OHMS	VOLTS	6L6G	VOLTS	OHMS	OHMS	VOLTS	5V4G	VOLTS	OHMS		
10,500	215		0	190M	10,500	215		0.	190M	55	AC		AC	58		
13,000	395		0	0	13,000	395		6.3	0	13,500	405		405	13,000		
0	6.3		0	0	0	0		0	0	0	0		0	0		
0	0		18.7*	205	0	0		18.7*	225							

*3 VOLT SCALE

VOLTAGE AND RESISTANCE ANALYSIS CHART

**30 VOLT SCALE

FAIRBANKS, MORSE & CO.

MODEL 9A,12A
Automatic Dial Notes
MODEL 12A
Alignment

THE AUTOMATIC DIAL

Since the Model 12AC6 is to be delivered to the customer with the dial set up for the locality in which he lives, it is important that the serviceman be thoroughly familiar with the proper set-up procedure so that he can perform the operation accurately and in a small amount of time.

It would be practically impossible to design a mechanical tuning device for a receiver as selective as the 12A which would automatically tune stations to the exact point of resonance every time without the operator's having to watch some sort of resonance indicator. For that reason automatic frequency control (true AFC tuning) has been incorporated into this model. The automatic frequency control makes up for the slight mechanical tolerances necessary in a device such as the automatic dial by shifting the oscillator to the exact frequency of the station to which the dial is tuned. It will be noted that stations can be "pulled" into resonance with the dial as much as 10 kilocycles away from the point where they would come in with the automatic tuning switch in the "out" position, and for that reason accurate setting of the dial might seem unimportant. It must be remembered, however, that the sensitivity of the receiver is best at the point where the stations come in without A.F.C. and that A.F.C. shifts only the oscillator frequency, not the RF and detector stages. Therefore, accurate setting of the dial is important if good reception is to be obtained on all the stations.

First, throw the automatic tuning switch to the "OUT" position. Then, by means of the outer tuning knob, tune in a station to which a button is to be assigned. Now, place a finger on the button nearest the "click" point (the mid-point at the bottom) and move it over to the "click" point until the dial locks. Care must be taken at this point that in depressing the button without its pyralin covering the metal plunger in the center is not pushed to a point where the dial will not lock. If this difficulty is experienced, try depressing the button with the nail of the forefinger against its outer edge.

After the dial has clicked into place and seems to be locking properly,

release the button taking care not to move the dial. Now, with a pencil or screw driver held in the left hand push the metal plunger at the center of the button in as far as it will go. With the right hand return the station carefully and then release the metal plunger. It may not come all the way out at first and a slight back and forth motion of the vernier knob may be necessary before it snaps out to its original position. Be sure that the plunger is back into place before the station tab is placed in the button.

To check the setting before putting in the station tab, rotate the dial until the button which was just set is somewhere near the top of the dial. Throw the automatic tuning switch to the "IN" position and use the button to tune in the station just as is described under "Automatic Tuning" in the Operating Instructions. Observe the same precautions as were mentioned before in regard to the metal plunger or the setting will have to be made all over again. With the station still tuned in, throw the automatic tuning switch to the "OUT" position and note the amount of detuning which occurs. If the station is detuned more than 3 or 4 kilocycles or to a point where the side bands are just barely audible, there is a closer setting possible and the button should be reset. When the dial seems to be tuning in the station properly, put in the proper station tab and place one of the pyralin discs over it. The tab should be placed so as to read right side up when the button is at the "click" point. This gives a uniform appearance to the dial when the buttons have all been set. In case any of the buttons are not used, put in one of the blank tabs supplied and a pyralin disc.

Set the remainder of the buttons in exactly the same manner, making sure each time that the switch is in the "OUT" position before an adjustment is started.

When the dial setting has been completed, replace the sheets of station tabs in their envelope and put the envelope, together with the one containing the pyralin discs, into the back of the cabinet beside the chassis so that they will be available later should the customer desire to have the dial set for other stations.

ALIGNMENT PROCEDURE CHART

No.	Connect Capacitor To	Signal Generator Frequency	Dummy Antenna	Range Switch	Dial Setting	Scope	Trimmer No.	AFC Switch	Peak For	Special Instructions
1	6L7G Grid	456 KC	.1 Mfd. Condenser	Broadcast	550 KC	Disc.	1	Out	Max.	***See foot note below.
2	6L7G Grid	456 KC	.1 Mfd. Condenser	Broadcast	550 KC	Disc.	2	Out	Max.	***See foot note below.
3	6L7G Grid	456 KC	.1 Mfd. Condenser	Broadcast	550 KC	Disc.	18	Out	Min.	***See foot note below.
4	6L7G Grid	456 KC	.1 Mfd. Condenser	Broadcast	550 KC	2nd IF	3	Out	Max.	
5	6L7G Grid	456 KC	.1 Mfd. Condenser	Broadcast	550 KC	2nd IF	4	Out	Max.	
6	6L7G Grid	456 KC	.1 Mfd. Condenser	Broadcast	550 KC	1st IF	5	Out	Max.	
7	6L7G Grid	456 KC	.1 Mfd. Condenser	Broadcast	550 KC	1st IF	6	Out	Max.	
8	Antenna	1500 KC	200 Mmf. Condenser	Broadcast	1500 KC	B.C. Osc.	7	Out	Max.	
9	Antenna	1500 KC	200 Mmf. Condenser	Broadcast	1500 KC	B.C. R.F.	8	Out	Max.	
10	Antenna	1500 KC	200 Mmf. Condenser	Broadcast	1500 KC	B.C. Ant.	9	Out	Max.	
11	Antenna	600 KC	200 Mmf. Condenser	Broadcast	600 KC	B.C. Pad.	10	Out	*Max.	*While rocking, Repeat 8, 9, 10, and 11 until no change is noted.
12	Antenna	5.4 MC	400 Ohm Resistor	Police Amateur	5.4 MC	Police Osc.	11	Out	Max.	
13	Antenna	5.4 MC	400 Ohm Resistor	Police Amateur	5.4 MC	Police R.F.	12	Out	Max.	
14	Antenna	5.4 MC	400 Ohm Resistor	Police Amateur	5.4 MC	Police Ant.	13	Out	Max.	
15	Antenna	1.8 MC	400 Ohm Resistor	Police Amateur	1.8 MC	Police Pad.	*	Out		*Check calibration at 1.8 MC. Padder is fixed.
16	Antenna	18 MC	400 Ohm Resistor	Short Wave	18 MC	S.W. Osc.	15	Out	Max.	
17	Antenna	18 MC	400 Ohm Resistor	Short Wave	18 MC	S.W. R.F.	16	Out	Max.	
18	Antenna	18 MC	400 Ohm Resistor	Short Wave	18 MC	S.W. Ant.	17	Out	Max.	
19	Antenna	6 MC	400 Ohm Resistor	Short Wave	6 MC	S.W. Pad.	*	Out		*Check calibration at 6.0 MC. Padder is fixed.
20	Antenna	60 MC	400 Ohm Resistor	Ultra S.W.	60 MC		**	Out		**See foot note below.
21	Antenna	30 MC	400 Ohm Resistor	Ultra S.W.	30 MC		**	Out		**See foot note below.

**No adjustment is required on this band. If signal is not received on or near dial setting, check the oscillator tube, switch contacts, the fixed padding condenser and the coils.
***To check the setting of the discriminator, tune in a fairly weak station near 1000 kilocycles with the automatic tuning switch in the "OUT" position. Peak the station carefully and then throw the switch to the "IN" position. If throwing the switch detunes the station, repeak it carefully using trimmer number 18. A further check may be made by tuning to either side of the station with the switch out until only the side bands are audible and then throwing the switch in. The station should come into resonance as the switch is thrown in. Failure to do so indicates that the adjustment just described has not been careful enough and that it should be made over again.

MODEL 12C6
 Chassis 12C
 Socket, Trimmers
 Voltage, Resistance

FAIRBANKS. MORSE & CO.

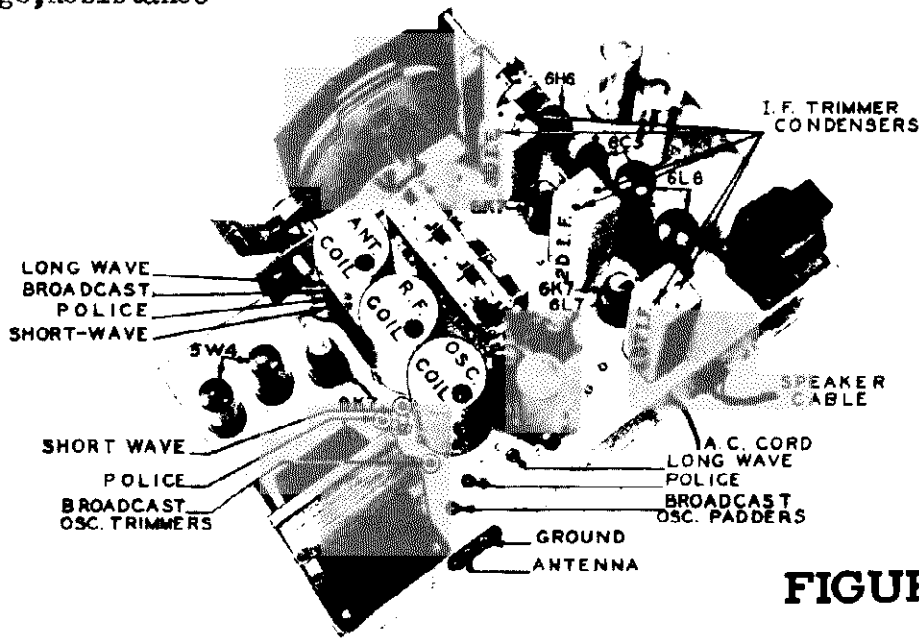


FIGURE 4

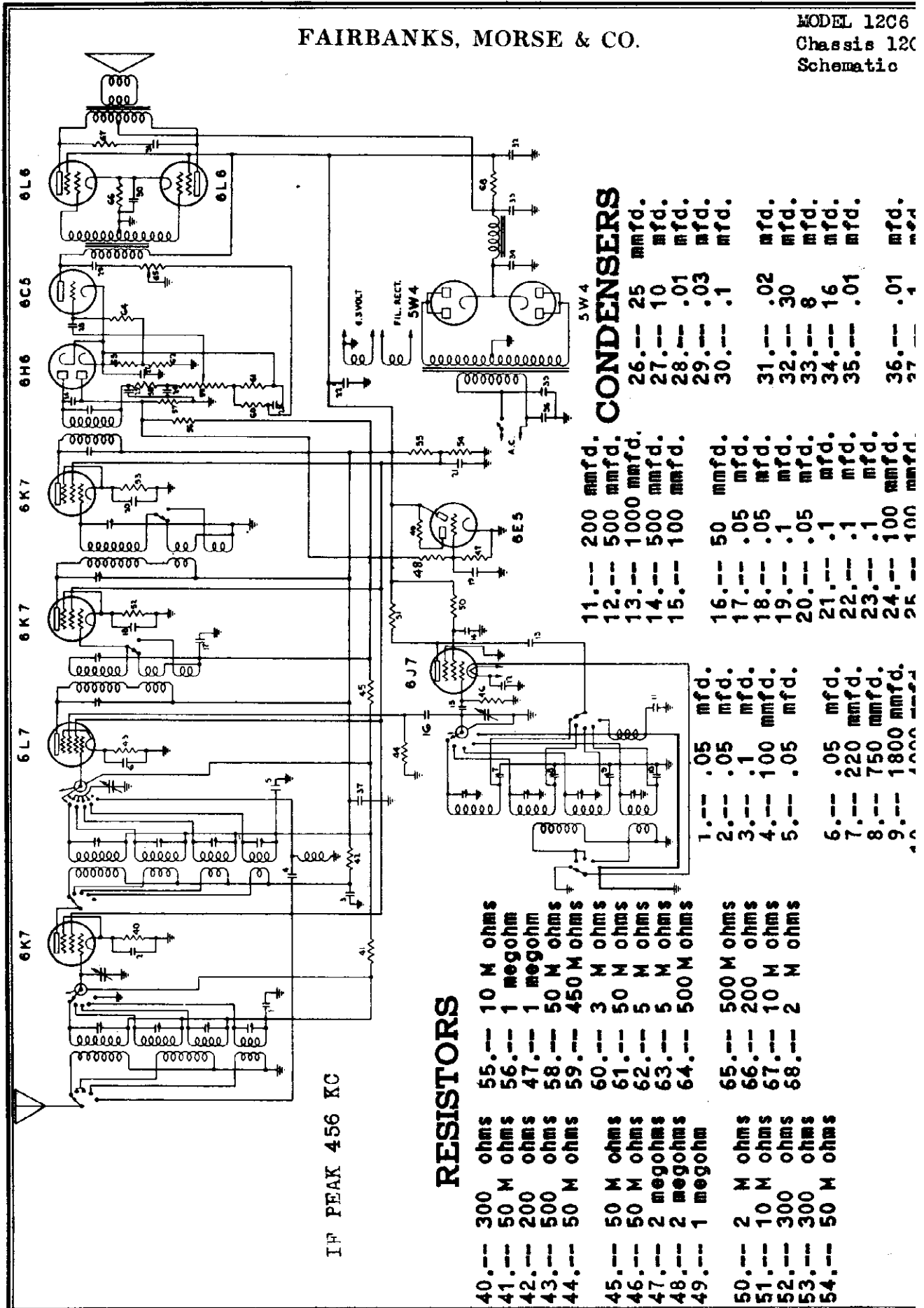
OHMS	VOLTS	6E7 TUBE	VOLTS	OHMS
50H	105		3	300
60H	245		0	2 MEG
.2	6.3		0	0
0	0		3	300
OHMS	VOLTS	6E7 TUBE	VOLTS	OHMS
50H	105		3.5	300
60H	245		0	1 MEG
.2	6.3		0	0
0	0		3.5	300
OHMS	VOLTS	6C5 TUBE	VOLTS	OHMS
60H	245		0H	500H
.2	6.3		0	0
0	0		18	1H
0	0			
OHMS	VOLTS	5H4 TUBE	VOLTS	OHMS
45	A.C.		A.C.	45
60H	420			
0	0		420	60H
0	0			
OHMS	VOLTS	6L7 TUBE	VOLTS	OHMS
50H	105		4.5	50H
60H	245		0	2 MEG
.2	6.3		0	0
0	0		4	500
OHMS	VOLTS	6E7 TUBE	VOLTS	OHMS
50H	105		2.5	300
60H	245		0	1
.2	6.3		0	0
0	0		2.5	300
OHMS	VOLTS	6L6 TUBE	VOLTS	OHMS
60H	245		0	750
60H	355		0	0
.2	6.3		0	0
0	0		17.5	200
OHMS	VOLTS	6E6 TUBE	VOLTS	OHMS
60H	245		0	750
60H	355		0	0
.2	6.3		0	0
0	0		17.5	200
OHMS	VOLTS	6E6 TUBE	VOLTS	OHMS
1 MEG	0		245	60H
2 MEG	2.5		0	0
.2	6.3		0	0
0	0			

FIGURE 6
 VOLTAGE AND RESISTANCE TABLE

The voltage and resistance charts in this manual give detailed information regarding the resistance from various points to various other points in the chassis. The measured voltage from the various tube socket contacts to ground is also given. When these charts are followed faithfully, little difficulty should be experienced in finding almost any fault that may develop.

FAIRBANKS, MORSE & CO.

MODEL 12C6
Chassis 12C
Schematic



IF PEAK 456 KC

RESISTORS

- 40.--- 300 ohms
- 41.--- 50 M ohms
- 42.--- 200 ohms
- 43.--- 500 ohms
- 44.--- 50 M ohms
- 45.--- 50 M ohms
- 46.--- 50 M ohms
- 47.--- 2 megohms
- 48.--- 2 megohms
- 49.--- 1 megohm
- 50.--- 2 M ohms
- 51.--- 10 M ohms
- 52.--- 300 ohms
- 53.--- 300 ohms
- 54.--- 50 M ohms
- 55.--- 10 M ohms
- 56.--- 1 megohm
- 47.--- 1 megohm
- 58.--- 50 M ohms
- 59.--- 450 M ohms
- 60.--- 3 M ohms
- 61.--- 50 M ohms
- 62.--- 5 M ohms
- 63.--- 5 M ohms
- 64.--- 500 M ohms
- 65.--- 500 M ohms
- 66.--- 200 ohms
- 67.--- 10 M ohms
- 68.--- 2 M ohms

CONDENSERS

- 1.--- .05 mfd.
- 2.--- .05 mfd.
- 3.--- 1 mfd.
- 4.--- 100 mmfd.
- 5.--- .05 mfd.
- 6.--- .05 mfd.
- 7.--- 220 mmfd.
- 8.--- 750 mmfd.
- 9.--- 1800 mmfd.
- 11.--- 200 mmfd.
- 12.--- 500 mmfd.
- 13.--- 1000 mmfd.
- 14.--- 500 mmfd.
- 15.--- 100 mmfd.
- 16.--- 50 mmfd.
- 17.--- .05 mfd.
- 18.--- .05 mfd.
- 19.--- .1 mfd.
- 20.--- .05 mfd.
- 21.--- .1 mfd.
- 22.--- .1 mfd.
- 23.--- .1 mfd.
- 24.--- 100 mmfd.
- 25.--- 100 mmfd.
- 26.--- 25 mmfd.
- 27.--- 10 mfd.
- 28.--- .01 mfd.
- 29.--- .03 mfd.
- 30.--- .1 mfd.
- 31.--- .02 mfd.
- 32.--- .30 mfd.
- 33.--- 8 mfd.
- 34.--- 16 mfd.
- 35.--- .01 mfd.
- 36.--- .01 mfd.

MODEL 12C6
Chassis 120
Alignment

FAIRBANKS, MORSE & CO.

THE OSCILLATOR CIRCUIT

The oscillator circuit is unconventional in that the tickler coils are in the cathode circuit of the 6J7 oscillator tube. This is done to obtain sufficient band coverage with the additional capacity of the 6L7 tube injector grid across the tune circuits and also to accommodate the receiver to operation up to 70 megacycles. One tickler serves for both the Broadcast and Police-Amateur bands and the second tickler serves the short wave band, being switched in and out by the range switch.

The tuned circuit coil for the Ultra Short wave band consists of three pieces of heavy bus wire. The cathode taps into this circuit and causes oscillation at the high frequency end of the band. In addition, on this band, a small coil which is inductively coupled to the bus wire coil is switched into the plate circuit and causes the tube to oscillate at the low frequency end of the band.

On the other bands, the plate of the oscillator tube is by-passed to ground through the padding condensers of the oscillator tuned circuits and assists the oscillator at the low frequency end of each band. The patent on this circuit was issued to MacHabb.

INTERMEDIATE FREQUENCY ALIGNMENT

With the range switch on the broadcast position, the fidelity switch on "Sharp" (clockwise) and the gang condenser closed (maximum capacity), supply a 456 kilocycle signal, stage by stage, to the intermediate frequency amplifier, beginning with the grid of the second intermediate frequency tube. To accomplish this, a .1 MFD. condenser should be connected between the signal generator supply lead and the second intermediate frequency tube.

The trimmers of the third intermediate frequency transformer should be adjusted for maximum output with minimum input from the signal generator. Then the signal generator lead should be moved to the first intermediate frequency tube and the trimmers of the second intermediate transformer should be adjusted. The next step is to supply the signal to the grid of the first detector tube and adjust the trimmers of the first intermediate frequency transformer. This method of procedure is essential because of the extreme selectivity of the receiver. After each stage has been aligned, it is well to go back over all adjustments to make sure they are accurate.

The next step in the intermediate frequency alignment is to supply a very strong (about 1000 microvolt) signal to the grid of the first detector tube through the .1 MFD. condenser. CAUTION: Before the signal is applied to the receiver, the volume control should be retarded to zero. After the signal is applied to the receiver, the volume control should be advanced slowly and carefully until a suitable indication appears on the output meter.

The fidelity switch should be turned to the high fidelity or Third Dimension position. Symmetrical double humps should appear, one on each side of where the sharp resonance point appeared on the "Sharp" position (see Figure 5), when the signal generator is tuned approximately 8 kilocycles on each side of the resonance point. The two humps must be of equal amplitude. If this is not the case, the trimmers of the third intermediate frequency transformer must be adjusted until a condition of equal amplitude is obtained. This may be found to be a very difficult adjustment unless an oscillograph is used.

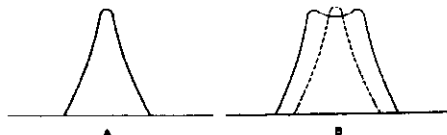


FIGURE 5

USE OF THE OSCILLOGRAPH

A signal generator with a sweep circuit must be employed in making this check. The output of the signal generator should be fed to the grid of the first detector tube in the receiver. The grid clip must be removed from the tube, but, since the first detector is one of the A.V.C. controlled tubes, it is necessary to complete the grid circuit. To accomplish this, connect a large resistor (about 50,000 or 100,000 ohms) between the grid clip and the grid cap of the tube. The low side of the signal generator should be connected to the chassis ground.

The "vertical" binding posts of the oscillograph should be connected to the audio output of the second detector. The high side connection from the "vertical" plates should be made to the point of juncture between resistors 58 and 59. The low side connection may be made to ground. Thus, the audio voltage is applied to the "vertical" plates of the oscillograph.

With the receiver operating on the "Sharp" position, the intermediate frequency amplifier resonance curve will appear on the screen, when the receiver is switched to the "3RD DIMENSION" position, symmetrical double humps, approaching a wide flat top resonance curve, should appear in place of the "Sharp" resonance curve (see Figure 5). Each side of the curve should be of equal amplitude. If this is not the case, the trimmers of the third intermediate frequency transformer should be adjusted until the proper curve is obtained. The adjustment of one trimmer, in addition to effecting its own side of the curve, will reflect in the other side and, for this reason, great care must be exercised in making these adjustments.

RADIO FREQUENCY ALIGNMENT

The parallel or high frequency trimmer condensers for each coil are housed in the same can with the coil, with the exception of the oscillator trimmers, these are air dielectric condensers and are mounted on the chassis. These trimmers are used for aligning the high frequency end of each band. The location of the various trimmers is shown on Figure 4. It is essential that the bands be aligned in the order they appear in the following instructions. In other words, the police band alignment must be completed before the broadcast band alignment is started because of the interlocking effect of the padding condensers on these bands.

Adjustable series padding condensers are used for tracking the oscillator at the low frequency end of each band. The padding condensers may be adjusted from the top of the chassis, through the holes indicated in Figure 4. Since a fixed mica padding condenser is employed on the short wave band, no adjustment is necessary. While making padding condenser adjustment, the gang condenser should be retarded back and forth across the signal to insure adjustment to the peak of greatest intensity.

POLICE BAND

With the band selector switch on the police position and the fidelity switch on the "Sharp" position, supply a 5 megacycle signal from the signal generator to the antenna of the receiver, using a 400 ohm carbon resistor in series with the signal generator lead. Tune the receiver to 5 megacycles and then adjust the oscillator, radio frequency and antenna stage police band trimmers for maximum output with minimum input from the signal generator. WARNING: Care must be exercised to avoid aligning the receiver to the image frequency as outlined under "Short Wave Band".

Supply a 1.8 megacycle signal to the receiver and tune the receiver to 1.8 megacycles. Adjust the police band oscillator padding condenser (see Figure 4), for the signal of greatest intensity, rocking the gang condenser back and forth across the signal while making adjustment. Check at 5 megacycles and then at 1.8 megacycles to correct for any frequency change.

BROADCAST BAND

With the band selector switch on the broadcast position, supply a 1500 kilocycle signal from the signal generator to the receiver, using a standard dummy antenna or a 200 Mhfd. condenser in series between the signal generator and the antenna post of the receiver to serve as the dummy antenna. Make certain that the fidelity switch is on the "Sharp" position.

Tune the receiver to 1500 kilocycles and adjust the radio frequency, antenna and oscillator stage broadcast band trimmers for maximum output with minimum input from the signal generator.

Supply a 600 kilocycle signal to the receiver through the same connections. Tune the receiver to 600 kilocycles. Adjust the broadcast band oscillator padding condenser (see Figure 4), for the peak of greatest intensity while rocking the tuning condenser back and forth across the signal. Recheck at 1500 kilocycles and then at 600 kilocycles and make any frequency corrections that appear necessary.

LONG WAVE BAND

With the band selector switch on the long wave position, supply a 350 kilocycle signal from the signal generator to the antenna of the receiver, using a standard dummy antenna or a 200 Mhfd. condenser in series with the lead. Make sure the fidelity switch is on the "Sharp" position. Tune the receiver to 350 kilocycles and adjust the oscillator, radio frequency and antenna stage trimmer condensers for maximum output with minimum input from the signal generator.

NOTE - The Long Wave oscillator trimmer is accessible through a hole in the chassis bottom shield plate.

Supply a 175 kilocycle signal to the receiver through the same connections used in the previous adjustment. Tune the receiver to 175 kilocycles. Adjust the long wave oscillator padding condenser for the peak of greatest intensity while rocking the tuning condenser back and forth across the signal. Recheck at 350 kilocycles and then at 175 kilocycles as many times as may be necessary to obtain satisfactory tracking.

SHORT WAVE BAND

Turn the band selector switch to the short wave position. Supply an 18 megacycle signal from the signal generator through a 400 ohm carbon resistor (dummy antenna) to the antenna post of the receiver. Tune the receiver to 18 megacycles on the dial. Adjust the short wave band oscillator trimmer condenser for maximum output with minimum input from the signal generator, then adjust the short wave band antenna and Radio Frequency stage trimmer condensers for maximum output, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity. The 6 megacycle signal should be received near 6 megacycles on the dial. If the signal is not received check the oscillator tube, switch connections, the fixed padding condenser and the coils. No adjustment is required at this point. Check the calibration and, if necessary, readjust all three stages.

WARNING: The image signal should be received at approximately 17 megacycles after the above adjustments have been made. If it cannot be located, the oscillator has probably been aligned to the image frequency and the oscillator trimmer must be backed out until the proper signal comes in at 18 megacycles and the somewhat weaker image is received at approximately 17 megacycles. If this readjustment is necessary, it will also be necessary to again align all three trimmers for maximum output.

ULTRA SHORT WAVE BAND

No adjustment is required on this band. If signals are not properly received check the oscillator tube, switch contacts, fixed condenser and the coils.

POWER TRANSFORMERS

Lead Color	Voltage
Black	115 Volts Primary
Green	6.3 volt Filament
Yellow	5.0 Volt Filament
Red	High Voltage Sec.
Red & White	High Voltage C.T.

COLOR CODES

I. F. TRANSFORMERS

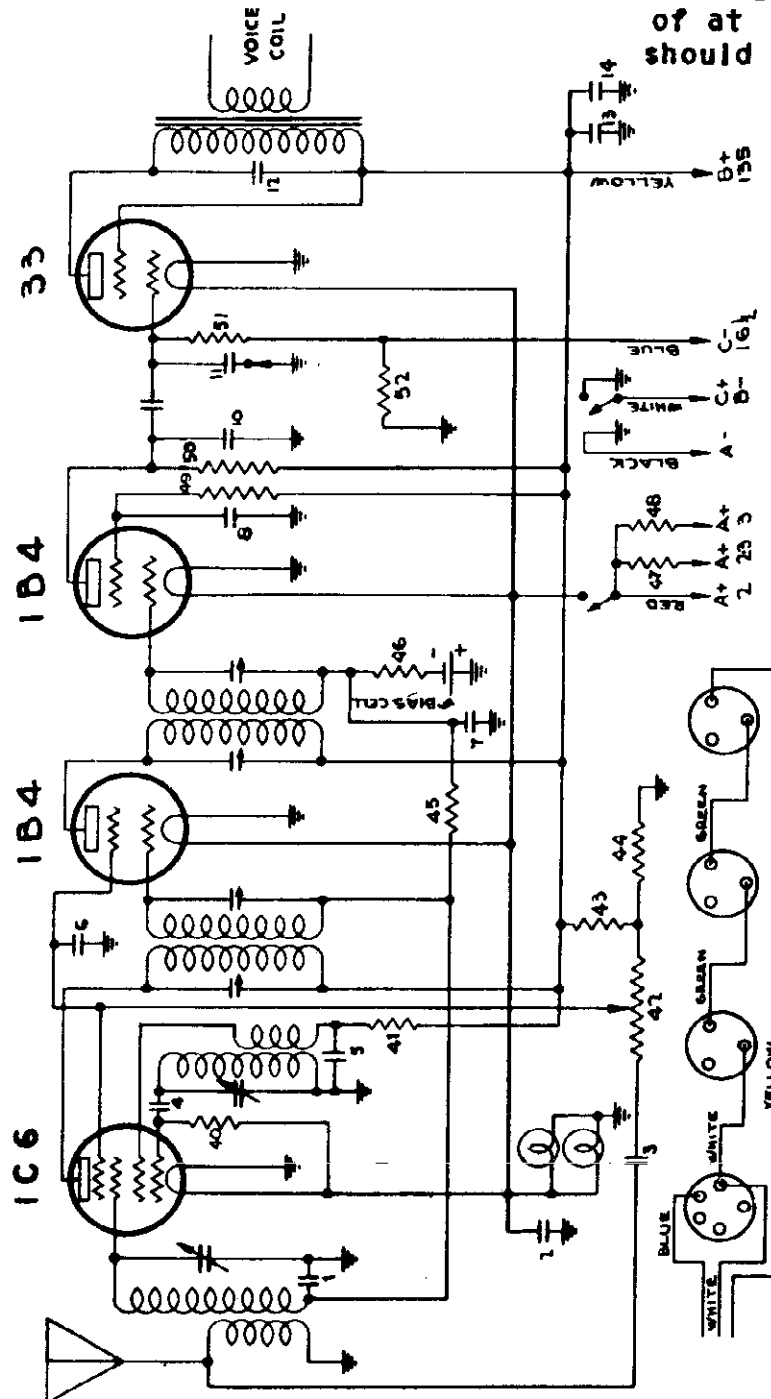
FIRST	SECOND
Plate	Blue
"B" Plus	Red
Grid (Top)	Green
Grid Return (A.V.C.)	Black-White
Switch Lead	Brown-White
Switch Lead (Sharp)	Green
Switch Lead (3rd Bin)	Black

THIRD	
Plate	Blue
"B" Plus	Red
Grid	Green
Grid Return	Black-White

FAIRBANKS, MORSE & CO.

MODELS 42CIB, 42TOB
Chassis 42
Schematic, Notes

The model 42 chassis employs a type 1C6 pentagrid converter. The incoming signal is supplied to this tube through a preselector coil arrangement. This tube serves the dual function of first detector and oscillator. A type 1B4 is employed as the intermediate frequency amplifier. This tube and the two intermediate frequency transformers are responsible for most of the selectivity and gain in the receiver. A type 1B4 tube performs the dual function of detector and first audio amplifier. The output of the second type 1B4 tube is resistance coupled to a type 33 tube in the power output stage. A storage battery having a capacity of at least 135 ampere hours should be used with the receiver.



IF PEAK 456 KC

RESISTORS

1 - .1 MFD	8 - .05 MFD	40 - 50M Ohms	47 - .4 Ohms
2 - .5 MFD	9 - .02 MFD	41 - 25M Ohms	48 - 1.2 Ohms
3 - .05 MFD	10 - .0005 MFD	42 - 400M Ohms	49 - 2 Meg.
4 - .001 MFD	11 - .006 MFD	43 - 25M Ohms	50 - 250M Ohms
5 - .1 MFD	12 - .006 MFD	44 - 50M Ohms	51 - 500M Ohms
6 - .1 MFD	13 - .25 MFD	45 - 100M Ohms	52 - 20M Ohms
7 - .1 MFD	14 - 8. MFD	46 - 250M Ohms	

CONDENSERS

MODELS 42CIB, 42TOB

Chassis 42

Socket, Trimmers, Notes

Alignment, Batt. Conn.

FAIRBANKS, MORSE & CO.

BATTERIES

This receiver has been designed to operate equally well on an Air Cell "A" Battery or a Two Volt Storage Battery as the "A" supply.

A three volt dry battery may be used with the receiver but the life of such a battery is usually not as long as that of the other types.

AIR CELL "A" BATTERY

If the receiver is to be operated on an air cell battery only one section of the "resistance link" circuit should be connected (See "1" Figure 3). The remaining two leads from the positive (+) "A" lead should be taped or otherwise insulated so they will not come in contact with any of the other battery terminals.

TWO VOLT STORAGE "A" BATTERY

If the receiver is to be operated on a Two Volt Storage "A" Battery, none of the "resistance link" circuit is to be used. The Positive (+) "A" connections are to be made as shown under "2" of Figure 3. The unused leads should be taped so they will not come in contact with the other battery terminals.

THREE VOLT "A" BATTERY

If the receiver is to be operated on a Three Volt "A" Battery the "resistance link" circuit should be connected as shown under "3" of Figure 3. The unused leads should be taped so they will not come in contact with any of the battery terminals.

When the Three Volt "A" Battery becomes so low or weak that the receiver will no longer operate satisfactorily, the connections may then be changed to conform with "1" under Figure 3, thus obtaining a little more operating time from the battery.

When the Three Volt "A" Battery again becomes so low that the receiver will not operate satisfactorily, the connections may once more be changed, to conform with "2" of Figure 3, thus again obtaining more operating time from the battery.

NOTE - These changes must not be made until the battery becomes so low that the receiver does not operate properly, and then the change must be made one step at a time as described above otherwise the tubes in the receiver may be damaged.

"B" BATTERIES

Three 45 volt "B" batteries, with standard plug receptacles, are required with the receiver. Good quality, HEAVY DUTY batteries are recommended.

"C" BATTERIES

16 1/2 volts of "C" battery are required on the receiver. This voltage may be obtained from a standard 22 1/2 volt battery, with a standard plug receptacle, with a 16 1/2 volt tap.

BATTERY CABLE CONNECTIONS

"A" BATTERY

The Black battery lead is to be connected to "A" minus (-). The Red battery lead is to be connected to "A" plus (+). See Figure 3.

"B" AND "C" BATTERIES

Four Standard Battery Plugs will be found on the battery cable, three of these are identical to each other and are to be plugged into the Standard Receptacles on the three "B" batteries. The remaining plug, with the different terminal arrangement, should be plugged into the "C" battery.

WARNING - DO NOT ALLOW THE "A" BATTERY LEADS TO COME IN CONTACT WITH ANY OF THE "B" BATTERY TERMINALS. IF THIS HAPPENS, THE TUBES, RECEIVER AND BATTERIES MAY BE SERIOUSLY DAMAGED.

SUGGESTED SERVICE PROCEDURE

If the receiver does not operate properly, first test all batteries and then test all tubes in a reliable tube tester or, better still, replace the tubes in the receiver, one by one, with tubes known to be good. Most difficulties will be found in or centered around defective tubes, or batteries. If, after replacing any defective tubes or batteries, the receiver is still inoperative, remove the chassis from the cabinet and conduct a careful resistance analysis using the resistance values shown on the schematic diagram as a guide. This will usually reveal the source of the difficulty.

ALIGNMENT PROCEDURE

To insure obtaining the performance the model 42 chassis is capable of delivering, it is essential that it be aligned perfectly. For this reason, it is urged that the following instructions be studied carefully before any alignment adjustments are attempted.

Proper adjustment of the various tuned circuits will be possible only through the use of an accurate and reliable signal generator employed in conjunction with an output meter, which may be connected from plate to ground on the output tube. A fixed condenser (.1 Mfd.) should be connected in series with the output meter.

NOTE - All adjustments should be made with the volume control "full on". Any desired variation in signal strength should be obtained by adjusting the output of the signal generator.

INTERMEDIATE FREQUENCY

- 1.- Turn the gang condenser to maximum capacity (fully meshed).
- 2.- Set the dial pointer at 530 kilocycles and then tighten the set screw.
- 3.- Supply a 456 kilocycle signal from the signal generator to the grid of the type 105 first detector tube through a .1 Mfd. condenser connected in series with the signal generator lead.
- 4.- Adjust the radio frequency trimmer ("B" Figure 1) for maximum output with minimum input from the signal generator.

- 4.- Adjust the four trimmers of the two intermediate frequency transformers (see Figure 1) for maximum output with minimum input from the service oscillator.

RADIO FREQUENCY ALIGNMENT

The parallel or high frequency trimmer condensers for each stage located on the gang condenser (see Figure 1)

- 1.- Tune the receiver to 1500 kilocycles.
- 2.- Supply a 1500 kilocycle signal from the signal generator to the antenna lead of the receiver through a standard dummy antenna or a 200 Mfd. (.0002 Mfd.) condenser, connected in series with the signal generator lead.
- 3.- Adjust the oscillator stage trimmer condenser ("A" Figure 1) for maximum output with minimum input from the signal generator.

FIRST I. F. TRANSFORMER		COLOR CODES		SECOND I. F. TRANSFORMER	
Plate	Blue			Plate	Blue
"B" Plus	Red			"B" Plus	Red
Grid Return	Black			Diode Return	Black
Grid (Top)	Green			Diode	Green

STANDARD RMA

RESISTOR AND CONDENSER COLOR CODE

0	Black	5	Green
1	Brown	6	Blue
2	Red	7	Purple
3	Orange	8	Grey
4	Yellow	9	White

POWER TRANSFORMERS

Lead Color	Voltage
Black	115V. Primary
Green	6.3V. Filament
Yellow	5.0V. Filament
Red	High Voltage Sec.
Red and White	High Voltage C.T.

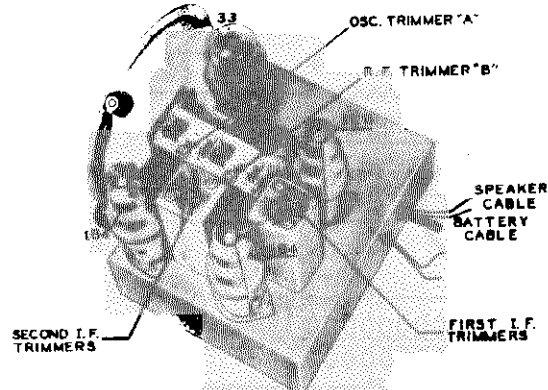


FIGURE 1
TOP VIEW

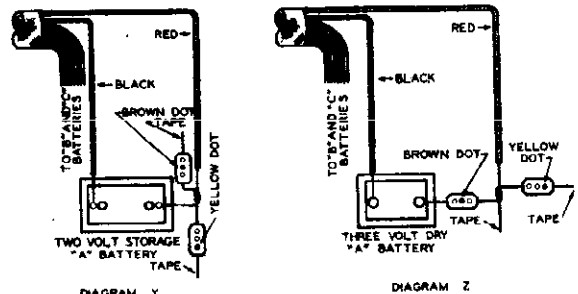
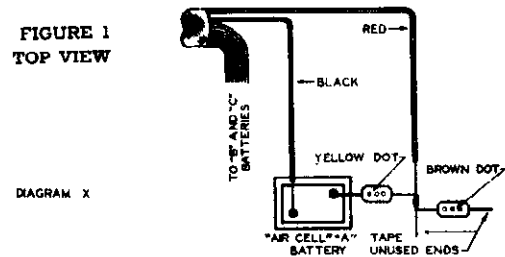


FIGURE 3
BATTERY CABLE CONNECTIONS

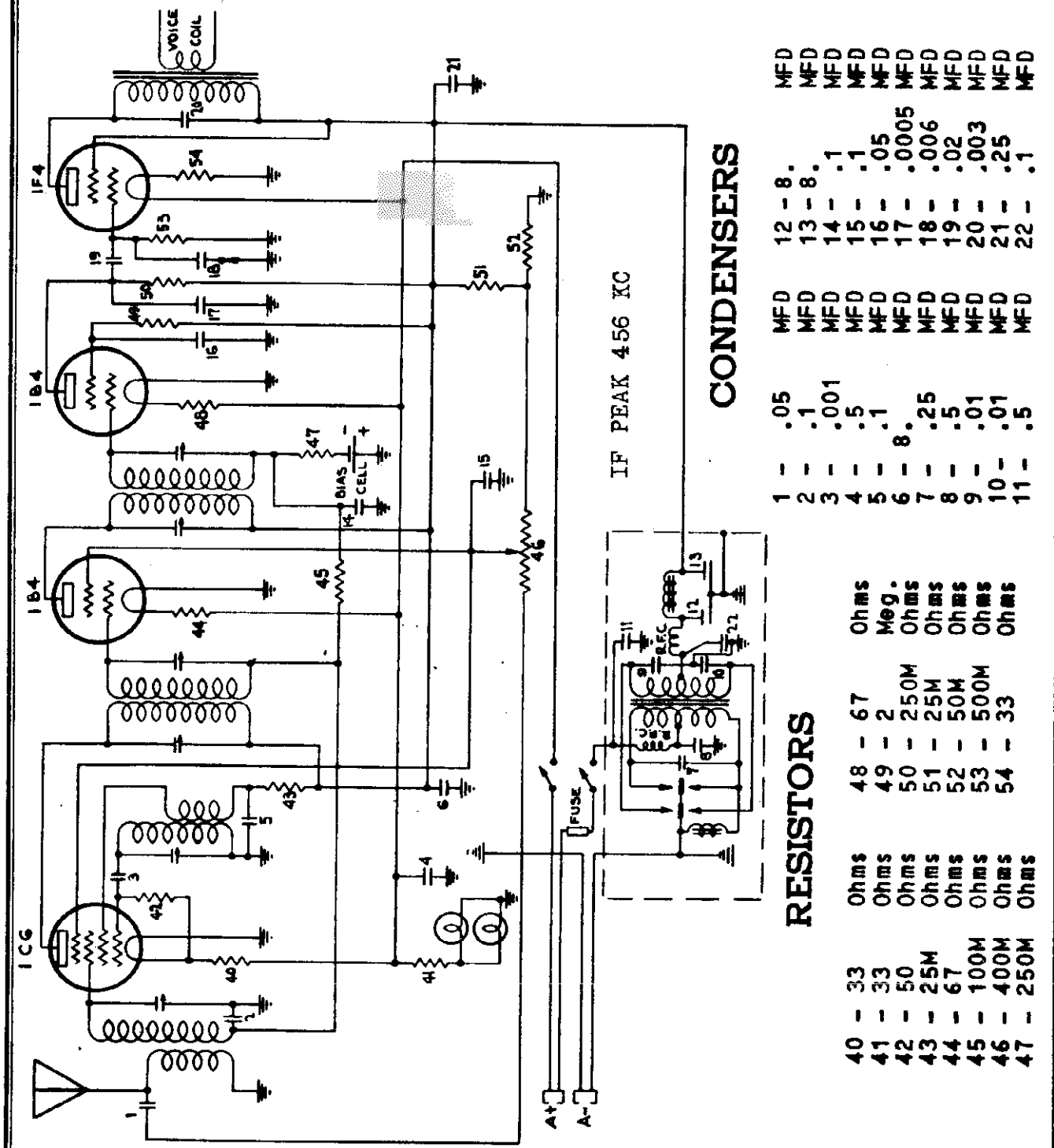
FAIRBANKS, MORSE & CO.

MODELS 43CIB, 43TIB

Chassis 43

Schematic, Notes

The model 43 chassis employs a type 1C6 pentagrid converter. The incoming signal is supplied to this tube through a preselector coil arrangement. This tube serves the dual function of first detector and oscillator. A type 1B4 tube is employed as the intermediate frequency amplifier. This tube and the two intermediate frequency transformers are responsible for most of the selectivity and gain in the receiver. A type 1B4 tube performs the dual function of detector and first audio amplifier. The output of the second type 1B4 tube is resistance coupled to a type 1F4 tube in the power output stage.



CONDENSERS

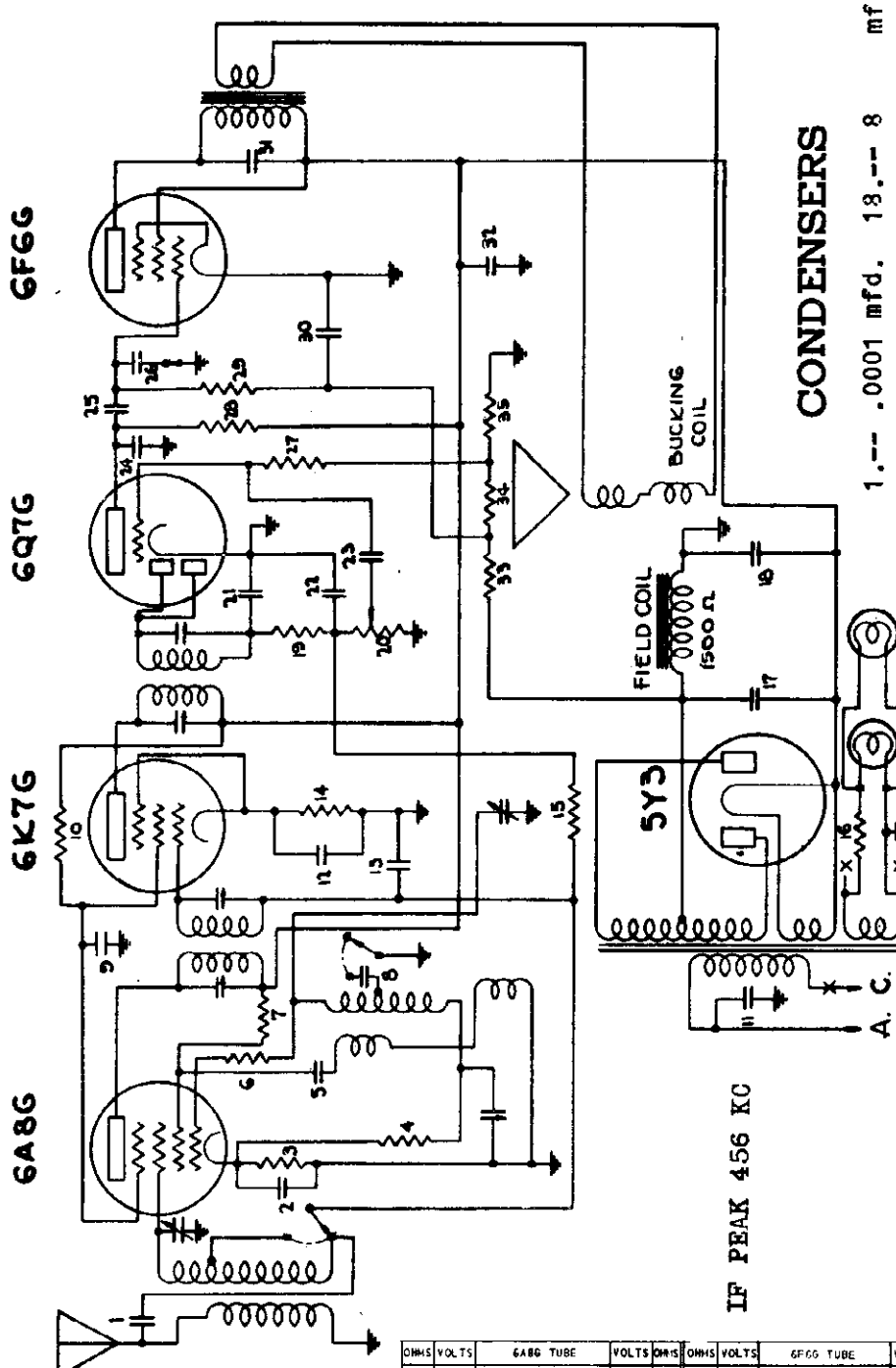
1	.05	MFD
2	.1	MFD
3	.001	MFD
4	.5	MFD
5	.1	MFD
6	.25	MFD
7	.5	MFD
8	.01	MFD
9	.01	MFD
10	.01	MFD
11	.5	MFD
12	8	MFD
13	8	MFD
14	.1	MFD
15	.1	MFD
16	.05	MFD
17	.0005	MFD
18	.006	MFD
19	.02	MFD
20	.003	MFD
21	.25	MFD
22	.1	MFD

RESISTORS

33	Ohms
40	Ohms
41	Ohms
42	Ohms
43	Ohms
44	Ohms
45	Ohms
46	Ohms
47	Ohms
48	Ohms
49	Ohms
50	Ohms
51	Ohms
52	Ohms
53	Ohms
54	Ohms
55	Ohms
56	Ohms
57	Ohms
58	Ohms
59	Ohms
60	Ohms
61	Ohms
62	Ohms
63	Ohms
64	Ohms
65	Ohms
66	Ohms
67	Ohms
2	Ohms
250M	Meg.
25M	Ohms
50M	Ohms
500M	Ohms
400M	Ohms
250M	Ohms

FAIRBANKS, MORSE & CO.

MODEL 57TO
Chassis 57
Schematic, Voltage
Resistance



CONDENSERS

- 1.--- .0001 mfd. 18.--- 8 mf
- 2.--- .05 mfd. 21.--- .0001 mf
- 5.--- .001 mfd. 22.--- .0001 mf
- 8.--- .003 mfd. 23.--- .02 mf
- 9.--- .1 mfd. 24.--- .0001 mf
- 11.--- .01 mfd. 25.--- .02 mf
- 12.--- .1 mfd. 26.--- .006 mf
- 13.--- .1 mfd. 30.--- .25 mf
- 16.--- .6 mfd. 31.--- .006 mf
- 17.--- 8 mfd. 32.--- .1 mf

RESISTORS

- 3.--- 300 ohms 14.--- 300 ohms
- 4.--- 20 M ohms 15.--- 1 megohm
- 6.--- 150 ohms 19.--- 50 M ohms
- 7.--- 10 M ohms 20.--- 500 M ohms
- 10.--- 20 M ohms 27.--- 500 M ohms
- 28.--- 500 M ohms
- 29.--- 500 M ohms
- 33.--- 2 megohms
- 34.--- 400 M ohms
- 35.--- 50 M ohms

IF PEAK 456 KC

FIGURE 5
VOLTAGE AND
RESISTANCE TABLE

6A8G TUBE		6K7G TUBE		6Q7G TUBE		6F6G TUBE		5Y3 TUBE	
OHMS	VOLTS	OHMS	VOLTS	OHMS	VOLTS	OHMS	VOLTS	OHMS	VOLTS
INF.	106	.5	23M	INF.	218	-.5	1900	-95	
INF.	218	0	INF.	INF.	208	6.3	.5	INF.	222
0	0	6.3	.5	0	0	0	0	0	0
0	0	4.2	300	0	0	0	0	0	0
500H	.15			1MEG	106	2.5	300		
500H	76			50M	218	0	INF.		
0	0			6.3	.5	6.3	.5		
0	0			0	0	0	0	2.5	300

MODEL 57T0

**Alignment, Trimmers
Socket, Notes**

FAIRBANKS, MORSE & CO.

COLOR CODES

FIRST

SECOND

I. F. TRANSFORMER

I. F. TRANSFORMER

Plate Blue
"B" Plus Red
Grid Return Black
Grid (Top) Green

Plate Blue
"B" Plus Red
Diode Return Black
Diodes Green

RESISTOR AND CONDENSER COLOR CODE

0 Black 2 Red 4 Yellow 6 Blue 8 Grey
1 Brown 3 Orange 5 Green 7 Purple 9 White

RESISTORS

The **BODY COLOR** represents the **FIRST FIGURE** of the resistance value
The **END COLOR** represents the **SECOND FIGURE** of the resistance value
The **DOT COLOR** represents the **NUMBER OF CIPHERS** following the first two figures

4.- The 6 megacycle signal should be received near 6 megacycles on the dial. If this is not the case, check the oscillator tube, switch connections, the fixed padding condenser (C-4) and coils. No adjustment is necessary on this band.

5.- Repeat 1, 2, 3 and 4 at 3.6 megacycles.

THE ANTENNA

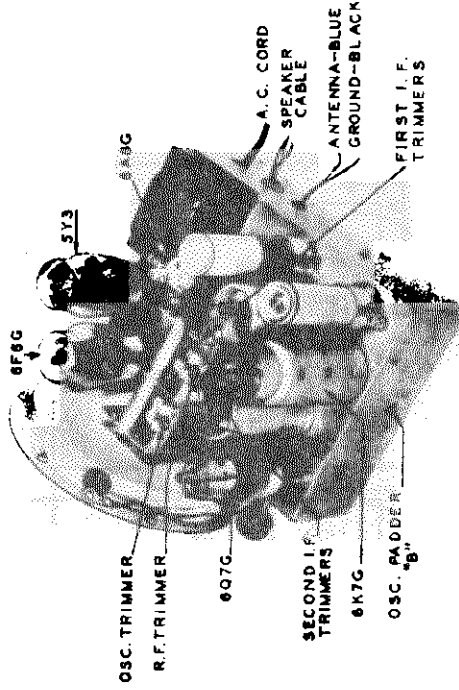
A good outside antenna is recommended for best results. An inside antenna will usually give satisfactory results on local broadcast stations, but it cannot be relied upon for distant and short wave reception.

The most satisfactory antenna for any installation will vary, depending largely upon local structural details and sources of interference. It should be kept as far as possible from buildings, trees and other obstructions. The antenna should not run parallel to nearby power lines and should not run near a tin roof or any metallic structure. The length of the antenna has much to do with the volume of the receiver. As the length of the antenna is increased, the volume on distant stations will be increased.

The most suitable antenna for use in large cities or congested radio districts, where interference is a serious problem, is the doublet. In small centers of population, where interference is not serious, a single wire antenna having a total length of from 75 to 100 feet, erected as high as possible, with a good insulator at each end, will prove satisfactory. The lead-in should go to the receiver by the most direct route and should be kept away, as far as possible, from obstructions. Such an antenna will have less directional properties and less tendency to pick up power line interference than a low antenna with a long horizontal lead.

POWER TRANSFORMER

Lead Color	Voltage
Black	115 Volt Primary
Green	6.3 Volt Filament
Yellow	5.0 Volt Filament
Red	High Voltage Sec.
Red & White	High Voltage C.T.



INTERMEDIATE FREQUENCY ALIGNMENT

- 1.- Turn the gang condenser to maximum capacity (fully meshed.)
- 2.- Set the band selector switch on the "Broadcast" position.
- 3.- Supply a 455 kilocycle signal from the signal generator to the antenna lead of the receiver through a .1 Mfd. condenser connected in series with the signal generator lead.
- 4.- Adjust the four trimmers of the two intermediate frequency transformers (see Figure 1) for maximum output with minimum input from the service oscillator.

RADIO FREQUENCY ALIGNMENT

The parallel or high frequency trimmer condensers for the broadcast band are on the gang condenser. These trimmers are used for aligning the high frequency end of the broadcast band. The location of the trimmers is shown in Figure 1.

The oscillator adjustable series padding condenser is used for tracking the oscillator at the low frequency end of the broadcast band. The padding condenser may be adjusted from the side of the chassis through the hole indicated in Figure 1. While making padding condenser adjustments, the gang condenser should be rotated back and forth across the signal to insure adjustment to the peak of greatest intensity.

DIAL ADJUSTMENT

Before making any radio frequency alignment adjustments, close the variable tuning condenser (maximum capacity), place the dial pointer at 540 kilocycles (gang condenser still closed) and then proceed with the following adjustments.

BROADCAST BAND

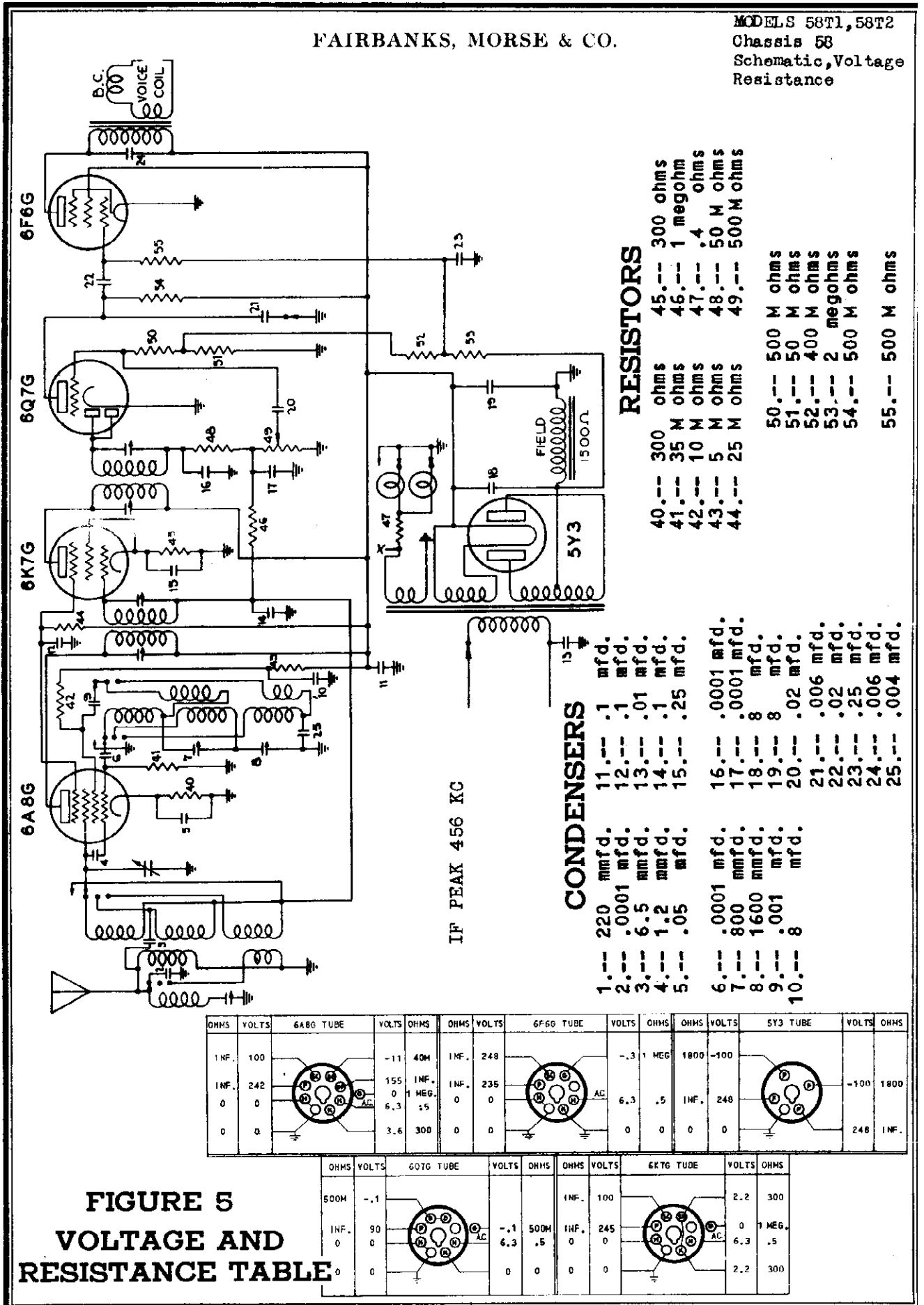
- 1.- Turn the band selector switch to the broadcast (Counter-Clockwise) position.
- 2.- Tune the receiver to 1500 kilocycles.
- 3.- Supply a 1500 kilocycle signal from the signal generator to the antenna lead of the receiver through a standard dummy antenna or a 200 Mfd. (.002 Mfd.) condenser, connected in series with the signal generator lead.
- 4.- Adjust the trimmer condensers on the gang condenser (Figure 1) for maximum output with minimum input from the signal generator.
- 5.- Tune the receiver to 600 kilocycles.
- 6.- Supply a 600 kilocycle signal to the antenna of the receiver through the same connections as previously used.
- 7.- Adjust the broadcast band oscillator padding condenser "B" (side of chassis, see Figure 1) for maximum output with minimum input from the signal generator, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 8.- Check at 1500 kilocycles and then at 600 kilocycles. Make any adjustments that are necessary to obtain satisfactory calibration.

SHORT WAVE BAND

- 1.- Turn the band selector switch to the short wave position (clockwise).
- 2.- Tune the receiver to 6 megacycles.
- 3.- Supply a 6 megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.

FAIRBANKS, MORSE & CO.

MODELS 58T1, 58T2
Chassis 58
Schematic, Voltage
Resistance



RESISTORS

- 40.--- 300 ohms
- 41.--- 35 M ohms
- 42.--- 10 M ohms
- 43.--- 5 M ohms
- 44.--- 25 M ohms
- 45.--- 300 ohms
- 46.--- 1 megohm
- 47.--- .4 ohms
- 48.--- 50 M ohms
- 49.--- 500 M ohms
- 50.--- 500 M ohms
- 51.--- 50 ohms
- 52.--- 400 M ohms
- 53.--- 2 megohms
- 54.--- 500 M ohms
- 55.--- 500 M ohms

CONDENSERS

- 1.--- 220 mmfd.
- 2.--- .0001 mfd.
- 3.--- 6.5 mmfd.
- 4.--- 1.2 mmfd.
- 5.--- .05 mfd.
- 6.--- .0001 mfd.
- 7.--- 800 mmfd.
- 8.--- 1600 mmfd.
- 9.--- .001 mfd.
- 10.--- 8 mfd.
- 11.--- .1 mfd.
- 12.--- .1 mfd.
- 13.--- .01 mfd.
- 14.--- .1 mfd.
- 15.--- .25 mfd.
- 16.--- .0001 mfd.
- 17.--- .0001 mfd.
- 18.--- 8 mfd.
- 19.--- 8 mfd.
- 20.--- .02 mfd.
- 21.--- .006 mfd.
- 22.--- .02 mfd.
- 23.--- .25 mfd.
- 24.--- .006 mfd.
- 25.--- .004 mfd.

IF PEAK 456 KC

OHMS	VOLTS	6A8G TUBE	VOLTS	OHMS	OHMS	VOLTS	6F6G TUBE	VOLTS	OHMS	OHMS	VOLTS	5Y3 TUBE	VOLTS	OHMS
INF.	100		-11	40M	INF.	248		-3	1 MEG	1800	-100			
INF.	242		155	1 MEG.	INF.	235		6.3	.5	INF.	248		-100	1800
0	0		6.3	.15	0	0		0	0	0	0		248	INF.
0	0		3.6	300	0	0		0	0	0	0			
OHMS	VOLTS	6Q7G TUBE	VOLTS	OHMS	OHMS	VOLTS	6K7G TUBE	VOLTS	OHMS	OHMS	VOLTS	OHMS		
500M	-.1				INF.	100		2.2	300					
INF.	90		-.1	500M	INF.	245		0	1 MEG.					
0	0		6.3	.5	0	0		6.3	.5					
0	0		0	0	0	0		2.2	300					

**FIGURE 5
VOLTAGE AND
RESISTANCE TABLE**

MODELS 58T1, 58T2

Chassis 58

Alignment, Trimmers

Socket, Notes

FAIRBANKS, MORSE & CO.

INTERMEDIATE FREQUENCY ALIGNMENT

- 1.- Turn the gang condenser to maximum capacity (full meshed). With the Range Switch on the broadcast position.
- 2.- Supply a 456 kilocycle signal from the signal generator to the grid of the first detector tube (5A8G) through a .1 Mfd. condenser connected in series with the signal generator lead.
- 3.- Adjust the four trimmers of the two intermediate frequency transformers (see Figure 1) for maximum output with minimum input from the service oscillator.

RADIO FREQUENCY ALIGNMENT

The parallel or high frequency trimmer condensers for each coil are housed in the same shield can with the coil. These trimmers are used for aligning the high frequency end of each band. The location of the various trimmers is shown in Figure 1.

The oscillator, adjustable, series padding condensers are used for tracking the oscillator at the low frequency end of each band. The padding condenser may be adjusted from the top of the chassis through the hole indicated in Figure 1. Since a fixed mica padding condenser is employed on the short wave band, no adjustment is necessary. While making padding condenser adjustments, the gang condenser should be rotated back and forth across the signal to insure adjustment to the peak of greatest intensity.

DIAL ADJUSTMENT

Before making any radio frequency alignment adjustments, close the variable tuning condenser (maximum capacity). Loosen the screw that secures the dial pointer, place the pointer in a horizontal position (gang condenser still closed) and then tighten the screw.

NOTE - The three bands must be aligned in the following order: First, police; second, broadcast; third, short wave.

POLICE BAND

- 1.- Turn the band selector switch to the police band (center) position.
- 2.- Tune the receiver to 6 megacycles.
- 3.- Supply a 6 megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.
- 4.- Adjust the police band oscillator trimmer condenser (Figure 1) for maximum output with minimum input from the signal generator, then adjust the police band antenna stage trimmer for maximum output, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 5.- Tune the receiver to 2.4 megacycles.
- 6.- Supply a 2.4 megacycle signal to the receiver through the same connections used on the previous adjustment.
- 7.- Adjust the police band oscillator padding condenser (top of chassis, see Figure 1) for maximum output with minimum input from the signal generator, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 8.- Check at 6 megacycles and then at 2.4 megacycles and make any adjustments that are necessary to obtain satisfactory calibration.

BROADCAST BAND

- 1.- Turn the band selector switch to the broadcast (counter-clockwise) position.
- 2.- Tune the receiver to 1500 kilocycles.
- 3.- Supply a 1500 kilocycle signal from the signal generator to the antenna lead of the receiver through a standard dummy antenna of a 200 Mfd. (.0002 Mfd.) condenser, connected in series with the signal generator lead.
- 4.- Adjust the broadcast band oscillator trimmer condenser (Figure 1) for maximum output with minimum input from the signal generator. Then adjust the broadcast band antenna stage trimmer for maximum output.
- 5.- Tune the receiver to 600 kilocycles.
- 6.- Supply a 600 kilocycle signal to the antenna of the receiver through the same connections as previously used.
- 7.- Adjust the broadcast band oscillator padding condenser (top of chassis, see Figure 1) for maximum output with minimum input from the signal generator, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 8.- Check at 1500 kilocycles and then at 600 kilocycles. Make any adjustments that are necessary to obtain satisfactory calibration.
- 9.- Supply a 456 kilocycle signal to the antenna of the receiver through the dummy antenna with the gang condenser at 600 kilocycles.

SHORT WAVE BAND

- 1.- Turn the band selector switch to the short wave (clockwise) position.
- 2.- Tune the receiver to 20 megacycles.
- 3.- Supply a 20 megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.

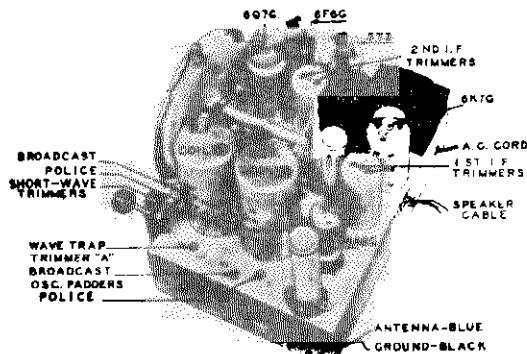
- 4.- Adjust the short wave band oscillator trimmer condenser (Figure 1) for maximum output with minimum input from the signal generator. Then adjust the short wave band antenna stage trimmer for maximum output, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 5.- The 4 megacycle signal should be received near 8 megacycles on the dial. If this is not the case, check the oscillator tube, switch connections, the fixed padding condenser and the coils. No adjustment is necessary at this point.

WARNING - The image signal should be received at approximately 19 megacycles on the dial. If not, the oscillator has been aligned to the image frequency and the oscillator trimmer condenser must be backed out until the correct signal is received at 20 megacycles and the image at approximately 19 megacycles. If readjustment is found necessary, the antenna stage trimmer should also be checked again.

ANTENNA AND GROUND CONNECTIONS

The BLUE wire on the receiver is to be connected to the antenna. The BLACK wire on the receiver is to be connected to the ground. When a FAIRBANKS-MORSE ANTENNA is used, the BLUE wire from the receiver is to be connected to the red wire on the antenna set coupler and the BLACK wire from the receiver is to be connected to the black wire on the antenna set coupler and to a good ground.

The most suitable antenna for use in large cities or congested radio districts, where interference is a serious problem, is the doublet. In small centers of population, where interference is not serious, a single wire antenna having a total length of from 75 to 100 feet, erected as high as possible, with a good insulator at each end, will prove satisfactory. The lead-in should go to the receiver by the most direct route and should be kept away, as far as possible, from obstructions. Such an antenna will have less directional properties and less tendency to pick up power line interference than a low antenna with a long horizontal lead.



COLOR CODES

FIRST	SECOND
I. F. TRANSFORMER	I. F. TRANSFORMER
Plate Blue	Plate Blue
"9" Pin Red	"9" Pin Red
Grid Return Black	Diode Return Black
Grid (Top) Green	Diodes Green

RESISTOR AND CONDENSER COLOR CODE

0 Black	2 Red	4 Yellow	6 Blue	8 Grey
1 Brown	3 Orange	5 Green	7 Purple	9 White

POWER TRANSFORMER

Lead Color	Voltage
Black	115 Volt Primary
Green	6.3 Volt Filament
Yellow	5.0 Volt Filament
Red	High Voltage Sec.
Red & White	High Voltage C.T.

RESISTORS

The BODY COLOR represents the FIRST FIGURE of the resistance value
The END COLOR represents the SECOND FIGURE of the resistance value
The DOT COLOR represents the NUMBER OF ZEPHERS following the first two figures

MICA CONDENSERS

(Capacity in Micro-Microfarads)

The FIRST DOT on the condenser represents the FIRST FIGURE of the capacity
The SECOND DOT on the condenser represents the SECOND FIGURE of the capacity
The THIRD DOT on the condenser represents the NUMBER OF ZEPHERS following the first two figures.
The colors on the condensers should be read from left to right with the condenser in an upright position.

FAIRBANKS, MORSE & CO.

MODEL 6875
Chassis 68
Schematic

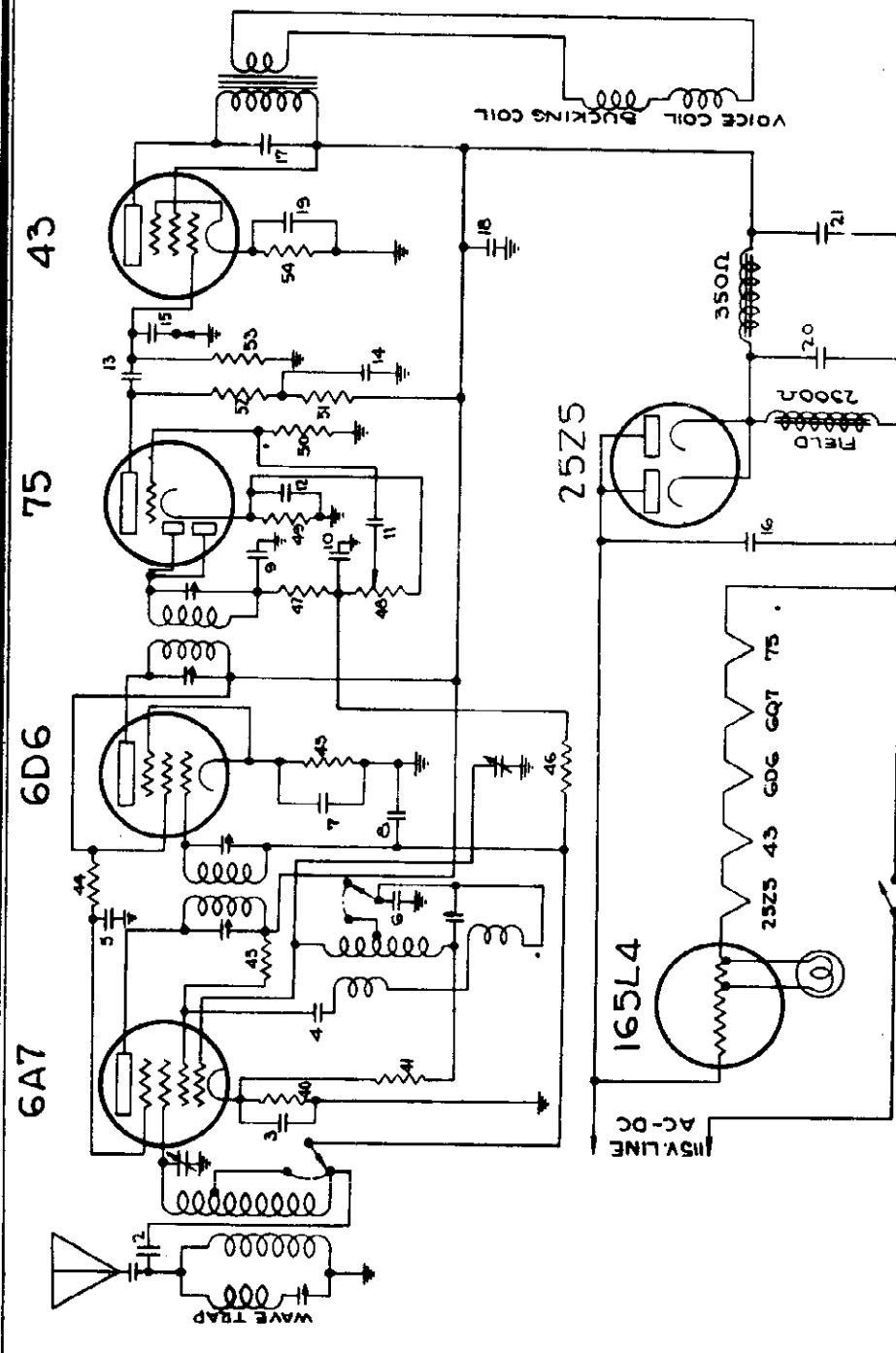
COLOR CODES

FIRST I. F. TRANSFORMER

Plate.	Blue
"B" Plus	Red
Grid Return.	Black
Grid (Top)	Green

SECOND I. F. TRANSFORMER

Plate.	Blue
"B" Plus	Red
Diode Return	Black
Diodes	Green



RESISTORS

40 -	300 OHMS
41 -	20M OHMS
42 -	10M OHMS
43 -	10M OHMS
44 -	35M OHMS
45 -	300 OHMS
46 -	1 MEGOHM
47 -	50M OHMS
48 -	500M OHMS
49 -	10M OHMS
50 -	500M OHMS
51 -	100M OHMS
52 -	250M OHMS
53 -	500M OHMS
54 -	600 OHMS

CONDENSERS

1 -	.01 MFD.
2 -	.0001 MFD.
3 -	.05 MFD.
4 -	.001 MFD.
5 -	.1 MFD.
6 -	.003 MFD.
7 -	.1 MFD.
8 -	.1 MFD.
9 -	.0001 MFD.
10 -	.0001 MFD.
11 -	.01 MFD.

IF PEAK 456 KC

MODEL 68T6
Chassis 68
Socket, Trimmers
Alignment

FAIRBANKS, MORSE & CO.

DIAL ADJUSTMENT

Before making any radio frequency alignment adjustments, close the variable tuning condenser (Maximum capacity), place the dial pointer at 540 kilocycles (gang condenser still closed) and then proceed with the following adjustments.

BROADCAST BAND

1. Turn the band selector switch to the broadcast (Counter-Clockwise) position.
2. Tune the receiver to 1500 kilocycles.
3. Supply a 1500 kilocycle signal from the signal generator to the antenna lead of the receiver through a standard dummy antenna or a 200 Mfd. (.0002 Mfd.) condenser, connected in series with the signal generator lead.
4. Adjust the trimmer condensers on the gang condenser (Figure 1) for maximum output with minimum input from the signal generator.
5. Tune the receiver to 600 kilocycles.
6. Supply a 600 kilocycle signal to the antenna of the receiver through the same connections as previously used.
7. Adjust the broadcast band oscillator padding condenser (top of chassis, see Figure 1) for maximum output with minimum input from the signal generator, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
8. Check at 1500 kilocycles and then at 600 kilocycles. Make any adjustments that are necessary to obtain satisfactory calibration.
9. Supply a 456 kilocycle signal to the antenna of the receiver through the dummy antenna with the gang condenser at 600 kilocycles.
10. Adjust the wave trap trimmer (see Figure 1) for minimum output.

SHORT WAVE BAND

1. Turn the band selector switch to the short wave position (clockwise).
2. Tune the receiver to 6 megacycles.
3. Supply a 6 Megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.
4. The 6 megacycle signal should be received near 6 megacycles on the dial. If this is not the case, check the oscillator tube, switch connections, the fixed padding condenser (C-6) and coils. No adjustment is necessary on this band.
5. Repeat 1, 2, 3, and 4 at 3.6 megacycles.

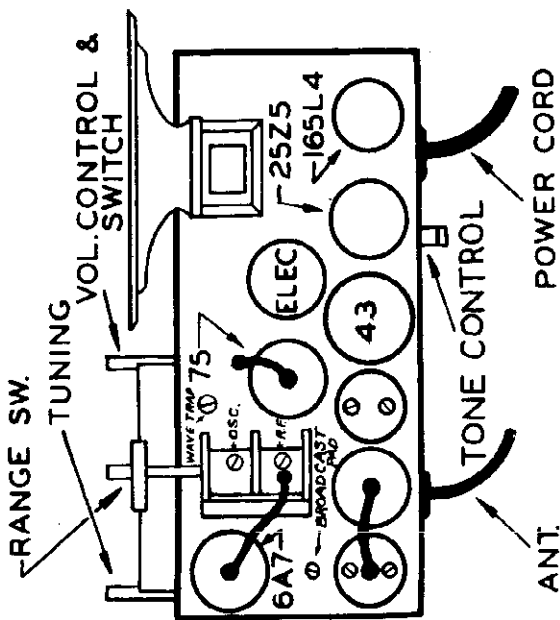


FIGURE 1
TOP VIEW OF THE MODEL 68 CHASSIS

INTERMEDIATE FREQUENCY ALIGNMENT

1. Turn the gang condenser to maximum capacity (fully meshed.)
2. Set the band selector switch on the "Broadcast" position.
3. Supply a 456 kilocycle signal from the signal generator to the antenna lead of the receiver through a .1 Mfd. condenser connected in series with the signal generator lead.
4. Adjust the four trimmers of the two intermediate frequency transformers (see Figure 1) for maximum output with minimum input from the service oscillator.

RADIO FREQUENCY ALIGNMENT

The parallel or high frequency trimmer condensers for the broadcast band are on the gang condenser. These trimmers are used for aligning the high frequency end of the broadcast band. The location of the trimmers is shown in Figure 1.

The oscillator adjustable series padding condenser is used for tracking the oscillator at the low frequency end of the broadcast band. The padding condenser may be adjusted from the top of the chassis through the hole indicated in Figure 1. While making padding condenser adjustments, the gang condenser should be rotated back and forth across the signal to insure adjustment to the peak of greatest intensity.

FAIRBANKS, MORSE & CO.

MODEL 68T6
Chassis 68
Model 69T7
Chassis 69
Voltage,
Resistance

Upper
Voltage
Readings
A. C.

Lower
Voltage
Readings
D. C.

OHMS VOLTS		6D6		VOLTS OHMS		43		VOLTS OHMS		25Z5		VOLTS OHMS	
2700	108 96			0 0	1 MEG	2700	108 96	0	500M	25	124 107	124 107	25
2700	108 96			3.5 2.4	500	3M	95 97	15 15	600	170	115 115	115 115	170
10.2	17.5 17.5			7.8 7.8	7.8	23	45 45	17.5 17.5	10.2	34	45 45	66 66	25
OHMS VOLTS		6A7		VOLTS OHMS		75		VOLTS OHMS		165L4		VOLTS OHMS	
17.5M	8.5 7.5			0 0	1 MEG	0	0	0	500M	0	0	70 70	57
37M	20 46			.2 .16	22.5M	500M	0	0	800M	0	0	0	0
2700	108 96			1.6 1.3	500	40M	36 26	.4 .35	8300	0	0	66 66	35
7.8	12.6 12.6			6.4 6.4	4.2	4	6.3 6.3	0 0	170	115 115	0	0	0

FIGURE 5

VOLTAGE AND RESISTANCE TABLE MODEL 68

OHMS VOLTS		6D6		VOLTS OHMS		43		VOLTS OHMS		25Z5		VOLTS OHMS	
2500	95 95			0 0	500M	2500	95 95	-.45 -.4	1 MEG	2500	95 95	95 95	2500
2500	95 95			3 3.8	300	3000	87 77	0 0	0	590	98AC 95	98AC 95	590
450	29AC 2.1			2.9AC 3.5	450	450M	35AC 2.5	29AC 2.5	450M	450	54AC 50	35AC 2.5	450
OHMS VOLTS		6A7		VOLTS OHMS		75		VOLTS OHMS		165L4		VOLTS OHMS	
2500	95 95			0 0	6.8	0	0	0	0	0	0	98AC 55	490
3300	44 45			1.75 1.75	50M	0	0	0	0	0	0	0	0
2500	95 95			1.75 2.25	150	250M	48 50	1 4	100M	0	0	54AC 50	450
450	29AC 1.6			30AC 1.5	450	450	30AC 1.5	30AC 1.5	450	590	98AC 95	54AC 50	450

FIGURE 5

VOLTAGE AND RESISTANCE TABLE
MODEL 69

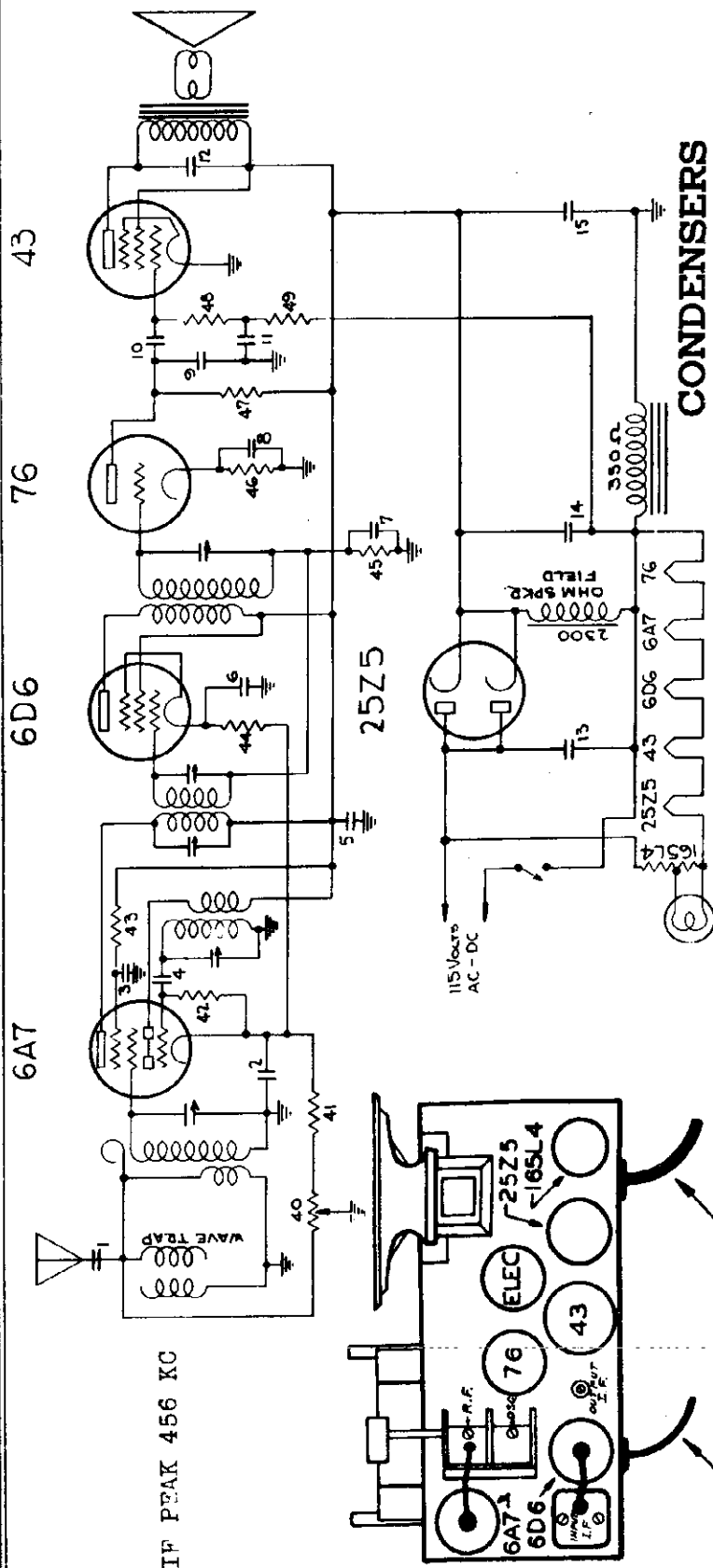
NOTE - The upper voltage readings shown indicate the voltage from each respective prong to ground with the receiver connected to an A.C. (Alternating Current) power line.

The lower voltage readings were taken with the receiver connected to D.C. (Direct Current) power line.

These Voltage readings may vary with the fluctuation in line voltage.

MODEL 69T7
 Chassis 69
 Schematic, Socket
 Trimmers, Alignment

FAIRBANKS, MORSE & CO.



RESISTORS	
40	5M OHMS
41	150 OHMS
42	50M OHMS
43	35M OHMS
44	150 OHMS
45	500M OHMS
46	100M OHMS
47	250M OHMS
48	500M OHMS
49	500M OHMS
1	.01 MFD.
2	.05 MFD.
3	.05 MFD.
4	.0001 MFD.
5	.25 MFD.
6	.05 MFD.
7	.1 MFD.
8	.1 MFD.
9	.0005 MFD.
10	.01 MFD.
11	.25 MFD.
12	.006 MFD.
13	.01 MFD.
14	.16 MFD.
15	.8 MFD.

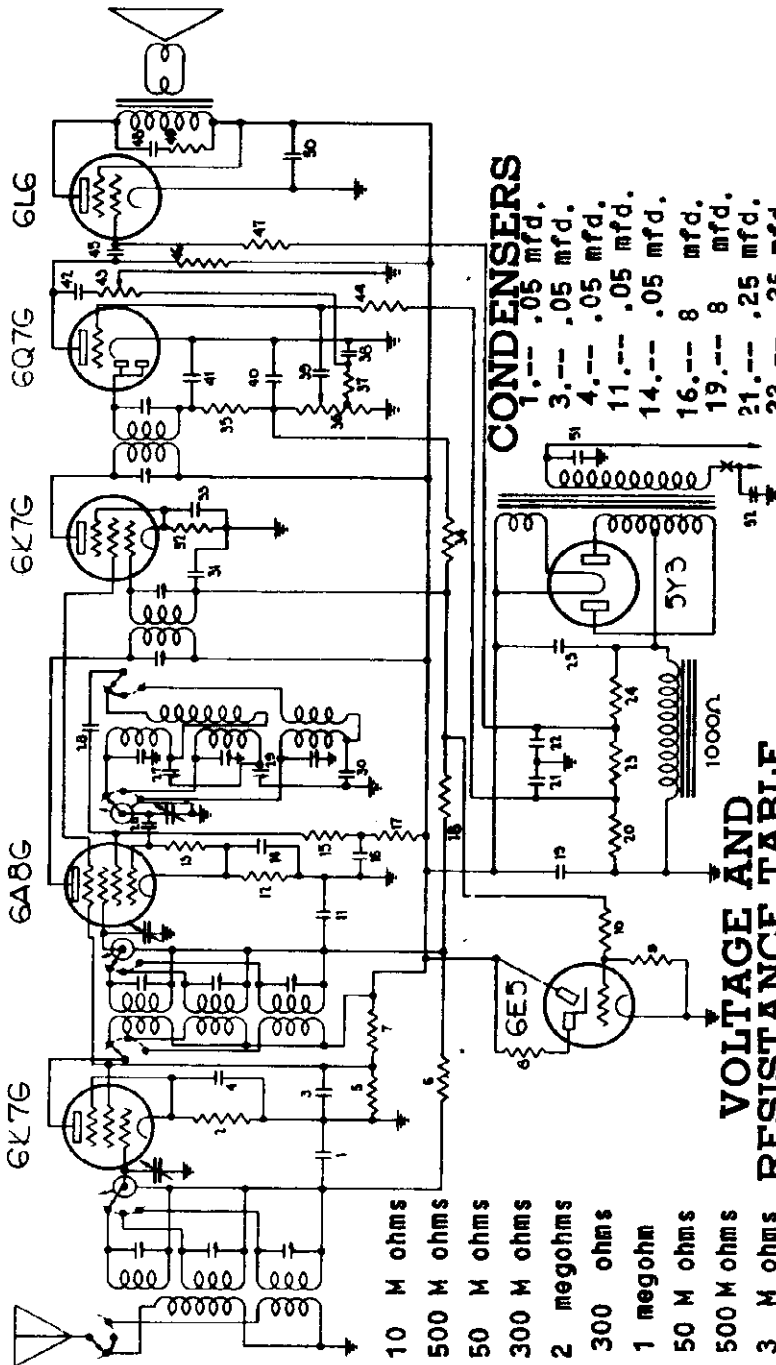
COLOR CODES	
FIRST	
I. F. TRANSFORMER	
Plate	Blue
"B" Plus	Red
Grid Return	Black
Grid (Top)	Green
SECOND	
I. F. TRANSFORMER	
Plate	Blue
"B" Plus	Red
Grid Return	Black
Grid	Green

INTERMEDIATE FREQUENCY ALIGNMENT:—Supply a 456 KC signal from the sig. gen. to the antenna lead thru a .1 mfd. cond. in series with the signal gen. Adjust the three trimmers for maximum output with minimum input from the osc.

RADIO FREQUENCY ALIGNMENT: With min. cap. of var. cond. set dial at 540 KC. Tune the receiver at 1500 KC. — Supply a 1500 signal from sig. gen. to antenna thru 200 mmfd. cond., connected in series with sig. gen. lead. Adj. trimmers for max. OP. Tune receiver to 600 KC — Supply 600 KC to ant. thru the same connection as above. Low freq. of band does not employ an osc. padding cond. but is tracked by means of a split section of gang cond. The wave trap requires no adjustment.

FAIRBANKS, MORSE & CO.

MODEL S 72C2, 72C3, 72T3
 Chassis 72
 Schematic, Voltage
 Resistance



IF PEAK 456 KC

RESISTORS

- 43.--- 500 M ohms
- 44.--- 500 M ohms
- 46.--- 250 M ohms
- 47.--- 250 M ohms
- 49.--- 5 M ohms

- 2.--- 300 ohms
- 5.--- 50 M ohms
- 6.--- 50 M ohms
- 7.--- 15 M ohms
- 8.--- 1 megohm
- 9.--- 2 megohms
- 10.--- 1 megohm
- 12.--- 300 ohms
- 13.--- 50 M ohms
- 15.--- 10 M ohms
- 17.--- 10 M ohms
- 18.--- 500 M ohms
- 20.--- 50 M ohms
- 23.--- 300 M ohms
- 24.--- 2 megohms
- 32.--- 300 ohms
- 34.--- 1 megohm
- 35.--- 50 M ohms
- 36.--- 500 M ohms
- 37.--- 3 M ohms

CONDENSERS

- 1.--- .05 mfd.
- 3.--- .05 mfd.
- 4.--- .05 mfd.
- 11.--- .05 mfd.
- 14.--- .05 mfd.
- 16.--- 8 mfd.
- 19.--- 8 mfd.
- 21.--- .25 mfd.
- 22.--- .25 mfd.
- 25.--- 16 mfd.
- 26.--- 100 mfd.
- 27.--- 750 M mfd.
- 28.--- 1000 M mfd.
- 29.--- 1800 M mfd.
- 30.--- 4000 M mfd.
- 31.--- .05 mfd.
- 33.--- .05 mfd.

**VOLTAGE AND
 RESISTANCE TABLE**

OHMS VOLTS	6A8G TUBE	VOLTS OHMS	OHMS VOLTS	6K7G TUBE	VOLTS OHMS	OHMS VOLTS	6K7G TUBE	VOLTS OHMS	6L6 TUBE	OHMS VOLTS	6Q7G TUBE	OHMS VOLTS	6E5 TUBE	VOLT OHMS
50M	85	50M	85	1.75	300	50M	85	1.75	300	50M	85	1.75	300	38.--- .1 mfd.
65M	195	65M	195	0	1 MEG.	65M	195	0	1 MEG.	65M	195	0	1 MEG.	39.--- .01 mfd.
.5	6.3	.5	6.3	0	0	0	0	0	0	0	0	0	0	40.--- 100 M mfd.
0	0	0	0	1.75	300	0	0	1.75	300	0	0	0	0	41.--- 100 M mfd.
0	0	0	0	0	0	0	0	0	0	0	0	0	0	42.--- .03 mfd.
0	0	0	0	0	0	0	0	0	0	0	0	0	0	43.--- .02 mfd.
0	0	0	0	0	0	0	0	0	0	0	0	0	0	44.--- .01 mfd.
0	0	0	0	0	0	0	0	0	0	0	0	0	0	45.--- .01 mfd.
0	0	0	0	0	0	0	0	0	0	0	0	0	0	46.--- .01 mfd.
0	0	0	0	0	0	0	0	0	0	0	0	0	0	47.--- .01 mfd.
0	0	0	0	0	0	0	0	0	0	0	0	0	0	48.--- .01 mfd.
0	0	0	0	0	0	0	0	0	0	0	0	0	0	49.--- .01 mfd.
0	0	0	0	0	0	0	0	0	0	0	0	0	0	50.--- .01 mfd.
0	0	0	0	0	0	0	0	0	0	0	0	0	0	51.--- .01 mfd.
0	0	0	0	0	0	0	0	0	0	0	0	0	0	52.--- .01 mfd.

MODELS 72C2, 72C3, 72T3
Chassis 72

FAIRBANKS, MORSE & CO.

Alignment, Socket
Trimmers, Data

INTERMEDIATE FREQUENCY ALIGNMENT

- 1.- Turn the gang condenser to maximum capacity (fully meshed). With the range switch on the broadcast position.
- 2.- Supply a 455 kilocycle signal from the signal generator to the grid of the first detector tube (6A86) through a .1 Mfd. condenser connected in series with the signal generator lead.
- 3.- Adjust the four trimmers of the two intermediate frequency transformers (see Figure 1) for maximum output with minimum input from the service oscillator.

RADIO FREQUENCY ALIGNMENT

The parallel or high frequency trimmer condensers for each coil are housed in the same shield can with the coil except the oscillator trimmers. These are air dielectric condensers and are mounted on the chassis. These trimmers are used for aligning the high frequency end of each band. The location of the various trimmers is shown in Figure 1.

The oscillator, adjustable, series padding condensers are used for tracking the oscillator at the low frequency end of each band. The padding condensers may be adjusted from the top of the chassis through the holes indicated in Figure 1. Since a fixed mica padding condenser is employed on the short wave band, no adjustment is necessary. While making padding condenser adjustments, the gang condenser should be rotated back and forth across the signal to insure adjustment to the peak of greatest intensity.

DIAL ADJUSTMENT

Before making any radio frequency alignment adjustments, close the variable tuning condenser (maximum capacity), loosen the screw that secures the dial pointer, place the pointer in a horizontal position (gang condenser still closed) and then tighten the screw.

POLICE BAND

- 1.- Turn the band selector switch to the police band (center) position.
- 2.- Tune the receiver to 6 megacycles.
- 3.- Supply a 5 megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.
- 4.- Adjust the police band oscillator trimmer condenser (Figure 1) for maximum output with minimum input from the signal generator, then adjust the police band radio frequency and antenna stage trimmers for maximum output.
- 5.- Tune the receiver to 2.5 megacycles.
- 6.- Supply a 2.5 megacycle signal to the receiver through the same connections used on the previous adjustment.
- 7.- Adjust the police band oscillator padding condenser (top of chassis, see Figure 1) for maximum output with minimum input from the signal generator, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 8.- Check at 6 megacycles and then at 2.5 megacycles and make any adjustments that are necessary to obtain satisfactory calibration.

BROADCAST BAND

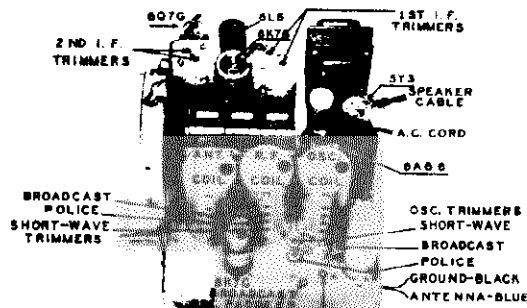
- 1.- Turn the band selector switch to the broadcast (counter-clockwise) position.
- 2.- Tune the receiver to 1500 kilocycles.
- 3.- Supply a 1500 kilocycle signal from the signal generator to the antenna lead of the receiver through a standard dummy antenna or a 200 Mfd. (.0002 Mfd.) condenser, connected in series with the signal generator lead.
- 4.- Adjust the broadcast band oscillator trimmer condenser (Figure 1) for maximum output with minimum input from the signal generator. Then adjust the broadcast band radio frequency and antenna stage trimmers for maximum output.
- 5.- Tune the receiver to 600 kilocycles.
- 6.- Supply a 600 kilocycle signal to the antenna of the receiver through the same connections as previously used.
- 7.- Adjust the broadcast band oscillator padding condenser (top of the chassis, see Figure 1) for maximum output with minimum input from the signal generator, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 8.- Check at 1500 kilocycles and then at 600 kilocycles. Make any adjustments that are necessary to obtain satisfactory calibration.

SHORT WAVE BAND

- 1.- Turn the band selector switch to the short wave (clockwise) position.
- 2.- Tune the receiver to 20 megacycles.
- 3.- Supply a 20 megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.
- 4.- Adjust the short wave band oscillator trimmer condenser (Figure 1) for maximum output with minimum input from the signal generator. Then adjust the short wave band antenna and radio frequency stage trimmers for maximum output, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 5.- The 8 megacycle signal should be received near 8 megacycles on the dial. If this is not the case check the oscillator tube, switch connections, the fixed padding condenser and the coils. No adjustment is required at this point.

WARNING

The image signal should be received at approximately 19 megacycles on the dial. If not, the oscillator has been aligned to the image frequency and the oscillator trimmer condenser must be backed out until the correct signal is received at 20 megacycles and the image approximately 19 megacycles. If readjustment is found necessary, the antenna and radio frequency stage trimmers should also be checked again.



COLOR CODES

FIRST I. F. TRANSFORMER		SECOND I. F. TRANSFORMER	
Plate	Blue	Plate	Blue
"B" Plus	Red	"B" Plus	Red
Grid Return	Black	Diode Return	Black
Grid (Top)	Green	Diodes	Green

STANDARD RMA

RESISTOR AND CONDENSER COLOR CODE

0 Black	2 Red	4 Yellow	6 Blue	8 Grey
1 Brown	3 Orange	5 Green	7 Purple	9 White

RESISTORS

The BODY COLOR represents the FIRST FIGURE of the resistance value
The END COLOR represents the SECOND FIGURE of the resistance value
The DOT COLOR represents the NUMBER OF CIPHERS following the first two figures

MICA CONDENSERS

(Capacity in Micro-Microfarads)

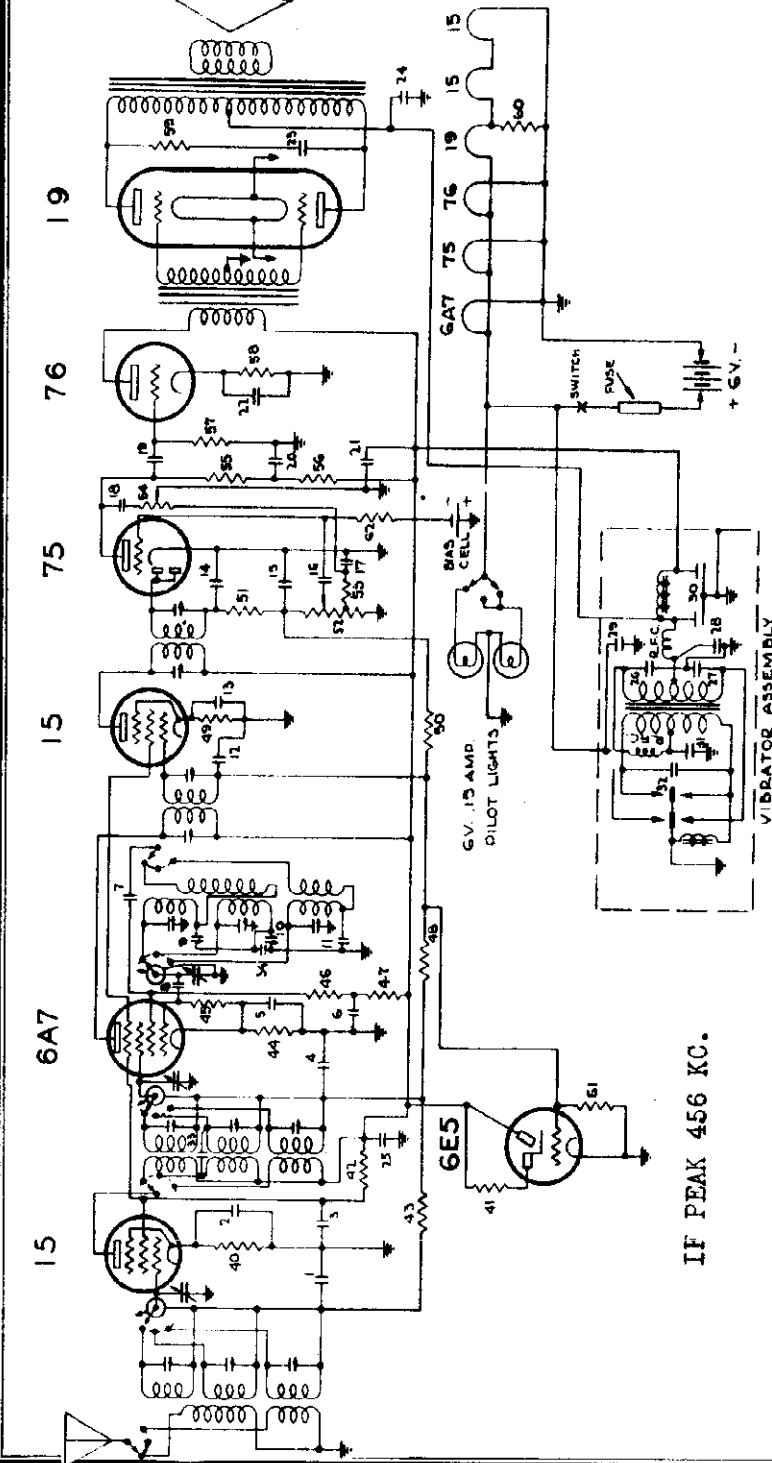
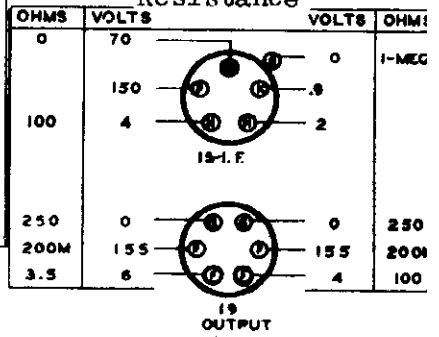
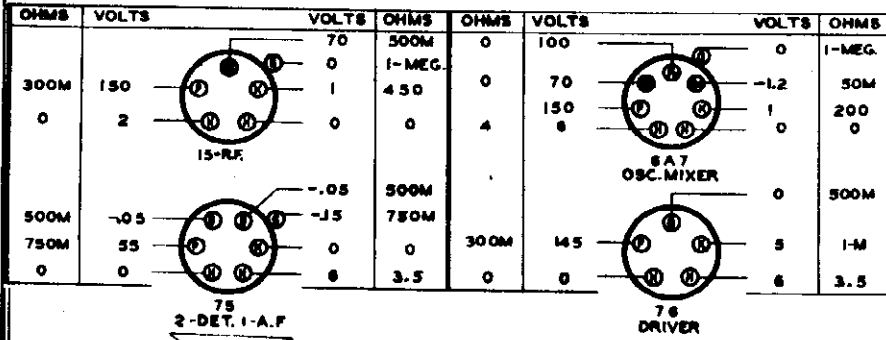
The FIRST DOT on the condenser represents the FIRST FIGURE of the capacity
The SECOND DOT on the condenser represents the SECOND FIGURE of the capacity
The THIRD DOT on the condenser represents the NUMBER OF CIPHERS following the first two figures.
The colors on the condensers should be read from left to right with the condenser in an upright position.

POWER TRANSFORMER

Lead Color	Voltage
Black	115 Volt Primary
Green	6.3 Volt Filament
Yellow	5.0 Volt Filament
Red	High Voltage Sec.
Red & White	High Voltage C.T.

FAIRBANKS, MORSE & CO.

MODELS 73C3B, 73T3E
Chassis 73
Schematic, Voltage
Resistance



IF PEAK 456 KC.

RESISTORS		CONDENSERS	
40 - 500 ohms	50 - 1 megohm	1 - .05 mfd	11 - .004 mfd
41 - 1 megohm	51 - 50M ohms	2 - .05 mfd	12 - .05 mfd
42 - 25M ohms	52 - 500M ohms	3 - .1 mfd	13 - .05 mfd
43 - 50 ohms	53 - 3M ohms	4 - .05 mfd	14 - .0001 mfd
44 - 150 ohms	54 - 500M ohms	5 - .05 mfd	15 - .0001 mfd
45 - 50M ohms	55 - 250M ohms	6 - 8 mfd	16 - .01 mfd
46 - 10M ohms	56 - 250M ohms	7 - .001 mfd	17 - .1 mfd
47 - 10M ohms	57 - 500M ohms	8 - 100 mmfd	18 - .03 mfd
48 - 500M ohms	58 - 1M ohms	9 - .0005 mfd	19 - .01 mfd
49 - 500 ohms	59 - 10M ohms	10 - .00175 mfd	20 - .1 mfd
60 - 100 ohms		21 - .25 mfd	22 - .10 mfd
61 - 2 megohms		23 - .01 mfd	24 - .25 mfd
62 - 500M ohms		24 - .25 mfd	25 - .1 mfd
		26 - .01 mfd	26 - .01 mfd
		27 - .01 mfd	27 - .01 mfd
		28 - .1 mfd	28 - .1 mfd
		29 - .05 mfd	29 - .05 mfd
		30 - Dual 8 mfd	30 - Dual 8 mfd
		31 - .5 mfd	31 - .5 mfd
		32 - .25 mfd	32 - .25 mfd
		33 - 10 mfd	33 - 10 mfd
		34 - 300 mmfd	34 - 300 mmfd

MODELS 73C3B, 73T3B

Chassis 73

Socket, Trimmers
Alignment, Data

FAIRBANKS, MORSE & CO.

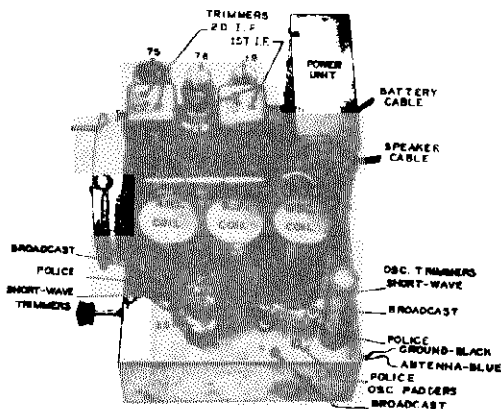


FIGURE 3
TOP VIEW OF THE MODEL 73 CHASSIS

INTERMEDIATE FREQUENCY ALIGNMENT

- 1.- Turn the gang condenser to maximum capacity (fully meshed). Set the band selector switch on the broadcast position.
- 2.- Supply a 456 kilocycle signal from the signal generator to the grid of the first detector tube (6A7) through a .1 Mfd. condenser connected in series with the signal generator lead.
- 3.- Adjust the four trimmers of the two intermediate frequency transformers (see Figure 3) for maximum output with minimum input from the service oscillator.

RADIO FREQUENCY ALIGNMENT

The parallel or high frequency trimmer condensers for each coil are housed in the same shield can with the coil except the oscillator trimmers. These are air dielectric condensers and are mounted on the chassis. These trimmers are used for aligning the high frequency end of each band. The location of the various trimmers is shown in Figure 3.

The oscillator, adjustable, series padding condensers are used for tracking the oscillator at the low frequency end of each band. The padding condensers may be adjusted from the top of the chassis through the holes indicated in Figure 3. Since a fixed mica padding condenser is employed on the short wave band, no adjustment is necessary. While making padding condenser adjustments, the gang condenser should be rotated back and forth across the signal to insure adjustment to the peak of greatest intensity.

DIAL ADJUSTMENT

Before making any radio frequency alignment adjustments, close the variable tuning condenser (maximum capacity), loosen the screw that secures the dial pointer, place the pointer in a horizontal position (gang condenser still closed) and then tighten the screw.

POLICE BAND

- 1.- Turn the band selector switch to the police band (center) position.
- 2.- Tune the receiver to 6 megacycles.
- 3.- Supply a 6 megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.
- 4.- Adjust the police band oscillator trimmer condenser (Figure 3) for maximum output with minimum input from the signal generator, then adjust the police band radio frequency and antenna stage trimmers for maximum output.
- 5.- Tune the receiver to 2.5 megacycles.
- 6.- Supply a 2.5 megacycle signal to the receiver through the same connections used on the previous adjustment.
- 7.- Adjust the police band oscillator padding condenser (top of chassis, see Figure 3) for maximum output with minimum input from the signal generator, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 8.- Check at 6 megacycles and then at 2.5 megacycles and make any adjustments that are necessary to obtain satisfactory calibration.

BROADCAST BAND

- 1.- Turn the band selector switch to the broadcast (counter-clockwise) position.
- 2.- Tune the receiver to 1500 kilocycles.
- 3.- Supply a 1500 kilocycle signal from the signal generator to the antenna lead of the receiver through a standard dummy antenna or a 200 Mfd. (.0002 Mfd.) condenser, connected in series with the signal generator lead.

- 4.- Adjust the broadcast band oscillator trimmer condenser (Figure 3) for maximum output with minimum input from the signal generator. Then adjust the broadcast band radio frequency and antenna stage trimmers for maximum output.
- 5.- Tune the receiver to 600 kilocycles.
- 6.- Supply a 600 kilocycle signal to the antenna of the receiver through the same connections as previously used.
- 7.- Adjust the broadcast band oscillator padding condenser (top of chassis, see Figure 3) for maximum output with minimum input from the signal generator, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 8.- Check at 1500 kilocycles and then at 600 kilocycles. Make any adjustments that are necessary to obtain satisfactory calibration.

SHORT WAVE BAND

- 1.- Turn the band selector switch to the short wave (clockwise) position.
- 2.- Tune the receiver to 20 megacycles.
- 3.- Supply a 20 megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.
- 4.- Adjust the short wave band oscillator trimmer condenser (Figure 3) for maximum output with minimum input from the signal generator. Then adjust the short wave band antenna and radio frequency stage trimmers for maximum output, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 5.- The 8 megacycle signal should be received near 8 megacycles on the dial. If this is not the case check the oscillator tube, switch connections, and fixed padding condenser and the coils. No adjustment is required at this point.

WARNING

The image signal should be received at approximately 19 megacycles on the dial. If not, the oscillator has been aligned to the image frequency and the oscillator trimmer condenser must be backed out until the correct signal is received at 20 megacycles and the image at approximately 19 megacycles. If readjustment is found necessary, the antenna and radio frequency stage trimmers should also be checked again.

SUGGESTED SERVICE PROCEDURE

If the receiver does not operate properly, test all tubes in a reliable tube tester or, better still, replace the tubes in the receiver, one by one, with tubes known to be good. Care must be exercised to see that the switch is turned off before any tubes are removed from the receiver, since some of them are two volt tubes, while others are six volt tubes, their filaments being connected in a series parallel arrangement. If, after replacing any defective tubes, the receiver is still inoperative, remove the chassis from the cabinet and conduct a careful resistance and voltage analysis.

The voltage and resistance charts in this manual give detailed information regarding the resistance from various points to various other points in the chassis. The measured voltage from the various tube socket contacts to ground is also given. When these charts are followed faithfully, little difficulty should be experienced in finding almost any fault that may develop.

NOTE - All adjustments should be made with the volume control "full on". Any desired variation in signal strength should be obtained by adjusting the output of the signal generator.

FUSE

In case of difficulty, the fuse located in a metal cartridge near the end of the positive (red) battery lead should be checked. A 15 ampere fuse, FAIRBANKS-MORSE part number 5605, should be used for replacement purposes.

BATTERY

A storage battery having a capacity of at least 135 ampere hours should be used with the receiver. The storage battery should be located as far from the chassis of the receiver as the battery cables will permit. Attach the long, red lead from the receiver to the positive (+) side of the storage battery. Attach the long, black lead from the receiver to the negative (-) side of the battery.

POWER TRANSFORMERS

Lead Color	Voltage
Black	115V. Primary
Green	6.3V. Filament
Yellow	5.0V. Filament
Red	High Voltage Sec.
Red and White	High Voltage C.T.

COLOR CODES

FIRST	SECOND
I. F. TRANSFORMER	I. F. TRANSFORMER
Plate	Blue
"B" Plus	Red
Grid Return	Black
Grid (Top)	Green
	Diodes
	Black
	Green

Schematic, Voltage Resistance

FAIRBANKS, MORSE & CO.

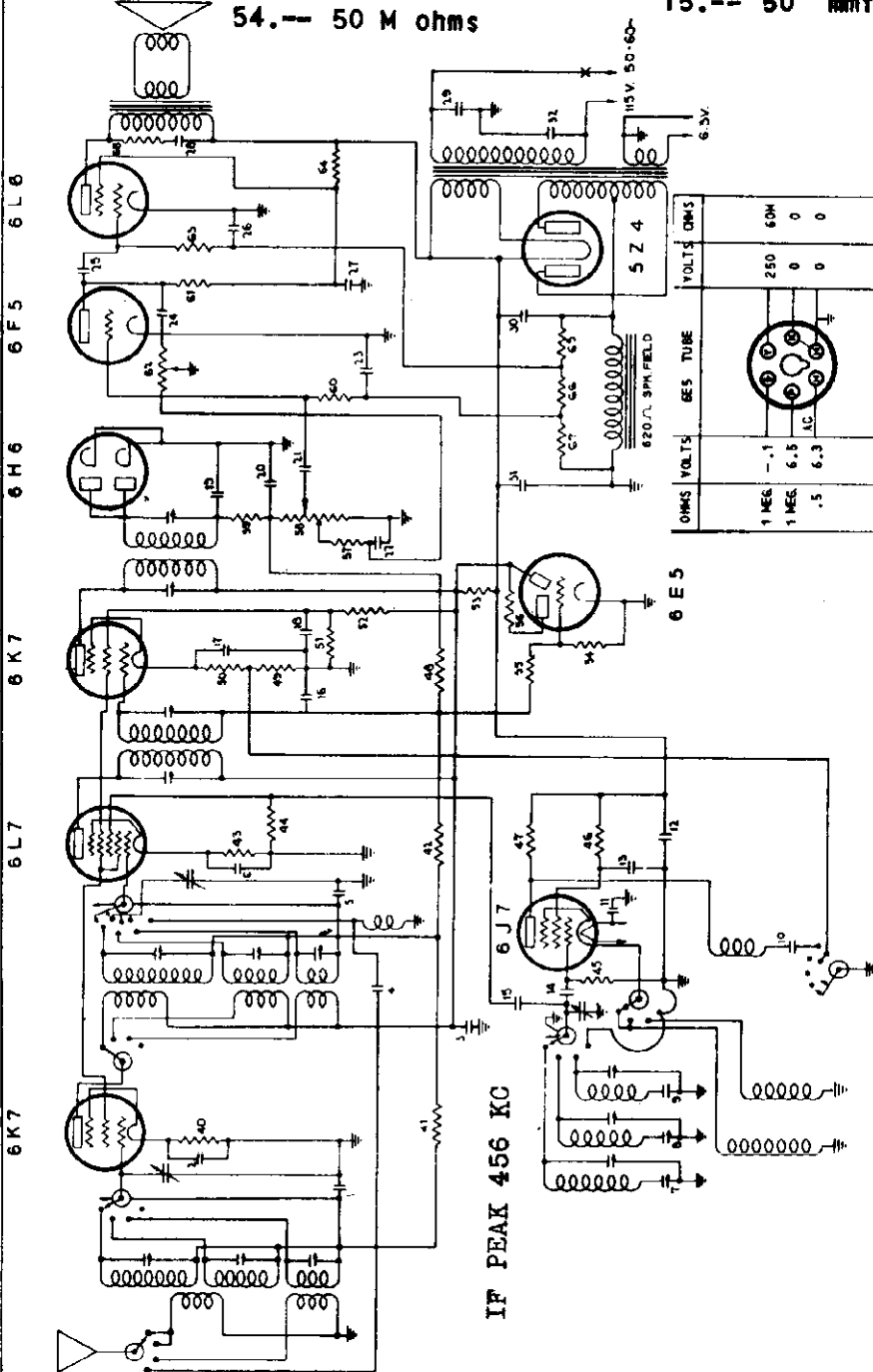
MODELS 91C4, 91C5, 91T
Chassis 91

RESISTORS

CONDENSERS

- 40.-- 300 M ohms
- 41.-- 50 M ohms
- 42.-- 500 M ohms
- 43.-- 500 ohms
- 44.-- 50 M ohms
- 45.-- 50 M ohms
- 46.-- 2 M ohms
- 47.-- 10 M ohms
- 48.-- 1 megohm
- 49.-- 2 M ohms
- 50.-- 300 ohms
- 51.-- 50 M ohms
- 52.-- 500 M ohms
- 53.-- 500 ohms
- 55.-- 1 megohm
- 56.-- 1 megohm
- 57.-- 3 M ohms
- 58.-- 500 M ohms
- 59.-- 50 M ohms
- 60.-- 500 M ohms
- 61.-- 250 M ohms
- 62.-- 500 M ohms
- 63.-- 250 M ohms
- 64.-- 10 M ohms
- 65.-- 2 megohms
- 66.-- 400 M ohms
- 67.-- 40 M ohms
- 68.-- 5 M ohms

- 1.-- .05 mfd.
- 2.-- .05 mfd.
- 3.-- .1 mfd.
- 4.-- 100 mfd.
- 5.-- .05 mfd.
- 6.-- .05 mfd.
- 7.-- 750 mmfd.
- 8.-- 1800 mmfd.
- 9.-- .004 mfd.
- 10.-- 200 mmfd.
- 11.-- 500 mmfd.
- 12.-- .1 mfd.
- 13.-- 500 mmfd.
- 14.-- 100 mmfd.
- 15.-- 50 mmfd.
- 16.-- .05 mfd.
- 17.-- .05 mfd.
- 18.-- .1 mfd.
- 19.-- 100 mmfd.
- 20.-- 100 mmfd.
- 21.-- .01 mfd.
- 22.-- .1 mfd.
- 23.-- .25 mfd.
- 24.-- .03 mfd.
- 25.-- .01 mfd.
- 26.-- .25 mfd.
- 27.-- 4 mfd.
- 28.-- .02 mfd.
- 29.-- .01 mfd.
- 30.-- 16 mfd.
- 31.-- 30 mfd.
- 32.-- .01 mfd.



OHMS	VOLTS	6L7 TUBE	OHMS	VOLTS	6L7 TUBE	OHMS	VOLTS	6K7 TUBE	OHMS	VOLTS	6K7 TUBE	OHMS	VOLTS	6H6 TUBE	OHMS	VOLTS	6H6 TUBE	OHMS	VOLTS	6F5 TUBE	OHMS	VOLTS	6F5 TUBE	OHMS	VOLTS	6L6 TUBE	OHMS	VOLTS	6L6 TUBE	OHMS	VOLTS	6L6 TUBE		
50M	130		50M	130		50M	130		50M	130		50M	130		50M	130		50M	130		50M	130		50M	130		50M	130		50M	130		50M	130
60M	250		60M	250		60M	250		60M	250		60M	250		60M	250		60M	250		60M	250		60M	250		60M	250		60M	250		60M	250
.5	6.3		.5	6.3		.5	6.3		.5	6.3		.5	6.3		.5	6.3		.5	6.3		.5	6.3		.5	6.3		.5	6.3		.5	6.3		.5	6.3
D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0
D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0
50M	130		50M	130		50M	130		50M	130		50M	130		50M	130		50M	130		50M	130		50M	130		50M	130		50M	130		50M	130
60M	250		60M	250		60M	250		60M	250		60M	250		60M	250		60M	250		60M	250		60M	250		60M	250		60M	250		60M	250
D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0
D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0
50M	130		50M	130		50M	130		50M	130		50M	130		50M	130		50M	130		50M	130		50M	130		50M	130		50M	130		50M	130
60M	250		60M	250		60M	250		60M	250		60M	250		60M	250		60M	250		60M	250		60M	250		60M	250		60M	250		60M	250
D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0
D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0		D	0

MODELS 91C4, 91C5, 91T4

Chassis 91

Socket, Trimmers

Alignment, Data

FAIRBANKS, MORSE & CO.

NOTE - All adjustments should be made with the volume control "full on". Any desired variation in signal strength should be obtained by adjusting the output of the signal generator.

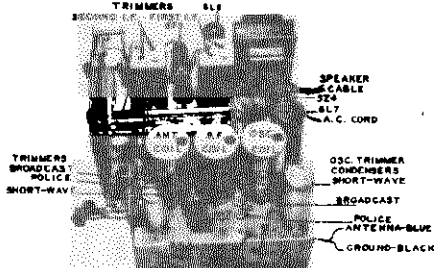


FIGURE 4
TOP VIEW OF THE MODEL 91 CHASSIS

INTERMEDIATE FREQUENCY ALIGNMENT

- 1.- Turn the gang condenser to maximum capacity (fully meshed). Band switch on broadcast position.
- 2.- Supply a 456 kilocycle signal from the signal generator to the grid of the first detector tube through a .1 Mfd. condenser connected in series with the signal generator lead.
- 3.- Adjust the four trimmers of the two intermediate frequency transformers (see Figure 4) for maximum output with minimum input from the service oscillator.

RADIO FREQUENCY ALIGNMENT

The parallel or high frequency trimmer condensers for each coil are housed in the same shield can with the coil. With the exception of the oscillator trimmers, these are air dielectric condensers and are mounted on the chassis. These trimmers are used for aligning the high frequency end of each band. The location of the various trimmers is shown in Figure 4.

The oscillator, adjustable, series padding condensers are used for tracking the oscillator at the low frequency end of each band. The padding condensers may be adjusted from the top of the chassis through the holes indicated in Figure 4. Since a fixed mica padding condenser is employed on the short wave band, no adjustment is necessary. While making padding condenser adjustments, the gang condenser should be rotated back and forth across the signal to insure adjustment to the peak of greatest intensity.

BROADCAST BAND

- 1.- Turn the band selector switch to the broadcast (clockwise) position.
- 2.- Tune the receiver to 1500 kilocycles.
- 3.- Supply a 1500 kilocycle signal from the signal generator to the antenna lead of the receiver through a standard dummy antenna or a 200 Mafd. (.0002 Mfd.) condenser, connected in series with the signal generator lead.
- 4.- Adjust the broadcast band oscillator trimmer condenser (Figure 4) for maximum output with minimum input from the signal generator. Then adjust the broadcast band radio frequency and antenna stage trimmers for maximum output.
- 5.- Tune the receiver to 600 kilocycles.
- 6.- Supply a 600 kilocycle signal to the antenna of the receiver through the same connections as previously used.
- 7.- Adjust the broadcast band oscillator padding condenser (top of chassis, see Figure 4) for maximum output with minimum input from the signal generator, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 8.- Check at 1500 kilocycles and then at 600 kilocycles. Make any adjustments that are necessary to obtain satisfactory calibration.

POLICE BAND

- 1.- Turn the band selector switch to the police band (center) position.
- 2.- Tune the receiver to 5.4 megacycles.
- 3.- Supply a 5.4 megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.
- 4.- Adjust the police band oscillator trimmer condenser (Figure 4) for maximum output with minimum input from the signal generator, then adjust the police band radio frequency and antenna stage trimmers for maximum output.
- 5.- Tune the receiver to 1.8 megacycles.
- 6.- Supply a 1.8 megacycle signal to the receiver through the same connections used on the previous adjustment.

- 7.- Adjust the police band oscillator padding condenser (top of chassis, see Figure 4) for maximum output with minimum input from the signal generator, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 8.- Check at 5.4 megacycles and then at 1.8 megacycles and make any adjustments that are necessary to obtain satisfactory calibration.

SHORT WAVE BAND

- 1.- Turn the band selector switch to the shortwave (clockwise) position.
- 2.- Tune the receiver to 18 megacycles.
- 3.- Supply an 18 megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.
- 4.- Adjust the short wave band oscillator trimmer condenser (in Figure 4) for maximum output with minimum input from the signal generator. Then adjust the short wave band antenna and radio frequency stage trimmers for maximum output, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 5.- The 6 megacycle signal should be received near 6 megacycles on the dial. If the signal is not received check the oscillator tube, switch connections, the fixed padding condenser and the coils. No adjustment is required at this point.
- 6.- Check and, if necessary, readjust all three stages for maximum output with minimum input from the signal generator.

WARNING

The image signal should be received at approximately 17 megacycles on the dial. If not, the oscillator has been aligned to the image frequency and the oscillator trimmer condenser must be backed out until the correct signal is received at 18 megacycles and the image at approximately 17 megacycles. If readjustment is found necessary, the antenna and radio frequency stage trimmers should also be checked again.

ULTRA SHORT WAVE BAND

No adjustment is required on this band. If signals are not properly received check the oscillator tube, switch contacts, the fixed padding condenser, and the coils.

COLOR CODES

FIRST	SECOND
I. F. TRANSFORMER	I. F. TRANSFORMER
Plate Blue	Plate Blue
"B" Plus Red	"B" Plus Red
Grid Return Black	Diode Return Black
Grid (Top) Green	Diodes Green

STANDARD RMA

RESISTOR AND CONDENSER COLOR CODE

0 Black	2 Red	4 Yellow	6 Blue	8 Grey
1 Brown	3 Orange	5 Green	7 Purple	9 White

RESISTORS

The BODY COLOR represents the FIRST FIGURE of the resistance value. The END COLOR represents the SECOND FIGURE of the resistance value. The DOT COLOR represents the NUMBER OF CIPHERS following the first two figures.

MICA CONDENSERS

(Capacity in Micro-Microfarads)

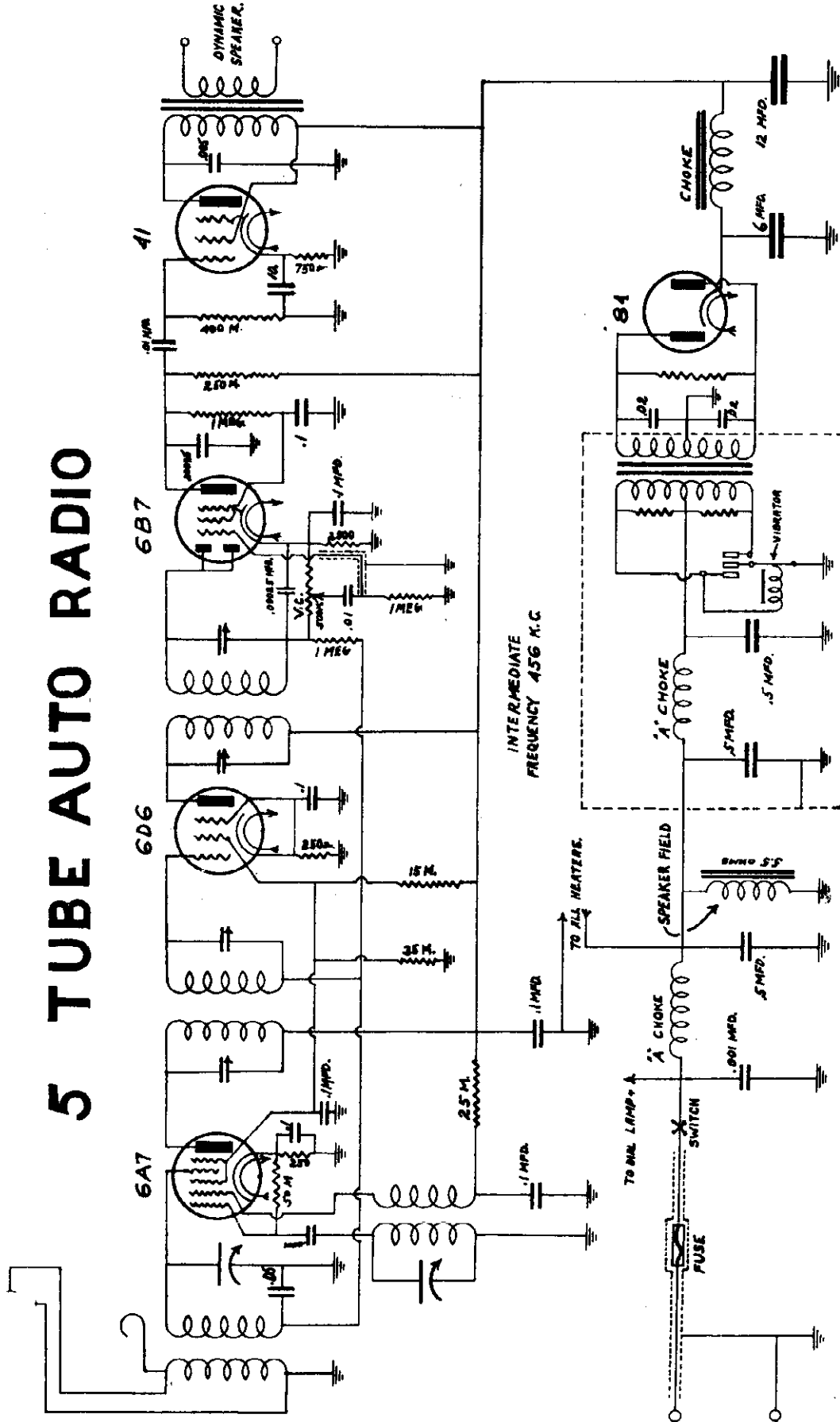
The FIRST DOT on the condenser represents the FIRST FIGURE of the capacity. The SECOND DOT on the condenser represents the SECOND FIGURE of the capacity. The THIRD DOT on the condenser represents the NUMBER OF CIPHERS following the first two figures. The colors on the condensers should be read from left to right with the condenser in an upright position.

POWER TRANSFORMER

Lead Color	Voltage
Black	115 Volt Primary
Green	6.3 Volt Filament
Yellow	5.0 Volt Filament
Red	High Voltage Sec.
Red & White	High Voltage C.T.

FEDERATED PURCHASER

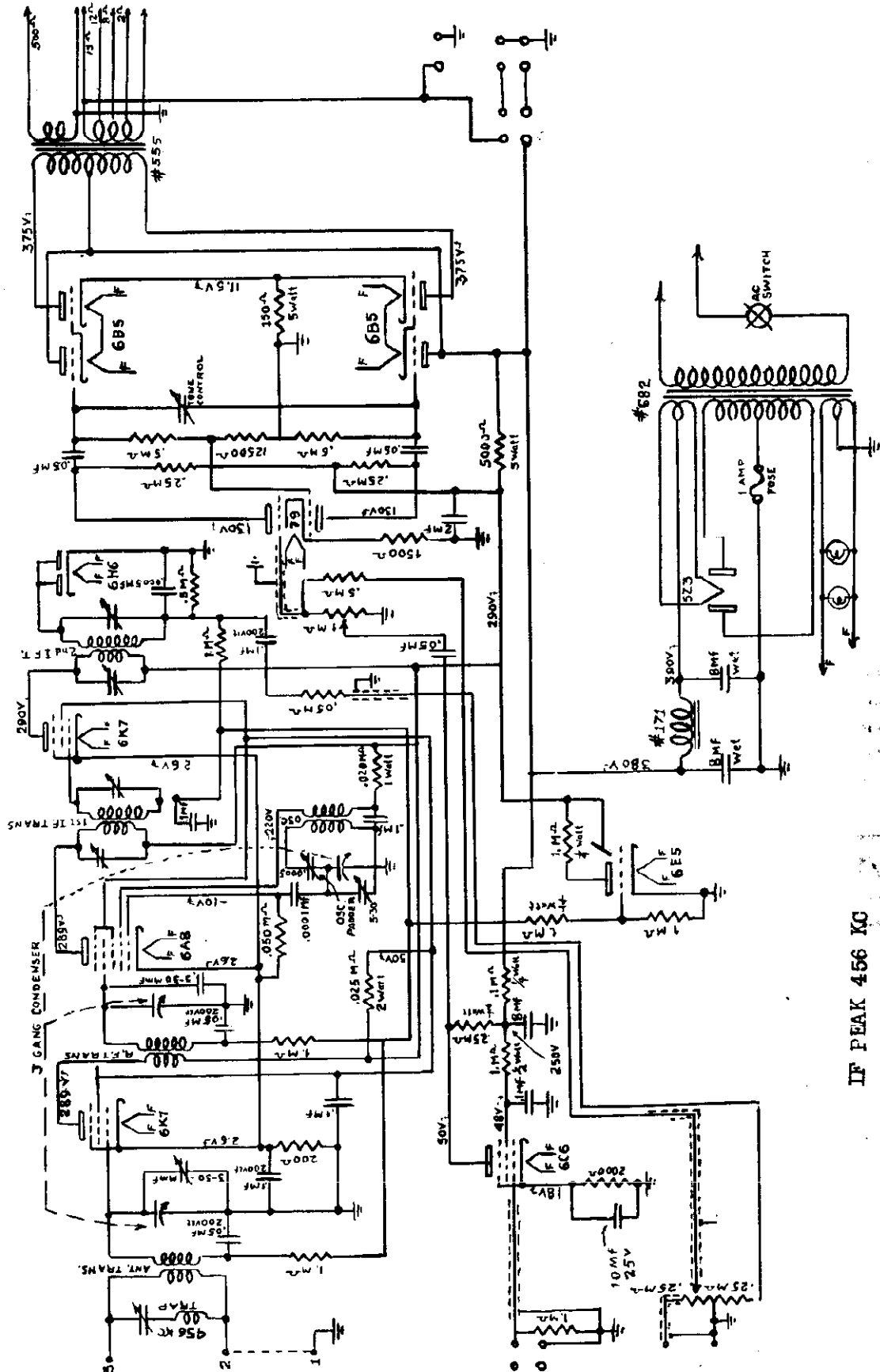
5 TUBE AUTO RADIO



ENGINEERING DEPARTMENT
CIRCUIT — 5 TUBE AUTO SUPERHET
APR 1 1935

MODEL 1940
Schematic

FEDERATED PURCHASER



IF PEAK 456 KC

FIRESTONE

MODEL 7405-1
Schematic, Socket
Notes, Parts

MODEL 7405-1
4 Tube - AC-DC - Receiver
(Airchief)

4-Tube AC-DC Receiver
For Use on 110-115 VOLTS AC OR DC Current Only

This receiver is a four-tube tuned-radio-frequency type which operates on either AC or DC current. It will provide very satisfactory entertainment for those who desire a small set.

First, carefully remove all packing material from the set and around the tubes. See that all tubes are pushed down tightly in the sockets, all grid caps on top of tubes properly connected, and tube shields in place. Test by means of a lamp that there is power at the receptacle you have chosen for your radio, and be sure that the voltage is 110 volts. Disconnect attachment cord to outlet.

SUPPLY VOLTAGE

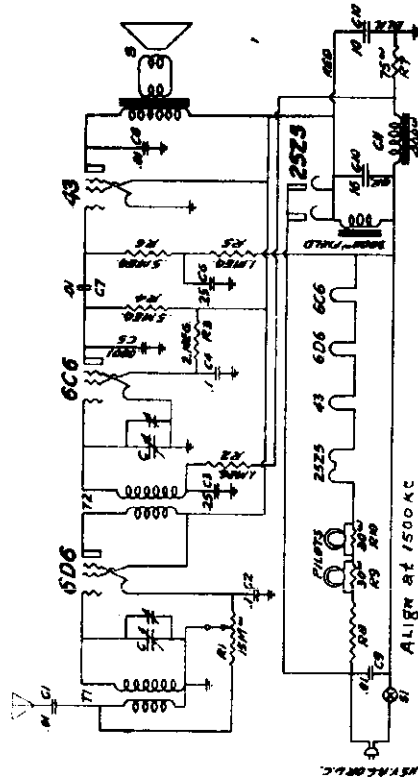
This receiver operates from any 110 volt light socket of any frequency AC or straight DC. When operating on a DC socket, the plug may have to be reversed in the socket to obtain the correct polarity, as it will work only in one position on DC current, but in either position on AC current.

ANTENNA

A 20-foot coil of antenna wire is supplied connected to the receiver. This is usually sufficient for most locations if it is unrolled and laid on the floor or thrown out of window. However, in some buildings of steel construction it may be necessary to use an outside antenna to obtain satisfactory results. Connect it to end of the antenna supplied.

GROUND

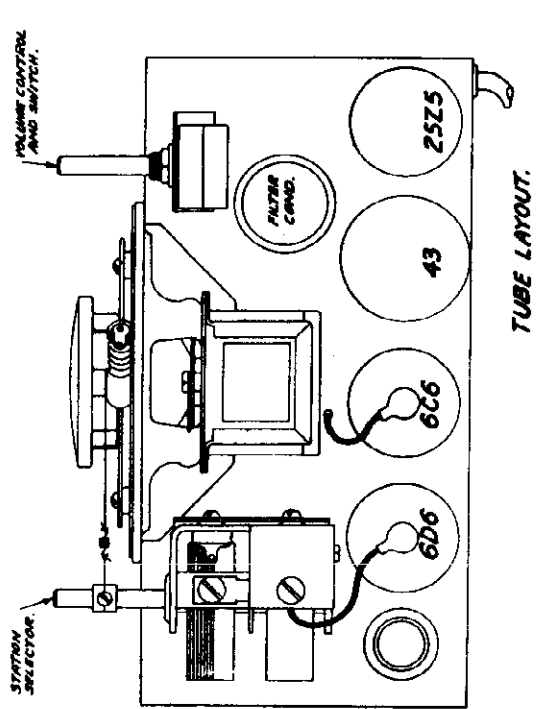
No ground connection is necessary. There is no provision made for its use on this set.



REPLACEMENT PARTS LIST

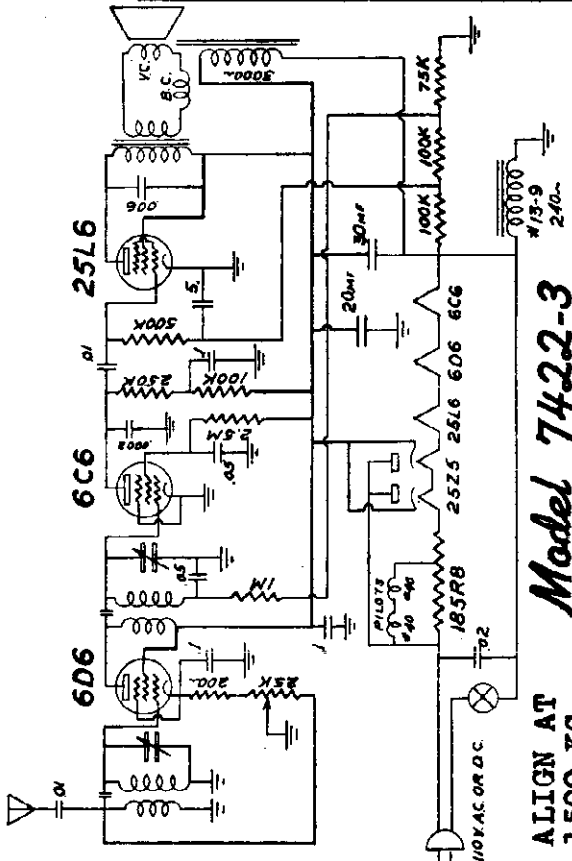
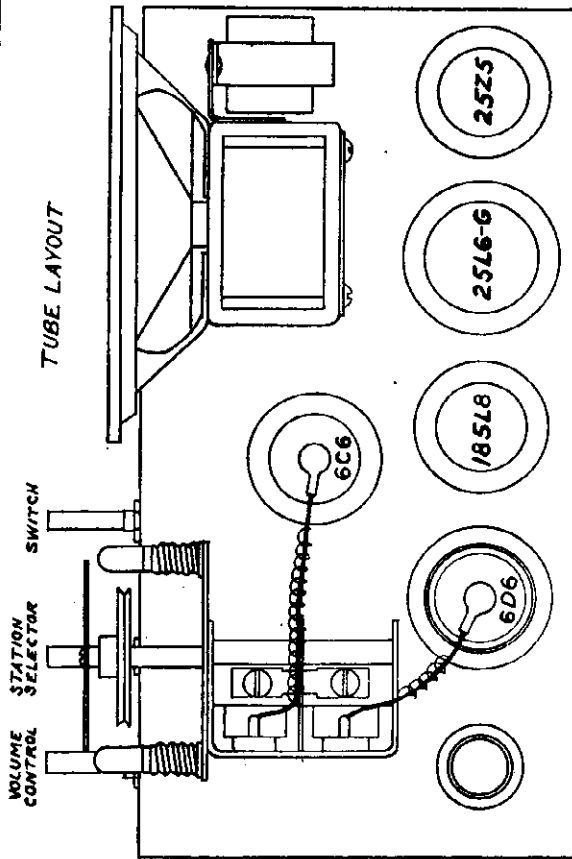
In Detailing Always State Model, Description & Part No.

Part #	Description	Letter	List Price
4808-A	Antenna Coil	T1	.68
4804-A	R.F. Coil	T2	.68
5008-A	Load Speaker	S	4.28
5201-C	Choke	CK	.78
5208-A	Tuning Condenser	C	2.06
	Mica Condenser .0001 Mc.	C8	.18
	Variable Condenser .01 Mc. 100 V.	C1, C7, C8, C9	.10
	"	C2, C4	.10
	"	C3, C5	.10
4808-A	Filter Condenser 15 & 10 Mc.	C10	1.80
4108-A	Volume Control & Switch	V1, S1	1.08
	Carbon Resistor 1. meg., 1 watt	R2, R5	.10
	"	R3	.10
	"	R4	.10
	"	R6	.10
	"	R7	.10
4658-A	Armored Resistor 1/2 W. 100	R9, R10	.28
4454-A	Resistance Cord	R8	.78
4451-F	Pilot Bulb	B	.18



PRICES SUBJECT TO CHANGE WITHOUT NOTICE

FIRESTONE



ALIGN AT
1500 KC

Model 7422-3
"AIR CHIEF"

GENERAL INFORMATION This is a 5-tube tuned radio frequency receiver and operates from either an alternating or a direct current lighting circuit having the usual 110-115 volt terminal potential.

After taking the set out of its carton, be sure that all packing material has been removed. The line cord is un-wound and later inserted in the nearest receptacle. First, however, be sure that the line voltage is of the value mentioned above.

ANTENNA A 20-foot coil of antenna wire is supplied attached to the receiver. This is usually sufficient for most locations if it is unrolled and laid on the floor or dropped out the window. Inside a steel constructed building it may be necessary to erect an outside antenna either up to the roof or on top of it. In localities where signal strengths are low as in rural districts, an outside antenna is always advisable with any radio receiver.

GROUND No ground is needed as set is grounded to the supply circuit internally.

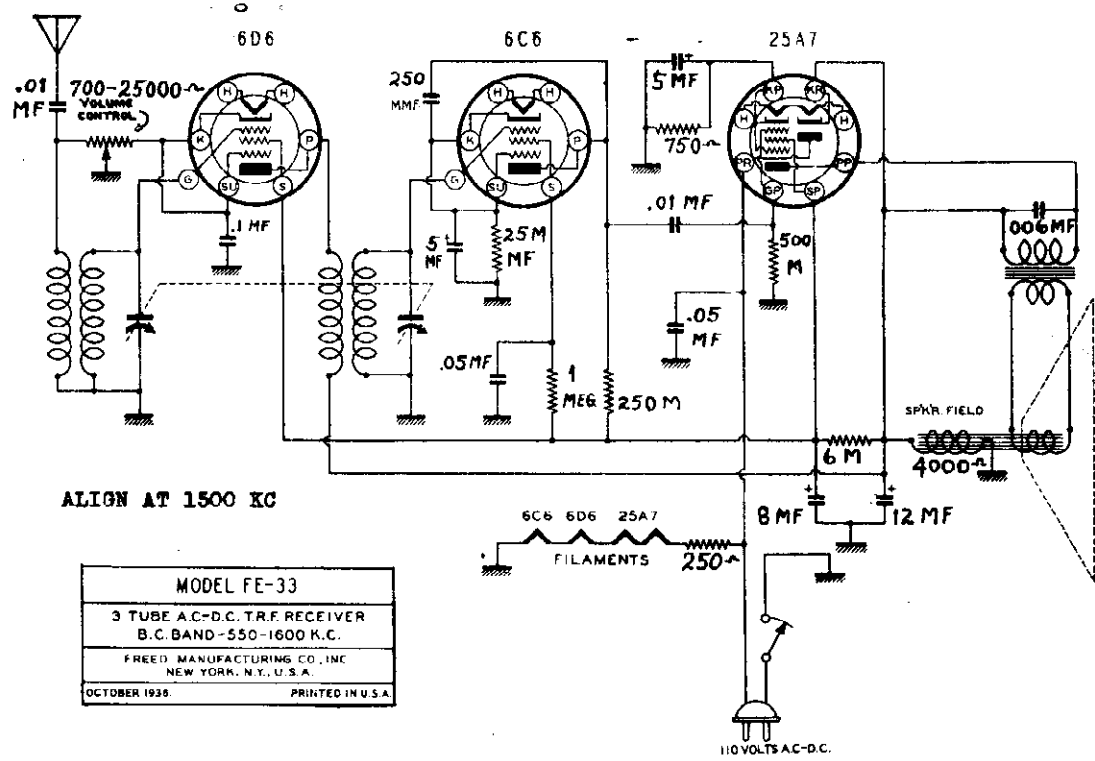
PRICES SUBJECT TO CHANGE
WHOLESALE NOTICE

REPLACEMENT PARTS LIST

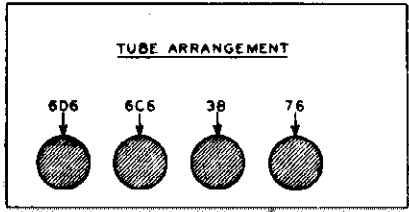
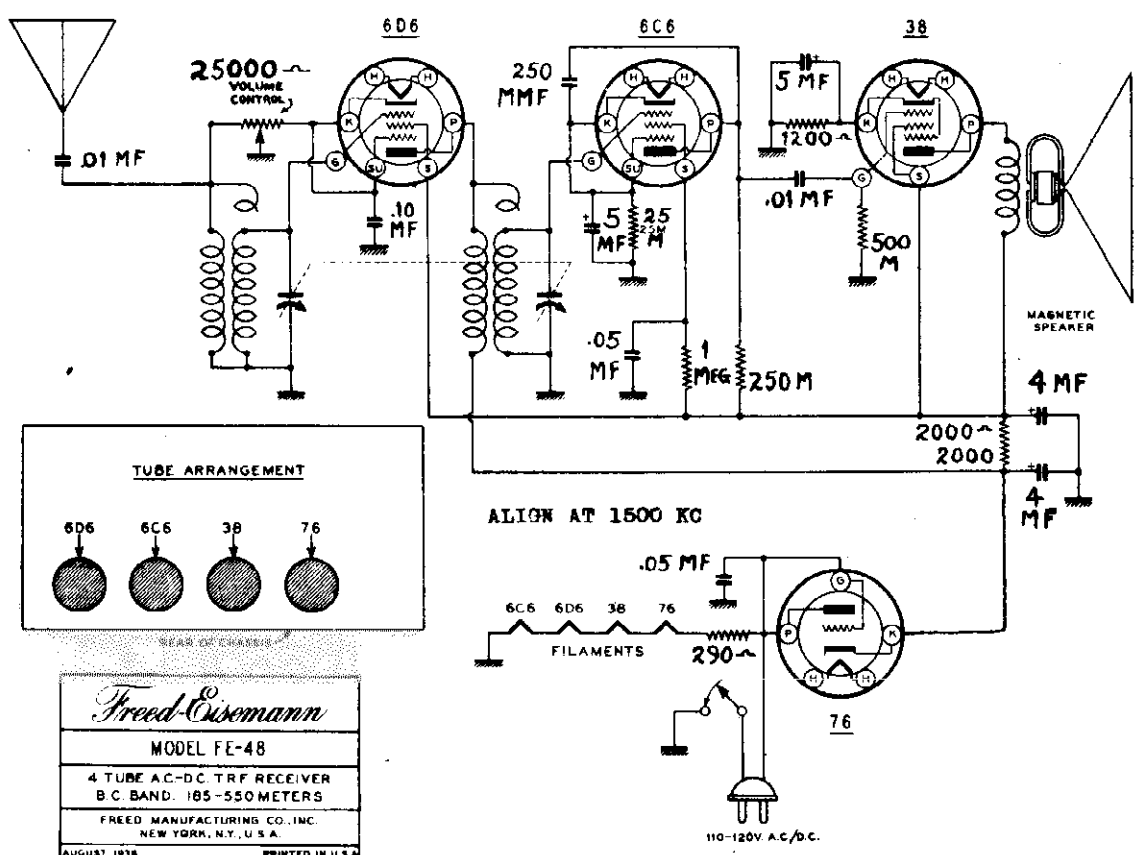
Part No.	Description	Price
5-39	Volume Control	.75
6-3	.01 mfd. 400V condenser	.15
6-7	.02 mfd. 400V condenser	.15
6-12	.05 mfd. 200V condenser	.15
6-21	.006 mfd. 400V condenser	.15
6-24	.1 mfd. 200V condenser	.15
7-27	Electrolytic condenser	1.50
8-29-B	.0002 mfd. mica condenser	.10
10-39	Variable Tuning Condenser	2.15
13-9	Filter Choke	.85
14-18	Switch	.40
15-76	An-enna coil	.65
15-77	R. F. coil	.65
19-F-5	Dial Scale	.50
19-G-13	Dial indicator	.15
34-2	Antenna cord	.20
43-60	Speaker	3.90
46-36	Control Knobs	.10
44-52	Cabinet	6.50

MODEL FE33
 MODEL FE48
 Schematics

FREED MFG. CO., INC.



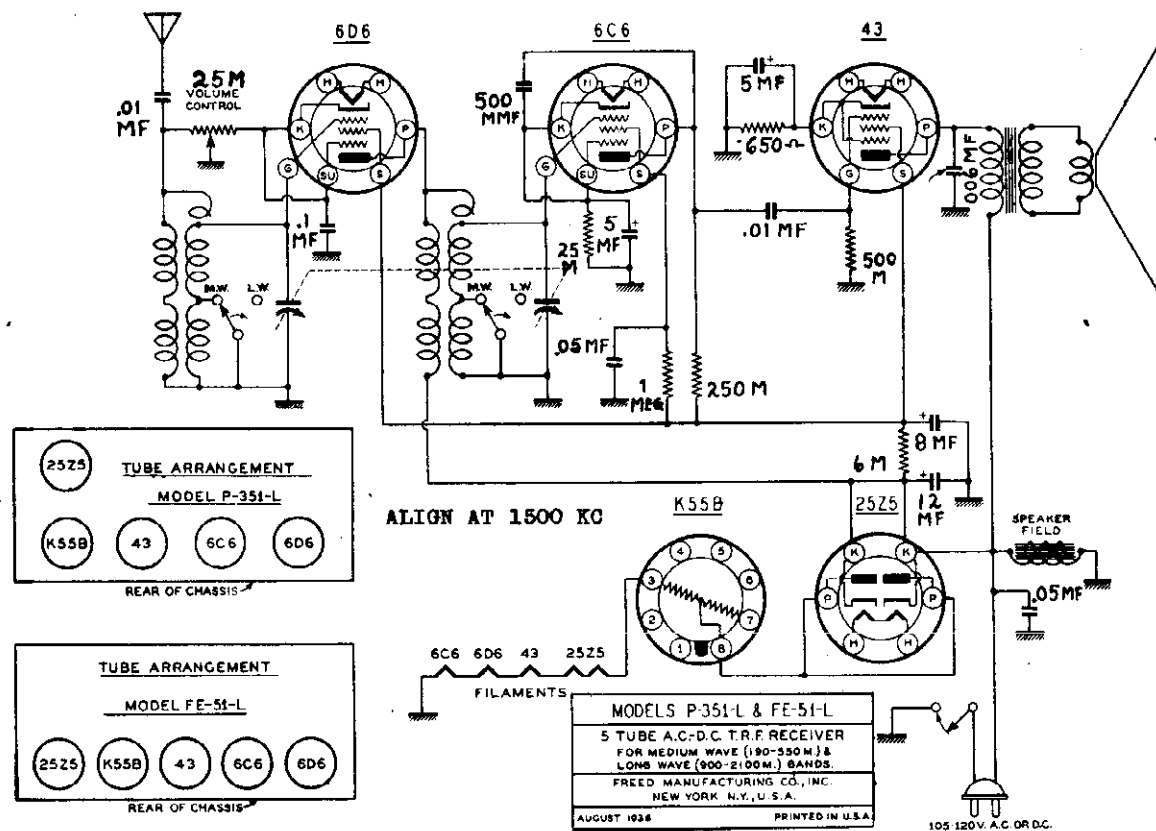
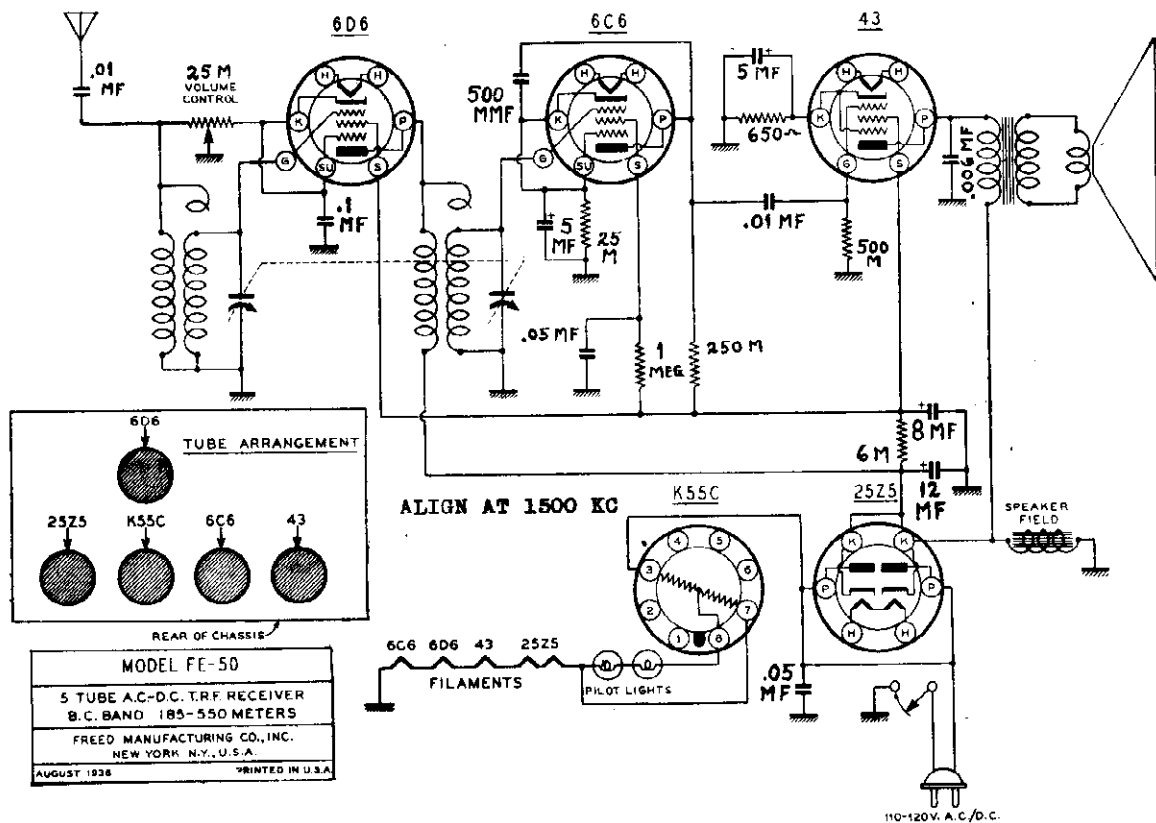
MODEL FE-33
 3 TUBE A.C.-D.C. TRF RECEIVER
 B. C. BAND - 550-1600 K.C.
 FREED MANUFACTURING CO., INC.
 NEW YORK, N.Y., U.S.A.
 OCTOBER 1936. PRINTED IN U.S.A.



Freed-Cisemann
 MODEL FE-48
 4 TUBE A.C.-D.C. TRF RECEIVER
 B. C. BAND - 185-550 METERS
 FREED MANUFACTURING CO., INC.
 NEW YORK, N.Y., U.S.A.
 AUGUST 1936. PRINTED IN U.S.A.

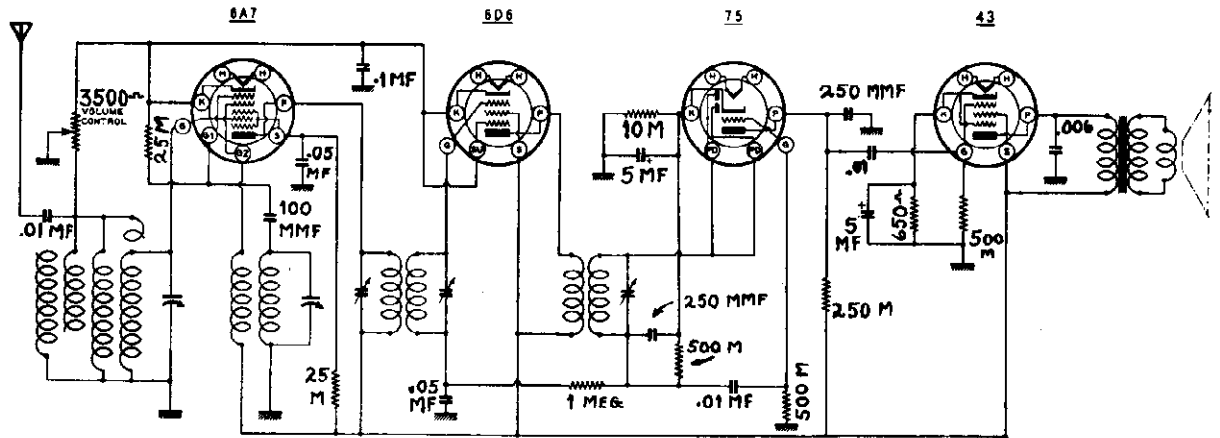
MODEL FE50
 MODELS FE51L, P351L
 Schematics, Sockets

FREED MFG. CO., INC.



MODEL FE60
 MODEL FE62
 Schematics
 Socket

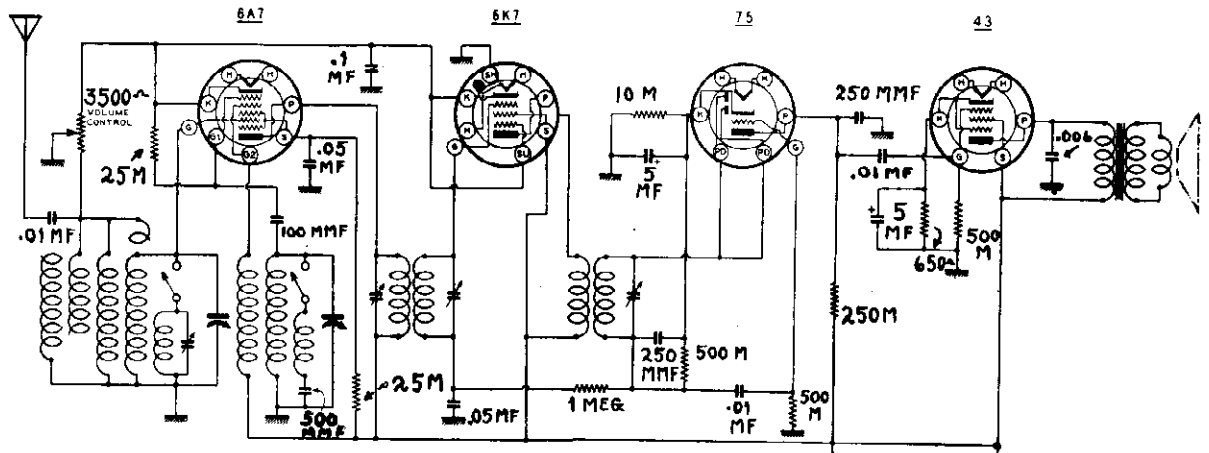
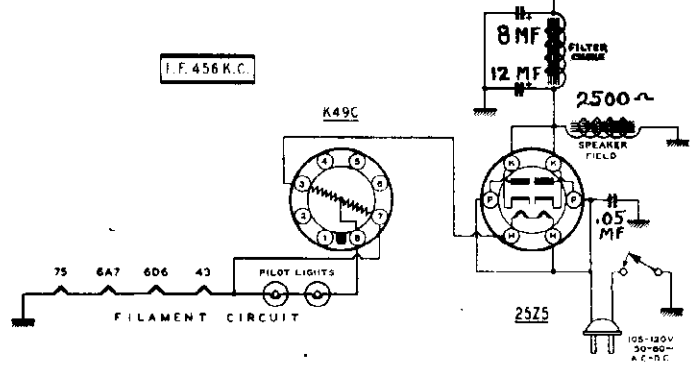
FREED MFG. CO., INC.



TUBE SOCKETS SHOWN

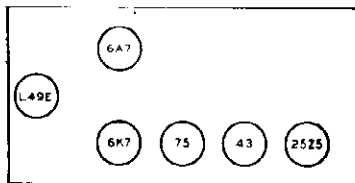
BOTTOM VIEW

Freed Circuits Radio	
MODEL	FE-60
5 TUBE, A.C.-D.C. SUPERHETERODYNE, B.C. BAND (85-330M.)	
FREED MANUFACTURING CO., INC. NEW YORK, N.Y., U.S.A.	
AUGUST 1935 PRINTED IN U.S.A.	



TUBE SOCKETS SHOWN

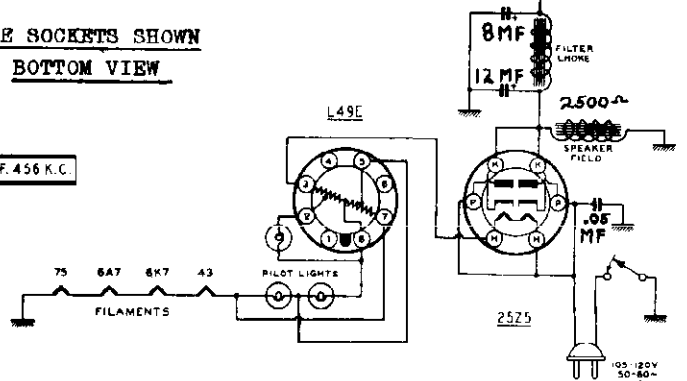
BOTTOM VIEW



REAR OF CHASSIS
 TUBE ARRANGEMENT

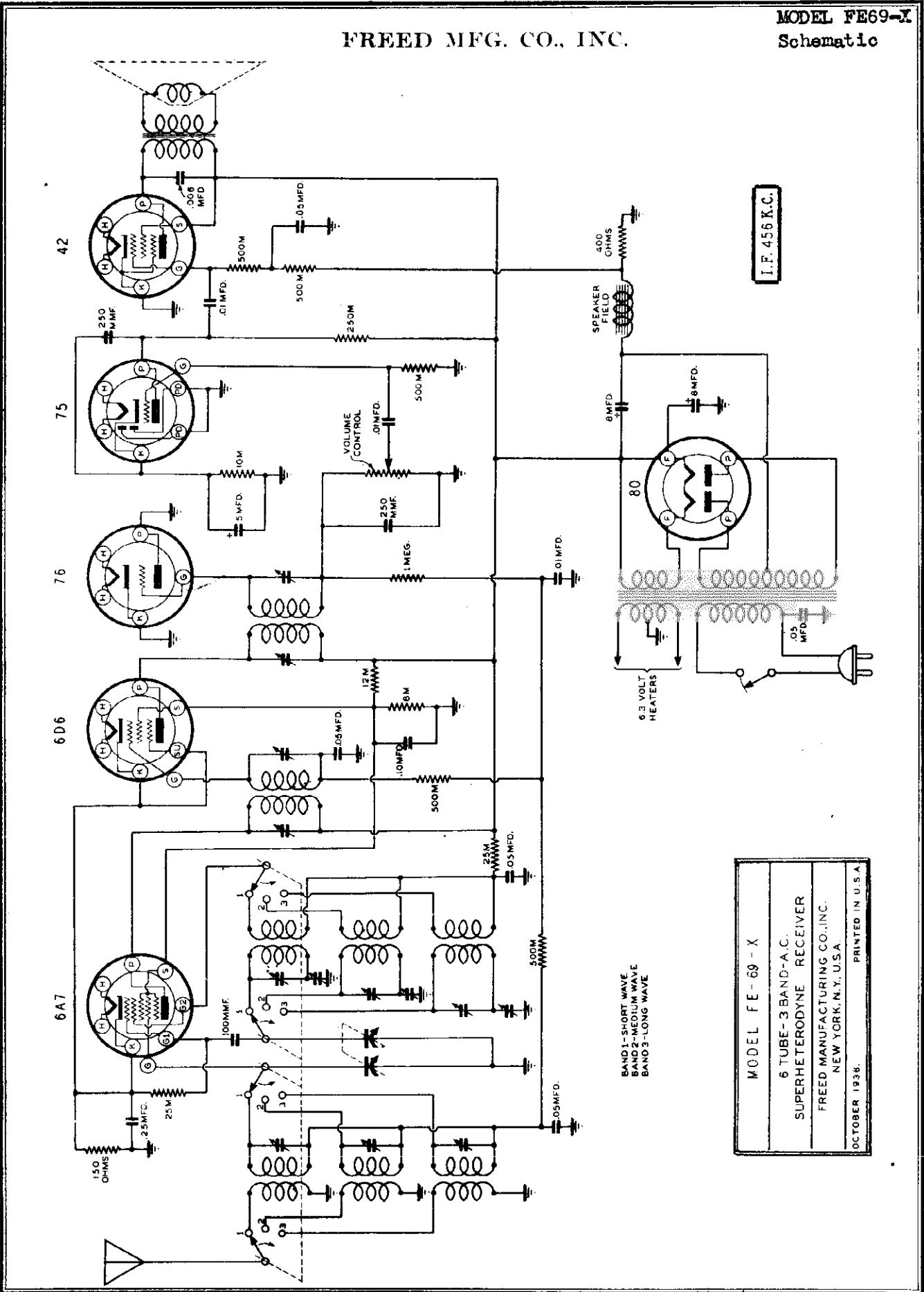
Freed Circuits Radio	
MODEL	FE-62
4 TUBE, A.C.-D.C. SUPERHETERODYNE, 2 BANDS (550-1800K.C. & 1800-3800K.C.)	
FREED MANUFACTURING CO., INC. NEW YORK, N.Y., U.S.A.	
AUGUST 1935 PRINTED IN U.S.A.	

I.F. 456 K.C.



FREED MFG. CO., INC.

MODEL FE69-X
Schematic

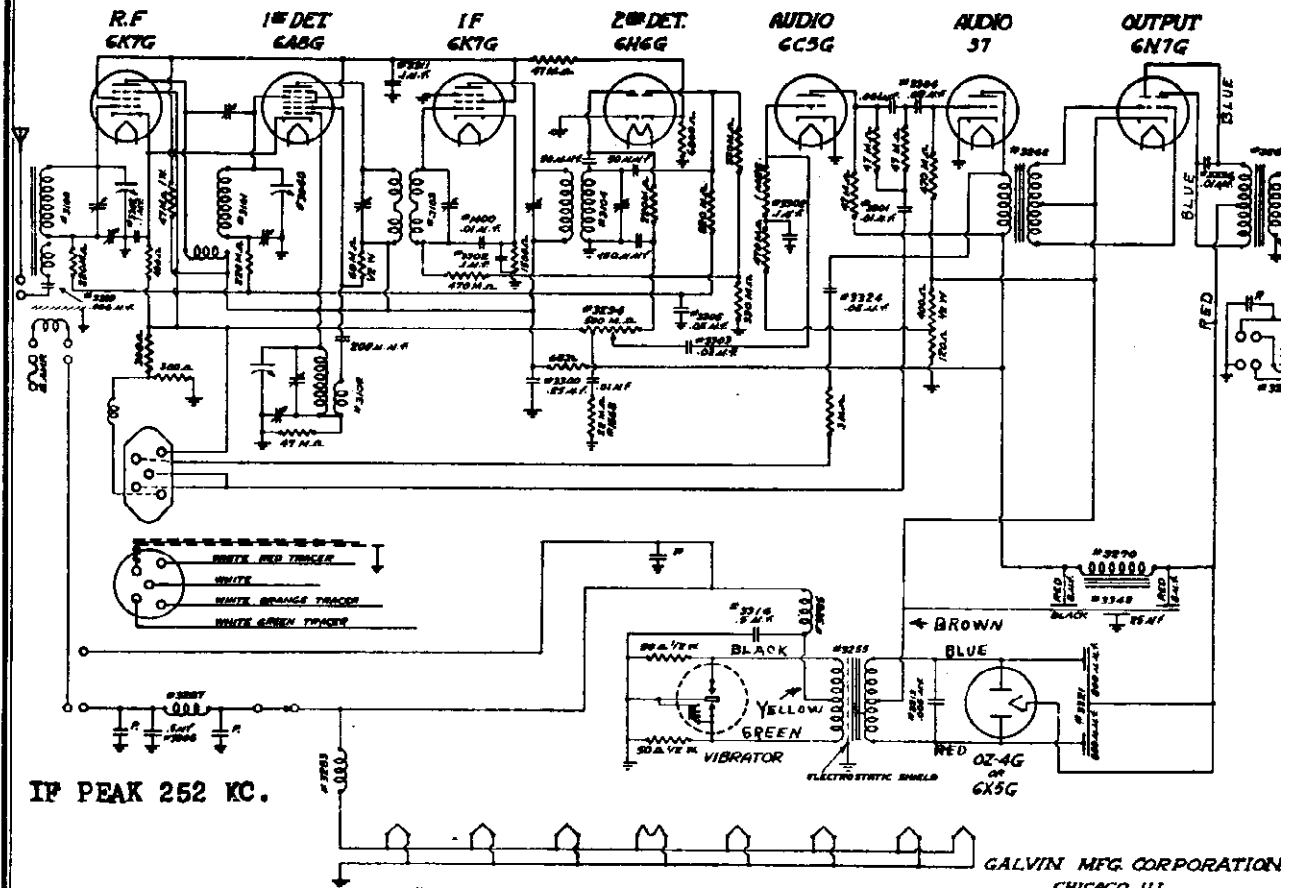


MODEL FE-69-X
6 TUBE-3 BAND-A.C.
SUPERHETERODYNE RECEIVER
FREED MANUFACTURING CO., INC.
NEW YORK, N.Y., U.S.A.
OCTOBER 1936. PRINTED IN U.S.A.

BAND 1-SHORT WAVE
BAND 2-MEDIUM WAVE
BAND 3-LONG WAVE

GALVIN MFG. CO.

MODEL Golden Voice
1937 Early
Schematic, Alignment
Sensitivity, Voltage
Chassis



IF PEAK 252 KC.

DUMMY ANTENNA - 200 MMF Condenser
in series & 500000 Ohms in shunt
with the Generator output.

GALVIN MFG CORPORATION
CHICAGO, ILL.
CIRCUIT DIAGRAM OF MODEL
GOLDEN VOICE

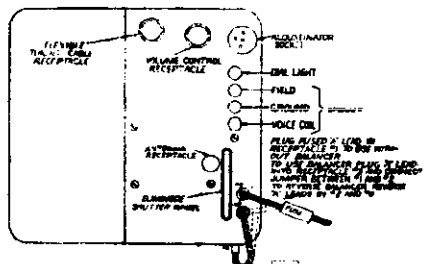
ALIGNMENT

Average Microvolt Input	Generator Feeder Connected to Grid of	Generator Set At	Output meter Across Voice Coil
50,000	6K7G	262 K.C.	Voice coil resistance is 3 ohms—
1,000	6A8G	262 K.C.	
1,200	6A8G*	600 K.C.	1.73 Volts equals 1 Watt output
50	6K7G*	600 K.C.	
1.5	Ant.	600 K.C.	

Peak the oscillat at 1600 kc and pa the oscillator at 600 kc. Peak the r-f circuits at 1400 kc.

*Microvolt input may be 10 to 20% more at 600 K.C. than at 262 K.C. This is due to normal conversion loss in the Translator tube. If greater, replace Translator tube. CURRENT DRAIN - 7 AMPS

SEE INDEX FOR T DATA ON MAGIC E MINODE ADJUSTME AND ACOUSTINATO



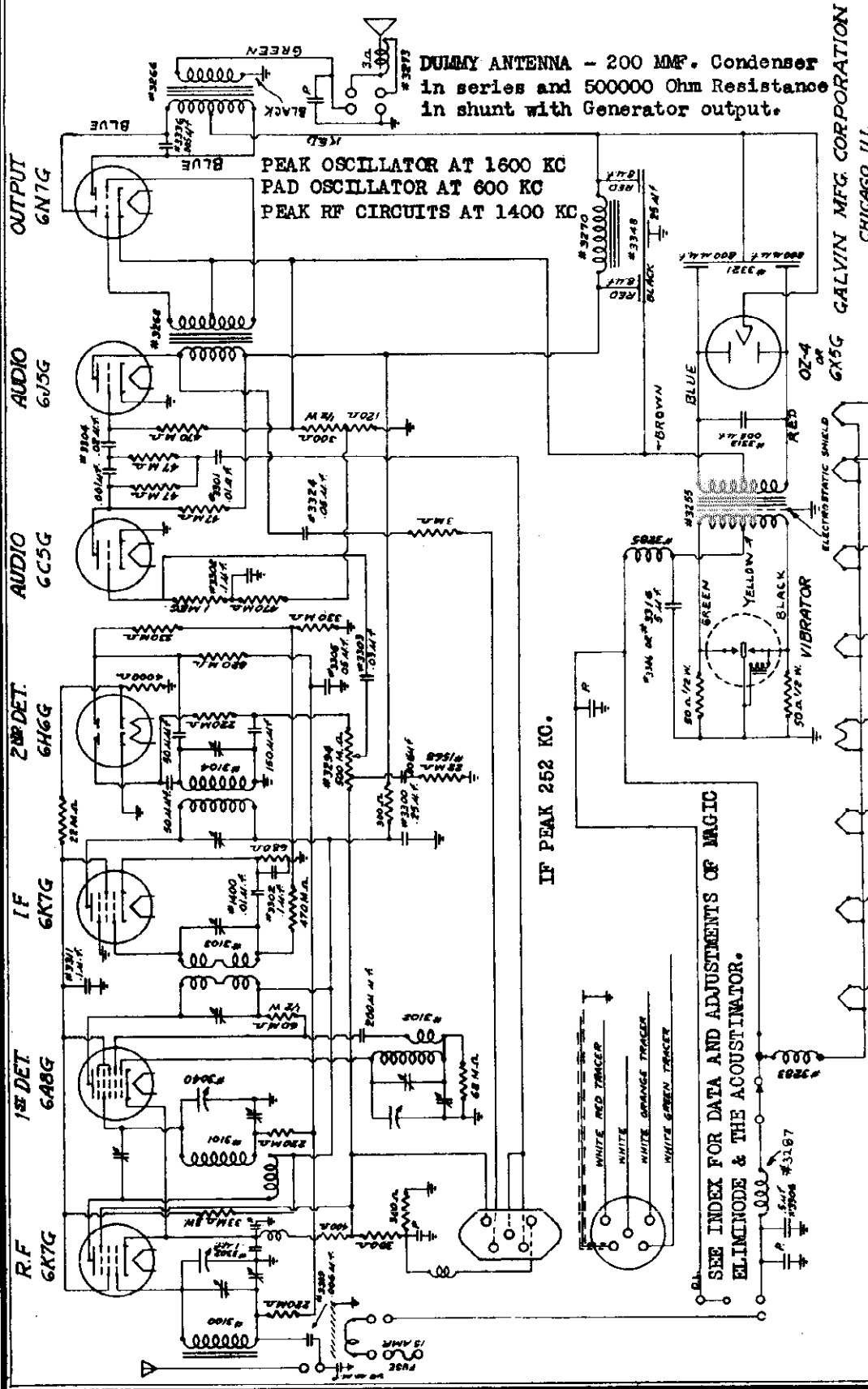
(FIG. 2)

- Plate voltage260
- Plate to cathode voltage (output tube)250
- Plate voltage for 37 tube250
- Plate voltage for 6C5 tube180
- Screen voltage65
- Bias voltage for 37 tube15
- Bias voltage for 6C5 tube3.5
- Bias voltage for R.F. tubes3.5
- AVC Delay voltage (total)9.0

The above readings all made with Battery Voltage of 6.3

GALVIN MFG. CO.

MODEL Golden Voice
1937 Late
Schematic, Voltage
Sensitivity, Alignment



DUMMY ANTENNA - 200 MMF. Condenser in series and 500000 Ohm Resistance in shunt with Generator output.

PEAK OSCILLATOR AT 1600 KC
PAD OSCILLATOR AT 600 KC
PEAK RF CIRCUITS AT 1400 KC

IF PEAK 252 KC.

SEE INDEX FOR DATA AND ADJUSTMENTS OF MAGIC ELIMINATOR & THE ACQUASTINATOR.

GOLDEN VOICE
ACQUASTINATOR SET AT "COUNTRY" AND "VOICE"

GOLDEN VOICE
ACQUASTINATOR SET AT "COUNTRY" AND "VOICE"

Average Microvolt Input	50,000
Generator Connected to Grid e1	6K7G
Generator Set At	262 K.C.
Output meter Across Voice Coil	1.5
Current drain	7.00 amps.

Plate voltage	260	Bias voltage for 6J5 tube	15
Plate to cathode voltage (output tube)	250	Bias voltage for 6C5 tube	3.5
Plate voltage for 6J5 tube	250	Bias voltage for R.F. tubes	3.5
Plate voltage for 6C5 tube	180	AVC Delay voltage (total)	9.0
Screen voltage	65		

The above readings all made with Battery Voltage of 6.3

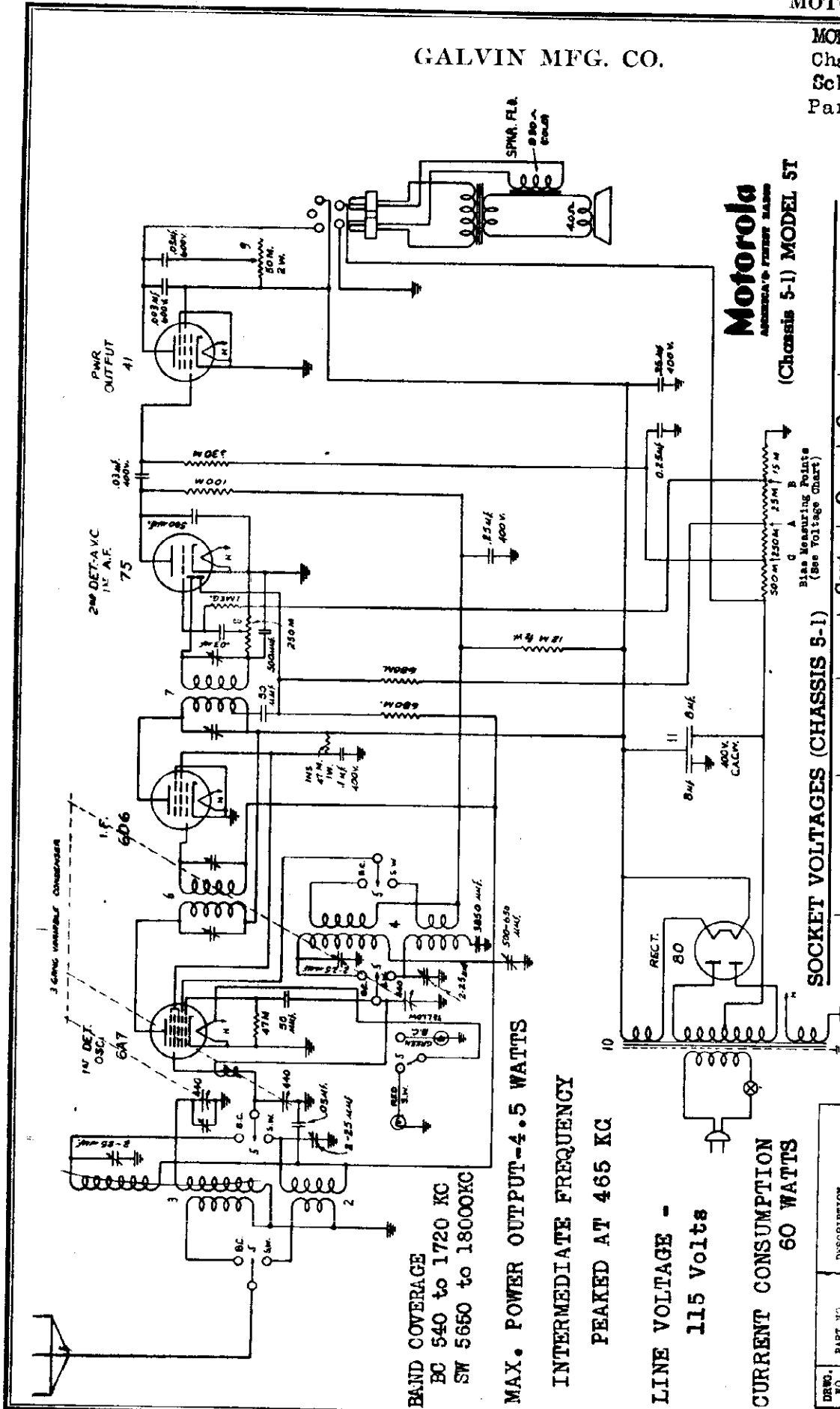
GALVIN MFG. CORPORATION
CHICAGO, ILL.

GALVIN MFG. CORPORATION
CHICAGO, ILL.

GALVIN MFG. CORPORATION
CHICAGO, ILL.

GALVIN MFG. CO.

MODEL 5T
Chassis 5-1
Schematic, Vol.
Parts



Motorola
ADDRESS YOUR PARTS ORDER TO
MOTOROLA ELECTRONIC CORP.

(Chassis 5-1) MODEL 5T

SOCKET VOLTAGES (CHASSIS 5-1)
(See Voltage Chart)

Tube	Position	Fil.	Cath.	Cont. Grid	Osc. Grid	Osc. Plate	Screen	Plate
6A7	1st. det.-osc.	6.0 AC	0	Note A	-9.3	170	75	250
6D6	I. F.	6.0 AC	0	Note A	.....	.....	75	250
75	2nd det.-A.V.C.	6.0 AC	0	Note B	.....	.....	.....	50
41	Output	6.0 AC	0	Note C	.....	.....	250	235

BAND COVERAGE
BC 540 to 1720 KC
SW 5650 to 18000KC

MAX. POWER OUTPUT-4.5 WATTS
INTERMEDIATE FREQUENCY
PEAKED AT 465 KC

LINE VOLTAGE -
115 Volts

CURRENT CONSUMPTION
60 WATTS

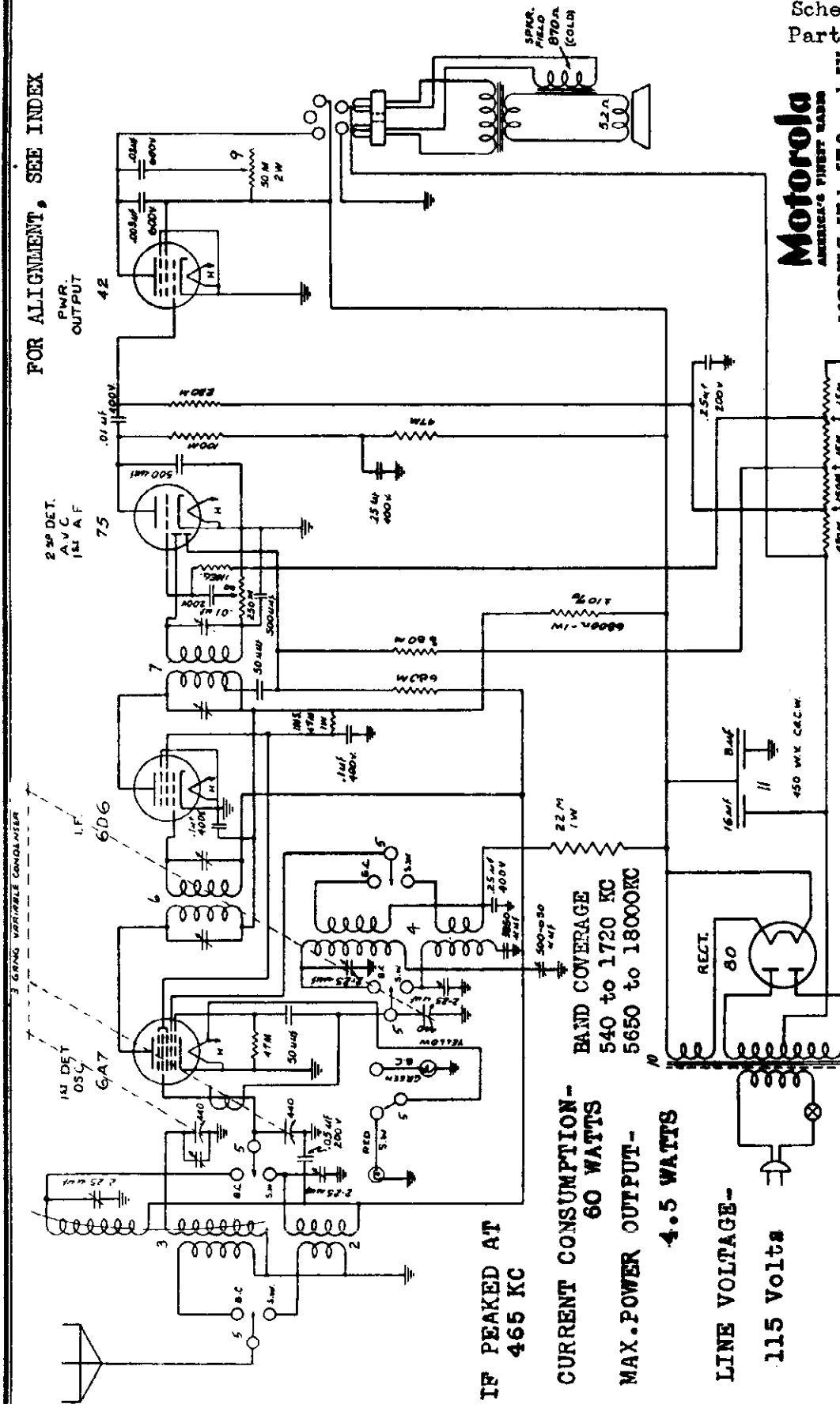
DRWG. NO.	PART NO.	DESCRIPTION
1	14-R-37283	3 Gang Condenser
2	13-R-37234	Ant. Coil (S.W.)
3	13-R-37233A	Ant. Coil (B.C.)
4	13-R-37244	Ceb. Coil
5	54-R-37762	Band Switch
6	47-R-37684A	1st. I.F. Coil assem.
7	47-R-37684A	2nd. I.F. Coil assem.
8	60-R-37638	Volume Control
9	60-R-37638	Tone Control & switch
10	50-R-37781	Power Transformer

GALVIN MFG. CO.

MODELS 5T-1, 5T-2, 5Y
Chassis 5-2
Schematic, Voltage
Parts

Motorola
America's Finest Radio
MODELS 5T-1, 5T-2 and 5Y
CHASSIS 5-2

FOR ALIGNMENT, SEE INDEX



3 GANG VARIABLE CONDENSER

2ND DET.
A.V.C
1ST A.F.

P.M.R.
OUTPUT

IF PEAKED AT
465 KC

CURRENT CONSUMPTION-
60 WATTS

MAX. POWER OUTPUT-
4.5 WATTS

LINE VOLTAGE-
115 Volts

BAND COVERAGE
540 to 1720 KC
5650 to 18000 KC

VOLTAGE CHART

(CHASSIS 5-2)

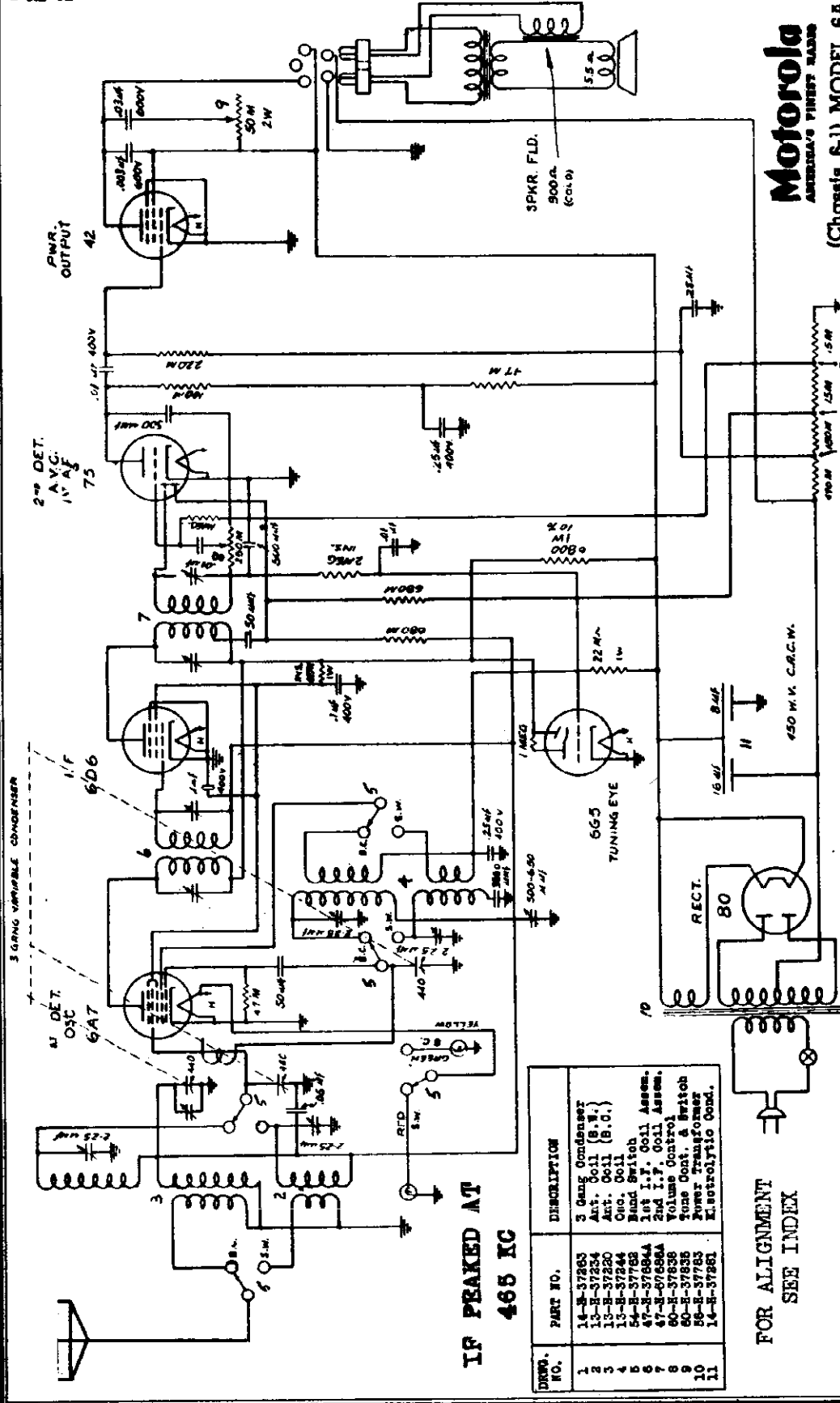
DRG. NO.	PART NO.	DESCRIPTION
1	14-H-37265	3 Gang Condenser
2	13-H-37234	Ant. Coil (B.W.)
3	13-H-37230	Ant. Coil (B.C.)
4	54-H-37244	Osc. Coil
5	54-H-37268	Band Switch
6	47-H-37684A	1st I.F. Coil Assem.
7	47-H-37684B	2nd I.F. Coil Assem.
8	60-H-37838	Volume Control
9	60-H-37835	Power Transformer
10	56-H-37783	Electrolytic Cond.
11	14-H-37281	

6A7	1st det.-osc.	6.0 AC	Note A	130	70	200
6D6	I. F.	6.0 AC	Note A	.....	70	200
75	2nd det.-AVC	6.0 AC	Note B	.....	.....	125
42	Output	6.0 AC	Note C	.....	260	255
80	Rectifier	4.75 AC	.....	.....	.....	No.1 315 AC No.2 315 AC

MODEL 6A
Chassis 6-1
Schematic, Voltage
Parts

GALVIN MFG. CO.

Motorola
 AMERICA'S FINEST RADIO
(Chassis 6-1) MODEL 6A



IF PEAKED AT
465 KC

DRAW. NO.	PART NO.	DESCRIPTION
1	14-B-37263	3 Gang Condenser
2	15-B-37264	Ant. Coil (S.W.)
3	15-B-37265	Ant. Coil (B.O.)
4	15-B-37266	Out. Coil
5	15-B-37267	Misc. Switch
6	15-B-37268	1st I.F. Coil Assem.
7	15-B-37269	2nd I.F. Coil Assem.
8	15-B-37270	Volume Control
9	15-B-37271	Tone Control & Switch
10	15-B-37272	Power Transformer
11	14-B-37282	Electrolytic Cond.

FOR ALIGNMENT
 SEE INDEX

LINE VOLTAGE - 115 VOLTS
CURRENT CONSUMPTION -
60 WATTS
MAX. POWER OUTPUT - 4.5 Watts

BAND COVERAGE
 BC - 540 to 1720 KC
 SW - 5650 to 18000 KC

VOLTAGE CHART
(CHASSIS 6-1)

Part No.	Notes	Notes A	Notes B	Notes C	Notes D
6A7	1st det.-osc.	6.0 AC	0	0	180
6D6	I. F.	6.0 AC	0	0	180
75	2nd det.-AVC	6.0 AC	0	0	125
42	Output	6.0 AC	0	0	260
80	Rectifier	4.75 AC	0	0	No.1 305 AC No.2 305 AC
6U5	Eye	6.0 AC	0	0	180

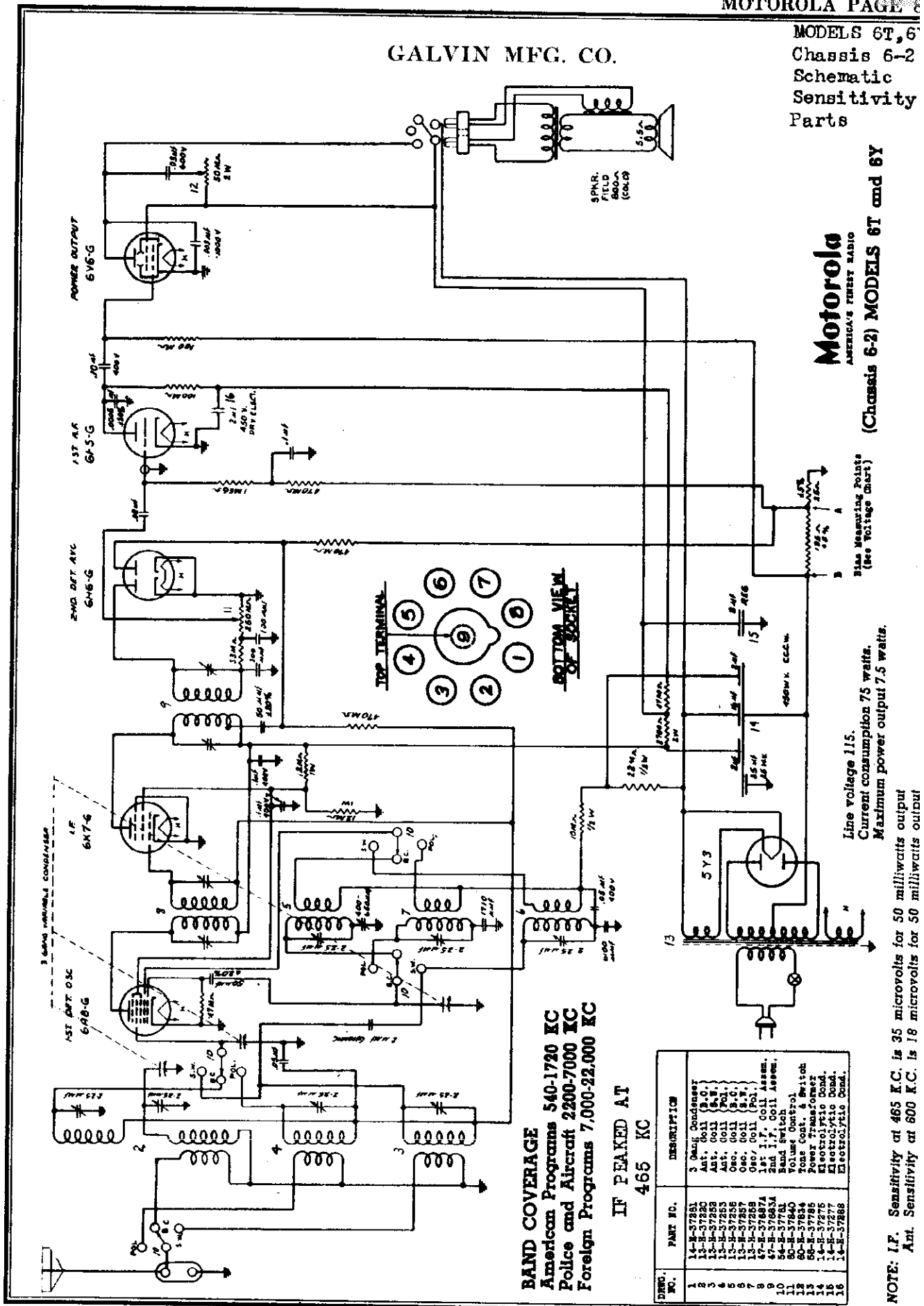
Bias Measuring Points
 (See Voltage Chart)

GALVIN MFG. CO.

MODELS 6T, 6Y
Chassis 6-2
Schematic
Sensitivity
Parts

Motorola
AMERICA'S FINEST RADIO

(Chassis 6-2) MODELS 6T and 6Y



BAND COVERAGE
American Programs 540-1720 KC
Police and Aircraft 2200-7000 KC
Foreign Programs 7,000-22,000 KC

IF PEAKED AT
465 KC

DRWG. NO.	PART NO.	DESCRIPTION
1	14-B-37261	3 Gang Condenser
2	13-B-37260	Ant. Coil (B.O.)
3	13-B-37253	Ant. Coil (S.W.)
4	13-B-37253	Ant. Coil (Pol.)
5	13-B-37256	Occ. Coil (B.C.)
6	13-B-37256	Occ. Coil (S.P.)
7	13-B-37256	1st I.F. Coil (S.P.)
8	47-B-37687A	2nd I.F. Coil Assm.
9	54-B-37683A	Band Switch
10	54-B-37681	Volume Control
11	54-B-37640	Power Transformer
12	50-B-37834	Power Transformer
13	50-B-37834	Power Transformer
14	14-B-37275	Electrolytic Cond.
15	14-B-37275	Electrolytic Cond.
16	14-B-37266	Electrolytic Cond.

Bias Measuring Points
(See Voltage Chart)

Line voltage 115.
Current consumption 75 watts.
Maximum power output 7.5 watts.

NOTE: I.F. Sensitivity at 465 K.C. is 35 microvolts for 50 milliwatts output
Ant. Sensitivity at 600 K.C. is 18 microvolts for 50 milliwatts output

MODELS 6T, 6Y
Chassis 6-2
Voltage, Socket
Trimmers, Alignment

GALVIN MFG. CO.

CHASSIS 6-2

ALIGNMENT PROCEDURE

Connect signal generator to control grid of first detector tube (6AG6) through a .05 MF condenser, and to chassis. Do not remove grid cap. Also connect output meter across speaker voice coil. Turn band switch to "American Programs" position. Turn condenser gang completely out of mesh.

Set signal generator at 465 K.C. and carefully adjust the four I.F. trimmers (located in top of I.F. coil cans) to point showing highest reading on output meter.

Leave band switch in "American Programs" position. Connect signal generator to antenna and ground terminals using a .0002 MF condenser in antenna lead.

Set signal generator and receiver dial both at 1700 K.C. Adjust B.C. OSC. trimmer until 1700 K.C. signal is heard.

Set signal generator at 1400 K.C. and turn condenser gang to the signal at 1400 K.C. Adjust antenna section and second section of preselector trimmers to point showing highest reading on output meter.

Set signal generator at 800 K.C. and rock pointer at 800 K.C. position on dial scale, while adjusting B.C. paddler, until combination is found which gives highest output reading. (Note: If there is noise level at 800 K.C., paddler can be adjusted to maximum noise without rocking gang and without use of signal generator. (Use short wire for pick-up if necessary.)

Turn band switch to "Police and Aircrat" position. Replace .0002 MF condenser in signal generator antenna lead with a 400 ohm carbon resistor.

Set signal generator and receiver dial both at 7.0 MC. Adjust POLICE OSC. trimmer until 7.0 MC signal is heard.

Set signal generator at 5.8 MC and turn condenser gang to signal at 5.8 MC. Adjust POLICE ANT. trimmer to point giving greatest output reading, while slightly rocking condenser gang.

Turn band switch to "Foreign Programs" position, still using 400 ohm carbon resistor in antenna lead to signal generator.

Set signal generator and receiver dial both at 22.0 MC. Adjust SW OSC. trimmer until 22.0 MC signal is heard.

Set signal generator at 18.7 MC. and turn condenser gang to signal at 18.7 MC. Adjust SW ANT. trimmer to point giving greatest output reading, while slightly rocking condenser gang.

Padders on "Police" and "Foreign" bands are fixed (no adjustment necessary).

SOCKET VOLTAGES (CHASSIS 6-2)

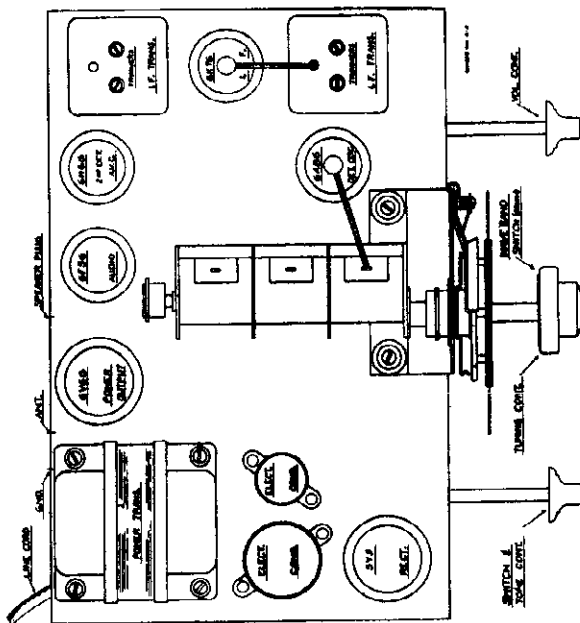
Tube	Position	1	2	3	4	5	6	7	8	9—Top Grid
6AG6	1st det.-osc.	0	0	225	80	-7.0	175	6.3 AC	0	Note A
6K7G	I. F.	0	0	225	80	0	X	6.3 AC	0	Note A
6H6G	2nd det.-AVC	0	6.3 AC	0	0	Note A	X	0	0	.....
6F5G	A. F.	0	6.3 AC	X	120	X	X	0	0	Note A
6V6G	Output	0	6.3 AC	255	260	Note B	X	0	0	.....
5Y3	Rectifier	0	5.0 AC	.....	350 AC	.....	360 AC	X	5.0 AC	.....

"X" indicates socket terminals used as dummy tie points.

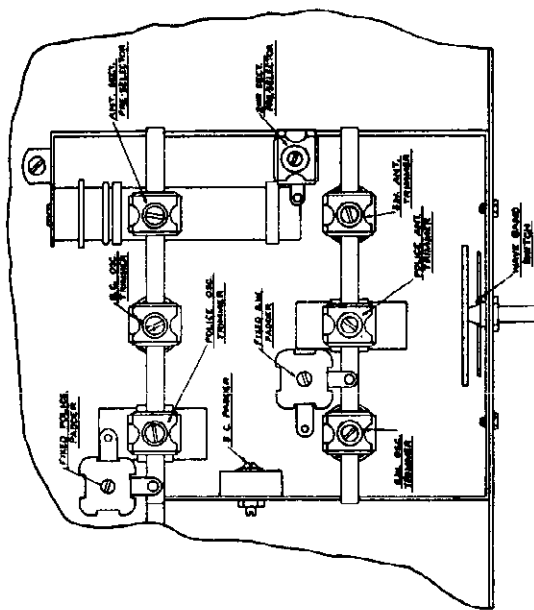
Note A:— 2.8 V measured point A to ground on 10 V scale (see circuit diagram).

Note B:— 13.0 V measured point B to ground on 50 V scale (see circuit diagram).

All voltages except rectifier filaments measured from socket terminal indicated to chassis ground, using 1000 ohms per volt meter.



CHASSIS LAYOUT



TRIMMERS

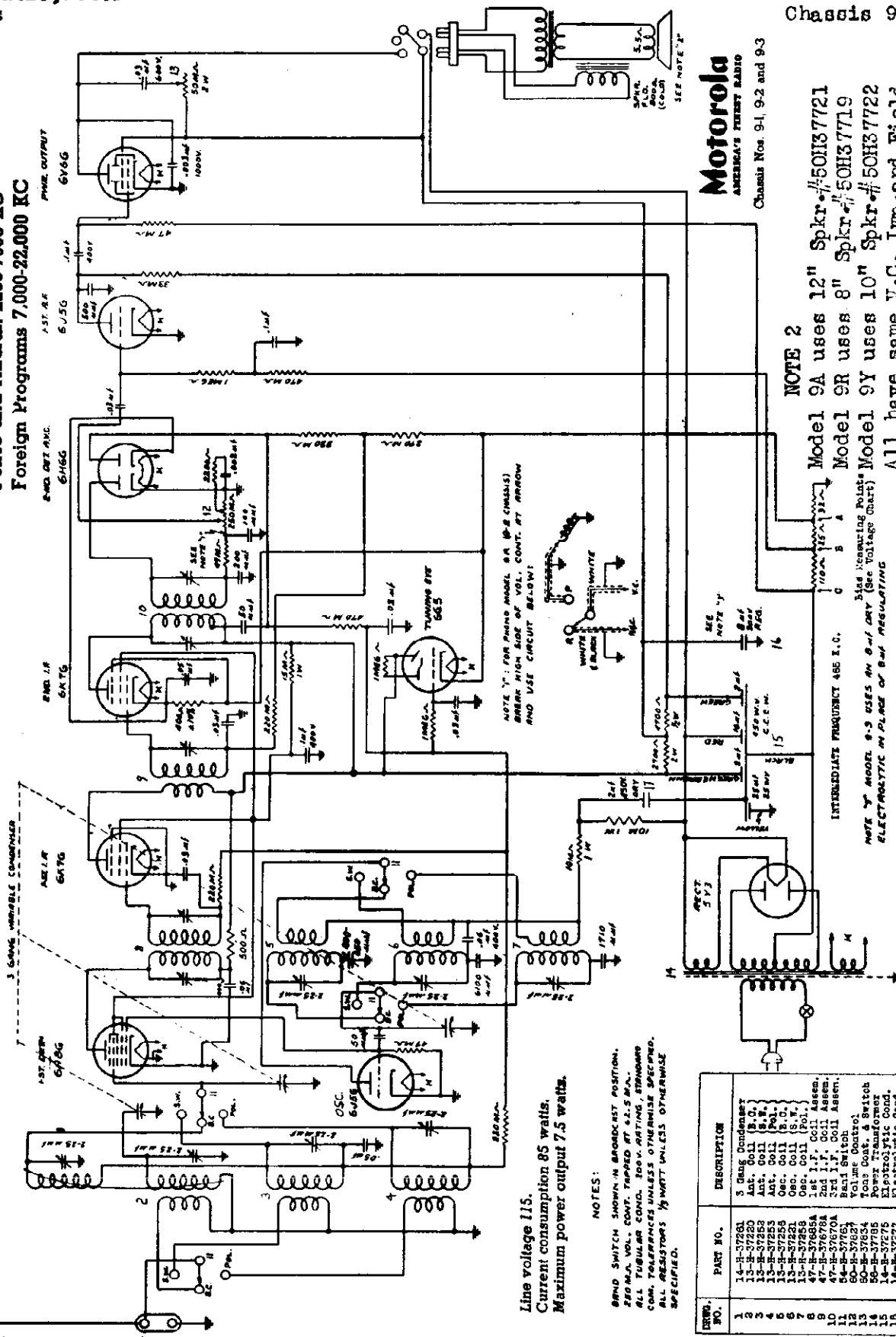
MODEL 9A
Chassis 9-3
Schematic, Notes
Parts

GALVIN MFG. CO.

MODEL 9Y
Chassis 9-1
MODEL 9R
Chassis 9-2

BAND COVERAGE
American Programs 540-1720 KC
Police and Aircraft 2200-7000 KC
Foreign Programs 7,000-22,000 KC

NOTE: I.F. Sensitivity at 465 K.C. is 20 microvolts for 50 milliwatts output
Ant. Sensitivity at 600 K.C. is 7 microvolts for 50 milliwatts output



Line voltage 115.
Current consumption 85 watts.
Maximum power output 7.5 watts.

NOTES:
BRAND SWITCH SHOWN IN EARDEST POSITION.
SEC. H.A. VOL. CONT. TAPPED AT 62.5 M.A.
ALL TUBULAR COND. 200 V. RATING, STANDARD
CON. TOLERANCES UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS 1/2 WATT UNLESS OTHERWISE SPECIFIED.

DRWG. NO.	PART NO.	DESCRIPTION
1	14-B-37281	5 Ring Condenser
2	13-B-37280	Ant. Coil (S.W.)
3	13-B-37282	Ant. Coil (P.O.)
4	13-B-37283	Ant. Coil (P.O.)
5	13-B-37284	Ant. Coil (S.W.)
6	13-B-37285	Osc. Coil (S.W.)
7	13-B-37286	Osc. Coil (P.O.)
8	13-B-37287	Osc. Coil (P.O.)
9	13-B-37288	2nd I.F. Coil Assen.
10	47-B-37678	3rd I.F. Coil Assen.
11	54-B-37679	Base Switch
12	60-B-37680	Volume Control
13	60-B-37681	Tone Coat. & Switch
14	60-B-37682	Power Transformer
15	14-B-37289	Electrolytic Cond.
16	14-B-37290	Electrolytic Cond.
17	14-B-37288	Electrolytic Cond.

Motorola
AMERICA'S FINEST RADIO
Chassis Nos. 9-1, 9-2 and 9-3

NOTE 2
Model 9A uses 12" Spkr. #50H37721
Model 9R uses 8" Spkr. #50H37719
Model 9Y uses 10" Spkr. #50H37722
All have same V.C. Imp. and Field resistance

MODELS 9Y, 9R, 9A
 Chassis 9-1, 9-2, 9-3
 Socket, Trimmers
 Voltage, Alignment

GALVIN MFG. CO.

**CHASSIS 9-1, 9-2 and 9-3
 ALIGNMENT PROCEDURE**

Connect signal generator to control grid of first detector tube (6A8G) through a .05 MF. condenser, and to chassis. Do not remove grid cap. Also connect output meter across speaker voice coil. Turn band switch to "American Programs" position. Turn condenser gang completely out of mesh.

Set signal generator at 465 K.C. and carefully adjust the five I.F. trimmers (located in top of I.F. coil cans) to point showing highest reading on output meter.

Leave band switch in "American Programs" position. Connect signal generator to antenna and ground terminals using a .0002 MF condenser in antenna lead.

Set signal generator and receiver dial both at 1700 K.C. Adjust BC OSC. trimmer until 1700 K.C. signal is heard.

Set signal generator at 1400 K.C. and turn condenser gang to the signal at 1400 K.C. Adjust antenna section and second section of preselector trimmers to point showing highest reading on output meter.

Set signal generator at 600 K.C. and rock pointer at 600 K.C. position on dial scale, while adjusting BC paddler, until combination is found which gives highest output reading. (Note: If there is noise level at 600 K.C., paddler can be adjusted to maximum noise without rocking gang and without use of signal generator. Use short wire for pick-up if necessary.)

Turn band switch to "Police and Aircraif" position. Replace .0002 MF condenser in signal generator antenna lead with a 400 ohm carbon resistor.

Set signal generator and receiver dial both at 7.0 MC. Adjust POLICE OSC. trimmer until 7.0 MC signal is heard.

Set signal generator at 5.8 MC and turn condenser gang to the signal at 5.8 MC. Adjust POLICE ANT. trimmer to point giving greatest output reading, while slightly rocking condenser gang.

Turn band switch to "Foreign Programs" position still using 400 ohm carbon resistor in antenna lead to signal generator.

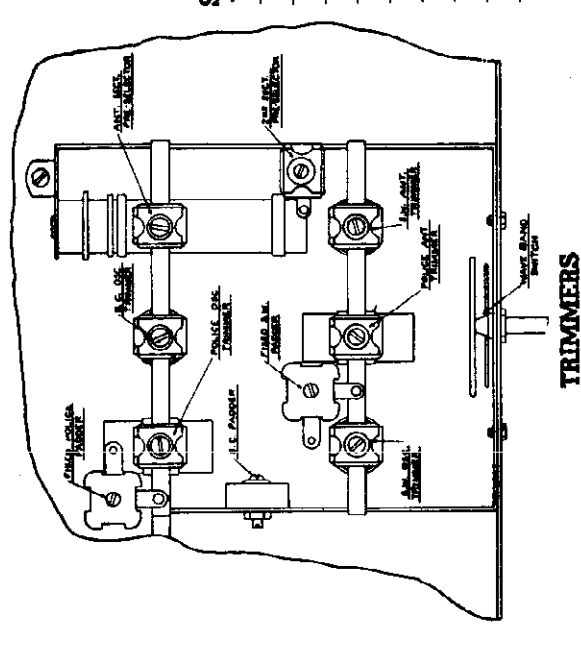
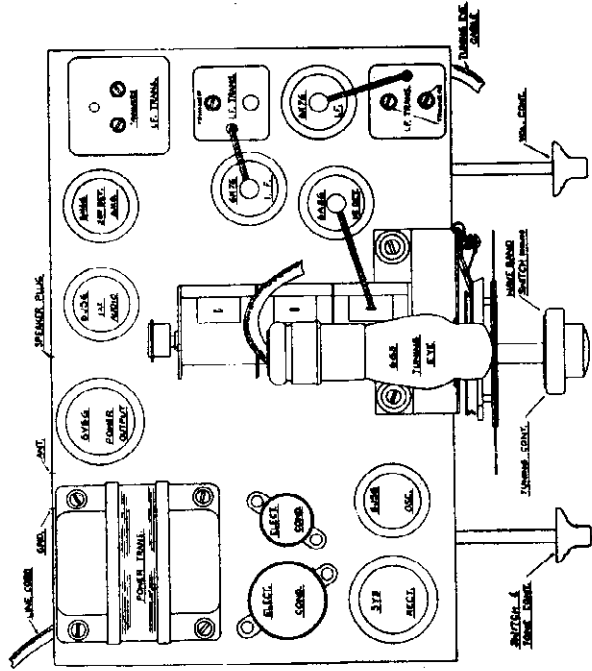
Set signal generator and receiver dial both at 22.0 MC. Adjust SW OSC. trimmer until 22.0 MC signal is heard.

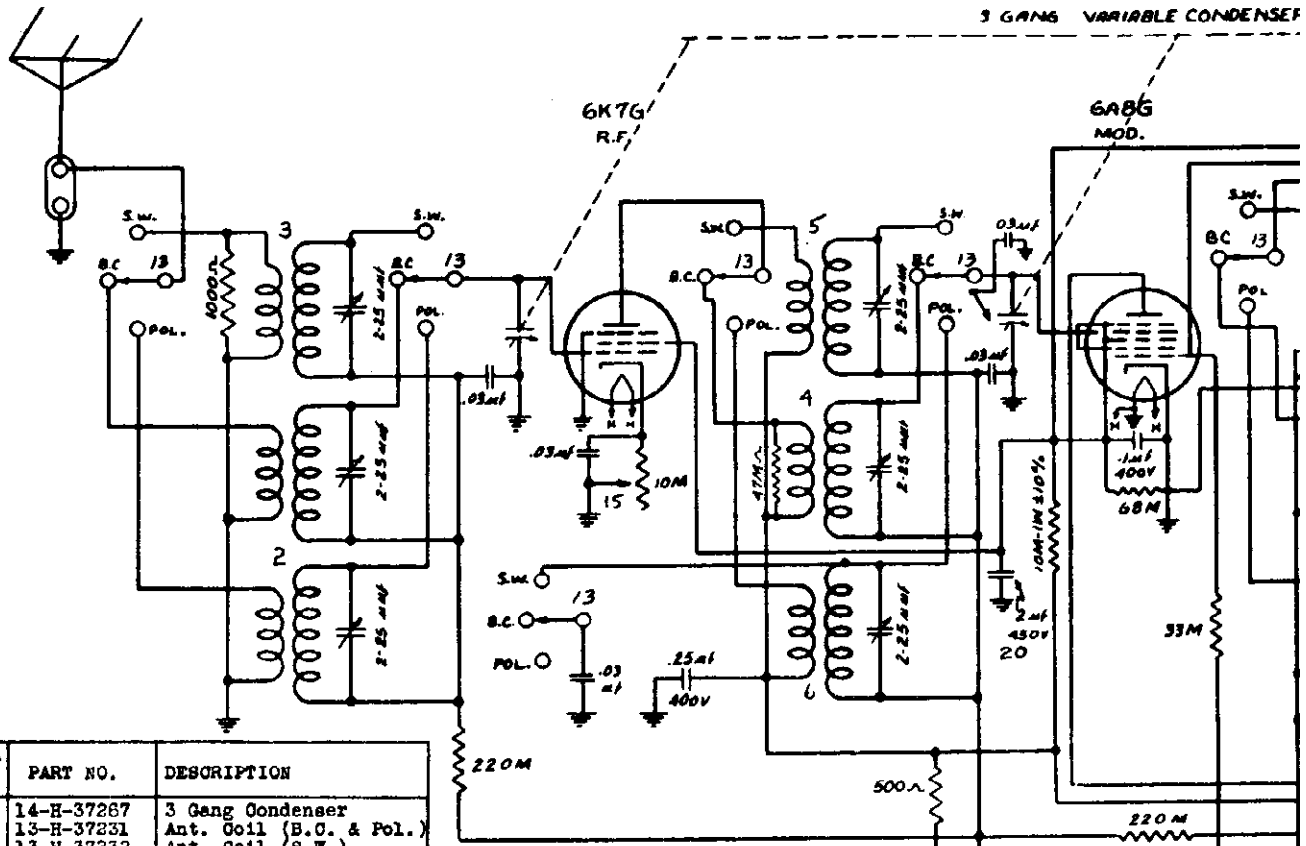
Set signal generator at 18.7 MC and turn condenser gang to the signal at 18.7 MC. Adjust SW ANT. trimmer to point giving greatest output reading, while slightly rocking condenser gang.

Padders on "Police" and "Foreign" bands are fixed (no adjustment necessary).

SOCKET VOLTAGES (CHASSIS 9-1, 9-2, AND 9-3)

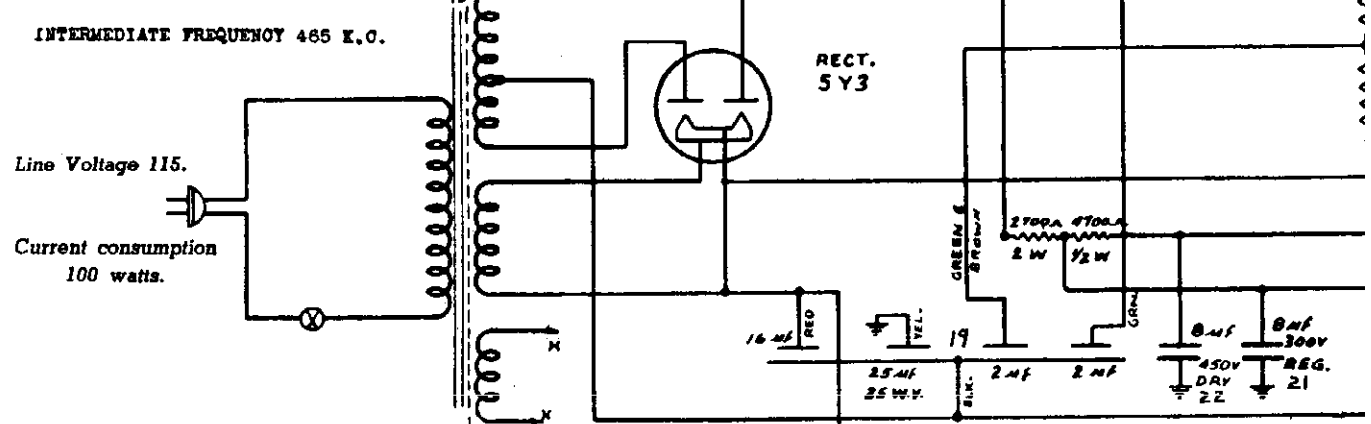
Tube	Position	1	2	3	4	5	6	7	8	9
6A8G	1st det.	0	6.3 AC	195	80	-6.0	80	0	0	Note A
6J5G	Osc.	0	0	160	-6.0	-16.0	...	6.3 AC	0	...
6K7G	1st I. F.	0	0	200	80	0	X	6.3 AC	0	Note A
6K7G	2nd I. F.	0	6.3 AC	200	80	-3.0	X	0	1.2	Note A
6H6G	2nd det.-AVC	0	6.3 AC	0	0	Note A	X	0	1.2	...
6J5G	A. F.	0	6.3 AC	125	240	Note B	X	0	0	...
6V6G	Output	0	6.3 AC	250	260	Note C	X	0	0	...
5Y3	Rectifier	0	5.0 AC	...	350 AC	...	350 AC	X	5.0 AC	...
6G5	Eye	Fil. (Brown wire) 6.3 AC		Plate (Red wire) 200		Cathode (Black wire) Note A		Grid (Green Wire) Note A		





DRWG. NO.	PART NO.	DESCRIPTION
1	14-H-37267	3 Gang Condenser
2	13-H-37231	Ant. Coil (B.C. & Pol.)
3	13-H-37232	Ant. Coil (S.W.)
4	13-H-37235	R.F. Coil (B.C.)
5	13-H-37236	R.F. Coil (S.W.)
6	13-H-37237	R.F. Coil (Pol.)
7	13-H-37239	Osc. Coil (B.C.)
8	13-H-37241	Osc. Coil (S.W.)
9	13-H-37242	Osc. Coil (Pol.)
10	47-H-37679A	1st I.F. Coil Assem.
11	47-H-37867A	2nd I.F. Coil Assem.
12	47-H-37868A	3rd I.F. Coil Assem.

BAND COVERAGE —
 American Programs 540-1720 KC
 Police and Aircraft 2200-7000 KC
 Foreign Programs 7,000-22,000 KC



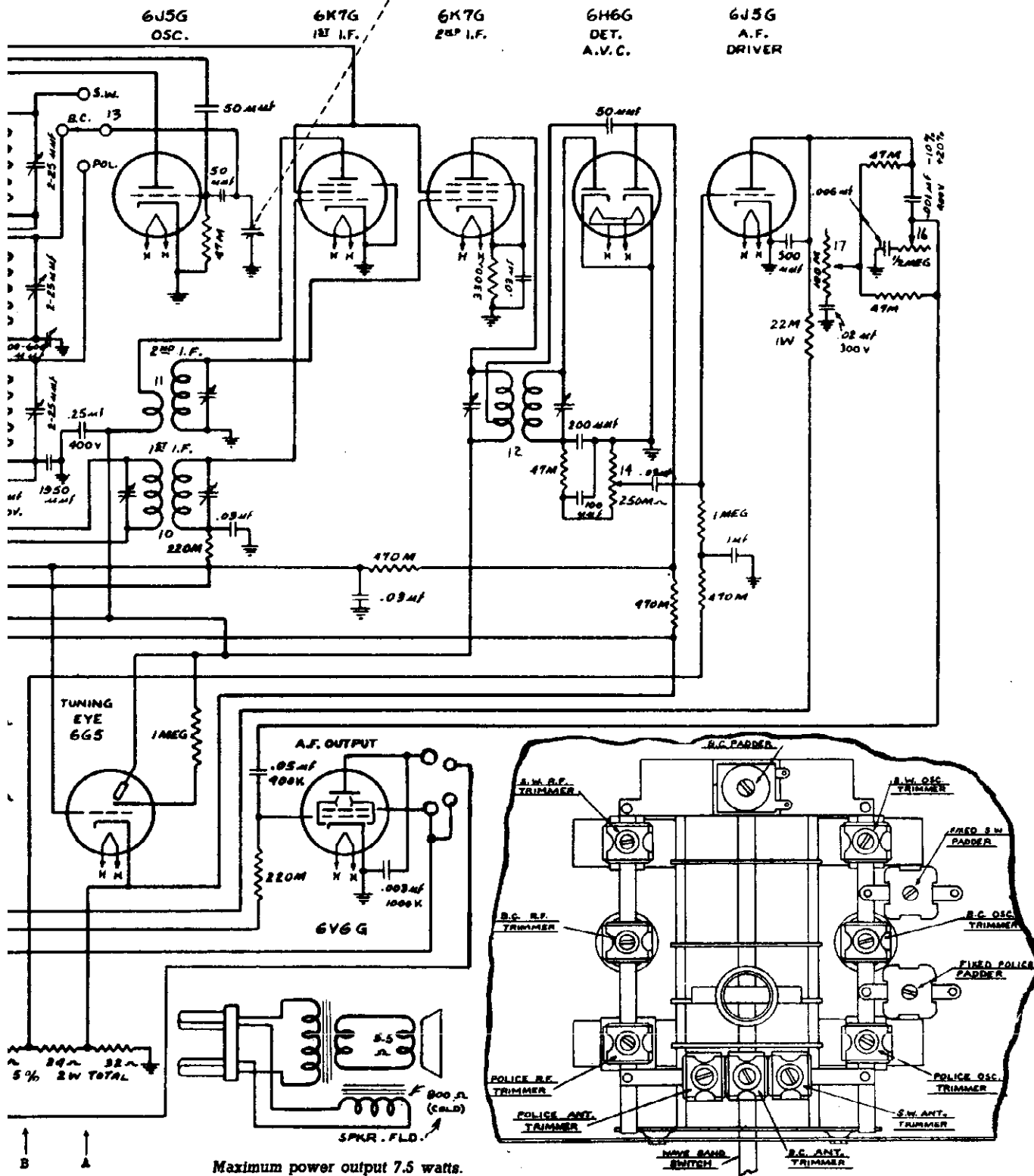
13	54-H-37770	Band Switch
14	60-H-37839	Volume Control
15	60-H-37831	Sensitivity Control
16	60-H-37833	Tone Control (Fidelity)
17	60-H-37836	Tone Comp. (HiLite)
18	56-H-37788	Power Transformer
19	14-H-37275	Electrolytic Cond.
20	14-H-37288	Electrolytic Cond.
21	14-H-37277	Electrolytic Cond.
22	14-H-37279	Electrolytic Cond.

Motorola
 Chassis No. 10-1
MODEL 10Y

MFG. CO.

MODEL 10Y
Chassis 10-1
Schematic, Parts
Trimmers

440 MMF PER SECTION



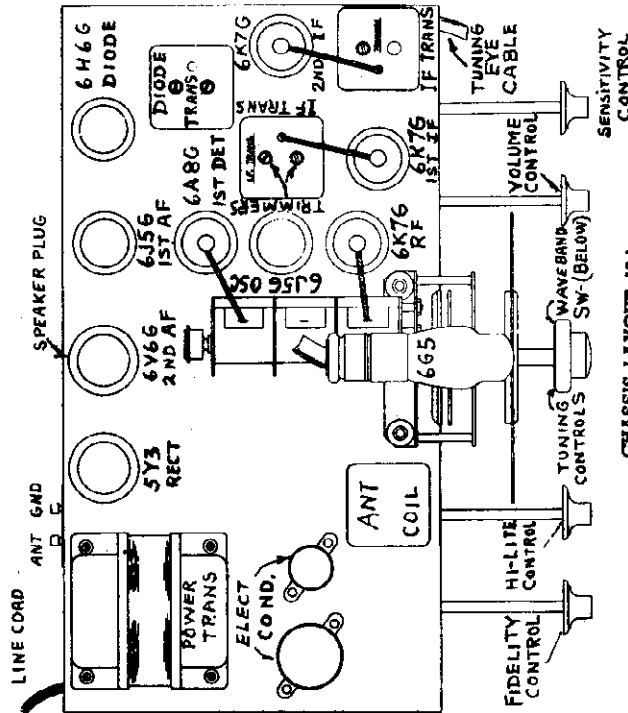
Maximum power output 7.5 watts.

Wiring Points (tag Chart)

TRIMMERS 10-1

GALVIN MFG. CO.

MODEL 10Y
Chassis 10-1
Socket, Trimmers
Alignment, Voltage
Sensitivity



CHASSIS LAYOUT 10-1

"X" indicates socket terminals used as dummy in points.
 Note A—3.0 V measured point A to ground on 10 V scale (see circuit diagram).
 Note B—5.0 V measured point B to ground on 10 V scale (see circuit diagram).
 Note C—15.0 V measured point C to ground on 50 V scale (see circuit diagram).
 All voltages, except rectifier filaments, measured from socket terminals indicated to chassis ground, using 1000 ohms per volt meter.

ALIGNMENT PROCEDURE

CHASSIS 10-1

1. Read alignment notes on Page 14.
2. Connect signal generator to control grid of first detector tube (6A9G) through a .05 MF. condenser and to chassis. Do not remove grid cap. Also connect output meter across speaker voice coil. Turn band switch to "American Programs" position. Turn condenser gang completely out of mesh.
3. Set signal generator at 465 K.C. and carefully adjust the five IF trimmers (located in top of IF coil cans) to point showing highest reading on output meter.
4. Leave band switch in "American Programs" position. Connect signal generator to antenna and ground terminals, using a .0002 MF condenser in antenna lead. Adjust BC OSC. trimmer until 1700 K.C. signal is heard.
5. Set signal generator at 1400 K.C. and turn condenser gang to the signal at 1400 K.C. Adjust BC ANT. and BC RF trimmers to point showing highest reading on output meter.
6. Set signal generator at 800 K.C. and rock pointer at 800 K.C. position on dial scale, while adjusting BC paddler, until combination is found which gives highest output reading. (Note: If there is noise level at 800 K.C., paddler can be adjusted to maximum noise without rocking gang and, without use of signal generator. (Use short wire for pick-up if necessary.)
7. Turn band switch to "Police and Aircraft" position. Replace .0002 M.F. condenser in signal generator lead with a 400 ohm carbon resistor.
8. Set signal generator and receiver dial both at 7.0 MC. Adjust POLICE OSC. trimmer until 7.0 MC signal is heard.
9. Set signal generator and receiver dial both at 22.0 MC. Adjust SW OSC. trimmer until 22.0 MC signal is heard.
10. Set signal generator at 5.8 MC and turn condenser gang to signal at 5.8 MC. Adjust POLICE ANT. and POLICE RF trimmers to point giving greatest output reading, while slightly rocking condenser gang.
11. Turn band switch to "Foreign Programs" position, still using 400 ohm carbon resistor in antenna lead to signal generator.
12. Set signal generator and receiver dial both at 22.0 MC. Adjust SW OSC. trimmer until 22.0 MC signal is heard.
13. Set signal generator at 18.7 MC and turn condenser gang to the signal at 18.7 MC. Adjust SW ANT. and SW RF trimmers to point giving greatest output reading, while slightly rocking condenser gang.
14. Padders on "Police" and "Foreign" bands are fixed. (No adjustment necessary).

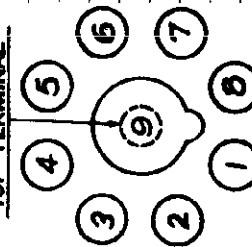
NOTE: IF Sensitivity at 465 K.C. is 90 microvolts for 50 milliwatts output
 Ant. Sensitivity at 800 K.C. is 1 microvolt for 50 milliwatts output

SOCKET VOLTAGE (CHASSIS 10-1)

Tube	Position	1	2	3	4	5	6	7	8	9
6R7G	R. F.	0	6.3 AC	21B	8B	0	X	0	7.0	Note A
6A9G	1st det.	0	6.3 AC	22B	90	25	90	0	0	Note A
6A9G	Osc.	0	6.3 AC	160	0	-23	0	0	0	Note A
6R7G	1st I. F.	0	6.3 AC	220	100	0	X	0	0	Note A
6R7G	2nd I. F.	0	6.3 AC	220	100	B	0	0	8	0
6H6G	2nd det.-AVC	0	6.3 AC	0	0	Note A	X	0	0	0
6A9G	A. F.	0	6.3 AC	190	0	Note B	X	0	0	0
6V6G	Output	0	6.3 AC	260	26B	Note C	0	0	0	0
5Y3	Rectifier	0	5.0 AC	X	350 AC	X	350 AC	X	5.0 AC	0
6G5	Eye	0	5.0 AC	X	350 AC	X	350 AC	X	5.0 AC	0

Filament (Brown wire) 6.3 AC
 Cathode (Black wire) Note A
 Plate (Red wire) 210
 Grid (Green wire) Note A

TOP TERMINAL



BOTTOM VIEW OF SOCKET

MODEL Acoustinator
MODEL Magic Eliminode
Notes

GALVIN MFG. CO.

ions to correct for the acoustic differences in the various makes of cars give a pleasing effect to any type of program that anyone might prefer.

The three steps of the sensitivity switch controlled by the left hand knob are:

Country; average sensitivity 1.5 Microvolts for 1 Watt.

City; average sensitivity 5 Microvolts for 1 Watt.

Street Car; average sensitivity 15 Microvolts for 1 Watt.

"High Fidelity" is a term applied to an audio system that reproduces all frequencies of the audible spectrum at the same level of output.

The human ear however is most sensitive to frequencies in the middle register occupied by the human voice. The acoustics of the average automobile tend to accentuate this effect. The actual effect to the ear then of "High Fidelity" is that the pleasing higher and lower frequencies of music are dropped into the background and tends to spotlight the human voice as shown on the chart in Fig. (1).

This is the condition that occurs when the right hand knob of the acoustinator is set at "Voice" position.

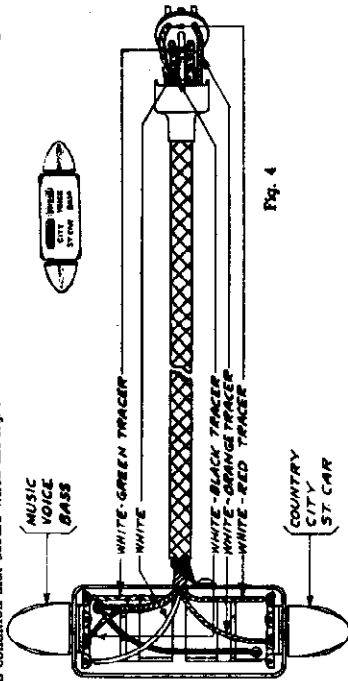


Fig. 4

A beautifully pleasing and lifelike effect would be given to any musical program if we would compensate for the limitations of the ear and in some manner drop the center portion of the audio register slightly below the level of the two ends. The deep bass notes and high notes that give expression to music would then stand out in a very natural manner. This has been done by means of an electrical filter network that is switched into the circuit when we turn to the "Music" position. Fig. (1).

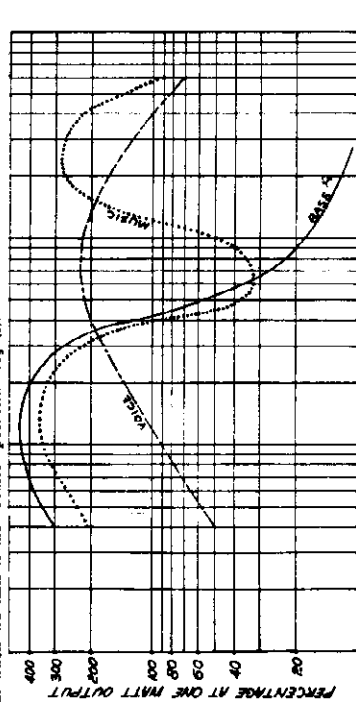


Fig. 1

RELATIVE AFFECT TO THE EAR EXPRESSED IN PERCENTAGE OF THREE ACCOUSTINATOR POSITIONS IN AVERAGE AUTOMOBILE

Many people prefer the deep bass instruments that mark the rhythm of music to be accentuated above all others. A soft mellowness is given music when this is done and the sound of static and non-made electrical interference which is reproduced at a very high audio frequency is reduced to a minimum when the acoustinator is set to the bass position.

Many combinations of positions then of right and left knobs are available to give us the finest reception regardless of the demands of the region through which we are driving and regardless of the tonal balance required of the program to which we may be listening.

THE 1937 IMPROVED MAGIC ELIMINODE

The 1937 Magic Eliminode consists of filters in the various supply leads to the radio set to prevent the introduction of "motor noise" at these points and an improved bucking or balancing circuit in Models 65, 70, and Golden Voice which may be adjusted to prevent the development of "motor noise" in the antenna circuit.

The manner in which the cancellation of "motor noise" in the antenna circuit is accomplished is as follows:

Developed on the antenna coil, from the antenna system we have both "motor noise" and "broadcast signal". Developed on the "A" lead of the radio set which is connected into the electrical system we have "motor noise" alone. We introduce "motor noise" into the antenna circuit from the "A" lead in opposite phase to that picked up by the antenna.

We then vary the intensity introduced from the "A" circuit into the antenna coil by means of the shifter between the two circuits, until the intensity from both antenna system and "A" circuit is the same. When this is accomplished there is cancellation of "motor noise" in the antenna system and the broadcast signal comes through without being affected in any way.

For those cases in which the motor noise developed in the "A" circuit is in phase with that of the antenna system, provision is made to reverse the phase of the coupling coil to the antenna circuit so that bucking action may occur. Refer to Fig. (2).

MAGIC ELIMINODE BALANCING PROCEDURE

After the set is completely installed, if any ignition noise is present with the shifter in a closed position and with the "A" lead plugged into the bottom of the set it will be necessary to use the balance.

To use the balance, pull the end of the fused "A" lead out of the bottom of the set No. 1 (Fig. 2) and plug it into the balance terminal receptacle No. 3 (Fig. 2). Take the short heavy jumper with pin prongs on either end and plug one end into receptacle No. 1 (Fig. 2) on the bottom of the set and plug the other end into balance terminal receptacle No. 2 (Fig. 2). Turn the set then to the point on the dial where the noise appears with greatest intensity.

Adjust the eliminode shifter wheel by revolving it with the thumb as shown in (Fig. 2) until the motor noise disappears.

If it is found when turning the shifter toward an open position that the noise gradually becomes louder without any sign of decrease at any point, it will be necessary to reverse the connections in receptacles No. 2 and No. 3 (Fig. 2). Then readjust the shifter wheel with the thumb as described above.

When this adjustment is once made, it will not change unless some change is later made in the car wiring or the radio set is installed in another car.

CHASSIS PICKUP

In extreme cases of "motor noise" in the Models No. 65, 70 and Golden Voice, a preliminary test for chassis pickup should be made before attempting to balance on antenna interference.

When making this test, it is necessary to use a well shielded dummy antenna plugged into the set in place of the regular antenna lead-in. The dummy antenna can be made by using a standard Motorola antenna series condenser, part M-94, and short circuiting the inside connection to the shell.

Balance the antenna trimmer very carefully to this dummy antenna so that the set is at maximum sensitivity and then run the car.

Should "motor noise" occur after this test, it will be entering the radio set through some other source than the antenna.

ACCOUSTINATOR

The Acoustinator used on the 1937 MOTOROLA must be mounted always at a point most convenient to the customer since its operation is just as essential as the tuning dial or the volume control in giving complete enjoyment and maximum performance from the radio set.

The Acoustinator performs the function of varying the sensitivity of the radio set in three logical predetermined steps from the extreme sensitivity necessary in isolated communities to the noise free smooth reception desired in Metropolitan areas, and changes the tone characteristics in three distinctly different post-

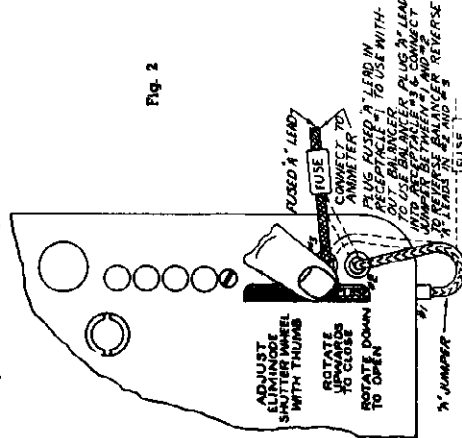
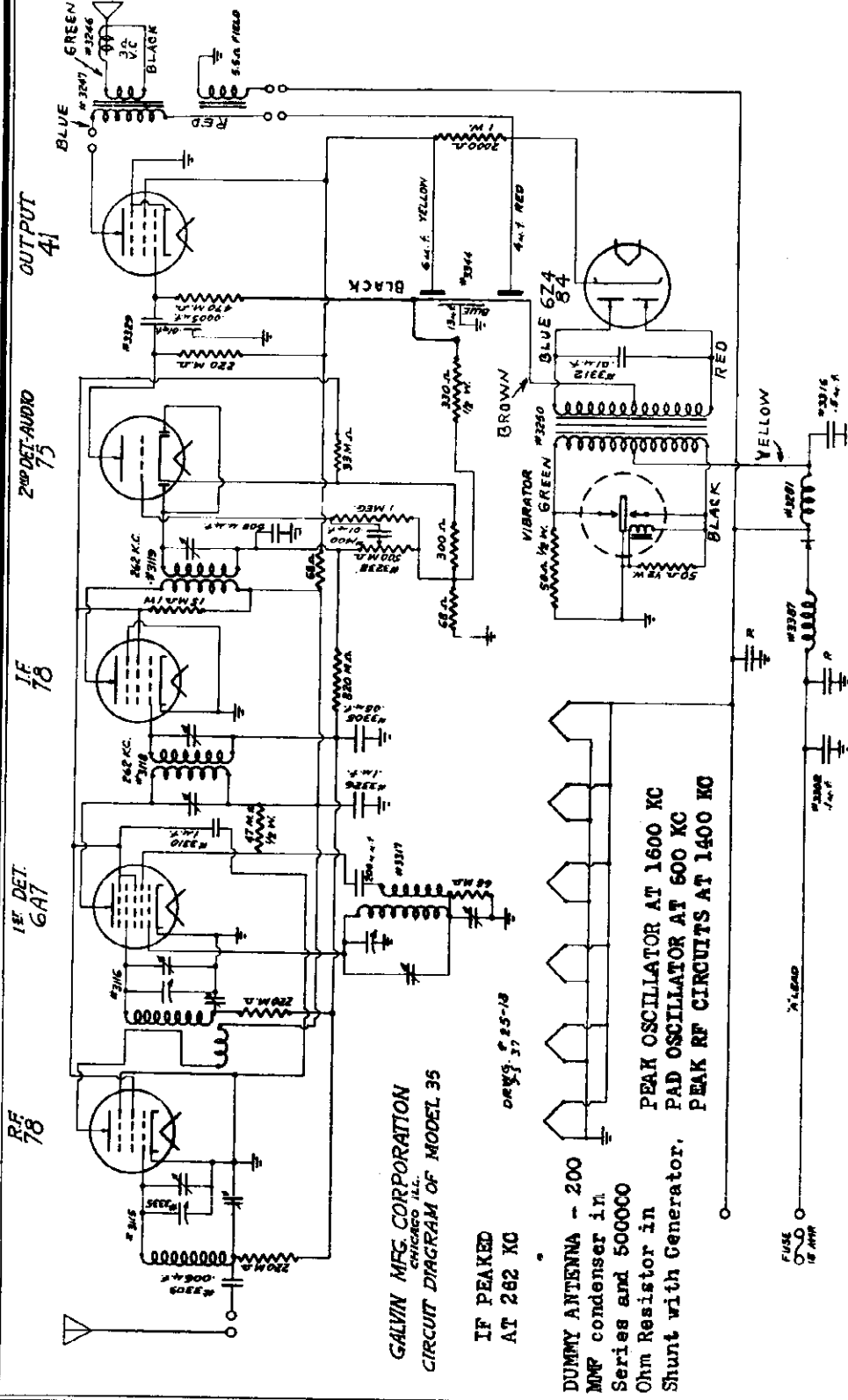


Fig. 2

GALVIN MFG. CO.

MODEL 35
Schematic, Voltage
Sensitivity, Alignment

ALL VOLTAGE ANALYSIS READINGS MADE
WITH A BATTERY VOLTAGE OF 6.3 VOLTS.



GALVIN MFG. CORPORATION
CHICAGO ILL.
CIRCUIT DIAGRAM OF MODEL 35

IF PEAKED
AT 262 KC

DUMMY ANTENNA - 200
MNF condenser in
Series and 500000
Ohm Resistor in
Shunt with Generator.

PEAK OSCILLATOR AT 1600 KC
PAD OSCILLATOR AT 600 KC
PEAK RF CIRCUITS AT 1400 KC

MODEL 35

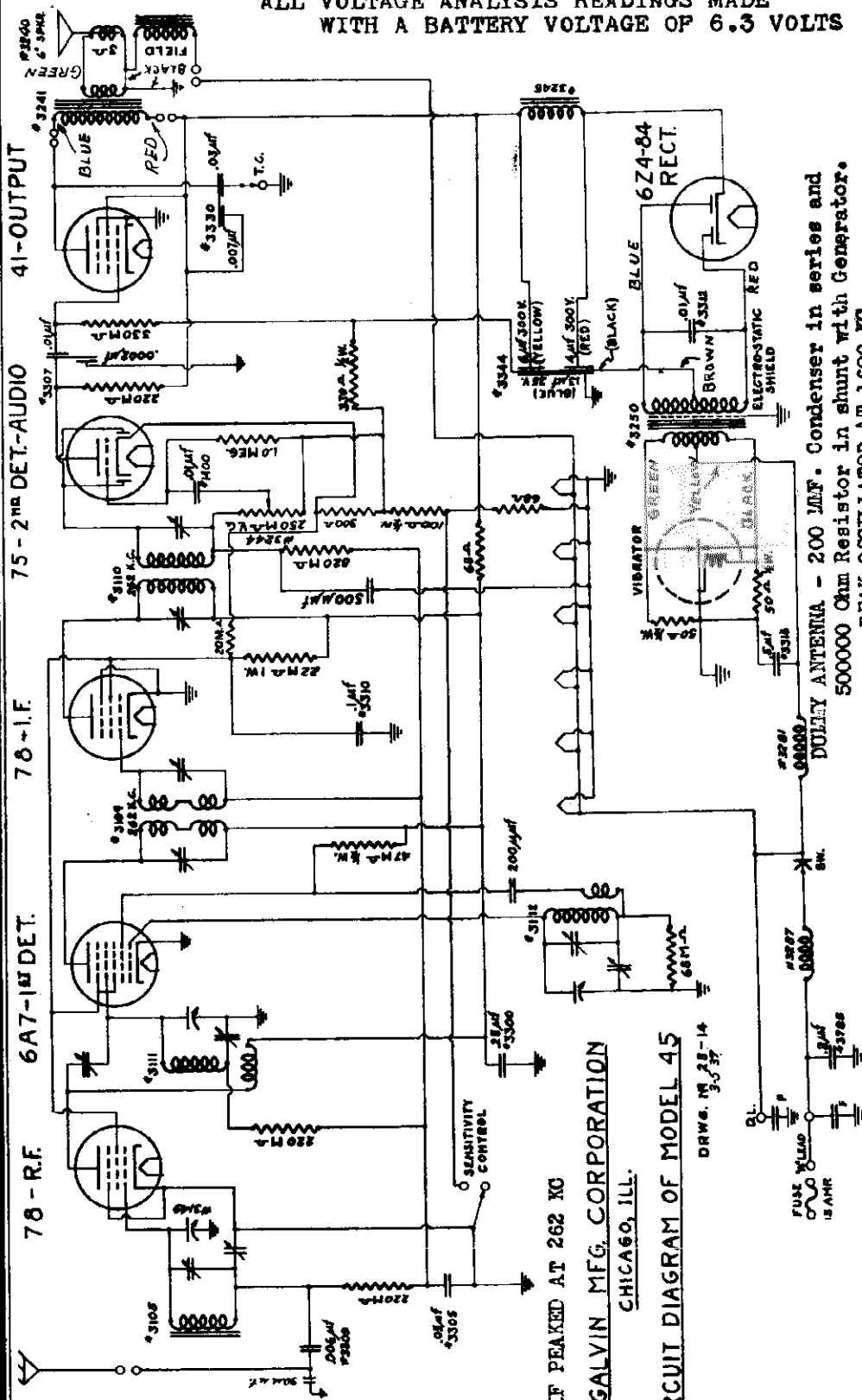
Plate voltage	Screen voltage	Bias voltage for R.F. tubes	Bias voltage for 75 tube	Bias voltage for 41 tube	Delay voltage	AVERAGE MICROVOLT INPUT	GEN. FEEDER CONNECTED TO GRID OF -	GENERATOR SET AT	OUTPUT METER ACROSS VOICE COIL
.....	30,000	- 78	262 K.C.	Voice coil resistance is 3 ohms— 1.73 Volts equals 1 Watt output
.....	2,000	- 6A7*	600 K.C.		
.....	2,000	- 6A7*	600 K.C.		
.....	70	- 78*	600 K.C.		
.....	3.5	- Ant.	.....	.....
Current drain	..... 5.75 amps.								

*Microvolt input may be 10 to 20% more at 600 K.C. than at 262 K.C. This is due to normal conversion loss in the Transistor tube. If greater, replace Transistor tube.

MODEL 45
Schematic, Voltage
Sensitivity, Alignment

GALVIN MFG. CO.

ALL VOLTAGE ANALYSIS READINGS MADE
WITH A BATTERY VOLTAGE OF 6.3 VOLTS



IF PEAKED AT 262 KC
GALVIN MFG. CORPORATION
CHICAGO, ILL.

CIRCUIT DIAGRAM OF MODEL 45
DRWG. NO. 28-14
3,537

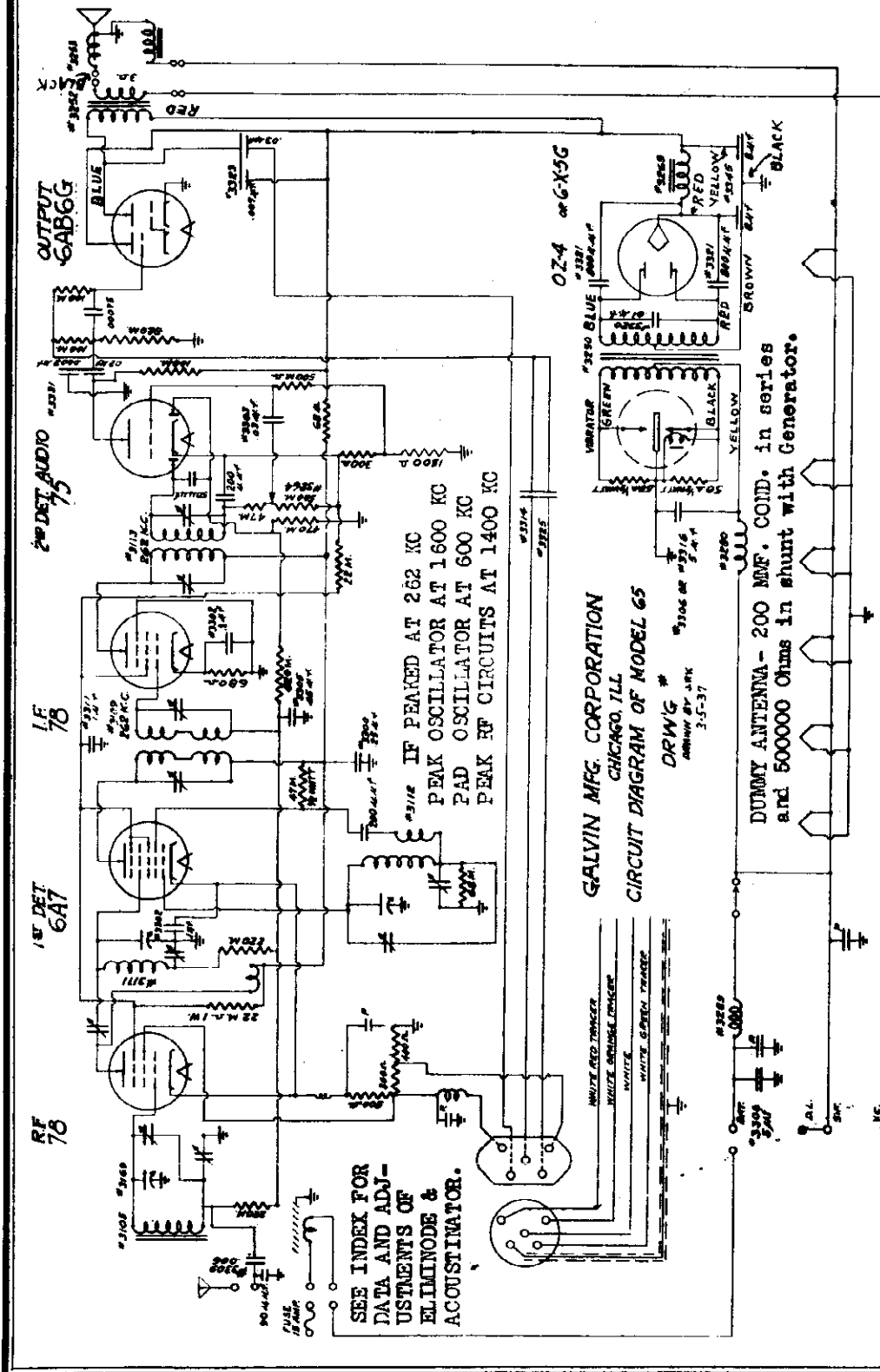
MODEL 45

Plate voltage	210	AVERAGE MICROVOLT INPUT	15,000
Plate on output tube	210	GEN. FEEDER CONNECTED TO GRID OF GENERATOR SET AT	262 K.C.
Screen voltage	65	PEAK RF CIRCUITS AT 1400 KC	262 K.C.
Bias voltage for R.F. tubes	3.5	PEAK OSCILLATOR AT 1600 KC	600 K.C.
Bias voltage for 75 tube	1.0	DULLY ANTENNA - 200 MF. Condenser in series and 500000 Ohm Resistor in shunt with Generator.	600 K.C.
Bias voltage for 41 tube	16	PAD OSCILLATOR AT 600 KC	50
Delay voltage	1.0	PEAK OSCILLATOR AT 1400 KC	1.5
Current Drain	6.00 amps.	OUTPUT METER ACROSS VOICE COIL	
		Voice coil resistance is	3 ohms—
		1.73 Volts equals	1 Wcatt output

GALVIN MFG. CO.

MODEL 65
Schematic, Voltage
Sensitivity, Alignment

ALL VOLTAGE ANALYSIS READINGS MADE
WITH A BATTERY VOLTAGE OF 6.3 VOLTS.



GALVIN MFG. CORPORATION
CHICAGO, ILL
CIRCUIT DIAGRAM OF MODEL 65
DRWG # 3106 OF 3-5-37
REVISED BY JMK

DUMMY ANTENNA - 200 MFD. COND. in series
and 500000 Ohms in shunt with Generator.

SEE INDEX FOR
DATA AND ADJUSTMENTS OF
ELIMINATOR &
ACQUINATOR.

MODEL 65

Plate voltage	220
Plate on output tube	210
Screen voltage	65
Bias voltage for R.F. tubes	3.5
Bias voltage for 75 tube	1.0
Bias voltage for 6AB6G tube	0.0
Delay voltage	1.0
Current drain	6.40 amps.

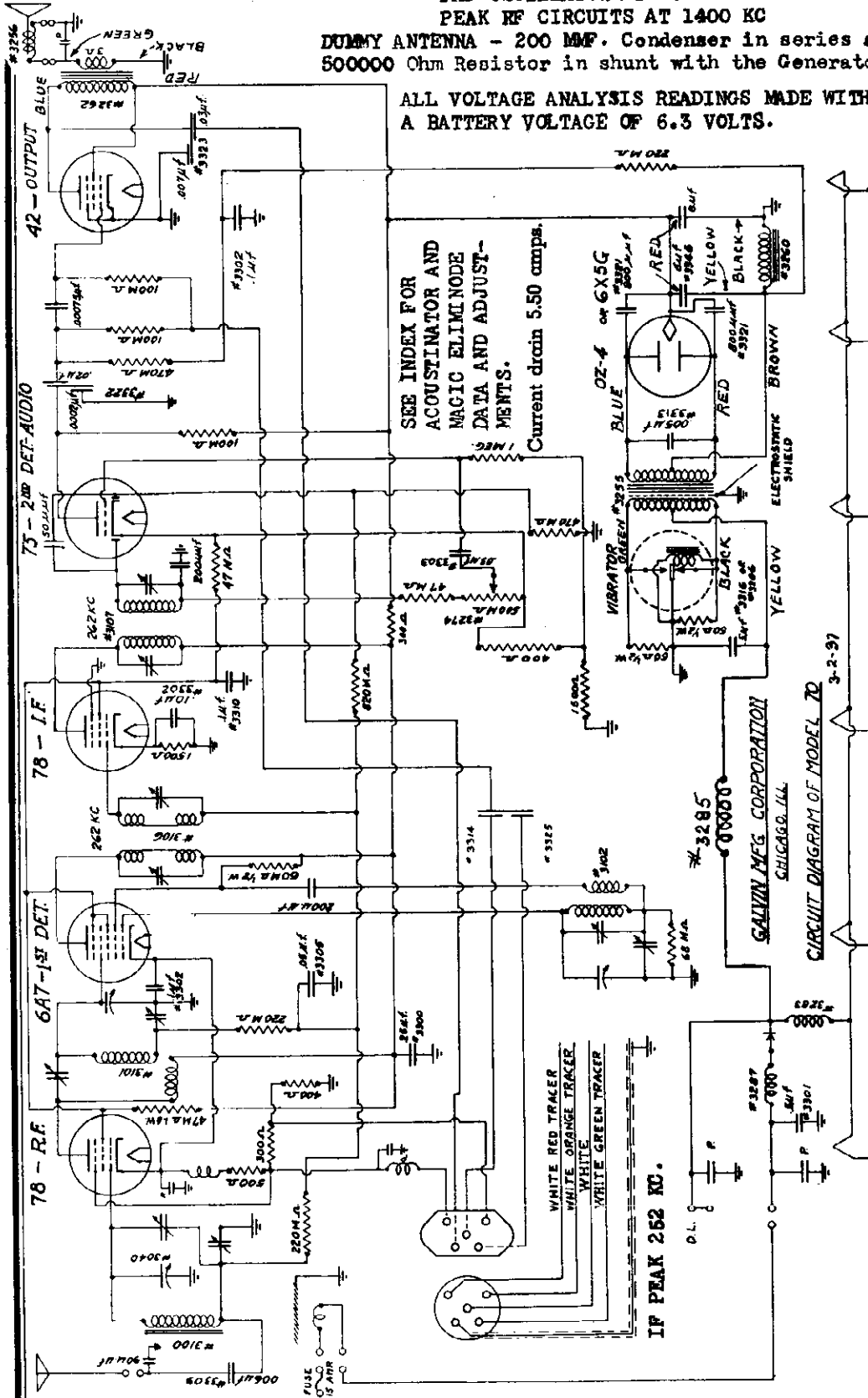
AVERAGE MICROVOLT INPUT	GEN. FEEDER CONNECTED TO GRID OF	GEN. SET AT	OUTPUT METER ACROSS VOICE COIL
15,000	78	262 K.C.	Voice coil resistance is 3 ohms—
500	6A7	262 K.C.	1.73 Volts equals 1 Watt output
500	6A7*	600 K.C.	
50	78*	600 K.C.	
1.5	Asst.	600 K.C.	

MODEL 70
Schematic, Voltage
Sensitivity, Alignment

GALVIN MFG. CO.

PEAK OSCILLATOR AT 1600 KC
PAD OSCILLATOR AT 600 KC
PEAK RF CIRCUITS AT 1400 KC
DUMMY ANTENNA - 200 MMF. Condenser in series and
500000 Ohm Resistor in shunt with the Generator.

ALL VOLTAGE ANALYSIS READINGS MADE WITH
A BATTERY VOLTAGE OF 6.3 VOLTS.



SEE INDEX FOR
ACOUSINATOR AND
MAGIC ELIMINODE
DATA AND ADJUST-
MENTS.
Current drain 5.50 amps.

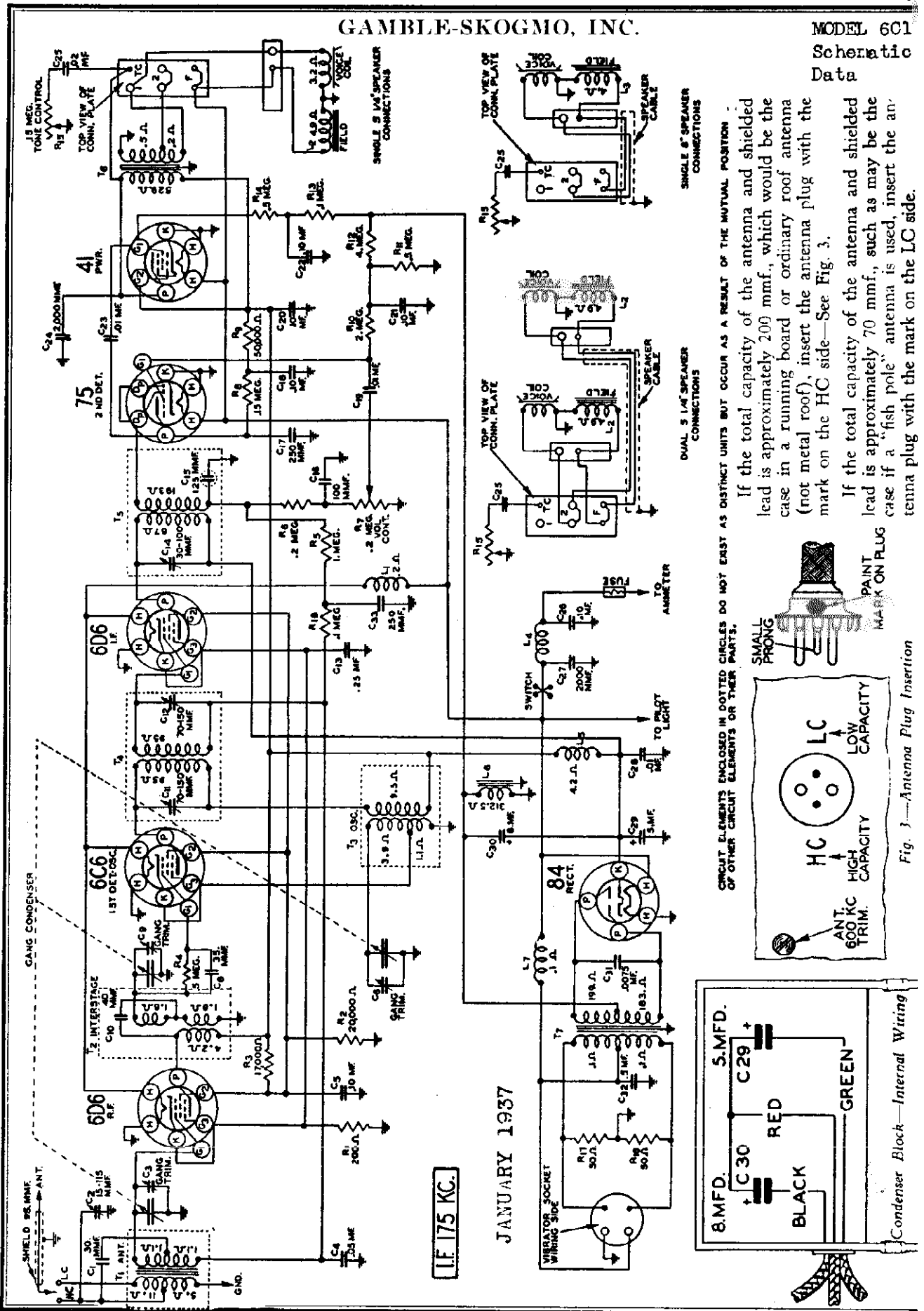
MODEL 70

GEN. FEEDER CONNECTED TO GRID OF -	GENERATOR SET AT	OUTPUT METER ACROSS VOICE COIL	Plate voltage
78	262 K.C.	Voice coil resistance is 3 ohms—	260
6A7	262 K.C.		250
6A7*	600 K.C.		85
78*	600 K.C.	1.73 Volts equals 1 Watt output	3.5
Ant.	600 K.C.		1.5
			18
			3

*Microvolt input may be 10 to 20% more at 600 K.C. than at 262 K.C. This is due to normal conversion loss in the Translator tube. If greater, replace Translator tube.

GAMBLE-SKOGMO, INC.

MODEL 6C1
Schematic
Data



I.F. 175 KC.

JANUARY 1937

IF the total capacity of the antenna and shielded lead is approximately 200 mmf., which would be the case in a running board or ordinary roof antenna (not metal roof), insert the antenna plug with the mark on the HC side—See Fig. 3.

If the total capacity of the antenna and shielded lead is approximately 70 mmf., such as may be the case if a "fish pole" antenna is used, insert the antenna plug with the mark on the LC side.

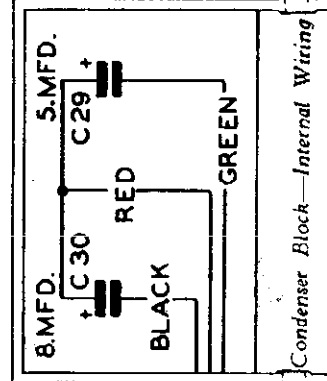
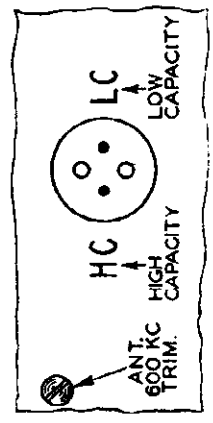
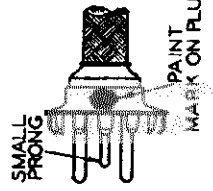


Fig. 3—Antenna Plug Insertion

MODEL 6C1
Alignment, Coils

GAMBLE-SKOGMO, INC.

Voltage, Socket
Trimmers

I. F. Adjustment

Set the signal generator for a signal of 175 KC.

Connect the output of the signal generator through a .05 mf. condenser to the stator of the R.F. interstage section of the tuning condenser. (See Fig. 2 for location of this section.)

Connect the ground lead of the signal generator to the chassis. The chassis should be in the case.

Set the volume control at the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.

Then adjust the three I.F. trimmers until maximum output is obtained. The location of these trimmers is shown in Fig. 2.

1581 KC Adjustment

Set the signal generator for 1581 KC.

Turn the rotor of the tuning condenser to the full open position.

Insert the antenna plug with the mark on the high capacity (HC) side. Connect the shielded antenna lead from the chassis through a 120 mmf. condenser to the antenna post of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained—see Fig. 2 for location of this trimmer.

1400 KC Adjustment

Set the signal generator for 1400 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the R.F. interstage and antenna 1400 KC trimmers for maximum output.

Do not change the setting of the oscillator trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Tune in this signal and adjust the 600 KC antenna trimmer to maximum (See Fig. 3 for location of this trimmer).

After the alignment procedure is completed, the antenna plug may be withdrawn and reinserted on the LC side if a low capacity (70 mmf.) car antenna is used.

Adjusting Antenna 600 KC Trimmer

After the radio is installed and the car antenna is connected, it will be necessary to readjust the antenna trimmer. Tune in a weak signal at approximately 600 KC with the volume control about three-fourths on. Turn the adjusting screw of the antenna 600 KC trimmer up or down until maximum output is obtained. See Fig. 3 for location of this trimmer.

Calibrating the Radio

To calibrate the radio, tune in a station of known frequency. At the back of the control head is the calibration screw. Remove the pilot lamp assembly. Hold the tuning knob. Insert a fine blade screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received.

A very short insulated screwdriver will be helpful.

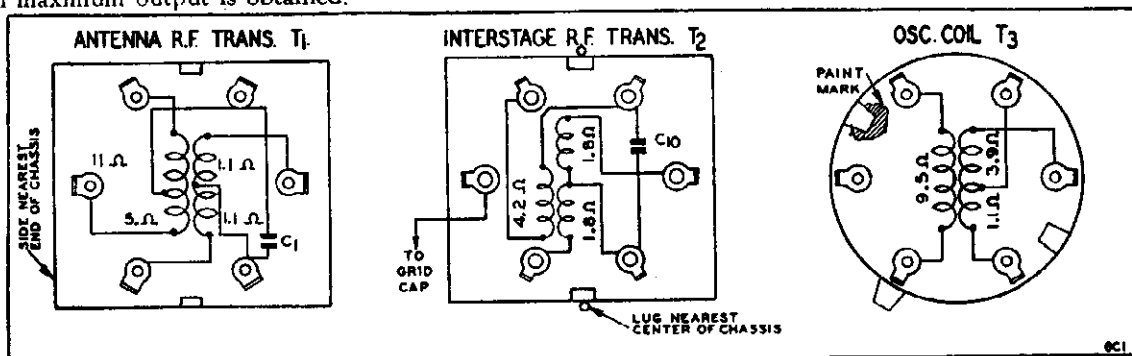


Fig. 4—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

VOLTAGES AT SOCKETS					
Battery—6.3 Volts Under Load					
Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground
6D6	R.F.	6.0	245	105	3.2
6C6	1st Det. and Osc.	6.0	243	105	
6D6	I.F.	6.0	245	105	3.2
75	2nd Det.	6.1	127		
41	Power	6.1	230	245	17(1)
84	Rectifier	6.1	600(2)		

(1) Grid bias read across filter choke L6
(2) A.C. voltage across plates

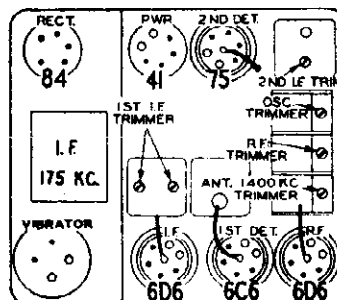
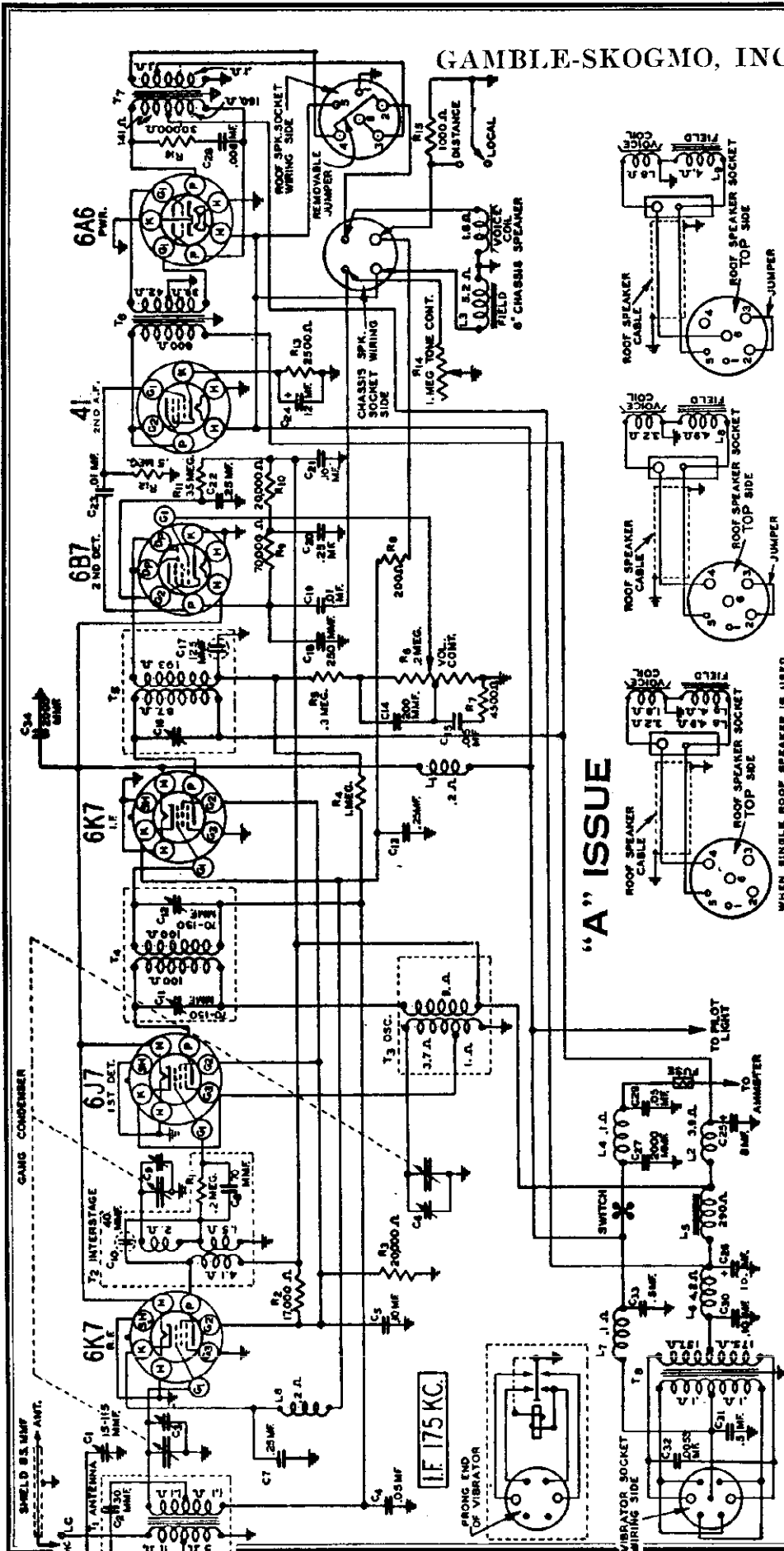


Fig. 2—Location of Tubes and Vibrator

MODEL 6J Series
"A" Issue
Schematic, Volta
Sensitivity, Dat

GAMBLE-SKOGMO, INC.



Series
Dual 6" Roof & 6" Chassis Speaker
Dual 5 1/4" or 6" Roof Speaker
Dual 6" Roof & 6" Chassis Speaker

POWER CONSUMPTION - 8.25 Amperes at 6.3 Volts
7 Amperes with P.M. Speaker
POWER OUTPUT ----- 6 Watt Undistorted at 6.3 Volts
Sensitivity ----- 0.8 Microvolts at 1 Watt Output (LD Switch in Distance Position.)
Selectivity ----- 43 KC Broad at 1000 times

VOLTAGES AT SOCKETS ("A" ISSUE)

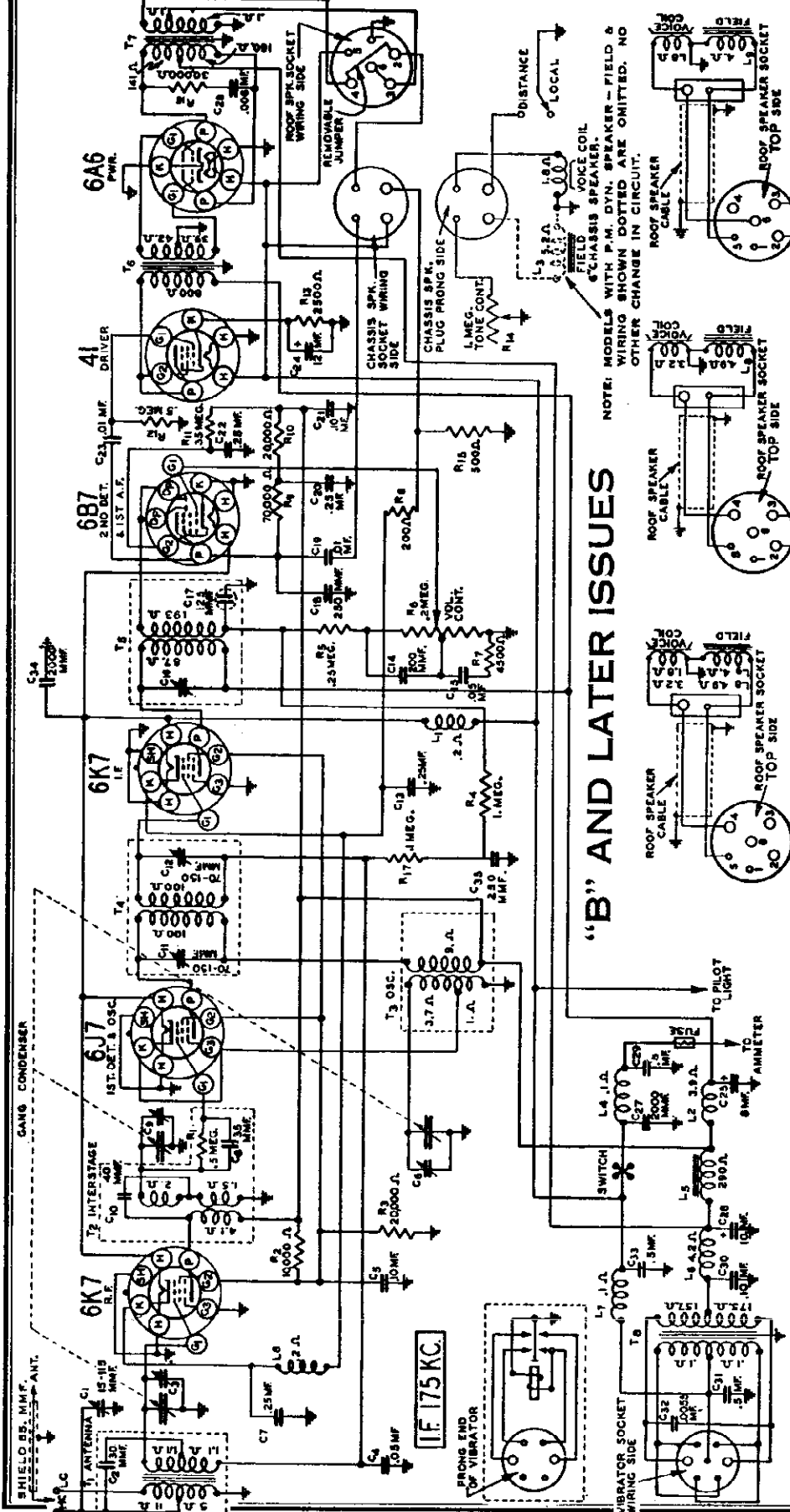
Battery—6.3 Volts Under Load L-D Switch in Distance Position

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground
6K7	R.F.	5.8	270	120	2.0
6J7	1st Det. and Osc.	5.8	268	120	0
6K7	I.F.	5.8	270	120	2.0
6B7	2nd Det. & 1st A.F.	5.8	70(1)	50(1)	0
41	2nd A.F.	6.0	260	260	28
6A5	Power	6.0	275		0

MODEL 6J Series
"B" & Later Issues

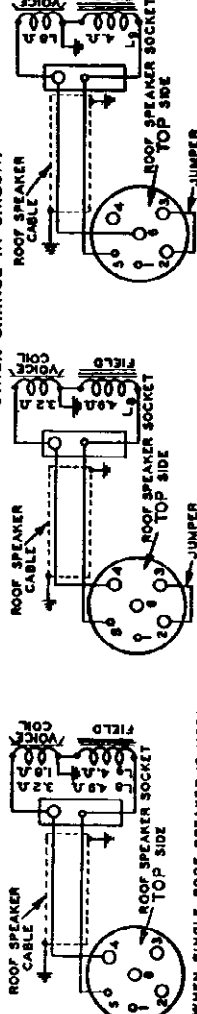
GAMBLE-SKOGMO, INC.

Schematic, Voltage
Sensitivity, Data



"B" AND LATER ISSUES

NOTE: MODELS WITH P.M. DYN. SPEAKER - FIELD & CHASSIS SPEAKER. WIRING SHOWN DOTTED ARE OMITTED. NO OTHER CHANGE IN CIRCUIT.



WHEN SINGLE ROOF SPEAKER IS USED, DISCONNECT FIELD LEAD OF CHASSIS SPEAKER.
SINGLE 5 1/4" OR 8" ROOF SPEAKER.

DUAL 5 1/4" ROOF & 6" CHASSIS SPEAKER
DUAL 8" ROOF & 6" CHASSIS SPEAKER

VOLTAGES AT SOCKETS ("B" AND LATER ISSUES)
Battery—4.3 Volts Under Load L-D Switch in Distance Position

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground
6K7	R.F.	5.8	250	132	3.6
6J7	1st Det. and Osc.	5.8	250	132	0
6K7	I.F.	5.8	250	132	3.6
6B7	2nd Det. & 1st A.F.	5.8	45(1)	45(1)	0
41	2nd A.F.	6.0	240	240	26
6A6	Power	6.0	262		0

(1) As read with 1000 ohm per volt meter—500 volt scale.

Series 6J

Jan., 1937

POWER CONSUMPTION - 8.25 Amperes at 6.3 Volts
7 Amperes with P.M. Speaker
POWER OUTPUT - - - - - 6 Watt Undistorted at 6.3 Volts
Sensitivity - - - - - 0.8 Microvolts at 1 Watt Output (LD Switch in distance position.)
Selectivity - - - - - 43 KC Broad at 1000 times Signal

Coils, Socket
Trimmers, Data

GAMBLE-SKOGMO, INC.

MODEL 6J Series
All Issues

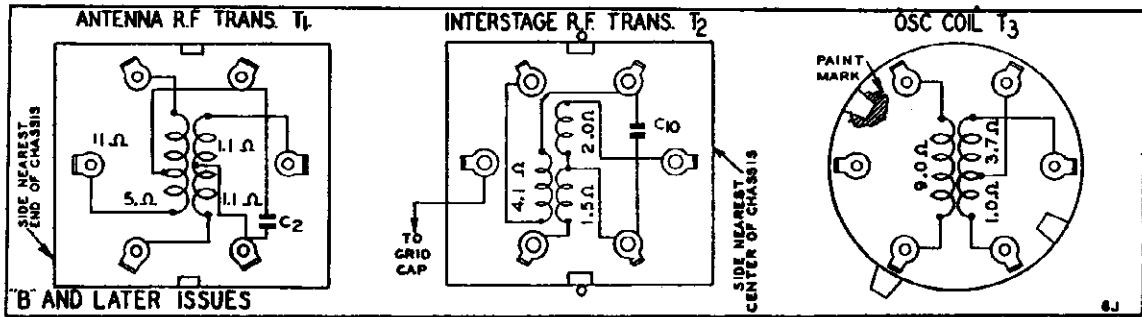


Fig. 4—R.F. and Oscillator Coil Base Terminal Arrangement and D.C. Resistance of Windings

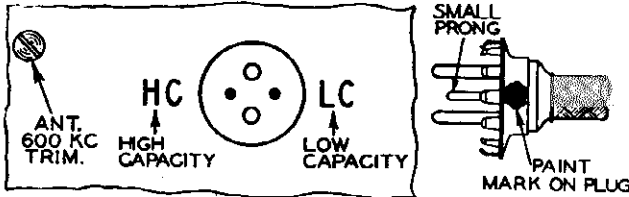


Fig. 5—Antenna Plug Insertion

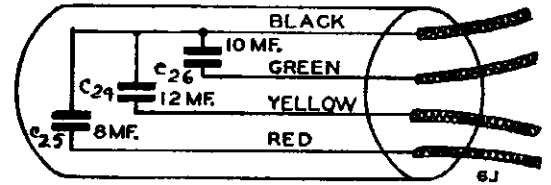


Fig. 6—Electrolytic Condenser Internal Connections

Instrument Panel Mounting Kits

Car	Year & Model	Kit No.	Car	Year & Model	Kit No.	Car	Year & Model	Kit No.
Buick	1937 40-60 Series	21A68	Ford	1937 DeLuxe	21A74	Packard	Six	21A56
	1937 30-90 Series	21A69		1937 Standard	21A73		1937 120-C	21A57
	1936	21A16		1936 Std. & DeLuxe	21A10		Super 8 & 12	21A77
Cadillac	1937	21A70	1935 DeLuxe	21A32	1936 120-B	21A21		
	1936	21A39	1934 Standard	21A38	1935 120	21A41		
Chevrolet	1937 All Models	21A58	Graham	1937 Cavalier & Supercharger	21A87	Plymouth	1937 DeLuxe	21A78
	1930-35 Standard & Master	21A11		1937 Imperial	21A86		1936 DeLuxe	21A64
Chrysler	1937 Royal	21A59	Hudson	1937 Crusader	21A75		1936 DeLuxe	21A12
	1937 Imperial	21A71		1935	21A48	1936-35 Standard	21A37	
	1937 Airflow	21A72		1934	21A35	1935 DeLuxe	21A33	
	1936 Six	21A19	1936-35	21A50	1934	21A49		
	1936 Eight	21A30	1937	21A89	1937	21A79		
DeSoto	1935-34 Except Imperial	21A47	LaFayette	1936-35	21A40	Pontiac	1936-35 Standard-DeLuxe 6 & 8	21A15
	1937	21A60	LaSalle	1937	21A76		Studebaker	Dictator Coupe	21A65
	1936 Airflow & Airstream Custom	21A22	1936	21A10	1937 Dictator	21A54		
	1936 Airstream DeLuxe	21A26	Lincoln	Zephyr 1937	21A76	1936 Dictator		21A55
Dodge	1935 DeLuxe	21A46	Nash	Zephyr 1936	21A10	1936 Dictator	21A20	
	1934	21A47	1937 Ambassador	21A63	1936 Dictator	21A24		
	1937	21A81	1936-35	21A36	1937	21A80		
	1936 DeLuxe	21A13	Nash Laf. 400	1937	21A62	1935	21A18	
1935	21A45	Oldsmobile	1937	21A88	1934	21A48		
1934	21A49		1936	21A14	Steering column and under panel kit.	Chromium Black	21A66	
			1935	21A34			21A67	

1934, 1935, 1936 and No. 21A67 Steering Column Kits Net Price Ea. \$0.60
 1937 and No. 21A66 Steering Column Kits Net Price Ea. .75

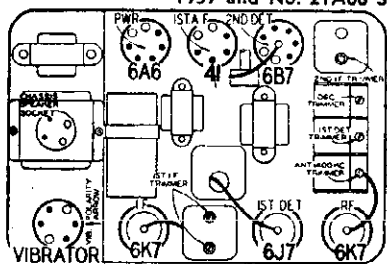


Fig. 3—Location of Tubes and Vibrator

Polarity in inserting the vibrator must be observed. It can be inserted in two ways, and the correct method depends on which terminal of the car storage battery is grounded. Full instructions are on the vibrator.

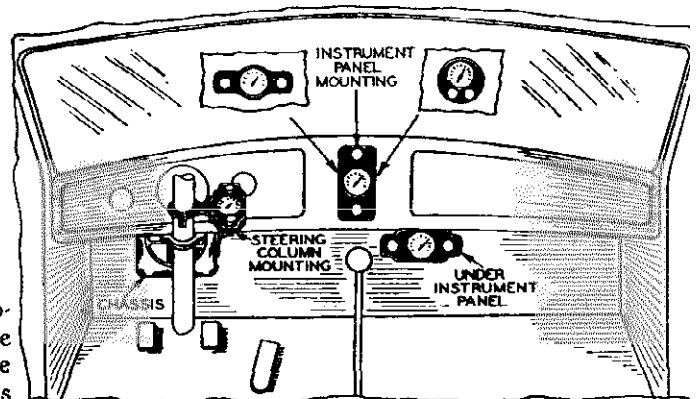


Fig. 7—Various Control Head Mountings

I. F. Adjustment

Set the signal generator for a signal of 175 KC.

Connect the output of the signal generator through a .05 mf. condenser to the stator of the 1st detector section of the tuning condenser. (See Fig. 3 for location of this section.)

Connect the ground lead of the signal generator to the chassis. The chassis should be in the case.

Set the volume control at the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.

Then adjust the three I.F. trimmers until maximum output is obtained. The location of these trimmers is shown in Fig. 3.

1581 KC Adjustment

Set the signal generator for 1581 KC.

Turn the rotor of the tuning condenser to the full open position.

Insert the antenna plug with the mark on the high capacity (HC) side. Connect the shielded antenna lead from the chassis through a 120 mmf. condenser to the antenna post of the signal generator.

For this and all subsequent adjustments, keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained—see Fig. 3 for location of this trimmer.

1400 KC Adjustment

Set the signal generator for 1400 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st detector and antenna 1400 KC trimmers for maximum output.

Do not change the setting of the oscillator trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Tune in this signal and adjust the 600 KC antenna trimmer to maximum. (See Fig. 5 for location of this trimmer).

After the alignment procedure is completed, the antenna plug may be withdrawn and reinserted on the LC side if a low capacity (70 mmf.) car antenna is used.

Adjusting Antenna 600 KC Trimmer

After the radio is installed and the car antenna is connected, it will be necessary to readjust the antenna trimmer. Tune in a weak signal at approximately 600 KC with the volume control about three-fourths on. Turn the adjusting screw of the antenna 600 KC trimmer up or down until maximum output is obtained. See Fig. 5 for location of this trimmer.

Calibrating the Radio

To calibrate the radio, tune in a station of known frequency. At the back of the control head is the calibration screw. Remove the pilot lamp assembly. Hold the tuning knob. Insert a fine blade screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received

Inserting Antenna Plug

IMPORTANT—The antenna plug can be inserted in two ways depending on whether the antenna is of high or low capacity.

If the total capacity of the antenna and shielded lead is approximately 200 mmf., which would be the case in a running board or ordinary roof antenna (not metal roof), insert the antenna plug with the mark on the HC side—See Fig. 5.

If the total capacity of the antenna and shielded lead is approximately 70 mmf., such as may be the case if a "fish pole" antenna is used, insert the antenna plug with the mark on the LC side.

The 1936 Chrysler Motors cars (except Plymouth—but including Chrysler, Dodge and DeSoto) have a steel roof, separated from the body proper, which is used as an antenna. The capacity of these antennas is about 1700 mmf. If this radio is installed in these cars, it will be necessary to use a running board or "fish pole" antenna.

Most 1937 General Motors cars are equipped with an antenna built into the running board which is insulated from the body proper.

If a running board or under-car antenna is used, it must be one which is covered with a suitable insulation, to prevent short circuiting in wet weather.

Changes in Later Models

The "B" and later issues of this series have changes incorporated in them as explained in this article. The issue letter is a large letter stamped on the chassis base.

The "B" and later issue models are different from the "A" issue models in the following respects: The antenna, interstage and oscillator assemblies have been redesigned; condensers C13, 21, 22, and 32 have been changed to a different type with a new part number; the value of condenser C8 has been changed from 70 mmf. to 35 mmf.; condenser C35, 250 mmf., has been added to the circuit. On radios with the

Roof Speaker and Dual Speakers**(1936 Cars)**

The Ford and General Motors 1936 automobiles have provision for mounting a speaker in the car roof (Ford 5¼ inch speaker, General Motors 5¼ or 8 inch speaker). This radio is so designed that roof speaker installations in these cars can readily be made.

Five types of speaker installations can be made as follows:

- Single 6 inch Speaker on Chassis Case Cover
- Single 5¼ inch Roof Speaker
- Single 8 inch Roof Speaker
- Dual 5¼ inch Roof and 6 inch Chassis Speakers
- Dual 8 inch Roof and 6 inch Chassis Speakers.

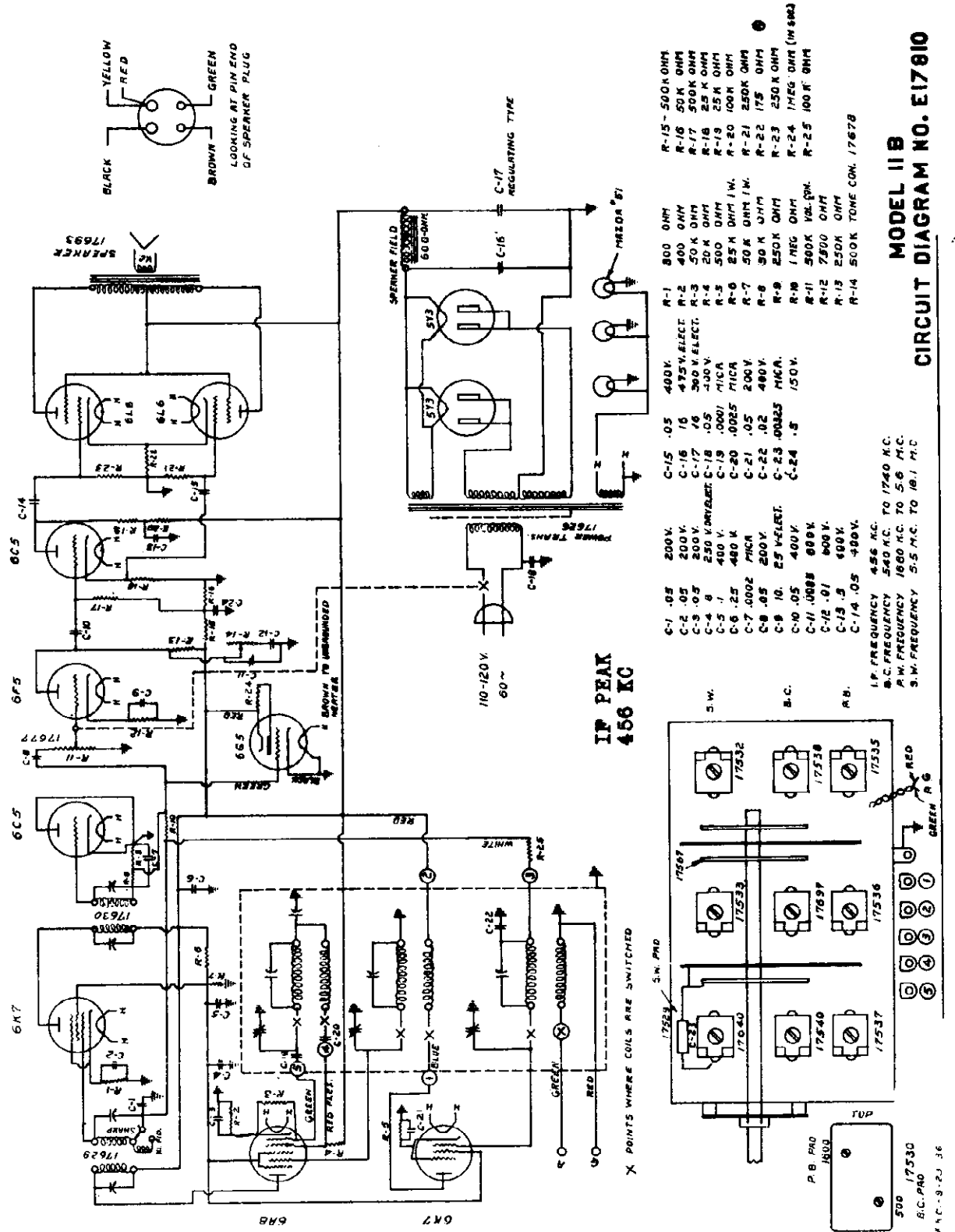
The electrical connections of the different speaker installations are shown in the schematics—Figs. 1 and 2.

Complete information regarding the method of making the installations is in the installation manual packed with each radio. The kits of parts required are listed in the installation manual and in the parts list at the back of this manual.

GAMBLE-SKOGMO, INC.

MODEL 11B Schematic Trimmers, Change

TUBE FUNCTIONS: 6-K-7 RF Stage on all bands, 6-A-8 Oscillator-First detector, 6-K-7 Intermediate amplifier, 6-C-5 Diode second detector, 6-F-5 first audio, 6-C-5 Phase inverter, 2 6-L-6 in push-pull class A Beam power amplifiers, 2 5-Y-3 as rectifiers, 6-G-5 Tuning indicator.



MODEL 11B
CIRCUIT DIAGRAM NO. E17810

CHANGE NOTE FOR HUM REDUCTION:
After Serial 929
R-20 changed to 50K ohms (50,000 ohms), R-13 connected to junction of R-19 and R-20 instead of B+.

MODEL 11B

Alignment
Voltage, Data

GAMBLE-SKOGMO, INC.

IF ALIGNMENT. If all parts and tubes check OK and sensitivity is low on all bands it is probably due to IF being out of adjustment. It is necessary to use a test oscillator or signal generator having accurate calibration and positive attenuation. Proceed as follows:

IF ALIGNMENT. Put wave switch in B. C. position, tone control in normal (not high fidelity), open tuning condenser, connect signal generator to Grid of 6-A-8 tube leaving present cap in place. A small condenser .002-.01 should be used in series with the signal generator lead. Set the signal generator at exactly 456 K. C. and adjust the trimmers in the top of the IF cans, going over them several times and reducing the output of the signal generator as the sensitivity increases, do not reduce by the volume control on the set. The 6-G-5 "Eye" may be watched to indicate "peak" or an output meter may be used, connected across the speaker.

HIGH FREQUENCY ALIGNMENT. This should not be changed unless all other possible defects are eliminated and the set still does not perform properly.

BROADCAST: Connect signal generator to Ant. post thru .0002 condenser. Trim oscillator at 1750 K. C. and pad at 535 K. C. See drawing on circuit diagram for location of trimmer and padding condensers. Trim B. C. Ant. and R. F. coils at 1400 K. C.

POLICE BAND. Trim oscillator at 5.6 M. C. and pad at 1.7 M. C. Trim Ant. and R. F. coils at 4.5 M. C.

SHORT WAVE. Use 400 ohms in series with the signal generator. Trim oscillator at 18 M. C. The pad is fixed so that the low frequency end point is approximately 5.5 M. C. Care should be taken to be sure that the oscillator is trimmed for reception of the fundamental frequency. With the tuning condenser set at the high frequency end, and the signal generator set at 18 M. C., two settings of the oscillator trimmer will be found to give response—one fairly tight and the other, loose—the loose one is the correct setting.

Trim the ant. and R. F. coils on 15 M. C., retuning the tuning condenser to compensate for reaction on the oscillator.

TUNING BELT SLIPPING: Usually due to:

1. Idler spring too loose.
2. Belt worn or stretched.
3. Condenser thrust bearing too tight or not lubricated.
4. Defective gear on condenser.

If the belt only slips slightly it can usually be remedied by applying a small amount of "belt dressing" such as used in machine shops, to the belt while the knob is turned through the entire range. Care should be used to not get too heavy a coating which will build up the pulleys. Idler spring tension may be increased by cutting off about one quarter inch of the spring and forming a new loop on the end. A worn or badly stretched belt should of course be replaced. A tight thrust bearing should be very carefully adjusted, usually one eighth turn to the left on the adjusting screw will be sufficient. A gear may stick due to dirt in the teeth, but if a tooth is damaged, the gear should be replaced, making sure that the floating gear is turned about two "teeth" against the spring to eliminate back lash.

REPLACING DIAL SCALE. Should the dial scale be broken in shipment, or for any reason need to be replaced, care should be taken to see that: the plate that holds the glass is not bent, that the glass lays "flat" on the plate, that there is clearance around the pointer shaft, and that rubber bands are in place on the hold down clamps.

Voltage Readings at 115 volt A. C. Line

ANTENNA OFF — NO SIGNAL

	Plate	Screen	Cathode	Other
6K7 RF	250	80	2	File 6.1
6A8 OSC	250	80	2.2	Anode 170
6K7 IF	250	80	2	
6C5 Diode	0		0	
6L5 1st AF	250V. Scale 65		1	
6C5 Inverter	250V. Scale 110		30	
6L6 Power	245	250	16	
5Y3 Rect.	330AC			File 4.9
Input to Speaker Field 340V.				

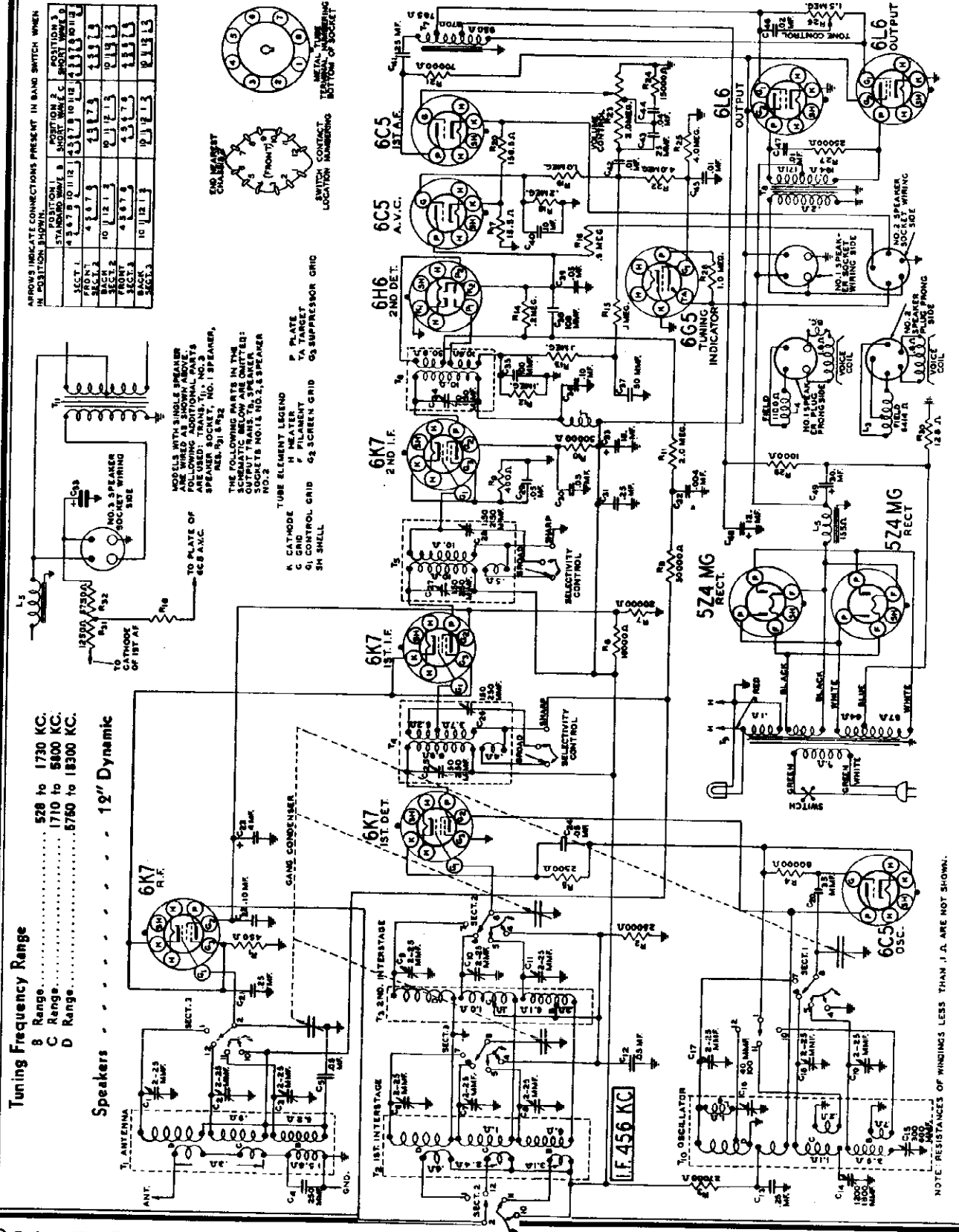
All voltages read from ground except rect. fil. and taken with a 1000 ohm per volt meter. Voltages may vary plus or minus 10% due to tolerances in tubes, resistors, etc., without affecting performance.

GAMBLE-SKOGMO, INC.

MODEL 42DL674
Schematic
Sensitivity

Power Consumption - 170 Watts (At 115 volts 60 cycles)
Power Output - - - - - 20 Watts Undistorted
Selectivity - 19 KC Broad at 1000 times Signal (Sharp)
Intermediate Frequency - - - - - 456 KC.

Sensitivity
B Range..... 1.0 Microvolts Absolute
C Range..... 0.5 to 3 Microvolts Absolute
D Range..... 1.0 to 5 Microvolts Absolute

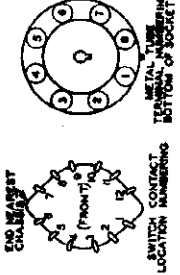


Tuning Frequency Range
B Range..... 528 to 1730 KC.
C Range..... 1710 to 5800 KC.
D Range..... 5750 to 18300 KC.

Speakers - - - - - 12" Dynamic

ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

SECT.	STANDARD SW. 1	STANDARD SW. 2	STANDARD SW. 3	POSITION 1	POSITION 2	POSITION 3
SECT. 1	4 3 7 9 10 11 2	4 3 7 9 10 11 2	4 3 7 9 10 11 2	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1
SECT. 2	4 3 7 9 10 11 2	4 3 7 9 10 11 2	4 3 7 9 10 11 2	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1
SECT. 3	4 3 7 9 10 11 2	4 3 7 9 10 11 2	4 3 7 9 10 11 2	1 1 1 1 1 1 1	1 1 1 1 1 1 1	1 1 1 1 1 1 1



MODELS WITH SINGLE SPEAKER ARE LISTED AS SHOWN ABOVE. FOR MODELS WITH TWO SPEAKERS ARE USED: TRANS. (T), NO. 3 SPEAKER SOCKET, NO. 1 SPEAKER, REL. (R) & (P) 2.

THE FOLLOWING PARTS IN THE OUTPUT TRANSFORMER SPEAKER SOCKETS NO. 1 & NO. 2, & SPEAKER NO. 2

TUBE ELEMENT LEGEND
K. CATHODE H. HEATER P. PLATE
C. CONTROL GRID T.A. TARGET
G1. CONTROL GRID G2. SUPPRESSOR GRID
SH. SHELL

NOTE: RESISTANCES OF WINDINGS LESS THAN 1 Ω ARE NOT SHOWN.

MODEL 42DL670
 Socket, Trimmers
 Coils, Phono Data

GAMBLE-SKOGMO, INC.

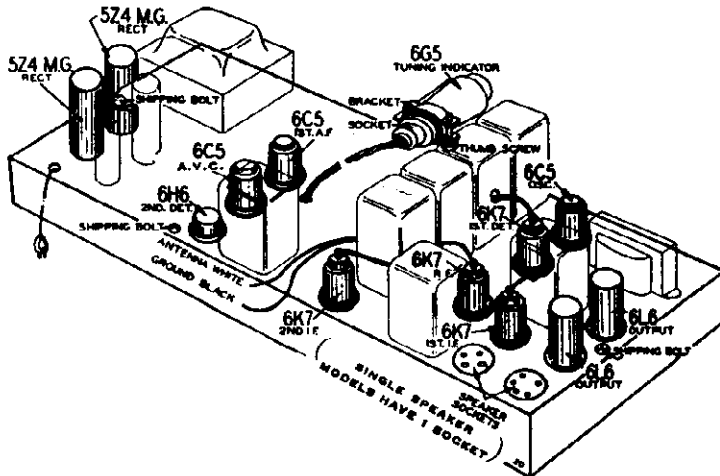


Fig. 5—Location of Tubes

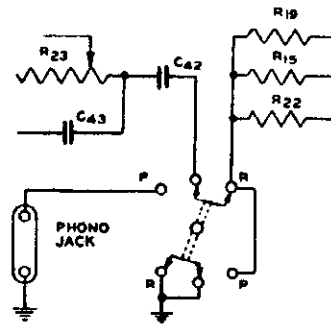


Fig. 7—Phonograph Connections

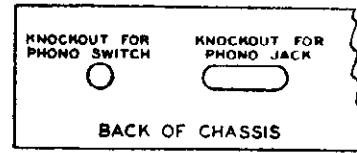


Fig. 8—Location of Phono Knockouts

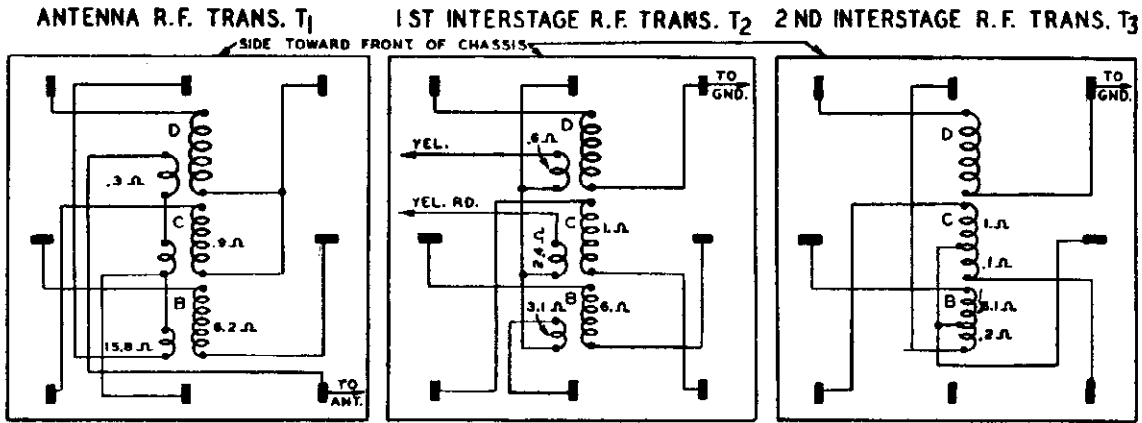


Fig. 6—R.F. and Oscillator Coil Base Terminal Arrangement and D.C. Resistance of Windings

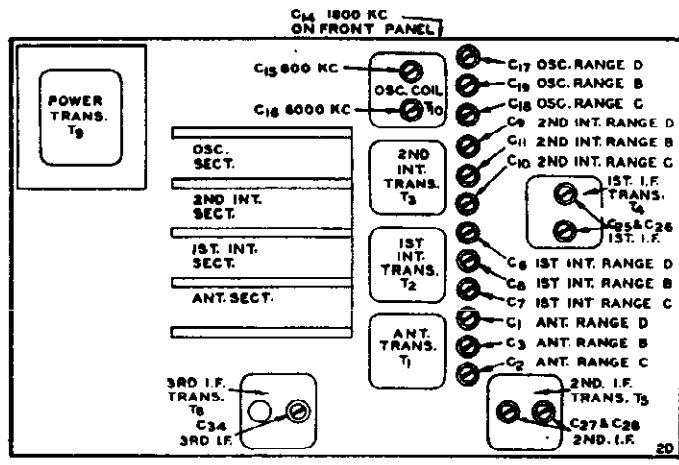
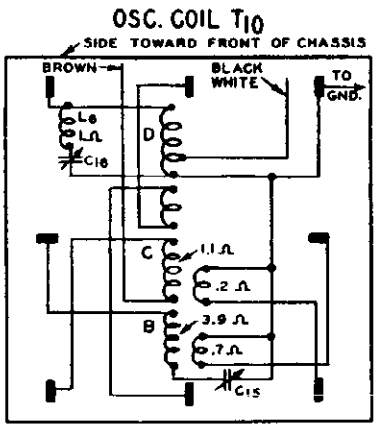


Fig. 3—Location of Trimmers

GAMBLE-SKOGMO, INC.

MODEL 42DL670 Alignment, Voltage Notes

Phonograph Connections

Phonograph connections can be made as shown in Fig. 7. The parts required are shown in the parts list. Knockouts are provided in the back of the chassis for mounting the phono jack and phono switch—See Fig. 8.

The phono switch should be mounted with one set of terminals nearest the bottom of the chassis base.

The connections are made by opening the diode return circuit at the volume control. This is done by removing the wire connecting condenser C42 to resistors R15, R19 and R22, at the terminal strip located near the back of the planetary drive. Cut this wire to correct length and solder it to the proper terminal on the phono switch—See Fig. 7, keeping the wire close to the back of the chassis base.

A wire is then connected from the lug on the above mentioned terminal strip to which C42 was connected, to the correct terminal on the phono switch—See Fig. 7. This wire should be brought directly to the back of the chassis at a point close to the phono jack pin tip nearest the channel provided for a chassis mounting bolt, and then routed over to the switch.

Complete the other connections as illustrated in Fig. 7.

It will be necessary to retrace the AC line cord away from the 6C3 1st audio grid lead by running it between the volume control and the filter choke and then straight back to the hole provided for it in the chassis base.

If a hum is heard when the phono pickup is touched, reverse the two pickup leads.

Twenty-five Cycle Models

The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer is used. The correct power transformer is shown in the parts list.

The twenty-five cycle receiver can be operated satisfactorily from a sixty cycle power supply. However, the reverse is not true, the sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

A 115-210 volt, 40 to 60 cycle as well as other power transformers with special power ratings are also available for this model.

TUBE	FUNCTION	VOLTAGE BETWEEN SOCKET PRONGS AND GROUND (Common connection indicated)										Antenna Shield to Ground Band Switch Standard Wave				
		Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9	Pin 10					
6X7	1st AF	0	4.5(0)	250	110	7.5(0)										
6X7	2nd AF	0	4.5(0)	250	110											
6X7	1st IF	0	4.5(0)	250	110	7.5										
6X7	2nd IF	0	4.5(0)	250	145	8.0										
6X4	2nd Det.	0	4.5(0)	250												
6C5	A.V.C.	0	4.5(0)	250												
6C5	1st A.F.	0	4.5(0)	120												
6A5	Power	0	4.5(0)	250												
6X4-6B	Rectifier	0	4.5(0)	250												
6A8	Tuning Indicator	0	4.5(0)													
6A8	Rectifier	0	4.5(0)	250												
6A8	Tuning Indicator	0	4.5(0)													
6A8	Rectifier	0	4.5(0)	250												

(1) A.C. voltage as read across heater terminals 2 and 7.
(2) Subject to variation.
(3) As read with 500,000 ohm meter.
(4) A.C. voltage as read across heater terminals 2 and 7.
(5) A.C. voltage as read across heater terminals 4 and 5.

Do not change the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Trimmer Replacement

If one trimmer of the gang trimmer strip should become defective, it is not necessary to replace the entire strip. A single trimmer P-17A36, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (side not grounded) of the defective trimmer in the strip. This connection is then made to the single trimmer. Connect it to the side of the trimmer not in contact with the adjusting screw. To other side of the single trimmer it then connects to the grid lead, using a piece of heavy wire in order to support the trimmer. The lead to the replacing trimmer be sure to keep both leads as short as possible and keep the ungrounded lead as far from ground as possible.

Planetary Drive Assembly

The planetary assembly is the unit that is integral with the tuning shaft.

If the nut on the back end of this assembly is too tight, the drive will be very hard to turn and in high speed. If the condenser rotates back off this nut one or two turns and note the effect.

If this nut is too loose, the drive will slip in slow speed. The remedy in this case, of course, is to tighten the nut.

Should the condenser drive cord slip when the planetary pulley is turning, inspect the tuning condenser, drive drum and gears to see if they are running properly or if they are being obstructed in some way.

If the drive turns unevenly (rough in spots), this may mean that the planetary assembly is defective or damaged internally and a new unit will be required.

Range C Alignment

CAUTION—When aligning the short wave bands be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 1900 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 1000 less 917 KC, or 4083 KC. It may be necessary to increase the input signal to hear the image.

5000 KC Adjustment

Set the signal generator for 5000 KC. Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range C position (four short wave band).

Adjust the oscillator Range C trimmer (C18) until maximum output is obtained. See Fig. 3 for location of this trimmer.

5000 KC Adjustment

Set the signal generator for 9000 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st and 2nd intermediate Range C trimmers (C7 and C10) and antenna Range C trimmer (C2) to maximum.

Do not change the setting of the oscillator Range C trimmer.

1800 KC Adjustment

Set the signal generator for 1800 KC. Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 1800 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range D Adjustment

Set the signal generator for 18,300 KC.

Keep the antenna lead of the receiver connected through the 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range D position (second short wave band).

Adjust the oscillator Range D trimmer (C17) until maximum output is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st and 2nd intermediate Range D trimmers (C6 and C9) and antenna Range D trimmer (C1) to maximum.

When adjusting the 2nd intermediate Range D trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

I. F. Adjustment

Set the signal generator for a signal of 416 KC. Connect the output of the signal generator through a .1 mf. condenser to the grid of the 1st detector. Connect the ground lead of the receiver to the ground post of the signal generator.

Turn the band switch to the Range B position (standard wave band).

Turn the selectivity control to the sharp position and keep it in this position for all adjustments.

Turn the volume control to the maximum position. Attenuate the signal from the signal generator to prevent the leveling off action of the AVC.

Then adjust the five I.F. trimmers until maximum output is obtained. The adjusting screws for these controls are reached from the top of the chassis and the location is shown in Fig. 3.

Range B Alignment

After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

1730 KC Adjustment

Set the signal generator for 1730 KC. Turn the rotor of the tuning condenser to the full open position.

Keep the band switch in the standard wave position.

Connect the antenna lead of the receiver through a 200 mf. condenser to the output of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the oscillator Range B trimmer (C19) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

1500 KC Adjustment

Set the signal generator for 1500 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.

In sets using potentiometers, loosen the screw of the large potentiometer, then turn it to the 1500 KC mark on the standard wave band scale. Retighten the screw.

In sets using the moving beam of light, there is moving light assembly held to the front of the drive drum of the frequency counter. Loosen this screw and move the light to the 1500 KC mark on the dial. Retighten the screw.

Adjust the 1st and 2nd intermediate Range B trimmers (C8 and C11) and antenna Range B trimmer (C3) to maximum.

Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment

Set the signal generator for 600 KC. Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

GAMBLE-SKOGMO, INC.

MODEL 46L
Schematic
Coils, Data

Power Consumption . . . 7.0 Amperes at 6.0 Volts
Power Output . . . 3 Watts Undistorted
Sensitivity . . . 1.0 Microvolt Absolute
Selectivity . . . 45 KC Broad at 1000 Times Signal

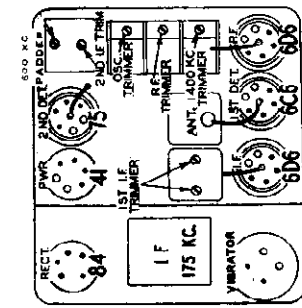


Fig. 2—Location of Tubes and Vibrator

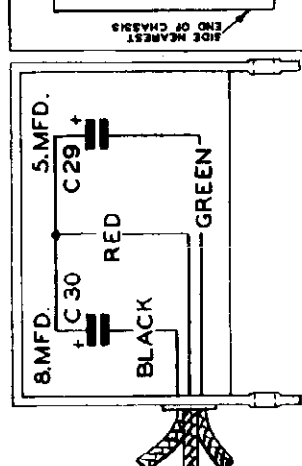
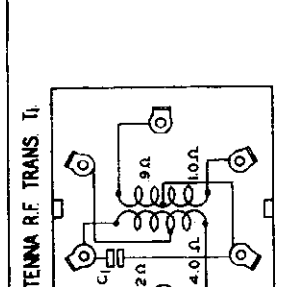
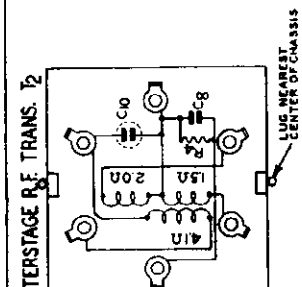
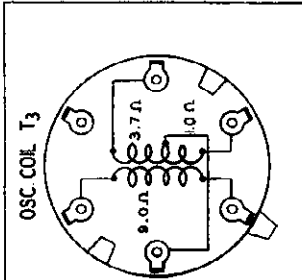
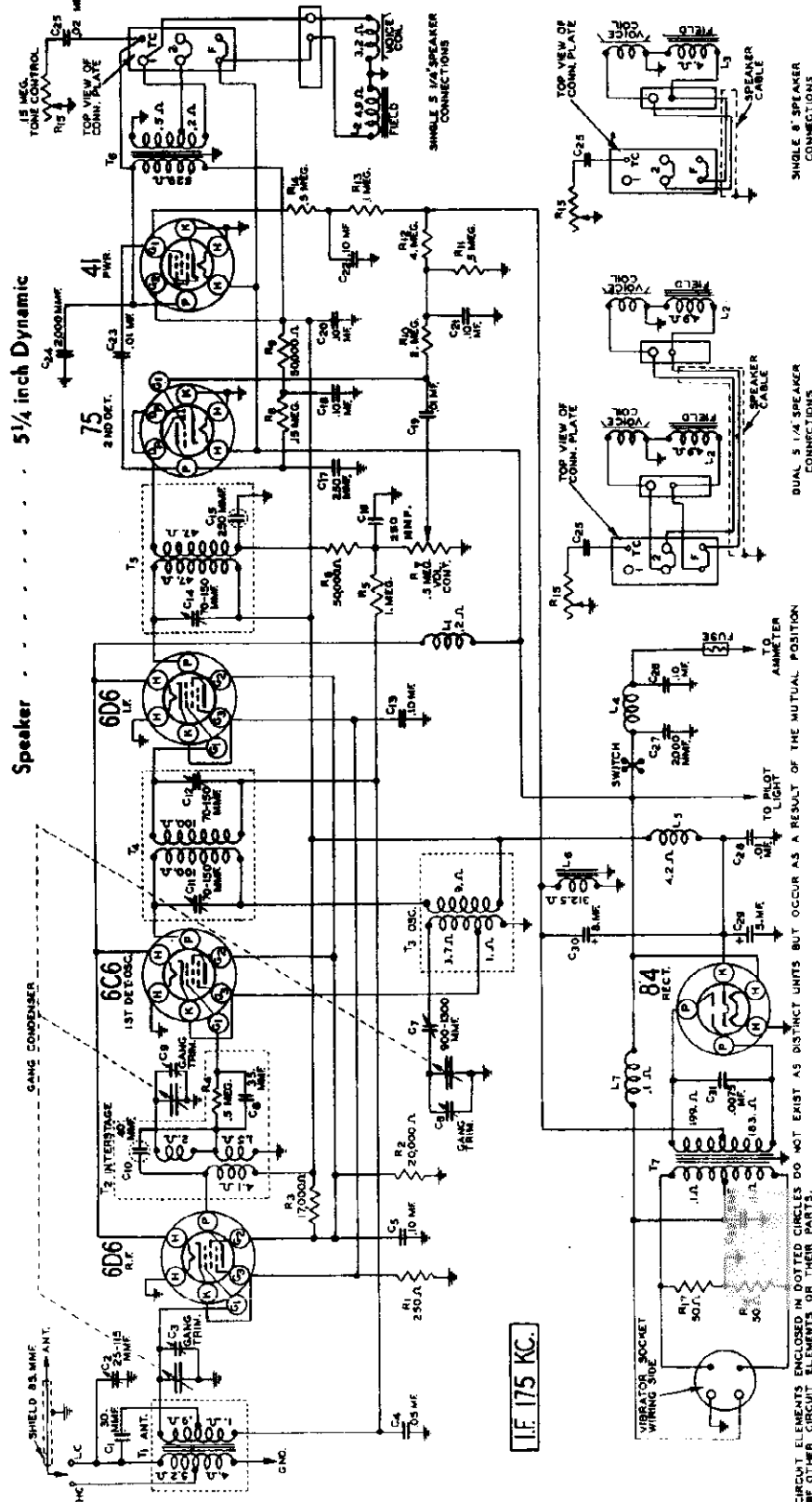


Fig. 4—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

Tuning Frequency Range . . . 530 to 1575 KC
Intermediate Frequency . . . 175 KC
Speaker . . . 5 1/4 inch Dynamic



SINGLE 5 1/4 SPEAKER CONNECTIONS

DUAL 5 1/4 SPEAKER CONNECTIONS

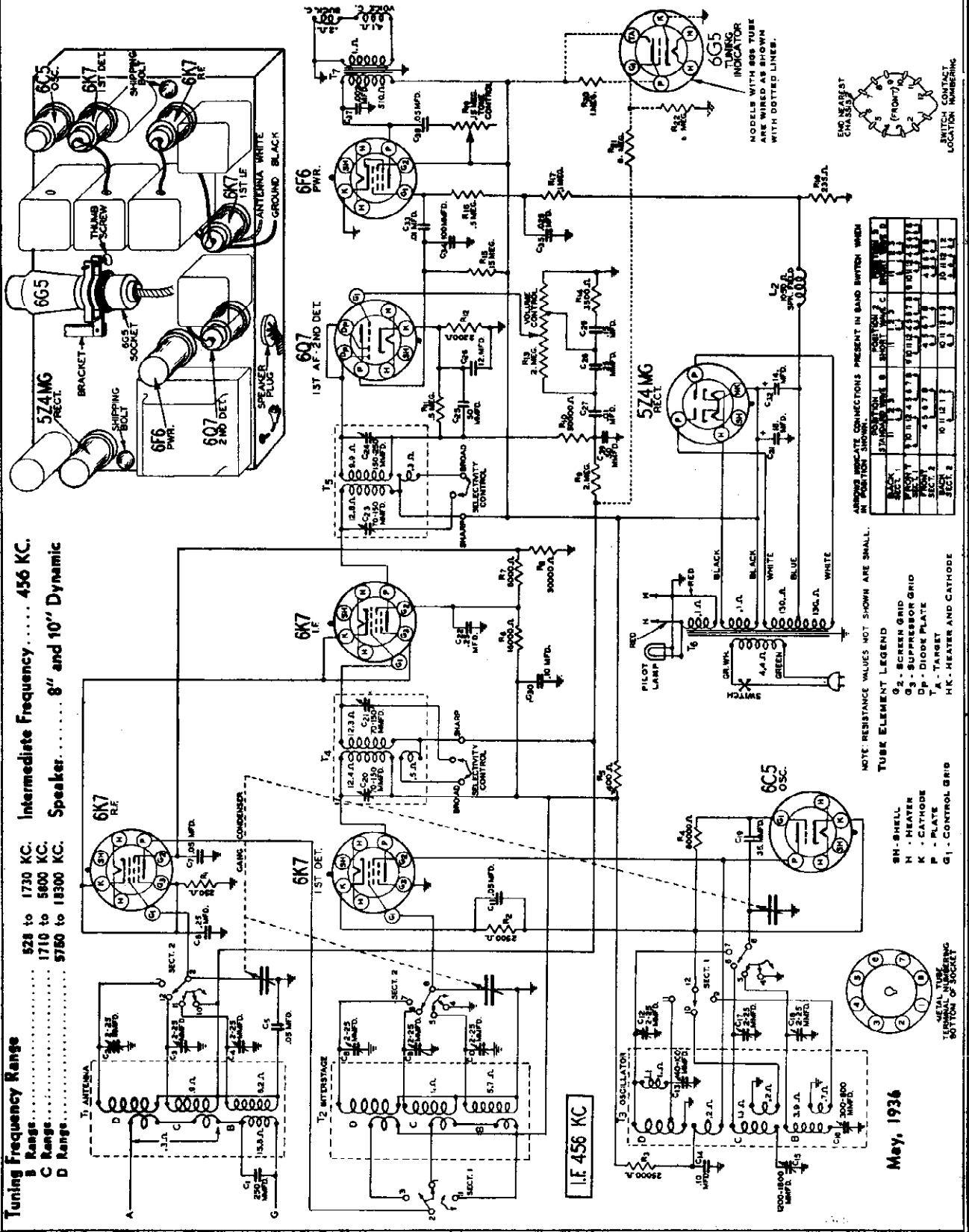
CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS.

GAMBLE-SKOGMO, INC.

MODEL 47LL
Schematic, Socket
Data

Power Consumption . . . 85 Watts (At 115 volts 60 cycles)
Power Output 3 Watts Undistorted
Selectivity 28 KC Broad at 1000 times Signal (Sharp)

Sensitivity
B Range 0.5 to 2 Microvolts Absolute
C Range 0.5 to 2 Microvolts Absolute
D Range 1.0 to 4 Microvolts Absolute



Tuning Frequency Range
B Range 528 to 1730 KC.
C Range 1710 to 5800 KC.
D Range 5750 to 18300 KC.
Intermediate Frequency 456 KC.
Speaker 8" and 10" Dynamic

NOTE: RESISTANCE VALUES NOT SHOWN ARE SMALL.

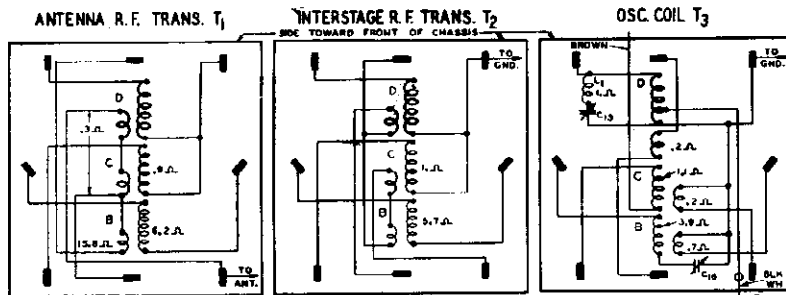
RESISTANCE VALUES NOT SHOWN ARE SMALL.

POSITION	SECTION	RESISTANCE
1	1	100,000 Ω
2	1	100,000 Ω
3	1	100,000 Ω
4	1	100,000 Ω
5	1	100,000 Ω
6	1	100,000 Ω
7	1	100,000 Ω
8	1	100,000 Ω
9	1	100,000 Ω
10	1	100,000 Ω
11	1	100,000 Ω
12	1	100,000 Ω
13	1	100,000 Ω
14	1	100,000 Ω
15	1	100,000 Ω
16	1	100,000 Ω
17	1	100,000 Ω
18	1	100,000 Ω
19	1	100,000 Ω
20	1	100,000 Ω
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36	1	100,000 Ω
37	1	100,000 Ω
38	1	100,000 Ω
39	1	100,000 Ω
40	1	100,000 Ω
41	1	100,000 Ω
42	1	100,000 Ω
43	1	100,000 Ω
44	1	100,000 Ω
45	1	100,000 Ω
46	1	100,000 Ω
47	1	100,000 Ω
48	1	100,000 Ω
49	1	100,000 Ω
50	1	100,000 Ω
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87	1	100,000 Ω
88	1	100,000 Ω
89	1	100,000 Ω
90	1	100,000 Ω
91	1	100,000 Ω
92	1	100,000 Ω
93	1	100,000 Ω
94	1	100,000 Ω
95	1	100,000 Ω
96	1	100,000 Ω
97	1	100,000 Ω
98	1	100,000 Ω
99	1	100,000 Ω
100	1	100,000 Ω

May, 1936

MODEL 47LL
Alignment, Trimmers
Voltage, Coils
Phono Connections

GAMBLE-SKOGMO, INC.



NOTE: RESISTANCE VALUES NOT SHOWN ARE SMALL.
Fig. 4—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

1800 KC Adjustment
Set the signal generator for 1800 KC. Turn the tuning condenser rotor until maximum output is obtained. Turn the rotor slowly back and forth, at the same time adjusting the 1800 KC trimmer, until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

18,300 KC Adjustment
Set the signal generator for 18,300 KC. Keep the antenna lead of the receiver connected through the 400 ohm resistor to the output of the signal generator. Turn the rotor of the tuning condenser to the full open position. Turn the band selector to the Range D position (2nd short wave band). Adjust the oscillator Range D trimmer (C12) until maximum output is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment
Set the signal generator for 15,000 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained. Adjust the interstage Range D trimmer (C8) and antenna Range D trimmer (C2) to maximum. When adjusting the interstage Range D trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained. Do not change the setting of the oscillator Range D trimmer.

6000 KC Adjustment
Set the signal generator for 6000 KC. Turn the tuning condenser rotor until maximum output is obtained. Turn the rotor slowly back and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

antenna Range B trimmer (C4) to maximum.
Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment
Set the signal generator for 600 KC. Turn the tuning condenser rotor until maximum output is obtained. Turn the rotor slowly back and forth, at the same time adjusting the 600 KC trimmer, until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range B Alignment
After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

Range C Alignment
CAUTION—When aligning the short wave bands be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 plus 912 KC, or 4088 KC. It may be necessary to increase the input signal to hear the image.

5800 KC Adjustment
Set the signal generator for 5800 KC. Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator. Turn the rotor of the tuning condenser to the full open position. Turn the band selector to the Range C position (1st short wave band). Adjust the oscillator Range C trimmer (C17) until maximum output is obtained. See Fig. 3 for location of this trimmer.

5000 KC Adjustment
Set the signal generator for 5000 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained. Adjust the interstage Range C trimmer (C9) and antenna Range C trimmer (C3) to maximum. Do not change the setting of the oscillator Range C trimmer.

I. F. Adjustment
Set the signal generator for a signal of 475 KC. Connect the output of the signal generator through a .1 mf. condenser to the grid of the 1st detector. Connect the ground lead of the receiver to the ground post of the signal generator. Turn the band selector to the Range B position (standard wave band). Turn the selectivity control to the sharp position and keep it in this position for all adjustments. Turn the volume control to the maximum position. Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC. Then adjust the four I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 3.

Twenty-five Cycle Receivers
Set the signal generator for 1750 KC. Turn the rotor of the tuning condenser to the full open position. Keep the band selector in the standard wave position. Connect the antenna lead of the receiver through a 200 mf. condenser to the output of the signal generator. For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action. Adjust the oscillator Range B trimmer (C18) until maximum output is obtained. The location of this trimmer is shown in Fig. 3. **1500 KC Adjustment**
Set the signal generator for 1500 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained. Loosen the pointer set screw and set the large pointer at the 1500 KC mark on the standard wave band scale. Retighten the set screw. Adjust the interstage Range B trimmer (C10) and

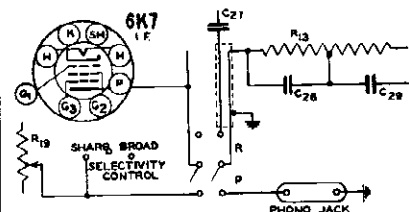


Fig. 7—Phonograph Connections

TOP VIEW OF CHASSIS
Alignment parts locations

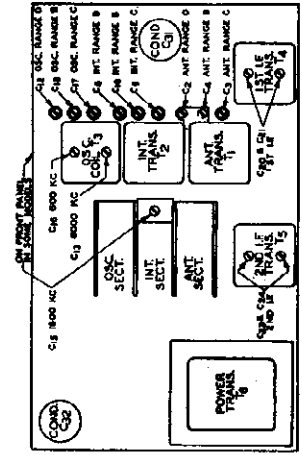


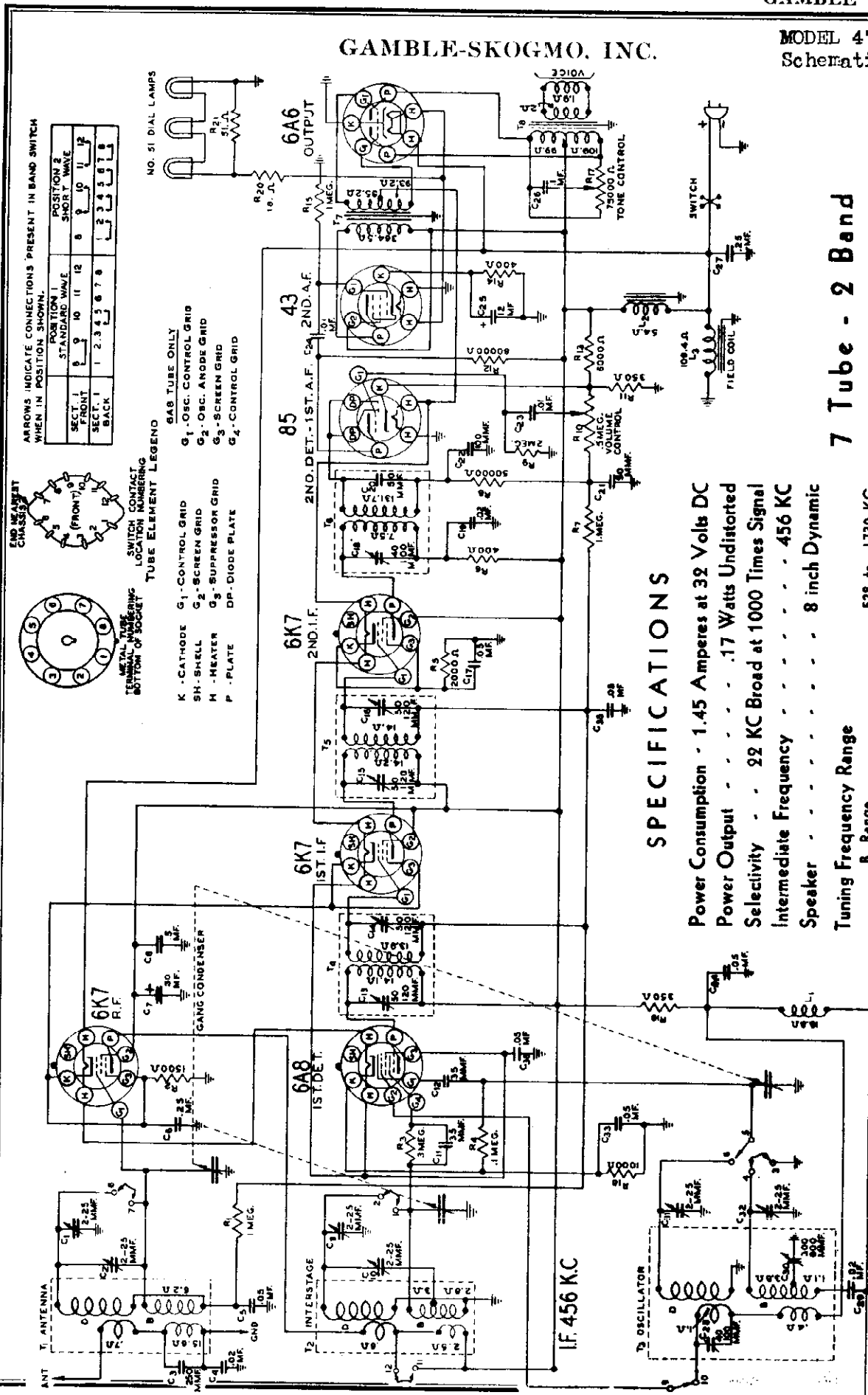
Fig. 3—Location of Trimmers

TUBE	FUNCTION	Position of Band Switch: Standard Wave						Across Heater	
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6		Prong No. 7	Prong No. 8
6K7	RF	0	6.1(3)	240	100	4.0	6.1(1)	4.0	
6K7	1st Det.	0	6.1(3)	240	118	0	6.1(1)	9.0	
6C5	Det.	0	6.1(3)	120	...	0	6.1(1)	0	
6K7	I.F.	0	6.1(3)	240	138	4.0	6.1(1)	4.0	
6Q7	1st A.F.—2nd Det.	0	6.1(3)	105	0	0	6.1(1)	1.4	
6F6	Power Amp.	0	6.1(3)	238	260	18	6.1(1)	0	
5Z4MG	Rect.	0	4.9(2)	...	600(3)	...	6.1(1)	4.9(2)	
6E5	Tuning Indicator	Plate to Ground 30(4)	Target to Ground 270	Cathode to Ground 0	Across Heater 6.1 A.C.				

(1) A.C. voltage as read across heater terminals 4 and 6.
(2) A.C. voltage as read across heater terminals 2 and 8.
(3) A.C. voltage as read across terminals 4 and 6.
(4) A.C. voltage as read across heater terminals 2 and 8.

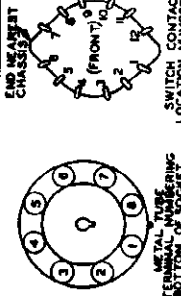
GAMBLE-SKOGMO, INC.

MODEL 47P608
Schematic, Data



ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

SECT. I	SECT. II	POSITION 1	POSITION 2
FRONT	BACK	STANDARD WAVE	SHORT WAVE
1	1	9	10
2	2	11	11
3	3	12	12
4	4	13	13
5	5	14	14
6	6	15	15
7	7	16	16
8	8	17	17
9	9	18	18
10	10	19	19
11	11	20	20
12	12	21	21
13	13	22	22
14	14	23	23
15	15	24	24
16	16	25	25
17	17	26	26
18	18	27	27
19	19	28	28
20	20	29	29
21	21	30	30
22	22	31	31
23	23	32	32
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75	75	84	84
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77	77	86	86
78	78	87	87
79	79	88	88
80	80	89	89
81	81	90	90
82	82	91	91
83	83	92	92
84	84	93	93
85	85	94	94
86	86	95	95
87	87	96	96
88	88	97	97
89	89	98	98
90	90	99	99
91	91	100	100



END VIEW OF CHASSIS

METAL TUBE SOCKET TERMINAL NUMBERING

SWITCH CONTACT LOCATION NUMBERING

TUBE ELEMENT LEGEND

6A8 TUBE ONLY

G₁ - OSC. CONTROL GRID
G₂ - OSC. ANODE GRID
G₃ - SCREEN GRID
G₄ - CONTROL GRID

K - CATHODE
SH - SHELL
H - HEATER
P - PLATE
DP - DIODE PLATE

SPECIFICATIONS

- Power Consumption - 1.45 Amperes at 32 Volts DC
- Power Output - .17 Watts Undistorted
- Selectivity - 22 KC Broad at 1000 Times Signal
- Intermediate Frequency - 456 KC
- Speaker - 8 inch Dynamic
- Tuning Frequency Range
 - B Range - 528 to 1730 KC
 - D Range - 5650 to 16000 KC
- Sensitivity
 - B Range - 4 Microvolts Absolute
 - D Range - 6 Microvolts Absolute

7 Tube - 2 Band
32 Volt D. C. Radio

October, 1936

MODEL 47P608
Voltage, Trimmers
Socket, Coils
Data

GAMBLE-SKOGMO, INC.

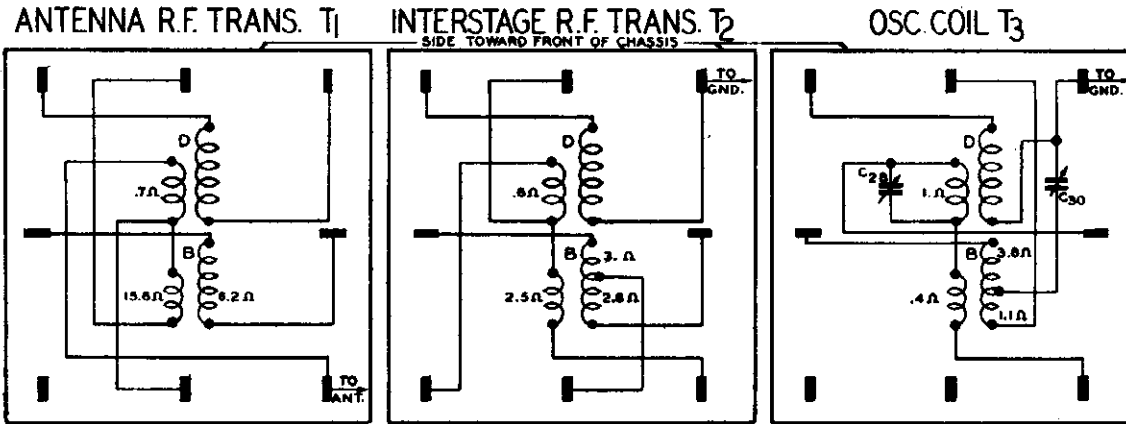


Fig. 4—R.F. and Oscillator Coil Base Terminal Arrangement and D.C. Resistance of Windings

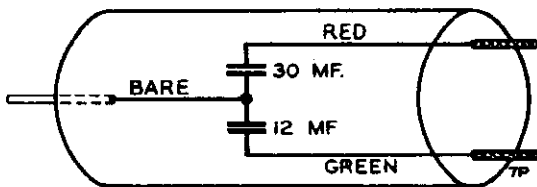


Fig. 5—Electrolytic Condenser Internal Connections

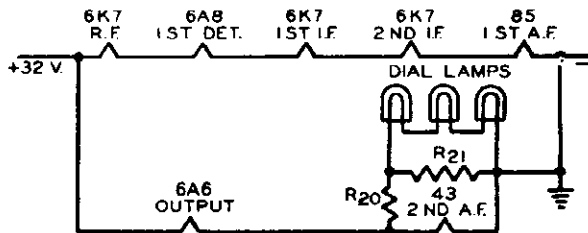


Fig. 7—Abridged Wiring Diagram Showing Tube Heater and Dial Lamp Wiring System

VOLTAGES AT SOCKETS					
Volume Control at Maximum			Antenna Shorted to Ground		
Line Voltage: 32					
Type of Tube	Function	Across Filament	Plate to Ground	Screen to Ground	Cathode to Ground
6K7	R.F.	6.3(1)	31	31	3.2
6A8	1st Det. and Osc.	6.3(1)	31 31(2)	20	1.25
6K7	1st I.F.	6.3(1)	31	31	3.2
6K7	2nd I.F.	6.3(1)	31	31	3.0
85	2nd Det. and 1st A.F.	6.3(1)	10		1.5
43	2nd A.F.	26.0(1)	28.2	31	3.2
6A6	Output	6.0(1)	31		6.4(3)

- (1) Subject to Variation
- (2) Anode Grid to Ground
- (3) Center Tap of Output Transformer to Ground

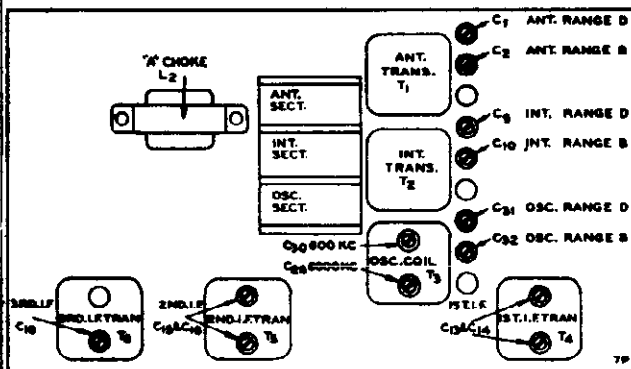


Fig. 3—Location of Trimmers

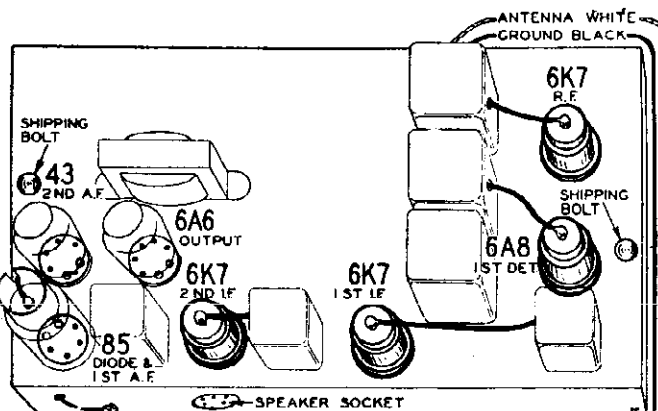


Fig. 6—Tube Arrangement

GAMBLE-SKOGMO, INC.

MODEL 47P608
Alignment
Power Supply Notes
Notes

7 TUBE - 2 BAND

32 VOLT D.C. RADIO

OCTOBER 1936

ALIGNMENT & NOTES

I. F. Adjustment

Set the signal generator for a signal of 456 KC.

Connect the output of the signal generator through a .1 mf. condenser to the grid of the 1st detector (G₁).

Connect the ground lead of the radio to the ground post of the signal generator.

Turn the band switch to the Range B position (standard wave band).

Turn the volume control to the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.

Then adjust the five I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 3.

Range B Alignment

After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

1730 KC Adjustment

Set the signal generator for 1730 KC.

Turn the rotor of the tuning condenser to the full open position.

Keep the band switch in the standard wave position.

Connect the antenna lead of the radio through a 200 mmf. condenser to the output of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the oscillator Range B trimmer (C32) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

1500 KC Adjustment

Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Loosen the pointer screw and set the pointer at the 1500 KC mark on the standard wave band scale. Retighten the screw.

Adjust the interstage Range B trimmer (C10) and antenna Range B trimmer (C2) to maximum.

Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer (C30) until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range D Alignment

CAUTION—When aligning the short wave band be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC., or 14,088 KC. It may be necessary to increase the input signal to hear the image.

ary to increase the input signal to hear the image.

16,000 KC Adjustment

Set the signal generator for 16,000 KC.

Connect the antenna lead of the radio through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range D position (short wave band).

Adjust the oscillator Range D trimmer (C31) until maximum output is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range D trimmer (C9) and antenna Range D trimmer (C1) to maximum. When adjusting these trimmers, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

Do not change the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC (C28) trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Antenna and Ground

Run the antenna at right angles to any 32 volt lines and keep it as far away from these lines as possible, in order to avoid line noise being carried into the radio via the antenna.

A ground connection may be obtained by connecting to a water pipe, a pipe driven in the ground, or the metal jacket of a water pump. Do not ground the receiver to the 32 volt system conduit or fittings at any point.

CAUTION—Read the Following

To avoid the danger of damage to the radio and accidental short circuit, the following facts should be understood.

The metal chassis is connected to one side of the line—See Fig. 2. 32 volt lines are generally grounded on one side—either side may be used. If the side of the line, not connected to the metal chassis, is grounded and the metal chassis comes in contact with the external ground, the line will be short circuited and an excessive current may result.

In any service work, therefore, on this chassis keep it on a wood or other insulated surface. Disconnect the antenna and ground leads to avoid the possibility of any external ground contacts with the chassis. The person working on the set should avoid coming in contact with any ground.

32 Volt Power Supply

Polarity of Power Supply

There is a red mark on the plug at the end of the power supply cord of the radio. The prong of the plug at which the red mark is placed must be plugged into the positive side of the line.

Use a receptacle on the 32 volt line from which the plug will not have to be removed after it has once been inserted correctly.

If the polarity of the line is not known, that is, if it is not known which side of the line is positive, a meter may be used to indicate the polarity. A voltmeter of 50 volt range or up is used. Connect the meter across the line. If the pointer deflects correctly, then the positive post of the meter is connected to the positive side of the line.

If the polarity of the line is not known and there is no way of determining it, insert the power supply plug, turn on the set, advance the volume control and proceed to tune the radio. If no sounds are heard from the speaker after the plug has been in two minutes, withdraw the plug, turn it around and re-insert it. This time sounds should be heard after the tubes have been heated.

Caution

If used on any other type of power supply than 32 volt DC, severe damage may be done to the receiver.

Do not turn the radio on unless all of the tubes and the dial lamps are in the proper sockets. Use only No. 51 bayonet pin base lamps.

Do not leave the plug inserted for more than five minutes if it is found that the radio does not operate.

Line Voltage Range

The radio will operate satisfactorily within a line voltage range of 25 to 42 volts.

Series Resistor

If the line voltage is higher than 42, it will be necessary to use a series resistor to cut it down. If the voltage varies, a variable resistor may be required.

Starting Current

When first turned on, the drain for a few seconds is slightly higher than normal until the tubes heat up. Some automatic plants are adjusted to start under a load of 200 to 300 watts. If a number of devices such as lights or motors are being used and the radio set is turned on the total drain may be sufficient to start the plant.

Eliminating Ignition and Generator Noise

After the radio is in working order, the following procedure must be followed in practically all cases to eliminate ignition and generator noise caused by the charging plant. If the charging plant causes no noise, then of course, these steps do not have to be taken.

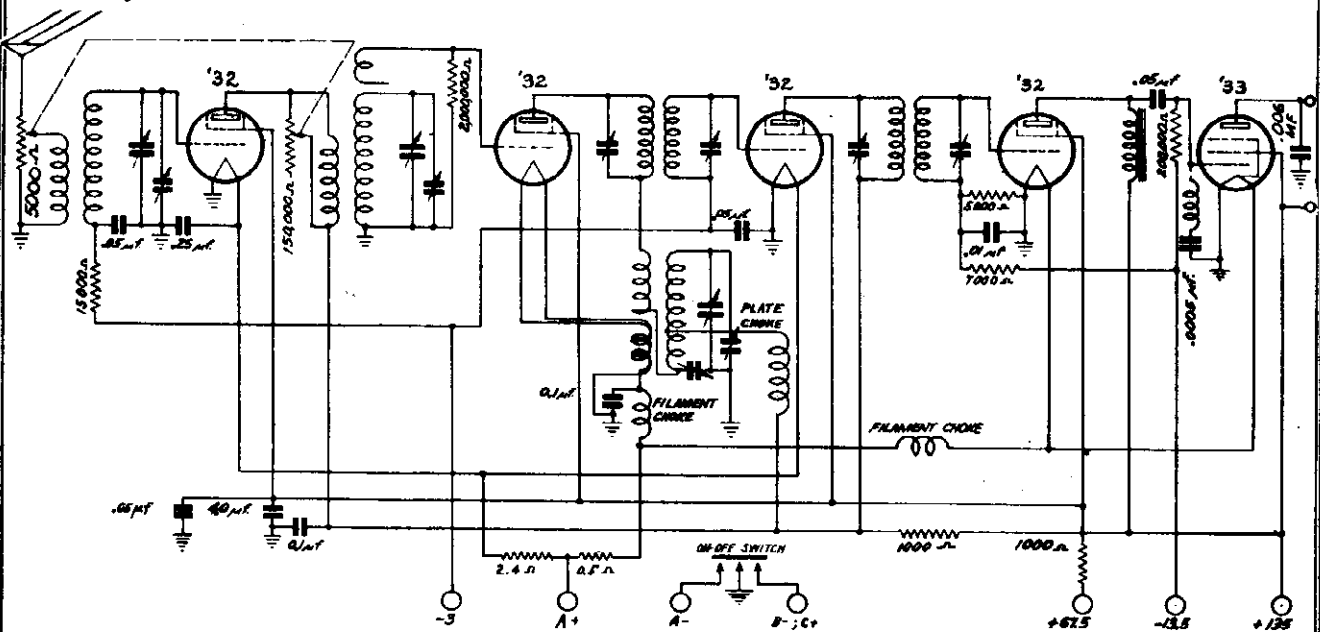
One spark plug suppressor must be placed on each spark plug of the engine. One spark plug for example would be required on a one-cylinder engine and four must be used on a four-cylinder engine. To connect the spark plug suppressor, remove the wire from the top of the plug, put the suppressor on and attach the wire to the other end of the suppressor.

A generator condenser must be used. This consists of two .5 mf. sections in one unit. The two sections have one side grounded to the metal case of the condenser. Mount the condenser on the frame of the charging plant. This will ground it. Then connect the two leads to the charging switch, one on each side of the line.

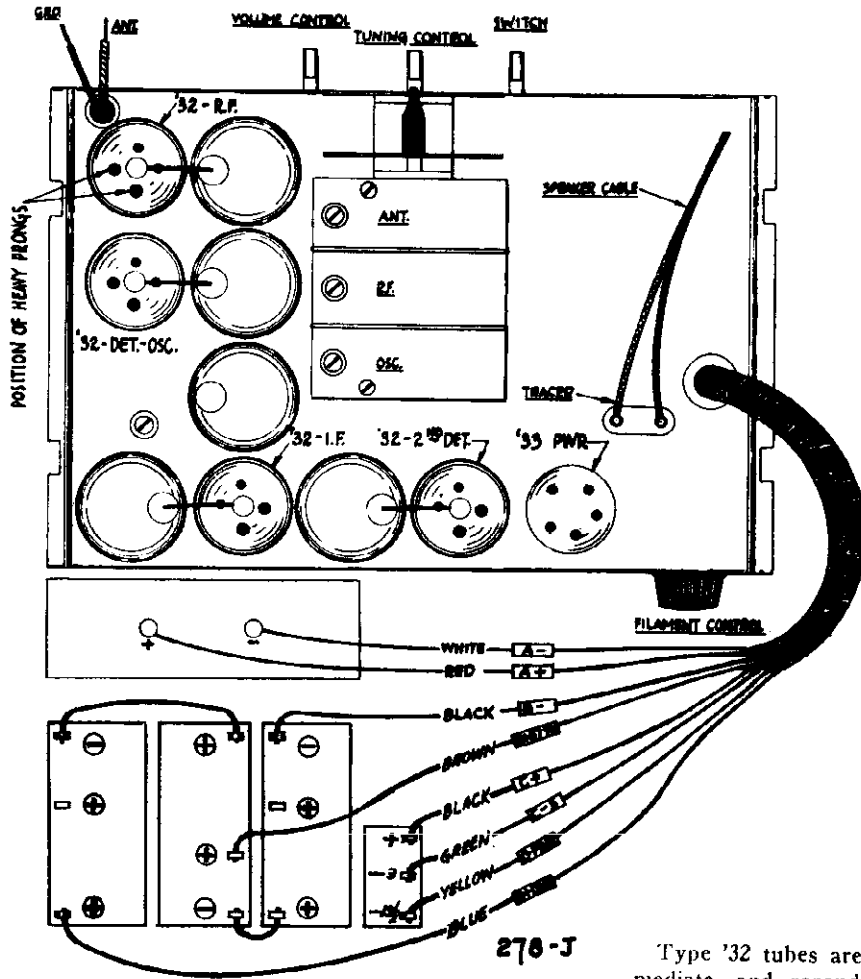
In some large installations, where the charging unit is on only two or three times a week, the above steps do not have to be taken as interference is caused only when the generating plant is in operation.

MODEL 90
Schematic
Socket, Notes

GAMBLE-SKOGMO, INC.



CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION



IF PEAK 175 KC

Circuit

This chassis has one stage of radio frequency amplification, a combined detector and oscillator, one stage of intermediate frequency amplification, a second detector, and one stage of audio frequency amplification. The intermediate stage operates at a frequency of 175 K.C. All stages are transformer coupled with the exception of the audio stage which is coupled to the detector by a choke, condenser and resistor network.

The plate choke in the oscillator circuit has been substituted for the 15,000 ohm resistor to allow wider limits on the tube used in this circuit.

The complete chassis is mounted on rubber to prevent any vibration being transmitted to the tubes.

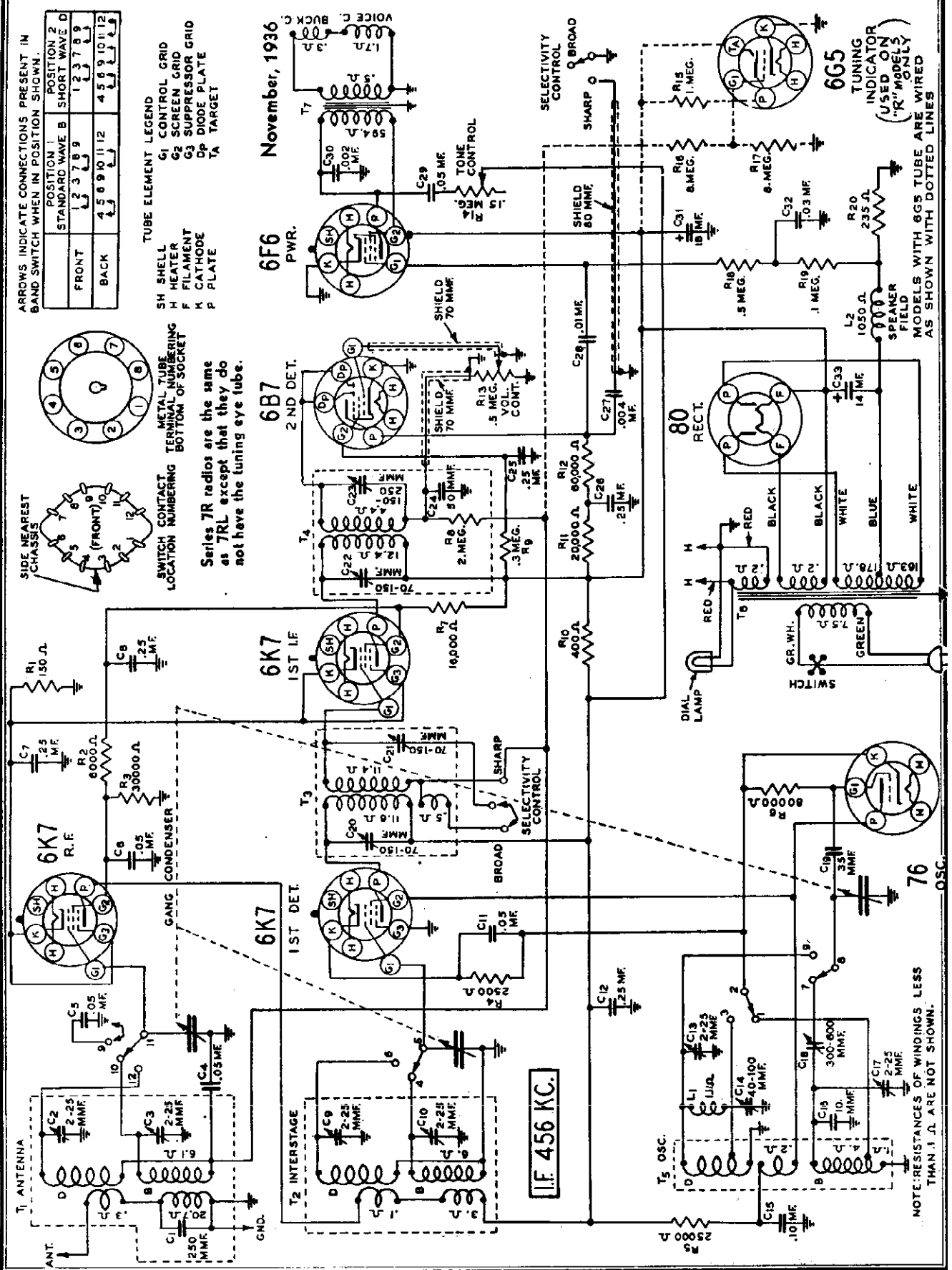
Tubes

Type '32 tubes are used in the R.F., 1st detector, intermediate, and second detector stages. The audio output tube is a type '33 pentode.

Figure 2. Top View of Chassis

GAMBLE-SKOGMO, INC.

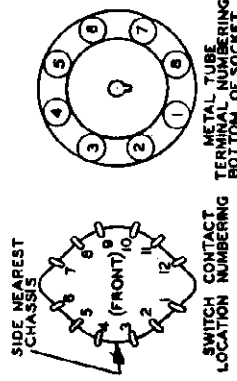
MODELS 47R, 47RL
Schematic



ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

	POSITION 1	POSITION 2
STANDARD WAVE	1 2 3 7 8 9	1 2 3 7 8 9
SHORT WAVE	4 5 6 9 10 11 12	4 5 6 9 10 11 12

TUBE ELEMENT LEGEND
 SH SHELL
 H HEATER
 F FILAMENT
 K CATHODE
 P PLATE
 G1 CONTROL GRID
 G2 SCREEN GRID
 G3 SUPPRESSOR GRID
 DP DIODE PLATE
 TA TARGET



Series 7R radios are the same as 7RL except that they do not have the tuning eye tube.

665 TUNING INDICATOR (USED ON "R" MODELS ONLY)
 MODELS WITH 6G5 TUBE ARE WIRED AS SHOWN WITH DOTTED LINES

NOTE: RESISTANCES OF WINDINGS LESS THAN 1 Ω. ARE NOT SHOWN.

MODELS 47R, 47RL
Voltage, Socket
Trimmers, Coils
Sensitivity

GAMBLE-SKOGMO, INC.

SPECIFICATIONS

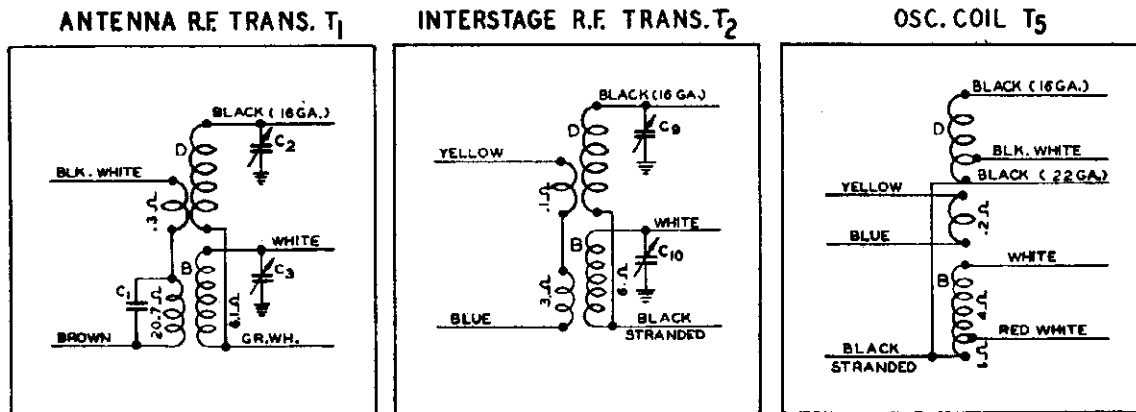
Power Consumption - 71 Watts (At 115 volts 60 cycles)
Power Output - 3 Watts Undistorted
Selectivity - 28 KC Broad at 1000 times Signal (Sharp)
Intermediate Frequency - 456 KC.
Speaker - 8" Dynamic

Tuning Frequency Range

B Range 535 to 1730 KC.
D Range 5.75 to 18.3 MC.

Sensitivity

B Range Average5 Microvolts Absolute
D Range Average 2.0 Microvolts Absolute



NOTE: RESISTANCES OF WINDINGS LESS THAN .1 Ω ARE NOT SHOWN

Fig. 4—R.F. and Oscillator Coil Base Terminal Arrangement and D.C. Resistance of Windings

VOLTAGES AT SOCKETS

Line Voltage: 115
Volume Control: Maximum
Antenna Shorted to Ground
Band Switch: Standard Wave

Tube	Function	Across Filament	Plate to Ground	Screen to Ground	Cathode to Ground
6K7	R.F.	6.2	245	105	2.8
6K7	1st Det.	6.2	245	105	9.0
76	Osc.	6.2	105		
6K7	1st I.F.	6.2	250	130	2.8
6B7	2nd Det.	6.2	50	35	
6F6	Output	6.2	230	250	17(1)
80	Rectifier	5.0			
6G5	Tuning Eye	6.2	25	250	

(1) As read across resistor, R20.

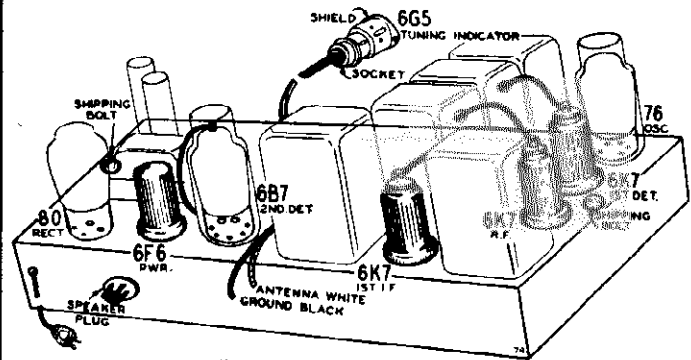


Fig. 5—Location of Tubes

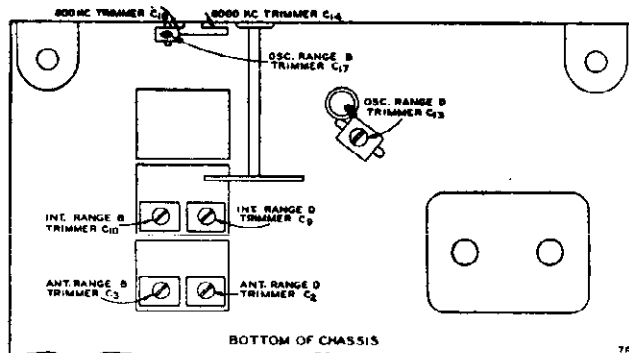
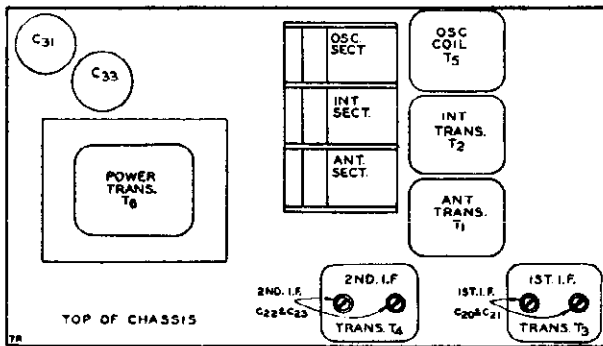


Fig. 3—Location of Trimmers

GAMBLE-SKOGMO, INC.

MODELS 47R, 47RL Alignment, Notes Parts

Part No.	Description	Price
P-1000	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1001	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1002	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1003	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1004	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1005	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1006	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1007	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1008	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1009	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1010	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00

DIAL AND DRIVE ASSEMBLY

Part No.	Description	Price
P-1011	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1012	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1013	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1014	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1015	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1016	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1017	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1018	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1019	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1020	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00

CONDENSERS

Part No.	Code	Capacitance	Voltage	Price
P-1021	000000000000000000	100	50	1.00
P-1022	000000000000000000	100	50	1.00
P-1023	000000000000000000	100	50	1.00
P-1024	000000000000000000	100	50	1.00
P-1025	000000000000000000	100	50	1.00
P-1026	000000000000000000	100	50	1.00
P-1027	000000000000000000	100	50	1.00
P-1028	000000000000000000	100	50	1.00
P-1029	000000000000000000	100	50	1.00
P-1030	000000000000000000	100	50	1.00

ELECTROLYTIC

Part No.	Code	Capacitance	Voltage	Price
P-1031	000000000000000000	100	50	1.00
P-1032	000000000000000000	100	50	1.00
P-1033	000000000000000000	100	50	1.00
P-1034	000000000000000000	100	50	1.00
P-1035	000000000000000000	100	50	1.00

MOLDED

Part No.	Code	Capacitance	Voltage	Price
P-1036	000000000000000000	100	50	1.00
P-1037	000000000000000000	100	50	1.00
P-1038	000000000000000000	100	50	1.00
P-1039	000000000000000000	100	50	1.00
P-1040	000000000000000000	100	50	1.00

TRIMMER

Part No.	Code	Capacitance	Voltage	Price
P-1041	000000000000000000	100	50	1.00
P-1042	000000000000000000	100	50	1.00
P-1043	000000000000000000	100	50	1.00
P-1044	000000000000000000	100	50	1.00
P-1045	000000000000000000	100	50	1.00

MISCELLANEOUS

Part No.	Code	Capacitance	Voltage	Price
P-1046	000000000000000000	100	50	1.00
P-1047	000000000000000000	100	50	1.00
P-1048	000000000000000000	100	50	1.00
P-1049	000000000000000000	100	50	1.00
P-1050	000000000000000000	100	50	1.00

RESISTORS

Part No.	Code	Capacitance	Voltage	Price
P-1051	000000000000000000	100	50	1.00
P-1052	000000000000000000	100	50	1.00
P-1053	000000000000000000	100	50	1.00
P-1054	000000000000000000	100	50	1.00
P-1055	000000000000000000	100	50	1.00

CARBON

Part No.	Code	Capacitance	Voltage	Price
P-1056	000000000000000000	100	50	1.00
P-1057	000000000000000000	100	50	1.00
P-1058	000000000000000000	100	50	1.00
P-1059	000000000000000000	100	50	1.00
P-1060	000000000000000000	100	50	1.00

WIRE WOUND

Part No.	Code	Capacitance	Voltage	Price
P-1061	000000000000000000	100	50	1.00
P-1062	000000000000000000	100	50	1.00
P-1063	000000000000000000	100	50	1.00
P-1064	000000000000000000	100	50	1.00
P-1065	000000000000000000	100	50	1.00

VALVES

Part No.	Code	Capacitance	Voltage	Price
P-1066	000000000000000000	100	50	1.00
P-1067	000000000000000000	100	50	1.00
P-1068	000000000000000000	100	50	1.00
P-1069	000000000000000000	100	50	1.00
P-1070	000000000000000000	100	50	1.00

Please specify to change without notice.

control electrode. When the signal is tuned to resonance, practically no plate current flows and the voltage of the control electrode is the same as that of the target. There is no opposition to the flow of electrons to the target. Tuning of resonance decreases the control electrode voltage and causes the distorted sector of the target to widen, because of the opposition to the flow of electrons in the direction of the control electrode.

Referring to the 1st I.F. transformer T3 in Fig. 2, it will be noted that there is a coupling winding shown below the primary.

When the selectivity control is in the sharp position, the coupling winding is open circuited and the loose coupling which exists between the primary and secondary of this transformer results in high selectivity; also, the plate of the audio section of the 6B7 tube is bypassed by condenser C17.

When the selectivity control is in the broad position, the coupling winding which is wound under the primary is connected in series with the secondary. This provides overcoupling which results in a wide greatly softened resonance curve. Passage of a wide range of audio frequencies is thus obtained. Condenser C17 is connected in this position to avoid bypassing the higher audio frequencies.

When the selectivity control is in the broad position, the coupling winding which is wound under the primary is connected in series with the secondary. This provides overcoupling which results in a wide greatly softened resonance curve. Passage of a wide range of audio frequencies is thus obtained. Condenser C17 is connected in this position to avoid bypassing the higher audio frequencies.

When the selectivity control is in the broad position, the coupling winding which is wound under the primary is connected in series with the secondary. This provides overcoupling which results in a wide greatly softened resonance curve. Passage of a wide range of audio frequencies is thus obtained. Condenser C17 is connected in this position to avoid bypassing the higher audio frequencies.

Replacement Parts

NOTE—There is a large letter on the sheets which identifies the set as to make part changes. When ordering parts, please be sure to mention the make number and the large letter.

MISCELLANEOUS

Part No.	Description	Price
P-1071	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1072	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1073	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1074	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1075	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1076	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1077	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1078	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1079	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1080	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00

SOCKETS

Part No.	Description	Price
P-1081	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1082	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1083	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1084	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1085	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00

SPEAKER

Part No.	Description	Price
P-1086	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1087	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1088	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1089	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1090	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00

RINGS

Part No.	Description	Price
P-1091	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1092	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1093	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1094	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1095	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00

GENERAL

Part No. Description Price
P-1096 1000 Ohm, 1/2 Watt, Carbon Film Resistor 1.00
P-1097 1000 Ohm, 1/2 Watt, Carbon Film Resistor 1.00
P-1098 1000 Ohm, 1/2 Watt, Carbon Film Resistor 1.00
P-1099 1000 Ohm, 1/2 Watt, Carbon Film Resistor 1.00
P-1100 1000 Ohm, 1/2 Watt, Carbon Film Resistor 1.00
P-1101 1000 Ohm, 1/2 Watt, Carbon Film Resistor 1.00
P-1102 1000 Ohm, 1/2 Watt, Carbon Film Resistor 1.00
P-1103 1000 Ohm, 1/2 Watt, Carbon Film Resistor 1.00
P-1104 1000 Ohm, 1/2 Watt, Carbon Film Resistor 1.00
P-1105 1000 Ohm, 1/2 Watt, Carbon Film Resistor 1.00

TRANSFORMERS AND COILS

Part No.	Description	Price
P-1106	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1107	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1108	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1109	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1110	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1111	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1112	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1113	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1114	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00
P-1115	1000 Ohm, 1/2 Watt, Carbon Film Resistor	1.00

Turn the band switch to the Range D position (short wave band).
Adjust the oscillator Range D trimmer (C13) until maximum output is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.
Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range D trimmer (C9) and antenna Range D trimmer (C3) to maximum.
When adjusting the interstage and antenna Range D trimmers it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

Then go back and repeat the procedure as given for the 15,000 KC adjustment. If it is found necessary to make any appreciable change in the setting of the oscillator rotor, wave trimmer, the 15,000 KC adjustment must be repeated.

Do not change the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.
Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Twenty-five Cycle Models
The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer is used. The correct power transformer is shown in the parts list.

The twenty-five cycle receiver can be operated satisfactorily from a sixty cycle power supply. However, the reverse is not true, the sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

A 117-230 volt, 40 to 60 cycle as well as other power transformers with special power ratings are also available for this model.

General Data
The models with the tuning indicator tube are wired as shown in the schematic. This tube contains a triode and cathode ray section in one envelope.

The cathode ray is produced by the attraction of electrons from the upper end of the cathode to the coated target or anode which is operated at a high positive potential. When this electron stream strikes the target the coating glows. The electron stream is controlled by an additional element, or control electrode, in the tube.

As a signal is tuned in, the control grid of the triode section of the 6C5 cathode ray tube becomes increasingly negative, the negative bias voltage is taken from the AVC line. The AVC voltage is reduced to a suitable value by the voltage divider arrangement of the 8 megohm resistors. The increased bias voltage reduces the triode plate current. This reduces the voltage drop across the 1 megohm plate resistor and raises the triode plate voltage. The triode plate is connected to the control electrode of the cathode ray section of the tube.

The shape and size of the area on the target struck by the cathode ray is governed by the voltage of the

I. F. Adjustment
Set the signal generator for a signal of 456 KC.
Connect the output of the signal generator through a .1 microfarad capacitor to the grid of the 1st detector.

Connect the ground lead of the receiver to the ground post of the signal generator.
Turn the band switch to the Range B position (standard wave band).

Turn the selectivity control to the sharp position and keep it in this position for all adjustments.
Turn the volume control to the maximum position.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.
Then adjust the four I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 3.

Range B Alignment

After the procedure for the adjustment of each range, as explained below, is completed, it is advisable to repeat the procedure on a final check.

1730 KC Adjustment

Set the signal generator for 1730 KC.
Turn the rotor of the tuning condenser to the full open position.

Keep the band switch in the standard wave position.
Connect the antenna lead of the receiver through a 200 microfarad capacitor to the output of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the oscillator Range B trimmer (C17) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

1500 KC Adjustment
Set the signal generator for 1500 KC.
Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Loosen the pointer set screw and set the pointer at the 1500 KC mark on the standard wave band scale. Retighten the set screw.

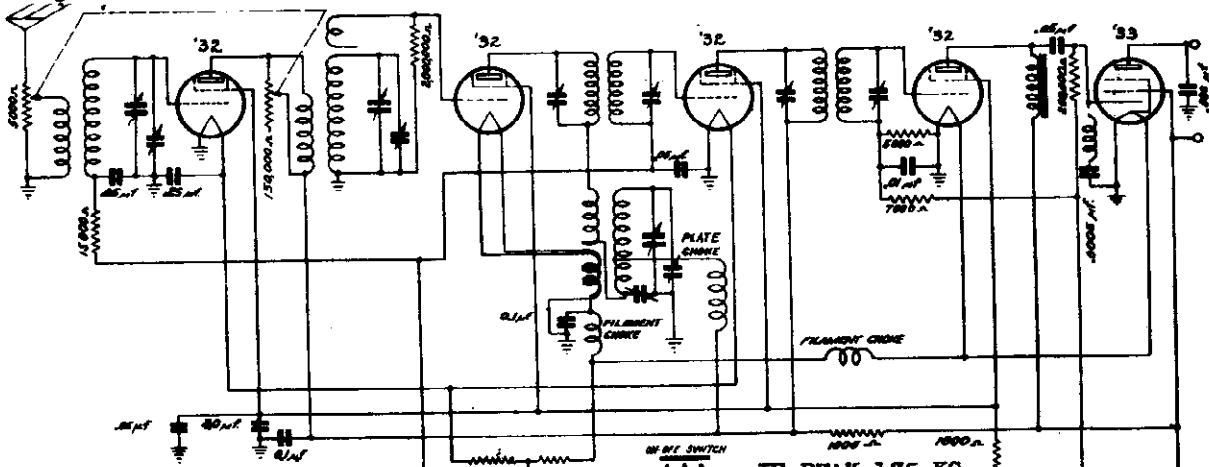
Adjust the interstage Range B trimmer (C10) and antenna Range B trimmer (C3) to maximum.
Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment
Set the signal generator for 600 KC.
Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range D Alignment
Set the signal generator for 18,100 KC.
As mentioned above, keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.
Turn the rotor of the tuning condenser to the full open position.

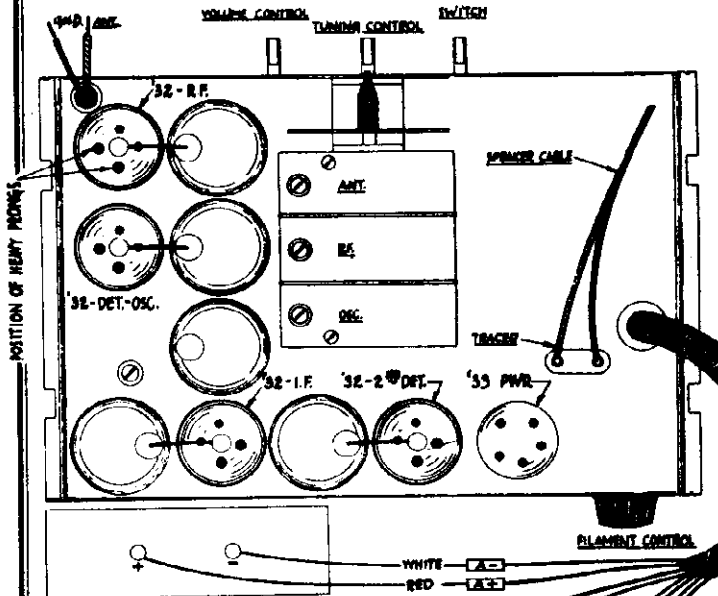
MODELS 92D, 92M
Schematic, Socket
Voltage, Data

GAMBLE-SKOGMO, INC.



CONVENTIONAL ALIGNMENT
(SEE SPECIAL SECTION)

TURN THE VOLUME CONTROL ALL THE WAY ON, CONNECT THE ANTENNA AND GROUND LEADS TOGETHER AND TURN THE GANG CONDENSER PLATES ALL THE WAY OUT. CHECK BATTERY VOLTAGES.



TUBE	CIRCUIT	VOLTAGE
R.F. '32	Filament	2.
	Screen Grid	65.
	Plate	127.
	Control Grid	1.4
1st Det. & Oscillator '32	Filament	2.
	Screen Grid	65.
	Plate	85.
	Control Grid	No Reading
I.F. '32	Filament	2.
	Screen Grid	65.
	Plate	125.
	Control Grid	5. *
2nd Det '32	Filament	2.
	Screen Grid	67.
	Plate	127.5
	Control Grid	3.2
Audio '33	Filament	2.
	Screen Grid	132.5
	Plate	117.5
	Control Grid	7.5 **

*This includes filament voltage.

**250 v. Scale.

The measurement of grid bias voltages is not recommended as this causes an abnormal rise in plate current which is injurious to the tube. When the receiver does not function properly and the trouble is apparently due to incorrect grid bias on any tube or tubes, the cause of the incorrect bias may be determined by applying the proper continuity test.

CAUTION: Do not attempt to take voltage measurements or test the '33 pentode tube with a set analyzer which is not designed to test that type of tube. A special adaptor is necessary. The latest type analyzers only are designed to test pentode tubes. The UY socket in an analyzer which is used to test '24, '35, and '27 tubes cannot be used to test '33 pentode tubes. A break-in adaptor and the external binding posts of the set analyzer may be used to take voltage measurements when an adaptor is not available.

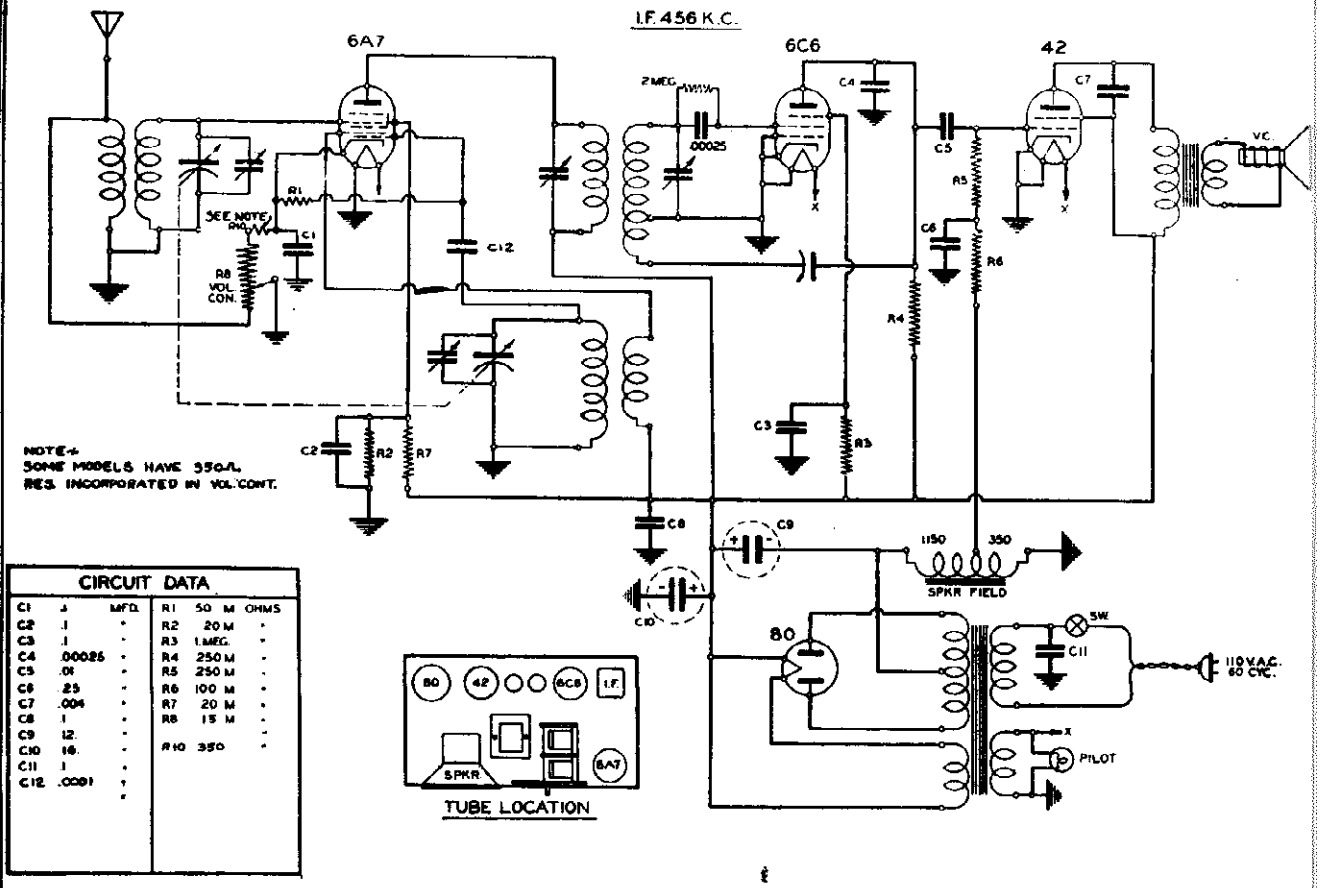
Comparison of the voltage measurements taken and those shown in the chart below will show any irregularities. The cause of any variation may be determined by applying the proper continuity test. **REMEMBER**—Voltage measurements will vary slightly with different sets of tubes, and also with different chassis. Unless the voltages are radically different than normal, they may be considered satisfactory.

The voltages shown in the chart were taken with a 1000 ohm per volt voltmeter; voltage measurements taken with a voltmeter having a different resistance will, of course, differ from those shown.

The .006 mfd. condenser connected from the plate of the pentode tube to ground is there for two reasons,—one, to prevent any I.F. or harmonic of the intermediate frequency from getting into the speaker and possibly coupling back into the antenna to cause a squeal; two, to put the proper amount of capacity across the speaker winding to produce a pleasing tone quality. This condenser may be varied in any value from .002 mfd. to .006 mfd. without losing its effectiveness in preventing the I.F. from getting into the speaker.

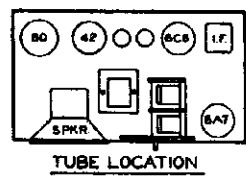
GAMBLE-SKOGMO, INC.

MODEL 460
Schematic, Socket
Parts



NOTE-4
SOME MODELS HAVE 350-V.
RES. INCORPORATED IN VOL. CONT.

CIRCUIT DATA			
C1	3	MFD.	R1 50 M OHMS
C2	1		R2 20 M
C3	1		R3 1MEG.
C4	.00025		R4 250 M
C5	.04		R5 250 M
C6	.25		R6 100 M
C7	.004		R7 20 M
C8	1		R8 15 M
C9	12		
C10	16		
C11	1		
C12	.0001		



PARTS LIST—460 A. C. Superheterodyne

1925	2 Gang Condenser.....	1.65	6025	50 M. 1/3 W 20% Resistor.....	.06
8030	Power Trans	1.73	6026	100 M. 1/3 W. 20% Resistor.....	.06
2441	Volume Control .....	.73	6120	20 M. 1/2 W. 20% Resistor.....	.08
1841	Wet Electrolytic 16 mfd.....	.60	1501	.0001—20% Mica Cond.....	.10
1840	Wet Electrolytic 12 mfd.....	.60	1504	.00025—20% Mica Cond.....	.12
1142	Ant. Coil .....	.32	8901	No. 40 Pilot Light Bulb.....	.18
1143	Osc. Coil .....	.10	242	Pilot Light Bracket.....	.06
1126	I. F. Trans. ....	.85	6850	4 Prong Socket.....	.10
2054	Trimmer .....	.10	6852	6 Prong Socket.....	.10
1600	.1—200 V. Bypass Condenser.....	.12	6853	7 Prong Socket.....	.10
1601	.1—400 V. Bypass Condenser.....	.13	7933	Speaker	3.00
1604	.01—600 V. Bypass Condenser.....	.10		Dial—(order by name and description)..	.75
1614	.25—200 V. Bypass Condenser.....	.16	5218	Knobs, Plain.....	.12
1651	.004—600 V. Bypass Condenser.....	.12	TUBES		
6017	1 Meg. 1/3 W 20% Resistor.....	.06	6A7		
6020	2 Meg. 1/3 W 20% Resistor.....	.06	6C6		
6024	1/4 Meg. 1/3 W 20% Resistor.....	.06	42		
			80		

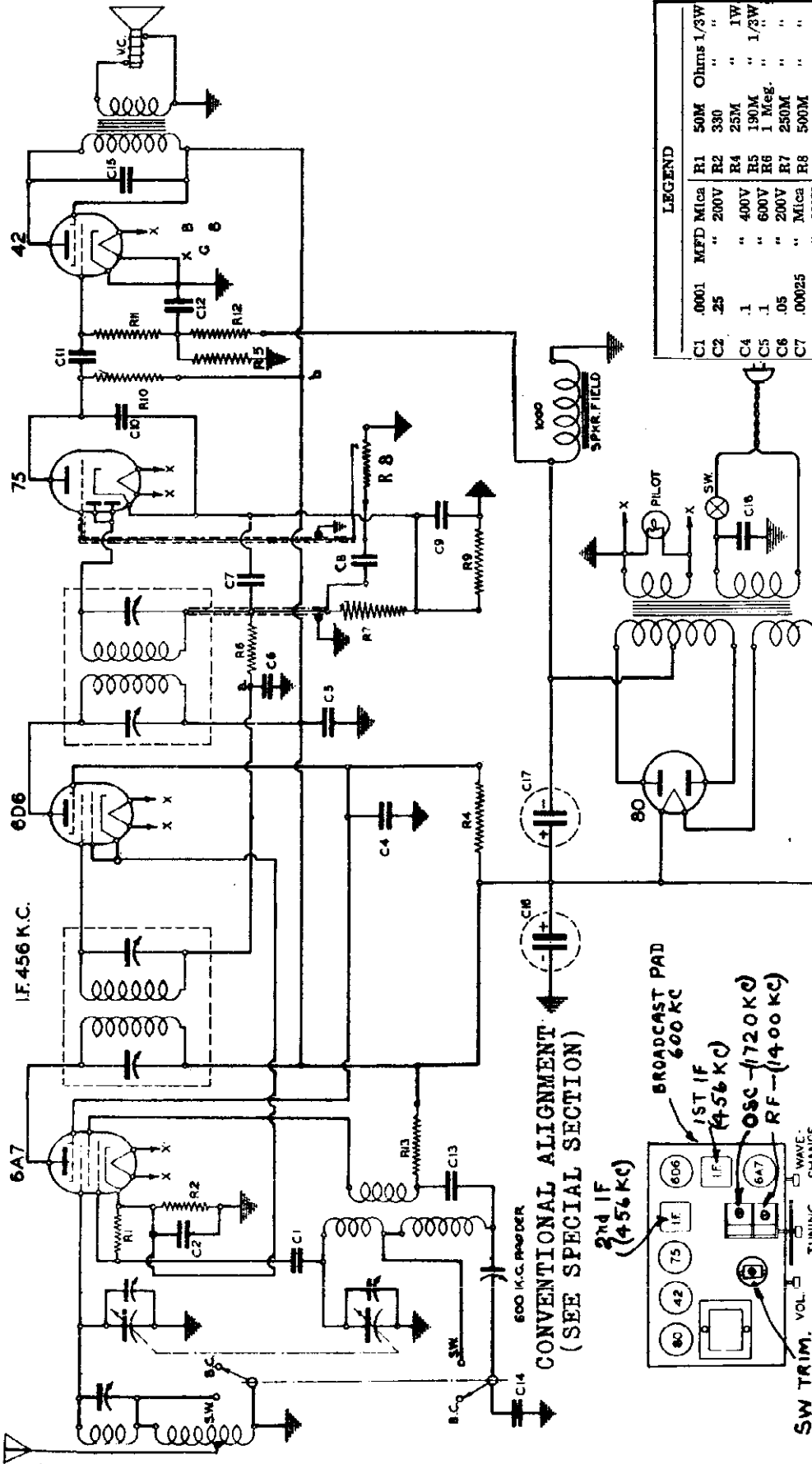
PRICES SUBJECT TO CHANGE
WITHOUT NOTICE

This receiver should be connected ONLY to an electric light outlet supplying current of 110 to 120 volts, 50 to 60 cycle A.C. If connected to any other type of current or voltage, the set may be seriously damaged. If you are in doubt as to the type of current available, your electric power company will be glad to furnish the needed information.

MODELS 510, 511

GAMBLE-SKOGMO, INC.

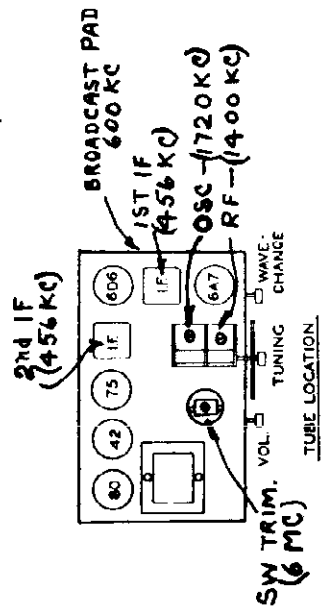
Schematic, Socket
Trimmers, Alignment



LEGEND

C1	.0001	MFD	Mica	R1	500M	Ohms	1/3W
C2	.25	"	"	R2	330	"	"
C4	.1	"	"	R4	25M	"	1W
C5	.1	"	"	R5	190M	"	1/3W
C6	.05	"	"	R6	1 Meg.	"	"
C7	.00025	"	"	R7	2500M	"	"
C8	.01	"	"	R8	5000M	"	"
C9	.10	"	"	R9	4500	"	"
C10	.00025	"	"	R10	2500M	"	"
C11	.01	"	"	R11	500M	"	"
C12	.1	"	"	R12	600M	"	"
C13	.001	"	"	R13	10X	"	1/2W
C14	.002	"	"			"	
C15	.004	"	"			"	
C16	.8	"	"			"	
C17	8	"	"			"	
C18	.1	"	"			"	

WARNING—This receiver can be operated only on 105-120 volt, A. C., 50-60 cycle. This is the current commonly supplied, although a few communities or neighborhoods are supplied with 25-30 cycle or with D.C. The receiver may be badly damaged if it is connected to incorrect supply. If there is any doubt whether your supply is proper for this receiver, your local electric company can advise you.



MODEL Z516
Voltage, Parts
Alignment

GAMBLE-SKOGMO, INC.

Resistors

- 63-121 100M ohm, 1 Watt (2nd Detector Plate).....
- 63-135 25M " " (2nd Detector Cathode).....
- 63-137 250M " " (Oscillator & Power Grid)..
- 63-140 1 meg" " (A.V.C. Screen).....
- 63-160 100M " " (A.V.C. Plate).....
- 63-169 400M " " (A.V.C. Grid).....
- 63-239 24M ohm 1 Watt (Oscillator Plate).....
- 63-244 500 " $\frac{1}{4}$ " (1st Detector Cathode).
- 63-251 Voltage Divider (six tap).....
- 63-252 Voltage Divider (five tap).....

Coils and Chokes

- 20-30 Antenna Coil.....
- 20-31 Oscillator Coil.....
- 20-35 Detector Coil.....
- 95-133 1st & 2nd I. F. Transformer.....

Condensers

- 22-112 .1 mfd 300 volt (2nd Detector Screen & Power Grid).....
- 22-113 .5 "(R.F. 1st Detector & I.F. Grid Return).....
- *22-115 .1 " 200 volt (Four used, see below).....
- 22-117 .5 "(R.F. 1st Detector, & I.F. Screen).....
- 22-137 .05 " 400 volt (Oscillator Plate).....
- 22-147 .0005 600 volt (2nd Detector Plate & A.V.C. Screen).....
- 22-170 .1 mfd 400 volt (R.F. & 1st Detector Plate, 2nd Detector Plate)..
- 22-171 .05 " 600 volt (Tone Control).....
- 22-172 2. " 450 volt (Filter).....
- 22-173 8. " 500 volt (Filter).....

Socket Voltages

Tube Type	Position	Fil. Volt.	Plate Volt.	Cath. Volt.	Screen Volt.	Supp. Volt.	Plate Current
Z-58	R.F.	2.4	190	0	95	0	7.
Z-58	1st Det.	2.4	190	2.3	95	2.3	4.
Z-56	Osc.	2.4	100	0	-	-	4.
Z-58	I.F.	2.4	190	0	90	0	2.
Z-57	2nd Det.	2.4	90	-60	70	-60	.2
Z-57	A.V.C.	2.4	-10	-65	-2	-65	0
Z-59	Power	2.4	175	-70	165	-70	25
Z-80	Rect.	5.	*350	-	-	-	*36

Line 115 Volts

All Controls Maximum

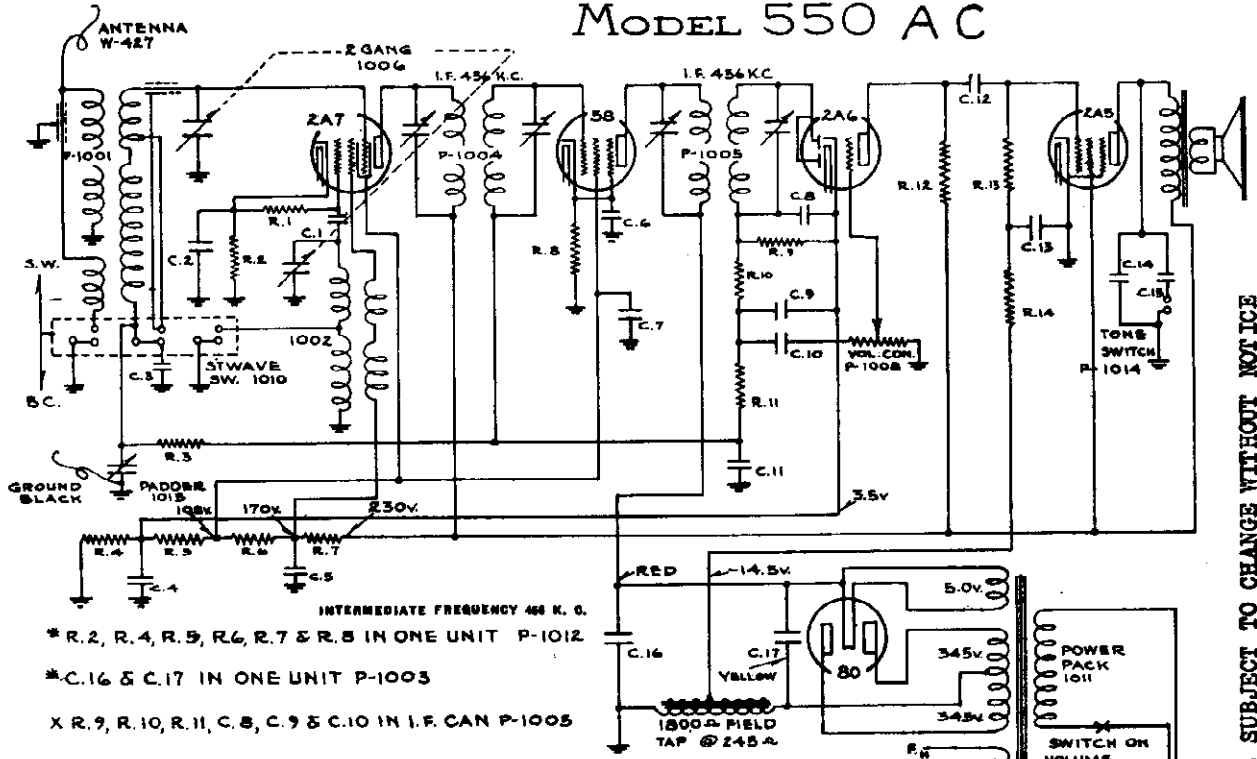
All readings, with exception of heaters, taken from socket connections to ground. Use 1,000 ohm per volt D. C. meter.)

BALANCE I.F. frequency at 175 K.C. Condenser gang at 1500 K.C. and oscillator padder at 600 K.C.

GAMBLE-SKOGMO, INC.

MODEL 550 AC
Schematic, Voltage
Parts, Alignment

MODEL 550 AC



INTERMEDIATE FREQUENCY 466 K. C.
* R. 2, R. 4, R. 5, R. 6, R. 7 & R. 8 IN ONE UNIT P-1012
* C. 16 & C. 17 IN ONE UNIT P-1003
X R. 9, R. 10, R. 11, C. 8, C. 9 & C. 10 IN I.F. CAN P-1005

SERVICE MANUAL FIVE TUBE TWO BAND SUPERHETERODYNE

W I T H A. V. C.

105-115 volts alternating current 50-60 cycles - 60 watts.
GREEN (broadcast band) 530 - 1650 Kilocycles
RED (short wave band) 1650 - 14,000 Kilocycles

SERVICE NOTES

Should it be at any time necessary to rebalance this set, the correct procedure is as follows:
To peak I.F. transformers connect oscillator (set at 466 KC) to grid of 2A7 tube and (black) ground at minimum capacity. With variable condenser set at minimum capacity, (extreme left of its rotation) adjust four trimmers (one nut and one screw on each transformer trimmer) to resonance (maximum deflection on an output meter connected across the primary of the speaker input transformer).
To align Broadcast band, set wave changing switch to Green (right turn) and with variable condenser at minimum capacity disconnect antenna wire and connect 1550 KC oscillator to antenna coil in series with a 75 MFD condenser. Adjust oscillator (front) section trimmer to resonance. Set oscillator to 1400 KC, rotate variable condenser until signal is tuned in, then adjust R.F. (rear) section trimmer to resonance. Check output at 1200, 1000, 800, and 600 Kilocycles if necessary bend plates (of rear k.f. section of variable only).
To align Short wave band, set wave changing switch to RED (left turn) and with input oscillator connected as above and set at 1720 KC, tune in signal, adjust padding condenser on rear of chassis to resonance. Check for output at 1650 KC and at harmonics of 1000 KC (2000 KC), of 1200 KC (2400 KC), of 1400 KC (2800 KC), and of 1720 KC (3440 KC). DO NOT BEND PLATES.
For failure to operate over both bands check 2A7 tube and connections to and contacts of wave changing switch.

Part No.	Description	List Price
1001	Antenna Coil	\$ 2.50 ea.
1002	Oscillator Coil & Bracket	1.20 ea.
1002	8-8 MFD electrolytic filter condenser.	2.50 ea.
1004	Input I.F. Transformer and can	1.60 ea.
1005	Output I.F. Transformer with can and including parts as indicated on schematic circuit diagram.	2.50 ea.
1006	Two gang gear drive variable condenser.	2.75 ea.
1008	500M Ohm volume control with switch	1.35 ea.
1010	Wave changing switch	.75 ea.
1011	105-115 volt 50-60 cycle power transformer	3.50 ea.
1012	31,050 Ohm metal clad resistor.	1.00 ea.
1014	Tone control switch	.30 ea.
1015	400-800M-MFD Padding condenser	.80 ea.
1017	Special light socket	.10 ea.
1019	Rubber line cord & plug	.90 ea.
1039	Celluloid selector scale	.15 ea.
1040	Celluloid volume scale	.15 ea.
1041	Escutcheon for parts 1039 and 1040	.35 ea.
1044	Color indicating strip assembly.	.25 ea.
5051	Small knobs for wave changing switch & tone control.	.16 ea.
5052	2.5 volt pilot lights	.20 ea.
K214	Knob (selector and volume controls)	.15 ea.
	All molded mica condensers	.25 ea.
	All single section tubular paper bypass condensers.	.25 ea.
	All dual section tubular paper bypass condensers.	.50 ea.

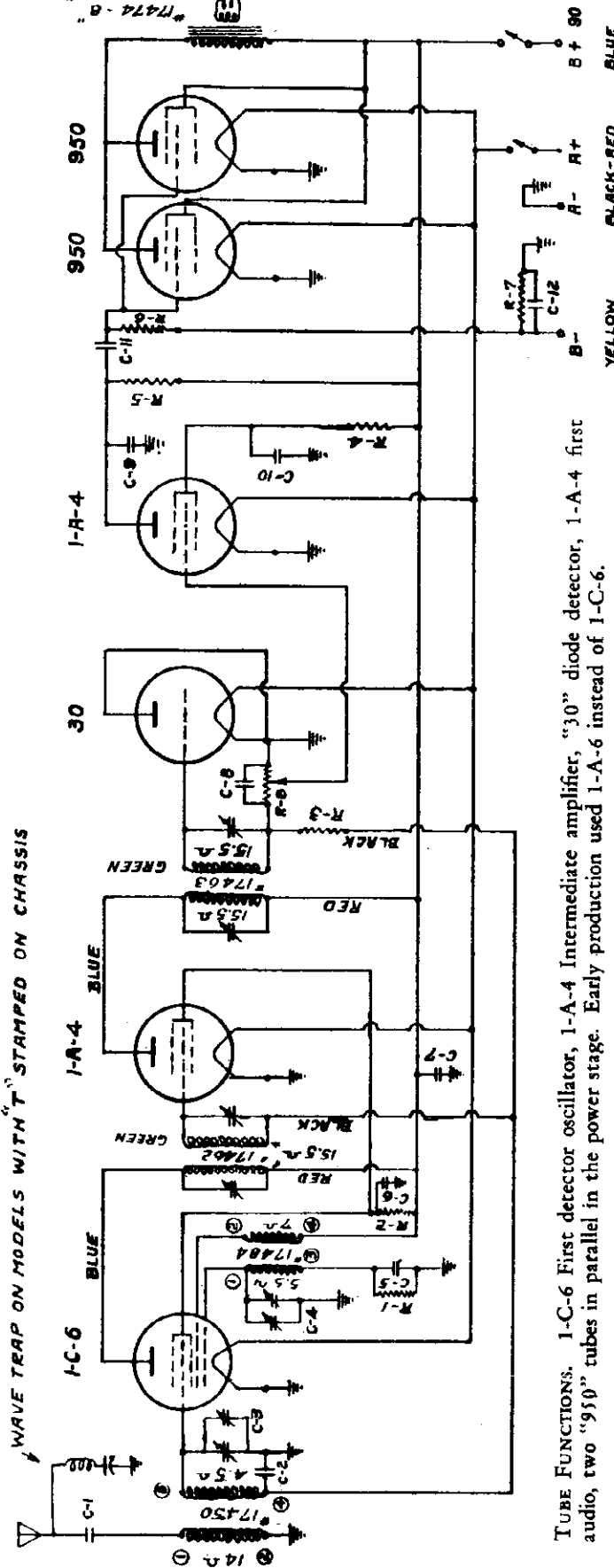
LEGEND

R. 1	50M
R. 2	500 *
R. 3	250M
R. 4	250 *
R. 5	20M *
R. 6	6M *
R. 7	4M *
R. 8	300 *
R. 9	250M X
R. 10	50M X
R. 11	250M X
R. 12	250M
R. 13	300M
R. 14	250M.
C. 1	250MMF.
C. 2	.05
C. 3	.05
C. 4	.05
C. 5	.05
C. 6	.05
C. 7	.J
C. 8	500MMF. X
C. 9	500MMF. X
C. 10	.01 X
C. 11	.J
C. 12	.01
C. 13	.05
C. 14	.01
C. 15	.02
C. 16	8MF *
C. 17	8MF *

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODEL 650 A-B-C

GAMBLE-SKOGMO, INC.

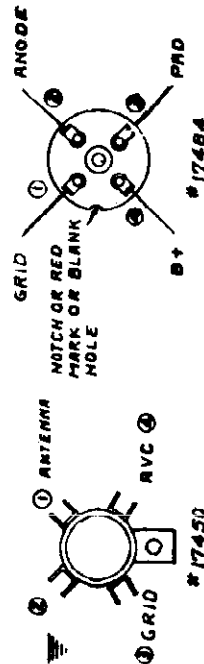


TUBE FUNCTIONS. 1-C-6 First detector oscillator, 1-A-4 Intermediate amplifier, "30" diode detector, 1-A-4 first audio, two "950" tubes in parallel in the power stage. Early production used 1-A-6 instead of 1-C-6.

I.F. FREQUENCY 456 K.C.
B.C. FREQUENCY 540 K.C. TO 1725 K.C.

- C-1 .01 200 V.
- C-2 .05 200 V.
- C-3 .00037 TUNING COND.
- C-4 .0005 PRD
- C-5 .05 200 V
- C-6 .25 200 V
- C-7 .0005 600 V.
- C-8 .0005 600 V.
- C-9 .01 200V.
- C-10 .01 200V.
- C-11 .01 200V.
- C-12 10 MFD. 2.5 V. ELECT.

- R-1 50,000
- R-2 15,000
- R-3 2-MEG.
- R-4 500,000
- R-5 100,000
- R-6 1 MEG.
- R-7 450
- R-8 500,000 VOL. CONTROL #17451



#17450
LOOKING AT PLAIN END OF COIL

K.R.C. 5-G-36

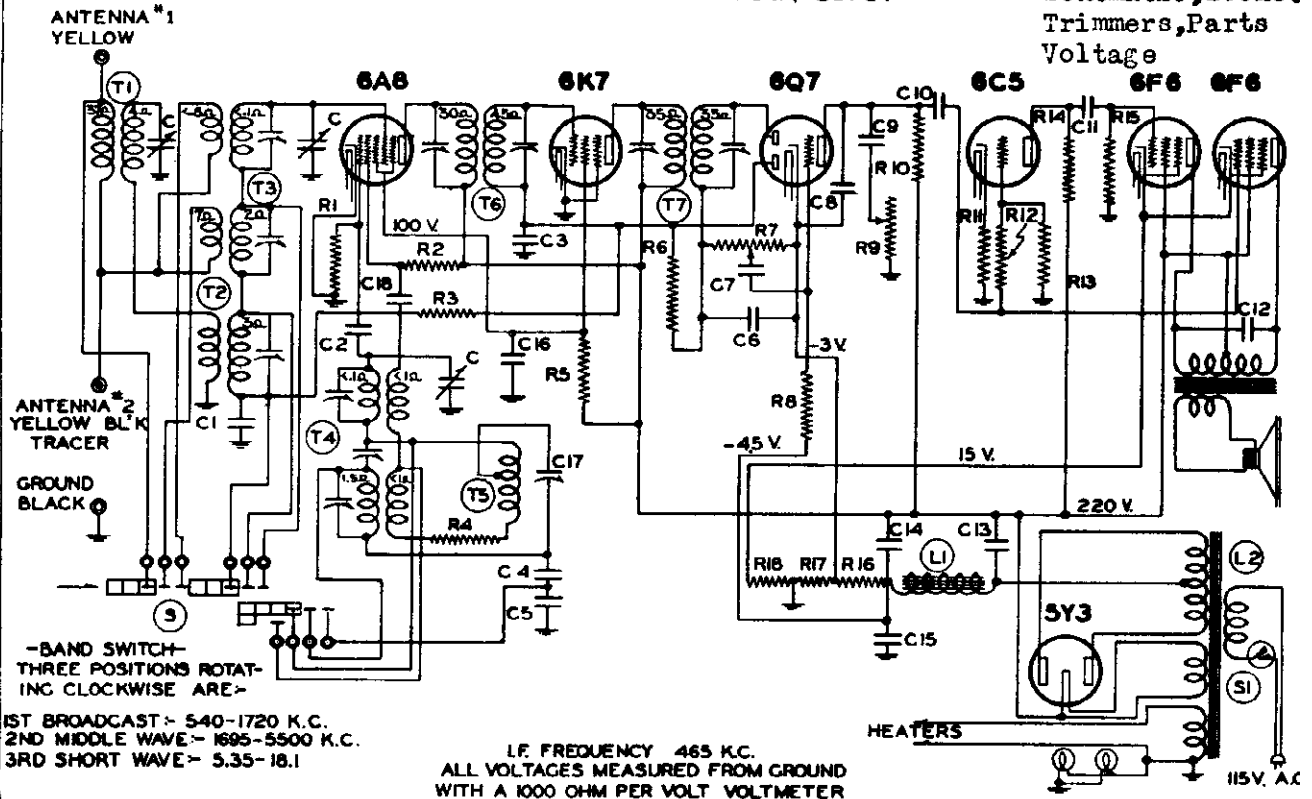
BATTERY RADIO

ALIGNMENT. IF and Broadcast alignment same as Model 11-B. For IF, connect signal generator to grid of 1-C-6 tube, be sure tuning condenser is open.

CODE INTERFERENCE. This may be noticeable in regions close to the Great Lakes and is due to shore radiotelegraph service being received directly on the IF amplifier and usually comes in regardless of tuning. All late production of this model going into Great Lakes territory were equipped with a wave trap which greatly reduces such interference. Such sets had the letter "T" marked on back of chassis and on carton. This wave trap No. 17736 may be added to any other production sets as shown in the circuit diagram. After installation it must be tuned to minimum response to a 456 signal applied to the antenna lead or to minimum reception of the code interference.

GAMBLE-SKOGMO, INC.

MODEL 740
Schematic, Socket
Trimmers, Parts
Voltage



1ST BROADCAST - 540-1720 K.C.
2ND MIDDLE WAVE - 1695-5500 K.C.
3RD SHORT WAVE - 5.35-18.1

L.F. FREQUENCY 465 K.C.
ALL VOLTAGES MEASURED FROM GROUND
WITH A 1000 OHM PER VOLT VOLTMETER

No. Part No. Description

RESISTORS

R1	130-12	50M ohms - 1/3 w.
R2	130-48	15M ohms - 1/3 w.
R3	130-103	100M ohms - 1/3 w.
R4	130-27	50 ohms - 1/3 w.
R5	130-96	25M ohms - 1/2 w.
R6	130-4	3 megohm - 1/3 w.
R7	101-74	1 megohm - Volume Control
R8	130-4	3 megohm - 1/3 w.
R9	101-75	300M ohm - Tone Control
R10	130-100	150M ohms - 1/3 w.
R11	130-22	5M ohms - 1/3 w.
R12	130-163	400M ohms - 1/3 w.
R13	130-103	100M ohms - 1/3 w.
R14	130-12	50M ohms - 1/3 w.
R15	130-100	150M ohms - 1/3 w.
R16	106-37	20 ohms - Muter
R17	106-37	42 ohms - Muter
R18	106-37	250 ohms - Muter

NOTE: R16, R17 and R18 in one unit, No. 106-37

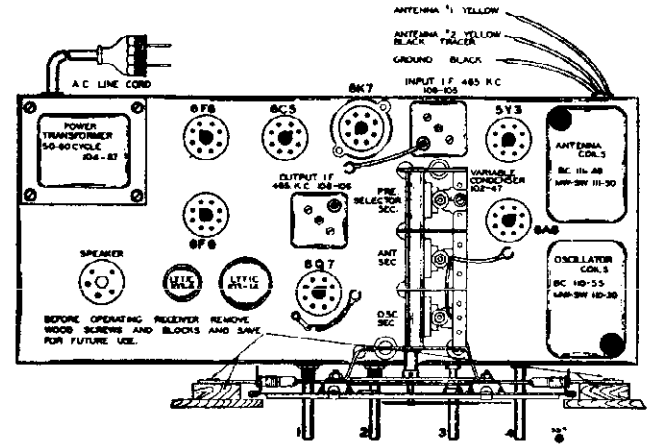
CONDENSERS

C1	100-22	.05 x 200 v.
C2	129-39	.00005 Mica
C3	100-22	.05 x 200 v.
C4	129-55	.0034 Mica
C5	129-54	.003 Mica
C6	129-5	.0001 Mica
C7	100-11	.01 x 400 v.
C8	129-2	.0005 Mica
C9	100-57	.006 x 600 v.
C10	100-26	.02 x 400 v.
C11	100-26	.02 x 400 v.
C12	100-12	.003 x 600 v.
C13	103-6	8 mfd. x 350 v.
C14	103-14	16 mfd. x 250 v.
C15	100-20	.1 x 200 v.
C16	100-39	.1 x 400 v.
C17	124-35	Adjustable Padder - Working Capacity 740 mmf.
C18	100-12	.003 x 600 v.

C	102-47	One section of three gang condenser
T1	111-51	B.C. Pre-Selector
T2	111-49	B.C. Antenna Coil Assembly
T3	111-50	MW - SW Antenna Coil Assembly
T4	110-39	MW - SW Oscillator Coil Assembly
T5	110-55	B.C. Oscillator Coil Assembly
T6	108-105	Input I.F. - 465 kc.
T7	108-106	Output I.F. - 465 kc.
L1	114-66	6" Speaker (Field Resistance 900 ohms)
L2	104-87	Power Transformer (60 cycle) 115 volts
S	125-17	Band Switch
S1	101-74	On-off Switch on volume control.

PARTS

- 1—Type 6A8G—Pentagrid mixer, first detector and oscillator.
- 1—Type 6K7 Remote cut-off pentode I.F. amplifier (465 K.C.)
- 1—Type 6Q7G duplex diode triode second detector. A.V.C. and audio.
- 1—Type 6C5 Inverter stage.
- 2—Type 6F6G—pentode push-pull output amplifier.
- 1—Type 5Y3G high vacuum rectifier.



Vol. Control Tone Tuning Band
On-Off Switch Control Control Switch

MODEL 740

GAMBLE-SKOGMO, INC.

Alignment
Trimmers**SERVICE NOTES:**

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 115 volts on the primary of the power transformer.

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagrams.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between the plate and cathode terminals of the 5 prong speaker socket. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-106 Output I.F. Transformer

Part No. 108-105 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

- With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
 - Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6K7 tube, and adjust the output I.F. transformer (No. 108-106) to resonance.
 - With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap of 6AG6 and adjust input I.F. transformer (No. 108-105) to resonance.

BROADCAST BAND ALIGNMENT:

540 to 1720 Kilocycles

- With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to tan antenna lead and black ground lead, make following adjustments:
 - Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance (adjustment number 1; see bottom view of coil assembly, Fig. 3.)
 - Re-set external oscillator to 1550 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (Adjustment number 4) to resonance; also adjust preselector trimmer which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 1, for location of this adjustment.)

- Re-set external oscillator to 600 K.C., and adjust broadcast series pad to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3.)
- Repeat adjustments "a" and "b" until sensitivity is at its maximum.
- Check for tracking and sensitivity at 1000 kilocycles. Under no circumstances bend plates of variable condenser sections to correct tracking.

SHORT WAVE BAND ALIGNMENT:

5.35 to 18.1 Megacycles

- With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
 - Move dial pointer to 17 megacycles and adjust short wave oscillator (Adjustment number 3) and short wave antenna (Adjustment number 6) to resonance.
 - Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check sensitivity.
 - Re-set external oscillator and check set at 18.1 megacycles and 5.3 megacycles for band coverage.

NOTE: It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental. An example of this is an image of a fundamental 18.3 megacycle signal appears near 17.4 megacycles.

MIDDLE WAVE BAND ALIGNMENT:

1690 to 5500 Kilocycles

- With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5000 kilocycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
 - Move dial pointer to 5000 kilocycles and adjust middle wave oscillator (Adjustment number 2) and middle wave antenna (Adjustment number 5) to resonance.
 - Re-set external oscillator to 1800 kilocycles and pick up signal by rotating variable condenser and check sensitivity.
 - Re-set external oscillator and check set at 5400 kilocycles and 1700 kilocycles for band coverage.
 - Recheck broadcast band alignment.

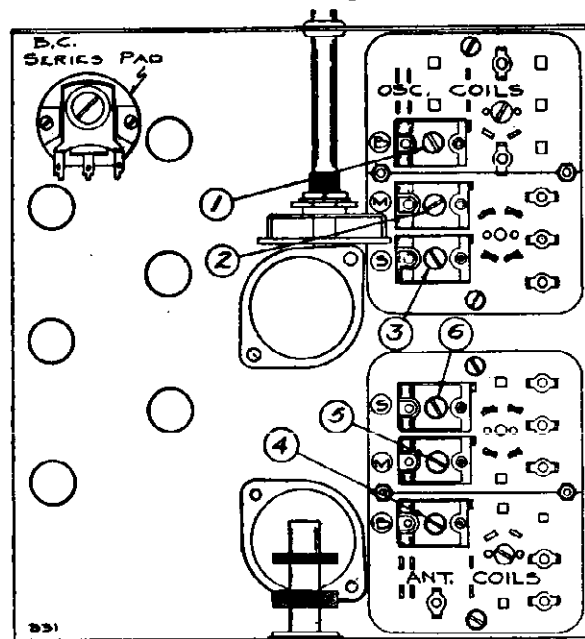


FIG. 3.—BOTTOM VIEW SHOWING TRIMMERS

GAMBLE-SKOGMO, INC.

MODEL 762
Scheme 110
Data

Power Consumption - 67 Watts (At 117 volts 60 cycles)

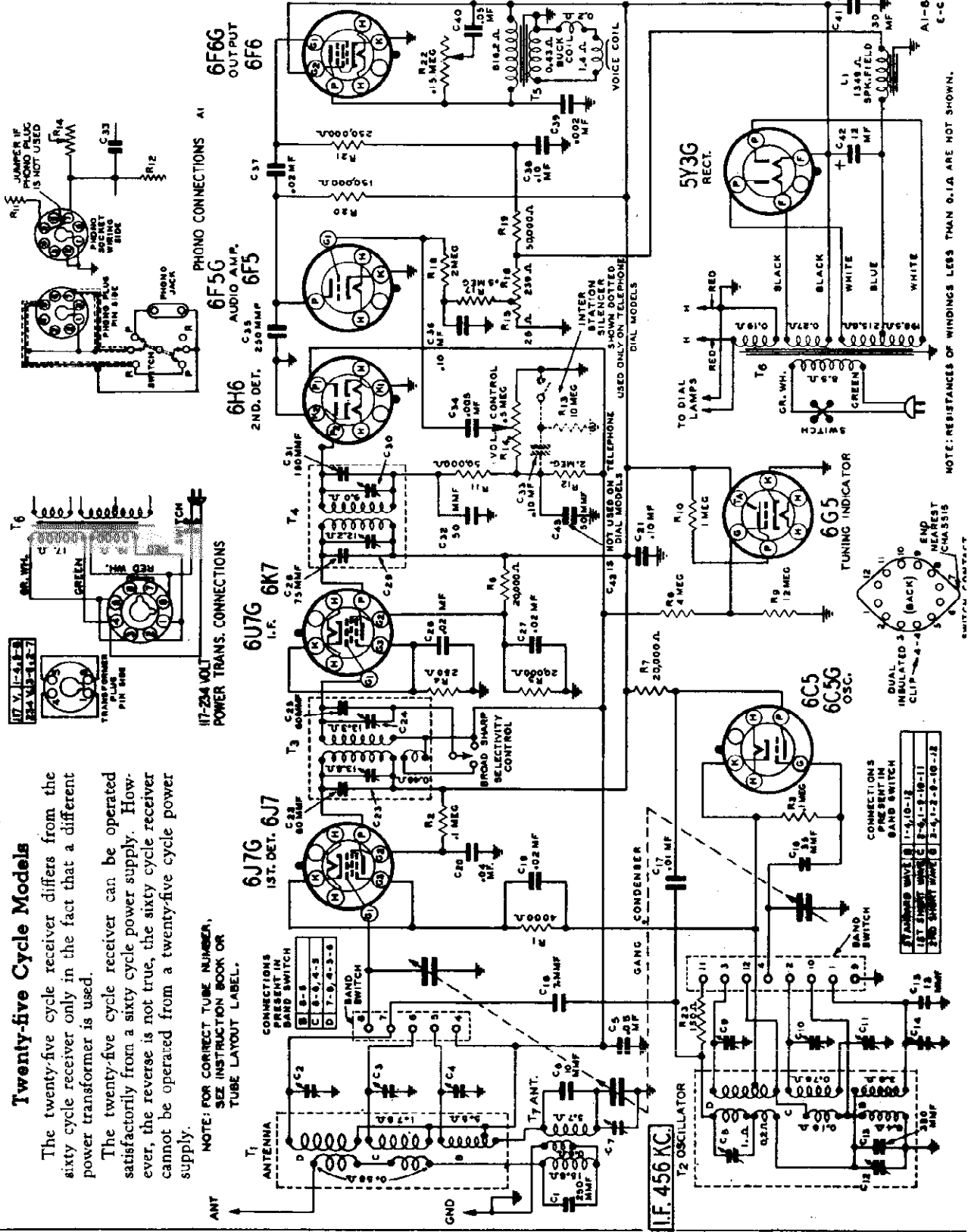
Power Output - 2.5 Watts Undistorted
4.5 Watts Maximum

Selectivity - 30 KC Broad at 1000 times Signal
(Sharp)

Intermediate Frequency - 456 KC.

Sensitivity

- B Range..... 8 Microvolts Average
- C Range..... 13 Microvolts Average
- D Range..... 9 Microvolts Average

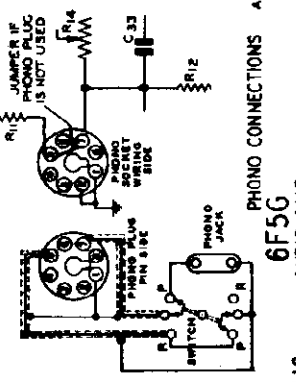
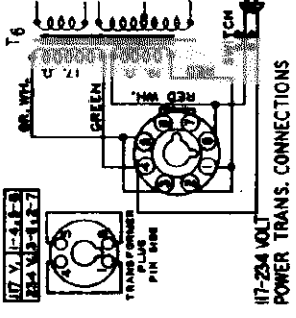


Twenty-five Cycle Models

The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer is used.

The twenty-five cycle receiver can be operated satisfactorily from a sixty cycle power supply. However, the reverse is not true, the sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

NOTE: FOR CORRECT TUBE NUMBER, SEE INSTRUCTION BOOK OR TUBE LAYOUT LABEL.

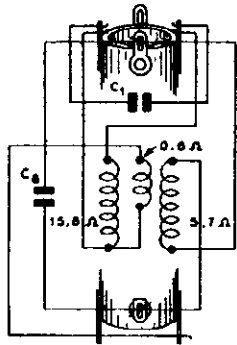


MODEL 762

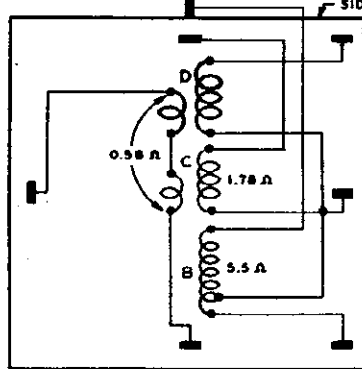
Socket, Chassis
Voltage, Coils

GAMBLE-SKOGMO, INC.

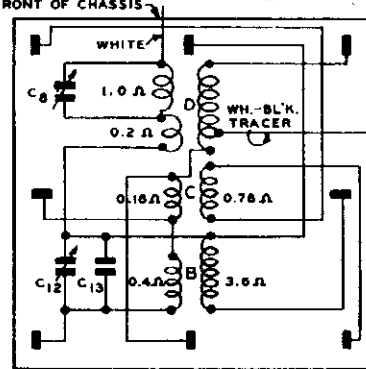
1ST ANT. "B" TRANS. T7



ANT. R.F. TRANS. "C" & "D" - 2ND ANT. "B" T1



OSC. COIL T2



NOTE: RESISTANCES OF WINDINGS LESS THAN .1Ω ARE NOT SHOWN.

A1-48

Fig. 7—Coil Terminal Arrangement and D.C. Resistance of Windings

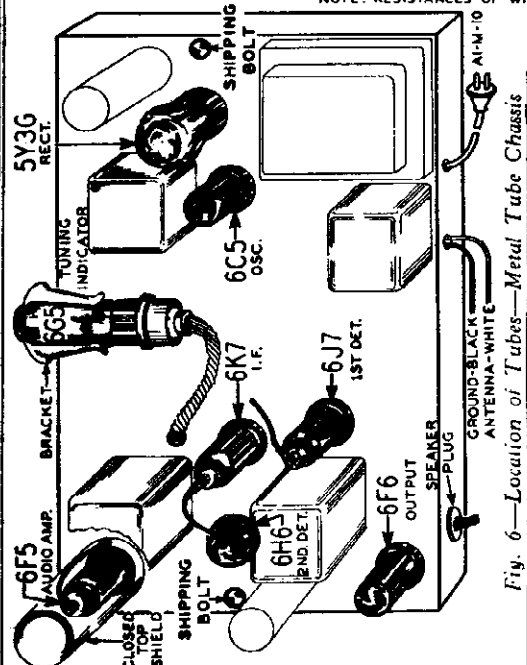


Fig. 6—Location of Tubes—Metal Tube Chassis

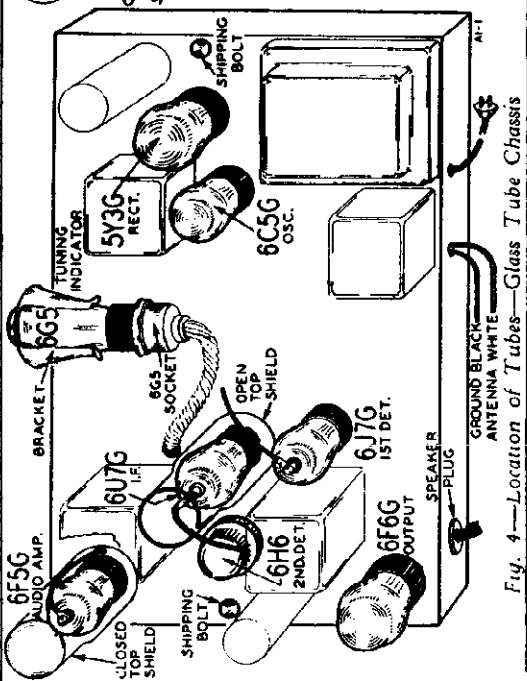


Fig. 4—Location of Tubes—Glass Tube Chassis

VOLTAGES AT SOCKETS

Antenna Shorted to Ground
Position of Band Switch: Standard Wave

Line Voltage: 117—Volume Control: Maximum
Readings taken with 1000 Ohm-per-volt meter.

TUBE	FUNCTION	VOLTAGE BETWEEN SOCKET PRONG AND GROUND (Unless otherwise indicated)								Cathode to Ground	Across Heater		
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8				
6J7 6J7G	1st Det.	0	6.1(1)	220	100	7.9		6.1(1)	7.9				
6C5 6C5G	Osc.	0	6.1(1)	140				6.1(1)	0				
6K7 6U7G	I.F.	0	6.1(1)	220	100	2		6.1(1)	2				
6H6	2nd Det.	0	6.1(1)		0			6.1(1)	0				
6F5 6F5G	Audio Amp.	0	6.1(1)		75			6.1(1)	0(2)				
6F6 6F6G	Power	0	6.1(1)	215	220			6.1(1)	0(3)				
5Y3G	Rectifier	0	4.9(4)		610(5)			6.1(1)	4.9(4)				
6G5	Tuning Indicator	Plate to Ground 20		Target to Ground 220									Across Heater 6.1 A. C.

(1) A.C. voltage as read across heater terminals 2 and 7.
 (2) Bias (1.5 volts) as read across resistor R15.
 (3) Bias (14 volts) as read across resistors R15 and R16.
 (4) A.C. voltage as read across filament terminals 2 and 8.
 (5) A.C. voltage as read across terminals 4 and 6.

GAMBLE-SKOGMO, INC.

MODEL 762
Alignment
Trimmers, Data

APRIL, 1937

Tuning Frequency Range

Speakers 8", 10" or 12" Dynamic

B Range 520 to 1930 KC.
C Range 1810 to 6350 KC.
D Range 6300 to 22000 KC.

STEP (Follow Order as Given)	BAND SWITCH SETTING	DUMMY ANTENNA	SIGNAL GENERATOR		PROCEDURE	
			FREQUENCY SETTING	CONNECTION AT RADIO	INITIAL STEPS	ADJUSTMENT
i. F.						
2nd I.F. Adj. 485 KC . . . Grid of I.F. Tube . . . 2nd I.F. (C29) & (C30) . . . Turn Rotor to Full Open . . . Adjust to Maximum Output						
1st I.F. Adj. 455 KC . . . Grid of 1st Det. . . 1st I.F. (C23) & (C24) . . . Turn Rotor to Full Open . . . Adjust to Maximum Output						
RANGE B						
1830 KC 200 mmf. . . Antenna Lead . . . Oscillator Range B (C14) . . . Turn Rotor to Full Open . . . Adjust to Maximum Output						
1500 KC 200 mmf. . . Antenna Lead . . . 1st Ant. Range B (C7) 2nd Ant. Range B (C4) . . . Turn Rotor to Max. Output Set Indicator to 1500 KC— See Note A . . . Adjust to Maximum Output						
RANGE C						
600 KC 200 mmf. . . Antenna Lead . . . 600 KC (C12) . . . Turn Rotor to Max. Output . . . Adjust to Maximum Output Rock Rotor — See Note B						
6350 KC 400 Ohm . . . Antenna Lead . . . Oscillator Range C (C10) . . . Turn Rotor to Full Open . . . Adjust to Maximum Output						
6000 KC 400 Ohm . . . Antenna Lead . . . Antenna Range C (C3) . . . Turn Rotor to Max. Output . . . Adjust to Maximum Output Rock Rotor — See Note B						
RANGE D						
2000 KC 400 Ohm . . . Antenna Lead . . . 2000 KC (C11) . . . Turn Rotor to Max. Output . . . Adjust to Maximum Output Rock Rotor — See Note B						
22,000 KC 400 Ohm . . . Antenna Lead . . . Oscillator Range D (C9) . . . Turn Rotor to Full Open . . . Adjust to Maximum Output Rock Rotor — See Note B						
20,000 KC 400 Ohm . . . Antenna Lead . . . Antenna Range D (C2) . . . Turn Rotor to Max. Output . . . Adjust to Maximum Output Rock Rotor — See Note B						
7000 KC 400 Ohm . . . Antenna Lead . . . 7000 KC (C8) . . . Turn Rotor to Max. Output . . . Adjust to Maximum Output Rock Rotor — See Note B						

ALIGNMENT PROCEDURE

The following equipment is required for aligning:
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter — Non-Metallic Screwdriver.
Dummy Antennas — .1 mf., 200 mmf., and 400 ohms.

Volume Control—Maximum All Adjustments.
Selectivity Control—Sharp Position All Adjustments
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.
Allow Chassis and Signal Generator to "Heat Up" for Several Minutes.

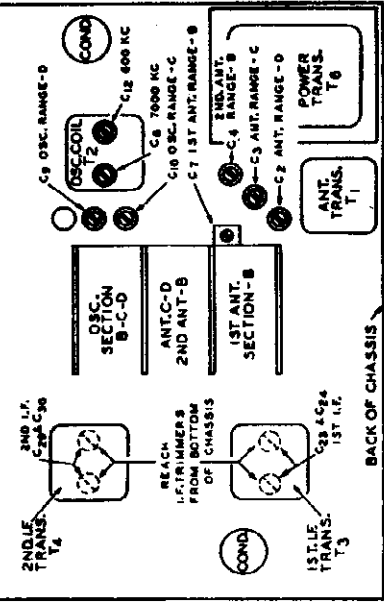


Fig. 3—Location of Trimmers

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC on the dial. It may be necessary to increase the input signal to hear the image.

NOTICE—Re-alignment is necessary if glass tubes are replaced by their equivalent in metal tubes, or vice versa, in the R.F. and I.F. stages.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.
After each range is completed, repeat the procedure as a final check.

NOTE A—In sets using the telephone dial tuning, there will be seen inside the telephone dial button a moving light assembly held to the front of the drive drum by means of a screw. Loosen this screw and move the light assembly until the beam is at the 1500 KC mark on the dial. Retighten the screw.

In sets using the moving beam of light indicator, there is a moving light assembly held to the front of the drive drum by means of a screw. Loosen this screw and move the light assembly until the beam is at the 1500 KC mark on the dial. Retighten the screw.

MODEL 762
Circuit Data
Notes, Parts

GAMBLE-SKOGMO, INC.

Circuit

This model is a three band AC operated radio with a tuning range as shown in the specifications above.

Referring to the schematic circuit diagram, Fig. 2, T1 and T2 are the antenna coil assemblies and T3 is the oscillator coil assembly. The standard wave, 1st and 2nd short wave coils and D respectively are indicated by the letters B, C and D respectively.

The band switch completes connections to the coils in use. When it is in the Range B position, a double tuned antenna R.F. stage is used while for the C and D Ranges, a single tuned secondary is used.

A type 6J7 tube functions as the 1st detector. A separate type 6G5 tube is employed in the oscillator circuit. The oscillating circuit is always resonant at 456 KC above the frequency to which the R.F. amplifier is tuned.

One stage of I.F. amplification is employed using a 6K7 tube. The primaries and secondaries of the 1st and 2nd I.F. transformers are tuned by small trimmer condensers.

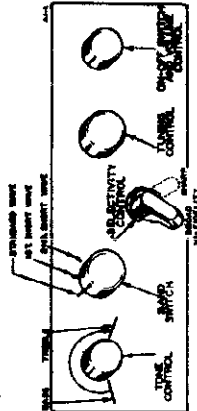


Fig. 1—Arrangement of Controls

Referring to Fig. 2, it will be noted that there is a coupling winding connected in series with the secondary of I.F. transformer T3. When the selectivity control is in the sharp position, the coupling winding is open circuited and the loose coupling which exists between the primary and secondary of this transformer results in high selectivity.

When the selectivity control is in the broad position, the coupling winding which is wound under the primary is connected in series with the secondary. This provides overcoupling which results in a greatly widened resonance curve. Passage of a wide range of audio frequencies is thus obtained.

A 6H6 tube functions as a diode 2nd detector. AVC voltage is applied to the control grid circuits of the 1st detector and I.F. tubes.

A 6E5 triode tube functions as the first audio amplifier while the output stage uses a 6F6 output pentode tube. A dynamic reproducer is employed.

The power unit uses a 5Y3G full wave rectifier. A 6G5 tuning indicator tube is employed.

Replacement Parts

NOTICE—There is a large letter on the chassis which identifies the set to major part changes. When ordering parts, please be sure to mention the letter number and this large letter. With the exception of the parts otherwise indicated, the following parts are common to Series A1 chassis using either the Telephone Dial or the Phantom Light Dial.

MISCELLANEOUS table listing parts like Tubes, Sockets, and other components with their respective part numbers and descriptions.

TRANSFORMERS AND COILS table listing various transformer and coil models such as 117-234, 117-234, and 117-234.

CONDENSERS table listing different types of capacitors like electrolytic, mica, and paper capacitors.

RESISTORS table listing various resistor values and types such as carbon and wire wound resistors.

PHONO ATTACHMENT PARTS table listing components for the radio's phono section, including tone controls and volume knobs.

DIAL AND DRIVE ASSEMBLY table listing parts for the radio's tuning dial and drive mechanism.

CONDENSERS (Cont.)

TUBULAR (Cont.) table listing tubular capacitor models and their specifications.

ELECTROLYTIC table listing electrolytic capacitor models and their specifications.

MISCELLANEOUS table listing miscellaneous capacitor models and their specifications.

RESISTORS table listing resistor models and their specifications.

PHONO ATTACHMENT PARTS table listing phono attachment parts.

DIAL AND DRIVE ASSEMBLY table listing dial and drive assembly parts.

CONDENSERS table listing capacitor models and their specifications.

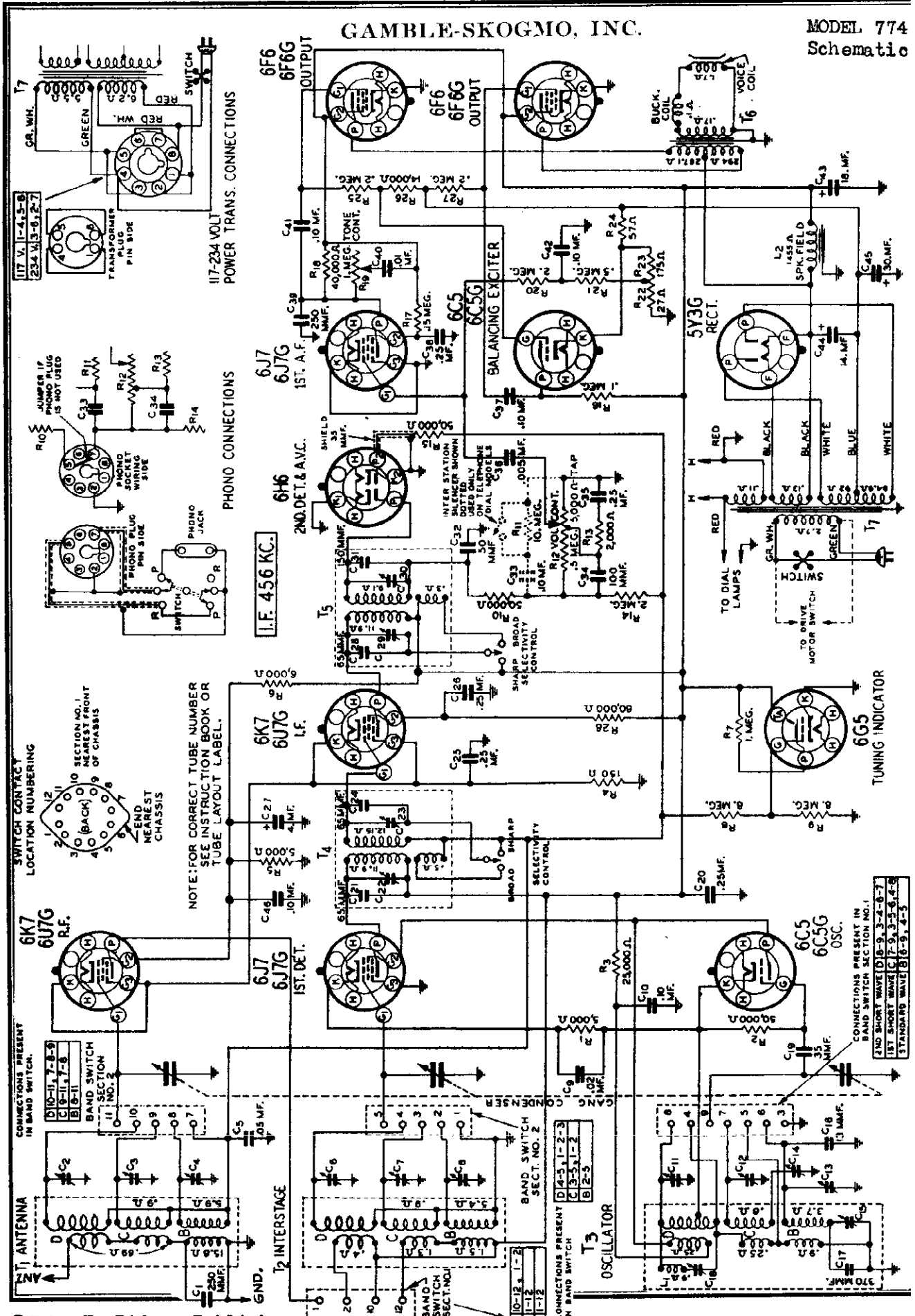
RESISTORS table listing resistor models and their specifications.

PHONO ATTACHMENT PARTS table listing phono attachment parts.

DIAL AND DRIVE ASSEMBLY table listing dial and drive assembly parts.

GAMBLE-SKOGMO, INC.

MODEL 774 Schematic



SWITCH CONTACT LOCATION NUMBERING

1	2
3	4
5	6
7	8
9	10

SECTION NO. 1 NEAREST FRONT OF CHASSIS

END NEAREST CHASSIS

NOTE: FOR CORRECT TUBE NUMBER SEE INSTRUCTION BOOK OR TUBE LAYOUT LABEL.

CONNECTIONS PRESENT IN BAND SWITCH.

D	10-11, 7-8-9
C	10-11, 7-8
B	8-11

BAND SWITCH

CONNECTIONS PRESENT IN BAND SWITCH

D	4-5, 1-2-3
C	3-5, 1-2
B	2-5

BAND SWITCH

CONNECTIONS PRESENT IN BAND SWITCH SECTION NO. 1

D	8-9, 3-4-6-7
C	7-9, 3-5, 4-5
B	6-9, 4-5

2ND SHORT WAVE

D	8-9, 3-4-6-7
C	7-9, 3-5, 4-5
B	6-9, 4-5

1ST SHORT WAVE

D	8-9, 4-5
C	7-9, 4-5
B	6-9, 4-5

STANDARD WAVE

GAMBLE-SKOGMO, INC.

MODEL 774
Alignment
Trimmers

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.
Selectivity Control—Sharp Position All Adjustments.
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter — Non-Metallic Screwdriver.
Dummy Antennas — .1 mf., 200 mmf., and 400 ohms.

STEP (Follow Order as Given)	BANDSWITCH SETTING	DUMMY ANTENNA	SIGNAL GENERATOR FREQUENCY SETTING	CONNECTION AT RADIO	TRIMMERS ADJUSTED See Illustration	INITIAL STEPS	PROCEDURE	ADJUSTMENT
RANGE B								
1. F.	2nd I.F. Adj. Range B	.1 mf.	456 KC	Grid of I.F. Tube	2nd I.F. (C29) & (C30)	Turn Rotor to Full Open	Adjust to Maximum Output	
	1st I.F. Adj. Range B	.1 mf.	456 KC	Grid of 1st Det.	1st I.F. (C22) & (C23)	Turn Rotor to Full Open	Adjust to Maximum Output	
	1830 KC Range B	200 mmf.	1830 KC	Antenna Lead	Oscillator Range B (C13)	Turn Rotor to Full Open	Adjust to Maximum Output	
	1500 KC Range B	200 mmf.	1500 KC	Antenna Lead	Ant. Range B (C4) Int. Range B (C8)	Turn Rotor to Max. Output Set Indicator to 1500 KC— See Note A	Adjust to Maximum Output	
RANGE C								
	600 KC Range B	200 mmf.	600 KC	Antenna Lead	600 KC (C15)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor—See Note B	
	6350 KC Range C	400 Ohm	6350 KC	Antenna Lead	Oscillator Range C (C12)	Turn Rotor to Full Open	Adjust to Maximum Output	
	6000 KC Range C	400 Ohm	6000 KC	Antenna Lead	Antenna Range C (C3) Int. Range C (C7)	Turn Rotor to Max. Output	Adjust to Maximum Output	
RANGE D								
	2000 KC Range C	400 Ohm	2000 KC	Antenna Lead	2000 KC (C14)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor—See Note B	
	22,000 KC Range D	400 Ohm	22,000 KC	Antenna Lead	Oscillator Range D (C11)	Turn Rotor to Full Open	Adjust to Maximum Output	
	20,000 KC Range D	400 Ohm	20,000 KC	Antenna Lead	Ant. Range D (C2) Int. Range D (C6)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor—See Note B	
	7000 KC Range D	400 Ohm	7000 KC	Antenna Lead	7000 KC (C18)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor—See Note B	

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

NOTE A—In sets using the telephone dial tuning, there will be seen inside the telephone dial button ring an escutcheon plate held in place by four screws. Loosen the 2 screws nearest the pointer. An extension of the pointer will be seen protruding over the edge of this escutcheon plate. Move the pointer to the 1500 KC mark on the dial and then tighten the 2 escutcheon screws. (Do not tighten these screws too much.)

In sets using the moving beam of light indicator, there is a moving light assembly held to the front of the drive drum by means of a screw. Loosen this

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC on the dial. It may be necessary to increase the input signal to hear the image.

NOTICE—Re-alignment is necessary if glass tubes are replaced by their equivalent in metal tubes, or vice versa, in the R.F. and I.F. stages.

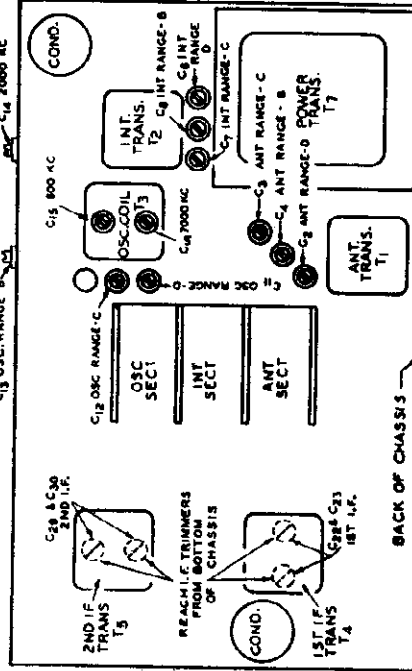


Fig. 3—Location of Trimmers

GAMBLE-SKOGMO, INC.

MODEL 774
Voltage, Socket
Chassis, Coils

Power Consumption - 100 Watts (At 117 volts 60 cycles)
Power Output - - - - - 9.8 Watts Unidistorted
12 Watts Maximum
Selectivity - - 27 KC Broad at 1000 times Signal
(Sharp)
Intermediate Frequency - - - - - 456 KC.
Speaker - - - - - 12" Dynamic

Tuning Frequency Range
B Range 528 to 1830 KC.
C Range 1810 to 6350 KC.
D Range 6300 to 22000 KC.
Sensitivity
B Range 1.0 Microvolts Average
C Range 1.0 Microvolts Average
D Range 2.0 Microvolts Average

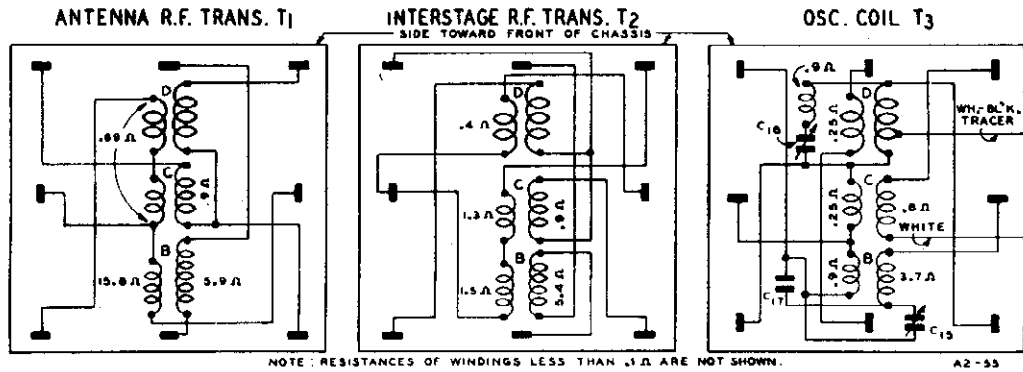


Fig. 6—Coil Terminal Arrangement and DC Resistance of Windings

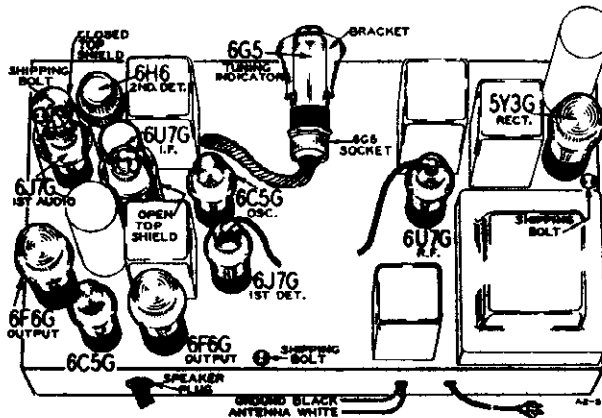


Fig. 4—Location of Tubes—Glass Tube Chassis

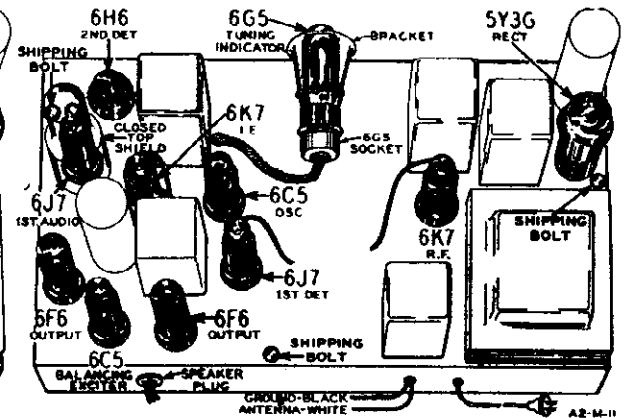


Fig. 5—Location of Tubes—Metal Tube Chassis

VOLTAGES AT SOCKETS

Line Voltage: 117—Volume Control: Maximum
Readings taken with 1000 Ohm-per-volt meter.

Antenna Shorted to Ground
Position of Band Switch: Standard Wave

TUBE	FUNCTION	VOLTAGE BETWEEN SOCKET PRONG AND GROUND (Unless otherwise indicated)							
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
6K7 6U7G	R.F.	0	6.1(1)	250	106	2.5		6.1(1)	2.5
6J7 6J7G	1st Det.	0	6.1(1)	250	125	0		6.1(1)	5.8
6C5 6C5G	Osc.	0	6.1(1)	125(2)				6.1(1)	0
6K7 6U7G	I.F.	0	6.1(1)	250	100	2.5		6.1(1)	2.5
6H6	2nd Det.—A.V.C.	0	6.1(1)					6.1(1)	0
6J7 6J7G	1st A.F.	0	6.1(1)	110	120	0(3)		6.1(1)	0(3)
6C5 6C5G	Balancing Exciter ...	0	6.1(1)	100				6.1(1)	18.5
6F6 6F6G	Output	0	6.1(1)	330	250			6.1(1)	0(4)
5Y3G	Rectifier	0	4.8(5)		730(6)		730(6)		4.8(5)
6G5	Tuning Indicator.	Plate to Ground 20		Target to Ground 250		Cathode to Ground 0		Across Heater 6.1 A.C.	

(1) A.C. voltage as read across heater terminals 2 and 7.
(2) Subject to variation.
(3) Bias [2.5 volts] as read across resistor R22.

(4) Bias [24 volts] as read across resistors R22, R23, & R24.
(5) A.C. voltage as read across filament terminals 2 and 8.
(6) A.C. voltage as read across terminals 4 and 6.

MAY, 1937

MODEL 774
Notes, Parts

GAMBLE-SKOGMO, INC.

Replacement Parts

CONDENSERS (Cont.)

Table with columns: Part No., Description, Price. Includes electrolytic and molderd condenser parts.

MISCELLANEOUS

Table with columns: Part No., Description, Price. Includes various electronic components like resistors, capacitors, and sockets.

SPEAKERS

Table with columns: Part No., Description, Price. Lists speaker models and their specifications.

ENOS

Table with columns: Part No., Description, Price. Lists various electronic components.

GENERAL

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TRANSFORMERS AND COILS

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CONDENSERS

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Twenty-Five Cycle Models

The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer is used.

The twenty-five cycle receiver can be operated satisfactorily from a sixty cycle power supply. However, the reverse is not true—the sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

Phonograph Connections

Phonograph connections are made as shown in the schematic circuit diagram Fig. 2. On the front panel of the chassis base is a round knockout 1/4 inches in diameter. An octal base socket is mounted in this knockout opening and wired as shown in the schematic.

A phono cable assembly may then be purchased (see parts list). On one end of this cable is an octal plug and on the other end is a phonograph radio switch and double tip jack.

Some models are shipped from the factory equipped with the phono socket. A jumper is inserted in this socket which must be removed if the phonograph installation is made—see Fig. 2.

117-234 Volt Power Transformers

Some models are equipped with a 117-214 volt 40 to 60 cycle power transformer. Connections as shown in Fig. 2 are completed to a special octal socket mounted on the back panel of the chassis. A plug which goes with this socket may then be inserted for either the 117 volt or 214 volt connection.

If one of these transformers is to be installed in a chassis equipped with a regular transformer, there is a 1 1/2 inch round knockout on the back panel which may be removed to permit installation of the octal socket mentioned above.

Dial and Drive Assembly

Complete information regarding the dial and drive assemblies will be found in the Dial and Drive Service Manual issued for this chassis.

Changes in Later Models

Later models of this series have the following changes incorporated in them.

On the first models, the 2nd I.F. Coil was not expanded. In other words, the extra selectivity coupling winding was not incorporated in the early type coil. Models with the letter "C" or any later issue stamped on the chassis use the new type coil with the selectivity coupling winding. Because of the change in coil connections, the selectivity switch used on the late model is not interchangeable with that on the early model.

When ordering parts, therefore, it is important that the issue letter on the chassis be noted and the correct part number as shown in the parts list be specified.

The R.F. circuit of early models was slightly different from that used in later models. The screen grids of the R.F. and I.F. tubes now supplied by separate voltage sources were formerly connected together and supplied from a single source. On the latter models, resistor R 28 and condenser C 46 were not used.

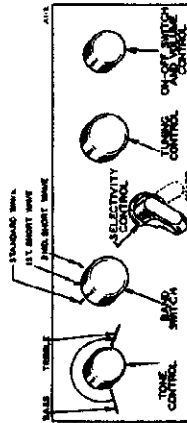


Fig. 1—Arrangement of Controls

Re-alignment is necessary if glass tubes are replaced by their equivalent in metal tubes, or vice versa, in the R.F. and I.F. stages.

Prices Subject to Change Without Notice.

NOTICE—There is a large letter on the chassis which identifies the set as to major part changes. When ordering parts, please be sure to mention the series number and this large letter.

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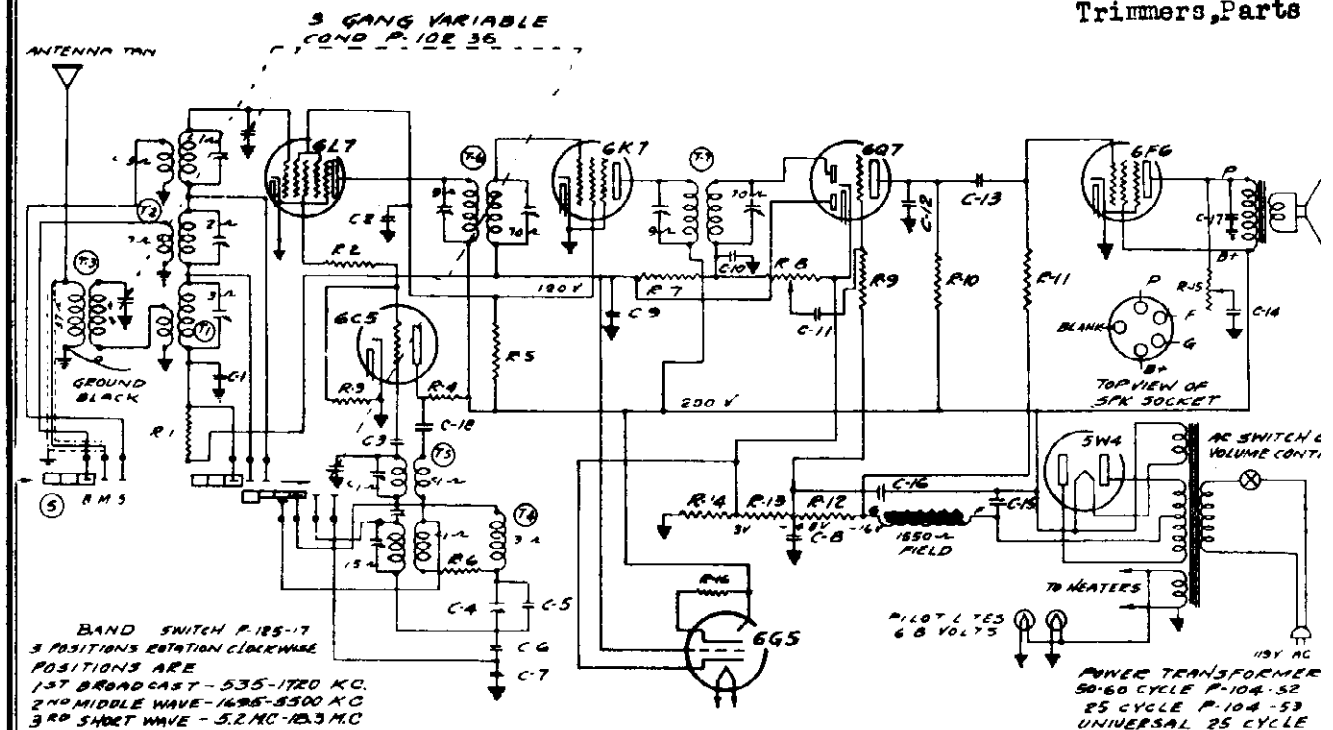
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CONDENSERS</

GAMBLE-SKOGMO, INC.

MODEL 787
Schematic
Voltage, Socket
Trimmers, Parts



BAND SWITCH P-125-17
3 POSITIONS ROTATION CLOCKWISE
POSITIONS ARE
1ST BROADCAST - 535-1720 KC.
2ND MIDDLE WAVE - 1625-3500 KC
3RD SHORT WAVE - 5.2 MC - 12.3 MC

RESISTORS		
No.	Part No.	Description
R1	130-20	100M Ohm - 1/4 Watt - 20% - 50 Volt Carbon
R2	130-105	150 Ohm - 1/4 Watt - 20% - 30 Volt Carbon
R3	130-12	50M Ohm - 1/4 Watt - 20% - 10 Volt Carbon
R4	130-104	24M Ohm - 1 Watt - 20% - 100 Volt Carbon
R5	130-34	15M Ohm - 1 Watt - 20% - 100 Volt Carbon
R6	130-27	50 Ohm - 1/4 Watt - 20% - 3 Volt Carbon
R7	130-19	1 Meg Ohm - 1/4 Watt - 20% - 100 Volt Carbon
R8	101-46	1 Meg Ohm - Volume Control
R9	130-4	3 Meg Ohm - 1/4 Watt - 20% - 100 Volt Carbon
R10	130-103	100M Ohm - 1/4 Watt - 20% - 50 Volt Carbon
R11	130-102	500M Ohm - 1/4 Watt - 10% - 50 Volt Carbon
R12	220	220 Ohm
R13	104-26	32 Ohm
R14	52	52 Ohm
R15	101-53	50M Ohm - Tone Control
R16	130-110	1 Meg Ohm - 1/10 Watt - 10% - 100 Volt Carbon

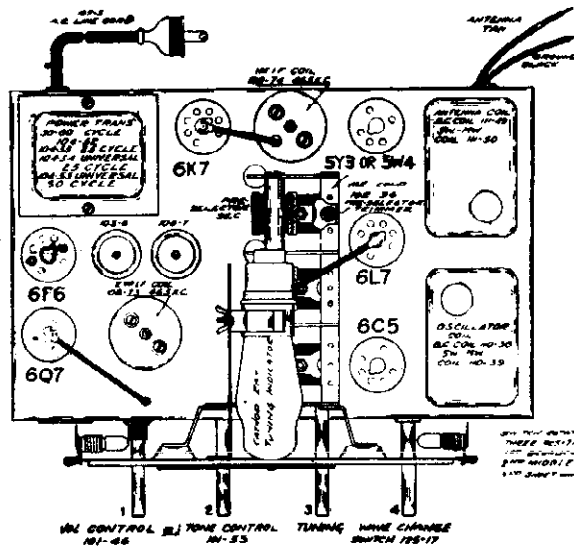
CONDENSERS		
No.	Part No.	Description
C1	100-22	.05x200 Volt - 25%
C2	100-1	.1x400 Volt - 4 - 50% - 10%
C3	129-59	.00005 Mica (MT-O) - 20%
C4	124-28	Series Pad (80-225)

C5	129-65	.00055 Mica (MT-O) - 5%
C6	129-55	.0034 Mica (MW-W) - 2 1/2%
C7	129-54	.003 Mica (MW-W) - 2 1/2%
C8	100-20	1x200 Volt - 25%
C9	100-22	.05x200 Volt - 25%
C10	129-12	.00025 Mica (MT-O) - 20%
C11	100-11	.01x400 Volt - 25%
C12	129-2	.0005 Mica (MT-O) - 20%
C13	100-11	.01x400 Volt - 25%
C14	100-27	.025x600 Volt - 25%
C15	103-6	8 Mfd. x 350 Volt Electrolytic
C16	103-7	8 Mfd. x 300 Volt Electrolytic
C17	100-25	.002x600 Volt - 20%
C18	100-37	.005x600 Volt - 10%

PARTS		
No.	Description	
T1	111-49	Broadcast Antenna Coil
T2	111-50	S.W. - M.W. Antenna Coil
T3	111-51	B.C. - Pre-Selector Coil Assem.
T4	118-36	B.C. Oscillator Coil
T5	118-39	S.W. - M.W. Oscillator Coil
T6	108-74	Input I.F. - 465 K.C.
T7	108-73	Output I.F. - 465 K.C.
S	125-17	Wave Change Switch

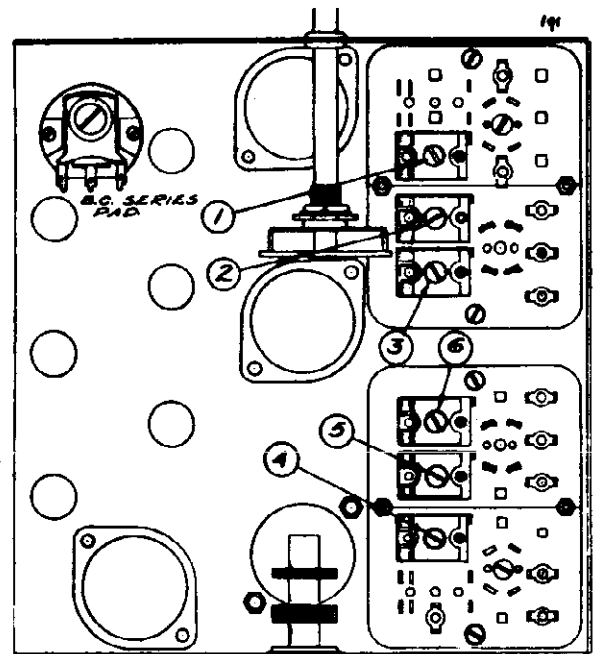
I. F. FREQUENCY
465 K. C.

FIG. 3—BOTTOM VIEW
(Showing Trimmers)



60 Cycle, 55 Watt, 105-115 Volt
BRC-787 (Model 787), Series A

FIG. 1—TOP VIEW



MODEL 787
Alignment
Notes

GAMBLE-SKOGMO, INC.

Including Cathode-Ray Tuning Indicator
3-Band A. C. Superheterodyne Receiver

TUNING RANGE—
Standard Broadcast Band
535-1720 Kilocycles.

Middle Wave Band
1695-5500 Kilocycles.
Short Wave Band
5.2-18.2 Megacycles.

BROADCAST BAND ALIGNMENT:

- 535 to 1720 Kilocycles
1. With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to tan antenna lead and black ground lead, make following adjustments:
(a) Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance (adjustment number 1; see bottom view of coil assembly, Fig. 3).
(b) Re-set external oscillator to 1550 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (Adjustment number 4) to resonance; also adjust preselector trimmer which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 1, for location of this adjustment.)
(c) Re-set external oscillator to 600 K.C., and adjust broadcast series pad to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis, directly under the variable gang condenser. (See bottom view of chassis, Fig. 3.)
(d) Repeat adjustments "a" and "b" until sensitivity is at its maximum.
(e) Check for tracking and sensitivity at 1000 Kilocycles. Under no circumstances bend plates of variable condenser sections to correct tracking.

SHORT WAVE BAND ALIGNMENT:

- 5.2 to 18.3 Megacycles
1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
(a) Move dial pointer to 17 megacycles and adjust short wave oscillator (Adjustment number 3) and short wave antenna (Adjustment number 6) to resonance.
(b) Re-set external oscillator to 5 megacycles and pick up signal by rotating variable condenser and check sensitivity.
(c) Re-set external oscillator and check set at 18.1 megacycles and 5.3 megacycles for band coverage. It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental. An example of this is an image of a fundamental 18.3 megacycle signal appears near 17.4 megacycles.

MIDDLE WAVE BAND ALIGNMENT:

- 1695 to 5500 Kilocycles
1. With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5000 kilocycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
(a) Move dial pointer to 5000 kilocycles and adjust middle wave oscillator (Adjustment number 2) and middle wave antenna (Adjustment number 5) to resonance.
(b) Re-set external oscillator to 1800 kilocycles and pick up signal by rotating variable condenser and check sensitivity.
(c) Re-set external oscillator and check set at 5400 kilocycles and 1700 kilocycles for band coverage.

or grounded antenna systems, low line voltages, defective tubes, condensers and resistors. In order to properly align this chassis an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet. Remove the knobs and the four bolts which are used to fasten the chassis.

All adjustments should be made with a non-metallic screw driver.

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1," "Dummy 2," and "Dummy 3."

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.
Dummy 2: (Broadcast)—Consists of a 200 mfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and screen terminals of the type 6F6 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

ALIGNING I.F. TRANSFORMERS; (465 K.C.):

Part No. 108-73 Output I.F. Transformer.
Part No. 108-74 Input I.F. Transformer.

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on (the extreme right of its rotation), the band changing switch in the broadcast position (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

- (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1," to the control grid cap of the type 6K7 tube, and adjust the output I.F. transformer (No. 108-73) to resonance.
- (b) With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap to 6L7 and adjust input I.F. transformer (No. 108-74) to resonance.
- (c) With oscillator still connected to 6L7, readjust output I.F. transformer (108-73) if necessary.

ALIGNMENT PROCEDURE:

The following adjustments to be made after the I.F.'s have been aligned as explained above.

DESCRIPTION:

Model 787 is a seven tube A.C. all wave superheterodyne receiver. It has a tuning range of 535 K.C. to 18.3 megacycles in three bands, and is characterized by its exceptional stability, and by a sensitivity both high and uniform, with high signal to noise ratio on all bands. The I.F. frequency used is 465 K.C., which in conjunction with the pre-selector circuit, gives high image and I.F. attenuation (freedom from whistles and telegraphic interference).

A separate oscillator, effective automatic volume control, broad nose sharp skirt selectivity and new type oval airplane dial, are a few of the outstanding features of this model.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 25, 40 and 60 cycles and with primary taps for 108, 127, 150, 225 and 240 volts (see instructions), and also sometimes equipped with 25 cycle transformers with 105-115 volt or 220 volt primaries, not universal.

TUBE COMPLEMENT:

The tube complement of the model 787 consists of the latest metal tubes. They are as follows:

- 1-Type 6L7 Pentagrid Mixer, First Detector.
- 1-Type 6C5 Oscillator.
- 1-Type 6K7 Remote Cut-off Pentode, I.F. Amplifier (465 K.C.).
- 1-Type 6Q7 Duplex Diode Triode Second Detector, A.V.C. and First Audio.
- 1-Type 6F6 Pentode Output Amplifier.
- 1-Type 5W4 High Vacuum Rectifier.
- 1-Type 6G5 Cathode-Ray Tuning Indicator.
(Note: 6G6 available in all glass only.)

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on diagram are measured with 110 volts on the primary of the power transformer.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in I.F.C. voltages is usually caused by a shorted electrolytic condenser. Bypass condensers frequently cause oscillation and distorted tone.

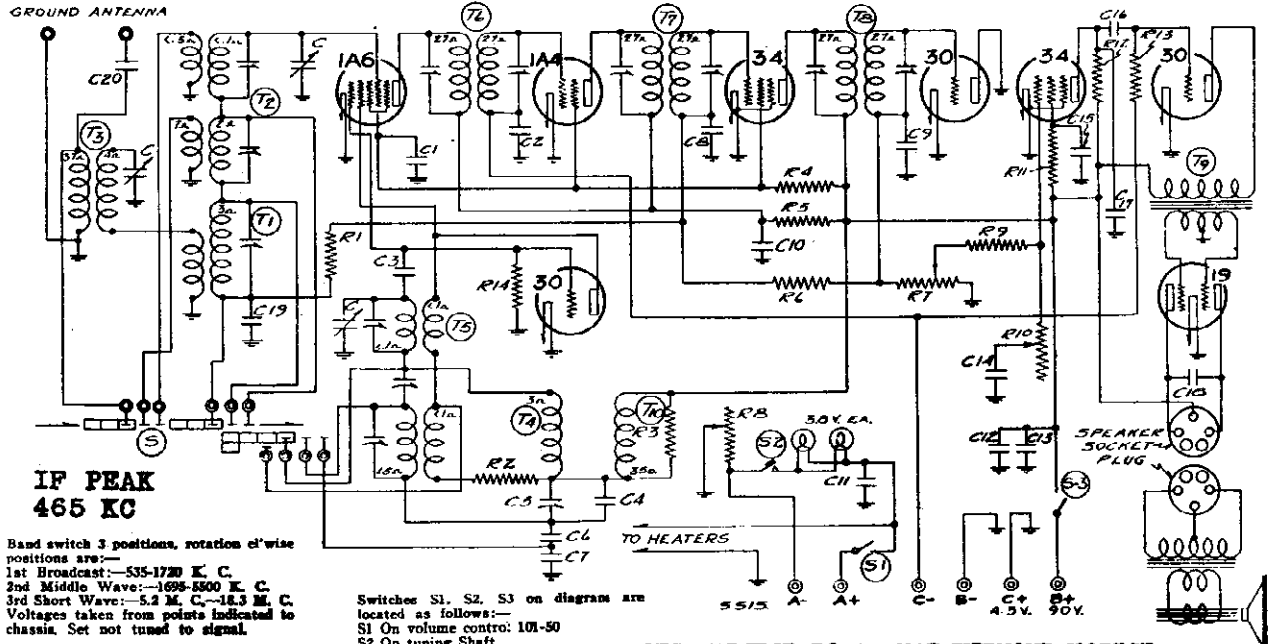
ALIGNING INSTRUCTIONS:

CAUTION:—No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open

Schematic, Socket Trimmers, Parts

GAMBLE-SKOGMO, INC.

MODEL 822



PRICES SUBJECT TO CHANGE WITHOUT NOTICE

LIST OF REPAIR PARTS (Serial No. 6K 411500 and up)

Use Only Genuine Factory Replacement Parts

Part No.	Circuit Diagram Reference	Description	No. Used in Set	List Price Each	Part No.	Description	No. Used in Set	List Price Each
CONDENSERS								
100-5B	C11	1.0 x 120 Volt Tubular with Bracket	1	.50	125-17	S	Band Switch	1 .85
100-6	C1	.25 x 200 Volt Tubular less Bracket	1	.35	128-51		Wood Knob with Spring	3 .15
100-6B	C13	.25 x 200 Volt Tubular with Bracket	1	.35	128-52		"Tuning" Knob with Set Screw—Wood	1 .15
100-11	C14, C16, C20	.01 x 400 Volt Tubular	3	.25	131-12		Bakelite Knob with Arrow	1 .15
100-20	C10	.1 x 200 Volt Tubular	1	.25	RESISTORS			
100-22	C2, C8, C15, C19	.05 x 200 Volt Tubular	4	.25	130-11	R12	250M Ohm—1/2 Watt—20%—50 Volt Carbon	1 .20
100-25	C18	.002 x 600 Volt Tubular	1	.25	130-12	R3, R9, R14	50M Ohm—1/2 Watt—20%—20 Volt Carbon	3 .20
103-11	C12	8 Mid. x 200 Volt Electrolytic	1	.75	130-19	R5, R11, R13	1 Meg Ohm—1/2 Watt—20%—100 Volt Car.	3 .20
129-5	C17	.0001 Mica—Type MT—20%	1	.25	130-20	R1	100M Ohm—1/2 Watt—20%—50 Volt Carbon	1 .20
129-12	C9	.00025 Mica—Type MT—20%	1	.25	130-27	R2	50 Ohm—1/2 Watt—20%—3 Volt Carbon	1 .20
129-50	C3	.00004 Mica—Type MT—30%	1	.25	130-31	R5	1500 Ohm—1/2 Watt—20%—10 Volt Carbon	1 .29
129-54	C7	.003 Mica—Type MW—2 1/2%	1	.35	130-109	R4	7500 Ohm—1/2 Watt—20%—50 Volt Carbon	1 .20
129-55	C6	.0034 Mica—Type MW—2 1/2%	1	.35	COILS			
124-28	C4	.00055 Mica—Type MT—5%	1	.25	108-77	T6	Input I.F. complete with Can	1 1.25
MISCELLANEOUS								
101-50	R7	Volume Control and Switch (250 M ohm)	1	1.25	108-78	T7	Interstage I.F. complete with Can	1 1.25
101-51	R10	Tone Control (300 M ohm)	1	.70	108-79	T8	Output I.F. complete with Can	1 1.25
101-52	R8	Filament Rheostat (2 ohm)	1	.50	110-38	T4	Broadcast Oscillator Coil Complete	1 .50
102-28	C	Three Gang Variable Condenser	1	4.00	110-39	T5	Mid-Wave & Short Wave Oscillator Coil Com.	1 1.50
105-28	T9	Audio Input Transformer	1	1.75	111-49	T1	Broadcast Antenna Coil Assembly Complete	1 .75
113-34		Ant.-Gnd. Strip	1	.15	111-50	T2	Mid-Wave & Short Wave Antenna Coil Assen. Complete	1 1.50
115-35		Antenna-Oscillator Shield	2	.15	111-51	T3	Broadcast Preselector Coil	1 .75
115-46		Shield Cap for Part 115-49	2	.05	123-3	T10	R. F. Choke Coil	1 .35
115-49		Tube Shield for Types 1A4—1A6 Tubes	2	.15				
115-55		Tube Shield for Type 34 Tube	1	.10				
124-28	C5	J-3 Series Pad	1	.35				

GROUNDING: RED AT ANT. BLACK AT BATTERY EMERGENCY

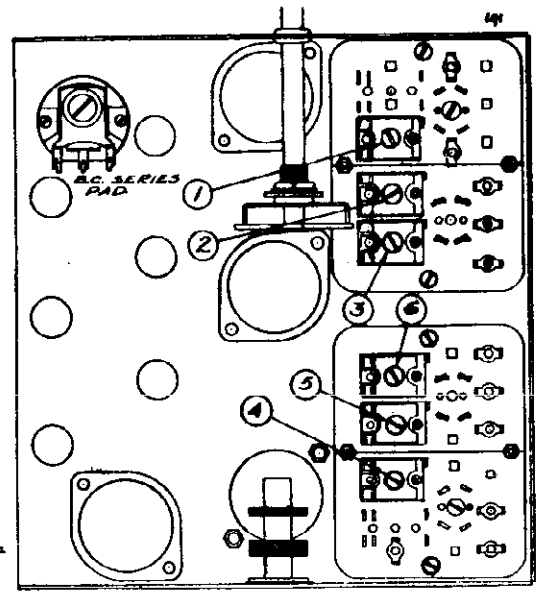
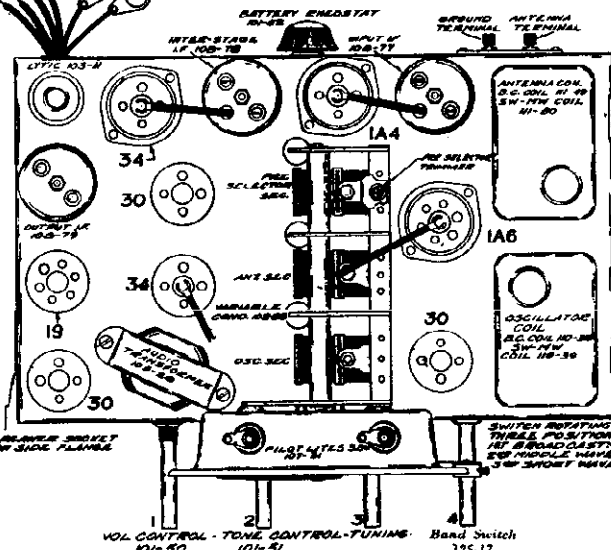


FIG. 3—BOTTOM VIEW SHOWING TRIMMERS

MODEL 822
Alignment
Notes

GAMBLE-SKOGMO, INC.

BAND	DIAL SCALE	FREQUENCY RANGE
Broadcast.....	Outer Scale.....	535 to 1720 K.C. (Kilocycles)
Middle Wave.....	Center Scale.....	1695 to 5500 K.C. (Kilocycles)
Short Wave.....	Inner Scale.....	5.2 to 18.3 M.C. (Megacycles)

BATTERIES REQUIRED:

The following batteries are required:

- 2—45 Volt "B" Batteries.
- 1—4½ Volt "C" Battery.
- 1—3 Volt Dry "A" Battery or 2 Volt Storage Battery.

TUBES:

The tube complement of this chassis is as follows:

- 1—Type 1A6 Pentagrid Mixer, First Detector.
- 1—Type 1A4 Tetrode First I.F. Amplifier (465 K.C.)
- 1—Type 34 Remote Cut-Off Pentode, 2nd I.F. Amplifier (465 K.C.)
- 1—Type 30 Oscillator.
- 1—Type 80 Second Detector and A. V. C.
- 1—Type 34 A.F. Amplifier.
- 1—Type 30 Driver Amplifier.
- 1—Type 19 Class "B" Push-Pull Output Amplifier.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on diagram, are measured with a new set of batteries.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

The approximate current consumption is as follows:

"A"—660 ma., "B"—18 to 24 ma.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the two plate terminals of the type 19 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

DUMMY ANTENNAS

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

- Part No. 108-79 Output I.F. Transformer
- Part No. 108-78 Interstage I.F. Transformer
- Part No. 108-77 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
 - (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 34 tube, and adjust the output I.F. transformer (No. 108-79) to resonance.

- (b) With "Dummy 1" still connected, move oscillator output clip from grid of 34 to grid cap to 1A4 and adjust interstage I.F. transformer (No. 108-78) to resonance.
- (c) Move oscillator to grid cap of 1A6 and adjust input I.F. transformer (No. 108-77).

BROADCAST BAND ALIGNMENT:

535 to 1720 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to antenna and ground posts, make following adjustments:
 - (a) Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance. (Adjustment number 1; see bottom view of coil assembly, Fig. 3)
 - (b) Re-set external oscillator to 1550 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (adjustment number 4) to resonance; also adjust preselector trimmer which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 1, for location of this adjustment).
 - (c) Re-set external oscillator to 600 K.C., and adjust broadcast series pad to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3).
 - (d) Repeat adjustments "a" and "b" until sensitivity is at its maximum.
 - (e) Check for tracking and sensitivity at 1000 kilocycles. Under no circumstances bend plates of variable condenser sections to correct tracking.

SHORT WAVE BAND ALIGNMENT:

5.2 to 18.3 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the antenna and ground posts, make the following adjustments:
 - (a) Move dial pointer to 17 megacycles and adjust short wave oscillator (adjustment number 3) and short wave antenna (adjustment number 6) to resonance.
 - (b) Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check sensitivity.
 - (c) Re-set external oscillator and check set at 18.1 megacycles and 5.3 megacycles for band coverage.

NOTE: It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental on the receiver dial. As an example of this a fundamental 18.3 megacycle signal can be tuned in not only at 18.3 on the dial but also at approximately 17.4 megacycles.

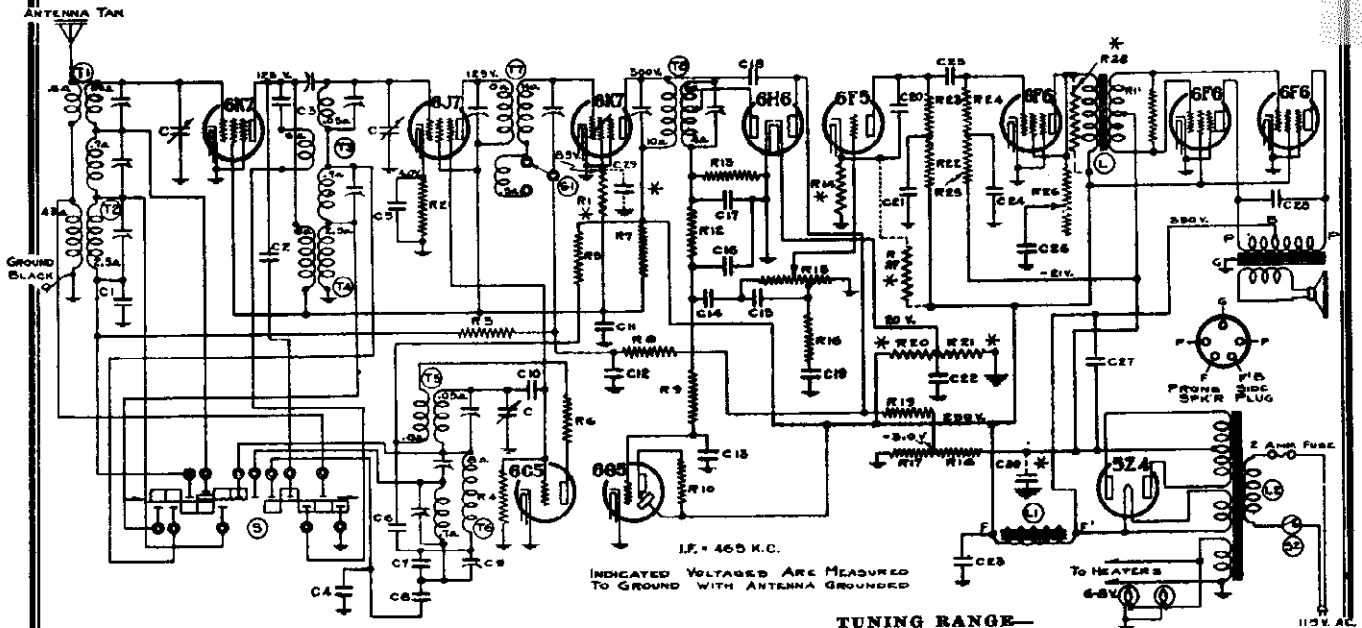
MIDDLE WAVE BAND ALIGNMENT:

1695 to 5500 Kilocycles

1. With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5000 kilocycles and connected in series with "Dummy 3" to the antenna and ground posts make the following adjustments:
 - (a) Move dial pointer to 5000 kilocycles and adjust middle wave oscillator (adjustment number 2) and middle wave antenna (adjustment number 5) to resonance.
 - (b) Re-set external oscillator to 1800 kilocycles and pick up signal by rotating variable condenser and check sensitivity.
 - (c) Re-set external oscillator and check set at 5400 kilocycles and 1700 kilocycles for band coverage.

GAMBLE-SKOGMO, INC.

MODEL 1170
Schematic, Voltage
Socket, Trimmers, Parts



INDICATED VOLTAGES ARE MEASURED TO GROUND WITH ANTENNA GROUNDING

BAND CHANGE SWITCH
THREE POSITIONS, ROTATING
CLOCKWISE ARE:
1st BROADCAST: 535-1720 K.C.
2nd MIDDLE WAVE: 1690-5300 K.C.
3rd SHORT WAVE: 5.2-18.1 M.C.

I. F. FREQUENCY
465 K. C.

TUNING RANGE—
Standard Broadcast Band
585-1720 Kilocycles.
Middle Wave Band
1690-5300 Kilocycles
Short Wave Band
5.2-18.1 Megacycles.

Part No. No.	Description
RESISTORS	
*R1 130-76	30M Ohm—1/2 Watt—20%—Carbon
R2 130-129	2500 Ohm—1/2 Watt—10%—Carbon
R3 130-20	100M Ohm—1/2 Watt—20%—Carbon
R4 130-12	50M Ohm—1/2 Watt—20%—Carbon
R5 130-77	10M Ohm—1 Watt—20%—Carbon
R6 130-60	100 Ohm—1/2 Watt—20%—Carbon
R7 130-88	10M Ohm—2 Watt—20%—Wire Wound
R8 130-19	1 meg Ohm—1/2 Watt—20%—Carbon
R9 130-4	3 meg Ohm—1/2 Watt—20%—Carbon
R10 130-110	1 meg Ohm—1/10 Watt—10%—Carbon
R11 130-21	20M Ohm—1/2 Watt—20%—Carbon
R12 130-20	100M Ohm—1/2 Watt—20%—Carbon
R13 130-20	100M Ohm—1/2 Watt—20%—Carbon
*R14 130-70	500 Ohm—1/2 Watt—10%—Carbon
R15 101-47	1 meg Ohm—Volume Control
R16 130-22	5M Ohm—1/2 Watt—20%—Carbon
R17 106-31	30 Ohm—Muter
R18 106-31	175 Ohm—Muter
R19 130-3	500M Ohm—1/2 Watt—20%—Carbon
*R20 130-130	100M Ohm—1/2 Watt—10%—Carbon
*R21 130-82	10M Ohm—1/2 Watt—10%—Carbon
R22 130-20	100M Ohm—1/2 Watt—20%—Carbon
R23 130-20	100M Ohm—1/2 Watt—20%—Carbon
R24 130-45	250M Ohm—1/2 Watt—20%—Carbon
R25 130-45	250M Ohm—1/2 Watt—20%—Carbon
R26 101-40	5000 Ohm Tone Control
*R27 130-130	100M Ohm—1/2 Watt—10%—Carbon
*R28 130-131	20M Ohm—1/2 Watt—10%—Carbon

NOTE: R17 and R18 in one Unit—No. 106-31.

CONDENSERS	
C1 100-9	.05 x 200 Volt—25%
C2 129-59	.0003 Mica—5%—MT-0
C3 129-39	.00005 Mica—20%—MT-0
C4 129-69	.0023 Mica—20%—MT-0
C5 100-9	.05 x 200 Volt—25%
C6 100-13	.05 x 400 Volt—25%
C7 129-57	.0005 Mica—5%—MT-0
C8 129-55	.0034 Mica—2 1/2%—MT-0
C9 124-34	200 mmf. Working cap. adjustable Pad
C10 129-31	.000025 Mica—15%—MT-0
C11 100-41	.25 x 400 Volt—20%
C12 100-9	.05 x 200 Volt—25%
C13 100-11	.01 x 400 Volt—25%
C14 100-22	.05 x 200 Volt—25%
C15 129-12	.00025 Mica—20%—MT-0
C16 129-60	.00015 Mica—20%—MT-0
C17 129-60	.00015 Mica—20%—MT-0
C18 129-3	.00002 Mica—20%—MT-0
C19 100-9	.05 x 200 Volt—25%
C20 129-5	.0001 Mica—20%—MT-0
C21 100-20	.1 x 200 Volt—25%
C22 100-19	.006 x 600 Volt—25%
C23 103-8	14 mid.—400 Volt—Electrolytic
C24 100-20	.1 x 200 Volt—25%
C25 100-13	.05 x 400 Volt—25%
C26 100-45	.1 x 600 Volt—25%
C27 103-10	.30 mid. x 450 Volt—Electrolytic
C28 100-32	.0005 x 1000 Volts—20%
*C29 100-11	.01 x 400 Volts—25%
*C30 100-20	.1 x 200 Volt—25%

PARTS	
C	102-35 One section of three gang condenser
T1	111-54 MW and SW Antenna Coil Assem.
T2	111-55 Broadcast Antenna Coil Assem.
T3	109-29 MW and SW R.F. Coil Assem.
T4	109-30 Broadcast R.F. Coil
T5	110-42 MW and SW Osc. Coil Assem.
T6	110-43 Broadcast Osc. Coil Assem.
T7	108-64 Input I.F. Coil—465 Kc.
T8	108-63 Output I.F. Coil—465 Kc.
L	105-33 Audio Transformer
L1	114-47C Speaker (Field Resist. 1225 ohm) Hot
L2	104-72 Power Transformer (50-60 Cycle)
S	125-18 Band Switch
S1	101-40 Fidelity Switch on Tone Control
S2	101-47 On-Off Switch on Volume Control

NOTE: Resistors and Condensers which are prefixed with an asterisk (*) on the circuit diagram and parts list were added or the values changed during production to meet certain conditions.

Resistors R1, R27, R28, and Condensers C29, C30 were added to correct certain variances of tube characteristics. Resistors R14, R20, R21 the values were changed. In some chassis the values of these resistors are as follows:
 R14—2500 Ohm—1/2 Watt
 R20—200M Ohm—1/2 Watt
 R21—20M Ohm—1/2 Watt
 Present values of these resistors are:
 R14—500 Ohm—1/2 Watt
 R20—100M Ohm—1/2 Watt
 R21—10M Ohm—1/2 Watt

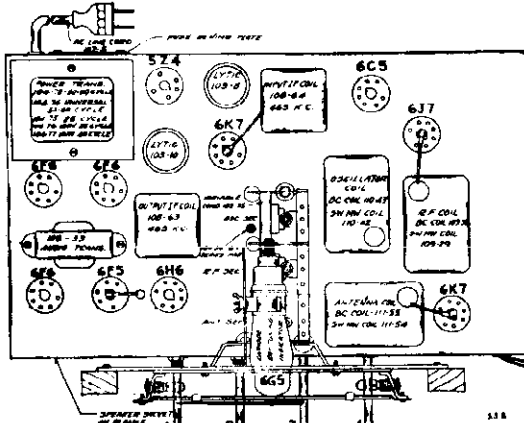


FIG. 3—TOP VIEW MODEL 1170

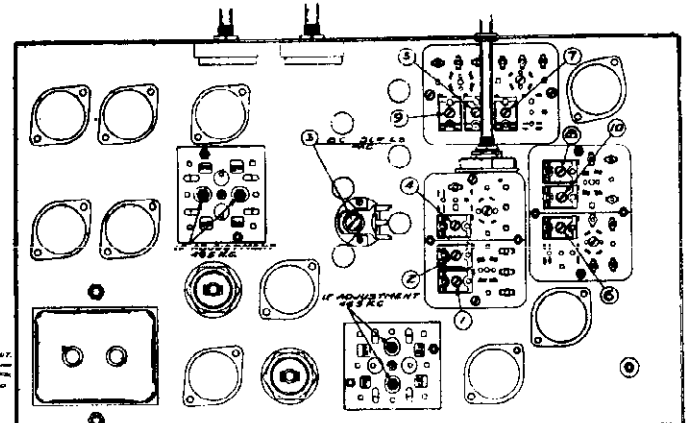


FIG. 1—BOTTOM VIEW SHOWING TRIMMERS

MODEL 1170

GAMBLE-SKOGMO, INC.

Alignment, Notes

(c) With oscillator still connected to 6J7, re-adjust output I.F. transformer if necessary.

ALIGNMENT PROCEDURE

The following adjustments to be made after the I.F.'s have been aligned as explained above.

BROADCAST BAND ALIGNMENT:

1. With band changing switch in the broadcast position, extreme left of its rotation, and with external oscillator set at 600 kilocycles and connected in series with "Dummy 2" to the tan antenna and black ground lead, make the following adjustments:

- (a) Adjust broadcast series pad (adjustment number 3) to resonance with oscillator. Keep set in tune with oscillator by slowly rocking to and fro the variable condenser until maximum output is obtained. Note: This adjustment is accessible from the top of the chassis and is located between the variable condenser and the 108-63 output I.F. transformer. See top view, Fig. 3.
- (b) Re-set external oscillator to 1400 K.C., move dial pointer to 1400 K.C. and adjust oscillator (adjustment number 4), R.F. (adjustment number 6) and antenna (adjustment number 7) to resonance. See bottom view for location of these adjustments, Fig. 1.
- (c) Repeat adjustments "a" and "b" until sensitivity is at its maximum.

NOTE: IT IS EXTREMELY NECESSARY IN MAKING ALL OF THESE ADJUSTMENTS THAT THE FUNDAMENTAL OSCILLATOR SIGNAL BE TUNED IN AND NOT THE IMAGE FREQUENCY WHICH WILL FALL BELOW THE FUNDAMENTAL.

SHORT WAVE BAND ALIGNMENT:

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:

- (a) Move dial pointer to 17 megacycles and adjust short wave oscillator (adjustment number 1), short wave R.F. (adjustment number 8) and short wave antenna (adjustment number 9) to resonance.
- (b) Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check for sensitivity.

MIDDLE WAVE BAND ALIGNMENT:

1. With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5 M.C. and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:

- (a) Rotate condenser, pick up signal and adjust middle wave R.F. (adjustment number 10), middle wave antenna (adjustment number 5) and middle wave oscillator (adjustment number 2) to resonance.
- (b) Re-check broadcast alignment and if it is found necessary to re-adjust either R.F. or antenna trimmers, repeat the 17 M.C. short wave and 5 M.C. middle wave adjustments.

ampere fuse. If replacement fuse blows out, check tubes, particularly 5Z4 rectifier) circuit, repair or replace defective tubes or parts.

NEVER ATTEMPT TO REPLACE FUSE WITHOUT FIRST DISCONNECTING POWER.
NEVER REPLACE WITH FUSE OTHER THAN 2 AMPERE RATING.

ALIGNING INSTRUCTIONS

Dummy Antennas

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

- Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.
- Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.
- Dummy 3: (Intermediate and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

Resonance Indicator:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between the plate and cathode terminals of the 5 prong speaker socket. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output.

A low range output meter or the low scale of a multi-range meter should be used.

CAUTION:

No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet. To remove the knobs, pull them off and to take the chassis out of the cabinet, remove the four bolts by which it is fastened.

ALIGNING I.F. TRANSFORMERS (465 K.C.)

Part No. 108-63 Output I.F. Transformer
Part No. 108-64 Input I.F. Transformer
These I.F. transformers have two adjustments, both of which are accessible from the underside of chassis (see bottom view Fig. 1).

1. With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), the tone control on "Hi" part of the sharp position (as much right rotation as possible without operating the Hi Fidelity switch), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

- (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6K7 tube, located between the two I.F. transformers, and adjust the output I.F. transformer 108-63 to resonance.
- (b) With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap to 6J7 and adjust input I.F. transformer (108-64) to resonance.

DESCRIPTION

The tube complement of this chassis is as follows:

- 1—Type 6K7 Remote cut-off pentode R.F. amplifier
- 1—Type 6J7 Pentode first detector
- 1—Type 6C5 Oscillator
- 1—Type 6K7 Remote cut-off pentode I.F. amplifier (465 K.C.)
- 1—Type 6H6 Duplex diode second detector and A.V.C.
- 1—Type 6F5 First audio amplifier
- 1—Type 5F6 Triode driver stage
- 2—Type 6P6 Class AB Output pentodes in push-pull
- 1—Type 5Z4 High vacuum rectifier
- 1—Type 6G5 Cathode Ray Tuning Indicator.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 25, 40 and 60 cycles and with primary taps for 108, 127, 150, 225, and 260 volts. (see instructions) and also sometimes equipped with 25 cycle transformers with 105-115 volt or 220 volt primaries, not universals.

SERVICE NOTES

NOTE: DeLuxe Model 1172 differs only from the Model 1170 in that dual speakers and a de luxe console cabinet are used. Both chassis are identical and the circuit diagram, the alignment procedure and the parts list contained in this manual apply to both models.

Attention is called to the circuit diagram contained in this manual. Several minor changes were made during production of these models to correct certain conditions. These changes are shown on the circuit diagram in dotted lines and explained in detail. Some of the chassis were equipped with 5Z3 rectifier tubes in place of the 5Z4 and do not have a fuse assembly in the power line.

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 115 volts on the primary of the power transformer.

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagrams.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.

This chassis is protected against damage from faulty tubes or abnormal line conditions by a fuse in the primary circuit.

If when set is turned on pilot lights do not light, look for a blown fuse.

This fuse is made accessible for replacement by removing fuse cover located on back flange of chassis, replace only with a 2

GAMBLE-SKOGMO, INC.

MODEL 1170
Parts

11-Tube Including Cathode-Ray
Tuning Indicator

3-Band A. C. High Fidelity
Superheterodyne Receiver

Serial No. 6J391150 to 6J391649 and from 6J408950 and up

Use only genuine factory replacement parts

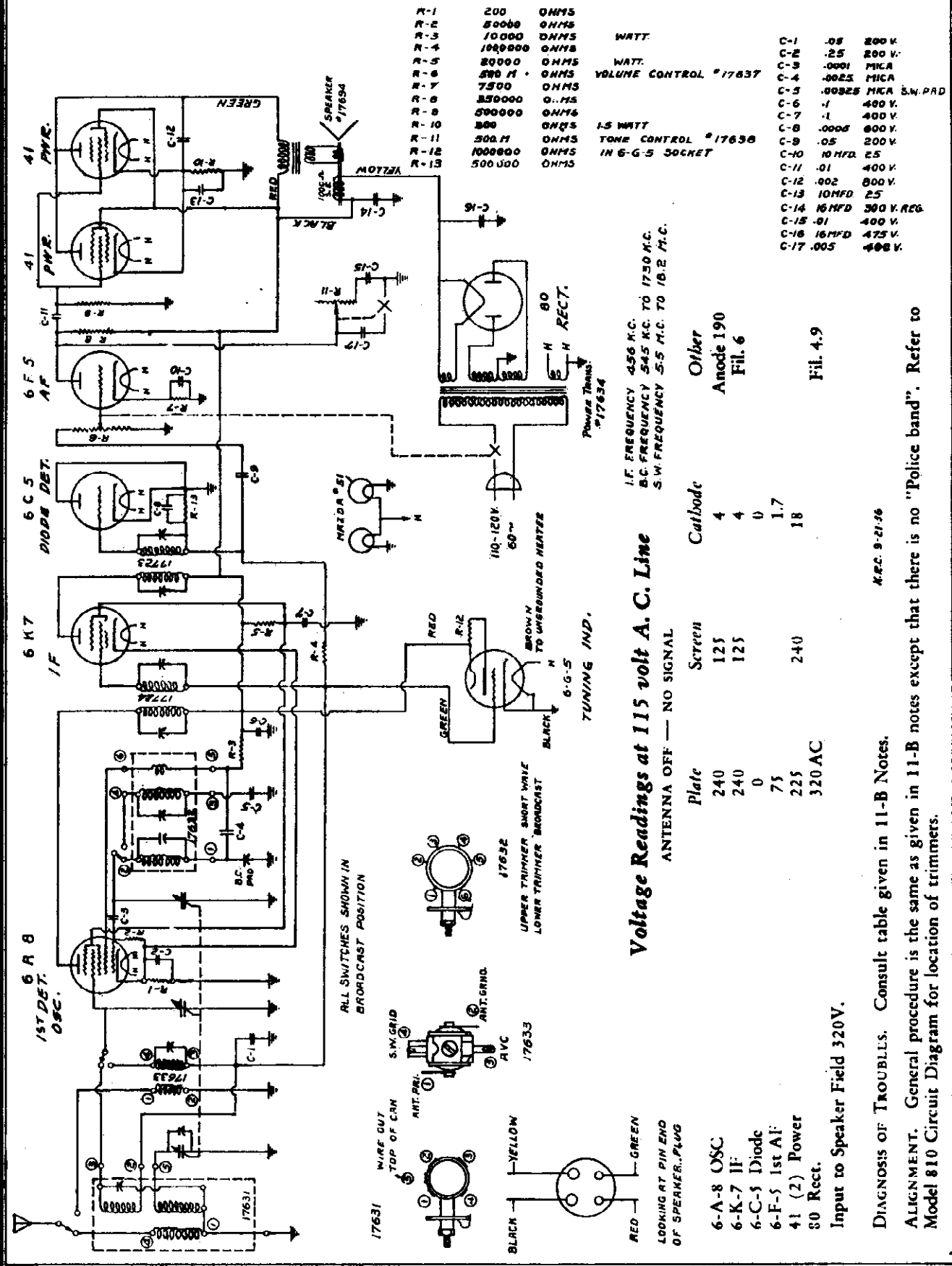
Part No.	DESCRIPTION	Circuit Diagram Reference	List Price Each	Part No.	DESCRIPTION	Circuit Diagram Reference	List Price Each																
CONDENSERS																							
100-9	.05 x 200 Volt Tubular	C1, C5, C12, C19	\$0.25	104-76	Universal—25 Cycle Primary		7.50																
100-11	.01 x 400 Volt Tubular	C13, C29	.25	104-77	Universal—40 Cycle Primary		6.00																
100-13	.05 x 400 Volt Tubular	C6, C25	.25	SOCKETS																			
100-19	.006 x 600 Volt Tubular	C21, C24, C22	.25	121-8	Five-Prong Socket Marked "Spkr"		.10																
100-20	.1 x 200 Volt Tubular	C14	.25	121-12	Seven-Prong Socket Marked "6K7"		.15																
100-22	.05 x 200 Volt Tubular	C28	.25	121-13	Seven-Prong Socket Marked "6I7"		.15																
100-32	.0005 x 1000 Volt Condenser	C11	.35	121-14	Seven-Prong Socket Marked "6F6"		.15																
100-41	.25 x 400 Volt Tubular (with Bracket)	C26	.35	121-16	Five-Prong Socket Marked "5Z4"		.10																
100-45	.1 x 600 Volt Tubular	C23	1.35	121-17	Six-Prong Socket Marked "6CS"		.15																
103-8	14 mfd. x 400 Volt Electrolytic	C27	1.35	121-19	Seven-Prong Socket Marked "6HG"		.15																
103-10	30 mfd. x 450 Volt Electrolytic	C18	.25	121-33	Five-Prong Socket Marked "6FS"		.10																
129-3	.00002 Mica—Type MT—20%	C20	.25	121-34	Four-Prong Socket Marked "5Z3"		.10																
129-5	.0001 Mica—Type MT—30%	C10	.25	SPEAKER FOR MODEL 1170																			
129-12	.00025 Mica—Type MT—20%	C3	.25	114-47C	Twelve Inch Dynamic (Field 1225 Ohms)	L1	8.50																
129-31	.00025 Mica—Type MT—15%	C13	.25	SPEAKERS FOR MODEL 1172																			
129-39	.00005 Mica—Type MT—20%	C8	.35	114-53	Twelve Inch Dynamic, with Special Voice Coil for Dual Speaker Operation		8.50																
129-55	.0034 Mica—Type MT—2 1/2%	C7	.25	114-54	Ten Inch Permanent Magnet Dynamic		10.00																
129-57	.0005 Mica—Type MT—5%	C2	.25	MISCELLANEOUS																			
129-59	.0003 Mica—Type MT—5%	C16, C17	.25	101-40	Tone Control and Fidelity Switch (5M Ohm)	R26, S1	1.35																
129-60	.00015 Mica—Type MT—20%	C4	.35	101-47	Volume Control and Switch (1 Meg Ohm)	R15, S2	1.25																
129-69	.0023 Mica—Type MT—2 1/2%			102-35	Three-Gang Variable Condenser	C	5.00																
RESISTORS																							
130-3	500M Ohm—1/3 Watt—20%—100 V. Carbon	R19	.20	107-5	Line Cord and Plug		.50																
130-4	3 meg Ohm—1/3 Watt—20%—20 V. Carbon	R9	.20	115-35	Antenna, Oscillator and R.F. Shield Can		.15																
130-12	50M Ohm—1/3 Watt—20%—20 V. Carbon	R4	.20	115-36	I.F. Shield Can		.15																
130-19	1 meg Ohm—1/3 Watt—20%—20 V. Carbon	R8	.20	105-33	Input Audio Transformer	L	1.35																
130-20	100M Ohm—1/3 Watt—20%—50 V. Carbon	R3, R12, R13, R22, R23	.20	115-54	Fuse Cover		.15																
130-21	20M Ohm—1/3 Watt—20%—20 V. Carbon	R11	.20	113-47	Fuse Clip Assembly		.15																
130-22	5M Ohm—1/3 Watt—20%—10 V. Carbon	R16	.20	125-18	Band Switch	S	.90																
130-76	30M Ohm—1/3 Watt—20%—Carbon	R1	.20	124-34	Single J Padder 200 mmf.	C9	.35																
130-45	250M Ohm—1/3 Watt—20%—Carbon	R24, R25	.20	131-34	2 Amp. Fuse Type 3AG		.10																
130-60	100 Ohm—1/3 Watt—20%—10 V. Carbon	R6	.20	128-51	Wood Knob with Spring		.15																
130-70	500 Ohm—1/3 Watt—10%—Carbon	R14	.20	All resistors and mica condensers are RMA color coded—specify value and/or resistor or condenser (per schematic diagram) and model number.																			
130-77	10M Ohm—1 Watt—20%—100 V. Carbon	R5	.20	Mica condensers are coded with an additional dot indicating tolerance:																			
130-82	10M Ohm—1/3 Watt—10%—Carbon	R21	.20	<table border="0"> <tr> <td>Tolerance</td> <td>Color of Dot</td> </tr> <tr> <td>5%</td> <td>Red</td> </tr> <tr> <td>10%</td> <td>White</td> </tr> <tr> <td>15%</td> <td>Green</td> </tr> <tr> <td>20%</td> <td>Blue</td> </tr> <tr> <td>More Than 20%</td> <td>Yellow</td> </tr> <tr> <td></td> <td>Red</td> </tr> <tr> <td></td> <td>None</td> </tr> </table>				Tolerance	Color of Dot	5%	Red	10%	White	15%	Green	20%	Blue	More Than 20%	Yellow		Red		None
Tolerance	Color of Dot																						
5%	Red																						
10%	White																						
15%	Green																						
20%	Blue																						
More Than 20%	Yellow																						
	Red																						
	None																						
130-88	10M Ohm—2 Watt—20%—Wire Wound	R7	.40	When ordering condensers, specify part number, model and/or capacitor (per schematic diagram) and model number.																			
130-129	2500 Ohm—1/3 Watt—10%—10 V. Carbon	R2	.20	When ordering parts, always specify part and model number as well as serial number of chassis.																			
130-130	100M Ohm—1/4 Watt—10%—Carbon	R20, R27	.20	All prices quoted are list and are subject to the usual trade discounts.																			
130-131	20M Ohm—1/2 Watt—10%—Carbon	R28	.20	Prices subject to change without notice.																			
130-110	1 meg Ohm—1/10 Watt—10%—Carbon	R10	.30	Shipments are F.O.B. our Factory. When remitting in advance, please include postage.																			
106-31	(30 Ohm, R17) (175 Ohm, R18) Metal Clad Resistor	R17, R18	.40	WE CANNOT SUPPLY SPEAKER PARTS, CONES, TRANSFORMERS, OR FIELDS SEPARATELY. WE CAN REPLACE OR REPAIR A DAMAGED SPEAKER FOR \$2.50 NET. IF IT IS RETURNED TO OUR FACTORY, TRANSPORTATION CHARGES PREPAID.																			
COILS																							
108-63	Output I.F. Coil Assembly Complete, Less Can	T8	1.50																				
108-64	Input I.F. Coil Assembly Complete, Less Can	T7	1.65																				
109-29	Mid-Wave and Short-Wave R.F. Coil Assembly Complete, Less Can	T3	1.50																				
109-30	Broadcast R.F. Coil Assembly Complete, Less Can	T4	1.00																				
110-42	Mid-Wave and Short-Wave Oscillator Coil Assembly Complete, Less Can	T5	1.25																				
110-43	Broadcast Oscillator Coil Assembly Complete, Less Can	T6	.50																				
111-54	Mid-Wave and Short-Wave Antenna Coil Assembly Complete, Less Can	T1	1.50																				
111-55	Broadcast Antenna Coil Assembly Complete, Less Can	T2	1.00																				
TRANSFORMERS																							
104-72	50/60 Cycle Power Transformer	L2	4.00																				
104-74	Universal—50/60 Cycle Primary		6.00																				
104-75	25 Cycle Power Transformer		7.00																				

DIAL PARTS LIST—MODEL 1170A

Part No.	DESCRIPTION	List Price Each	Part No.	DESCRIPTION	List Price Each
ASSEMBLIES					
112-188	Dial Plate Assembly—Including:	.75	DIAL PARTS ONLY		
	1—No. 117-17A Dial Plate		112-117A	Tuning Shaft	.05
	2—No. 117-11 Dial Bracket		112-118	Metal Oval Escutcheon Only	1.25
	1—No. 117-73A Bushing		112-119	Dial Pointer with 132-8 Screw	.20
	4—No. 162-4 Rivets		112-123	Oval Glass Crystal Only	.35
112-189	Switch Assembly—Including:	.35	112-139	Oval Glass Retaining Ring	.10
	2—No. 117-16 Band Indicator Arm		112-175	Background Plate Gasket	.10
	1—No. 117-15 Link (small)		112-176	Drive Belt	.20
	1—No. 117-14 Elbow		112-179	Band Spread Pointer	.10
	1—No. 117-13 Link (large)		112-180	Glass Dial Scale	.90
	1—No. 131-26 Washer		107-46	Right Pilot Light Bracket and Socket	.10
	3—No. 162-5 Rivets		107-47	Left Pilot Light Bracket and Socket	.10
	1—No. 117-22A Stud for link		115-65	Tuning Indicator Paper Tube Shield	.01
	1—No. 134-9 Horseshoe Spring Washer		107-14	6-8 Volt, T-46 Pilot Light	.10
	1—No. 131-30 Spring Washer		117-20A	Drive Belt Pulley	.05
	Red Cellulose		117-25A	Tone and Volume Shaft	.05
112-190	Switch Arm Assembly—Including:	.10	117-33A	Stud for Switch	.03
	1—No. 117-12 Switch Arm		117-39	Drive Belt Take-up Pulley	.03
	1—No. 117-35 Switch Arm Bushing		117-57	Tuning Indicator Holder	.25
	2—No. 132-13 Set Screws		117-64	Background Plate	.25
112-191	Tone Indicator Assembly—Including:	.60	117-72	Reflector Plate	.10
	1—No. 112-178 Celluloid Disc		117-74	Bushing	.10
	1—No. 117-75 Disc Bushing		120-53	Drive Belt Take-up Coil Spring	.05
	1—No. 120-54R Coil Spring		131-30	Spring Washer for Switch Link Assembly	.01
	Fish Line		131-31	Spring Washer for Switch Arm	.01
112-192	Volume Indicator Assembly—Including:	.60	131-33	Glass Dial Retaining Clips	.03
	1—No. 112-178 Celluloid Disc		154-2	Set Screw	.02
	1—No. 117-75 Disc Bushing		CATHODE-RAY TUNING INDICATOR PARTS		
	1—No. 120-54L Coil Spring		107-53	Cable and Socket Assembly (With 130-110 Resistor)	\$0.75
	Fish Line		117-57	Holder and Clamp	.25

MODEL 810
Schematic, Voltage

GAMBLE-SKOGMO, INC.



K22-9-21-16

DIAGNOSIS OF TROUBLES. Consult table given in 11-B Notes.

ALIGNMENT. General procedure is the same as given in 11-B notes except that there is no "Police band". Refer to Model 810 Circuit Diagram for location of trimmers.

Input to Speaker Field 320V.

- 6-A-8 OSC
- 6-K-7 IF
- 6-C-5 Diode
- 6-F-5 1st AF
- 41 (2) Power
- 80 Rect.

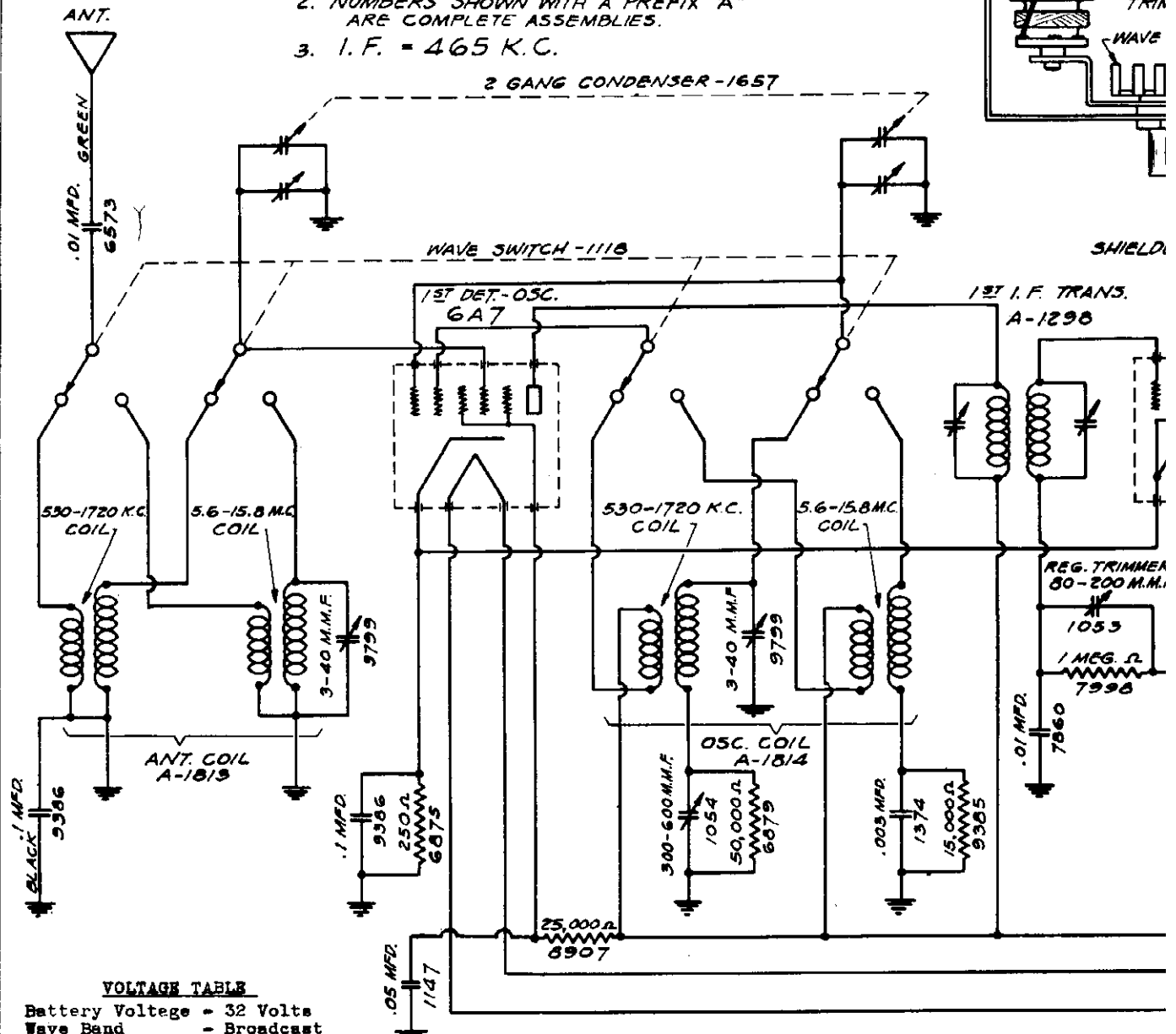
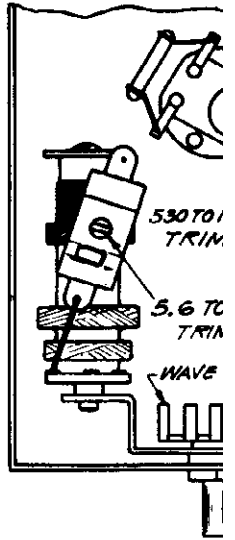
**SIX TUBE SUPERHETERODYNE
TWO BAND
1720 to 530 KC
15.8 to 5.6 MC
32 Volt**

GAMBLE-

This receiver is designed for operation on 32 volt battery plants only; and must not be used on battery plants of a higher rated voltage than 32 volts without a voltage regulator.

NOTE:

1. ALL NOS. SHOWN RELATIVE TO PARTS ARE OUR PART NUMBERS.
2. NUMBERS SHOWN WITH A PREFIX "A" ARE COMPLETE ASSEMBLIES.
3. I. F. = 465 K.C.



VOLTAGE TABLE

Battery Voltage - 32 Volts
Wave Band - Broadcast

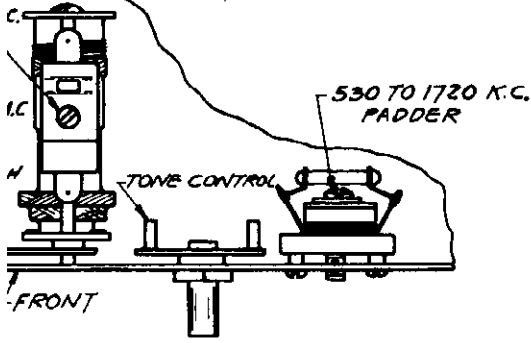
TUBES		FILAMENT	PLATE	SCREEN	CATHODE	GRID NO. 2	GRID NO. 1
6A7	1st Detector & Oscillator	6	32		.5	32	16
6D6	I. F. Amplifier	6	32	32	.6		
75	2nd Detector & A.V.C	6	5				
76	1st Audio	6	30				
48	Output	6	30	32	5		
48	Output	6	30	32	5		

* Triode plate comparative voltage only
Read all voltages from socket to chassis.

IGMO, INC.

I.F. REGENERATION
TRIMMER
1053

LOCATION OF PADDERS & TRIMMERS
IN LEFT HAND (FRONT) BOTTOM OF CHASSIS



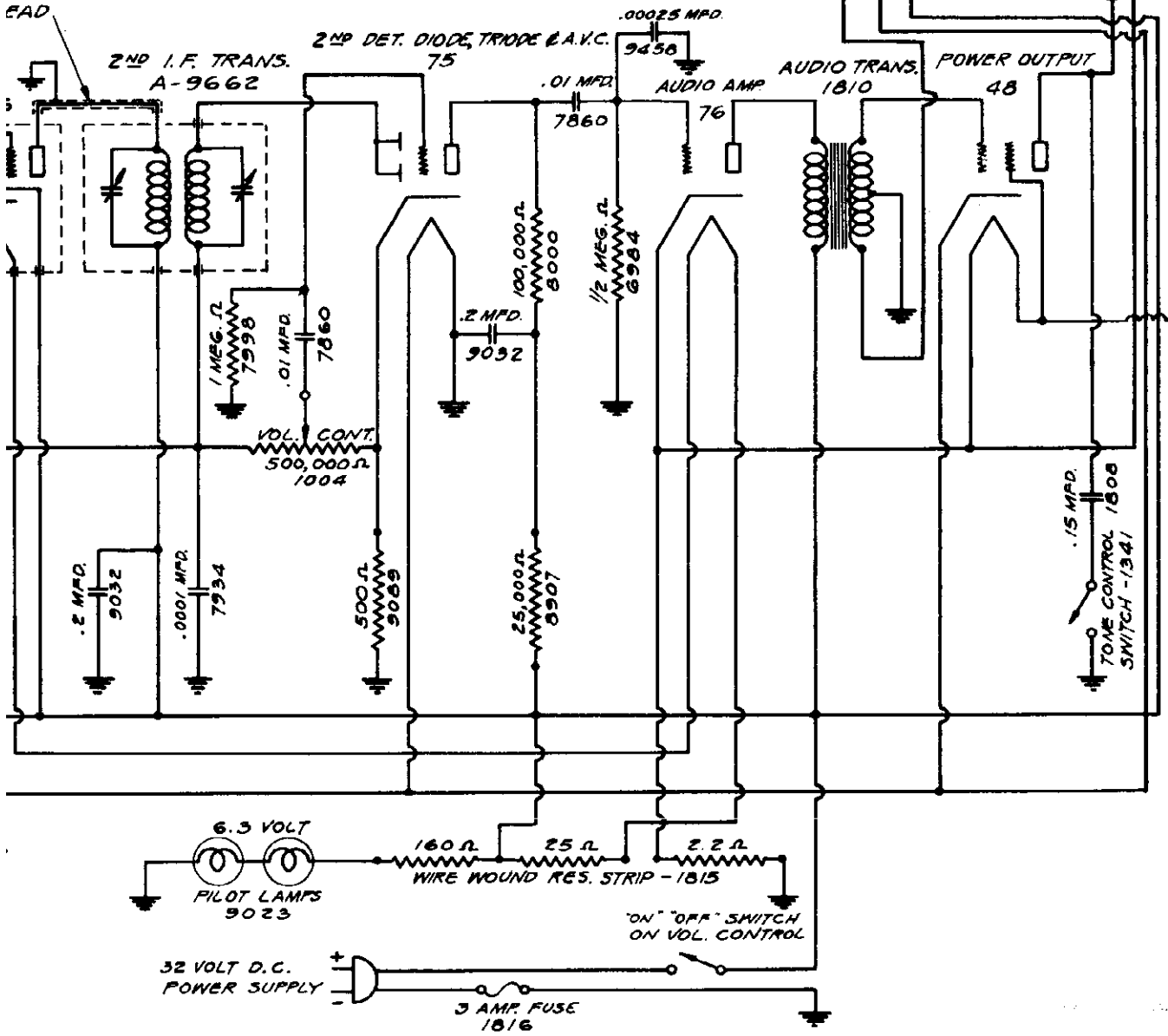
Schematic, Voltage
Trimmers

MODEL 5953A

DYNAMIC SPEAKER
6" DIA. = 1817
8" DIA. = 1818

VOICE COIL
120 A. FIELD COIL

OUTPUT TRANSFORMER



GAMBLE-SKOGMO, INC.

MODEL 5953A
Alignment, Parts

INTERMEDIATE ALIGNMENT:

1. Connect the high side of the oscillator output to the control grid of the 6A7 tube. Leave the grid cap disconnected and connect a 1 meg ohm resistor from the modulator grid to the chassis base. Connect the ground side of the oscillator to the receiver ground lead.
2. Set the test oscillator frequency to 465 kilocycles (this must be accurate).
3. Align the first intermediate transformer by turning one of the trimmer screws up and down (increasing and decreasing capacity) until maximum reading is obtained on the output meter, after which adjust the other trimmer screw of the same transformer for maximum sensitivity.
4. Adjust the other intermediate transformers in the same manner.

NOTE: Two types of intermediate transformer trimmers have been used in this receiver. One type has two parallel holes in the top of the shield, one for each trimmer. The other type has a brass hex nut for adjusting one trimmer, the other intermediate trimmer being adjusted with the trimmer screw located inside of the brass hex nut. Regardless of which type trimmer is used the procedure is the same.

5. Adjust the IF regeneration trimmer located underneath the chassis for maximum 465 kilocycle signal sensitivity. If adjustment of this trimmer causes the receiver to oscillate always adjust to a point where oscillation just stops, and then back off 1/8 turn.

TO ALIGN THE VARIABLE CONDENSER: It is important when aligning the gang condenser and padding and trimmer condensers to follow the procedure given carefully, otherwise the receiver will be insensitive and the dial calibration will be incorrect. The two coils located on the underside of the chassis which have trimmer condensers mounted on them will be referred to by their function as indicated on the circuit diagram.

1. Connect the high output side of the test oscillator through a .00025 Mfd. condenser to the set antenna lead and the ground to the set ground.
2. Place the band selector switch for operation on the 15.8 to 5.6 megacycle band, tune the receiver to EXACTLY 14 MEGACYCLES on the dial, and set the test oscillator frequency to EXACTLY 14 MEGACYCLES. THEN BRING IN THE 14 MEGACYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING THE TRIMMER CONDENSER LOCATED ON TOP OF THE OSCILLATOR SECTION OF THE GANG CONDENSER. Looking at the front of the receiver the oscillator section is the rear section of the gang condenser. When adjusting this trimmer two peaks, the fundamental and the image peak, will be noticed. CARE MUST BE TAKEN SO THAT THE FUNDAMENTAL PEAK AND NOT THE IMAGE PEAK IS USED FOR ALIGNING THE RECEIVER AT 14 MEGACYCLES. First back off the trimmer to minimum capacity, next screw down the trimmer (add capacity) until the first peak, which is the fundamental and the one you are to use, is tuned in. If the trimmer is screwed down beyond the point where this first peak is received the incorrect image peak will be tuned in. When the first peak has been located adjust the trimmer to bring in the 14 megacycle signal to maximum output. After completing this adjustment always check to see if the proper peak has been used. To do this leave the test oscillator frequency at 14 megacycles, increase the output of the test oscillator and then tune the receiver dial to approximately 13 megacycles. Vary the receiver dial slightly to the right and left of 13 megacycles and if the fundamental peak was used in aligning at 14 megacycles the test oscillator signal will be heard at approximately 13 megacycles on the receiver dial. If it is not possible to receive the signal then the fundamental peak was not used and the 14 megacycle adjustment of the trimmer on top of the oscillator section of the gang condenser must be gone over and properly adjusted.
3. Set the band selector switch for operation on the broadcast band (1720-530 K.C.) adjust the test oscillator frequency to EXACTLY 1400 KILOCYCLES and the receiver dial to EXACTLY 1400 KILOCYCLES. THEN BRING IN THE 1400 KILOCYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING THE 1720-530 KILOCYCLE TRIMMER (see circuit diagram) mounted on one of the coils located underneath the chassis. Next adjust the trimmer located on the front section of the gang condenser for maximum 1400 kilocycle signal sensitivity.
4. Leave the band selector switch for operation on the broadcast band (1720-530 K.C.), tune the receiver dial and set the test oscillator frequency to approximately 600 kilocycles. While rocking the gang condenser slightly to the right and left adjust the 1720-530 kilocycle trimmer which is located on and accessible through the small hole in the front of the chassis, for maximum sensitivity.
5. Recheck the 1400 kilocycle signal adjustment.
6. Place the band selector switch for operation on the short wave 15.8 to 5.6 megacycle band, set the test oscillator frequency to EXACTLY 14 MEGACYCLES and tune the receiver to EXACTLY 14 MEGACYCLES. While rocking the gang condenser slightly to the right and left adjust the 5.6 to 15.8 megacycle trimmer (see circuit diagram) mounted on one of the coils underneath the chassis.

This completes the alignment and it is recommended that all the adjustments be gone over again, as generally it will be found that improved results can be obtained if this is done. Assuming that all tubes and component parts of the set are okay, then extreme inaccuracies in the dial calibration, low sensitivity, and poor selectivity are indications that the alignment procedure has not been followed.

PART NUMBER	LIST PRICE	PART NUMBER	LIST PRICE
1813 Antenna Coil	\$1.63	1148 .5 Mfd. 200 Volt Condenser	\$.55
1814 Oscillator Coil	1.63	9032 .2 Mfd. 200 Volt Condenser	.23
1298 First I.F. Transformer	2.05	9386 .1 Mfd. 200 Volt Condenser	.19
9362 Second I. F. Transformer	2.05	1147 .05 Mfd. 200 Volt Condenser	.17
1810 Audio Transformer	1.75	6573 .01 Mfd. 200 Volt Condenser	.17
1657 Two Gang Variable Condenser	4.00	1808 .15 Mfd. 200 Volt Condenser	.17
1106 Drive Disc with Hub	.30	7840 .01 Mfd. 400 Volt Condenser	.17
1641 Calibrated Dial (Calibration No. 1853) with Frame and Gasket	.50	1815 Resistor Strip	.95
Glass for above Dial	.35	1333 18,000 Ohm 1/2 Watt Resistor	.19
1744 Calibrated Dial (Calibration No. 1745) with Frame and Gasket	.48	7928 1-Meg Ohm 1/3 Watt Resistor	.12
Glass for above Dial	.35	6984 500,000 Ohm 1/3 Watt Resistor	.19
9023 6.3 Volt .15 Ampere Pilot Light	.19	8907 25,000 Ohm 1/3 Watt Resistor	.19
1118 Wave Switch	.75	6879 50,000 Ohm 1/3 Watt Resistor	.19
9799 Trimmer Condenser	.15	9385 15,000 Ohm 1/3 Watt Resistor	.19
1053 Padding Condenser	.50	8000 100,000 Ohm 1/3 Watt Resistor	.19
1054 Padding Condenser	.55	9089 200 Ohm 1/3 Watt Resistor	.19
1004 Volume Control and Off and On Switch	1.24	6875 550 Ohm 1/3 Watt Resistor	.19
1816 3 Ampere Fuse	.12	1817 6" Dynamic Speaker	7.25
7934 .0001 Mfd. Moulded Condenser	.21	1818 8" Dynamic Speaker	9.00
9458 .00025 Mfd. Moulded Condenser	.21	1341 Tone Control Switch	.39
1374 .003 Mfd. Moulded Condenser	.21	1548 Fuse Block Receptacle	.25

Prices are subject to change without notice.

MODEL 850B

GAMBLE-SKOGMO, INC.

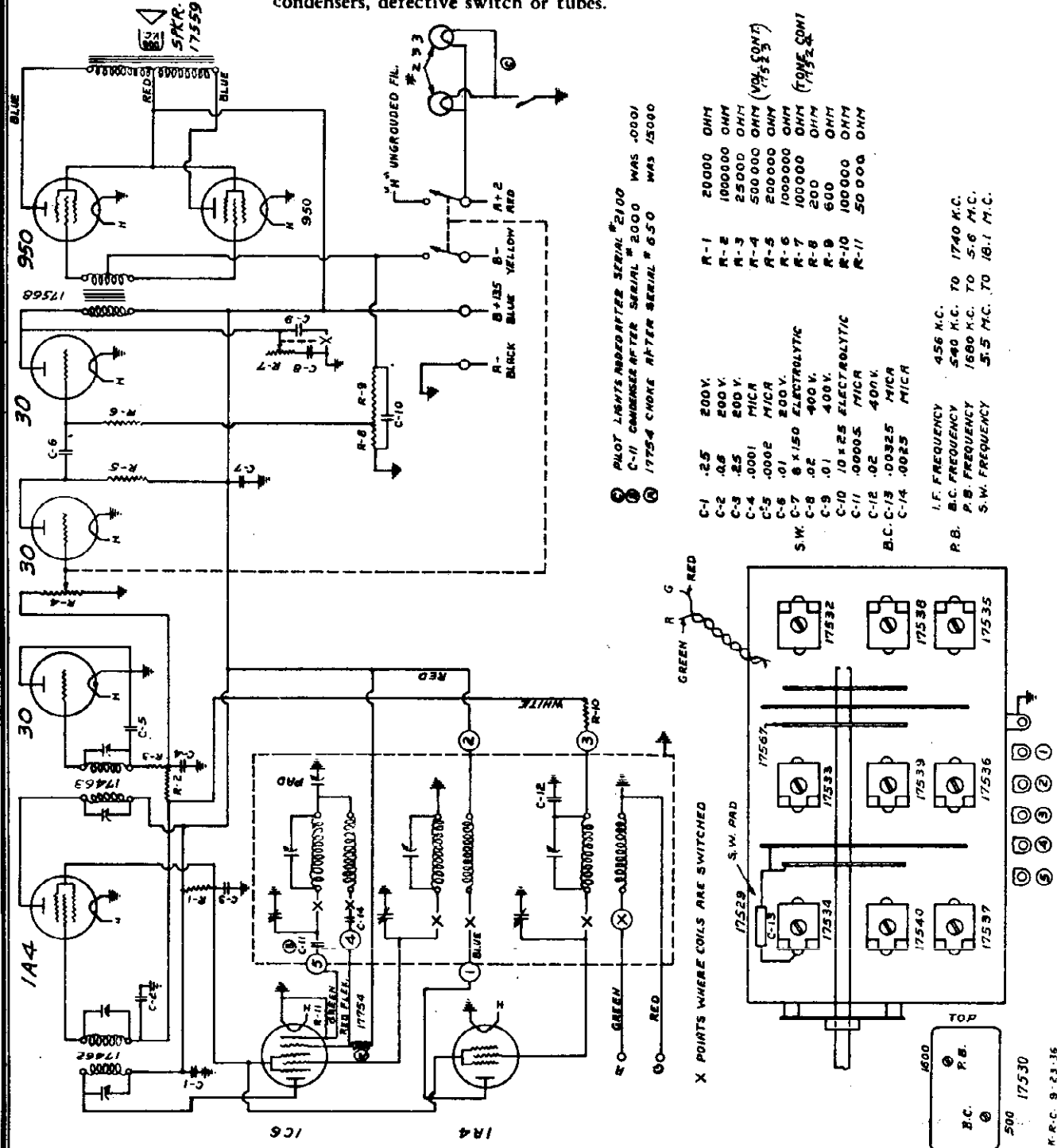
Schematic, Trimmers Alignment

ALIGNMENT. Refer to "Alignment" in 11-B notes. Connect signal generator to grid cap of 1-C-6 tube for IF alignment.

BELT AND DIAL REPLACEMENT. Belt may be replaced without removing any parts on this model. Also see notes on 11-B dial and belt.

TUBE FUNCTIONS. 1-A-4 R. F. Stage on all wave bands, 1-C-6 first detector-oscillator, 1-A-4 intermediate amplifier, "30" as diode detector, "30" as first audio, "30" as second audio, two type 950 Pentodes operating in push-pull class A prime as power tubes.

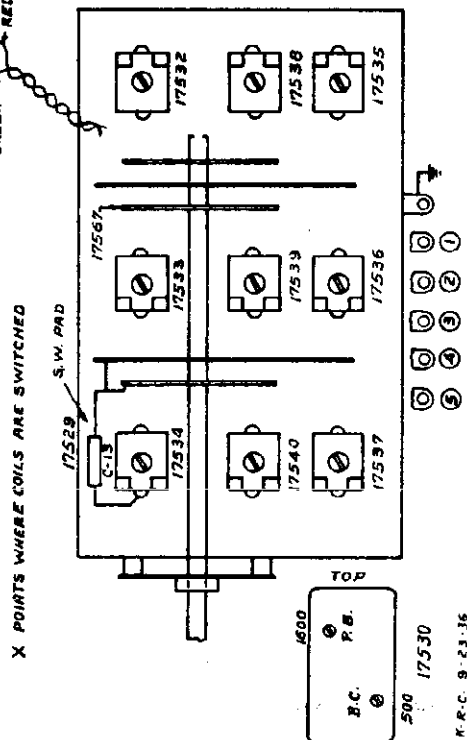
Excessive Battery Drain This should always be checked with a meter, since some people use a set more than they realize or may leave it "on" over night. The "A" drain should measure not over .68 amp. and the "B" 20 to 22 Milliamperes on low volume—increasing some when tuned in on high volume. Causes of excessive drain can usually be traced to shorted or leaky condensers, defective switch or tubes.

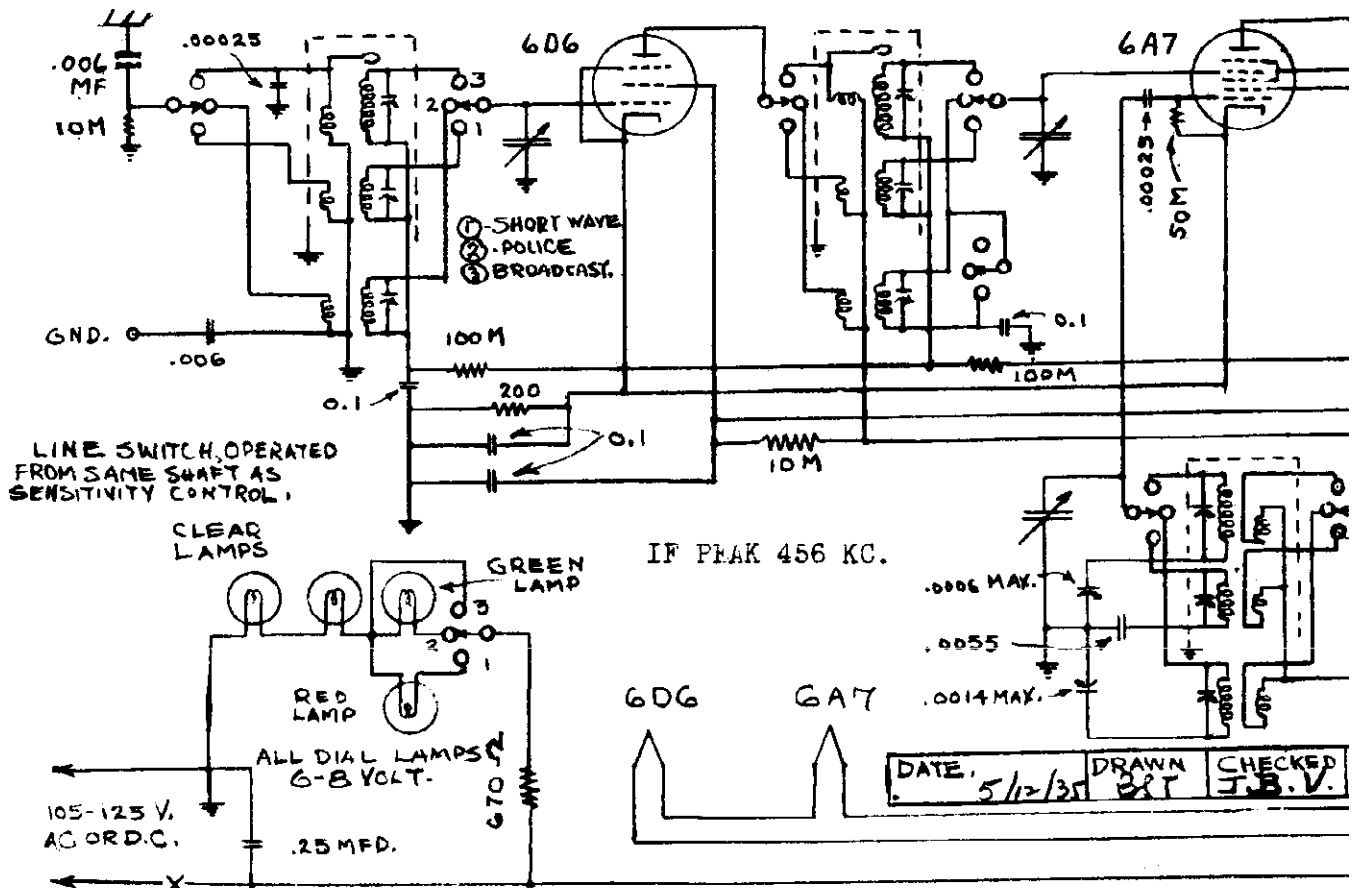
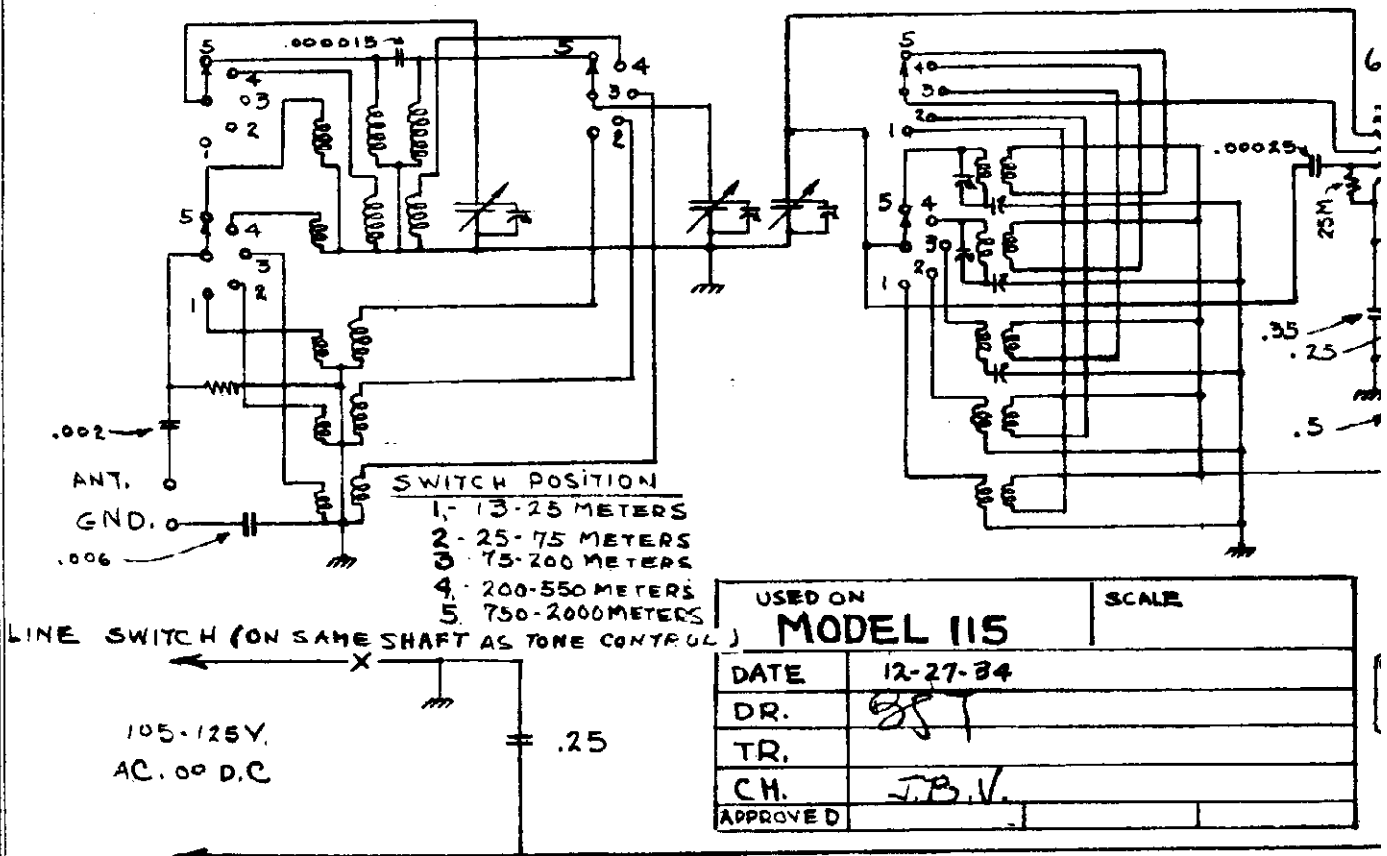


- Ⓢ PILOT LIGHTS INED AFTER SERIAL #2100
- Ⓣ C-11 CHANGE AFTER SERIAL # 2000 WAS .0001
- Ⓤ 1775-4 CHOKE AFTER SERIAL # 650 WAS 15000

C-1	.25	200V.	R-1	20000	OHM
C-2	.05	200 V.	R-2	1000000	OHM
C-3	.25	200 V.	R-3	25000	OHM
C-4	.0001	MICR	R-4	500000	OHM (VOL. CONTROL)
C-5	.0002	MICR	R-5	200000	OHM (POWER CONTROL)
C-6	.01	200 V.	R-6	1000000	OHM
C-7	6 x .150	ELECTROLYTIC	R-7	100000	OHM
C-8	.02	400 V.	R-8	600	OHM
C-9	.01	400 V.	R-9	600	OHM
C-10	10 x .25	ELECTROLYTIC	R-10	1000000	OHM
C-11	.00005	MICR	R-11	50000	OHM
C-12	.02	400V.			
C-13	.00325	MICR			
C-14	.0025	MICR			

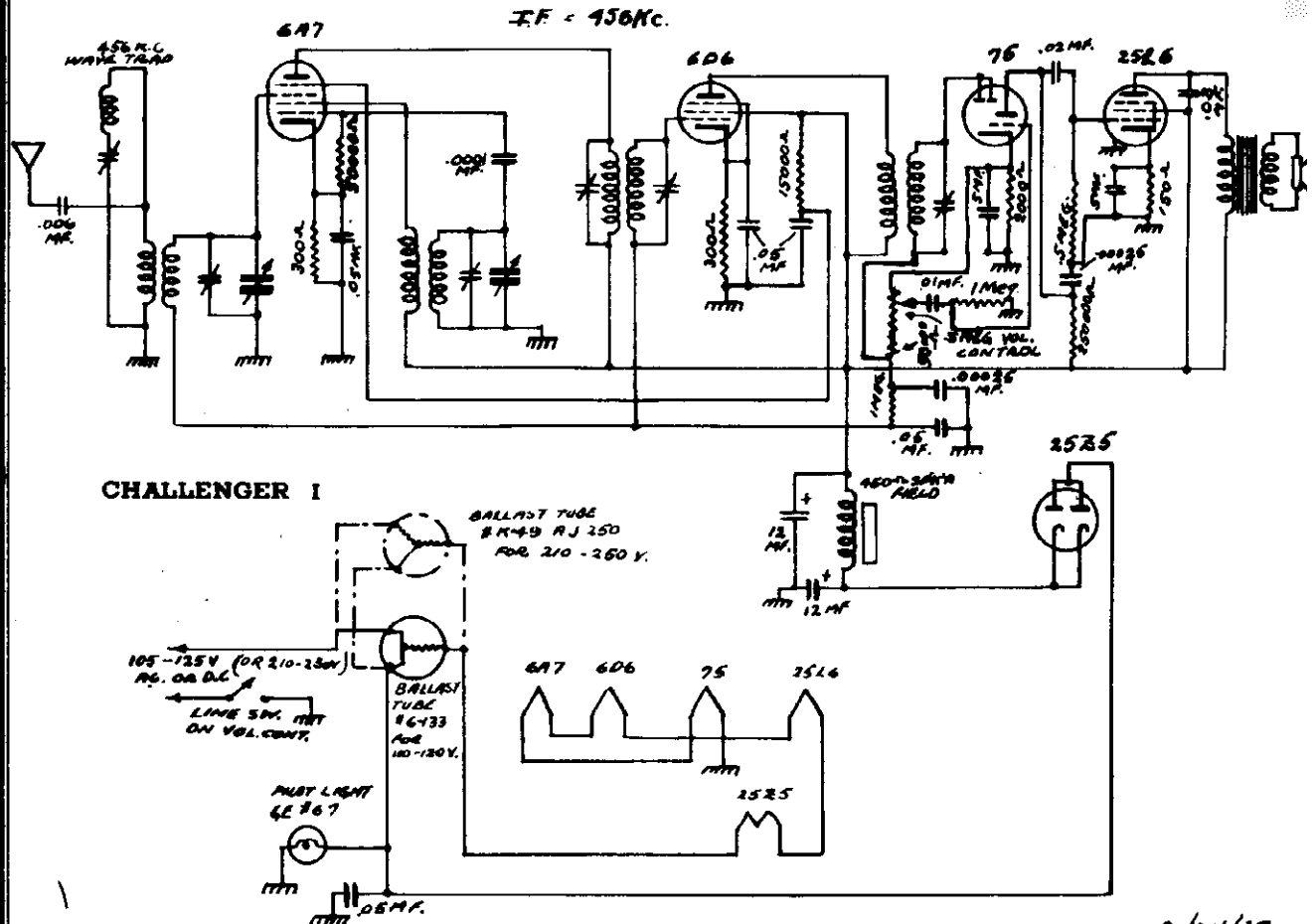
I.F. FREQUENCY	456 K.C.
B.C. FREQUENCY	540 K.C. TO 1740 K.C.
P.B. FREQUENCY	1680 K.C. TO 5.6 M.C.
S.W. FREQUENCY	5.5 M.C. TO 18.1 M.C.





GAROD RADIO CORP.

MODEL Challenger I
Schematic, Socket
Alignment, Voltage



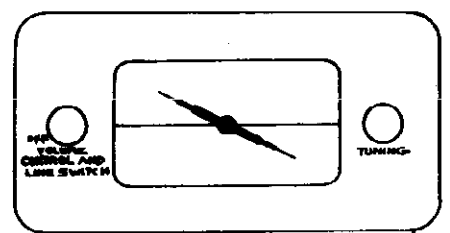
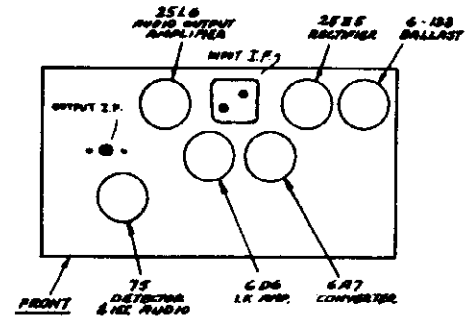
2/24/37

This receiver operates on either direct current or alternating current of any frequency on voltage between 105 and 130. If voltages in excess of this value are to be applied to the receiver, a special Ballast Tube must be used. When operating from direct current, if after the receiver has been turned on for about three quarters of a minute, no reception is obtained, the plug must be reversed in the socket. On alternating current, there is generally no difference, though sometimes quieter operation results.

I.F. ADJUSTMENT - The signal generator is set at 456 kc. The "hot" lead from the signal generator is connected to the grid cap on the 1st detector (6A7) tube, the clip having first been removed from the tube cap. The ground lead is connected to the receiver chassis. The oscillator section (front) of the gang tuning condenser is short-circuited and the volume control turned on full. The i.f. trimmers are then adjusted for maximum gain in the receiver. These trimmers are located on top of the i.f. transformer shield can and on the chassis to the left of the 6D6 tube. The one towards the right is the 1st i.f. transformer and the left one is the 2nd i.f. transformer. The oscillator section of the variable condenser is the one nearest the front of the chassis. The antenna trimmer is then adjusted for maximum output.

1500 KILOCYCLE ADJUSTMENT - The short-circuit is removed from the oscillator condenser and the grid clip replaced in its normal position on the cap of the 6A7 tube. The "hot" lead from the signal generator is connected to the antenna lead of the receiver and the ground lead to the ground of the receiver. With the volume control set at maximum and a minimum input signal from the signal generator, the band switch is turned to the left and the receiver dial set at 1500 K.C. The oscillator trimmer is adjusted so as to bring the signal in at this setting.

456 K.C. WAVE TRAP ADJUSTMENT: The signal generator is again set to 456 kc. The output of the signal generator is increased so as to obtain a good reading (about half scale) on the output meter connected to the receiver. The wave trap is then adjusted for a **MINIMUM** reading by rotating the trimmer on top of the antenna coil. This is located directly behind the dial scale.



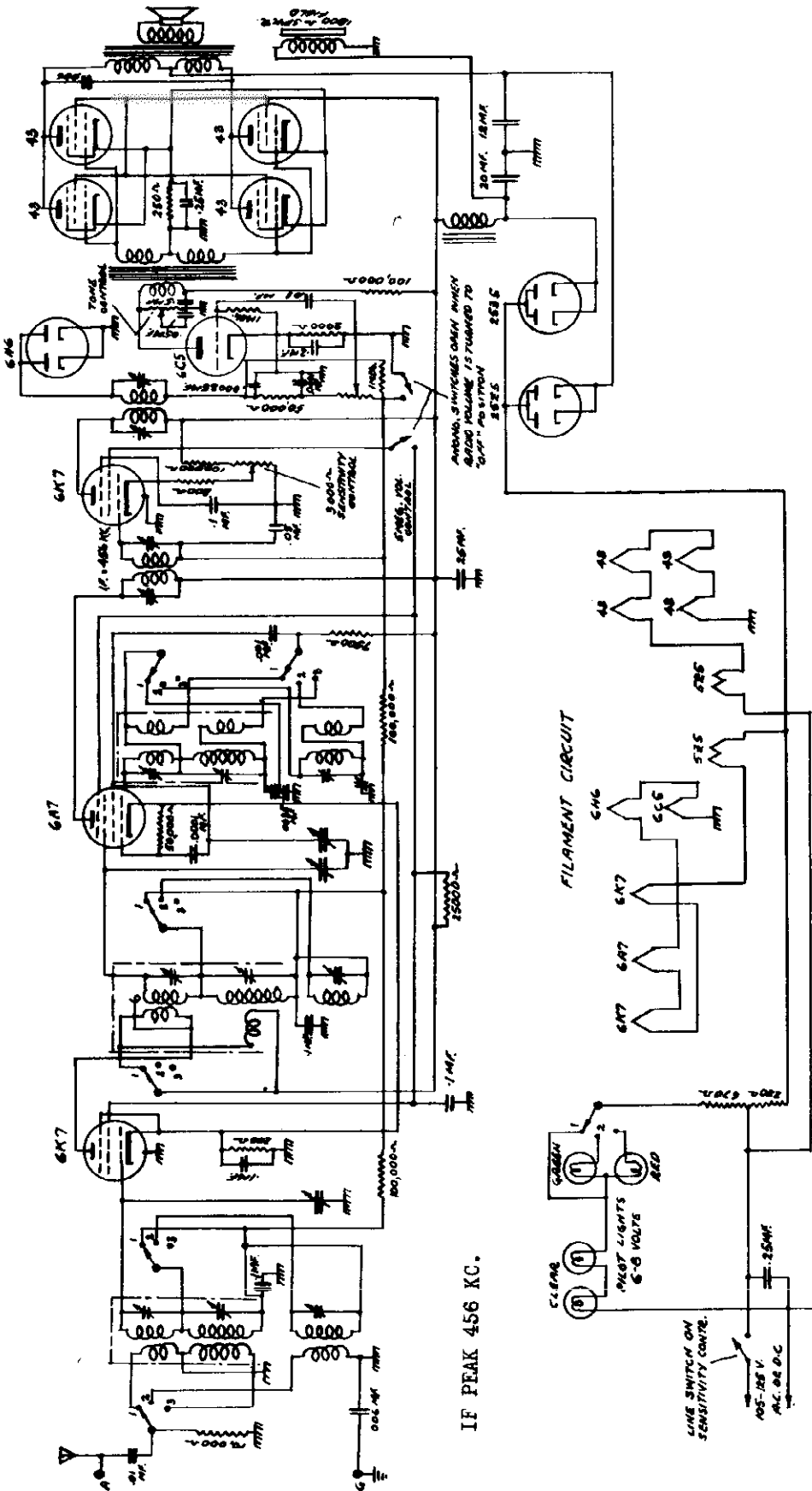
VOLTAGE TABLE

TUBE	FUNCTION	H.T.'R	PLATE	SC. GR.	GATE	GRG. PL.
6A7	det.-osc.	6.3	92	65.0	2.5	92
6D6	i.f. ampl.	6.3	92	---	2.0	---
7S	diode det. and 1st audio	6.3	40.0	---	---	---
25L6	audio outpt.	25.	92	---	7.5	---
25Z5	rectifier	25.	92	---	120.	---

NOTE: Fil. voltages measured with a high impedance A.C. voltmeter, other potentials with a high resistance (1000 OHMS per volt) voltmeter.

MODEL 311
Schematic

GAROD RADIO CORP.



GAROD RADIO CORP. NEW YORK, U.S.A.			
DATE 10-9-35	DR. D.A.	11 TUBE BAND - R.C.-D.C.	
TH. 1/3	CH. 1/3	RECEIVER	
APPROVED	USED ON	311	SCALE

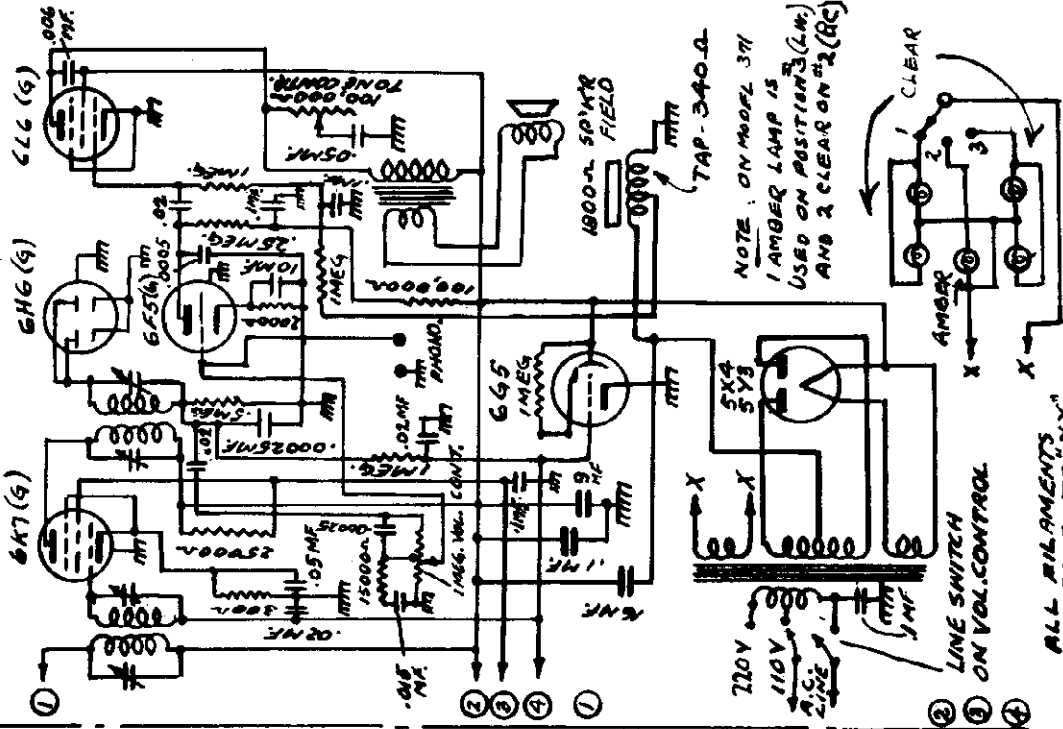
SWITCH LEGEND

- 1 - SHORT WAVE - 5.65 to 19.5 M.C.
- 2 - POLICE - 1.4 to 5.8 M.C.
- 3 - BROADCAST - 540 to 1500 K.C.

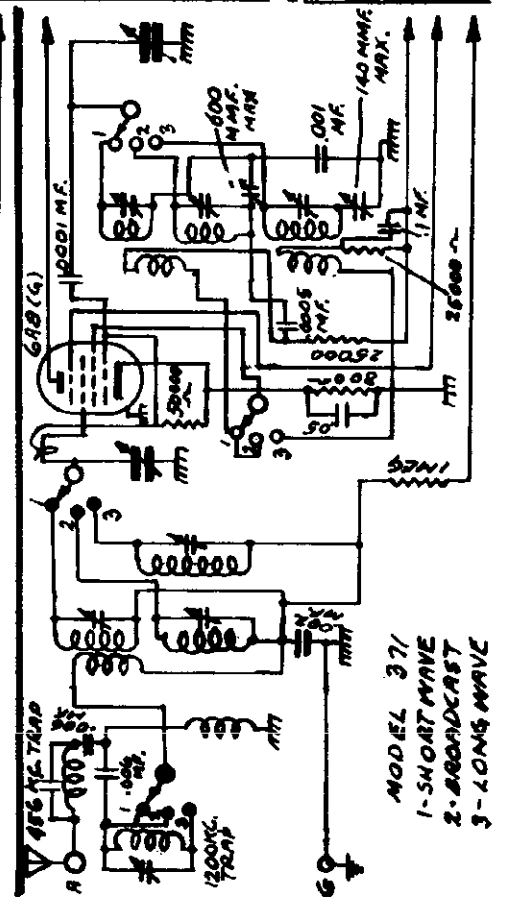
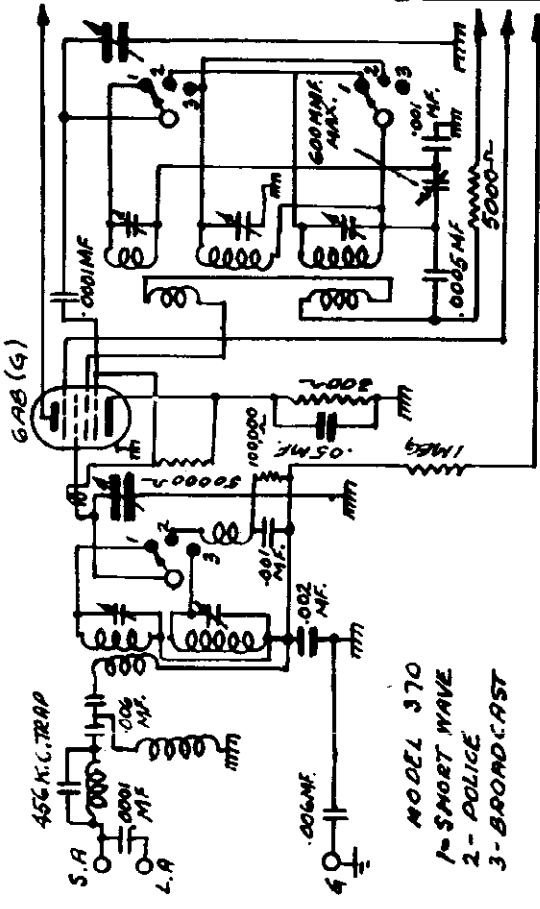
GAROD RADIO CORP.

MODELS 370, 370C, 370D, 370KC
 MODELS 371, 371C, 371D, 371KC
 Schematics

ALL PARTS AND CONNECTIONS INDICATED
 TO RIGHT OF THIS DOTTED LINE
 ARE IDENTICAL ON MODELS
 370 AND 371



IF PEAK 456 KC.
 - Foreign & American Short Waves
 - Regular Broadcast
 - Weather reports in the U.S.A.



WAVE BANDS For Model 370

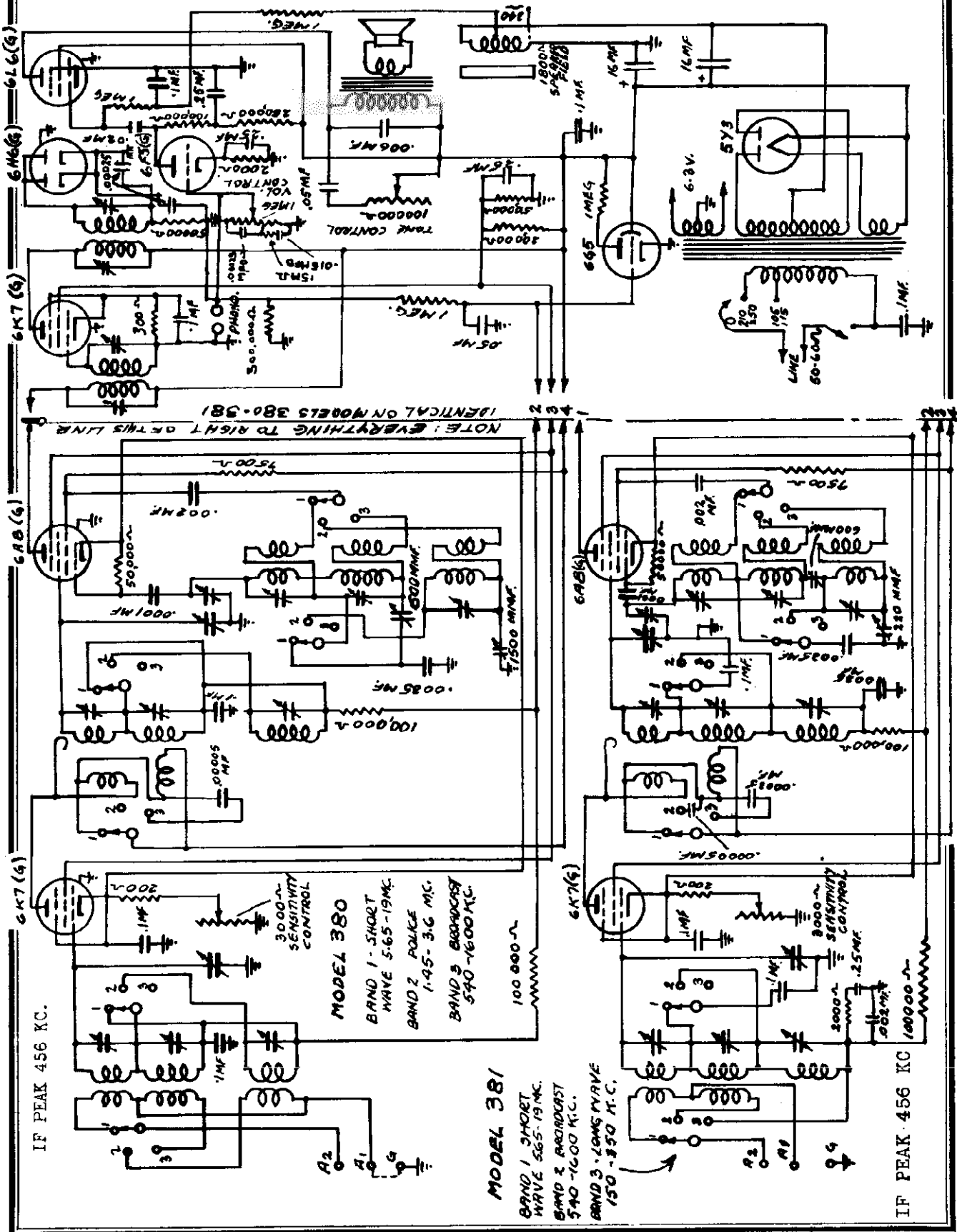
POSITION	WAVE BAND
1	15 to 24 meters
2	200 " 560 "
3	200 " 560 "

WAVE BANDS For Model 371

POSITION	WAVE BAND
1	16 to 52 meters
2	200 " 560 "
3	750 " 2000 "

MODELS 380, 380D, 380KC
 MODELS 381, 381D, 381KC
 Schematics

GAROD RADIO CORP.



Alignment, Voltage
Socket, Trimmers

GAROD RADIO CORP.

MODELS 380, 380D, 380KC
MODELS 381, 381D, 381KC

I.F. ADJUSTMENT - The signal generator is set at 456 kc. and is connected to the grid of the first detector (6A8). With the oscillator section of the tuning condenser short-circuited and the receiver volume control at its maximum position, the i.f. trimmers are adjusted for maximum output. These trimmers may be found on tops of the i.f. transformer shield cans.

MODEL 380

18 MEGACYCLE ADJUSTMENT - The high side of the signal generator is connected to the antenna lead of the receiver and the low side to the ground lead. The receiver and the signal are both tuned to a frequency of 18 mc. with the selector switch in position for band no. 1. The oscillator trimmer condenser is adjusted so that the 18 mc signal is tuned in exactly at the 18 mc calibration point, with the volume control on full and the signal generator adjusted for minimum input. The antenna preselector and first detector trimmers are then adjusted in the order named for maximum output. These trimmers are located on the sides of the shield cans and are opposite the lower openings. This is the only adjustment on Band #1.

1500 K.C. ADJUSTMENT - With the band selector switch in position for operation on band no. 3. and the receiver and signal generator both set at 1500 K.C. the procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can, and is opposite the upper opening. The antenna preselector and interstage coil trimmers are located in the same positions on the corresponding shield cans. The signal generator is set at 600 K.C. and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum gain while the gang tuning condenser is rocked slightly to the right and left. The 1500 K.C. adjustment should then be rechecked. The 600 K.C. Padder is located as indicated in the sketch.

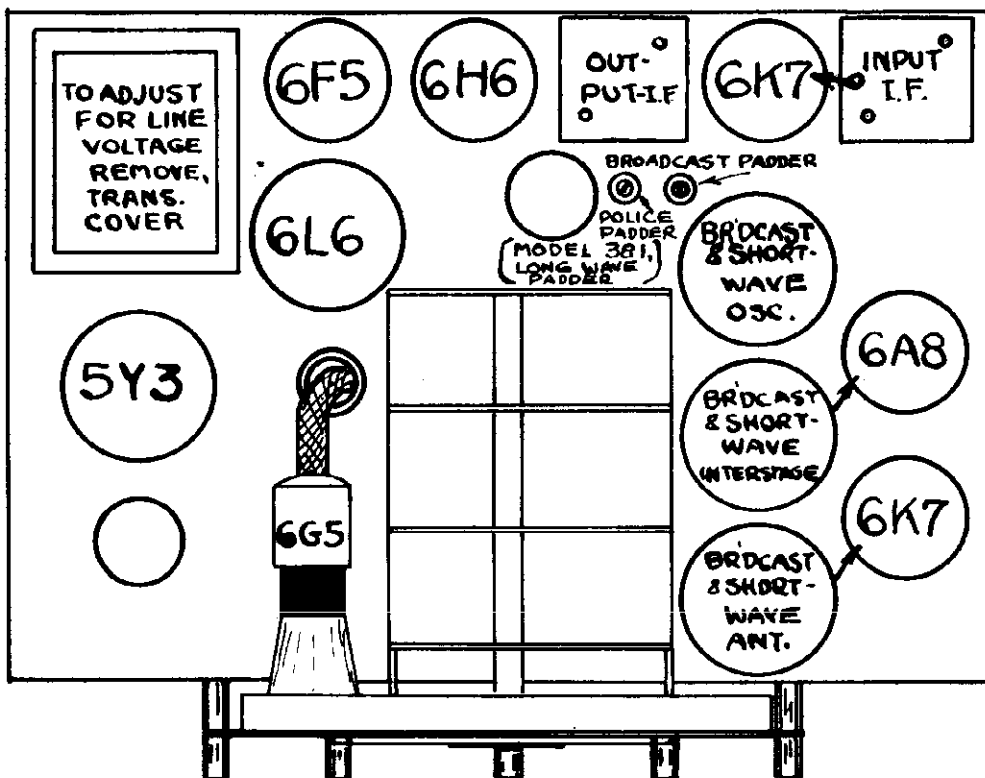
3 MC. ADJUSTMENT - The band selector switch is set in position for operation on the No. 2. band. The receiver and signal generator are both set at 3 M.C. and the procedure outlined above is repeated. The oscillator trimmer is found on the Police Band Coil located under the chassis and is towards the rear. The other trimmers for this band are located in similar positions on the corresponding coils. The signal generator is set at 1.7 M.C. and the signal tuned in on the dial. The padder condenser for the police band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 3 M.C. adjustment should then be rechecked. The 1.7 MC. padder is located as indicated.

MODEL 381

Model 381 is the same as Model 380 except that the Long Wave band is substituted for the Police Band. Alignment procedure is identical for the Short Wave and Broadcast Bands. The Long Wave Band is aligned as follows:

300 KC. ADJUSTMENT - The band selector switch is set in position for operation on band no. 3. The receiver and generator are both tuned to 340 kc. and the procedure outlined above is repeated. The oscillator trimmer is located under the chassis and is mounted on the rear coil. The signal generator is set at 150 kc. and the signal is tuned in on the dial. The padder condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 300 kc. adjustment should then be rechecked. The 150 kc. padder is located as indicated.

All voltages except filament, are measured from socket terminals to chassis and with a 1000 Ohms per volt voltmeter. The set must be in operation and the sensitivity control in its maximum clockwise position. Wave Band switch in broadcast position. Filament voltages are taken from filament prong to filament prong at tube socket and measured with a low impedance AC voltmeter.

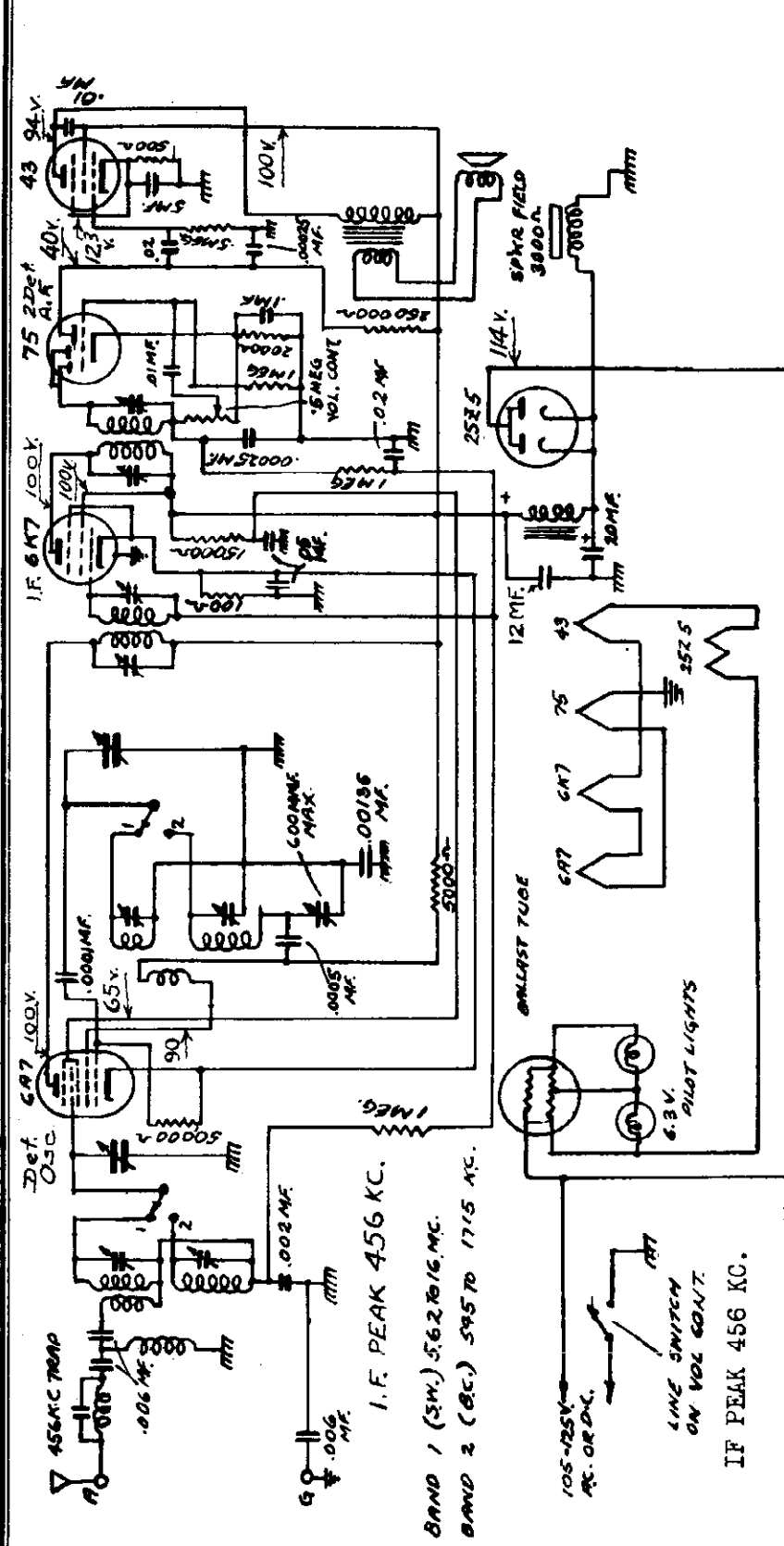


CHASSIS AND TUBE LAYOUT

MODEL 380 - 381		PLATE	SC. GR.	HEATER	FUNCTION	TUBE
OSC. FL.	280				R.F. Amp.	6K7(G)
CATH	7	265	110	6.3	Det. Osc.	6A8(G)
Volts Curt.	8	265	110	6.3	I.F. Amp.	6K7(G)
	7	0	0	6.3	Diode Det.	6H6(G)
		80		6.3	1st Audio Amp.	6F5(G)
	1.5	265	265	6.3	Audio Output	6L6(G)
	45			5.0	Rectifier	5Y3
	68					

MODEL 620
Schematic
Alignment

GAROD RADIO CORP.



from the signal generator, the band switch is turned to the left and the receiver dial set at 14 mc. The oscillator trimmer is adjusted so as to bring the signal in at this setting. The oscillator coil is underneath the chassis and is located directly under the variable gang condenser. The short wave trimmer is over the short wave winding (Heavy spaced wire). After the oscillator is set, the antenna trimmer is adjusted for maximum output as indicated by the output meter. (Again the S. W. antenna trimmer is located over the heavy spaced winding on the antenna coil, and is accessible from the top of the chassis.) There are no other adjustments on this band.

1500 KC. KILOCYCLE ADJUSTMENT - Turn the Wave Band Switch to the right. Set the signal generator to 1500 kc. and turn the dial pointer to correspond to this frequency. Adjust the oscillator trimmer for this band so that the signal is received exactly at this setting. (This trimmer is located over the close-wound fine winding on the oscillator coil.) Adjust the Broadcast antenna trimmer for maximum output as described previously. (This trimmer is over the small 5 section winding and is accessible from the top.)

500 KC. PADDER ADJUSTMENT - With all connections as above, the signal generator is set at 600 KC and the front sub-panel of the receiver, directly under the dial. This padder should be adjusted for maximum response of the receiver, while the tuning condenser is rocked slightly back and forth. The 1500 KC adjustment should then be rechecked.

I.F. ADJUSTMENT - The signal generator is set at 456 kc. The "hot" lead from the signal generator is connected to the grid cap on the 1st detector (6A7) tube, the clip having first been removed from the tube cap. The ground lead is connected to the receiver chassis. The oscillator section (front) of the gang tuning condenser is short-circuited and the volume control turned on full. The i.f. trimmers are then adjusted for maximum gain in the receiver. These trimmers are located on top of the i.f. transformer shield cans, which are situated in the rear of the chassis. The one towards the right is the 1st i.f. transformer and the left one is the 2nd i.f. transformer.

14 MEGACYCLE ADJUSTMENT - The short-circuit is removed from the oscillator condenser and the grid clip replaced in its normal position on the cap of the 6A7 tube. The "hot" lead from the signal generator is connected to the antenna lead of the receiver and the ground lead to the ground of the receiver. With the volume control set at maximum and a minimum input signal

Realignment of this receiver should not be attempted unless all other possible causes of faulty operation have first been thoroughly investigated. An accurately calibrated signal generator which will cover the various wavebands, and an output meter for indicating the effects of adjustments, are required.

ALIGNMENT PROCEDURE

IF PEAK 456 KC.

BAND 1 (S.W.) 562.16 MC.

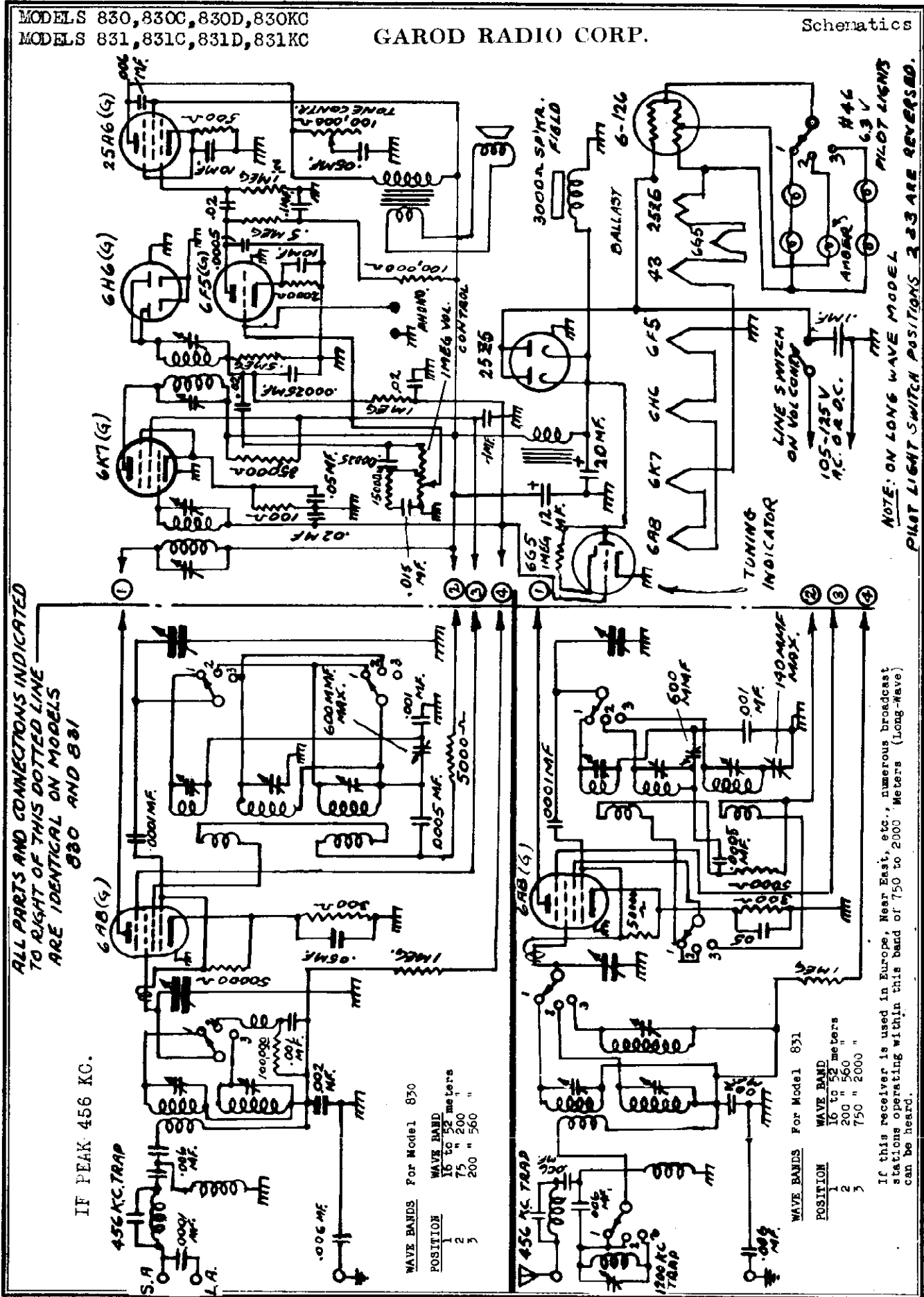
BAND 2 (B.C.) 595 TO 1715 KC.

IF PEAK 456 KC.

MODELS 830, 830C, 830D, 830KC
 MODELS 831, 831C, 831D, 831KC

GAROD RADIO CORP.

Schematics

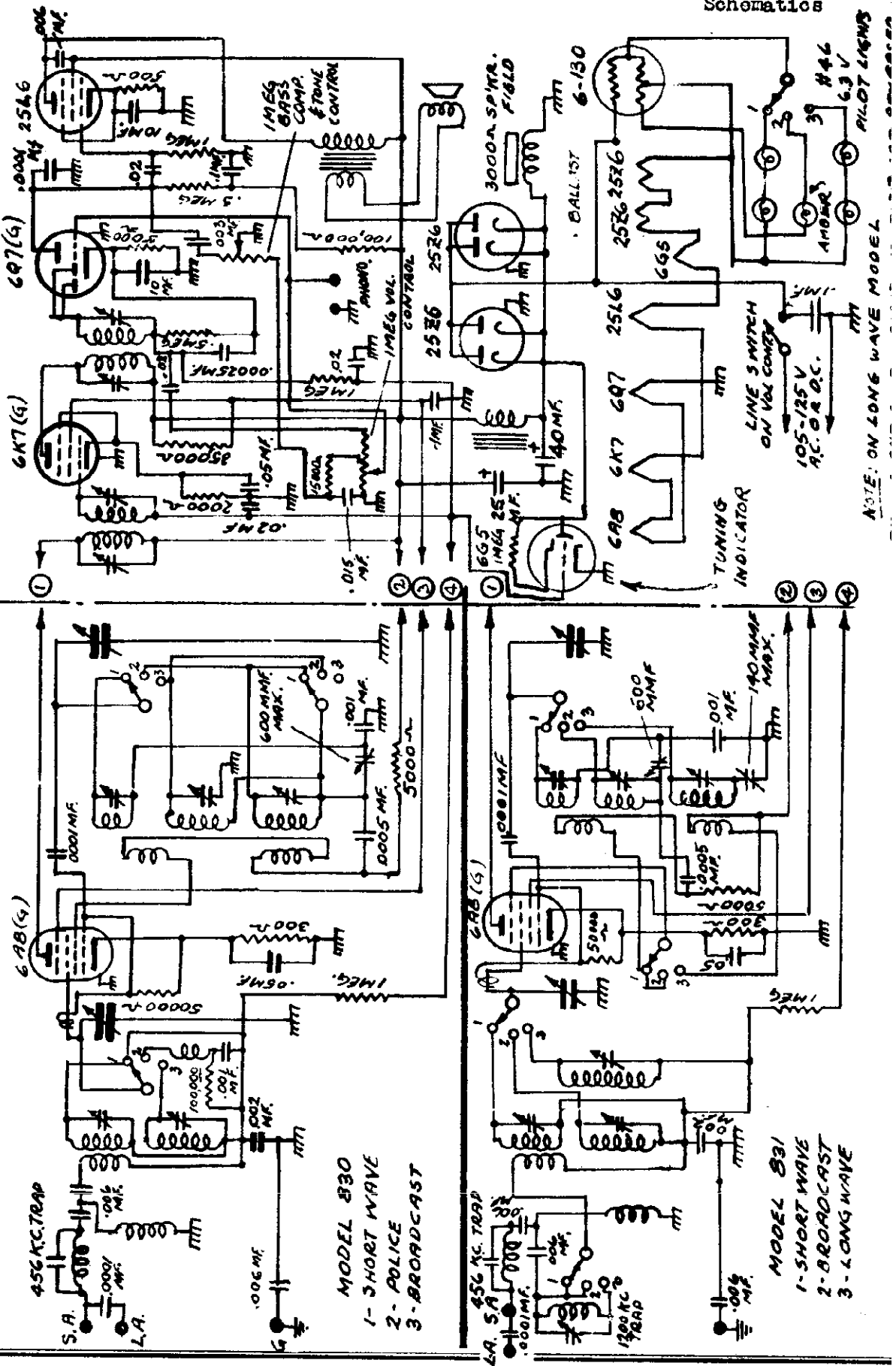


GAROD RADIO CORP.

MODELS 830A, 831A
Schematics

ALL PARTS AND CONNECTIONS INDICATED
TO RIGHT OF THIS DOTTED LINE
ARE IDENTICAL ON MODELS
830 AND 831

IF PEAK 456 KC.



- MODEL 830
- 1 - SHORT WAVE
 - 2 - POLICE
 - 3 - BROADCAST

- MODEL 831
- 1 - SHORT WAVE
 - 2 - BROADCAST
 - 3 - LONG WAVE

NOTE: ON LONG WAVE MODEL

Alignment, Socket, Trimmers
Voltage

GAROD RADIO CORP.

MODELS 930, 930A, 930D, 930E
MODELS 931, 931A, 931D, 931E

I.F. ADJUSTMENT - The signal generator is set at 456 kc. and is connected to the grid of the first detector (6A8). With the oscillator section of the tuning condenser short-circuited and the receiver volume control at its maximum position, the i.f. trimmers are adjusted for maximum output. These trimmers may be found on tops of the i.f. transformer shield cans.

MODEL 930

18 MEGACYCLE ADJUSTMENT - The high side of the signal generator is connected to the antenna lead of the receiver and the low side to the ground lead. The receiver and the signal are both tuned to a frequency of 18 mc. with the selector switch in position for band no. 1. The oscillator trimmer condenser is adjusted so that the 18 mc signal is tuned in exactly at the 18 mc calibration point, with the volume control on full and the signal generator adjusted for minimum input. The antenna preselector and first detector trimmers are then adjusted in the order named for maximum output. These trimmers are located on the sides of the shield cans and are opposite the lower openings. This is the only adjustment on band #1.

1500 K.C. ADJUSTMENT - With the band selector switch in position for operation on band no. 3. and the receiver and signal generator both set at 1500 K.C. the procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can, and is opposite the lower opening. The antenna preselector and interstage coil trimmers are located in the same positions on the corresponding shield cans.

The signal generator is set at 600 K.C. and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum gain while the gang tuning condenser is rocked slightly to the right and left. The 1500 K.C. adjustment should then be rechecked. The 600 K.C. Padder is located as indicated in the sketch.

3 MC ADJUSTMENT - The band selector switch is set in position for operation on the no. 2. band. The receiver and signal generator are both set at 3 M.C. and the procedure outlined above is repeated. The oscillator trimmer is found on the police band coil located under the chassis and is towards the rear. The other trimmers for this band are located in similar positions on the corresponding coils.

The signal generator is set at 1.7 M.C. and the signal tuned in on the dial. The padder condenser for the police band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 3 M.C. adjustment should then be rechecked. The 1.7 M.C. padder is located as indicated.

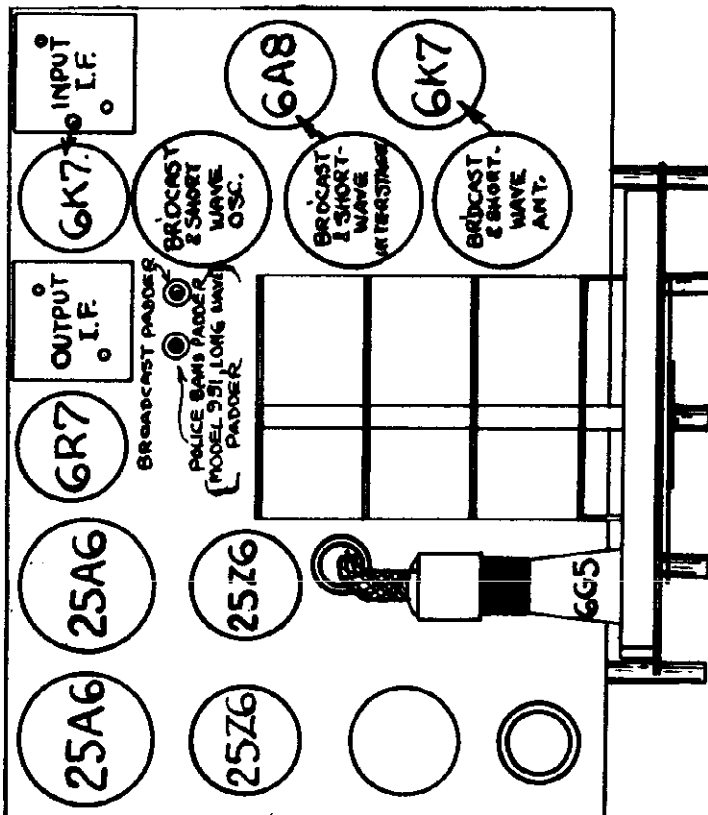
MODEL 931

Model 931 is the same as Model 930 except that the Long Wave band is substituted for the Police Band. Alignment procedure is identical for the Short Wave and Broadcast Bands. The Long Wave Band is aligned as follows:

300 KC. ADJUSTMENT - The band selector switch is set in position for operation on band no. 3. The receiver and generator are both tuned to 340 kc. and the procedure outlined above is repeated. The oscillator trimmer is located under the chassis and is mounted on the rear coil. The signal generator is set at 150 kc. and the signal is tuned in on the dial. The padder condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 300 kc. adjustment should then be rechecked. The 150 kc. padder is located as indicated.

All voltages except filament, are measured from socket terminals to chassis and with a 1000 Ohms per volt voltmeter. The set must be in operation and the sensitivity control in its maximum clockwise position. Wave band switch in the broadcast position.

Filament voltages are taken from filament prong to filament prong at tube socket and measured with a high impedance AC voltmeter. (Rectifier Type)



TUBE AND CHASSIS LAYOUT

MODEL 930 - 931					
TUBE	FUNCTION	HEATER	PLATE	SC. GR.	CATH. OSC. PL.
6K7 (G)	R.F. Amp.	6.3	120	50	1.3
6A8 (G)	Det. Osc.	6.3	120	50	1.3
6K7 (G)	I.F. Amp.	6.3	120	50	1.2
6R7 (G)	Diode Det. & 1st Audio Amp	6.3	60	20	2.
25A6 (G)(2)	Audio Output	25.	125	120	19.
25Z6(G)	Rectifier (B+ for RF Amp)	25.	125	125	60.
*25Z6	Rectifier (B+ for output tube plates)	25.	125	128.	35.

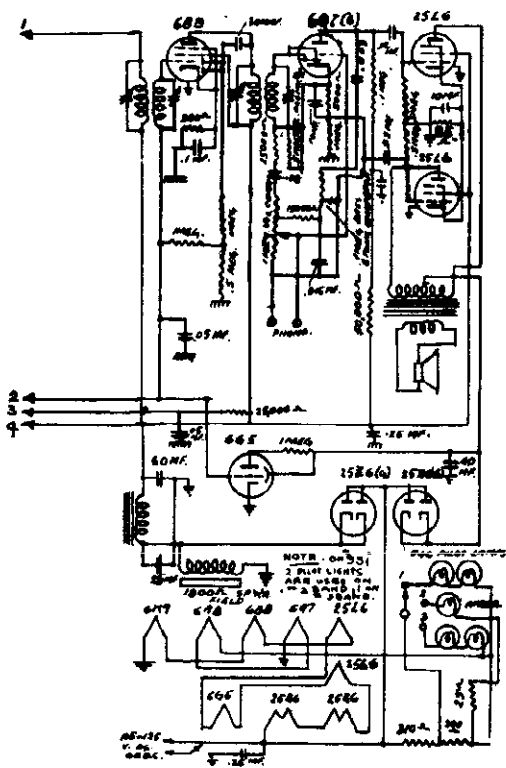
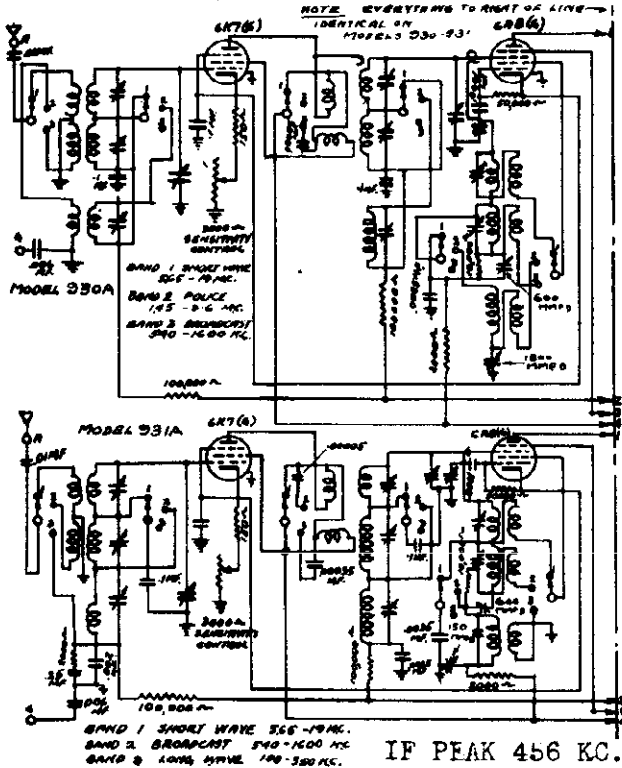
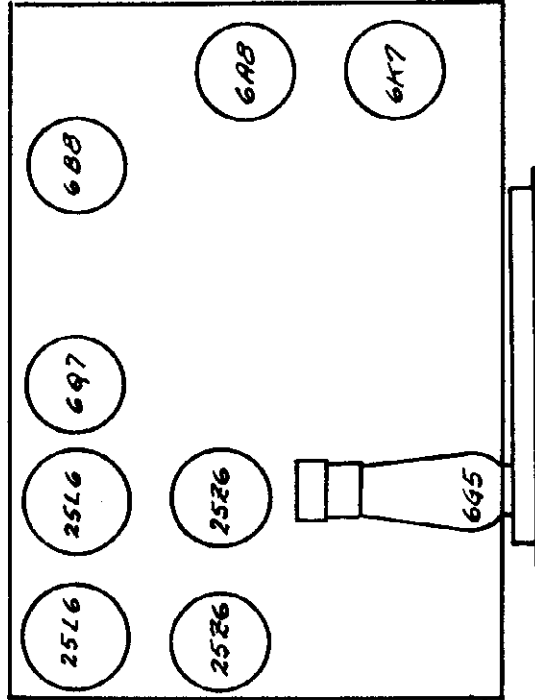
MODELS 930A, 931A
Schematics, Voltage
Socket

GAROD RADIO CORP.

MODEL 930A-931A					
TUBE	FUNCTION	HEATER PLATE SC.GR.	CATH Volts	Curr.	OSC. PL.
6K7 (G)	R.F. Amp.	6.3	2.0	7.0	
6A8 (G)	Det. Osc.	6.3	2.0	5.5	100
6B8	I.F. Amp & AVC	6.3	1.2	4	
6Q7 (G)	Diode Det. & 1st Audio Amp.	6.3	2.0	.2	
25L6(G)(2)	Audio Output	25.	8.5	52.	
25Z6(G)	Rectifier (B+ for RF Amp)	25.	125.	80.	
25Z6(G)	Rectifier (B+ for output tube plates)	25.	128.	90.	

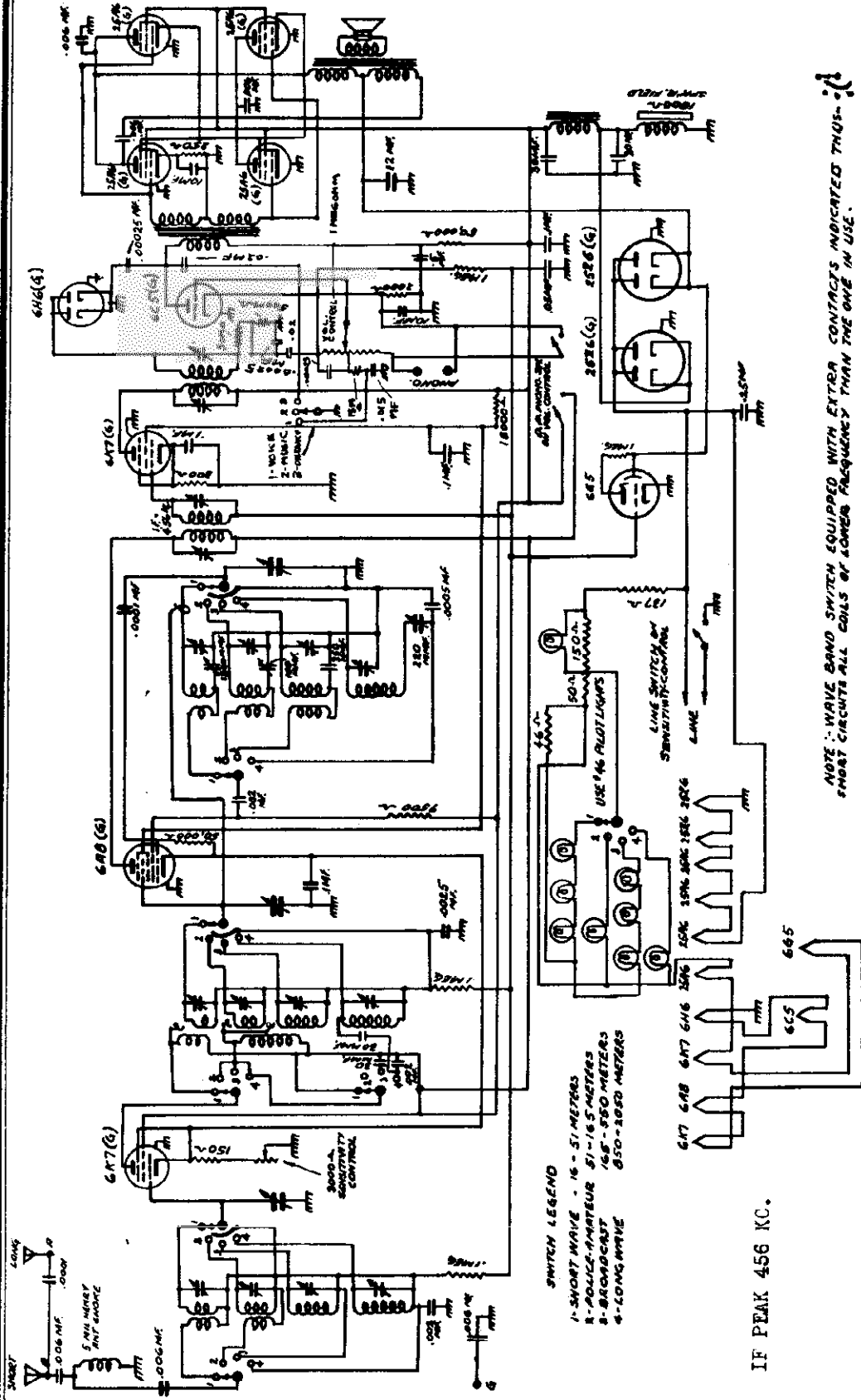
All voltages except filament, are measured from socket terminals to chassis and with a 1000 Ohms per volt voltmeter. The set must be in operation and the sensitivity control in its maximum clockwise position. Wave band switch in the broadcast position.

Filament voltages are taken from filament prong to filament prong at tube socket and measured with a high impedance AC voltmeter. (Rectifier Type)



GAROD RADIO CORP.

MODELS 1240, 1240B, 1240C
Schematic, Voltage



NOTE: WAVE BAND SWITCH EQUIPPED WITH EXTRA CONTACTS INDICATED THUS: SHORT CIRCUITS ALL COILS OF LOWER FREQUENCY THAN THE ONE IN USE.

SWITCH LEGEND
 1-SHORT WAVE - 16-51 METERS
 2-MIDDLE-MANEUVER 51-165 METERS
 3-BROADCAST 165-350 METERS
 4-LONG WAVE 350-1050 METERS

IF PEAK 456 KC.

All voltages except filament, are measured from socket terminals to chassis and with a 1000 Ohms per volt voltmeter. The set must be in operation and the sensitivity control in its maximum clockwise position. Filament voltages are taken from filament prong to filament prong at tube socket and measured with a low impedance AC voltmeter.

TUBE	FUNCTION	HEATER	PLATE	SC. GR	CATH	OSC. PL
6K7 (G)	RF Amp.	6.3	100	100	1.75	8.0
6A8 (G)	1st Det. & Osc.	6.3	100	55	1.75	5.5
6K7 (G)	IF Amp.	6.3	100	55	1.25	4.0
6H6 (G)	Diode detector	6.3	0	0	1.5	.75
6C5 (G)	1st Audio Amp.	6.3	60	100	20	15.
25A6 (G)	(4) Audio Output	25	120	107	87.	
25Z6	Rectifier for Set	25		125	60.	
25Z6	Rectifier for Output Plates	25				

MODELS 1240, 1240E, 1240LC
Socket, Trimmers, Alignment

GAROD RADIO CORP.

MODEL 1240A
Alignment

I.F. ADJUSTMENT - The signal generator is set at 456 kc. and is connected to the grid of the first detector (6AB). With the oscillator section of the tuning condenser short-circuited and the receiver volume control at its maximum position, the i.f. trimmers are adjusted for maximum output. These trimmers may be found on the tops of the I.F. Transformers.

18 MEGACYCLE ADJUSTMENT - The high side of the signal generator is connected to the antenna lead of the receiver and the low side to the ground lead. The receiver and the signal are both tuned to a frequency of 18 mc. with the selector switch in position for band no. 1. The oscillator trimmer condenser is adjusted so that the 18 mc. signal is tuned in exactly at the 18 mc. calibration point, with the volume control on full and the signal generator adjusted for minimum input. The antenna preselector and interstage trimmers are then adjusted in the order named for maximum output. These trimmers are located as indicated in the bottom view of the chassis.

6 MEGACYCLE ADJUSTMENT - The signal generator is set at 6 megacycle and the signal tuned in on the dial. The short wave padding condenser is adjusted for maximum output, while the gang condenser is rocked slightly to the right and left. The 18 megacycle adjustment should then be rechecked.

5 MC. ADJUSTMENT - With the band selector switch in position for operation on band no. 2. and the receiver and signal generator both set at 5 mc. the procedure outlined above is repeated.

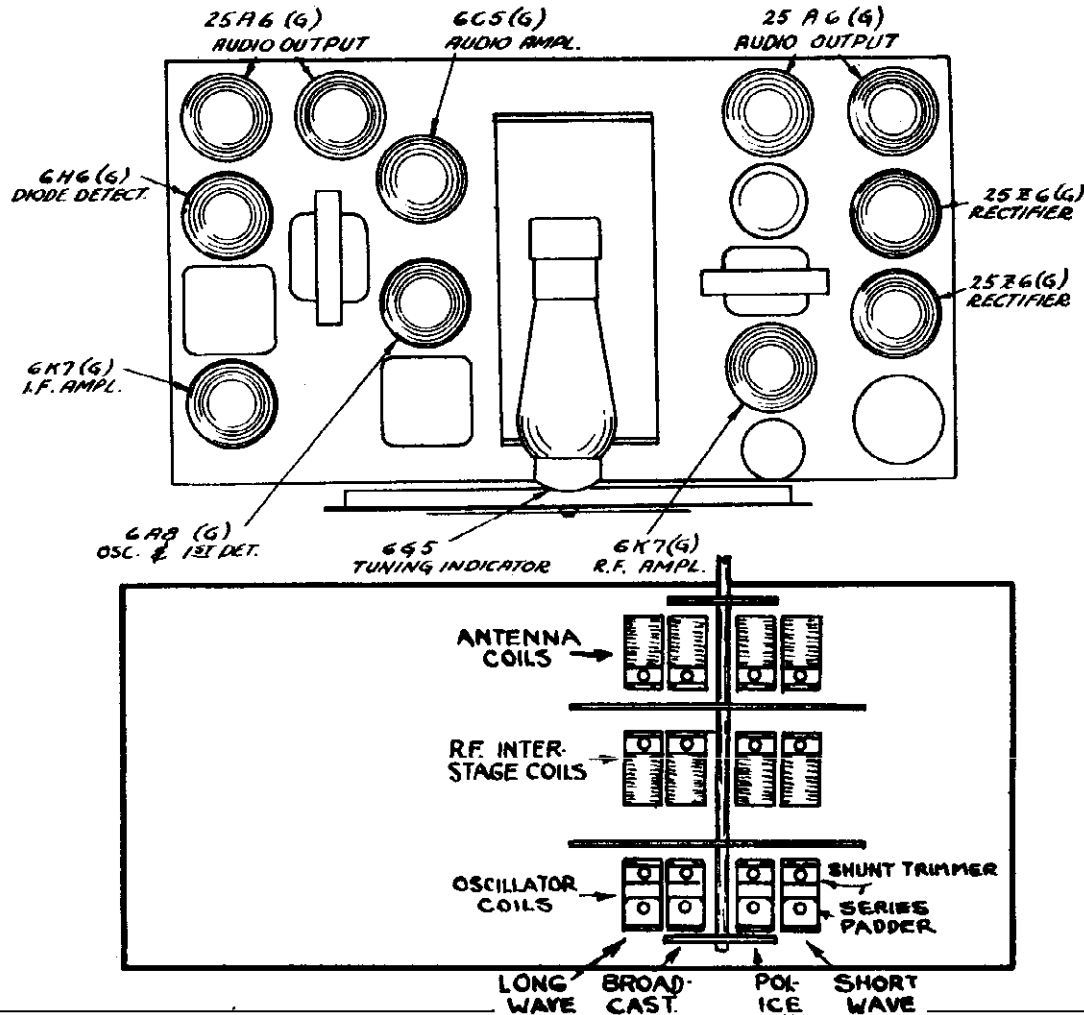
The signal generator is set at 1.8 mc. and the signal tuned in on the dial. The police band padder condenser is adjusted for maximum gain while the gang tuning condenser is rocked slightly to the right and left. The 5 mc. adjustment should then be rechecked.

1500 KC. ADJUSTMENT - The band selector switch is set in position for operation on the no. 3. band. The receiver and signal generator are both set at 1500 kc. and the procedure outlined above is repeated.

The signal generator is set at 600 kc. and the signal tuned in on the dial. The broadcast padder condenser is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 1500 kc. adjustment should then be rechecked.

300 KC. ADJUSTMENT - The band selector switch is set in position for operation on band no. 4. The receiver and generator are both tuned to 300 kc. and the procedure outlined above is repeated.

The signal generator is set at 150 kc. and the signal is tuned in on the dial. The long wave padder condenser is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 300 kc. adjustment should then be rechecked.



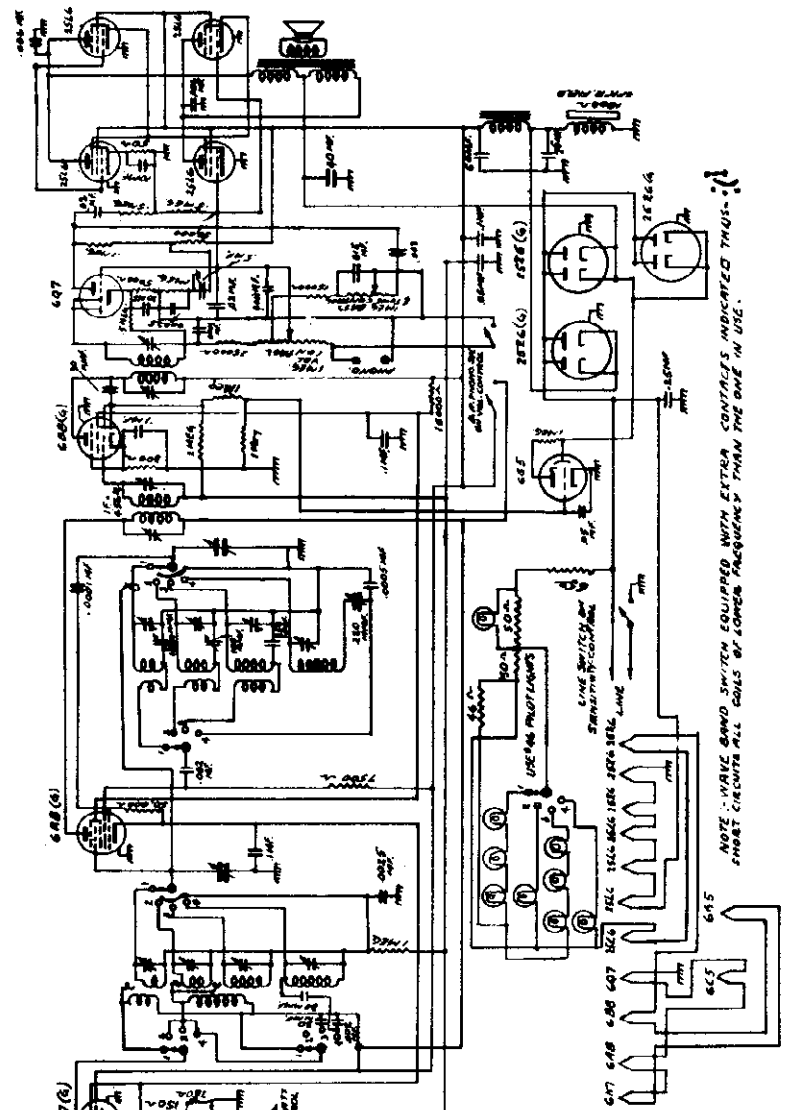
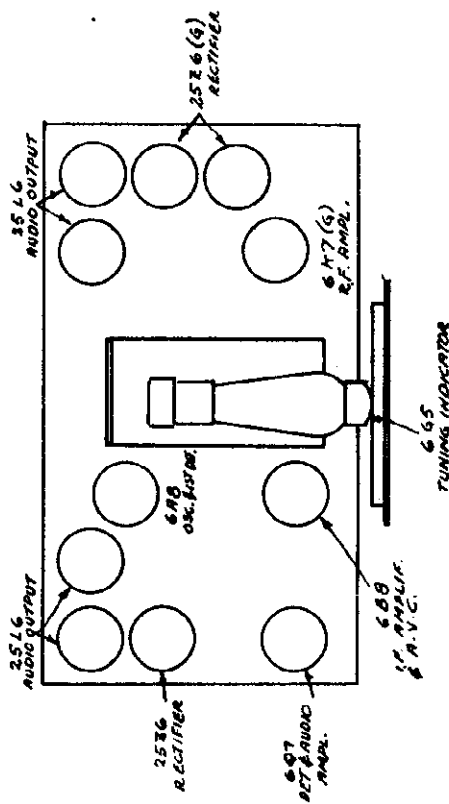
GAROD RADIO CORP.

MODEL 1240A
Schematic, Socket
Voltage

MODEL 1240A				
TUBE	FUNCTION	HEATER PLATE SC.GF.	CATH.	OCS. PL.
6K7 (G)	RF Amp.	6.3	1.75	8.0
6A8 (G)	1st Det. & Osc.	6.3	1.75	5.5
6B8 (G)	IF Amp.	6.3	2.00	6.0
25L6	(4) Audio Output	25	8.5	.50
25Z6 (G)	Rectifier for Set	25	1.07	87.
25Z6(G)(2)	Rectifier for Output Plates	25	125	85.
6Q7 G	Det. & 1st Audio	6.3	20	.2

All voltages except filament, are measured from socket terminals to chassis and with a 1000 Ohms per volt voltmeter. The set must be in operation and the sensitivity control in its maximum clockwise position.

Filament voltages are taken from filament prong to filament prong at tube socket and measured with a high impedance AC voltmeter. (Rectifier Type)



IF PEAK 456 KC.

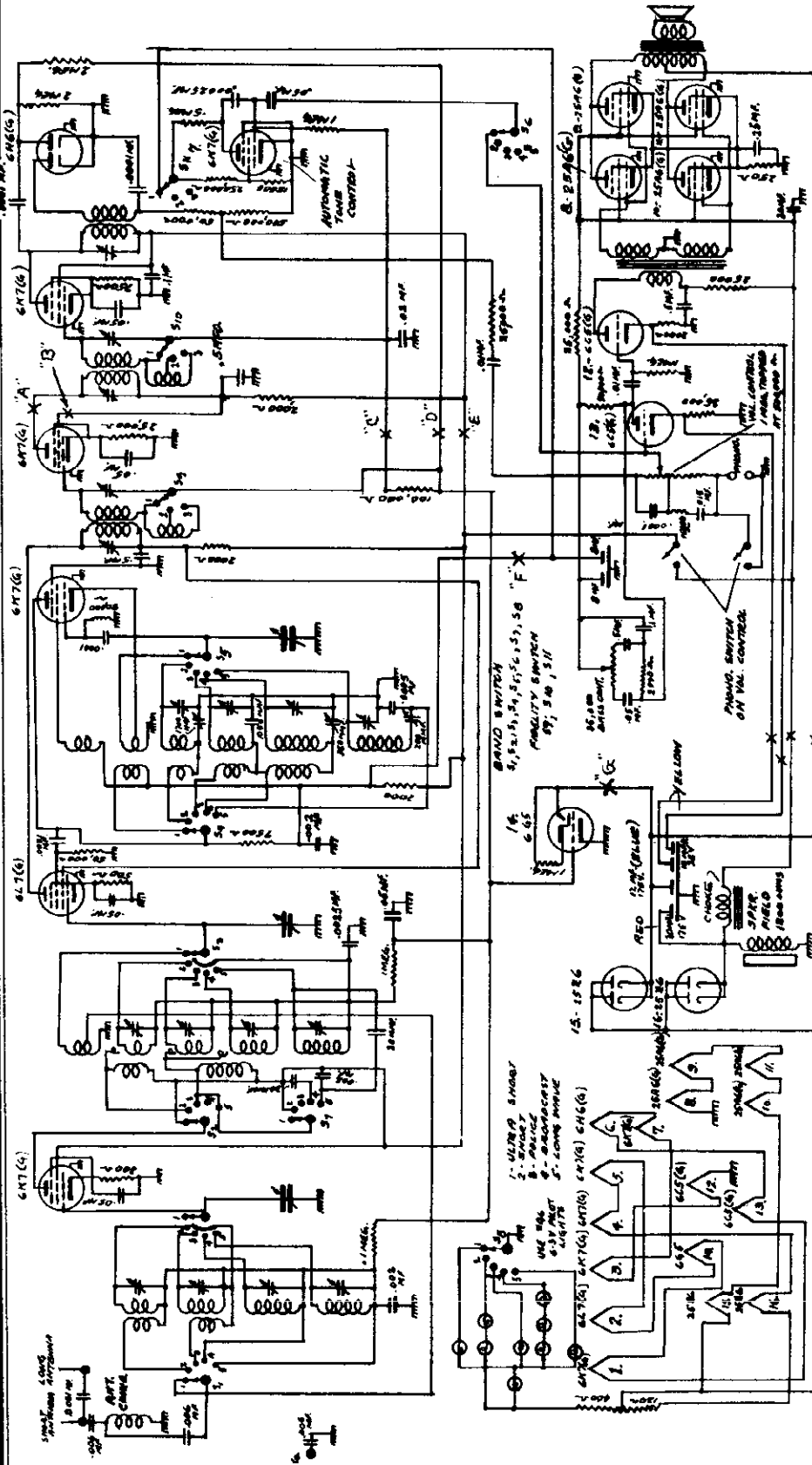
NOTE: On Model 1240A

The tone control is continuously variable, instead of 3 points as in earlier sets of this model (1240). To obtain maximum treble turn tone control all the way to the right (clockwise), and to increase bass or low frequencies, turn to the left.

- SWITCH LEGEND
- 1-SHORT-WAVE .15-5 METERS
 - 2-POLICE-WAVELENGTH 11-14.5 METERS
 - 3-BROADCAST 1/2-100 METERS
 - 4-LONG-WAVE 150-300 METERS

MODELS 1650, 1650H, 1650LC
Schematic, Voltage

GAROD RADIO CORP.



NOTE: WAVE BAND SWITCH EQUIPPED WITH EXTRA CONTACTS INDICATE THUS: SHORT CIRCUITS ALL COILS OF LOWER FREQUENCY THAN THE ONE IN USE.

MODEL 1650

IF PEAK 456 KC

TUBE	FUNCTION	HEATER	PLATE	SC. GRID	CATH. V.	I. MA.	TUBE	FUNCTION	HEATER	PLATE	SC. GR.	CATH.
6K7(G)	R.F. Amp.	6.3	100	100	2	6.7	6C5(G)	2nd Audio Amp.	6.3	60	100	1.5
6L7(G)	Converter	6.3	95	95	2.5	5.0	25A6(G)	(4) Audio Output	25	120	100	20
6K7(G)	Oscillator	6.3	80	100	0	4	25Z6(G)	Rectifier For Set	25	50	50	107
6K7(G)	1st I.F. Amp.	6.3	95	95	12	5	25Z6(G)	Rectifier For Output Plates	25	50	50	185
6K7(G)	2nd I.F. Amp.	6.3	100	100	6	1	6K7(G)	Automatic Tone Control	6.3	50	6	0
6H6(G)	Diode Det. & A.V.C.	6.3	0	0	0	0						
6C5(G)	1st Audio Amp.	6.3	30	30	1.5	0.3						

All voltages except filament, are measured from socket terminals to chassis and with a 1000 Ohms per volt voltmeter. The set must be in operation and the sensitivity control in its maximum clockwise position.

Filament voltages are taken from filament prong to filament prong at tube socket and measured with a low impedance AC voltmeter.

GAROD RADIO CORP

MODELS 1650, 1650H, 1650LO
 Socket, Trimmers, Alignment
 MODEL 1650A
 Alignment

I.F. ADJUSTMENT: The signal generator is set at 456 kc. and is connected to the grid of the first detector (6L7). With the oscillator section of the tuning condenser short-circuited and the receiver volume control at its maximum position, the i.f. trimmers are adjusted for maximum output. These trimmers may be found on the tops of the I.F. transformers.

18 MEGACYCLE ADJUSTMENT: The high side of the signal generator is connected to the antenna lead of the receiver and the low side to the ground lead. The receiver and the signal are both tuned to a frequency of 18 mc. with the selector switch in position for band no. 2 (Short Wave). The oscillator trimmer condenser is adjusted so that the 18 mc. signal is tuned in exactly at the 18 mc. calibration point, with the volume control on full and the signal generator adjusted for minimum input. The antenna preselector and inter-stage trimmers are then adjusted in the order named for maximum output. These trimmers are located as indicated in the bottom view of the chassis.

6 MEGACYCLE ADJUSTMENT: The signal generator is set at 6 megacycles and the signal tuned in on the dial. The Short Wave padding condenser is adjusted for maximum gain while the gang tuning condenser is rocked slightly to the right and left.

5 MC. ADJUSTMENT: With the band selector switch in position for operation on band no. 3 (Police) and the receiver and signal generator both set at 5 mc. the procedure outlined above is repeated.

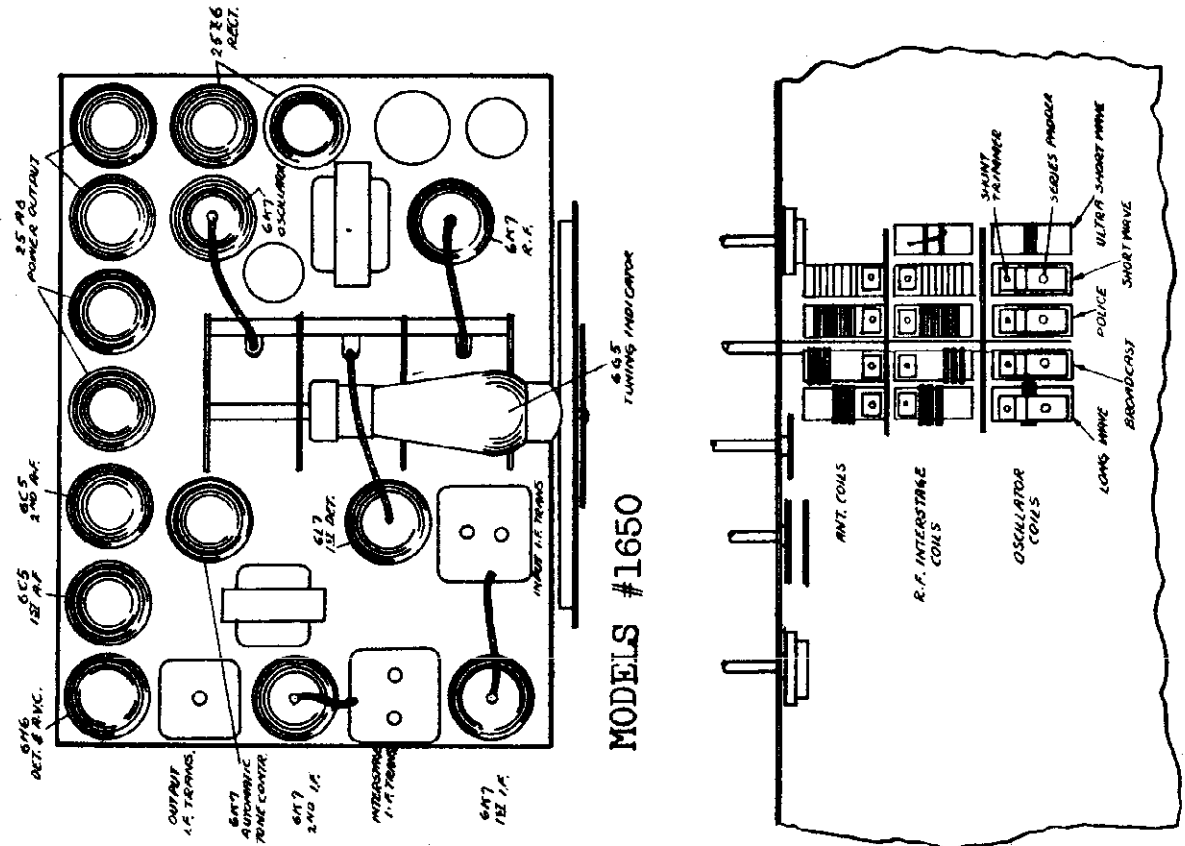
The signal generator is set at 1.8 mc. and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum gain while the gang tuning condenser is rocked slightly to the right and left. The 5 mc. adjustment should then be rechecked.

1500 KC. ADJUSTMENT: The band selector switch is set in position for operation on the no. 4 band. (Broadcast). The receiver and signal generator are both set at 1500 kc. and the procedure outlined above is repeated.

The signal generator is set at 600 kc. and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 1500 kc. adjustment should then be rechecked.

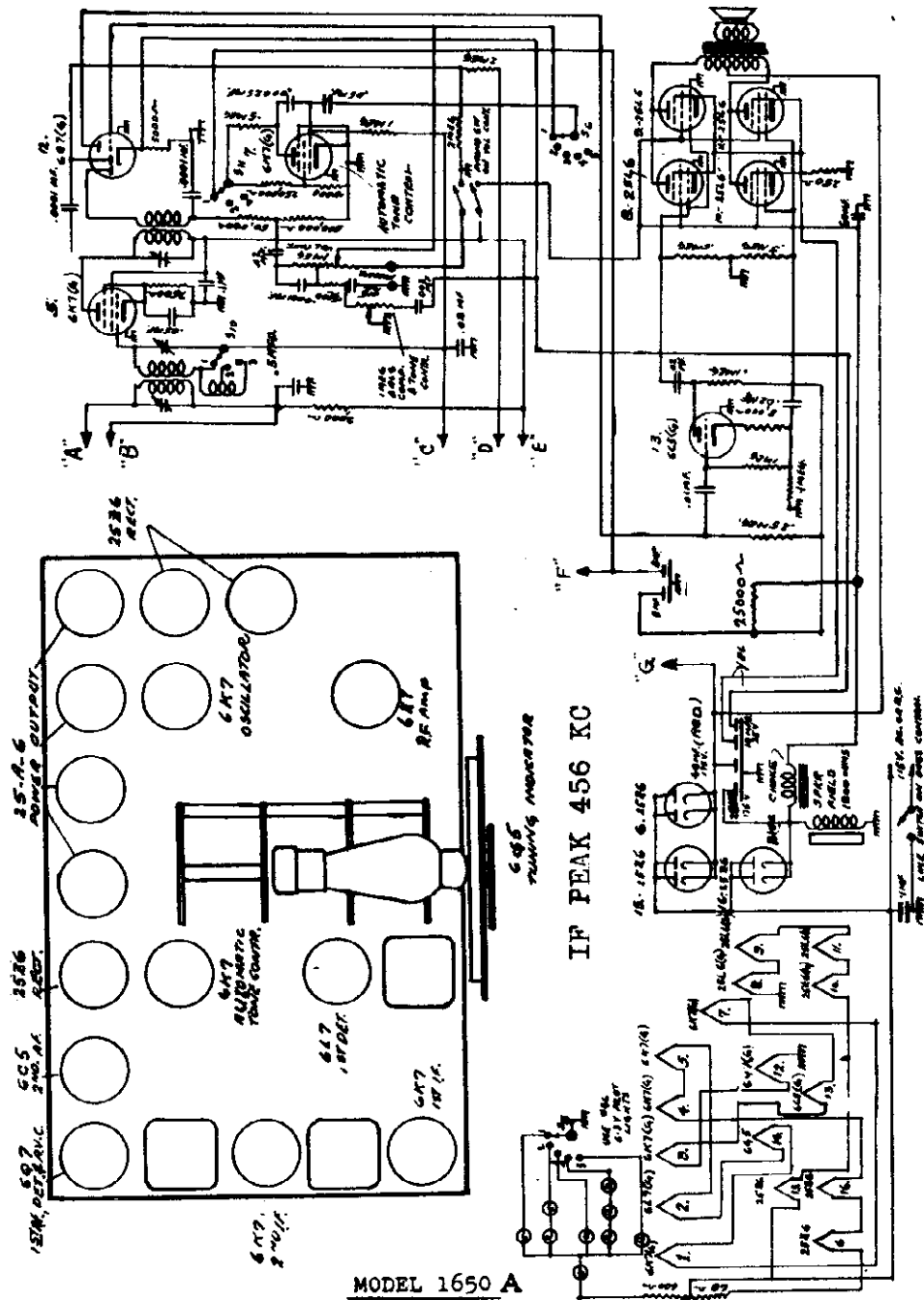
300 KC. ADJUSTMENT: The band selector switch is set in position for operation on band no. 5. The receiver and generator are both tuned to 300 kc. and the procedure outlined above is repeated.

The signal generator is set at 150 kc. and the signal is tuned in on the dial. The Long Wave padder condenser is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 300 kc. adjustment should then be rechecked.



MODEL 1650A
Schematic, Notes
Voltage, Socket

GAROD RADIO CORP.



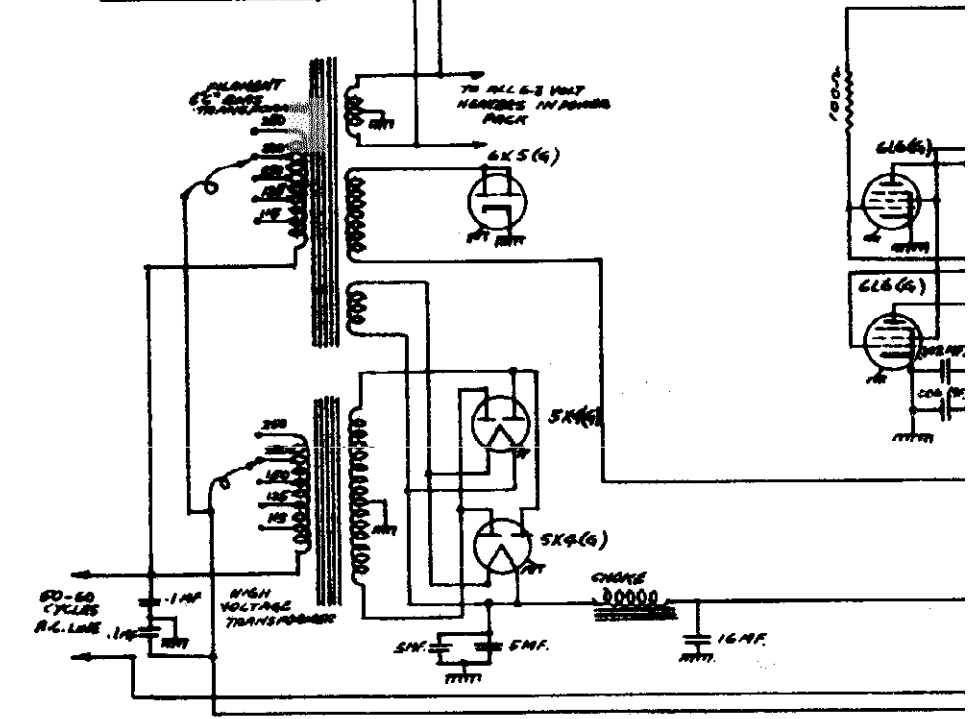
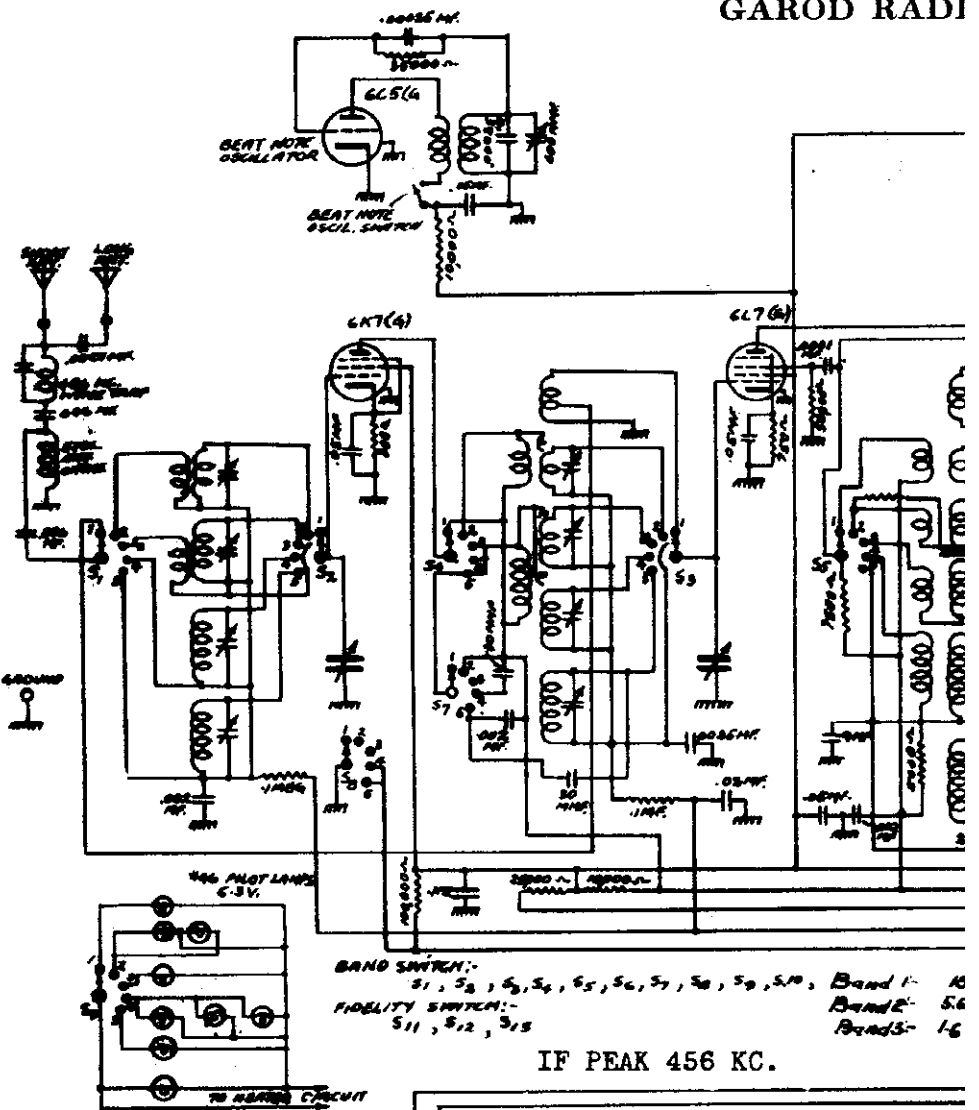
The RF and Oscillator circuits with their corresponding band switching arrangements for the MODEL 1650A, are the same as those of the MODEL 1650.

The schematic of the MODEL 1650 is shown broken at the various points marked with "X", lettered "A", "B", "C", "D", "E", "F", and "G", which are connected to the corresponding points marked in the same manner on the schematic above.

TUBE	FUNCTION	HEATER	PLATE	SC. GR.	CATH.	I. MA.
6K7(G)	R.F. Amp.	6.3	100	100	2	6.7
6L7(G)	Converter	6.3	95	95	2.5	5.0
6K7(G)	Oscillator	6.3	80	100		
6K7(G)	1st I.F. Amp.	6.3	95	95	12	5
6K7(G)	2nd I.F. Amp.	6.3	100	100	6	1
6Q7(G)	Diode Det. & AVC & 1st Audio	6.3	60		1.5	2.3
605(G)	2nd Audio Amp.	6.3	80		20.	2.
25L6(G) (4)	Audio Output	25.	120	100	8.5	50
2526(G)	Rectifier for Set	25.			107	87
2526(G) (2)	Rectifier for Output Plates	25.			125	85
6K7(G)	Automatic Tone Control	6.3	50	5	0	1

1650 A

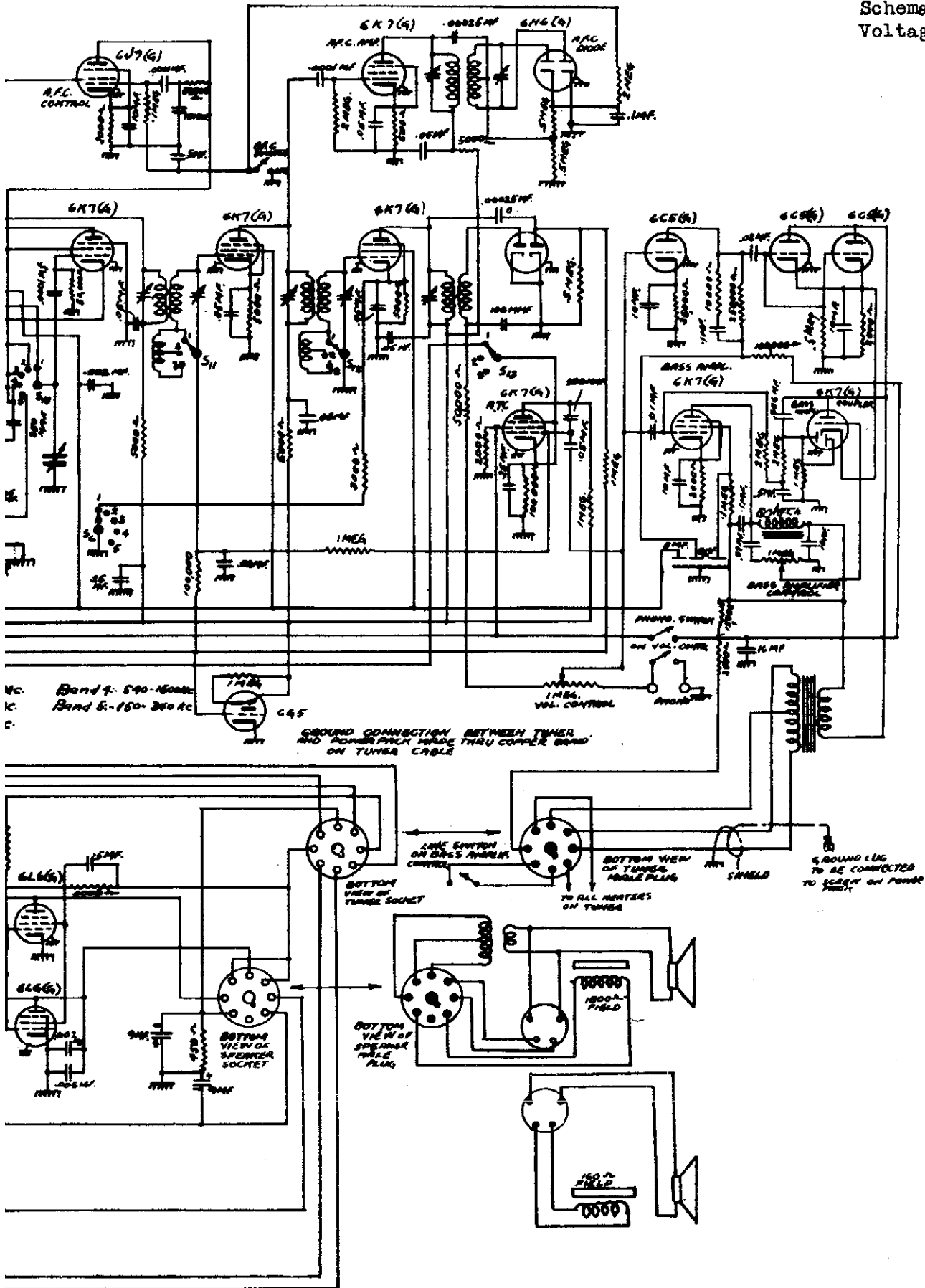
GAROD RADIO



TUBE	FUNCTION	HTR.	PLATE	SCREEN	CATHODE	TUBES	FUNCTION	HTR.	PLATE	SCREEN	CATHODE	GRID
6K7	H.F. AMP.	6.5	260	100	4	6C5	Beat note USC.	*	with switch ON 100V.		0	
6L7	Converter		245	100	6	6V7	AFC control				0	
6K7	Oscillator		280	100	0		tube		280	100		
6K7	1st I.F.		260	100	13	6K7	ATC		25	7	0	
6K7	2nd I.F.		260	100	9							
6H6	Audio det.		0		0	6L6	Audio Output		325	300	0	26
6K7	A.F.C. Amp.		240		4	6L6						
6H6	A.F.C. Diodes		0		0	6L6						
6C5	1st Audio		125		9	6L6	Bias					
6C5	Driver		150		8	6X5	Rectifier		140			
6K7	Base Amp.		150		11	5K4(6)	Rectifier					
6K7	Base Amp.		150		8	5K4(6)	Rectifier					
6K7	Coupler		150		8	5K4(6)	Rectifier					410

CORP.

MODEL 5240
Schematic
Voltage



- Mc. Band 4- 540-1500kc
- Kc. Band 5- 150-300kc
- C.

GROUND CONNECTION BETWEEN TUNER AND POWER PACK MADE THRU COPPER BOND ON TUNER CABLE

LAKE SWITCH ON BASS AMPLIFIER CONTROL

BOTTOM VIEW OF TUNER SOCKET

BOTTOM VIEW OF TUNER TRIPLE PLUG

TO ALL PINS ON TUNER

SHIELD

GROUND LUG TO BE CONNECTED TO SCREEN ON POWER PACK

BOTTOM VIEW OF SPEAKER TRIPLE PLUG

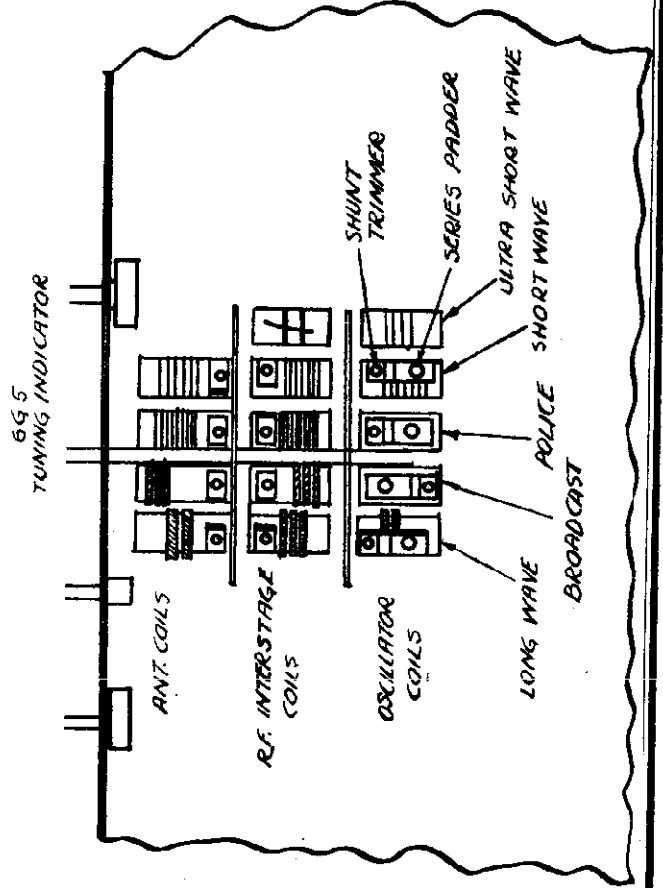
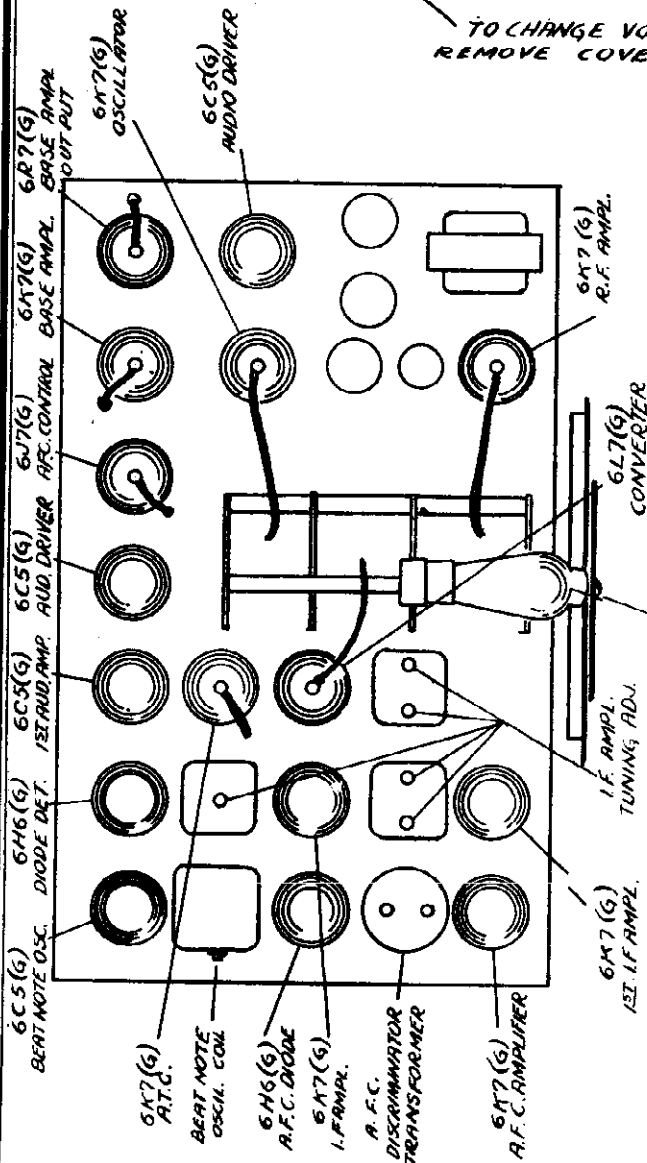
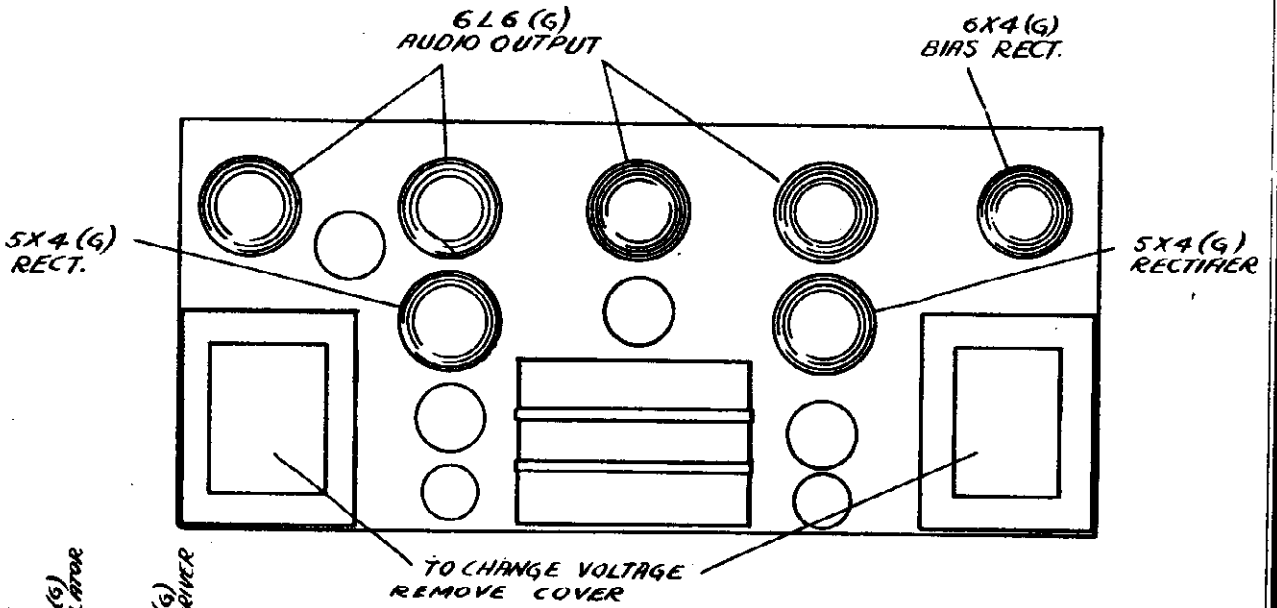
BOTTOM VIEW OF SPEAKER SOCKET

1000-Ω FIELD

150-Ω FIELD

GAROD RADIO CORP.

MODEL 5240
Socket, Trimmers



MODEL 5240

Alignment

GAROD RADIO CORP.

SERVICE NOTES FOR THE MODEL 5240
24 TUBE 5 BAND A.C. SUPERHETERODYNE RECEIVER
ALIGNMENT PROCEDURE

I.F. ADJUSTMENT - The signal generator is set at 456 kc. and is connected to the grid of the first detector (6L7). With the oscillator section of the tuning condenser short-circuited and the receiver volume control at its maximum position, the i.f. trimmers are adjusted for maximum output. These trimmers may be found on the tops of the I.F. transformers.

18 MEGACYCLE ADJUSTMENT - The high side of the signal generator is connected to the antenna lead of the receiver and the low side to the ground lead. The receiver and the signal are both tuned to a frequency of 18 mc. with the selector switch in position for band no. 2 (short wave). The oscillator trimmer condenser is adjusted so that the 18 mc. signal is tuned in exactly at the 18 mc. calibration point, with the volume control on full and the signal generator adjusted for minimum input. The antenna preselector and inter-stage trimmers are then adjusted in the order named for maximum output. These trimmers are located as indicated in the bottom view of the chassis.

5 MC. ADJUSTMENT - With the band selector switch in position for operation on band no. 3. (Police) and the receiver and signal generator both set at 5 mc. the procedure outlined above is repeated.

6 MEGACYCLE ADJUSTMENT - The signal generator is set at 6 megacycles and the signal tuned in on the dial. The Short Wave padding condenser is adjusted for maximum gain while the gang tuning condenser is rocked slightly to the right and left.

The signal generator is set at 1.8 mc. and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum gain while the gang tuning condenser is rocked slightly to the right and left. The 5 mc. adjustment should then be rechecked.

1500 KC. ADJUSTMENT - The band selector switch is set in position for operation on the no. 4 band (Broadcast). The receiver and signal generator are both set at 1500 kc. and the procedure outlined above is repeated.

The signal generator is set at 600 kc. and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 1500 kc. adjustment should then be rechecked.

300 KC. ADJUSTMENT - The band selector switch is set in position for operation on band no. 5. The receiver and generator are both tuned to 300 kc. and the procedure outlined above is repeated.

The signal generator is set at 150 kc. and the signal is tuned in on the dial. The Long Wave padder condenser is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 300 kc. adjustment should then be rechecked.

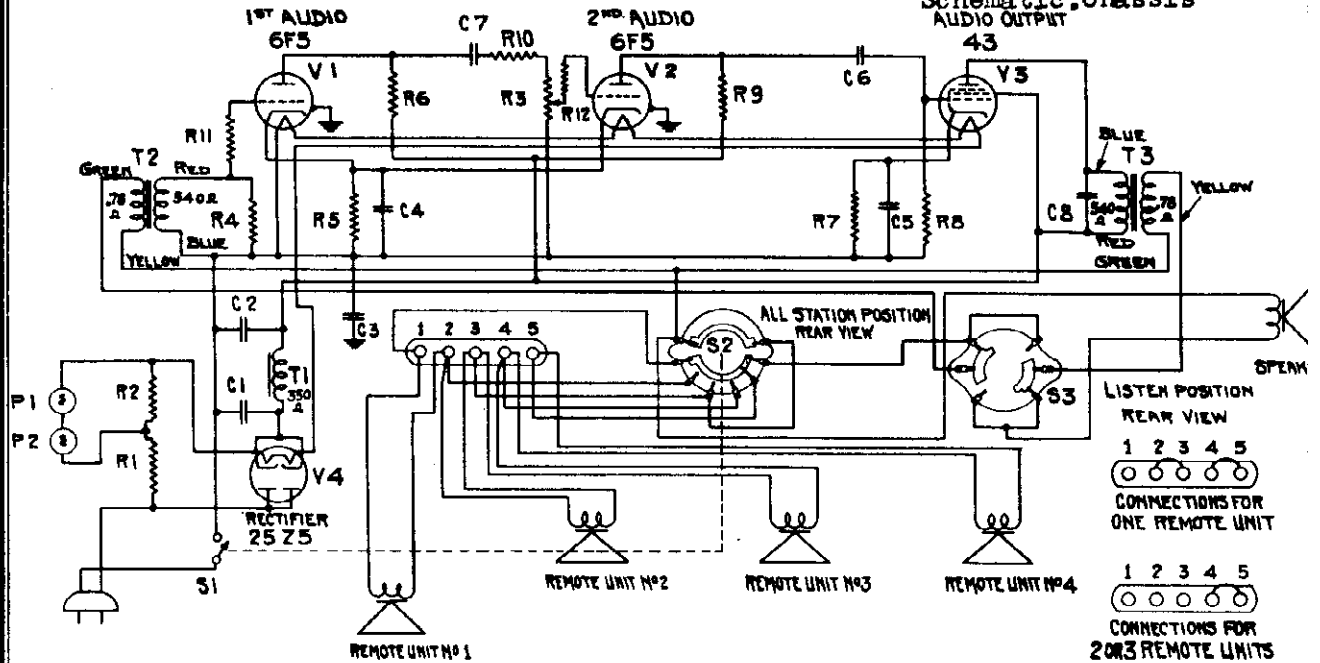
BEAT OSCILLATOR ADJUSTMENT - The signal generator, set at 456 K.C. is connected to the mixer tube (6L7) as described for the I.F. adjustment. The modulation switch is set to the "OFF" position and only a hiss or slight hum should be heard. Turn the Beat Oscillator "ON". If this is in exact adjustment (zero beat) no signal should be heard. If it has drifted however, a whistle will be heard the pitch of which can be varied by rotating the screw protruding from the side of square can on the left side of the chassis. As this is turned the pitch will change from high to low, then pass through a zero point, and then it will rise again in frequency. The "Zero Beat" position, where no signal is heard is the correct setting.

AUTOMATIC FREQUENCY CONTROL - Should it be found that after a station is tuned in accurately (in the selective position) as indicated by the cathode ray tube, that when the A.F.C. switch is turned "ON", the signal is detuned or a change observed in the tone of the receiver, it will be necessary to readjust the "Discriminator" transformer which controls this action. A low range (0-5 or 0-10V.) high resistance volt meter or preferably a microammeter is inserted in series with the diode load resistor at the grounded end, which will indicate a maximum when a signal is tuned to exact resonance. This 500,000 Ohms load resistor is located directly under the discriminator transformer. A 0-10 milliammeter is inserted in the cathode circuit of the A.F.C. control tube. An R.F. signal (any frequency in the Broadcast Band) is fed into the antenna and the receiver is tuned as accurately as possible to resonance (with the switch turned OFF). Now throw the secondary trimmer of the discriminator off resonance. Tune the primary for maximum output as indicated by the diode load meter. Turn the AFC switch "ON". Now tune the secondary trimmer, identified by a red paint mark, so that when the A.F.C. switch is turned from the ON to the OFF position and vice-versa, no change takes place in the cathode current of the A.F.C. control tube, as indicated by the milliammeter. Be sure that the receiver has been accurately tuned first without the A.F.C., or improper adjustment may result, whereby the frequency is automatically detuned instead of tuned. When this condition of no change in cathode current is obtained, it is indicated that no control voltage is being generated at exact resonance, which is the desired condition. If now the receiver is slightly detuned either above or below resonance, the cathode current will either increase or decrease above its normal value with the A.F.C. OFF, or no signal fed into the antenna. The voltage thus generated as indicated by this change in current serves to shift the frequency of the oscillator in the proper direction so as to automatically retune the oscillator to the exact frequency required to bring in the desired station with maximum clarity and a minimum of noise.

NOTE - IN ALLIGNING THE BROADCAST BAND (1500 KC AND 600 KC) THE A.F.C. MUST BE OFF

All voltages except filament measured with 1,000 Ohms per volt meter from socket to chassis with band switch in broadcast position, and fidelity switch in selective position. Filament voltages are taken across filament prongs at tube socket and measured with a low impedance AC Voltmeter.

MODEL FM-41, Handy Phone
 GENERAL ELECTRIC CO. MODEL FS-5, Remote Station
 Schematic, Chassis
 AUDIO OUTPUT



SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
C1	DRY ELECTROLYTIC CAP. 16 MFD 150 V	R7	CARBON RESISTOR 680 OHMS 1/2 W
C2	DRY ELECTROLYTIC CAP. 16 MFD 150 V	R8	CARBON RESISTOR 470,000 OHMS 1/2 W
C3	LINK CAPACITOR .1 MFD 400V A.C.	R9	CARBON RESISTOR 120,000 OHMS 1/2 W
C4	DRY ELECTROLYTIC CAP. 20 MFD 4 V	R10	CARBON RESISTOR 100,000 OHMS 1/2 W
C5	DRY ELECTROLYTIC CAP. 10 MFD 25 V	R11	CARBON RESISTOR 36,000 OHMS 1/2 W
C6	PAPER CAPACITOR .001 MFD. 250 V	R12	CARBON RESISTOR 36,000 OHMS 1/2 W
C7	MICA CAPACITOR .001 MFD. 200 V	S1	POWER SWITCH
C8	PAPER CAPACITOR .003 MFD. 200 V	S2	SELECTOR SWITCH
P1	PILOT LAMP 6.3 V .25 AMP	S3	SPEAKER SWITCH
P2	PILOT LAMP 6.3 V .25 AMP	T1	FILTER TRANSFORMER
R1	RESISTOR NETWORK 22W 140 OHMS	T2	INPUT TRANSFORMER
R2	RESISTOR NETWORK 22W 80 OHMS	T3	OUTPUT TRANSFORMER
R3	VOLUME CONTROL 50,000 OHMS	V1	6F5 TUBE
R4	CARBON RESISTOR 10,000 OHMS 1/2 W	V2	6F5 TUBE
R5	CARBON RESISTOR 1,000 OHMS 1/2 W	V3	43 TUBE
R6	CARBON RESISTOR 47,000 OHMS 1/2 W	V4	25Z5 TUBE

Fig. 1. Schematic Circuit Diagram

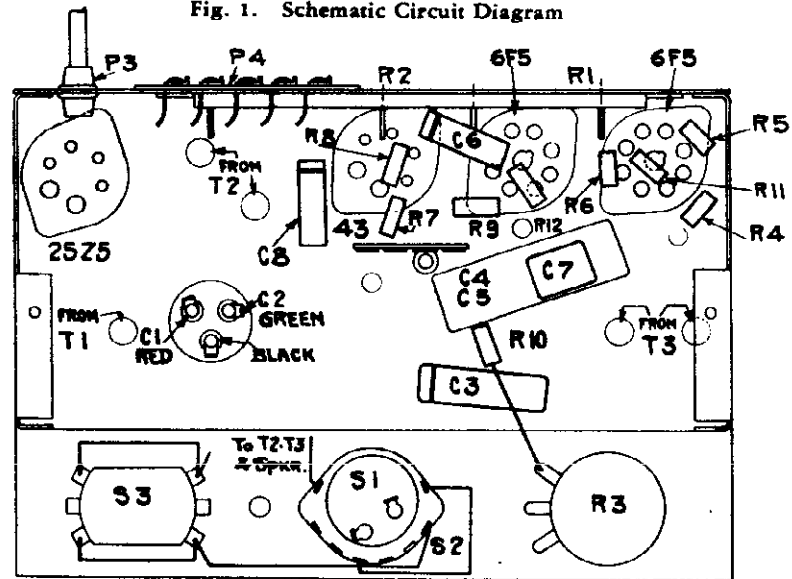


Fig. 2. Chassis Parts Layout

MODEL FM-41, Handy Phone
MODEL FS-5, Remote Station GENERAL ELECTRIC CO.
Circuit Data, Operation
Notes

Tubes

- 1st Audio Amplifier . . . 6F5 High-gain Triode
- 2nd Audio Amplifier . . . 6F5 High-gain Triode
- Audio Power Amplifier . 43 Power Amplifier Pentode
- Rectifier 25Z5 Rectifier
- Dial Lamps MAZDA No. 46

Permanent-Magnet "Speaker-Phone"

- Over-all diameter 5 1/4 inches
- Cone diameter 5 inches
- Voice Coil Impedance . . 5.0 ohms at 400 cycles

GENERAL INFORMATION

The Handy-Phone is an efficient loudspeaker phone system for use in offices, homes, hospitals or other places where voice communication between a central station and one or more remote stations is desirable. The system consists of one Model FM-41 Master Station and from one to four Model FS-5 remote "speaker-phone" stations.

The Master Station Model FM-41, employs four General Electric tubes in a three stage audio amplifier circuit with power supply. Volume is controlled by a variable potentiometer R-3 in the grid circuit of the 2nd audio amplifier. The "speaker-phone" used in this unit is of the permanent magnet type and is connected either as a microphone to the input circuit of the amplifier or as a loudspeaker to the output circuit of the amplifier by means of the talk-listen switch (S-3).

The heaters of all tubes and the dial lights with their shunt ballast resistor (R-2) are all in series and are furnished current from the power line through a dropping resistor (R-1). The two 6F5 tubes use the common self-biasing resistor R-5 for obtaining grid bias. The 43 output tube is self-biased by the voltage drop in R-7.

Note that the chassis is not the "B-" lead of the power supply. This "B-" lead is by-passed to the chassis through the capacitor C-3.

The Remote Station FS-5 uses a similar "speaker-phone" of the permanent magnet type but does not incorporate an amplifier or power supply; all operating power being supplied from the Master Station unit. The Remote Station speaker is also connected either to the input or output circuits of the amplifier in the Master Unit by means of the talk-listen switch (S-3).

As an example of the operation of the system: When the talk-listen switch (S-3) is in the normal "listen" position, the Remote Station functions as a microphone and is connected to the input of the amplifier while the Master Station speaker is connected across the output of the amplifier. When S-3 is placed in the "talk" position, the Master Station speaker then functions as a microphone and is connected to the input of the amplifier, while the Remote Station is connected to the output of the amplifier and functions as a speaker. The selector switch (S-2) connects either any one individual Remote Station or all Remote Stations to the Master unit. When the selector switch (S-2) is turned to the all position, the Remote Station units are connected in a series-parallel combination across the output of the amplifier.

DC Operation

When operating from a D.C. source, it is necessary to insert the plug with proper polarity. If the unit fails to function, after allowing time for the tubes to reach their operating temperature, reverse the power plug in the receptacle.

When the system is used on a D.C. supply, the 25Z5 rectifier tube and the filter remain in the circuit and serve two purposes. If the power cord should be plugged in with incorrect polarity, the 25Z5 tube protects the filter condensers from damage. On correct D.C. polarity the 25Z5 tube passes the D.C. and the filter circuit aids in smoothing the supply voltage, thus minimizing line noise.

AC Operation

When the system is used on alternating current, all D.C. potentials are supplied by a 25Z5 rectifier tube and its associated filter circuit. The tube is connected as a half-wave rectifier.

If any hum is noticed when the system is used on A.C., reverse the power plug in the receptacle. When the system has not been used for some time, a slight hum may be audible when the system is first turned on. This hum may not immediately clear up upon reversal of the power plug. However, it will probably be eliminated after approximately five minutes operation by which time the anode plates of the electrolytic capacitors will have re-formed.

Operating Distance

The following table gives the size of the twisted wire and additional equipment necessary to wire a remote station to the master station for various distances:

Distance of Remote from Master Station	Wire Size	Additional Equipment
1—500 Feet	No. 19—No. 22 B & S Gauge	None
500—2000 Feet	No. 16—No. 19 B & S Gauge	None
2000 Feet and Over	No. 19 B & S Telephone Wire	*Line Transformers

* Standard line transformers may be used. The transformers should be designed to operate from a five-ohm source into a line of 200, 500 or 600 ohms impedance. A similar transformer should be used on the remote station end to match the line impedance to the five-ohm load. These transformers may be procured from any radio supply house.

GENERAL ELECTRIC CO. MODEL FM-41, Handy Phone
 MODEL FS-5, Remote Station
 SOCKET VOLTAGES Voltage, Parts

Tube No.	PLATE TO -B (*) VOLTS D.C.		SCREEN TO -B (*) VOLTS D.C.		CATHODE TO -B (*) VOLTS D.C.		CATHODE CURRENT M.A. -D.C.		HEATER VOLTS	
	A.C.	D.C.	A.C.	D.C.	A.C.	D.C.	A.C.	D.C.	A.C.	D.C.
6F5 1st Audio	105	81	...	...	0.9	0.9	combined	combined	6.3	6.3
6F5 2nd Audio	85	63	...	...	0.9	0.9	0.9	0.9	6.3	6.3
43 Power Amplifier	121	94	133	103	18.0	14.0	27.0	20.0	25.0	25.0
25Z5 Rectifier	115	115	...	...	142	113	29.0	22.0	23.0	23.0

Measured at 115 volts, 60 cycles or 115 volts DC supply—Voltmeter 1000 ohms per volt—Measurements on highest readable scale.

* NOTE: The chassis is not the "B-" lead of the power supply. For voltage measurements, the "B-" may be taken at black terminal of the electrolytic capacitor.

Electrical Specifications		
Power Supply Volts	Frequency Cycles on A.C.	Power Consumption Watts (At 120 V. Line)
100-125 A.C.	25-100	46
100-125 D.C.	.....	38

Physical Specifications		Electrical Power Output	
Model	FM-41	A.C.	D.C.
Height	8 3/8 in.	0.7 watt	0.45 watt
Width	11 1/8 in.	1.0 watt	0.65 watt
Depth	7 1/8 in.		
Wt. Packed	13 pounds		

REPLACEMENT PARTS LIST
 HANDY-PHONE MODEL FM-41

INSIST ON GENUINE FACTORY-TESTED PARTS WHICH MAY BE PURCHASED FROM AUTHORIZED DEALERS

Stock No.	Description	List Price	Stock No.	Description	List Price
*RB-040	BOARD—Terminal Board (near 43 socket)	\$0.10	RQ-1259	RESISTOR—1000 ohm, 1/2 watt, Carbon (R-5) (Pkg. of 5)	\$0.70
RB-067	BOARD—Remote Station Terminal Board (5 terminals)	.25	RQ-1283	RESISTOR—10,000 ohm, 1/2 watt, Carbon (R-4) (Pkg. of 5)	.70
RC-005	CAPACITOR—.001 mfd., 400 volt, Paper (C-6)	.25	RQ-1296	RESISTOR—36,000 ohm, 1/2 watt, Carbon (R-11, R-12) (Pkg. of 5)	.70
*RC-023	CAPACITOR—.005 mfd., 600 volt, Paper (C-8)	.25	RQ-1307	RESISTOR—100,000 ohm, 1/2 watt, Carbon (R-10) (Pkg. of 5)	.70
*RC-123	CAPACITOR—.1 mfd., 400 volt, Paper (C-3)	.35	RQ-1308	RESISTOR—120,000 ohm, 1/2 watt, Carbon (R-9) (Pkg. of 5)	.70
*RC-296	CAPACITOR—500 mfd., Mica (C-7)	.25	RQ-1323	RESISTOR—470,000 ohm, 1/2 watt, Carbon (R-8) (Pkg. of 5)	.70
RC-577	CAPACITOR—Dry Electrolytic 16-16 mfd., 150 volt (C-1, C-2)	1.75	RR-729	RESISTOR—Bleeder Resistor, 140 ohm, 20 watt 60 ohm, 5 watt (R-1, R-2)	.60
RC-578	CAPACITOR—Dry Electrolytic 20 mfd., 6 volt; 10 mfd., 25 volt (C-4, C-5)	1.25	RS-059	SPEAKER—5-inch Permanent Magnet Type Speaker (Complete) (FM-41 and FS-5)	5.10
RC-865	CORD—Power Cord with Plug	.45	RS-220	SOCKET—Lamp Socket Assembly	.25
RC-926	CONE—5-inch Cone and Voice Coil	.90	RS-354	SWITCH—Talk-listen Switch (S-3)	.75
RE-020	ESCUTCHEON—Volume Control Escutcheon	.20	RS-355	SWITCH—Power and Selector Switch (S-1, S-2)	.40
RG-009	GRID CAP—Insulated Grid Cap and Lead	.25	RT-429	TRANSFORMER—Input or Output Transformer (T-2, T-3)	1.40
RI-007	INDICATOR—Selector Switch Indicator Plate	.55	RV-032	VOLUME CONTROL—50,000 ohm, Volume Control (R-3)	.70
RK-019	KNOB—Speech Control Knob	.20	*RW-101	WASHER—Felt Washer (Pkg. of 10)	.45
RK-020	KNOB—Station Selector Knob (Pkg. of 5)	.40	RX-026	ASSEMBLY—Chassis Mounting Screws and Washers	.10
RK-022	KNOB—Volume Control Knob (Pkg. of 5)	.60			
RL-333	REACTOR—Filter Reactor (T-1)	1.30			
RL-920	LAMP—Dial Lamp 6.3 volt, .25 amp. (Pkg. of 10)	1.50			
RQ-1255	RESISTOR—680 ohm, 1/2 watt, Carbon (R-7) (Pkg. of 5)	.70			

* Used on previous receivers.

(Prices subject to change without notice)

MODELS E-50, E-52

Chassis Wiring

GENERAL ELECTRIC CO.

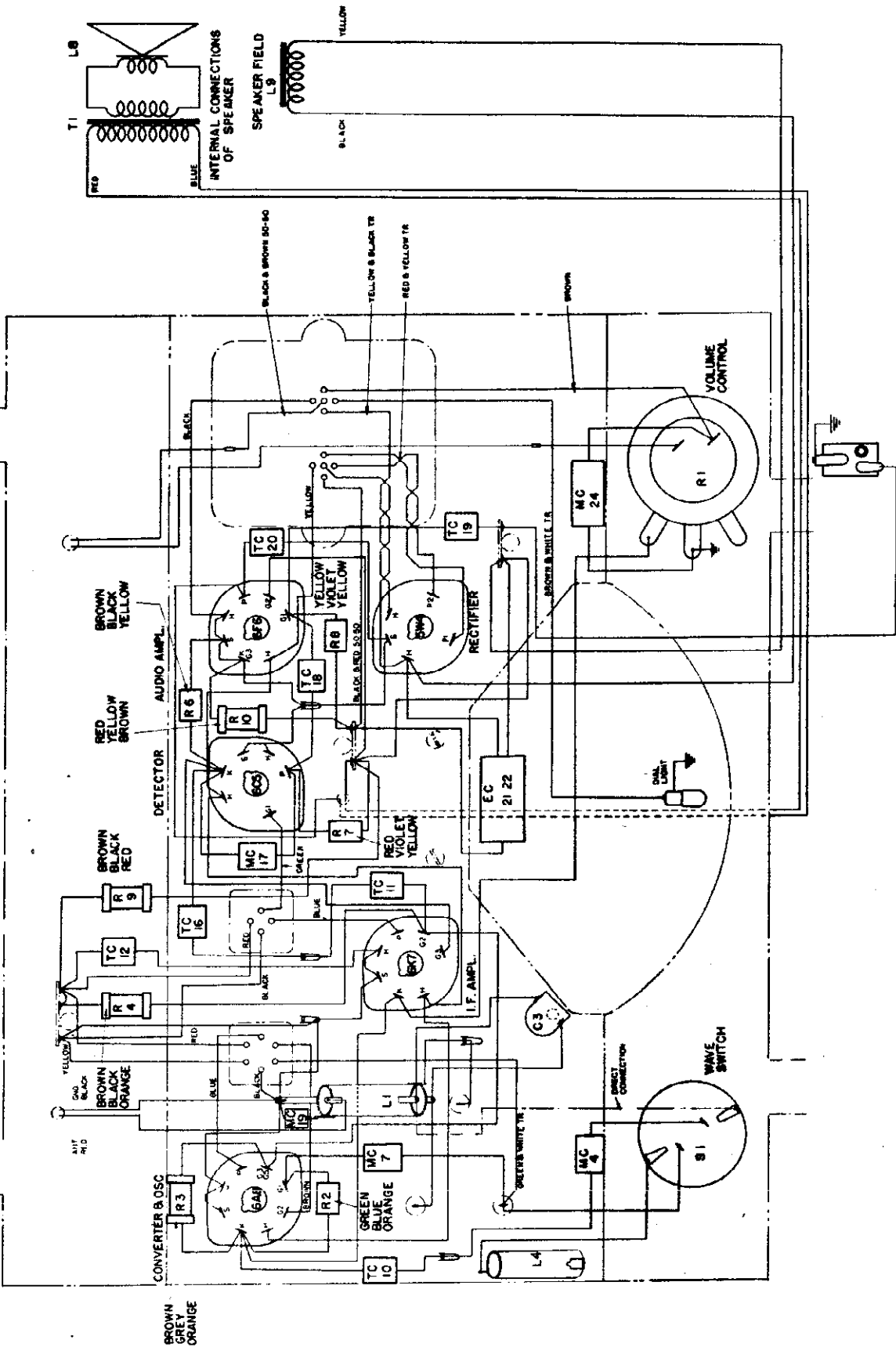
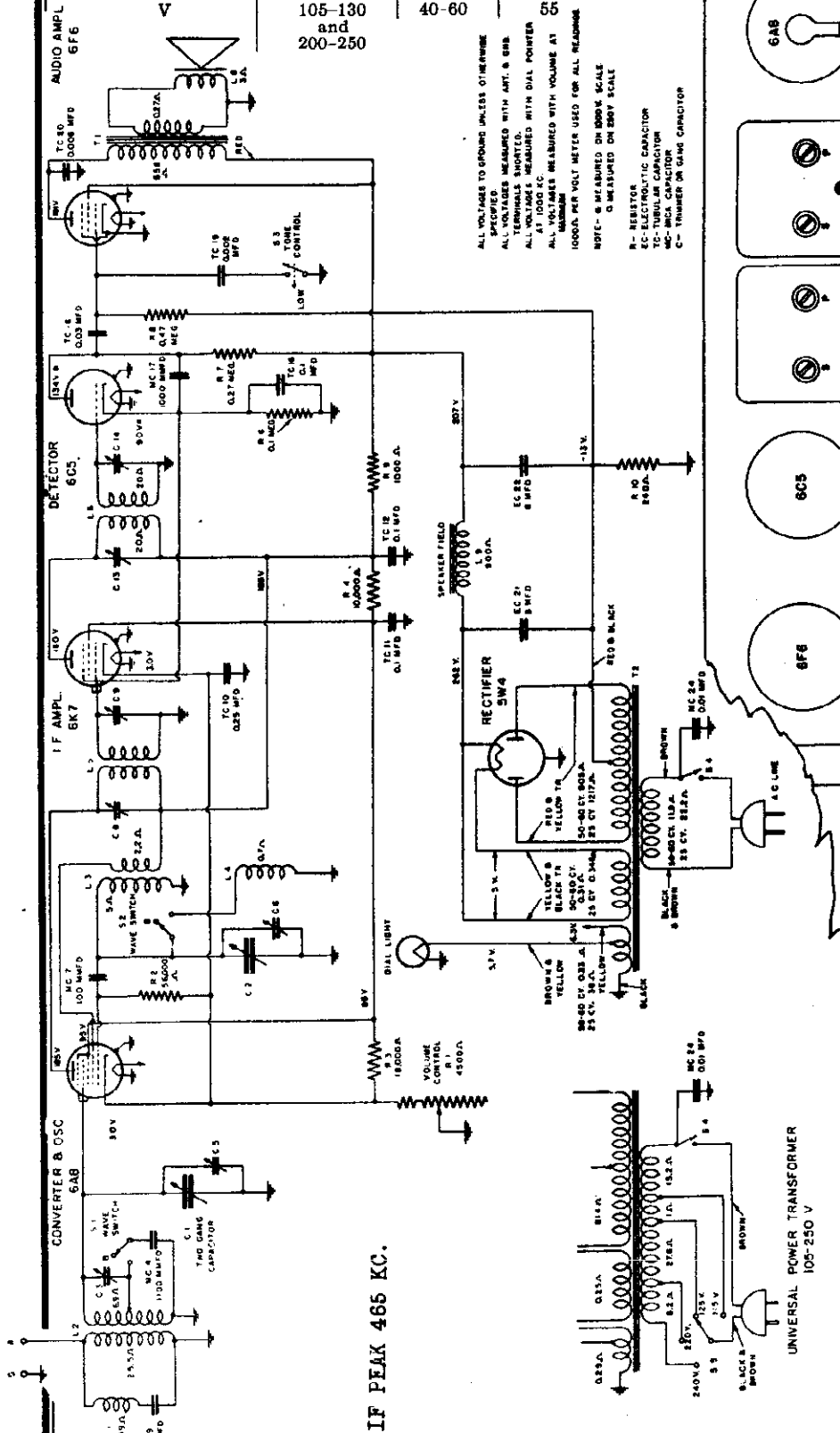


Fig. 2. Chassis Wiring Diagram

GENERAL ELECTRIC CO.

Electrical Specifications

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Watts)
A C V	115	50-60	50
	115	25-60	55
	105-130	40-60	55
	and 200-250		



IF PEAK 465 KC.

ALL VOLTAGES TO GROUND UNLESS OTHERWISE SPECIFIED. MEASURED WITH ANT. & SPA. TERMINALS SHORTED.
ALL VOLTAGES MEASURED WITH DIAL POINTER AT 1000 KC.
ALL VOLTAGES MEASURED WITH VOLUME AT 1000A PER VOLT METERS USED FOR ALL READINGS.
NOTE: - R MEASURED ON 500V SCALE
 O MEASURED ON 250V SCALE

R- RESISTOR
EC- ELECTROLYTIC CAPACITOR
TC- TUBULAR CAPACITOR
MC- MICRA CAPACITOR
C- TRIMMER OR GANG CAPACITOR

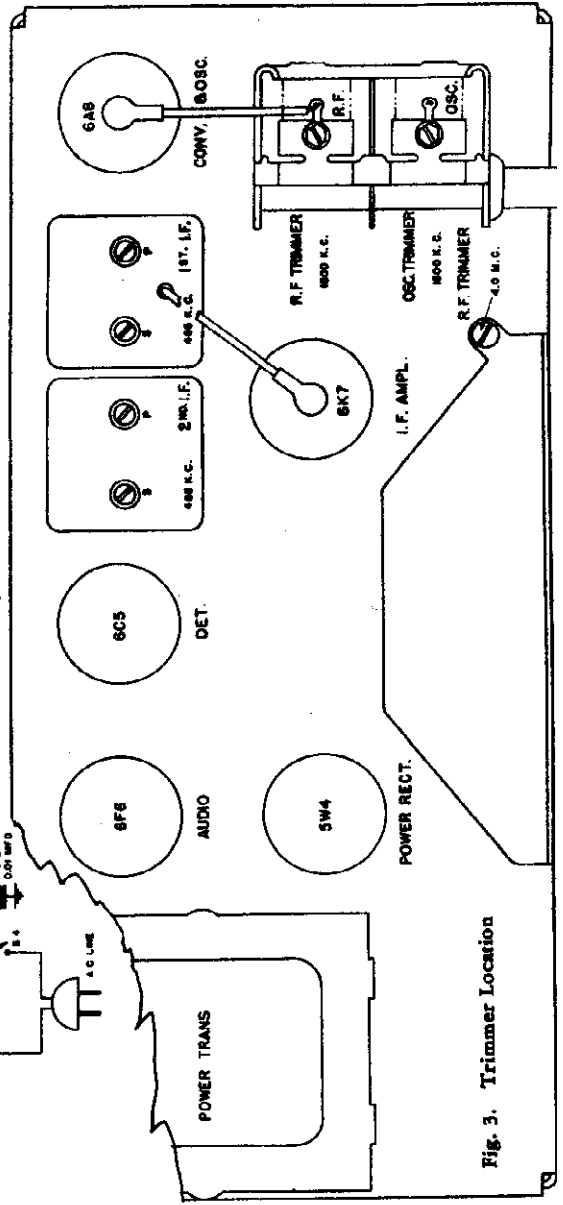


Fig. 3. Trimmer Location

- Tuning Frequency Range**
 Band "B".....540-1800 kc.
 Band "C".....1800-4000 kc.
- Tuning Control Drive Ratio**
 Single Speed.....1:1
- Electrical Power Output**
 Undistorted.....1.0
 Maximum.....3.0
- Loud-speaker—Electrodynamic**
 Cone Diameter: 6½ in.
 Cone Coil Impedance: 3 ohms at 400 cycles

MODELS E-50, E-52
Alignment, Parts

GENERAL ELECTRIC CO

DESCRIPTION OF ELECTRICAL CIRCUIT

The signal from the antenna is applied to the control grid of the 6A8 tube through the R.F. transformer, the secondary of which is tuned to the incoming signal by the rear section of the main tuning condenser. In the 6A8 tube the incoming signal is combined with the local oscillator signal which is 465 kc higher in frequency. The local signal is generated by the oscillator section of this tube, and the proper frequency difference is maintained throughout the tuning range by the front section of the tuning condenser in conjunction with the oscillator coils. The special-cut rotor of the front condenser section permits dispensing with the usual padding capacitor. The combination of the two signals produces the intermediate frequency of 465 kc. This particular frequency is chosen to reduce image response and improve short-wave performance. The intermediate frequency amplifier consists of a 6K7 tube and two transformers, both of which have tuned primaries and secondaries. Volume is controlled by the 400-ohm variable resistor, R-1, which varies the bias applied to the control grids of the 6A8 and 6K7 tubes. The output of the I.F. amplifier is applied to the grid of the 6C5 detector which is properly biased for this service by the .1 megohm cathode resistor, R-6. The output of the 6C5 detector is resistance coupled to the grid of the 6F8 power amplifier pentode. The plate circuit of the 6F8 is suitably matched to the loud-speaker by means of a step-down output transformer. The tone control circuit consists of a .002 mid. capacitor, connected in series with a two-point grounding switch, S-3, in the grid circuit of the 6F8 power pentode. When it is desired to reduce the high frequency output of the receiver, the switch, S-3, is turned to its counterclockwise grounding position. Plate and grid voltages for all tubes are supplied by the power supply system employing a 5W4 full-wave rectifier tube which, together with a suitable network of resistors and capacitors, supplies the required voltages and filtering action.

ALIGNMENT PROCEDURE

Before making any adjustments to the R.F. circuits, it is wise to determine the correctness of the existing alignment. This may be done by applying a signal from the test oscillator to the receiver and inserting a "tuning wand" into the antenna coil. The "tuning wand" consists of a bakelite rod having a brass cylinder attached to one end, and a small core of finely divided iron compacted into the opposite end. By inserting the brass cylinder end into the antenna coil, the inductance is lowered, increasing its resonant frequency. Inserting the iron-filled end into the coil raises its inductance, lowering its resonant frequency. If the circuits are in exact alignment, inserting either end of the tuning wand in the coil will result in a decrease in output. When an increase in signal is obtained with the iron-filled end of the wand at the 1000-ke. point or the 4.0-mc. point, a decrease in resonant frequency of that circuit by increasing the antenna trimmer capacity is indicated. When an increase in signal is obtained with the brass cylinder, a decrease in antenna trimmer capacity is indicated.

Changes Indicated by Wand

Wand	Signal	Trimmer Adjusted Required
Brass cylinder	Increase	Increase
Iron filings	Increase	None
Brass cylinder	Decrease	Decrease capacity
Iron filings	Decrease	Increase capacity

ALIGNMENT FREQUENCIES

I.F. Broadcast Short-wave
465 Kc. 1500 Kc. 4000 Kc.
In order to align these receivers properly it is necessary to have available:
1. A modulated test oscillator capable of producing the above alignment frequencies.
2. An output indicator, such as a high-resistance a-c voltmeter with a maximum scale reading of 3 to 5 volts, or a neon lamp indicator.
3. An alignment tool consisting of an insulating shaft with a small screwdriver blade.
The location of all alignment trimmer capacitors are illustrated in Fig. 3.

(1) I.F. Alignment

Set the frequency band switch of the receiver to the broadcast position and turn the volume control to maximum (extreme clockwise position). Tune the receiver to a point where no signal comes in and short-circuit the antenna and ground leads.
Connect the test oscillator output between the chassis and the control grid of the 6A8 tube. Connect the output meter across the control coil of the speaker. Set the test oscillator to 465 kc. and adjust the output until a small deflection is observed in the output meter.
The four I.F. trimmers, see Fig. 3, are adjusted in the following sequence:
1. Secondary trimmer on second I.F. transformer.
2. Primary trimmer on second I.F. transformer.
3. Secondary trimmer on first I.F. transformer.
4. Primary trimmer on first I.F. transformer.

Throughout all adjustments the output should be maintained at a low level by decreasing the test oscillator output at the various stages are brought in line. After these adjustments have been made, the same procedure should be repeated as a final check. The I.F. alignment will then be complete.

(2) I.F. Wave Trap

No adjustable trimmer is provided for the I.F. trap adjustment in this receiver. The capacitor MC-19, in conjunction with the inductance, L-1, automatically provides rejection of incoming I.F. signals.

(3) R.F. Alignment

The R.F. and oscillator trimmers are aligned at 1500 kc. First of all, check the position of the dial pointer. To do this, rotate the gang condenser to the maximum capacity position, i.e., plates fully meshed. While in this position, align the pointer with the last black line on the scale by loosening the dial drum set screws and rotating the drum on the gang shaft. Remove the short-circuit from the antenna and ground terminals and connect the test oscillator to same through a dummy antenna consisting of a 400-ohm resistor in series with a 200-mmf. capacitor. Connect the output indicator across the speaker cone coil.

(4) Broadcast Band—(540-1800 Kc.)

With the band switch in the clockwise position, set the tuning indicator to 1500 kc. Set the test oscillator at 1600 kc. and adjust the broadcast band oscillator trimmer, C-6, for maximum output. Next, set the R.F. trimmer, C-6, for maximum output, taking care that the output from the test oscillator is not high enough to overdrive any part of the set. No padding adjustment is required.
To complete the broadcast band line-up, repeat the R.F. trimmer adjustment after aligning the short-wave band.

(5) Short-wave Band (1800-4000 Kc.)

Turn the band switch to its counterclockwise position. Set the test oscillator at 4000 kc. and tune the receiver to resonate at this frequency. No trimmer is provided for short-wave oscillator alignment. To perform the R.F. short-wave adjustment, rock the tuning condenser back and forth through resonance while adjusting the short-wave R.F. trimmer, C-3, for maximum output indication on the tuning meter. It may now be necessary to readjust the broadcast band R.F. trimmer as indicated above.
Alignment of the receiver is now complete.

Physical Specifications

Dimensions	Model E-50	Model E-52
Height	8 1/4 in.	8 1/4 in.
Length	12 1/4 in.	12 1/4 in.
Depth	6 1/4 in.	6 1/4 in.
Weight Packed	14 lb.	14 lb.

REPLACEMENT PARTS

Insist on genuine factory-made parts, which may be purchased from authorized dealers

Stock No.	Description	List Price	Stock No.	Description	List Price
RA-308	ASSEMBLY—Dial Scale and Lamp Housing	\$1.00	RL-234	COIL—Oscillator Coil (C Band) (L-4)	\$0.40
RB-008	BOARD—Terminal Board Doubling Adjacent to Power Transformer	.10	RL-063	RESISTOR—50,000 Ohm, 1/4 Watt Carbon	.10
RB-041	BOARD—Terminal Board (Center of Chassis)	.10	RQ-107	RESISTOR—100,000 Ohm, 1/4 Watt Carbon (R-6) (Pkg. of 5)	.70
RB-053	BOARD—Terminal Board—3 Lug (Mount on chassis)	.10	RQ-117	RESISTOR—270,000 Ohm, 1/4 Watt Carbon (R-7) (Pkg. of 5)	.70
RC-013	CAPACITOR—.002 Mid., 200 V. Paper (C-16)	.25	RQ-123	RESISTOR—10,000 Ohm, 1/4 Watt Carbon (R-8) (Pkg. of 5)	.70
RC-026	CAPACITOR—.003 Mid., 1000 V. Paper (C-17)	.30	RQ-444	RESISTOR—240 Ohm, 1 Watt Carbon (R-10)	.15
RC-083	CAPACITOR—.08 Mfd., 400 V. Paper (TC-18)	.25	RQ-459	RESISTOR—1000 Ohm, 1 Watt Carbon (R-9)	.15
RC-122	CAPACITOR—1 Mid., 500 V. Paper (TC-15, TC-11)	.30	RQ-483	RESISTOR—10,000 Ohm, 1 Watt Carbon (R-3)	.15
RC-136	CAPACITOR—.25 Mfd., 300 V. Paper (TC-10)	.35	RS-200	SOCKET—8 Pin Tube Socket (Pkg. of 5)	.75
RC-235	CAPACITOR—100 Mmf., Mica (MC-7)	.25	RS-204	SOCKET—5 Pin Tube Socket (Pkg. of 5)	.75
RC-233	CAPACITOR—100 Mmf., Mica (MC-4)	.25	SS-322	SWITCH—Slide Lamp Socket (S-1, S-2)	.05
RC-264	V. Dry Electrolytic Capacitor (EC-21)	.35	SS-323	SWITCH—Tone Control Switch (S-3)	.40
RC-321	CAPACITOR—Trimmer Capacitor (C-9)	1.25	RT-057	TRANSFORMER—115 V. 60-60 Cycle Transformer (T-2)	3.85
RC-714	CONDENSER—Two Gang Tuning Condenser (C-2) Including (C-3, C-6)	3.00	RT-058	TRANSFORMER—115 V. 25-60 Cycle Transformer (T-2)	7.50
RC-756	CABLE—Dial Cable Assembly (Complete)	.15	RT-059	TRANSFORMER—Universal Transformer (Complete) and B Band Oscillator Coil (L-3, L-5, L-6, L-9)	8.00
RC-823	CORR.—Power Cord	.65	RT-229	TRANSFORMER—1st I.F. Transformer (Complete) and B Band Oscillator Coil (L-3, L-5, L-6, L-9)	1.90
RC-860	CUSHION—Gang Mounting Cushion	.10	RT-230	TRANSFORMER—1st I.F. Transformer (Complete) (L-3, L-5, L-6, L-9)	1.60
RC-944	CHASSIS—Electrolytic Capacitor Mounting	.05	RV-016	VOLUME CONTROL—4600-ohm Volume Control and Power Switch (R-1, S-4)	.95
RD-043	DIAL—Dial Scale	.15	RW-101	WASHER—Felt Washer for Knob (Pkg. of 1)	.45
RD-044	DRUM—Gang Drive Drum	.10	RX-019	WASHER—For mounting chassis in cabinet (Pkg. of 4)	.10
RG-001	GRID CAP.—Control Grid Clip (Pkg. of 8)	.10			
RK-010	KNOB—Control Knob (Black or White Cabinet) (Pkg. of 8)	.50			
RK-011	KNOB—Control Knob (Black or White Cabinet) (Pkg. of 8)	.50			
RL-024	COIL—Antenna Coil (Complete) (L-1, L-2, L-3, L-4, L-5, L-6, L-7, L-8, L-9)	1.00			

*Indicates part not used on 1938 "A" line of receivers.

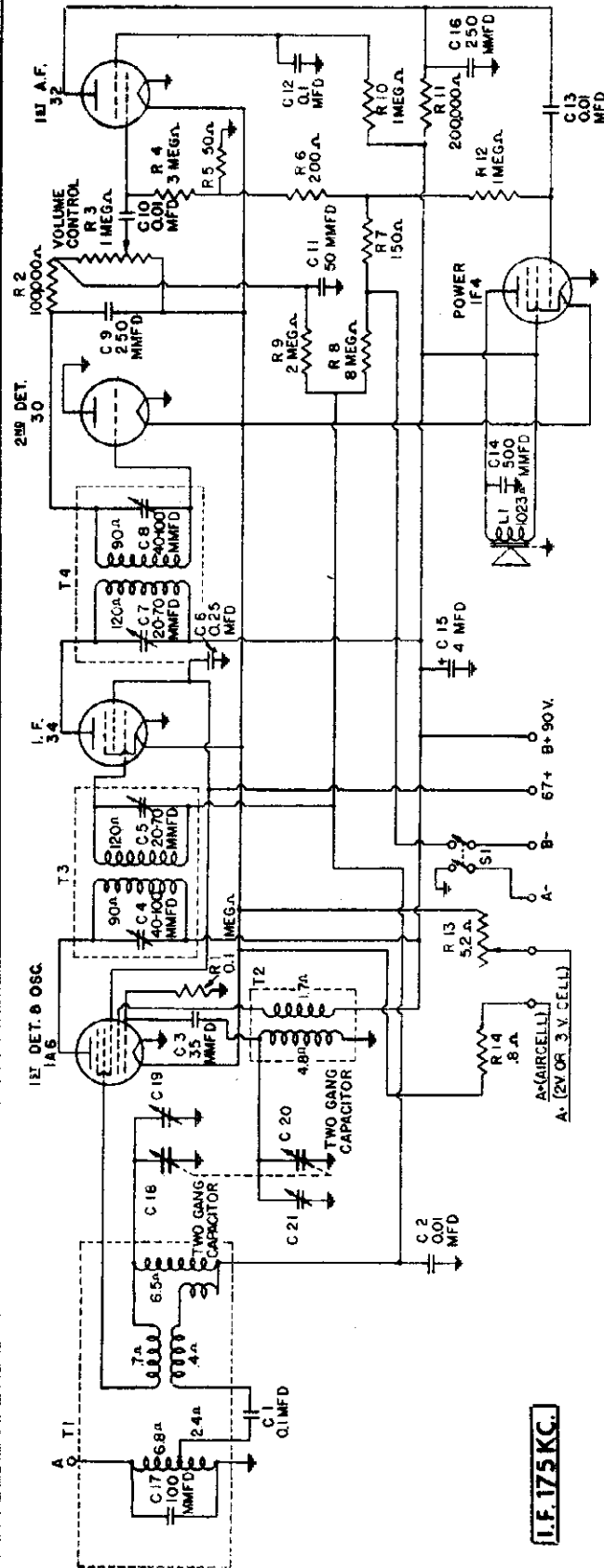
(Prices subject to change without notice)

SPEAKER ASSEMBLY

RC-915	CONR.—Speaker Cone	\$0.90
RS-040	SPEAKER—6 1/2 in. Type Speaker (Complete with Output Trans.) (L-7, L-8, L-9, L-1)	5.00
RT-420	TRANSFORMER—Output Transformer (T-1)	1.00

GENERAL ELECTRIC CO.

MODEL U-50
Schematic, Socket
Trimmers, Voltage



Voltages

Check the voltages at the sockets to see if correct values are being delivered to the tubes. The antenna and ground should be disconnected and the antenna

VOLTAGES AT SOCKETS				
Volume Control at Maximum				
Antenna Shorted to Ground				
"A" Battery—2 Volts				
Type of Tube	Function	Across Filament	Plate to Ground	Grid to Ground
1A6	1st Det.-Osc.	2	85	62
34	I.F.	2	85	62
30	2nd Det.	2	25	13
32	1st A.F.	2	80	85
1F4	Power	2	80	85

(1) Anode Grid to ground.
(2) As read across resistor, R5, with 100,000 ohm meter.
(3) As read across resistors, R5 and R6, with 250,000 ohm meter.

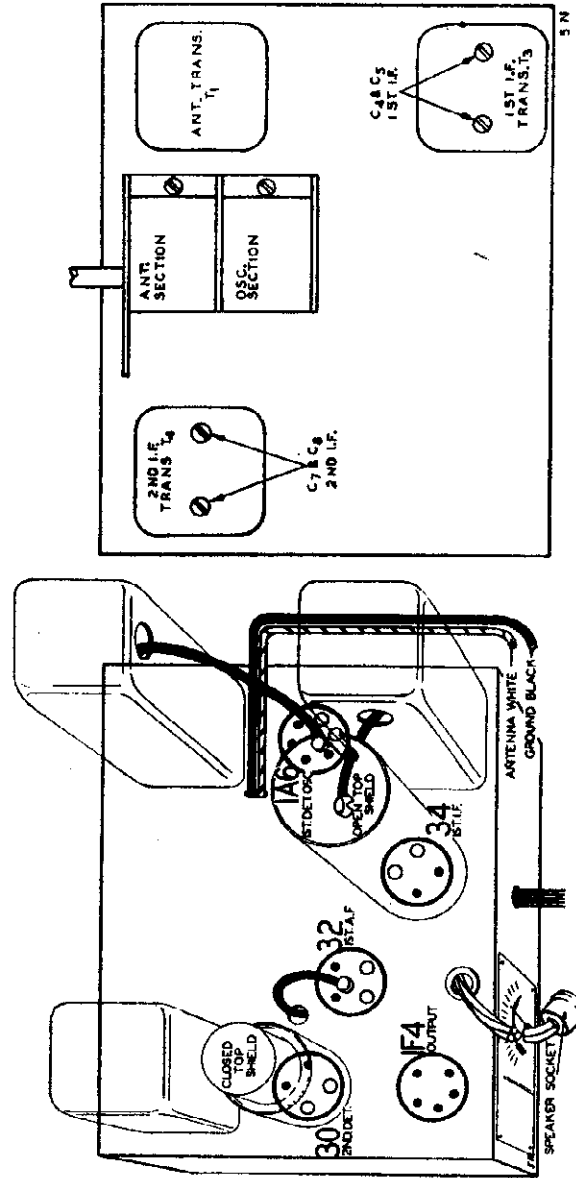


Fig. 7—Tube Arrangement

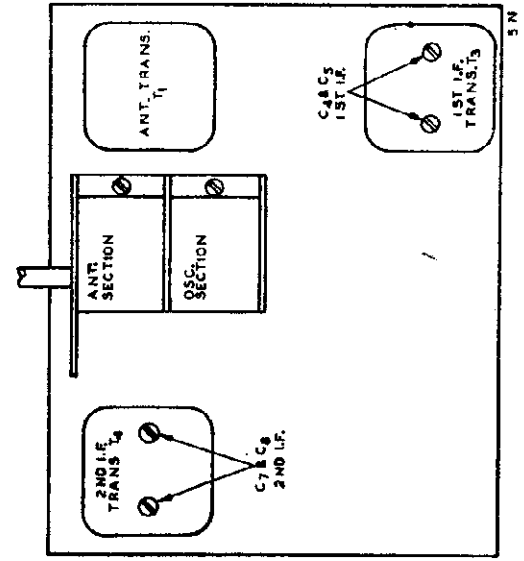


Fig. 6—Location of Trimmers

MODEL U-50

Alignment
Dial Drive Data

GENERAL ELECTRIC CO.

Alignment and Calibration

I. F. Adjustment

Set the signal generator for a signal of 175 KC.
 Connect the output of the signal generator through a .1 mf. condenser to the grid of the 1st detector.
 Connect the ground lead of the receiver to the ground post of the signal generator.
 Turn the volume control to the maximum position.
 Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.
 Then adjust the four I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 6.

1730 KC Adjustment

Set the signal generator for 1730 KC.
 Turn the rotor of the tuning condenser to the full open position.
 Connect the antenna lead of the receiver through a 200 mmf. condenser to the output of the signal generator.

Keep the volume control at the maximum position.
 Adjust the trimmer of the oscillator section of the two gang condenser until maximum output is obtained. The location of this trimmer is shown in Fig. 6.

1500 KC Adjustment

Set the signal generator for 1500 KC.
 Turn the rotor of the tuning condenser carefully until maximum output is obtained.
 The dial indicator should be near the 1500 KC mark on the dial scale. If it is a considerable distance from this mark, the position of the indicator on the drive cord must be changed. This procedure, however, should not be followed unless it is absolutely necessary as there is danger of breaking the clamps (See Fig. 8) which hold the indicator in place, and of fraying the drive cord. If the indicator must be moved, loosen the clamps at the back which hold it in place, and then retighten as explained in the article "Replacing Drive Cord."

Adjust the antenna trimmer for maximum output.
 Do not change the setting of the oscillator trimmer.

Grid Lead of 32 1st A. F. Tube

Keep the grid lead of the 32 1st A.F. tube in its normal position as shown in the tube arrangement, Fig. 7. If this lead is swung around so that it is close to the 1F4 output tube, an audio feedback may result which will manifest itself as a squeal.

Replacing Drive Cord

Remove the chassis from the cabinet.
 Remove the old drive cord, pulleys, washer and indicator.

Turn the drive drum until the slot in the rim is in the position shown in Fig. 8.

Insert one end of the drive cord in the slot and wind the cord around the drum in a clockwise direction for about two-thirds of a turn, or until it reaches the top of the drum.

Now, before putting the right pulley (from front) in place, bring the cord around the pulley from back to front so that the cord is adjacent to the celluloid dial scale; then place the pulley in position.

Extend the cord over to the left and bring it around the other pulley from front to back before placing this pulley. Put the small brass washer on the upper shaft of the pulley and place the pulley in position as shown in Fig. 8.

Bring the cord over to the drive drum and wind it around the drum in a clockwise direction, keeping it behind the cord already on the drum.

Push the pulley tension spring in toward the drive drum so as to provide slack in the cord while the free end is being inserted into the slot in the rim.

Now mesh the condenser plates completely. Replace the celluloid indicator on the dial strip and attach it to the drive cord as shown in Fig. 8. The line on the indicator should cover the 530 KC mark on the dial scale.

CAUTION—When attaching the indicator to the drive cord, do not pinch the center clamp too tightly on the cord or the cord will be cut. After the clamp is pinched slightly a small amount of shellac on it will hold the cord securely.

Input Voltages and Currents

"A" Battery 2 Volts—.36 Amperes
 "B" Batteries 90 Volts—10 to 15 Ma.

Power Output1 Watt Undistorted

Speaker 6" Magnetic

Intermediate Frequency 175 KC

Tuning Frequency Range 528 to 1730 KC

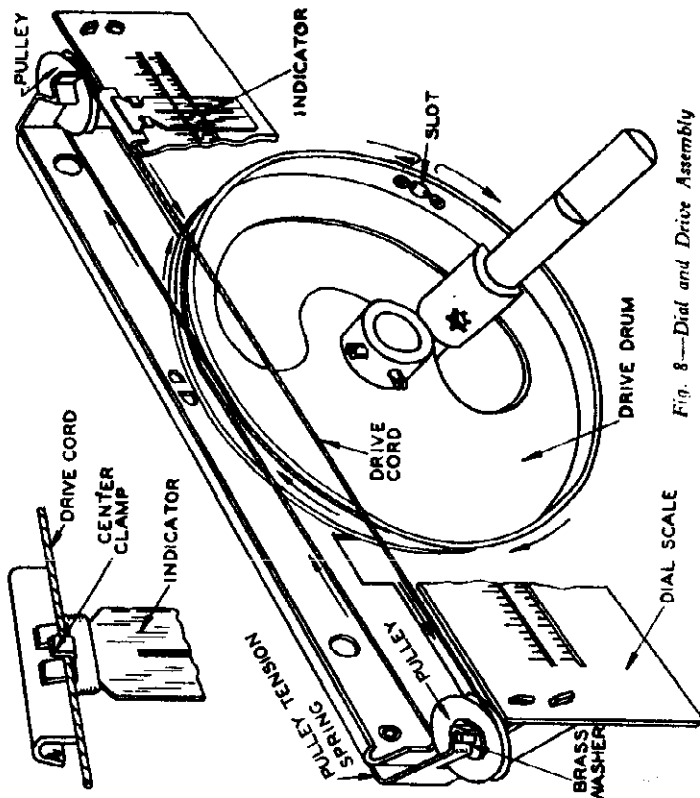


Fig. 8—Dial and Drive Assembly

MODEL E-51
Chassis Wiring

GENERAL ELECTRIC CO.

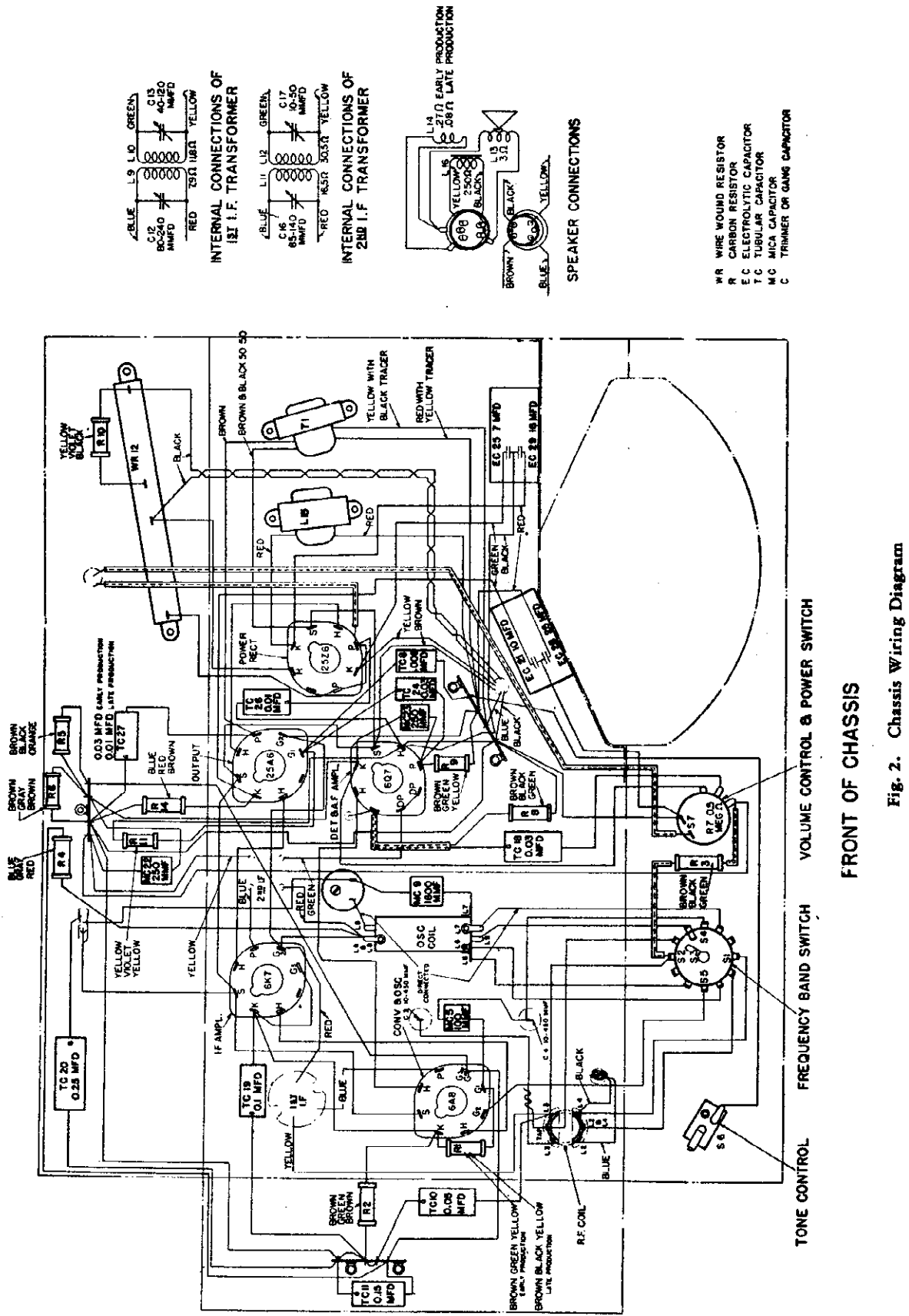


Fig. 2. Chassis Wiring Diagram

MODEL E-51
GENERAL ELECTRIC CO. Circuit Data, Alignment
 Voltage, Parts

SOCKET VOLTAGES

Power Supply	CATVORNS TO "B" VOLTS D.C.		SCREEN GRID TO "B" VOLTS D.C.		PLATE TO "B" VOLTS D.C.		HEATER VOLTS
	AC	DC	AC	DC	AC	DC	
6A8 Converter	2.4	2.3	56	51	102	98	9
6K7 Oscillator	2.4	2.2	108	92	102	98	9
6K7 I.F. Amplifier	1.2	1.1			90	81	2
6Q7 Detector and A.F. Amplifier	12.8	10.5	102	92	98	94	17.8
2A5A Rectifier	119	108			115	115	42.8
Sprk. Field	108	108			115	115	45.5

Measured at 115 volts 60 cycles or 115 volts D.C. supply. Dial 1000 kc. No signal input. Voltmeter 1000 ohms per volt; measurements taken on highest scale giving accurate readable deflection.

REPLACEMENT PARTS

Inside no genuine factory sealed parts, which may be purchased from authorized dealers

Stock No.	Description	List Price	Stock No.	Description	List Price
RECEIVER ASSEMBLY					
RB-009	BOARD—Terminal Board (Chassis Deck)	\$0.15	RP-061	PLATE—Abrazion Paste (Under Chassis)	\$0.15
RB-021	BOARD—Terminal Board (Chassis Deck)	.10	RQ-008	RESISTOR—180 ohm, 1/2 watt Carbon (R-8)	.60
RB-023	BOARD—Terminal Board (Rear Chassis Wall)	.10	RQ-041	RESISTOR—180 ohm, 1/2 watt Carbon (R-8) (Pkg. of 6)	.60
RB-190	BRACKET—Dial Light Bracket and Scale	.25	RQ-068	RESISTOR—10,000 ohm, 1/2 watt Carbon (R-8) (Pkg. of 6)	.70
RC-080	CAPACITOR—.005 mid., 400 V Paper (TC-8)	.25	RQ-091	RESISTOR—10,000 ohm, 1/2 watt Carbon (R-8) (Pkg. of 6)	.70
RC-087	CAPACITOR—.01 mid., 200 V A.C. (TC-20)	.75	RQ-123	RESISTOR—70,000 ohm, 1/2 watt Carbon (R-8) (Pkg. of 6)	.70
RC-060	CAPACITOR—.01 mid., 200 V Paper (TC-18, TC-24)	.25	RQ-131	RESISTOR—1 meg., 1/2 watt Carbon (R-8) (Pkg. of 6)	.70
RC-072	CAPACITOR—.05 mid., 200 V Paper (TC-18, TC-24)	.25	RQ-264	RESISTOR—500 ohm, 1/2 watt Carbon (R-8) (Pkg. of 6)	.70
RC-090	CAPACITOR—1 mid., 200 V Paper (TC-18, TC-24)	.25	RQ-278	RESISTOR—500 ohm, 1/2 watt Carbon (R-8) (Pkg. of 6)	.70
RC-110	CAPACITOR—.18 mid., 200 V Paper (TC-18, TC-24)	.30	RQ-427	RESISTOR—17 ohm, 1/2 watt Carbon (R-8) (Pkg. of 6)	.70
RC-180	CAPACITOR—.25 mid., 200 V Paper (TC-18, TC-24)	.30	RR-714	RESISTOR—50 ohm, 1/2 watt Carbon (R-8) (Pkg. of 6)	.05
RC-280	CAPACITOR—100 mmid., Mica (MC-9)	.35	RR-904	REFLECTOR—Dial Light Reflector	.15
RC-288	CAPACITOR—250 mmid., Mica (MC-28)	.25	RS-200	SOCKET—8 Pin Tube Socket (Pkg. of 8)	.75
RC-348	CONDENSER—1000 mmid., Mica (MC-9)	.25	RS-210	SOCKET—Dial Light Socket	.30
RC-350	CAPACITOR—25 mid., 150 V 10 mid., 25	1.50	RS-314	SWITCH—Band Switch (S-1, S-2, S-3, S-4)	.30
RC-366	V. Dry Electrolytic (EC-28, EC-21)	1.50	RS-381	SWITCH—Tone Control Switch (S-6)	.10
RC-408	CONDENSER—18 mid., 100 V 21 mid., 150	1.50	RT-214	PULLEY (Pkg. of 2)	1.50
RC-718	CONDENSER—Two-gang Tuning Condenser (C-3, C-4)	2.00	RT-216	TRANSFORMER—1st I.F. Transformer Assembled (L-9, L-10)	1.50
RC-816	CABLE—Dial Cable (Pkg. of 5)	2.00	RT-219	TRANSFORMER—Output Transformer Assembled (L-9, L-10)	1.50
RC-880	CORNER—Cabinet Corner (Pkg. of 4)	.45	RV-018	VOLUME CONTROL—Volume Control and Power Switch (R-7, S-7)	.15
RD-041	DRIVE—Dial Drive Drum	.40	RW-004	WINDOW—Dial Window	.15
RD-042	DRIVE—Condenser Drive Shaft (Pkg. of 4)	.40	RW-101	WASHER—Flat Washers for Control Shaft	.45
RE-404	KNOB—Control Knob (Pkg. of 4)	.40	RX-018	SCRUBBER ASSEMBLY—Chassis Mounting Screw Assembly	.15
RE-008	KNOB—Knob for use with Red Cabinet	.10	SPRAKER ASSEMBLY		
RE-009	KNOB—Knob for use with Black or Ivory Cabinet	.10	RC-914	CONB—04-in. Cone and Voice Coil (L-12)	\$0.25
RL-201	COIL—Oscillator Coil (L-2, L-4, L-4)	1.10	RP-050	PLUG—Male Speaker Plug	.20
RL-202	COIL—Oscillator Coil (L-6, L-6, L-7, L-8)	1.10	RP-060	PLUG—Female Speaker Plug	.20
RP-041	POINTER—Dial Pointer and Guide	1.00	SP-048	SPRAKER—04-in. Type Speaker (L-12)	\$0.50
RP-043	PULLY—Dial Pully (Pkg. of 2)	.25	SP-050	SPRAKER—04-in. Type Speaker (L-12)	\$0.50

Reference part also used on 1938 "A" line of receivers. (Prices subject to change without notice)

signal is obtained with the iron-filled end of the wand as the 1500-kc. point, a decrease in resonant frequency of that circuit by increasing the antenna trimmer capacity is indicated. When an increase in signal is obtained with the brass cylinder, a decrease in antenna trimmer capacity is indicated. In the event that the brass cylinder read causes an increase in output at the 680-kc. point when inserted in the antenna coil, it is necessary to increase the oscillator padder capacity, meanwhile rocking the tuning dial. An increase in output, resulting from inserting the iron-filled end, indicates a decrease in oscillator padder capacity.

ALIGNMENT FREQUENCIES

I.F. Broadcast Short-wave
 465 kc. 1500 kc. None

In order to properly align this receiver, it will be necessary to have the following service tools

1. Test Oscillator capable of producing the above alignment frequencies.
2. Non-metallic alignment screwdriver.
3. Output meter.

Trimmer locations as well as socket voltages are illustrated in Fig. 3.

I.F. Alignment

The I.F. amplifier should be tuned to 465 kc. set the test oscillator dial at this frequency. Turn the volume control to maximum and short-circuit the antenna and ground leads. Connect the test oscillator output between the 6A8 converter tube grid (with the grid cap on) and the chassis. Connect the output meter across the one end of the speaker and adjust the oscillator output until a small deflection is observed in the output meter.

The four I.F. trimmers are adjusted in the following sequence:

1. Secondary trimmer on second I.F. transformer.
2. Primary trimmer on second I.F. transformer.
3. Secondary trimmer on first I.F. transformer.
4. Primary trimmer on first I.F. transformer.

Throughout all adjustments the output should be maintained at a low level by decreasing the test oscillator output as the various stages are brought in line. After these adjustments have been made, the same procedure should be repeated as a final check. The I.F. alignment will then be complete.

R.F. Alignment

The R.F. and oscillator transformers are aligned at 680 and 1500 kc. With the tuning condenser plates fully meshed, line up the pointer and dial by adjusting the dial drive drum set screws so that the line at the extreme right-hand end of the dial is indicated.

Broadcast Read

With the band switch in the clockwise position, set the tuning dial to 1500 kc. Set the test oscillator at 1500 kc. and adjust the oscillator trimmer for maximum output. Next, adjust the R.F. trimmer for maximum output, taking care that the output from the test oscillator is not high enough to overload any part of the set. After these adjustments, tune the set and the test oscillator to 680 kc. Adjust the broadcast-tuning condenser for maximum output while rocking the padding condenser back and forth until maximum output is obtained. The dial setting after this adjustment may not agree exactly with the frequency, but this is not important. To complete the broadcast band line-up, repeat the adjustment at 1500 kc. as before.

Separate short-wave trimmer is provided on this receiver. The correct adjustment of the broadcast band trimmer automatically aligns the short-wave band.

DESCRIPTION OF ELECTRICAL CIRCUIT

The signal from the antenna is applied to the control grid of the 6A8 tube through the R.F. transformer. The secondary of which is tuned to the incoming signal by the rear section of the main tuning condenser. In the 6A8 tube the incoming signal is combined with the local oscillator signal which is 465 kc. higher in frequency. The local signal is generated by the oscillator section of this tube, and the proper frequency difference is maintained throughout the tuning range by the front section of the tuning condenser in conjunction with the oscillator coils and padding capacitor.

The combination of the two signals produces the intermediate frequency of 465 kc. This particular frequency is chosen to reduce image response and improve short-wave performance. The intermediate frequency amplifier consists of a 6K7 tube and two transformers, both of which have tuned primaries and secondaries.

The output of the I.F. amplifier is rectified by the diode section of the 6Q7 tube, providing automatic volume control, as well as detection. The audio frequency voltage developed across R-7 is applied through TC-18 to the grid of the 2A5A tube. The volume control of this tube from the variable arm of R-7, which constitutes the volume control of the receiver. The D.C. voltage developed across R-7 is applied to the control grids of the 6A8 and 6K7 tubes for automatic volume control.

The output of the 6Q7 amplifier section is resistance coupled to the grid of the 2A5A power amplifier pentode. The plate circuit of the 2A5A is initially matched to the load-speaker by means of a step-down output transformer. The tone control circuit consists of a .106-mfd. capacitor which is connected from the grid of the 2A5A tube to ground through the tone control switch. When it is desired to reduce the high frequency output of the receiver the tone control switch is closed by turning the tone control knob to the left.

When the receiver is used on alternating current, plate and grid voltages and load-speaker field current are supplied by a 2A5B rectifier tube and its associated filter circuits. Each section of the 2A5B tube acts as a separate half-wave rectifier, one for speaker field current, and the other for plate and grid voltages, each section having its own filter circuit.

When the receiver is used on a D.C. supply the 2A2A rectifier tube remains in the circuit and serves two purposes. If the power cord should be plugged in with incorrect polarity, the 2A2A tube protects the filter condensers from damage. On correct D.C. polarity the 2A2A tube aids the filter circuits in smoothing the supply, thus minimizing line noise.

The heaters of all tubes and the dial light with its shunt ballast resistor (the 30-ohm section of WR-12 and R-10) are all in series and are furnished current from the power line through a dropping resistor (the 150-ohm section of WR-12). Note that the chassis is not connected directly to either the ground lead or to the power supply, but is by-passed to the "B" lead capacitor TC-30.

ALIGNMENT PROCEDURE

Before making any adjustments in the R.F. circuits, it is wise to determine the correctness of the existing alignment. This may be done by supplying a signal from the test oscillator to the receiver and inserting a "tuning wand" into the antenna coil. The "tuning wand" consists of a bakelite rod having a brass cylinder non compacted into the opposite end. By inserting the brass cylinder end into the antenna coil, the inductance is lowered, increasing its resonant frequency. Inserting the iron-filled end into the coil raises its inductance, increasing its resonant frequency. If the circuit is in exact alignment, inserting either end of the tuning wand in the coil will result in a decrease in output. When an increase in

MODELS U-51, U-65
Parts, Notes

GENERAL ELECTRIC CO. Replacement Parts

Stock No.	Description	List Price	Stock No.	Description	List Price
RBB-001	BOARD—Terminal board, 2 lugs.....	.10	RBL-302	REACTOR—Vibrator reactor (L-3).....	.35
RBB-002	BOARD—Terminal board, 3 lugs.....	.10	RBL-303	REACTOR—"A" line reactor (L-4, L-5).....	.80
RBB-003	BOARD—Terminal board, 5 lugs.....	.10	RBL-304	REACTOR—"B" reactor (L-6).....	1.25
RBB-004	BOARD—Fuse board.....	.10	RBL-305	REACTOR—Transformer (L-7).....	.30
RBB-100	BRACKET—Dial support bracket with drive cord spring.....	.10	RBL-900	LEADS—Antenna and ground lead assembly.....	ea. .10
RBB-101	BRACKET—Dial mounting bracket.....	.20	RBP-001	PULLEY—Dial pulley.....	.10
RBC-001	CAPACITOR—1 Mfd., 180 volt paper (C-7, C-10, C-11, C-23, C-25, C-37, C-33, C-42).....	.20	RBP-002	POINTER—Dial pointer.....	.10
RBC-003	CAPACITOR—25 Mfd., 180 volt paper (C-21, C-31).....	.25	RBO-001	RESISTOR—100,000 ohm, .2 Watt Carbon (R-2, R-6, R-12, R-13).....	.15
RBC-004	CAPACITOR—.01 Mfd., 180 volt paper (C-16, C-18).....	.15	RBO-002	RESISTOR—3 megohm, .2 Watt Carbon (R-9, R-10).....	.10
RBC-005	CAPACITOR—.05 Mfd., 180 volt paper (C-4).....	.15	RBO-008	RESISTOR—1 megohm, .2 Watt Carbon (R-17).....	.10
RBC-006	CAPACITOR—.5 Mfd., 180 volt paper (C-19, C-20, C-39).....	.40	RBO-010	RESISTOR—30,000 ohm, .2 Watt Carbon (R-1).....	.15
RBC-007	CAPACITOR—.3 Mfd., 180 volt paper (C-22).....	.30	RBO-011	RESISTOR—80,000 ohm, .2 Watt Carbon (R-3).....	.15
RBC-008	CAPACITOR—.02 Mfd., 1000 volt paper (C-24).....	.15	RBO-012	RESISTOR—10,000 ohm, .2 Watt Carbon (R-4).....	.15
RBC-009	CAPACITOR—.01 Mfd., 180 volt paper (C-36, C-40, C-44).....	.20	RBO-013	RESISTOR—4 megohm, .2 Watt Carbon (R-5).....	.10
RBC-010	CAPACITOR—.5 Mfd., 180 volt paper (C-43).....	.30	RBO-014	RESISTOR—50,000 ohm, .2 Watt Carbon (R-7, R-8).....	.15
RBC-014	CAPACITOR—.01 Mfd., 240 volt paper (C-38).....	.15	RBO-015	RESISTOR—15,000 ohm, .2 Watt Carbon (R-15).....	.15
RBC-203	CAPACITOR—50 Mmfd., Mica (C-13, C-15, C-17).....	.10	RBO-016	RESISTOR—1,000 ohm, .2 Watt Carbon (R-16).....	.10
RBC-205	CAPACITOR—250 Mmfd., Mica (C-1).....	.15	RBS-702	RESISTOR—16.8 ohm, wire wound (R-14).....	.25
RBC-206	CAPACITOR—35 Mmfd., Mica (C-28).....	.10	RBS-002	SPEAKER—6" type speaker complete with output transformer (T-6).....	5.70
RBC-207	CAPACITOR—100 Mmfd., Mica (C-14, C-41).....	.10	RBS-003	SPEAKER—8" type speaker complete with output transformer (T-6).....	6.00
RBC-502	CAPACITOR—4 Mfd., 18 Mfd., 18 Mfd., 150 volt dry electrolytic (C-32, C-26, C-27).....	1.55	RBS-100	SHIELD—Large tube shield.....	.20
RBC-602	CAPACITOR—Quadruple trimmers, antenna and oscillator bands B and D (C-2, C-3, C-23, C-30).....	.45	RBS-101	SHIELD—Small tube shield (closed top).....	.10
RBC-603	CAPACITOR—Double trimmers 1st IF (C-5, C-6).....	.45	RBS-102	SHIELD BASE—Large tube shield base and vibrator shield base.....	.10
RBC-604	CAPACITOR—Double trimmers, 2nd IF (C-8, C-9).....	.40	RBS-103	SHIELD BASE—Small tube shield base.....	.10
RBC-605	CAPACITOR—Double padder, bands B and D (C-34, C-35).....	.45	RBS-104	SHIELD—Small tube shield (open top).....	.15
RBC-606	CAPACITOR—Trimmer, 3rd IF (C-12).....	.25	RBS-105	SHIELD—Vibrator shield.....	.20
RBC-609	CAPACITOR—Replacement trimmer for any one section of trimmer strip RBC-602.....	.10	RBS-106	SHIELD—Shield can for filter assembly (under vibrator and transformer assembly).....	.50
RBC-701	CONDENSER—Two gang tuning condenser and reduction drive.....	3.65	RBS-201	SOCKET—4 prong tube socket.....	.10
RBC-800	CABLE—Drive cable.....	.10	RBS-202	SOCKET—5 prong tube socket.....	.10
RBC-801	CABLE—Speaker cable and socket assembly.....	.40	RBS-203	SOCKET—6 prong tube socket.....	.10
RBC-803	CABLE—Shielded battery cable.....	1.00	RBS-204	SOCKET—6 prong vibrator socket.....	.10
RBC-901	CONE—6" Speaker cone (U51).....	2.50	RBS-300	SWITCH—Band change switch (S-1).....	.80
RBC-904	CONE—8" Speaker cone (U55).....	3.00	RBS-301	SWITCH—Tone control switch (S-3).....	.20
RBC-950	CUSHION—Rubber chassis mounting cushions.....	.10	RBT-050	TRANSFORMER—Power transformer (T-7).....	2.45
RBC-952	CLIP—Vibrator spring clip.....	.10	RBT-202	TRANSFORMER—1st IF transformer and shield assembly (T-3).....	1.45
RBD-001	DRUM—Dial drive drum.....	.30	RBT-203	TRANSFORMER—2nd IF transformer and shield assembly (T-4).....	1.50
RBD-003	DIAL—Dial scale.....	.35	RBT-204	TRANSFORMER—3rd IF transformer and shield assembly (T-5).....	1.60
RBD-004	DRIVE—Tuning cord reduction drive assembly.....	.90	RBT-400	TRANSFORMER—Output transformer (T-6).....	1.50
RBF-002	FOOT—Chassis mounting foot.....	ea. .10	RBV-001	VOLUME CONTROL—1 megohm volume control and on-off switch (R-11) (S-2).....	1.00
RBF-300	FUSE—5 Ampere fuse.....	.10	RBV-200	VIBRATOR—Vibrator unit.....	3.90
RBG-001	GRID CAP—Control grid cap.....	ea. .10	RBW-002	WINDOW—Dial window.....	.15
RBK-001	KNOB—Control knob.....	.10	RBL-101	WASHERS—Felt washers used behind knobs.....	ea. .10
RBL-002	COIL—Antenna coil and shield assembly (T-1).....	.55	RX-751	ASSEMBLY—Gang condenser mounting assembly (complete).....	.15
RBL-201	COIL—Oscillator coil and shield assembly (T-2).....	2.45	RBT-051	TRANSFORMER—Power transformer assembly, includes RBT-050, RBS-204, RBS-102, RBC-952, RBC-009.....	3.85
RBL-300	REACTOR—"B" Reactor (L-1).....	.20			
RBL-301	REACTOR—"B" Reactor (L-2).....	.25			

Prices subject to change without notice.

Trimmer Replacement

If one trimmer of the gang trimmer strip should become defective, it is not necessary to replace the entire strip. A single trimmer RBC-609, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (side not grounded) of the defective trimmer in the strip. This connection is then made to the single trimmer. Connect it to the side of the trimmer not in contact with the adjusting screw. The other side of the single trimmer is then connected to a good ground, using a piece of heavy wire in order to support the trimmer adequately. In replacing a trimmer, be sure to keep both leads as short as possible and keep the ungrounded lead as far from ground as possible.

Tubes

The tubes used in this receiver are of the 2 volt series. All of them are of the filament or directly heated types. The filaments are connected in the series-parallel arrangement shown in Fig. 6.

Synchronous Vibrator—The action of the synchronous vibrator used in the power unit is shown in the abridged wiring diagram Fig. 7. When the switch is closed, the armature is drawn up (from the standpoint of diagram) as a result of the current through the vibrator coil. When this occurs, the upper contacts are closed and the vibrator coil is short circuited. The spring action then causes the armature to spring back and the upper contacts are opened. The vibrator coil is again energized, but the inertia of the armature causes it to continue in motion until the two bottom contacts are closed.

The spring action then brings the armature up, opening the bottom contacts. The vibrator coil is again energized and the armature is drawn up to start the next cycle.

The "A" current (heavy lines, Fig. 7) flows first through one side of the power transformer primary and then through the other side in the opposite direction. An AC voltage is induced in the secondary as a result. That portion of the armature shown in light lines rectifies the current in the secondary circuit.

MODELS U-51, U-55
Coils, Resistance
Vibrator, Notes

GENERAL ELECTRIC CO.

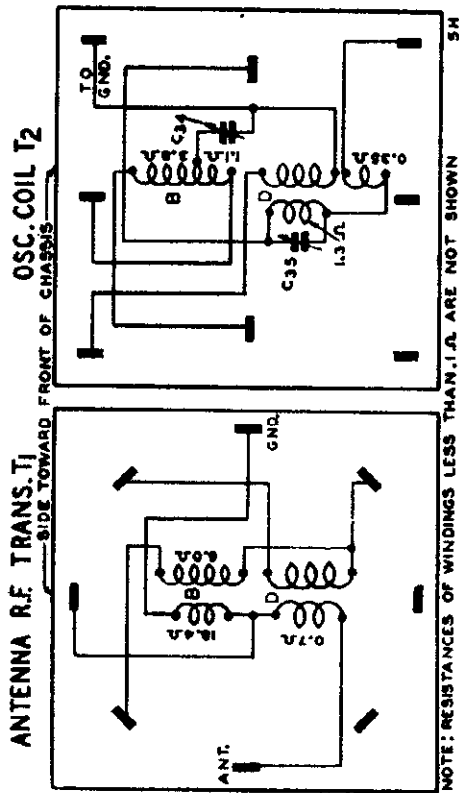


Fig. 8—R.F. and Oscillator Coil Base Terminal Arrangement and D.C. Resistance of Windings

NOTE: RESISTANCES OF WINDINGS LESS THAN 1.0 Ω ARE NOT SHOWN

D. C. Resistances of Audio and Filter
Circuit Windings –
Other Resistances are Shown in Fig. 2

The values given below will vary slightly in different sets.

Part No.	Winding	Code	D. C. Resistance in Ohms
RBT-400	Output Transformer	T6	
	Primary Winding		713.
	Secondary Winding		0.4
RBS-002 & 003	Dynamic Speaker 6" and 8"		
	Speaker Voice Coil		5.4
RBT-050	Power Transformer	T7	
	Primary Winding		
	Center Tap to Inside		0.3
	Center Tap to Outside		0.3
	Secondary Winding		
	Center Tap to Inside		166.
	Center Tap to Outside		185.
RBL-300	"B" Reactor	L1	18.3
RBL-301	"B" Reactor	L2	17.7
RBL-302	Vibrator Reactor	L3	0.1
RBL-303	"A" Line Reactor	L4	0.1
RBL-303	"A" Line Reactor	L5	0.1
RBL-304	"B" Reactor	L6	305.
RBL-305	Transformer	L7	
	Audio Choke (Primary)		1.3
	Hum Bucking Winding (Secondary)		22.7
RBL-300	"A" Reactor	L8	0.3

Caution

Do not turn the receiver on unless ALL the tubes are in the sockets. Removal of any of them will result in abnormal voltages on the remaining tubes.

Be sure that the battery clips are connected to the battery with the correct polarity. Reversed connections may damage the receiver.

Do not use any power source other than a 6 volt storage battery.

If the receiver does not operate after being turned on, turn the switch off immediately, examine the battery connections and the fuse and see if all tubes are properly inserted.

Switch Contact Location Numbering

A standard arrangement for switch contact location numbering has been adopted. This numbering is illustrated in Fig. 2. In contact locations not used, the number applying to that particular location is not employed.

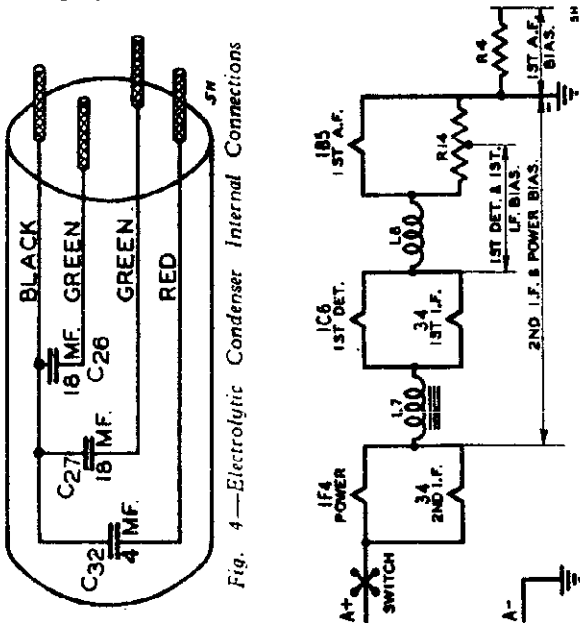


Fig. 4—Electrolytic Condenser Internal Connections

Fig. 6—Abridged wiring diagram showing filament wiring system and points at which no-signal bias voltages are obtained.

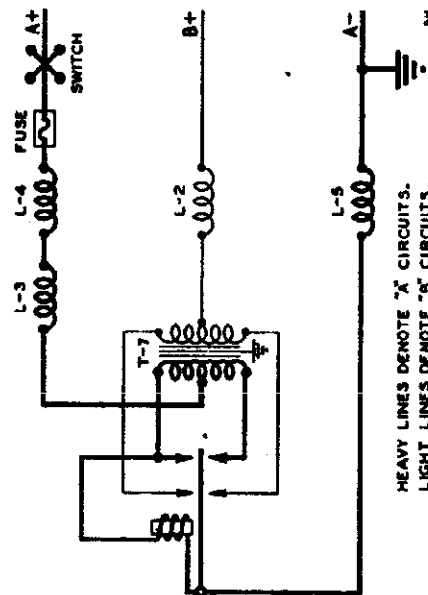


Fig. 7—Abridged wiring diagram showing action of synchronous vibrator

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MODELS U-51, U-55
Socket, Trimmers
Voltage, Dial Assembly

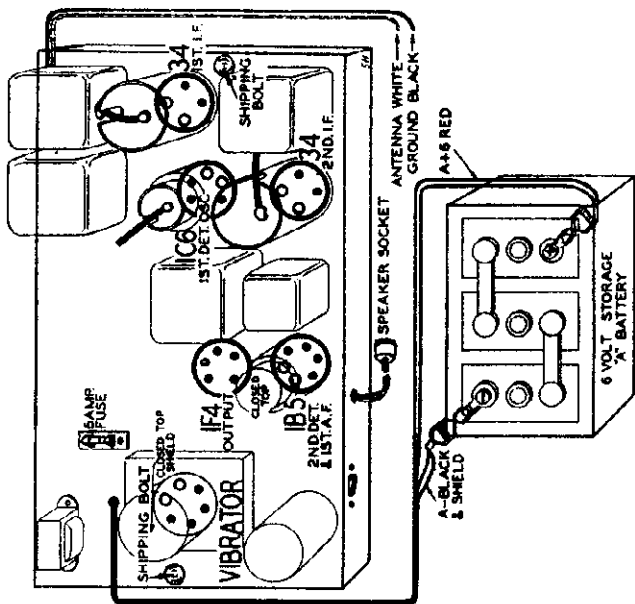


Fig. 5—Tube Arrangement and Battery Connections

Type of Tube	Function	Across Filament	Plate to Ground	Screen to Ground	Rias Voltage
IC6	1st Det.-Osc.	2.0	140 110(1)	55	1.1(2)
34	1st I.F.	2.0	140	55	1.1(2)
34	2nd I.F.	2.0	140	75	4.0
1B5	2nd Det. 1st A.F.	2.0	75		3.0(3)
1F4	Power	2.0	135	140	4.0

VOLTAGES AT SOCKETS

Volume Control at Maximum Antenna Shorted to Ground
Battery—6 Volts Band Switch in Standard Wave Position

- (1) Anode Grid to ground.
- (2) As read from negative filament leg to center top of R4.
- (3) As read across Resistor R4 (using 100,000 ohm meter). This voltage is subject to considerable variation depending on band and frequency setting.

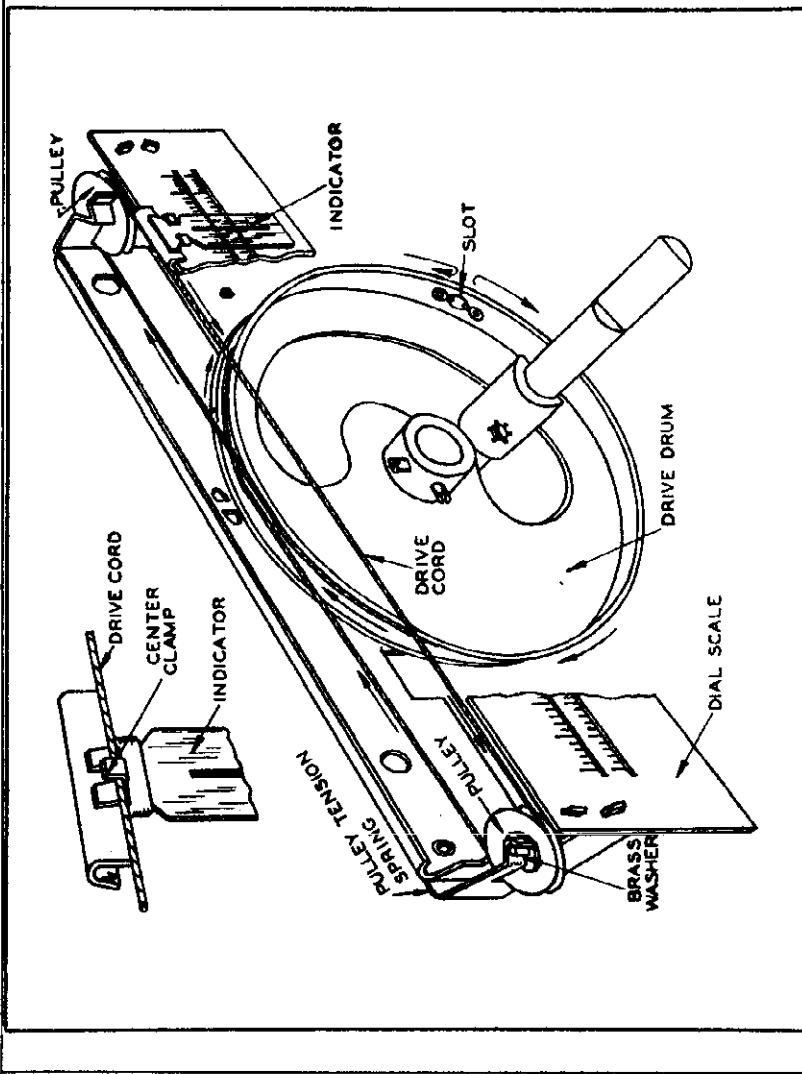


Fig. 9—Dial and Drive Assembly

Voltagess

Check the voltages at the sockets to see if correct values are being delivered to the tubes. The antenna and ground should be disconnected and the antenna and ground leads from the set connected together. The volume control should be turned to the right or maximum position. The voltage chart gives the voltages with all tubes in, the speaker connected and the set in operating condition. These voltages are typical of the sets but will vary slightly with variations in individual receivers, tubes, test equipment used and battery voltage. The voltage readings are taken with a voltmeter having a resistance of 1000 ohms per volt.

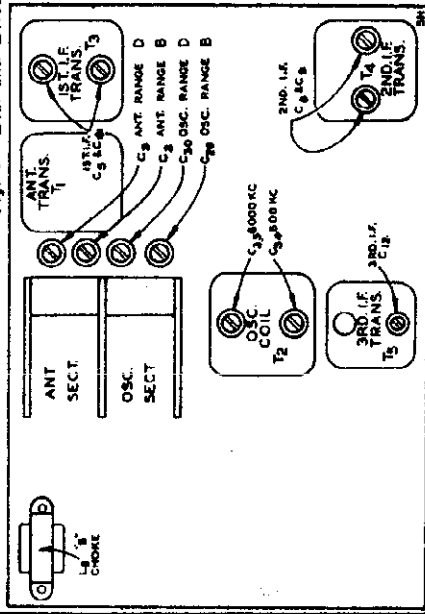


Fig. 3—Location of Trimmers

MODELS U-51, U-55

Alignment, Notes

Drive Cord Data

GENERAL ELECTRIC CO.

The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide an accurately calibrated signal at 456, 1730, 1500, 600, 16,000, 15,000 and 6000 KC and an output indicating meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 456 KC. Connect the output of the signal generator through a .1 mf. condenser to the control grid of the 1st detector.

Connect the ground lead of the receiver to the ground post of the signal generator.

Turn the band switch to the Range B position (standard wave band).

Turn the volume control to the maximum position. Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.

Then adjust the five I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 3.

Range B Alignment

After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

1730 KC Adjustment

Set the signal generator for 1730 KC.

Turn the rotor of the tuning condenser to the full open position.

Keep the band switch in the standard wave position.

Connect the antenna lead of the receiver through a 200 mmf. condenser to the output of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the oscillator Range B trimmer (C29) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

1500 KC Adjustment

Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

The dial indicator should be near the 1500 KC mark on the dial scale. If it is a considerable distance from this mark, the position of the indicator on the drive cord must be changed. This procedure, however, should not be followed unless it is absolutely necessary as there is danger of breaking the clamps (See Fig. 9) which hold the indicator in place, and of fraying the drive cord. If the indicator must be moved, loosen the clamps at the back which hold it in place, and then retighten as explained in the article "Replacing Drive Cord."

Adjust the antenna Range B trimmer (C2) to maximum.

Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 600 KC padder (C34) until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range D Alignment

CAUTION—When aligning the short wave band be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC. It may be necessary to increase the input signal to hear the image.

16,000 KC Adjustment

Set the signal generator for 16,000 KC.

Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range D position (short wave band).

Adjust the oscillator Range D trimmer (C30) until maximum output is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the antenna Range D trimmer (C3) to maximum. When adjusting this trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

Do not change the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC (C33) padder until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Servicing Power Unit

The power unit is that portion of the chassis assembly contained within the large rectangular shield can and the circuit for which is shown within the dotted lines at the lower center of the schematic diagram, Fig. 2.

Continuity Resistance Check—The power transformer, choke coil circuits and condenser shorts may be checked by utilizing the vibrator socket terminals and various points on the "A" or "B" lines, or ground without removal of the shield can. For example: when checking the continuity or resistance of the upper half of the transformer secondary, contact may be made with the test prods at the proper vibrator socket terminal, as shown on the circuit diagram, and at the terminal strip lug to which the 18 mf. electrolytic condenser, C26 is connected.

Removing Transformer and Vibrator Socket Assembly—Take off the filter unit shield can by removing the four self tapping screws at the right side (from front) of the chassis base and the five hex nuts from the bolts at the top of the chassis.

Unsolder the ground connections from the two lugs on the inside of the chassis base (right side from front).

Now unsolder the mounting lug holding the terminal strip to the transformer cover.

Remove the four nuts from the bolts holding the transformer assembly to the chassis. Do not remove these bolts from the transformer core. Then lift the assembly to free it from the chassis so that all parts of the assembly are readily accessible.

Proceed with replacement of the power transformer or with any other necessary service or replacements and then reassemble.

Replacement of Buffer Condenser C24—This condenser is located in the top of the transformer and vibrator assembly just underneath the vibrator socket. To replace, remove the assembly as explained in the preceding article.

In addition, the two screws holding the vibrator socket to the transformer cover assembly should be taken out. The condenser is then easily replaced.

Replacing Drive Cord

Remove the chassis from the cabinet.

Remove the old drive cord, pulleys, washer and indicator.

Turn the drive drum until the slot in the rim is in the position shown in Fig. 9.

Insert one end of the drive cord in the slot and wind the cord around the drum in a clockwise direction for about two-thirds of a turn, or until it reaches the top of the drum.

Now, before putting the right pulley (from front) in place, bring the cord around the pulley from back to front so that the cord is adjacent to the celluloid dial scale; then place the pulley in position.

Extend the cord over to the left and bring it around the other pulley from front to back before placing

this pulley. Put the small brass washer on the upper shaft of the pulley and place the pulley in position as shown in Fig. 9.

Bring the cord over to the drive drum and wind it around the drum in a clockwise direction, keeping it behind the cord already on the drum.

Push the pulley tension spring in toward the drive drum so as to provide slack in the cord while the free end is being inserted into the slot in the rim.

Now mesh the condenser plates completely. Replace the celluloid indicator on the dial strip and attach it to the drive cord as shown in Fig. 9. The line on the indicator should cover the 530 KC mark on the dial scale.

Caution—When attaching the indicator to the drive cord, do not pinch the center clamp too tightly on the cord or the cord will be cut. After the clamp is pinched slightly a small amount of shellac on it will hold the cord securely.

This receiver is designed to operate from a 6 volt storage battery and uses a synchronous vibrator and a transformer to provide the required high voltage. The tubes used are of the 7 volt type. They are connected in a series-parallel arrangement across the 6 volt battery.

Two bands are covered with a tuning range in each band as shown in the specifications above. Two band coverage is accomplished by means of two sets of antenna and oscillator coils and a single section double throw switch.

Referring to the schematic circuit diagram, Fig. 2, T1 and T2 are the antenna transformer and oscillator coil assemblies. The standard wave and short wave coils are indicated by the letters B and D respectively.

The band switch completes connections to the antenna transformer secondary and oscillator grid and plate coils in use. It also short circuits the antenna

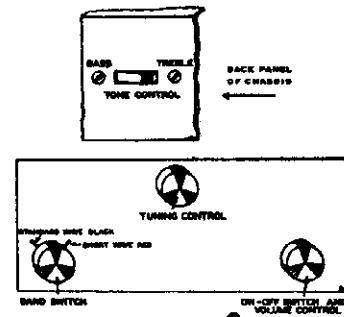


Fig. 1—Location of Controls

transformer B Range secondary and oscillator B Range grid coil when it is in the D Range position.

The antenna transformer with tuned secondary feeds into a type 1C6 pentagrid converter tube which functions as the oscillator and 1st detector.

The oscillator potential on the oscillator control grid of this tube modulates the electron stream from the cathode in such a manner as to impress on it the oscillator frequency which is always 456 KC above the frequency to which the R.F. amplifier is tuned. The electron stream is also modulated at the signal frequency by the detector control grid. As a result of the beating of the two frequencies, the intermediate or beat frequency of 456 KC. is present in the plate circuit of this tube.

Two stages of I.F. amplification are employed using type 34 tubes. The primaries and secondaries of the first and second I.F. transformers and the primary of the 3rd I.F. transformer are tuned by small trimmer condensers.

A type 1B5 duo-diode triode tube functions as the second detector and a one stage audio amplifier. AVC voltage is applied through isolating resistors to the control grid circuits of the 1st detector and 1st I.F. tubes. The audio voltage developed across volume control resistor R11 is applied through the movable arm to the control grid of the 1B5 tube.

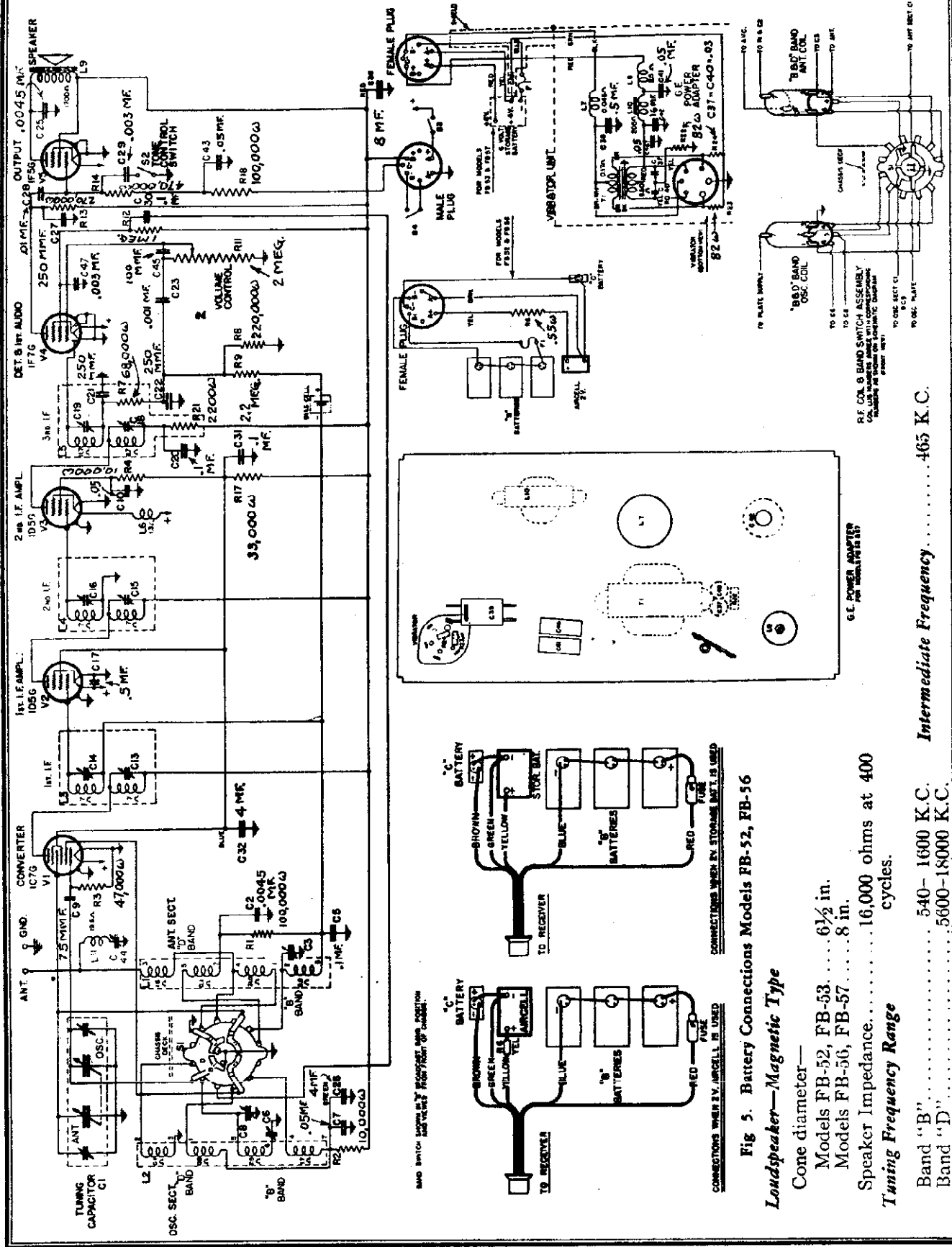
Resistance coupling is used between the 1st audio stage and the output stage which employs a 1F4 output pentode tube. A P.M. dynamic reproducer is employed.

The primary of transformer L7 serves as an audio choke in the filament circuit. The secondary of this transformer is in the control grid circuit of the 1F4, and acts as a h.v. bucking winding.

Filament Wiring—Fig. 6 is an abridged wiring diagram which shows the tube filament wiring system and also indicates the points at which the no-signal bias voltages are obtained.

GENERAL ELECTRIC CO.

MODELS FB-52, FB-53
FB-56, FB-57
Schematic, Batt. Conn.
Power Adapter



MODELS FB-52, FB-53
 FB-56, FB-57
 Voltage, Chassis

GENERAL ELECTRIC CO.

AVERAGE SOCKET VOLTAGES

Tube	Plate to Ground Volts D.C.	Screen Grid to Ground Volts D.C.	Filament Volts D.C.	D.C. Plate Current M.A.
1C7G Oscillator	134	...	2.0	2.8
1C7G Converter	136	46	2.0	1.3
1D5G 1st I.F. Amp.	136	46	2.0	2.3
1D5G 2nd I.F. Amp.	128	46	2.0	3.5
1F7G Det., AVC, Audio Amp.	40	15	2.0	0.4
1F5G Output	121	135	2.0	7.6

Measured with normal battery voltages using a 1000 ohm per volt meter—dial pointer at 540 K.C. with no signal input—volume control at minimum.

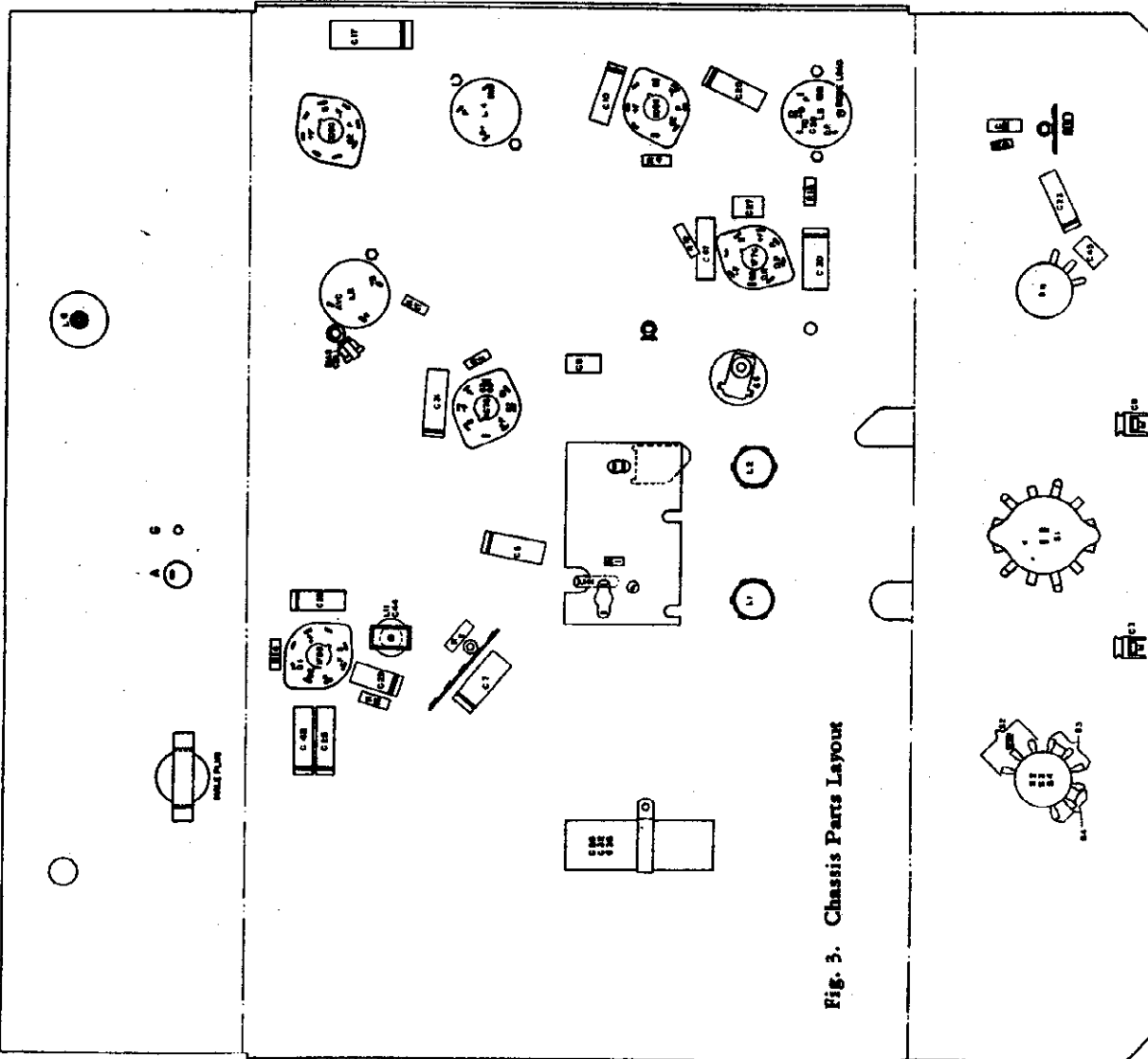


Fig. 3. Chassis Parts Layout

GENERAL ELECTRIC CO.

MODELS FB-52, FB-53
FB-56, FB-57
Trimmers, Alignment

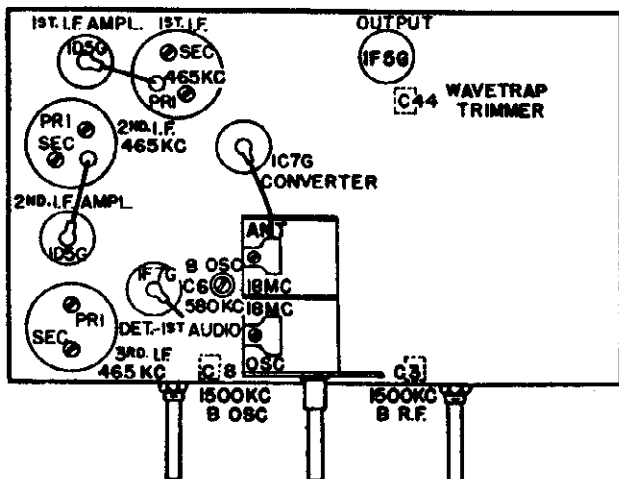


Fig. 1. Chassis Layout and Trimmer Locations

A 1-volt bias cell is used to supply initial bias for the 1C7G converter and the 1D5G 1st I.F. tubes which are controlled by the AVC. Do not attempt to measure the voltage of the cell with any device which draws current. The cell will last indefinitely under normal conditions. If the receiver oscillator stops functioning on the low frequency end of the "D" band, try substituting a new bias cell.

ALIGNMENT PROCEDURE

On the "D" Band (5600 to 18,000 K.C.) the oscillator operates on the low frequency side of the incoming signal; therefore, adjust the trimmer until the second oscillator peak is reached as the trimmer is increased in capacity. When the correct adjustment is made, it will be possible to tune the image of any signal on the "D" band 970 K.C. higher than the signal if the input is sufficiently high. Example: The image of 15 M.C. should be heard at 15,970 K.C.

The alignment procedure is given in table form on page 3. The "Dummy Antenna" is the capacitor or capacitor and resistor used in series with the signal generator antenna lead.

I.F. ALIGNMENT WITH OSCILLOSCOPE

Band Switch Setting	Input Frequency	Point of Input	Dummy Ant.	Trimmer	Remarks
1 Band "B"	465 K.C. Sweep	1st I.F. Grid	.05 MFD or Larger	3rd I.F. Sec. (C-19) 3rd I.F. Pri. (C-18)	Gang condenser plates closed—connect audio input of oscilloscope to ground and to the diode load terminal of the 3rd I.F. transformer—Adjust trimmers in order mentioned for a single symmetrical curve of maximum amplitude.
2 Band "B"	465 K.C. Sweep	1st I.F. Grid	.05 MFD or Larger	2nd I.F. Sec. (C-16) 2nd I.F. Pri. (C-15)	
3 Band "B"	465 K.C. Sweep	Converter Grid	.05 MFD or Larger	1st I.F. Sec. (C-14) 1st I.F. Pri. (C-13)	
4 Band "B"	465 K.C. Sweep	Antenna Post	250 MMF 400 ohms	Wave Trap Trimmer	Adjust trimmer for minimum amplitude.

I.F. ALIGNMENT WITH OUTPUT METER

1 Band "B"	465 K.C. with modulation	1st I.F. Grid	.05 MFD or Larger	3rd I.F. Sec. (C-19) 3rd I.F. Pri. (C-18)	Adjust trimmer for maximum output
2 Band "B"	465 K.C. with modulation	1st I.F. Grid	.05 MFD or Larger	2nd I.F. Sec. (C-16) 2nd I.F. Pri. (C-15)	
3 Band "B"	465 K.C. with modulation	Converter Grid	.05 MFD or Larger	1st I.F. Sec. (C-14) 1st I.F. Pri. (C-13)	
4 Band "B"	465 with modulation	Antenna Post	250 MMF 400 ohms	Wave Trap Trimmer	Adjust trimmer for minimum output.

R.F. ALIGNMENT WITH OUTPUT METER

1 Band "B"					Close gang plates—adjust pointer to first line at left end of tuning scale (530 K.C.).
2 Band "D"	18 MC with modulation	Antenna Post	250 MMF 400 ohms	Oscillator (18 MC) Antenna (18 MC) See Trimmer Location View	Connect output meter across Loudspeaker—tone control on "Bass" position—set osc. trimmer. While rocking the gang cond., adjust the antenna trimmer for maximum output.
3 Band "B"	1500 K.C. with modulation	Antenna Post	250 MMF 400 ohms	Osc. (C-8) Ant. (C-3)	Peak trimmers for maximum output with a low input signal.
4 Band "B"	580 K.C. with modulation	Antenna Post	250 MMF 400 ohms	Osc. Padder (C-6)	Adjust padder for a maximum output meter indication in vicinity of 580 K.C. while rocking the gang condenser.
5 Band "B"	1500 K.C. with modulation.	Antenna Post	250 MMF 400 ohms	Osc. (C-8)	As in operation No. 3.

**MODELS FB-52, FB-53
FB-56, FB-57**
**Drive Cord Data
Notes, Parts**

GENERAL ELECTRIC CO.

turn, provides "B" and "C" voltages. If desired, the 2-volt receiver may be converted to G.E. Power Adapter, Model BA-407, by connecting a 2-volt receiver to the storage battery, first clip in the lead to the filament accidentally. Also, be sure to separate the two clips by connecting them to opposite ends of the battery connector strap, as shown on the Power Adapter label. This avoids establishing a common path for the filament and Power Adapter supply which would result in objectionable vibrator noise. If it is difficult to snap the Power Adapter into position on the chassis, apply a little vaseline to the rubber mounting feet.

is pinched slightly, a small amount of shellac on it will hold the cord securely.

Power Supply

The chassis used in these receivers are identical except for the type of power supply employed. The 2-volt Models FB-52 and FB-56 are operated by "A", "B", and "C" batteries which are operated by a receiver by a battery cable, Stock No. BK-327. Models FB-53 and FB-57 are operated entirely by a 6-volt storage battery. Call (2 volts) of which sufficient filament current is remaining two sets (4 volts) supply the G.E. Power Adapter which, in

REPLACEMENT PARTS LIST

Stock No.	Description	List Price	Stock No.	Description	List Price
RD-400	DRUM—Condenser drive drum	\$0.40	RD-400	DRUM—Condenser drive drum	\$0.40
RD-404	DIAL—Dial scale	.25	RD-404	DIAL—Dial scale	.25
RD-405	DRIVE—Condenser reduction drive	1.00	RD-405	DRIVE—Condenser reduction drive	1.00
RD-406	FOOT—Mounting foot assembly	.30	RD-406	FOOT—Mounting foot assembly	.30
RD-407	FUSE—1/4 Amp fuse (Used on FB-52 and FB-53 and FB-57 only) (Pg. of 5)	1.20	RD-407	FUSE—1/4 Amp fuse (Used on FB-52 and FB-53 and FB-57 only) (Pg. of 5)	1.20
RD-408	GRID CAP—Control grid cap (Pg. of 5)	1.00	RD-408	GRID CAP—Control grid cap (Pg. of 5)	1.00
RD-409	GRID CAP—Control grid cap (Pg. of 5)	.10	RD-409	GRID CAP—Control grid cap (Pg. of 5)	.10
RD-410	GRID CAP—Control grid cap (Pg. of 5)	.50	RD-410	GRID CAP—Control grid cap (Pg. of 5)	.50
RD-411	GRID CAP—Control grid cap (Pg. of 5)	.50	RD-411	GRID CAP—Control grid cap (Pg. of 5)	.50
RD-412	GRID CAP—Control grid cap (Pg. of 5)	.50	RD-412	GRID CAP—Control grid cap (Pg. of 5)	.50
RD-413	GRID CAP—Control grid cap (Pg. of 5)	.50	RD-413	GRID CAP—Control grid cap (Pg. of 5)	.50
RD-414	GRID CAP—Control grid cap (Pg. of 5)	.50	RD-414	GRID CAP—Control grid cap (Pg. of 5)	.50
RD-415	GRID CAP—Control grid cap (Pg. of 5)	.50	RD-415	GRID CAP—Control grid cap (Pg. of 5)	.50
RD-416	GRID CAP—Control grid cap (Pg. of 5)	.50	RD-416	GRID CAP—Control grid cap (Pg. of 5)	.50
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RD-418	GRID CAP—Control grid cap (Pg. of 5)	.50	RD-418	GRID CAP—Control grid cap (Pg. of 5)	.50
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RD-420	GRID CAP—Control grid cap (Pg. of 5)	.50	RD-420	GRID CAP—Control grid cap (Pg. of 5)	.50
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RD-425	GRID CAP—Control grid cap (Pg. of 5)	.50	RD-425	GRID CAP—Control grid cap (Pg. of 5)	.50
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RD-499	GRID CAP—Control grid cap (Pg. of 5)	.50	RD-499	GRID CAP—Control grid cap (Pg. of 5)	.50
RD-500	GRID CAP—Control grid cap (Pg. of 5)	.50	RD-500	GRID CAP—Control grid cap (Pg. of 5)	.50

* Used on previous receivers.
† Prices subject to change without notice.

- Takes**
 Converter and Oscillator.....1C7G Pentagrid Converter
 1st I.P. Amplifier.....1D4G Super Control Amplifier
 2nd I.P. Amplifier.....1D5G Super Control Amplifier
 Detector, AVC and Audio Amplifier.....1F7G Duplex Diode Pentode
 Output.....1F6G Power Amplifier Pentode

REPLACING DRIVE CORD

Remove the old drive cord, pulleys, washer and indicator.
 Turn the drive drum until the slot in the rim is in the position shown in Fig. 4.
 Insert one end of the drive cord in the slot and wind the cord around the drum in a clockwise direction for about two-thirds of a turn, or until it reaches the top of the drum.
 Now, before putting the right pulley (from front) in place, bring the cord around the pulley from behind to front so that the pulley is behind the indicator drum.
 Feed the cord over to the left and bring it around the other pulley from front to back before placing this pulley. Put the small brass washer on the upper shaft of the pulley and place the pulley in position as shown in Fig. 4.
 Bring the cord over to the drive drum and wind it around the drum in a clockwise direction, keeping it behind the drum already on the drum.
 Push the pulley tension spring in toward the drive drum so as to provide slack in the cord while the free end is being inserted into the slot in the rim.
 Now mesh the condenser plates completely. Reattach the drive cord as shown in Fig. 4. The indicator drum should cover the 530 K.C. mark on the dial scale.
CAUTION—When attaching the indicator to the drive cord, do not punch the center clamp too tightly on the cord or the cord will be cut. After the clamp

- ELECTRICAL SPECIFICATIONS**
Tuning Frequency Range
 Band "B".....540-1900 K.C.
 Band "D".....5600-18000 K.C.
Intermediate Frequency.....465 K.C.
Electrical Power Output
 Undistorted.....0.35 Watts
 Maximum.....0.85 Watts
Tone Control.....2-point control
Batteries Required
 Models FB-52, FB-56
 1—2-volt Arcell Battery (Eveready A-400)
 or
 1—2-volt Storage Battery
 3—45-volt "B" Batteries (Eveready No. 388,
 No. 485, No. 486 or equivalent)
 1—4½-volt "C" Battery (Eveready No. 771 or
 equivalent)
 Models FB-53, FB-57
 1—6-volt storage battery.

- Current Consumption**
 Models FB-52, FB-56
 "A" Battery.....0.42 Amps at 2 Volts
 "B" Battery.....30 M.A. at 135 Volts
 Models FB-53, FB-57
 "A" Battery.....6 Volts
 Filament (2 volts).....0.42 Amps.
 G.E. Power Adapter.....1.7 Amps.
 (4 volts)

- Loudspeaker—Magnetic Type**
 Cone diameter—
 Models FB-52, FB-53.....6¼ in.
 Models FB-56, FB-57.....8 in.
 Speaker Impedance.....10,000 ohms at 400
 cycles.

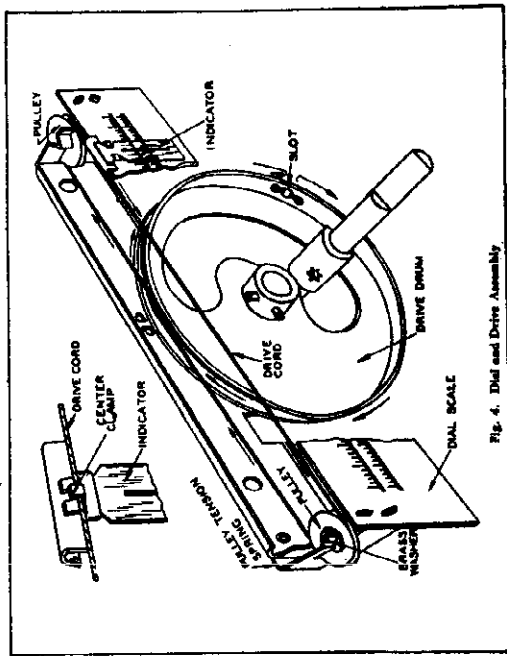
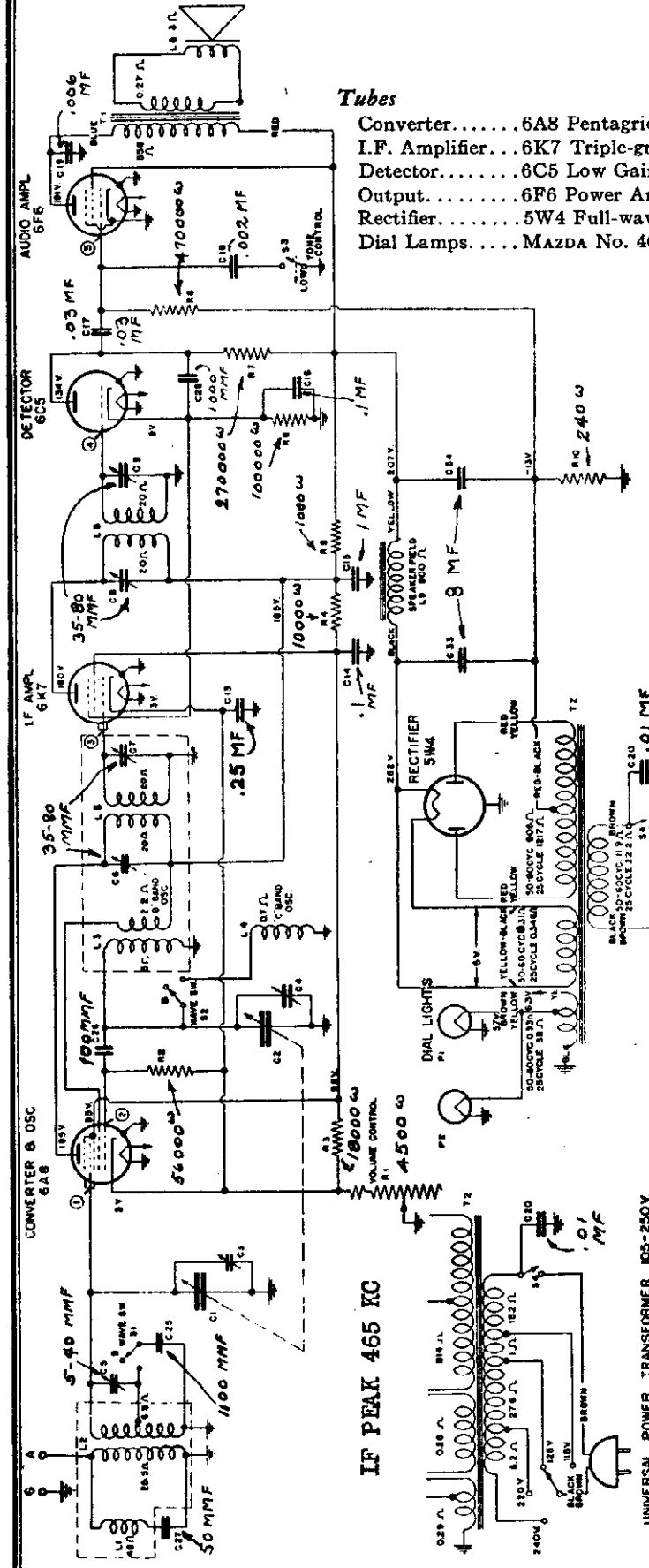


Fig. 4. Dial and Drive Assembly

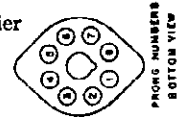
GENERAL ELECTRIC CO.

MODEL F-53
Schematic, Resistance
Transformer Data



Tubes

- Converter.....6A8 Pentagrid Converter
- I.F. Amplifier...6K7 Triple-grid, Super-control Amplifier
- Detector.....6C5 Low Gain Triode
- Output.....6F6 Power Amplifier Pentode
- Rectifier.....5W4 Full-wave Rectifier
- Dial Lamps.....MAZDA No. 40 (2)



Conditions of Test:
Wave switch on "B" band -- Power switch Off

APPROXIMATE RESISTANCE MEASUREMENTS:

RESIST. TO GND.	TUBE	SOCKET
1. 7 ohms	Conv. Grid	Cap Prong 5
2. 60,000 "	Osc. Grid	Cap Prong 5
3. 20 "	I-f Grid	Prong 5
4. 20 "	Det. Grid	Prong 5
5. 470,000 "	O.P. Grid	Prong 5

All voltages to ground unless otherwise specified
 " " measured with Ant. and Gnd. Terminals shorted
 " " " " Dial Pointer at 1000 kc
 " " " " volume at maximum

IF PEAK 465 KC

UNIVERSAL POWER TRANSFORMER 105-250V.

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Watts)
A	115	60	50
C	115	25-60	55
V	105-130 and 200-250	40-60	55

Tuning Frequency Range
 Band "B".....540-1800 kc.
 Band "C".....1800-4000 kc.
 Electrical Power Output
 Undistorted.....1.0
 Maximum.....3.0

Loud-speaker—Electrodynamic
 Cone Diameter: 6 1/2 in.
 Cone Coil Impedance: 3 ohms at 400 cycles

MODEL F-53
Socket, Trimmers
Alignment, Parts

GENERAL ELECTRIC CO.

The combination of the two signals produces the intermediate frequency of 465 kc. This particular frequency is chosen to reduce image response and improve short-wave performance. The intermediate frequency amplifier consists of a 6E7 tube and two transformers, both of which have tuned primaries and secondary. Volume is controlled by the 450-ohm variable resistor, R-1, which varies the bias applied to the control grids of the 9A8 and 6E7 tubes.

The output of the I.F. amplifier is applied to the grid of the 6C5 detector which is properly biased for this service by the .1 megohm cathode resistor, R-6.

The output of the 6C5 detector is resistance coupled to the grid of the 6F6 power amplifier pentode. The plate circuit of the 6F6 is suitably matched to the loud-speaker by means of a step-down output transformer.

The tone control circuit consists of a .002 mfd. capacitor, connected in series with a two-point grounding switch, S-3, in the grid circuit of the 6F6 power pentode. When it is desired to reduce the high frequency output of the receiver, the switch, S-3, is turned to its counter-clockwise grounding position.

This and grid voltages for all tubes are supplied by the power supply system employing a 37% full-wave rectifier tube which, together with a suitable network of resistors and capacitors, supplied the required voltages and filtering action.

Trimmer adjustment after aligning the short-wave band.

(4) *Short-wave Band (1600-4000 Kc.)*

Turn the band switch to its counter-clockwise position. Set the test oscillator at 4000 kc. and tune the receiver to resonate at this frequency. No trimmer is provided for short-wave oscillator alignment. To perform the Ant. short-wave adjustment, rock the tuning condenser back and forth through resonance while adjusting the short-wave rate, trimmer, C-4, for maximum output indication on the tuning meter. It may now be necessary to readjust the broadcast band Ant. trimmer as indicated above.

Alignment of the receiver is now complete.

DESCRIPTION OF ELECTRICAL CIRCUIT

The signal from the antenna is applied to the control grid of the 6A8 tube through the R.F. transformer, the secondary of which is tuned to the incoming signal by the rear section of the main tuning condenser. In the 6A8 tube the incoming signal is combined with the local oscillator signal which is 465 kc. higher in frequency. The local signal is generated by the oscillator section of this tube, and the proper frequency difference is maintained throughout the tuning range by the front section of the tuning condenser in conjunction with the oscillator coil. The special-cut rotor of the front condenser section permits dispensing with the usual peaking capacitor.

REPLACEMENT PARTS MODEL F-53

(Listed on genuine factory-made parts which may be purchased from authorized dealers)

Stock No.	Description	List Price	Stock No.	Description	List Price
*RB-008	BOARD—Terminal Board (two legs)	\$0.10	*RQ-101	RESISTOR—45,000 ohms, 1/4 W. Carbon	\$0.80
*RB-009	BOARD—Terminal Board (two legs)	.10	*RQ-102	RESISTOR—100,000 ohms, 1/4 W. Carbon	.70
*RC-013	CAPACITOR—.002 Mfd., 200 V. paper	.35	*RQ-117	RESISTOR—570,000 ohms, 1/4 W. Carbon	.70
*RC-027	CAPACITOR—.005 Mfd., 1000 V. paper	.35	*RQ-123	RESISTOR—470,000 ohms, 1/4 W. Carbon	.70
*RC-089	CAPACITOR—.01 Mfd., 600 V. paper	.35	*RQ-444	RESISTOR—240 ohms, 1/4 W. Carbon	.15
*RC-088	CAPACITOR—.03 Mfd., 400 V. paper	.35	*RQ-459	RESISTOR—1000 ohms, 1/4 W. Carbon	.15
*RC-122	CAPACITOR—1 Mfd., 200 V. paper	.35	*RQ-483	RESISTOR—10,000 ohms, 1/4 W. Carbon	.15
*RC-126	CAPACITOR—2 Mfd., 200 V. paper	.35	*RQ-489	RESISTOR—10,000 ohms, 1/4 W. Carbon	.15
*RC-210	CAPACITOR—30 Mfd., Mica (C-27)	.35	*RS-200	SOCKET—8-pin tube socket (Fig. of 5)	.75
*RC-233	CAPACITOR—100 Mfd., Mica (C-28)	.35	*RS-204	SOCKET—8-pin tube socket (Fig. of 5)	.75
*RC-338	CAPACITOR—1100 Mfd., Mica (C-29)	.35	*RS-233	SWITCH—Push lamp socket (S-1)	.40
*RC-564	CAPACITOR—8 Mfd., 250 V. 8 Mfd., 350 V. electrolytic (C-34)	1.25	*RT-229	TRANSFORMER—1st I.F. transformer (Company (L-1, L-2, C-4, C-7)	1.80
*RC-681	CONDENSER—440 Mfd., mica trimmer (C-3)	.30	*RT-230	TRANSFORMER—2nd I.F. transformer (Company (L-1, L-2, C-4, C-7)	1.50
*RC-714	CONDENSER—2 section tuning condenser with trimmers (C-1, C-2, C-3, C-4)	8.00	*RT-057	TRANSFORMER—Power transformer, 60 cycles, 110-120 volt (T-2)	3.85
RC-886	CABLE—Dial cable assembly (complete)	1.5	*RT-058	TRANSFORMER—Power transformer, 60 cycles, 110-120 volt (T-2)	7.50
*RC-990	CORP.—Power Cord	.65	*RT-059	TRANSFORMER—Universal power transformer	8.00
*RC-944	CUSHION—Gaug mtg. cushion	.10	*RW-101	WASHER—Felt washer for knob (Fig. of former)	4.0
RD-049	DIAL—Dial scale	.60	*RV-019	WASHER—Mounting washers and screws	4.15
RD-050	DIAL—Dial scale	.60	*RV-019	WASHER—Mounting washers and screws	4.15
*RG-001	GRID CLIP—Grid drive drum (Fig. of 1)	1.10	*RV-019	WASHER—Mounting washers and screws	4.15
*RL-024	COIL—Antenna coil (L-1, L-2)	1.00	*RV-019	WASHER—Mounting washers and screws	4.15
*RL-284	COIL—Osc. coil Band "C" (L-2)	.40	*RV-019	WASHER—Mounting washers and screws	4.15
*RL-919	LAMP—4.5 volt dial lamp (P-1, P-2) (9Mf. of 10)	1.25	*RV-019	WASHER—Mounting washers and screws	4.15
RP-071	POINTER—Dial scale pointer (Fig. of 8)	.25	*RV-019	WASHER—Mounting washers and screws	4.15

* Used on previous models.

(Prices subject to change without notice)

(excess clockwise position). Tune the receiver to a point where no signal comes in and short-circuit the antenna and ground leads.

Connect the test oscillator output between the chassis and the control grid of the 6A8 tube. Connect the output wiper across the cone coil of the speaker. Set the test oscillator to 465 kc. and adjust the output until a small deflection is observed in the output meter.

The four I.F. trimmers, see Fig. 2, are adjusted in the following sequence:

1. Secondary trimmer on second I.F. transformer.
 2. Primary trimmer on second I.F. transformer.
 3. Secondary trimmer on first I.F. transformer.
 4. Primary trimmer on first I.F. transformer.
- Throughout all adjustments the output should be maintained at a low level by decreasing the test oscillator output as the various stages are brought in line. After these adjustments have been made, the same procedure should be repeated as a final check. This I.F. alignment will then be complete.

(2) *I.F. Wave Trap*

No adjustable trimmer is provided for the I.F. trap adjustment in this receiver. The capacitor C-27, in conjunction with the inductance, L-1, automatically provides rejection of incoming I.F. signal.

(3) *R.F. Alignment*

The Ant. and oscillator trimmers are aligned at 1500 kc. First of all, check the position of the dial pointer. To do this, rotate the gang condenser to the maximum capacity position, i.e., plates fully meshed. While in this position, align the pointer with the last black line on the scale by loosening the dial drum set screws and rotating the drum on the gang shaft. Remove the short-circuit from the antenna and ground terminals and connect the test oscillator to raise through a dummy antenna consisting of a 400-ohm resistor in series with a 250-ohm capacitor. Connect the output indicator across the speaker cone coil.

(4) *Broadcast Band—(350-1500 Kc.)*

With the band switch in the clockwise position, set the tuning indicator to 1500 kc. Set the test oscillator at 1500 kc. and adjust the broadcast band oscillator trimmer, C-4 for maximum output. Next, set the Ant. trimmer, C-3, for maximum output, taking care that the output from the test oscillator is not high enough to overload any part of the set. No peaking adjustment is required.

To complete the broadcast band line-up, repeat the Ant.

ALIGNMENT PROCEDURE

Before making any adjustments to the R.F. circuits, it is wise to determine the correctness of the existing alignment. This may be done by applying a signal from the test oscillator to the receiver and inserting a tuning wand into the antenna coil. The "tuning wand" consists of a brass rod having a brass cylinder attached to one end, and a small cone of finely divided iron compressed into the opposite end. By inserting the brass cylinder end into the antenna frequency inductance, the iron filings in the coil bring the inductance to its maximum value. If the circuit is in exact alignment the test frequency of the tuning wand in the coil will result in a decrease in output. When an increase in signal will result with the iron-filled end of the wand at the 1500 kc. point on the 4.5-mc. point, a decrease in resonant frequency of that circuit by increasing the antenna trimmer capacity is indicated. When an increase in signal is obtained with the brass cylinder, a decrease in antenna trimmer capacity is indicated.

Changes Indicated by Wand

Wand	Signal	Trimmer Adjustment
Brass cylinder	Increase	Increase
Iron filings	Decrease	Decrease
Brass cylinder	Increase	Increase capacity
Iron filings	Decrease	Increase capacity
Iron filings	Increase	Increase capacity

ALIGNMENT FREQUENCIES

- I.F. Broadcast 1500 Kc.
465 Kc. Short-wave 4000 Kc.
1. A modulated test oscillator capable of producing the above alignment frequencies.
 2. An output indicator, such as a high-resistance voltmeter with a maximum scale reading of 3 to 5 volts, or a neon lamp indicator.
 3. An alignment tool consisting of an insulating shaft with a small screwdriver blade.
- The location of all alignment trimmer capacitors are illustrated in Fig. 2.

(1) *R.F. Alignment*

Set the frequency band switch of the receiver to the broadcast position and turn the volume control to maximum

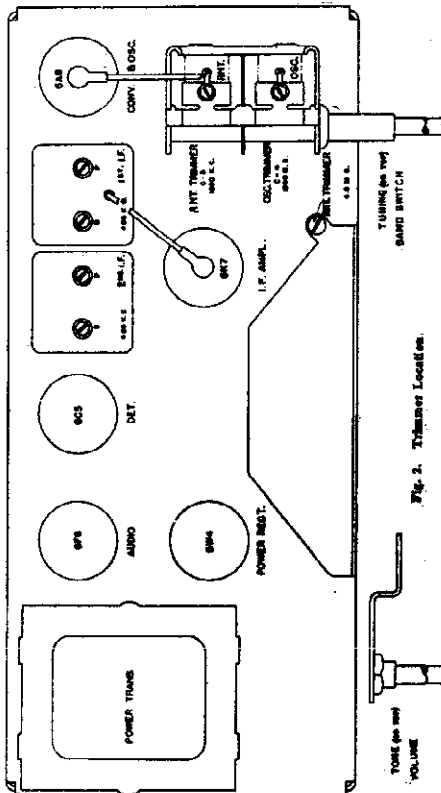
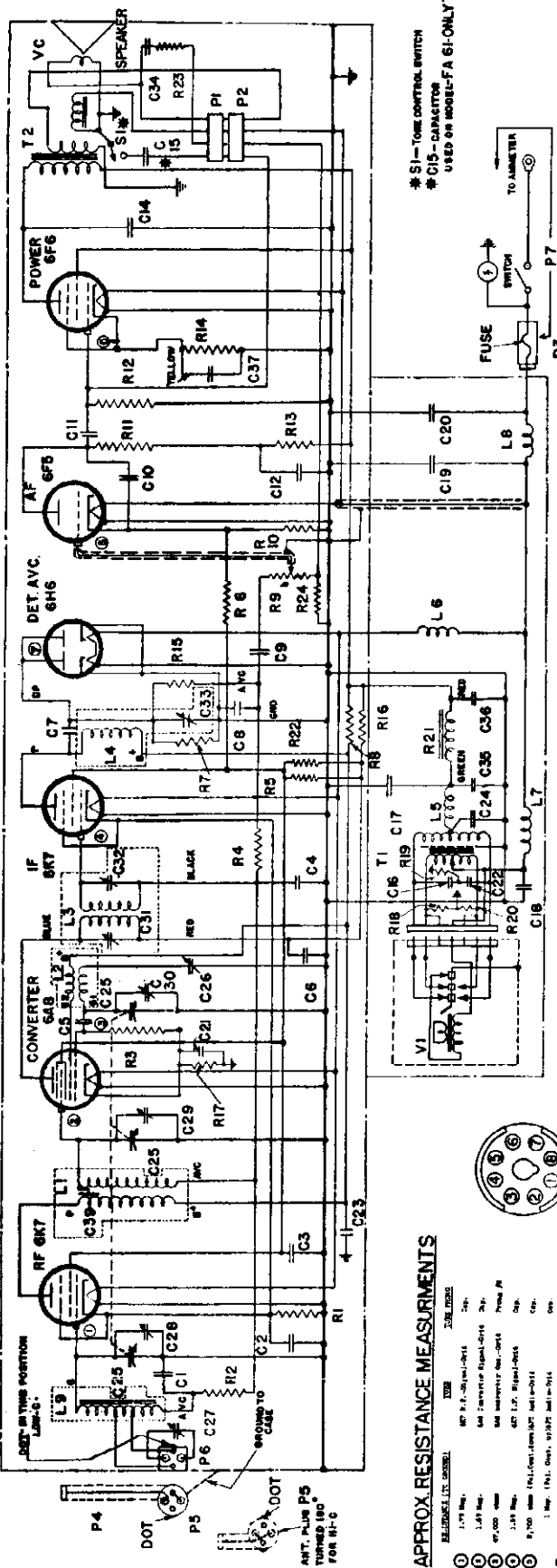


Fig. 2. Trimmer Location.

GENERAL ELECTRIC CO.

MODELS FA-60, FA-61
Schematic, Socket
Trimmers, Resistance



IF PEAK 175 KC.

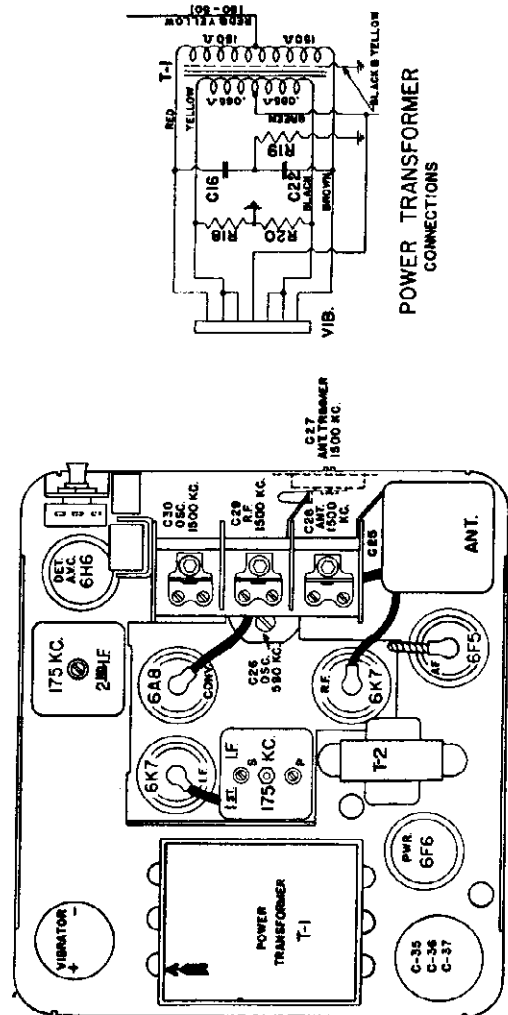


Fig. 1. Chassis Layout and Trimmer Locations

APPROX. RESISTANCE MEASUREMENTS

RESISTOR	VALUE	TYPE	MEASUREMENTS
R1	1.5K	500	1.5K
R2	1.5K	500	1.5K
R3	1.5K	500	1.5K
R4	1.5K	500	1.5K
R5	1.5K	500	1.5K
R6	1.5K	500	1.5K
R7	1.5K	500	1.5K
R8	1.5K	500	1.5K
R9	1.5K	500	1.5K
R10	1.5K	500	1.5K
R11	1.5K	500	1.5K
R12	1.5K	500	1.5K
R13	1.5K	500	1.5K
R14	1.5K	500	1.5K
R15	1.5K	500	1.5K
R16	1.5K	500	1.5K
R17	1.5K	500	1.5K
R18	1.5K	500	1.5K
R19	1.5K	500	1.5K
R20	1.5K	500	1.5K
R21	1.5K	500	1.5K
R22	1.5K	500	1.5K
R23	1.5K	500	1.5K
R24	1.5K	500	1.5K
R25	1.5K	500	1.5K
R26	1.5K	500	1.5K
R27	1.5K	500	1.5K
R28	1.5K	500	1.5K
R29	1.5K	500	1.5K
R30	1.5K	500	1.5K
R31	1.5K	500	1.5K
R32	1.5K	500	1.5K
R33	1.5K	500	1.5K
R34	1.5K	500	1.5K
R35	1.5K	500	1.5K
R36	1.5K	500	1.5K
R37	1.5K	500	1.5K
R38	1.5K	500	1.5K
R39	1.5K	500	1.5K
R40	1.5K	500	1.5K
R41	1.5K	500	1.5K
R42	1.5K	500	1.5K
R43	1.5K	500	1.5K
R44	1.5K	500	1.5K
R45	1.5K	500	1.5K
R46	1.5K	500	1.5K
R47	1.5K	500	1.5K
R48	1.5K	500	1.5K
R49	1.5K	500	1.5K
R50	1.5K	500	1.5K

COMPONENT	VALUE	TYPE	MEASUREMENTS
C1	100	500	100
C2	100	500	100
C3	100	500	100
C4	100	500	100
C5	100	500	100
C6	100	500	100
C7	100	500	100
C8	100	500	100
C9	100	500	100
C10	100	500	100
C11	100	500	100
C12	100	500	100
C13	100	500	100
C14	100	500	100
C15	100	500	100
C16	100	500	100
C17	100	500	100
C18	100	500	100
C19	100	500	100
C20	100	500	100
C21	100	500	100
C22	100	500	100
C23	100	500	100
C24	100	500	100
C25	100	500	100
C26	100	500	100
C27	100	500	100
C28	100	500	100
C29	100	500	100
C30	100	500	100
C31	100	500	100
C32	100	500	100
C33	100	500	100
C34	100	500	100
C35	100	500	100
C36	100	500	100
C37	100	500	100
L1	100	500	100
L2	100	500	100
L3	100	500	100
L4	100	500	100
L5	100	500	100
L6	100	500	100
L7	100	500	100
L8	100	500	100
T1	100	500	100
T2	100	500	100
V1	100	500	100
V2	100	500	100
V3	100	500	100
V4	100	500	100
V5	100	500	100
V6	100	500	100
V7	100	500	100
V8	100	500	100
V9	100	500	100
V10	100	500	100
V11	100	500	100
V12	100	500	100
V13	100	500	100
V14	100	500	100
V15	100	500	100
V16	100	500	100
V17	100	500	100
V18	100	500	100
V19	100	500	100
V20	100	500	100
V21	100	500	100
V22	100	500	100
V23	100	500	100
V24	100	500	100
V25	100	500	100
V26	100	500	100
V27	100	500	100
V28	100	500	100
V29	100	500	100
V30	100	500	100
V31	100	500	100
V32	100	500	100
V33	100	500	100
V34	100	500	100
V35	100	500	100
V36	100	500	100
V37	100	500	100
V38	100	500	100
V39	100	500	100
V40	100	500	100
V41	100	500	100
V42	100	500	100
V43	100	500	100
V44	100	500	100
V45	100	500	100
V46	100	500	100
V47	100	500	100
V48	100	500	100
V49	100	500	100
V50	100	500	100

Fig. 2. Schematic Circuit Diagram

MODELS FA-60, FA-61
Chassis and Spkr.
Layouts

GENERAL ELECTRIC CO.

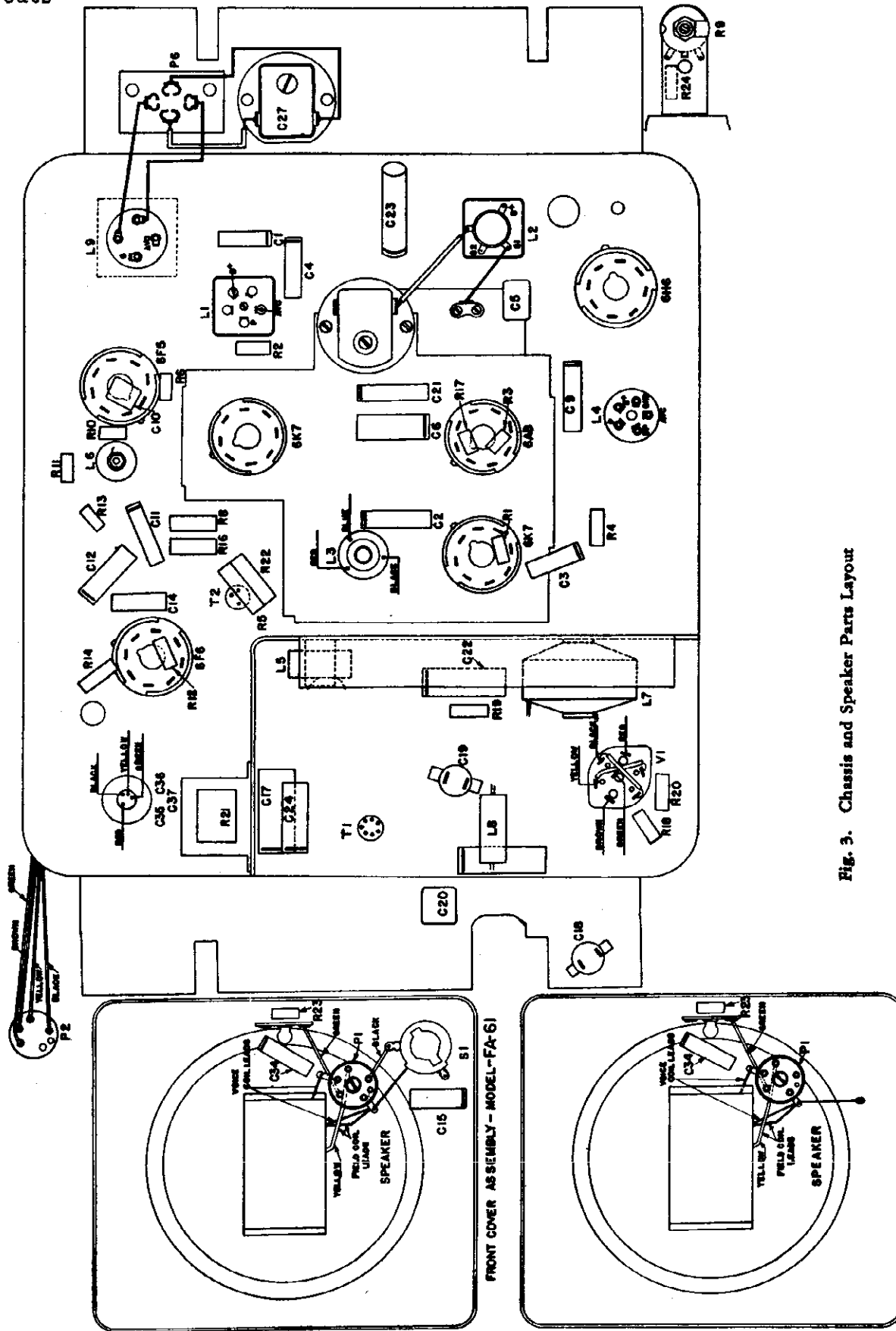


Fig. 3. Chassis and Speaker Parts Layout

FRONT COVER ASSEMBLY - MODEL-FA-61

FRONT COVER ASSEMBLY - MODEL-FA-60

GENERAL ELECTRIC CO.

MODELS FA-60, FA-61
Voltage, Installation

ELECTRICAL SPECIFICATIONS

Tuning Frequency Range..... 540-1600 kc

Intermediate Frequency..... 175 kc

Electrical Power Output

Undistorted..... 3 watts

Maximum..... 4 watts

Tone Control

Model FA-61..... 2-point control

Current Consumption

Storage Battery..... 6.3 volts—7.0 amps.

Loudspeaker—Electrodynamic

Speaker Diameter..... 6½ inches

Cone Coil Impedance..... 5.5 ohms at 400 cycles

AVERAGE SOCKET VOLTAGES

Tube	Plate to Ground Volts DC	Screen Grid to Ground Volts DC	Cathode to Ground Volts DC	Heater Volts DC	Cathode Current M.A.
6K7 R.F.	200	97	3.4	6.3	5.8
Oscillator	200	..	..	..	..
6A8 Converter	210	97	4	6.3	9.5
6K7 I.F.	200	97	3.4	6.3	5.8
6F5 1st A.F.	147	..	1.5	6.3	0.3
6F6 Output	231	251	15.6	6.3	37

Filter Input Voltage—285
Filter Output Voltage—251

Total Plate Current 63 M.A.

Storage Battery 6.4 volts—no signal input—1000 ohms per volt meter—dial pointer at 54.

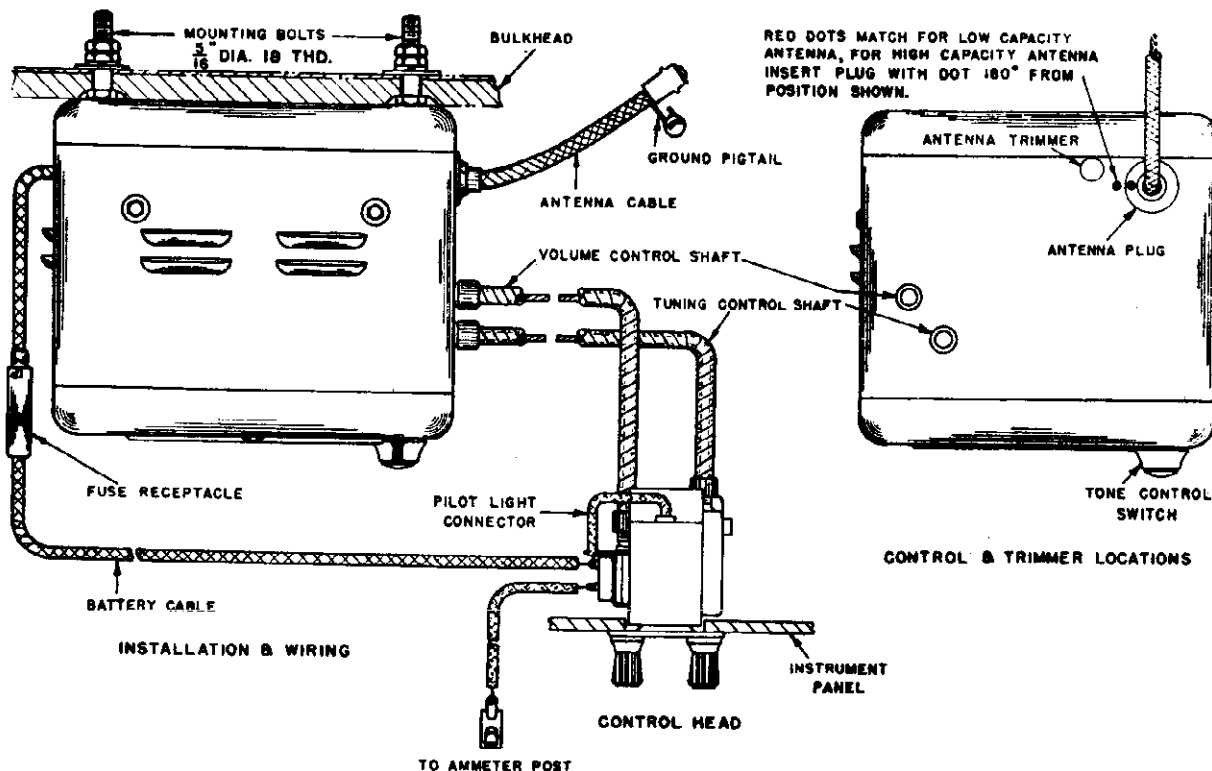


Fig. 1A. Installation Diagram

MODELS FA-60, FA-61
Alignment, Parts
Installation Notes

GENERAL ELECTRIC CO.

GENERAL INFORMATION

Models FA-60 and FA-61 are compact, single-unit super heterodyne receivers employing 6 General Electric Metal Tubes and a synchronous type vibrator power supply. A 6F6 pentode output tube provides ample power for the 6 1/2-in. electrodynamic speaker. The use of an iron core antenna coil and an antenna matching trimmer, results in maximum transfer of energy from the antenna to the control grid of the 6K7 R.F. tube, providing a high signal-to-noise ratio.

The receiver chassis are housed in sturdy metal cases. To change tubes or align the receiver it is only necessary to remove the speaker cover which is secured by four snap fasteners. The chassis can be taken out of the case for servicing by removing seven self-tapping screws.

ANTENNA MATCHING SYSTEM

The design of the antenna input system makes it possible to use these receivers with either low or high capacity antennas with maximum efficiency. In general, the fish-pole under-car, built-in top, and over-top antennas are of the low-capacity type. Insulated metal top or insulated running board antennas, used in some cars, are of the high-capacity type.

The antenna male plug can be inserted into the female receptacle on the receiver in either of two positions. If the car antenna is of the low-capacity type, the plug should be inserted so that the red dots on the male plug and the receiver case are on the same side. If a high-capacity antenna is used, the red dots should be opposite each other.

The antenna coupling trimmer (C-27) should be adjusted on a weak signal between 1500 and 1600 K.C. with volume control nearly full on.

It may not be possible to "peak" the trimmer if an extremely low-capacity antenna is used. In such cases, turn the trimmer (C-27) to its maximum capacity (counter-clockwise) position, and "peak" the trimmer (C-28) on the antenna section of the gang condenser. (Antenna plug in low-capacity position).

If the antenna coupling trimmer (C-27) can be peaked with the antenna plug inserted in either position, it is recommended that the low-capacity position (red dots adjacent) be used.

In some installations, where there is not much room to work, it is advisable to adjust the antenna coupling trimmer before bolting the receiver in place.

The wiring of the antenna plugs is such that, in the low capacity position, C-27 is in series with the antenna to the high tap on the antenna coil. In the high capacity position, C-27 is in series with the antenna to the low tap on the antenna coil. These connections may be traced on the schematic diagram.

Degeneration

Audio degeneration is provided by returning a portion of the voice coil voltage of the proper phase to a section of the volume control. This is accomplished by grounding one side of the voice coil and connecting the high side of the voice coil through the capacitor (C-24) and resistor (R-23) to the resistor (R-34) which is in series with the volume control to ground.

The use of degeneration improves the frequency response and reduces non-linear distortion introduced by the audio amplifier.

ALIGNMENT PROCEDURE

In order to align these receivers properly, it is necessary to have the following test equipment:

1. A modulated test oscillator.
2. An output indicator such as a 2 to 5 volt a c voltmeter.
3. An alignment tool with a small screw driver blade.

All trimmers for aligning the receiver can be reached by removing the speaker cover. When the speaker cover is removed from the case, the field return should be made by a jumper lead between the speaker cover and case. The alignment adjustments should be made with the test oscillator output at the lowest level which will give a readable output indication.

I. F. Alignment

1. Connect an output meter across the voice coil of the loud speaker. Place a modulated 175 K.C. signal on the grid of the converter (5A8) tube through a .06 Mfd. condenser. Set the volume control at maximum and adjust the 2nd I.F. trimmer and the 1st I.F. secondary and primary trimmers in the order mentioned for maximum output. Readjust all the trimmers to insure accurate alignment.

R. F. Alignment

Attach the flexible cables to the control head and to the proper bushings on the receiver. Make sure that the control head is rigidly fastened and that its relative position in respect to the receiver will not change.

1. Adjust the scale calibration by rotating the station selector knob in a counter-clockwise direction until the low frequency end of the dial has reached its stop and the gang plates are completely meshed.

2. Set the test oscillator to 1500 K.C. with the modulation "on." Connect its output through a 250 Mfd. condenser to the prong nearest the red dot on the receiver antenna receptacle. Set the receiver dial to 160 and peak the oscillator (C-30), R.F. (C-28) and antenna (C-28) trimmers respectively (see trimmer location drawing) to give maximum deflection on the output meter.

3. Set the test oscillator to 580 K.C. and tune the receiver to this signal. Peak the 580 K.C. capacitor (C-26) while rocking the tuning condenser back and forth through resonance. Leave the peeder at the setting which gives the greatest deflection.

4. Realign the oscillator trimmer (C-30) at 1600 K.C. as in separation No. 2.

Tubes

- R.F. Amplifier..... 6K7 Super-control triple-grid amplifier
- Converter and Oscillator..... 5A8 Pentagrid converter
- First I.F. Amplifier..... 6K7 Super-control triple grid amplifier
- Detector and A.V.C..... 6H6 Twin diode
- Audio Amplifier..... 6F5 High gain triode
- Output..... 6F6 Power amplifier pentode
- Dial Lamp..... G.S. Volt, Mazda No. 44

PHYSICAL SPECIFICATIONS

- Height..... 8 3/4 in.
- Width..... 9 in.
- Depth..... 7 3/4 in.
- Weight Packed..... 22 lbs.

Tuning Control Drive Ratio..... 12 to 1

INSTALLATION NOTES

several turns against the friction clutch and the dial will be set correctly.

SUPPRESSION OF IGNITION NOISE

Included with each receiver is a distributor suppressor, a generator condenser, and an ammeter condenser. When these are properly installed, the receiver should be free of ignition noise but if the interference persists, try one or more of the following suggestions:

See that the distributor contacts and spark plug points do not have too wide a gap. They should be set as recommended by the car manufacturer.

If a built-in roof antenna is used, shield the lead-in from the set up to the antenna and place an R.F. filter, consisting of a choke and condenser, in the lead to the dome light as close as possible to the point where the lead enters the corner post.

When grounding the antenna cable shield, or making any other grounds, select a point which is most effective in reducing the noise pick-up. In some cases quieter operation may be obtained by omitting the antenna-shield ground connection entirely.

Ground the motor block to the frame by means of 1/2-inch copper braid. Also ground the steering post, speedometer cable, oil gauge line, etc., to the bulkhead. It is possible that interference may be carried from the motor compartment to the receiver by these cables.

In cars with composite wood and steel bodies, it may be necessary to bend various parts together such as the instrument panel and the corner posts.

If the ignition coil is mounted on the inside of the bulkhead, it may be helped to move it to the motor side.

Wheel static interference may be overcome by installing static collector springs under the hub caps.

BATTERY POLARITY

If the receiver is being used in a car with the positive battery terminal grounded, the vibrator should be inserted so that the arrow on the label points to (+) on the vibrator top. For use with cars having the negative terminal grounded the arrow must point to (-). The receiver will not operate if the vibrator is inserted in the wrong position.

ATTACHING VOLUME CONTROL CABLE

1. Rotate the volume control fully clockwise with a screwdriver.
2. Turn the volume control knob to its extreme counter-clockwise position, then insert the flexible cable into the receiver bushing.
3. Rotate the knob fully clockwise against the slip-clutch built in the volume control. If the cable tip does not engage the slot in the volume control during the first half of its rotation, reset the volume control with a screwdriver, so that this will occur.
4. Tape both the volume and tuning control cables securely in place to prevent them from changing position.

If these instructions are followed, there will be no tendency for the switch to snap "on" due to tension in the flexible cable.

SETTING THE DIAL

The gang condenser drive is equipped with a friction clutch. After the flexible drive cables have been connected and taped securely in position, rotate the tuning knob in a counter-clockwise direction until the dial reaches its stop at the low frequency end. Continue to rotate the knob for

REPLACEMENT PARTS LIST

MODELS FA-60 AND FA-61

Insist on genuine factory-tested parts which may be purchased from authorized dealers.

Stock No.	Description	List Price	Stock No.	Description	List Price
KA-308	ASSEMBLY—Receiver mounting studs, nuts, and washers.....	\$0.20	RQ-1209	RESISTOR—2700 ohm, 1/4 W. Carbon (R-24) (Pkg. of 5).....	\$0.70
*RB-008	BOARD—Terminal Board (2 lugs).....	.10	RQ-1291	RESISTOR—22,000 ohm, 1/4 W. Carbon (R-23) (Pkg. of 5).....	.70
*RB-012	BOARD—Terminal Board (2 lugs).....	.10	RQ-1293	RESISTOR—27,000 ohm, 1/4 W. Carbon (R-6) (Pkg. of 5).....	.70
*RB-018	BOARD—Terminal Board (3 lugs).....	.10	RQ-1295	RESISTOR—47,000 ohm, 1/4 W. Carbon (R-3, R-13) (Pkg. of 5).....	.70
*RB-019	BOARD—Terminal Board (3 lugs).....	.10	RQ-1307	RESISTOR—1 meg 1/4 W. Carbon (R-2) (Pkg. of 5).....	.70
*RB-502	BASE—Vibrator grounding base.....	.15	RQ-1311	RESISTOR—180,000 ohm, 1/4 W. Carbon (R-11) (Pkg. of 5).....	.70
*RC-011	CAPACITOR—5 mfd., 100 volt paper (C-14).....	.25	RQ-1316	RESISTOR—220,000 ohm, 1/4 W. Carbon (R-7) (Pkg. of 5).....	.70
RC-032	CAPACITOR—.01 mfd., 200 volt paper (C-9).....	.25	RQ-1323	RESISTOR—47 meg, 1/4 W. Carbon (R-12, R-15) (Pkg. of 5).....	.70
*RC-036	CAPACITOR—.008 mfd., 200 volt paper (C-16) (Model FA-61 only).....	.30	RQ-1331	RESISTOR—1.5 meg, 1/4 W. Carbon (R-4) (Pkg. of 5).....	.70
RC-051	CAPACITOR—.02 mfd., 1500 volt paper (C-10) (C-22).....	.30	RQ-1450	RESISTOR—430 ohm, 1 W. Carbon (R-14).....	.20
*RC-072	CAPACITOR—.05 mfd., 200 volt paper (C-1, C-2, C-14).....	.25	RQ-1471	RESISTOR—3300 ohm, 1 W. Carbon (R-8).....	.20
*RC-080	CAPACITOR—.02 mfd., 400 volt paper (C-11).....	.25	RQ-1473	RESISTOR—3000 ohm, 1 W. Carbon (R-10).....	.20
*RC-096	CAPACITOR—.1 mfd., 200 volt paper (C-3).....	.30	RQ-1493	RESISTOR—22,000 ohm, 1 W. Carbon (R-5).....	.20
RC-102	CAPACITOR—.1 mfd., 100 volt paper (C-8).....	.30	RS-170	SHIELD—Antenna coil shield.....	.20
*RC-123	CAPACITOR—.1 mfd., 400 volt paper (C-5, C-12, C-24).....	.35	RS-181	SOCKET—Vibrator socket (Pkg. of 5).....	.75
RC-149	CAPACITOR—.25 mfd., 400 volt (C-23).....	.35	RS-214	SOCKET—8 pin tube socket (Pkg. of 5).....	.20
RC-166A	CAPACITOR—.5 mfd., 120 volt paper (C-18, C-19).....	.45	RS-339	SWITCH—Tone control switch (5-1) (Model FA-61 only).....	.40
RC-167A	CAPACITOR—.5 mfd., 200 volt inter-frequency capacitor.....	.45	RS-603	SLEEVES—Fuse insulating sleeve.....	.05
RC-182	CAPACITOR—.5 mfd., 400 volt paper (C-17).....	.45	RS-604	SUPPRESSOR—Ignition suppressor re- fuses including converter.....	.25
*RC-235	CAPACITOR—100 mmf. Mica (C-5, C-7, C-8).....	.25	RT-234	TRANSFORMER—1st I.F. transformer (complete) (L-3).....	1.75
*RC-238	CAPACITOR—250 mmf. Mica (C-10).....	.25	RT-235	TRANSFORMER—2nd I.F. transformer (complete) (L-4).....	1.85
*RC-249	CAPACITOR—.002 mfd. Mica (C-20).....	.30	RT-434	TRANSFORMER—Output transformer (T-2).....	1.15
RC-270	CAPACITOR—5 mfd., 450 volt (C-25) 8 mfd., 450 volt (C-26), 10 mfd., 20 volt (C-27), Dry Electrolytic.....	1.40	RT-0610	TRANSFORMER—Power transformer (T-1).....	3.80
RC-639	CAPACITOR—Antenna padder capacitor (C-28) 200-1000 cond.....	.40	RV-028	VOLUME CONTROL—1 meg. volume control (R-9).....	.90
RC-840	CAPACITOR—Detector padder capacitor (C-29) 150-500 cond.....	.40	RV-300	VIBRATOR—Rectifier type vibrator (V-1).....	4.00
RC-716-22	CONDENSER—3 gang condenser and trimmers (C-23, C-28, C-29, C-30).....	4.80			
RC-825	CABLE—Antenna lead-in cable complete with plugs (P-4).....	1.60			
RC-826	CABLE—Battery cable from set to fuse including separator.....	.30			
RC-1955	CUSHION—Gang condenser rubber mounting cushion assembly.....	.30			
RD-200-22	DRIVE—Gang drive assembly complete.....	.60			
RP-302	PASTER—Case cover snap fasteners (Pkg. of 4).....	.10			
RP-302	PUBS—30 amp fuse (Pkg. of 10).....	1.00			
*RG-001	GRID CAP—(Pkg. of 5).....	.10			
RK-014	KNOB—Tune control knob.....	1.20			
RL-037	COIL—Antenna coil (L-6).....	1.20			
RL-132	COIL—RF unit assembly (L-1).....	1.20			
RL-209	COIL—Oscillator coil.....	.20			
RL-221	COIL—Antenna coil.....	.20			
RL-322	COIL—Antenna coil.....	.25			
RL-323	COIL—Antenna coil.....	.25			
RL-324	COIL—Antenna coil.....	.25			
RL-325	COIL—Antenna coil.....	.25			
RP-007	PLUG—Female antenna plug.....	.95			
RP-008	PLUG—Male antenna plug.....	.15			
RQ-1227	RESISTOR—47 ohm, 1/4 W. Carbon (R-19) (Pkg. of 5).....	.70			
RQ-1845	RESISTOR—1/2 meg, 1/4 W. Carbon (R-1, R-18, R-20) (Pkg. of 5).....	.70			
RQ-1949	RESISTOR—270 ohm, 1/4 W. Carbon (R-10, R-17) (Pkg. of 5).....	.70			

* Used on previous models. (Prices subject to change without notice.)

MODELS F-63, F-65, F-66

Socket, Trimmers, Chassis Alignment

GENERAL ELECTRIC CO.

I. F. ALIGNMENT WITH OSCILLOSCOPE

Band Switch Setting	Input Freq.	Point of Input	Disney Antenna	Trimmer	Comments
1. Band "B"	465 K.C. Sweep	I.F. Grid	.05 Mfd. or Larger	2nd I.F. Sec. (C-10) 2nd I.F. Pri. (C-9)	Gang condenser plates wide open—connect audio input of oscilloscope to ground and to the junction of R-3 and R-4 of the 2nd I.F. transformer—Adjust trimmers in order mentioned for a single symmetrical curve of maximum amplitude.
2. Band "B"	465 K.C. Sweep	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. (C-7) 1st I.F. Pri. (C-6)	Adjust trimmer for minimum amplitude.
3. Band "B"	465 K.C. Sweep	Antenna Post	250 Mmf. 400 ohms	Wave Trap Trimmer (C-2)	

I. F. ALIGNMENT WITH OUTPUT METER					
1. Band "B"	465 K.C. with Modulation	I.F. Grid	.05 Mfd. or Larger	2nd I.F. Sec. (C-10) 2nd I.F. Pri. (C-9)	Gang condenser plates wide open—connect output meter across voice coil—keep input signal low and volume control on as far as possible. Adjust all trimmers for maximum output
2. Band "B"	465 K.C. with Modulation	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. (C-7) 1st I.F. Pri. (C-6)	
3. Band "B"	465 K.C. with Modulation	Antenna Post	250 Mmf. 400 ohms	Wave Trap Trimmer (C-2)	Adjust trimmer for minimum output.

R. F. ALIGNMENT

1. Band "B"	No adjustments necessary				Close gang plates—Adjust pointer to first line at left end of tuning scale.
2. Band "C"	1500 K.C. with Modulation	Antenna Post	250 Mmf. 400 ohms	Osc. trimmer (front sect. of Ant. trimmer)	Connect output meter across voice coil—tone control on "bass" position—peak trimmers for maximum output with a low input signal.
3. Band "B"	465 K.C. with Modulation	Antenna Post	250 Mmf. 400 ohms	Osc. padder (gang cond.) (C-3)	Adjust padder for a maximum output meter indication in vicinity of 580 K.C. while rocking the gang condenser.

through a resistor-capacitor network consisting of C-15, R-16 and R-6 to a tap on the volume control. This feed back voltage is out of phase with the input and the resulting degeneration improves the frequency characteristic and reduces distortion. In the "bass" position, the tone control switch connects C-18 in parallel with the above network. The value of C-18 is such that more degeneration of the high than the low frequency notes occurs, thereby increasing the bass response. The "foreign" position of the switch shorts out C-15 and R-16 and places C-19 and R-6 in parallel which gives a frequency response best suited for short-wave reception. In the "speech" position, C-15 and R-16 are shorted out, C-19 is removed from the circuit, leaving R-6, thereby providing flat degeneration at all frequencies which is the most desirable condition for the reception of programs predominating in speech. The tone control switching described can be traced on the schematic diagram shown in Fig. 1.

The intermediate frequency amplifier consists of a 9K7 tube and two transformers, both of which have tuned primaries and secondaries. The output of this amplifier is applied to one plate of the 6H8 diode which is a combined detector, initial bias and automatic volume control tube. Volume is controlled by the variable potentiometer R-5 in the grid circuit of the 6F5 1st audio amplifier tube. The output of the 6F5 tube is resistance coupled to the grid of the 41 type 41 power amplifier pentode. The plate circuit of the 41 tube is suitably matched to the loud-speaker by means of a step-down output transformer.

Proper bias voltages for the various tubes are obtained by the use of a tapped bleeder circuit across the speaker field L-14. One of the cathodes of the 6H8 diode is returned to -3.1 volts on this bleeder circuit in order to provide initial bias to all the tubes controlled by the A.V.C.

Tone Control

When the tone control switch is in the "normal" position, a portion of the output voltage of the receiver is fed back

- Tubes**
- Oscillator and Converter.....6A8 Pentagrid converter
 - I.F. Amplifier.....9K7 Triple-grid Super-control Amplifier
 - Detector and AVC.....6H6 Twin Diode
 - First Audio Amplifier.....6F5 High-gain Triode
 - Audio Power Amplifier.....41 Power Amplifier Pentode Rectifier
 - Dial Lamp.....80 Full-wave Rectifier
- MAEDA No. 46

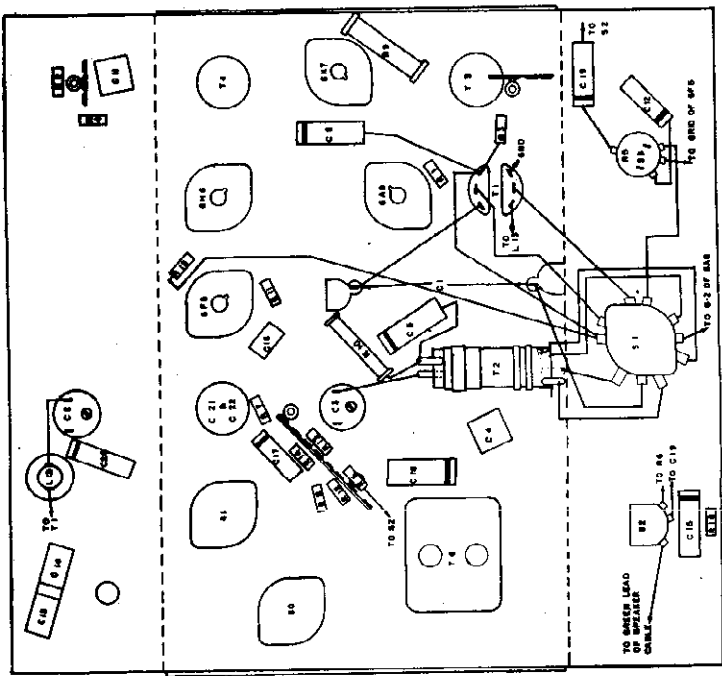


Fig. 1. Chassis Parts Layout

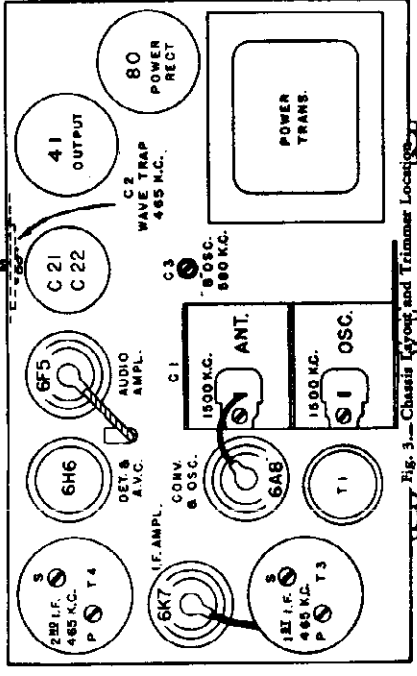
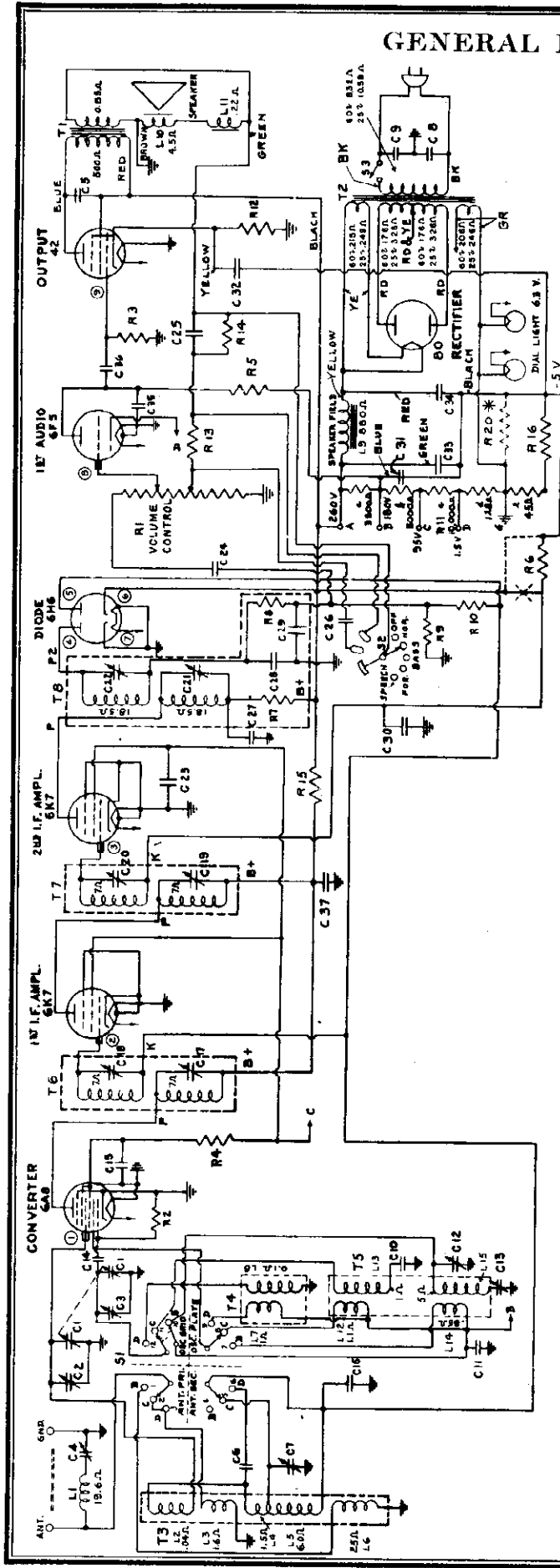


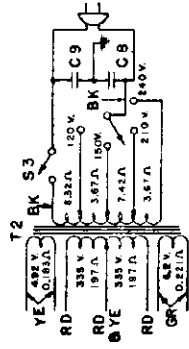
Fig. 2. Chassis Layout and Trimmer Locations

GENERAL ELECTRIC CO.

MODELS F-70, F-75
Schematic, Resista

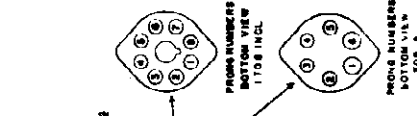


* CONNECT ONE OR MORE PARTS SHOWN IN BROKEN LINES
USING THE FOLLOWING CONNECTIONS ON R20 (500 Ω)
IS REMOVED AND R18 IS CHANGED FROM 22K TO 2.2K



UNIVERSAL TRANSFORMER
120-240 VOLTS

SYMBOL	DESCRIPTION	VALUES	DESCRIPTION	VALUES	SYMBOL	DESCRIPTION	VALUES
C1	TUNING TRIM.	10-450 MMF	VALVET	1000000	T1	5000000	4.00
C2	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T2	2500000	2.00
C3	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T3	1000000	1.00
C4	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T4	500000	0.50
C5	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T5	250000	0.25
C6	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T6	125000	0.125
C7	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T7	62500	0.0625
C8	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T8	31250	0.03125
C9	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T9	15625	0.015625
C10	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T10	7812.5	0.0078125
C11	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T11	3906.25	0.00390625
C12	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T12	1953.125	0.001953125
C13	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T13	976.5625	0.0009765625
C14	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T14	488.28125	0.00048828125
C15	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T15	244.140625	0.000244140625
C16	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T16	122.0703125	0.0001220703125
C17	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T17	61.03515625	0.00006103515625
C18	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T18	30.517578125	0.000030517578125
C19	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T19	15.2587890625	0.0000152587890625
C20	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T20	7.62939453125	0.00000762939453125
C21	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T21	3.814697265625	0.000003814697265625
C22	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T22	1.9073486328125	0.0000019073486328125
C23	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T23	0.95367431640625	0.00000095367431640625
C24	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T24	0.476837158203125	0.000000476837158203125
C25	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T25	0.2384185791015625	0.0000002384185791015625
C26	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T26	0.11920928955078125	0.00000011920928955078125
C27	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T27	0.059604644775390625	0.000000059604644775390625
C28	WAVE TRAP TRIM.	2-20 MMF	CARBON RESISTOR	1000000	T28	0.0298023223876953125	0.0000000298023223876953125
R1	VOLUME CONTROL	500K	OUTPUT TRANSFORMER	1000000	L1	1000000	1.00
R2	500K	OUTPUT TRANSFORMER	1000000	L2	500000	0.50	
R3	500K	OUTPUT TRANSFORMER	1000000	L3	250000	0.25	
R4	500K	OUTPUT TRANSFORMER	1000000	L4	125000	0.125	
R5	500K	OUTPUT TRANSFORMER	1000000	L5	62500	0.0625	
R6	500K	OUTPUT TRANSFORMER	1000000	L6	31250	0.03125	
R7	500K	OUTPUT TRANSFORMER	1000000	L7	15625	0.015625	
R8	500K	OUTPUT TRANSFORMER	1000000	L8	7812.5	0.0078125	
R9	500K	OUTPUT TRANSFORMER	1000000	L9	3906.25	0.00390625	
R10	500K	OUTPUT TRANSFORMER	1000000	L10	1953.125	0.001953125	
R11	500K	OUTPUT TRANSFORMER	1000000	L11	976.5625	0.0009765625	
R12	500K	OUTPUT TRANSFORMER	1000000	L12	488.28125	0.00048828125	
R13	500K	OUTPUT TRANSFORMER	1000000	L13	244.140625	0.000244140625	
R14	500K	OUTPUT TRANSFORMER	1000000	L14	122.0703125	0.0001220703125	
R15	500K	OUTPUT TRANSFORMER	1000000	L15	61.03515625	0.00006103515625	
R16	500K	OUTPUT TRANSFORMER	1000000	L16	30.517578125	0.000030517578125	



CONDITIONS OF TEST
WAVE SWITCH ON B BAND
POWER SWITCH OFF

APPROXIMATE RESISTANCE MEASUREMENTS

SYMBOL	RESISTANCE	SYMBOL	RESISTANCE
①	12 MEG. Ω	⑤	100,000 Ω
②	100,000 Ω	⑥	10,000 Ω
③	10,000 Ω	⑦	1,000 Ω
④	1,000 Ω	⑧	100 Ω
⑨	100 Ω	⑩	10 Ω
⑪	10 Ω	⑫	1 Ω
⑬	0.1 MEG. Ω	⑭	0.01 MEG. Ω
⑮	0.01 MEG. Ω	⑯	0.001 MEG. Ω
⑰	0.001 MEG. Ω	⑱	0.0001 MEG. Ω
⑲	0.0001 MEG. Ω	⑳	0.00001 MEG. Ω

ALL VOLTAGES TO GROUND UNLESS OTHERWISE SPECIFIED
ALL VOLTAGE MEASUREMENTS WITH ANTENNA TERMINALS
SHORTED TO 120V ON #41

Tone Control..... 4-point control

Loud-speaker—Electrodynamic

Cone: Model F-70..... 8 in.
Model F-75..... 12 in.

Intermediate Frequency..... 465 K.C.

Electrical Power Output

Undistorted..... 2.5 watts
Maximum..... 5.0 watts

GENERAL ELECTRIC CO.

MODELS F-70, F-71
Chassis, Voltage

SOCKET VOLTAGES

Tube No.	Plate to Ground Volts D-C	Screen Grid to Ground Volts D-C	Cathode to Ground Volts D-C	Cathode Current M.A.	Heater Volts A-C
6A8	Oscillator	190	....	....	....
	Converter	235	100 -	0	11
6K7 1st I.F. Amplifier	235	105	0	5	6.3
6K7 2nd I.F. Amplifier	235	105	0	7	6.3
6H6 Detector and A.V.C.	0 sig. -6 delay	....	0 sig. -6 delay	0	6.3
6F5 Audio Amplifier	120*	....	1.2	0.2	6.3
42 Output	250	265	16	39	6.3
80 Power Rectifier	640/320 RMS	....	335 D-C	70	5.0

A-C line voltage 120—No signal input—1000 ohms per volt-meter—dial pointer at 530 K.C.
* Measured on 500-volt scale.

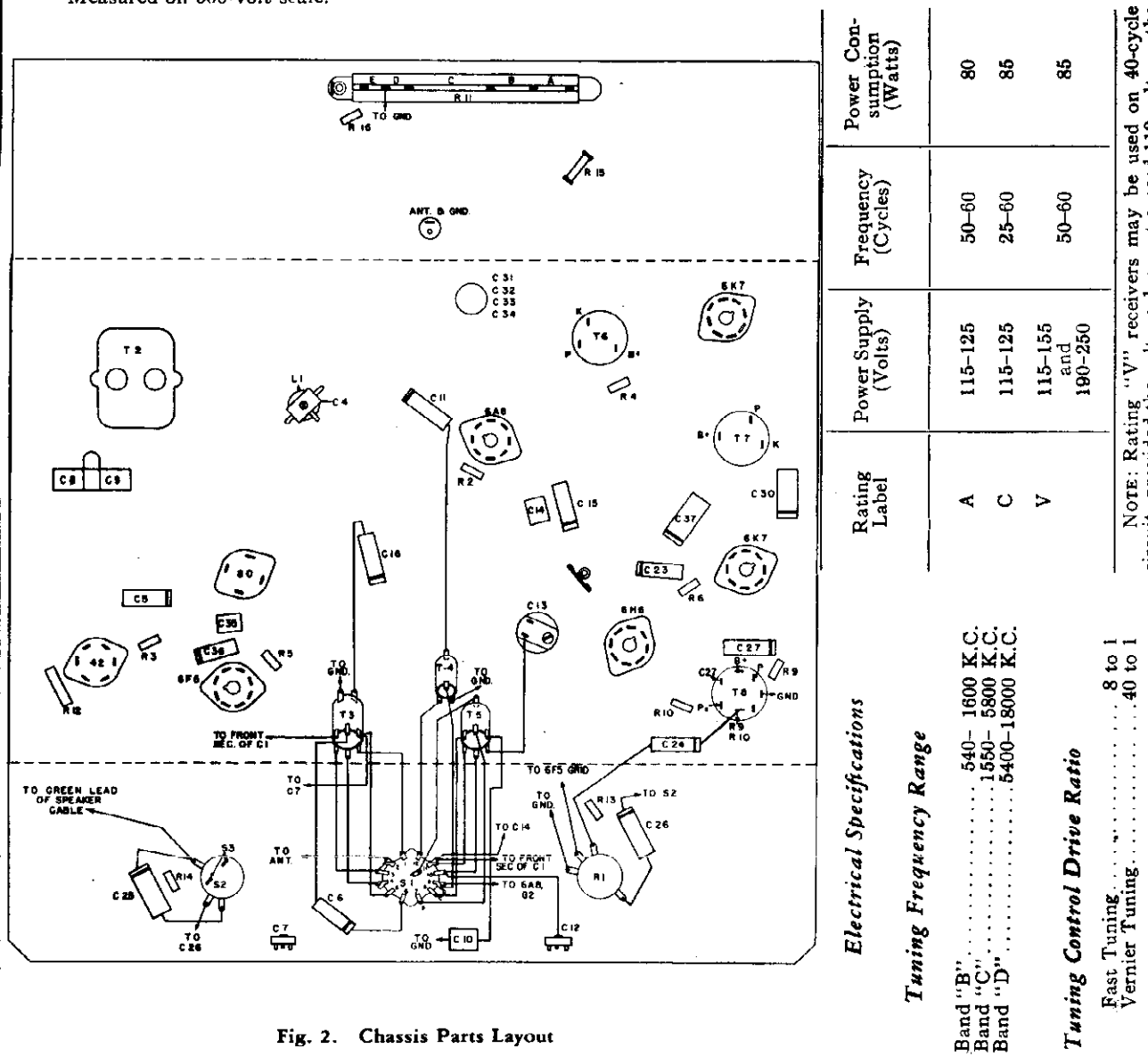


Fig. 2. Chassis Parts Layout

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Watts)
A	115-125	50-60	80
C	115-125	25-60	85
V	115-155 and 190-250	50-60	85

Electrical Specifications

Tuning Frequency Range

Band "B"..... 540-1600 K.C.
 Band "C"..... 1550-5800 K.C.
 Band "D"..... 5400-18000 K.C.

Tuning Control Drive Ratio

Fast Tuning..... 8 to 1
 Vernier Tuning..... 40 to 1

NOTE: Rating "V" receivers may be used on 40-cycle

MODELS U-70, U-75
Socket, Vibrator
Dial Assembly, Data

GENERAL ELECTRIC CO.

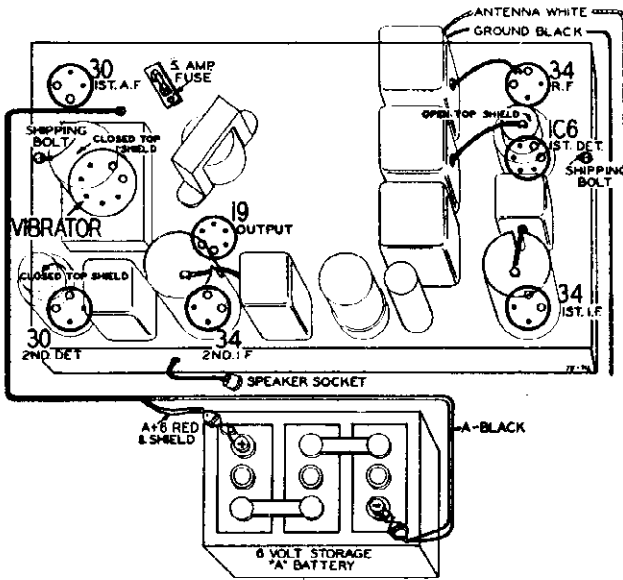


Fig. 4—Tube Arrangement and Battery Connections

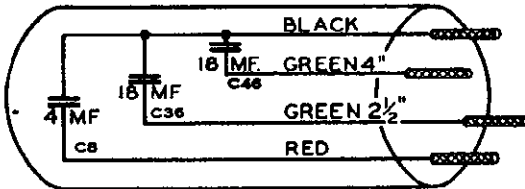


Fig. 8—Electrolytic Condenser Internal Connections

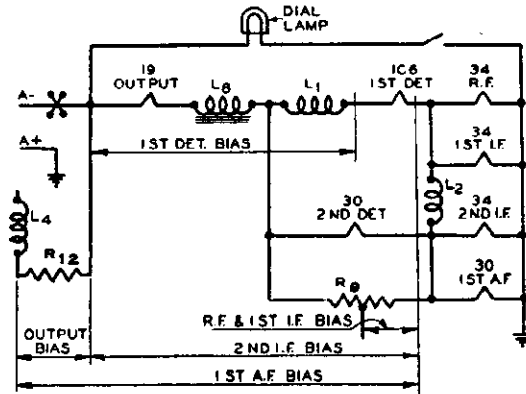


Fig. 5—Abridged wiring diagram showing filament wiring system and points at which no-signal bias voltages are obtained.

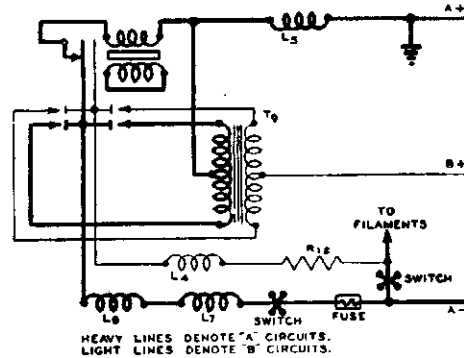


Fig. 6—Abridged wiring diagram showing action of synchronous vibrator

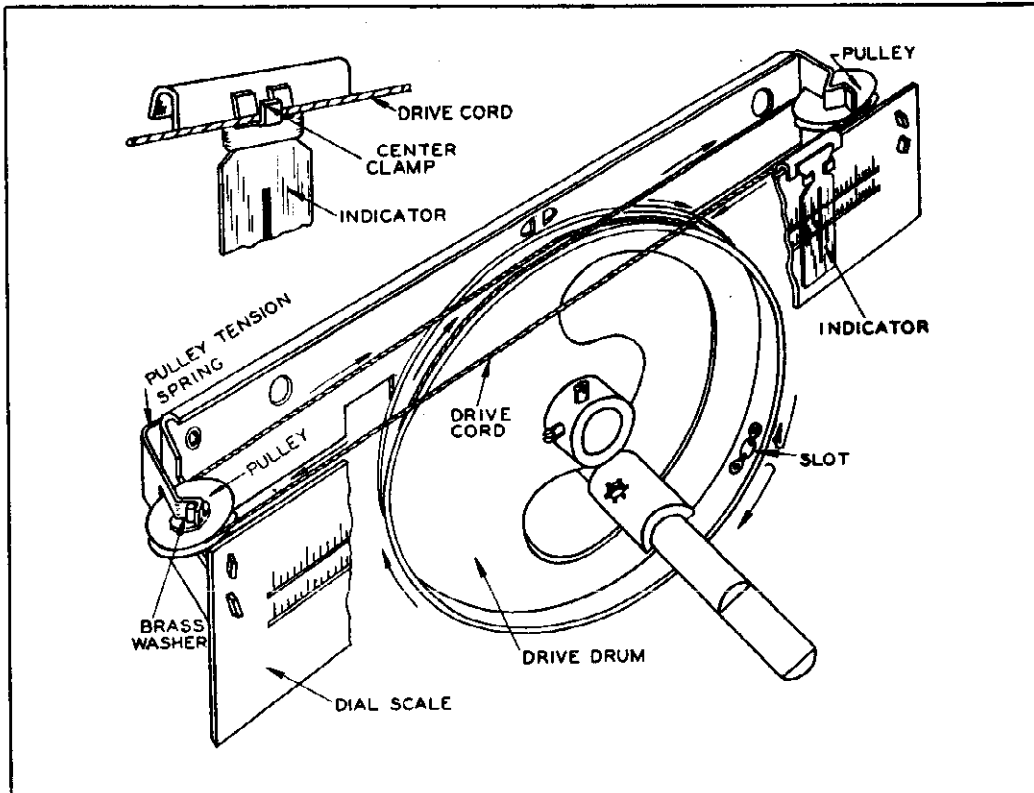
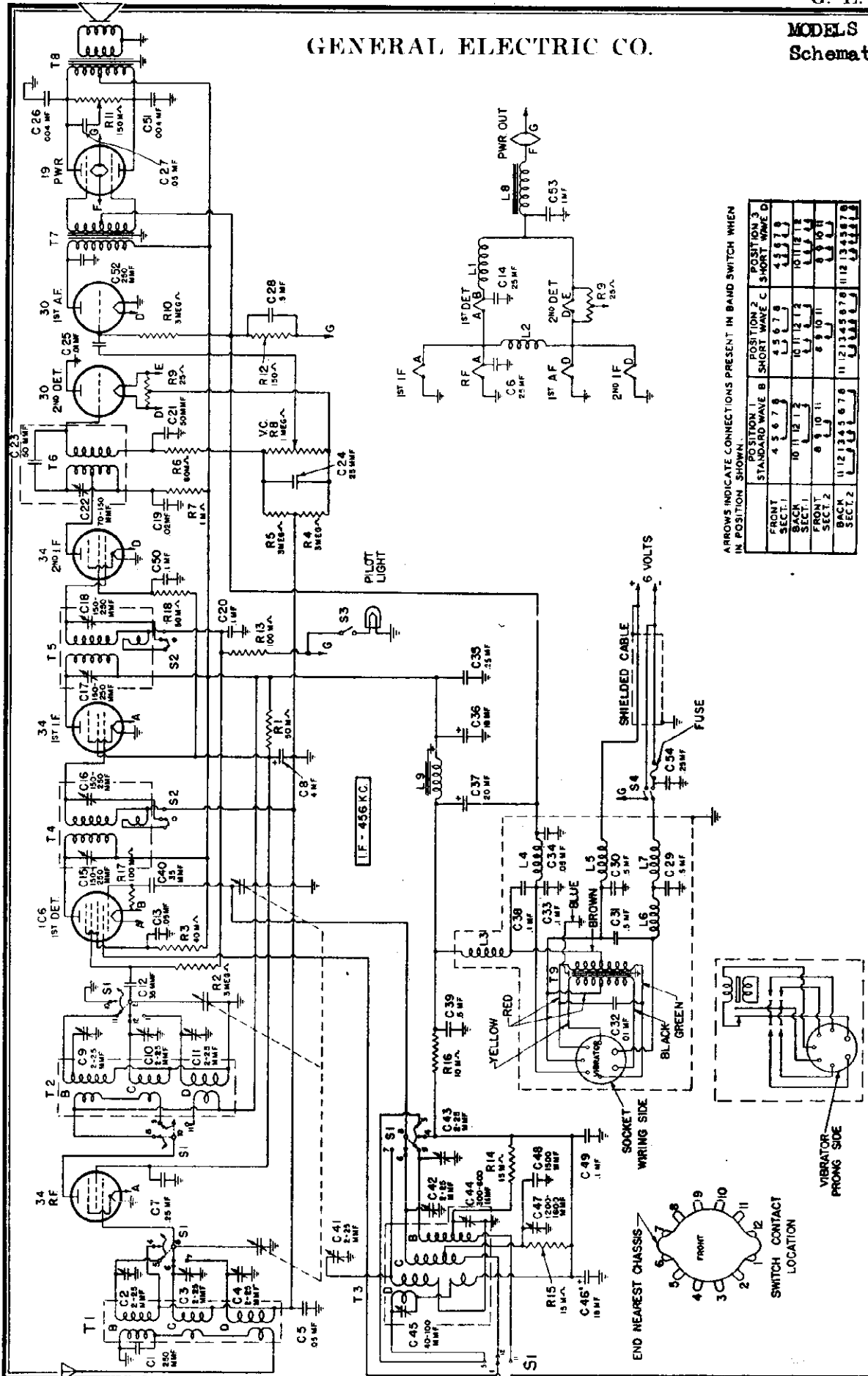


Fig. 9—Dial and Drive Assembly

GENERAL ELECTRIC CO.

G. F. PAGE
 MODELS U-70, U
 Schematic



Power Consumption - 1.4 Amperes at 6.3 Volts
 Power Output - 1.1 Watt Undistorted
 Intermediate Frequency - 456 KC.
 Tuning Frequency Range - 528 to 1730 KC.

MODELS U-70, U-75
Trimmers, Voltage
Resistance, Coils

GENERAL ELECTRIC CO.

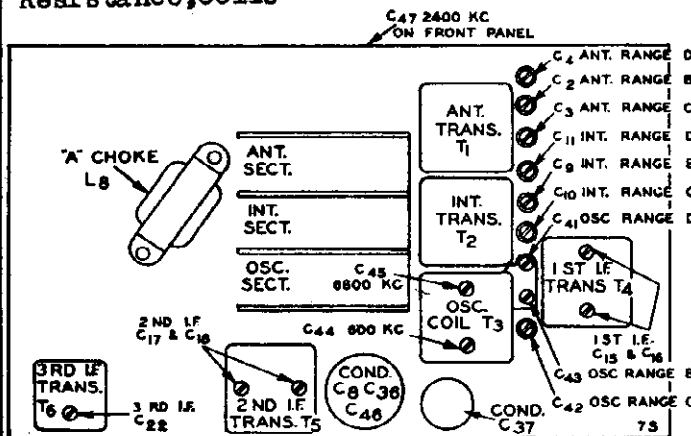
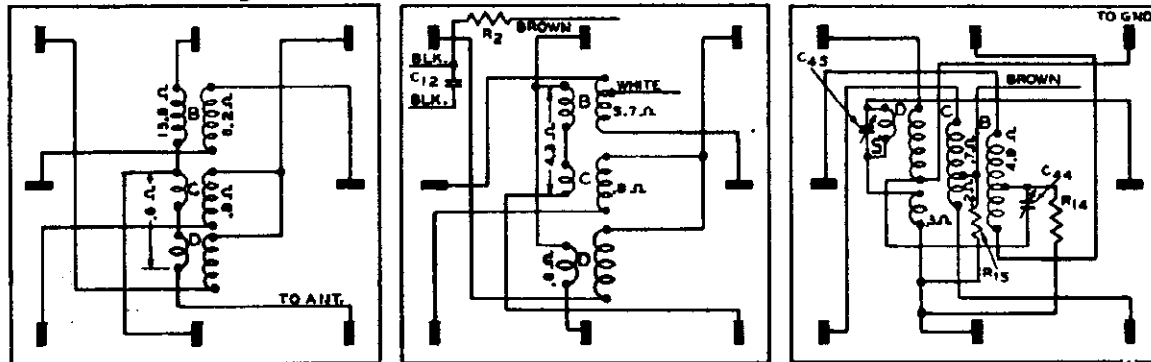


Fig. 3—Location of Trimmers

ANTENNA R.F. TRANS. T₁ INTERSTAGE R.F. TRANS. T₂ OSC. COIL T₃



NOTE RESISTANCES OF WINDINGS LESS THAN .1 Ω ARE NOT SHOWN

Fig. 7—R.F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

Switch Contact Location Numbering

A standard arrangement for switch contact location numbering has been adopted. This numbering is illustrated in Fig. 2. In contact locations not used, the number applying to that particular location is not employed.

D. C. Resistance of Windings

Refer to Figs. 2 & 7

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Part No.	Winding	Code	D. C. Resistance in Ohms
RBL-003	Antenna R.F. Transformer	T1	
	Range B Primary Winding		15.8
	Range C Primary Winding		0.6
	Range D Primary Winding		0.6
	Range B Secondary Winding		6.2
	Range C Secondary Winding		0.8
RBL-100	Interstage R.F. Transformer	T2	
	Range B Primary Winding		4.3
	Range C Primary Winding		0.6
	Range D Primary Winding		0.6
	Range B Secondary Winding		6.3
	Range C Secondary Winding		0.8
RBL-202	Oscillator Coils	T3	
	Range B Oscillator Grid Coil		3.9
	Range C Oscillator Grid Coil		0.7
	Range D Oscillator Grid Coil		Small
	Range B Oscillator Plate Coil		1.0
	Range C Oscillator Plate Coil		0.2
RBL-308	Oscillator Tracking Reactor		1.0
	Range D Oscillator Tracking Reactor		1.0

Volume Control at Maximum		Antenna Shorted to Ground Band Switch in Standard Wave Position			
Type of Tube	Function	Across Filament	Plate to Ground	Screen to Ground	Bias Voltage See Notes
34	R.F.	2.0	145	55	1.0(1)
1C6	1st Det.-Osc.	2.0	145 90(2)	60	2 (3)
34	1st I.F.	2.0	145	55	1.0(1)
34	2nd I.F.	2.0	140	90	4.0(3)
30	2nd Det.	2.0			
30	1st A.F.	2.0	140		9 (4)
19	Power	2.0	140		5 (5)

- (1) As read from negative filament leg to tap of resistor R9.
- (2) Anode grid to ground.
- (3) As read from negative filament leg to A—.
- (4) Total voltage drop from negative filament leg to low potential end of resistor R12.
- (5) As read across resistor R12.

Part No.	Winding	Code	D. C. Resistance in Ohms
RBT-205	1st I.F. Transformer	T4	
	Primary Winding		12.9
	Secondary Winding		12.8
	Coupling Winding		0.5
RBT-206	2nd I.F. Transformer	T5	
	Primary Winding		12.9
	Secondary Winding		12.9
	Coupling Winding		0.5
RBT-207	3rd I.F. Transformer	T6	
	Primary Winding (Upper Winding)		8.5
	Primary Winding (Lower Winding)		7.7
	Secondary Winding		126.5
RBT-500	Input Transformer	T7	
	Primary Winding		1035.
	Secondary Winding		
	Center Tap to Inside		610.
RBT-401	Output Transformer	T8	
	Primary Winding		
	Center Tap to Inside		118.
	Center Tap to Outside		135.
RBS-004 & 005	Dynamic Speaker 6" and 8"		
	Speaker Voice Coil		0.5
RBT-070	Power Transformer	T9	
	Primary Winding		
	Center Tap to Inside		0.3
	Center Tap to Outside		0.3
	Secondary Winding		
	Center Tap to Inside		165.
RBL-313	1st Det. Filament Reactor	L1	0.5
	1st I.F. Filament Reactor	L2	0.6
RBL-311	"B" Reactor	L3	17.
RBL-310	"B" Reactor	L4	0.3
RBL-308	"A" Line Reactor	L5	0.1
RBL-309	"A" Line Reactor	L6	0.1
RBL-308	"A" Line Reactor	L7	0.1
RBL-307	"A" Reactor (Iron Core)	L8	0.7
RBL-306	"B" Reactor (Iron Core)	L9	350.

A signal generator that will provide an accurately calibrated signal at 456, 1730, 1500, 600, 6700, 6000, 2400, 18,400, 15,000 and 6800 KC and an output indicating meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 456 KC.

Connect the output of the signal generator through a .1 mf. condenser to the control grid of the 1st detector.

Connect the ground lead of the receiver to the ground post of the signal generator.

Turn the band switch to the Range B position (standard wave band).

Turn the volume control to the maximum position.

Turn the selectivity control to the sharp position and keep it in this position for all adjustments.

Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.

Then adjust the five I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis and the location is shown in Fig. 3.

Range B Alignment

After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

1730 KC Adjustment

Set the signal generator for 1730 KC.

Turn the rotor of the tuning condenser to the full open position.

Range C Alignment

CAUTION—When aligning the short wave band be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC. It may be necessary to increase the input signal to hear the image.

6700 KC Adjustment

Set the signal generator for 6700 KC.

Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range C position (first short wave band).

Adjust the oscillator Range C trimmer (C42) until maximum output is obtained. See Fig. 3 for location of this trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range C trimmer (C10) and antenna Range C trimmer (C3) to maximum.

6700 KC Adjustment

Set the signal generator for 6700 KC.

Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range C position (first short wave band).

Adjust the oscillator Range C trimmer (C42) until maximum output is obtained. See Fig. 3 for location of this trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range C trimmer (C10) and antenna Range C trimmer (C3) to maximum.

Do not change the setting of the oscillator Range C trimmer.

2400 KC Adjustment

Set the signal generator for 2400 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 2400 KC padder (C47) until the peak of greatest intensity is obtained. See Fig. 3 for location of this padder.

Range D Alignment

18,400 KC Adjustment

Set the signal generator for 18,400 KC.

Keep the antenna lead of the receiver connected through the 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range D position (second short wave band).

Adjust the oscillator Range D trimmer (C41) until maximum output is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range D trimmer (C11) and antenna Range D trimmer (C4) to maximum.

When adjusting the interstage and antenna Range D trimmers, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

Do not change the setting of the oscillator Range D trimmer.

6800 KC Adjustment

Set the signal generator for 6800 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6800 KC padder (C45) until the peak of greatest intensity is obtained. See Fig. 3 for location of this padder.

Do not use any power source other than a 6 volt storage battery.

If the receiver does not operate after being turned on, turn the switch off immediately, examine the battery connections and the fuse and see if all tubes are properly inserted.

Servicing Power Unit

The power unit is that portion of the chassis assembly contained within the large rectangular shield can and the circuit for which is shown within the dotted lines at the lower left side of the schematic diagram, Fig. 2.

Continuity Resistance Check—The power transformer, choke coil circuits and condenser shorts may be checked by utilizing the vibrator socket terminals and various points on the "A" or "B" lines, without removal of the shield can. For example: when checking the continuity or resistance of the upper half of the transformer secondary, contact may be made with the test prods at the proper vibrator socket terminal, as shown on the circuit diagram, and at the positive terminal of the 20 mf. electrolytic condenser, C37.

Removing Transformer and Vibrator Socket Assembly—Take off the filter unit shield can by removing the four self tapping screws at the right side (from front) of the chassis base and the five hex nuts from the bolts at the top of the chassis.

Unsolder the ground connections from the two lugs on the inside of the chassis base (right side from front). Unsolder the black and white coded wire from the terminal strip lug nearest the front of the chassis. This terminal strip is mounted on the transformer cover. Now unsolder the bracket holding the terminal strip to the transformer cover.

Proceed with replacement of the power transformer or with any other necessary service or replacements and then reassemble.

Replacement of Buffer Condenser C32—This condenser is located in the top of the transformer and vibrator assembly just underneath the vibrator socket. To replace, remove the assembly as explained in the preceding article.

In addition, the two screws holding the vibrator socket to the transformer cover assembly should be taken out. The condenser is then easily replaced.

Replacing Drive Cord

Remove the chassis from the cabinet.

Lift off the dial lamp assembly and remove the old drive cord, pulleys, washer and indicator.

Turn the drive drum until the slot in the rim is in the position shown in Fig. 9.

Insert one end of the drive cord in the slot and wind the cord around the drum in a clockwise direction for about two-thirds of a turn, or until it reaches the top of the drum.

Now, before putting the right pulley (from front) in place, bring the cord around the pulley from back to front so that the cord is adjacent to the celluloid dial scale; then place the pulley in position.

Extend the cord over to the left and bring it around the other pulley from front to back before placing this pulley. Put the small brass washer on the upper shaft of the pulley and place the pulley in position as shown in Fig. 9.

Bring the cord over to the drive drum and wind it around the drum in a clockwise direction, keeping it behind the cord already on the drum.

Push the pulley tension spring in toward the drive drum so as to provide slack in the cord while the free end is being inserted into the slot in the rim.

Now mesh the condenser plates completely. Replace the celluloid indicator on the dial strip and attach it to the drive cord as shown in Fig. 9. The line on the indicator should cover the 530 KC mark on the dial scale.

Caution—When attaching the indicator to the drive cord, do not pinch the center clamp too tightly on the cord or the cord will be cut. After the clamp is pinched slightly a small amount of shellac on it will hold the cord securely.

Replace the dial lamp assembly.

Trimmer Replacement

If one trimmer of the gang trimmer strip should become defective, it is not necessary to replace the entire strip. A single trimmer RBC-609, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (side not grounded) of the defective trimmer in the strip. This connection is then made to the single trimmer. Connect it to the side of the trimmer not in contact with the adjusting screw. The other side of the single trimmer is then connected to a good ground, using a piece of heavy wire in order to support the trimmer adequately. In replacing a trimmer, be sure to keep both leads as short as possible and keep the ungrounded lead as far from ground as possible.

Caution

Do not turn the receiver on unless ALL the tubes are in the sockets. Removal of any of them will result in abnormal voltages on the remaining tubes.

Be sure that the battery clips are connected to the battery with the correct polarity. Reversed connections may damage the receiver.

MODELS U-70, U-75

Parts

GENERAL ELECTRIC CO.

Replacement Parts—Models U70 and U75

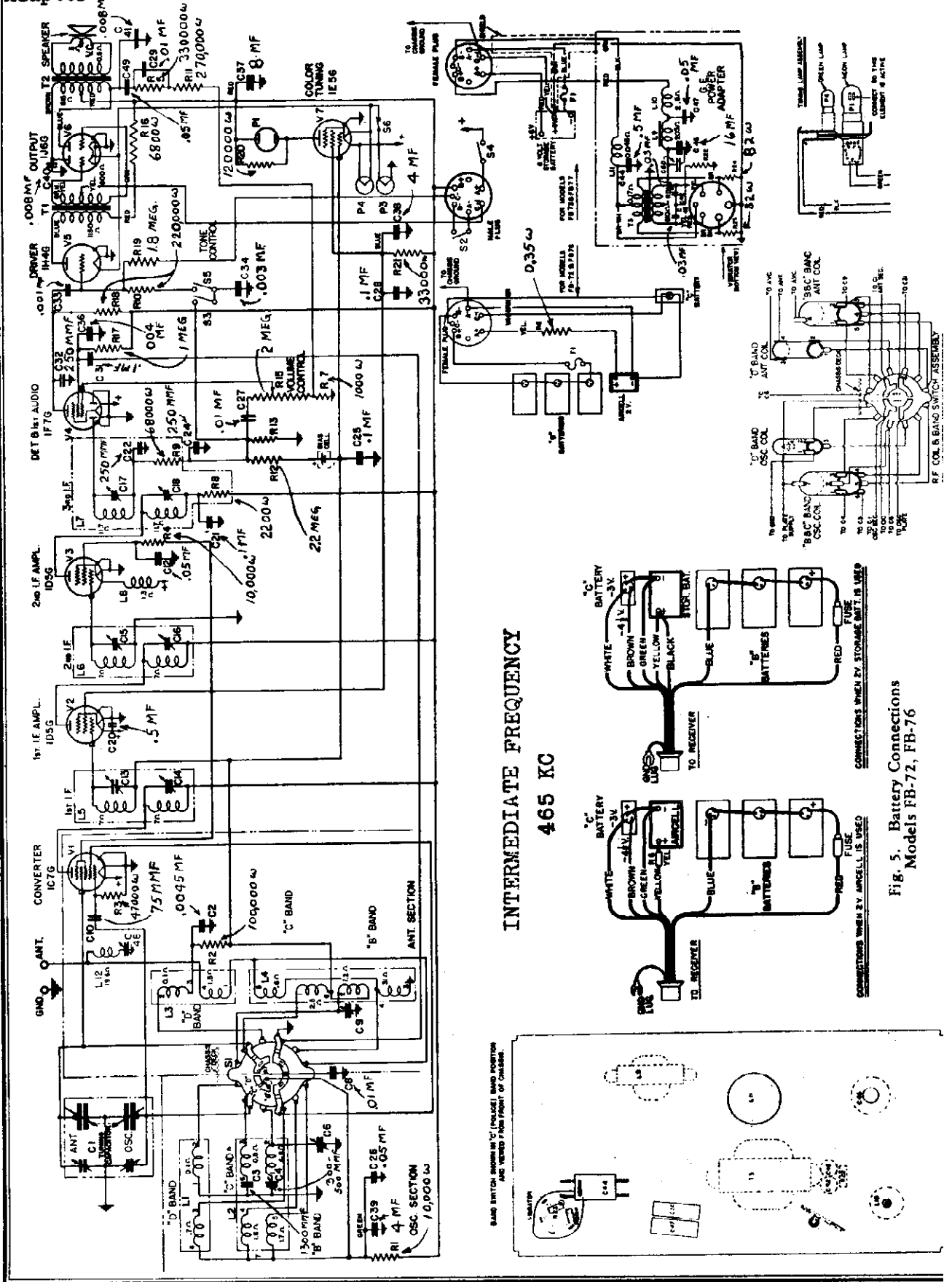
Insist on genuine factory-tested parts which may be
purchased from authorized dealers.

Stock No.	Description	List Price	Stock No.	Description	List Price
RBB-004	BOARD—Fuse Board	.10	RBK-001	KNOB—Control knob (except band switch)	.10
RBB-005	BOARD—Terminal board, single lug (Mtg. Foot left of lug)	.10	RBK-003	KNOB—Band switch knob	.15
RBB-006	BOARD—Terminal board single lug (Mtg. Hole at one end)	.10	RBL-003	COIL—Ant. coil and shield assembly (T-1)	1.90
RBB-007	BOARD—Terminal board, 2 lugs (Mtg. Hole in center)	.10	RBL-100	COIL—R.F. coil and shield assembly (T-2)	2.35
RBB-008	BOARD—Terminal board, single lug (Mtg. Foot to right of lug)	.10	RBL-202	COIL—Oscillator coil and shield assembly (T-3)	3.20
RBB-100	BRACKET—Dial support bracket	.10	RBL-306	REACTOR—"B" reactor (iron core) (L-9)	1.00
RBB-102	BRACKET—Dial mtg. bracket and reflector	.15	RBL-307	REACTOR—"A" reactor (iron core) (L-8)	.85
RBB-103	BRACKET—Gang support bracket	.20	RBL-308	REACTOR—"A" line reactor (L-5, L-7)	.35
RBB-104	BRACKET—Dial extension bracket	.10	RBL-309	REACTOR—"A" line reactor (L-6)	.35
RBB-105	BRACKET—Dial lamp bracket and socket	.20	RBL-310	REACTOR—"B" reactor (L-4)	.30
RBC-001	CAPACITOR—.1 Mfd., 180 V. paper (C-20, C-31, C-38, C-49, C-50, C-53)	.20	RBL-311	REACTOR—"B" reactor (L-3)	.30
RBC-003	CAPACITOR—.25 Mfd., 180 V. paper (C-6, C-7, C-14, C-35, C-54)	.25	RBL-312	REACTOR—1st IF filament reactor (L-2)	.35
RBC-004	CAPACITOR—.01 Mfd., 180 V. paper (C-25)	.15	RBL-313	REACTOR—1st Det. filament reactor (L-1)	.40
RBC-005	CAPACITOR—.05 Mfd., 180 V. paper (C-5, C-13, C-34)	.15	RBL-900	LEADS—Ant. and gnd. lead assembly	.30
RBC-006	CAPACITOR—.05 Mfd., 180 V. paper (C-28, C-29, C-39)	.40	RBL-902	LAMP—Dial lamp	.15
RBC-008	CAPACITOR—.01 Mfd., 1000 V. paper (C-32)	.15	RBP-001	PULLEY—Dial pulley	.10
RBC-009	CAPACITOR—.02 Mfd., 180 V. paper (C-19)	.15	RBP-003	POINTER—Dial pointer	.10
RBC-010	CAPACITOR—.5 Mfd., 180 V. paper (C-31)	.30	RBQ-002	RESISTOR—3 megohm, .2 Watt Carbon (R-2, R-4, R-5, R-10)	.15
RBC-011	CAPACITOR—.5 Mfd., 180 V. paper (C-30)	.30	RBQ-012	RESISTOR—10,000 ohm, .2 Watt Carbon (R-16)	.15
RBC-012	CAPACITOR—.05 Mfd., 240 V. paper (C-27)	.15	RBQ-016	RESISTOR—1,000 ohm, .2 Watt Carbon (R-7)	.10
RBC-013	CAPACITOR—.004 Mfd., 600 V. paper (C-26, C-51)	.15	RBQ-017	RESISTOR—50,000 ohm, .2 Watt Carbon (R-1, R-18)	.15
RBC-201	CAPACITOR—35 Mmfd., Mica (C-12, C-40)	.10	RBQ-018	RESISTOR—40,000 ohm, .2 Watt Carbon (R-3)	.10
RBC-203	CAPACITOR—50 Mmfd., Mica (C-21, C-23)	.10	RBQ-019	RESISTOR—60,000 ohm, .2 Watt Carbon (R-6)	.10
RBC-208	CAPACITOR—250 Mmfd., Mica (C-1, C-52)	.15	RBQ-020	RESISTOR—15,000 ohm, .2 Watt Carbon (R-14, R-15)	.10
RBC-209	CAPACITOR—1500 Mmfd., Mica (C-48)	.20	RBQ-021	RESISTOR—100,000 ohm, .2 Watt Carbon (R-13, R-17)	.15
RBC-210	CAPACITOR—25 Mmfd., Mica (C-24)	.10	RBR-703	RESISTOR—25 ohm, 3.0 Watt, 150 ohm, 2.0 Watt wire wound resistor (R-9, R-12)	.45
RBC-503	CAPACITOR—4 Mfd., 18 Mfd., 18 Mfd., 150 V. dry electrolytic (C-8, C-36, C-46)	1.50	RBS-004	SPEAKER—6" speaker complete with output transformer T8	5.70
RBC-504	CAPACITOR—20 Mfd., 150 V. wet electrolytic (C-37)	.95	RBS-005	SPEAKER—8" speaker complete with output transformer T8	6.00
RBC-604	CAPACITOR—70-150 Mmfd., double trimmers 1st and 2nd IF transformer (C-15, C-16, C-17, C-18)	.40	RBS-100	SHIELD—Large tube shield	.20
RBC-605	CAPACITOR—300-600, 40-100 Mmfd., double padder Band "B" and "D" (C-44, C-45)	.45	RBS-101	SHIELD—Small tube shield (closed top)	.10
RBC-606	CAPACITOR—40-100 Mmfd. trimmer 3rd IF transformer (C-22)	.25	RBS-102	SHIELD BASE—Large tube shield base and vibrator shield base	.10
RBC-607	CAPACITOR—2-25 Mmfd. Ant., R.F., and osc. trimmers, Bands "B", "C" and "D" (C-2, C-3, C-4, C-9, C-10, C-11, C-41, C-42, C-43) (See RBC-609 for replacement of any one section)	.95	RBS-103	SHIELD BASE—Small tube shield base	.10
RBC-608	CAPACITOR—1200-1600 Mmfd., padding capacitor (C-47)	.50	RBS-104	SHIELD—Small tube shield (open top)	.15
RBC-609	CAPACITOR—2-25 Mmfd., Mica Replacement trimmer for any section of trimmer strip RBC-607	.10	RBS-105	SHIELD—Vibrator shield	.20
RBC-702	CONDENSER—3 gang condenser and reduction drive	4.85	RBS-106	SHIELD—Shield can for filter assembly (under vibrator and transformer assembly)	.50
RBC-800	CABLE—Drive Cable	.10	RBS-201	SOCKET—4 prong tube socket	.10
RBC-804	CABLE—Spkr. cable and socket assembly	.45	RBS-203	SOCKET—6 prong tube socket	.10
RBC-805	CABLE—Shielded battery cable	1.00	RBS-205	SOCKET—7 prong Vibrator socket	.20
RBC-902	CONE—Spkr. Cone for U-70	2.50	RBS-302	SWITCH—Band change switch (S1)	1.55
RBC-903	CONE—Spkr. Cone for U-75	3.00	RBS-303	SWITCH—Selectivity Switch (S2)	.45
RBC-950	CUSHIONS—Rubber chassis mtg. cushions	ea. .10	RBS-304	SWITCH—Dial lamp push button switch assembly (S3)	.50
RBC-951	CLIP—25 Amp. Batt. clip	ea. .15	RBS-400	SPRING—Pulley tension spring	.10
RBC-952	CLIP—Vibrator spring clip	.10	RBT-070	TRANSFORMER—Power transformer (T-9)	2.45
RBC-954	CUSHION—Gang condenser rubber mounting cushion assembly	.40	RBT-071	TRANSFORMER—Power Transformer Assembly (Includes RBC-008, RBC-952, RBS-102, RBS-205, RBT-070)	3.85
RBD-001	DRUM—Dial drive drum	.30	RBT-205	TRANSFORMER—1st IF transformer and shield assembly (T-4)	1.55
RBD-005	DIAL—Dial scale	.35	RBT-206	TRANSFORMER—2nd IF transformer and shield assembly (T-5)	1.55
RBD-006	DRIVE—Tuning cord reduction drive assembly	1.10	RBT-207	TRANSFORMER—3rd IF transformer and shield assembly (T-6)	1.65
RBF-002	FOOT—Chassis mtg. foot	.10	RBT-401	TRANSFORMER—Output transformer (T-8)	1.30
RBF-003	FOOT—Rear mounting foot for gang condenser	.10	RBT-500	TRANSFORMER—Input transformer (T-7)	1.95
RBF-300	FUSE—5 Amp. fuse	.10	RBT-700	TONE CONTROL—150,000 ohm tone control (R-11)	.65
RBG-001	GRID CAP—Control grid cap	.10	RBV-002	VOLUME CONTROL—1 megohm Volume Control and on-off switch (R-8) (S-4)	1.00
			RBV-201	VIBRATOR—Vibrator unit	4.55
			RBW-002	WINDOW—Dial window	.15
			RBW-101	WASHER—Felt washer used behind knob	ea. .10

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Schematic, Batt. Conn. Switch Assembly Adapter

GENERAL ELECTRIC CO.



MODELS FB-72, FB-73
FB-76, FB-77

Socket, Trimmers
Alignment, Notes

GENERAL ELECTRIC CO.

Power Supply

The chassis used in these receivers are identical except for the type of power supply employed. The 2-volt Models FB-72 and FB-76 are operated by "A," "B," and "C" batteries which are connected to the receiver by a battery cable, Stock No. BK-727.

Models FB-73 and FB-77 are operated entirely by a 6-volt storage battery, 1 cell (2 volts) of which supplies filament current. The remaining two cells (4 volts) supply the G.E. Power Adapter which, in turn, provides "B" and "C" voltages.

If desired, the 2-volt receivers may be converted to 6-volt operation at any time by the addition of a G.E. Power Adapter, Model BA-407.

In connecting a 6-volt receiver to the storage battery, first clip the yellow and green leads on the battery to avoid applying excessive voltage to the filaments, accidentally. Also, be sure to separate the two clips by connecting them to opposite ends of the battery connector strap, as shown on the Power Adapter label. This avoids establishing a common path for the filament and Power Adapter supply which would result in objectionable vibrator noise.

If it is difficult to snap the Power Adapter into position on the chassis, apply a little vaseline to the rubber mounting feet.

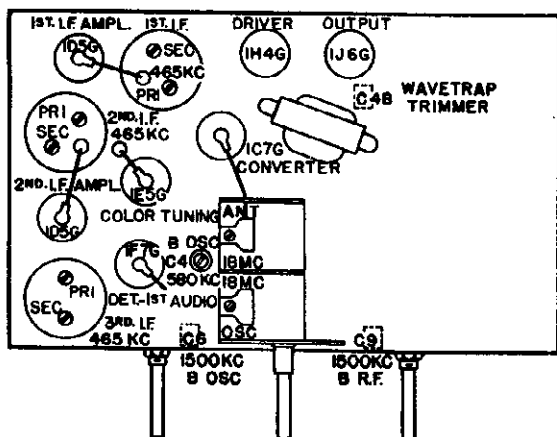


Fig. 1. Chassis Layout and Trimmer Locations

On the "D" Band (5600 to 18,000 K.C.) the oscillator operates on the *low* frequency side of the incoming signal; therefore, adjust the trimmer until the second oscillator peak is reached as the trimmer is *increased* in capacity. When the correct adjustment is made, it will be possible to tune the image of any signal on the "D" band 970 K.C. *higher* than the signal if the input is sufficiently high. Example: The image of 15 M.C. should be heard at 15,970 K.C.

The alignment procedure is given in table form on page 3. The "Dummy Antenna" is the capacitor or resistor used in series with the signal generator antenna lead.

ALIGNMENT PROCEDURE

I.F. ALIGNMENT WITH OSCILLOSCOPE

Band Switch Setting	Input Freq.	Point of Input	Dummy Ant.	Trimmer	Remarks
1 Band "B"	465 K.C. Sweep	1st I.F. Grid	.05 Mfd. or Larger	3rd I.F. Sec. (C-17) 3rd I.F. Pri. (C-18)	Gang condenser plates closed—connect audio input of oscilloscope to ground and to the diode load terminal of the 3rd I.F. transformer. Adjust the trimmers in order mentioned for a single symmetrical curve of maximum amplitude.
2 Band "B"	465 K.C. Sweep	1st I.F. Grid	.05 Mfd. or Larger	2nd I.F. Sec. (C-15) 2nd I.F. Pri. (C-16)	
3 Band "B"	465 K.C. Sweep	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. (C-13) 1st I.F. Pri. (C-14)	
4 Band "B"	465 K.C. Sweep	Antenna Post	250 Mmf. 400 ohms	Wave Trap (C-48)		Adjust trimmer for minimum amplitude.

I.F. ALIGNMENT WITH OUTPUT METER

1 Band "B"	465 K.C. with Modulation	1st I.F. Grid	.05 Mfd. or Larger	3rd I.F. Sec. (C-17) 3rd I.F. Pri. (C-18)	Gang condenser plates closed—Connect output meter across Voice Coil—Keep input signal low and Volume Control on as far as possible. Adjust all trimmers in order mentioned for maximum output reading on the meter.
2 Band "B"	465 K.C. with Modulation	1st I.F. Grid	.05 Mfd. or Larger	2nd I.F. Sec. (C-15) 2nd I.F. Pri. (C-16)	
3 Band "B"	465 K.C. with Modulation	Converter Grid	.05 Mfd. or Larger	1st I.F. Sec. (C-13) 1st I.F. Pri. (C-14)	
4 Band "B"	465 K.C. with Modulation	Antenna Post	250 Mmf. 400 ohms	Wave Trap (C-48)		Adjust trimmer for minimum output.

R.F. ALIGNMENT WITH OUTPUT METER

1 Band "B"					Close gang plates—adjust pointer to first line at left end of tuning scale (530 KC).
2 Band "D"	18 M.C. with Modulation	Antenna Post	250 Mmf. 400 ohms	Oscillator (18 M.C.) Antenna (18 M.C.) See Trimmer Location View	Connect output meter across Voice Coil—tone control on "Bass" position—set osc. trimmer. While rocking the gang cond. adjust the antenna trimmer for maximum output.
3 Band "C"	No adjustments necessary				
4 Band "B"	1500 K.C. with Modulation	Antenna Post	250 Mmf. 400 ohms	Osc. (C-6) Ant. (C-9)	Peak trimmers for maximum output with a low input signal.
5 Band "B"	580 K.C. with Modulation	Antenna Post	250 Mmf. 400 ohms	Osc. Padder (C-4)	Adjust padder for maximum output meter indication in vicinity of 580 K.C. while rocking the gang condenser.
6 Band "B"	1500 K.C. with Modulation	Antenna Post	250 Mmf. 400 Ohms	Osc. (C-6)	As in Operation No. 4.

GENERAL ELECTRIC CO.

MODELS FB-72, FB-73

FB-76, FB-77

Chassis, Voltage

AVERAGE SOCKET VOLTAGES

Tube	Plate to Ground Volts D.C.	Screen Grid to Ground Volts D.C.	Filament Volts D.C.	D.C. Plat Current M.A.
1C7G Oscillator.....	134	..	2.0	2.8
1C7G Converter.....	136	46	2.0	1.3
1D5G 1st I.F. Amp.....	136	46	2.0	2.3
1D5G 2nd I.F. Amp.....	128	46	2.0	3.5
1F7G Det. A.V.C. Audio Amp.....	40	15	2.0	0.4
1H4G Driver.....	100	..	2.0	4.1
1J6G Output.....	136	..	2.0	3.9
*1E5G Color Tuning.....	58	43	2.0	1.5

Measured with normal battery voltages using a 1000 ohm-per-volt meter dial pointer at 540 K.C. with no signal input volume control at minimum.

* Silent tuning switch pressed.

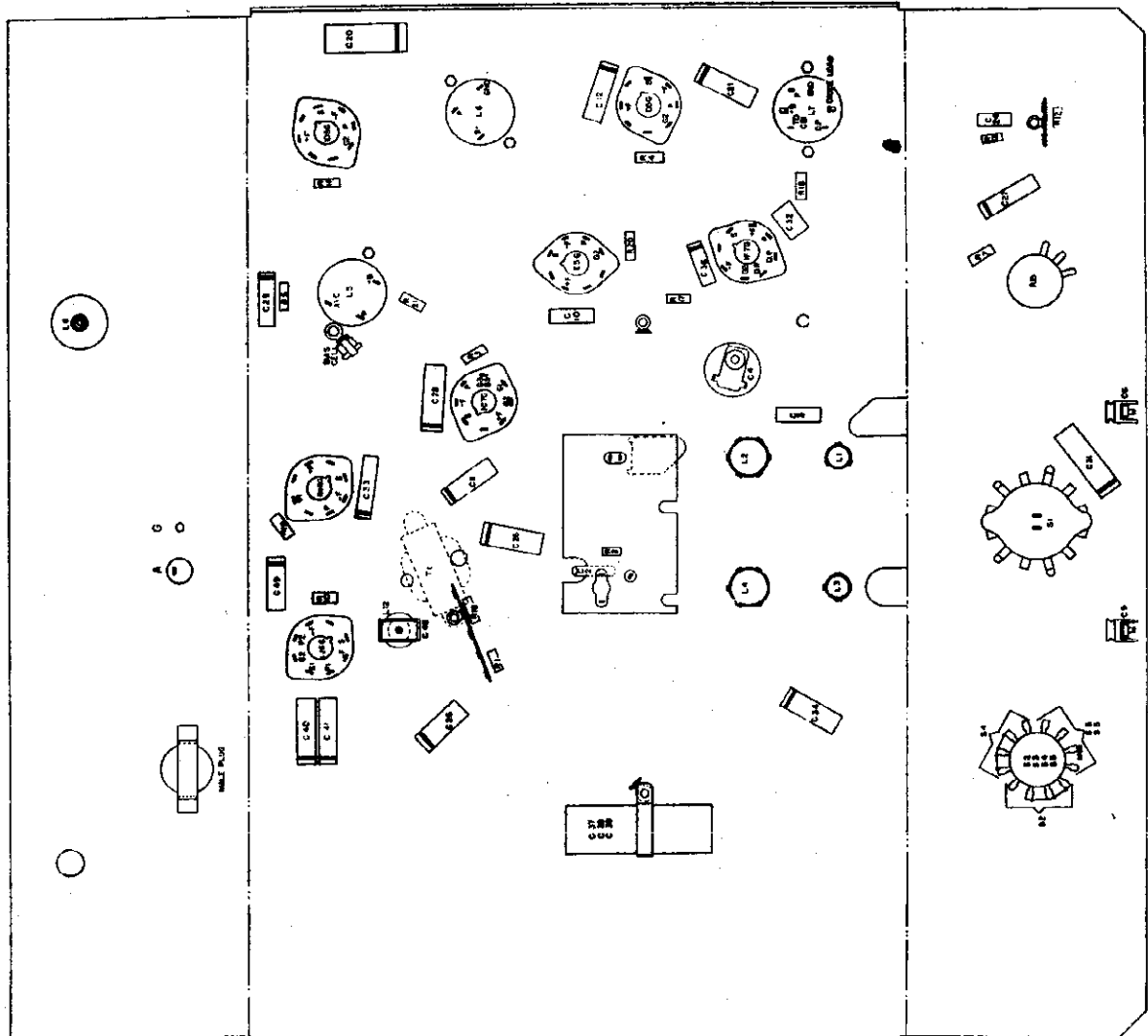


Fig. 3. Chassis Parts Layout

MODELS FB-72, FB-73
FB-76, FB-77

GENERAL ELECTRIC CO.

Notes, Parts
Dial Assembly

Table listing parts and their descriptions, including items like RL-91, RP-670, RB-100, etc., with corresponding part numbers and descriptions.

In front so that the cord is adjacent to the celluloid shield...
Extend the cord over to the left and bring it around the other pulley from front to back before placing this pulley. Put the small brass washer on the upper shaft of the pulley and place the pulley in position as shown in Fig. 4.

Table with columns: Part No., Description, List Price. Lists various components like BOARD, BOARD, BOARD, etc., with their respective prices.

bulb (P-4) and the 1E5G tube and full voltage is applied to the 1H4G and 1E6C filaments. When the switch is depressed, while tuning the receiver, the parallel connected filaments of the green bulb and the 1E5G are placed in series with the filaments of the audio tubes. Due to the low resistance of the latter, most of the voltage is applied to the green bulb and it is illuminated and the audio system becomes inoperative during the tuning period. It should be noted that the battery drain is lessened during the time the switch is depressed.

REPLACING DRIVE CORD
Remove the old drive cord, pulleys, washer and indicator. Turn the drive drum until the slot in the rim is in the position shown in Fig. 4. Lay the cord in the slot and wind the cord around the drum in a clockwise direction for about two-thirds of a turn, or until it reaches the top of the drum. Now, before putting the right pulley (from front) in place, bring the cord around the pulley (from back

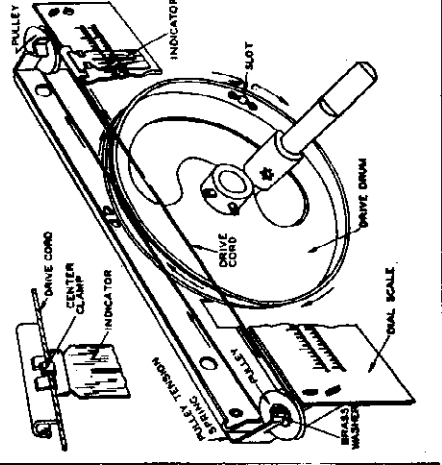


Fig. 4. Dial and Driver Assembly

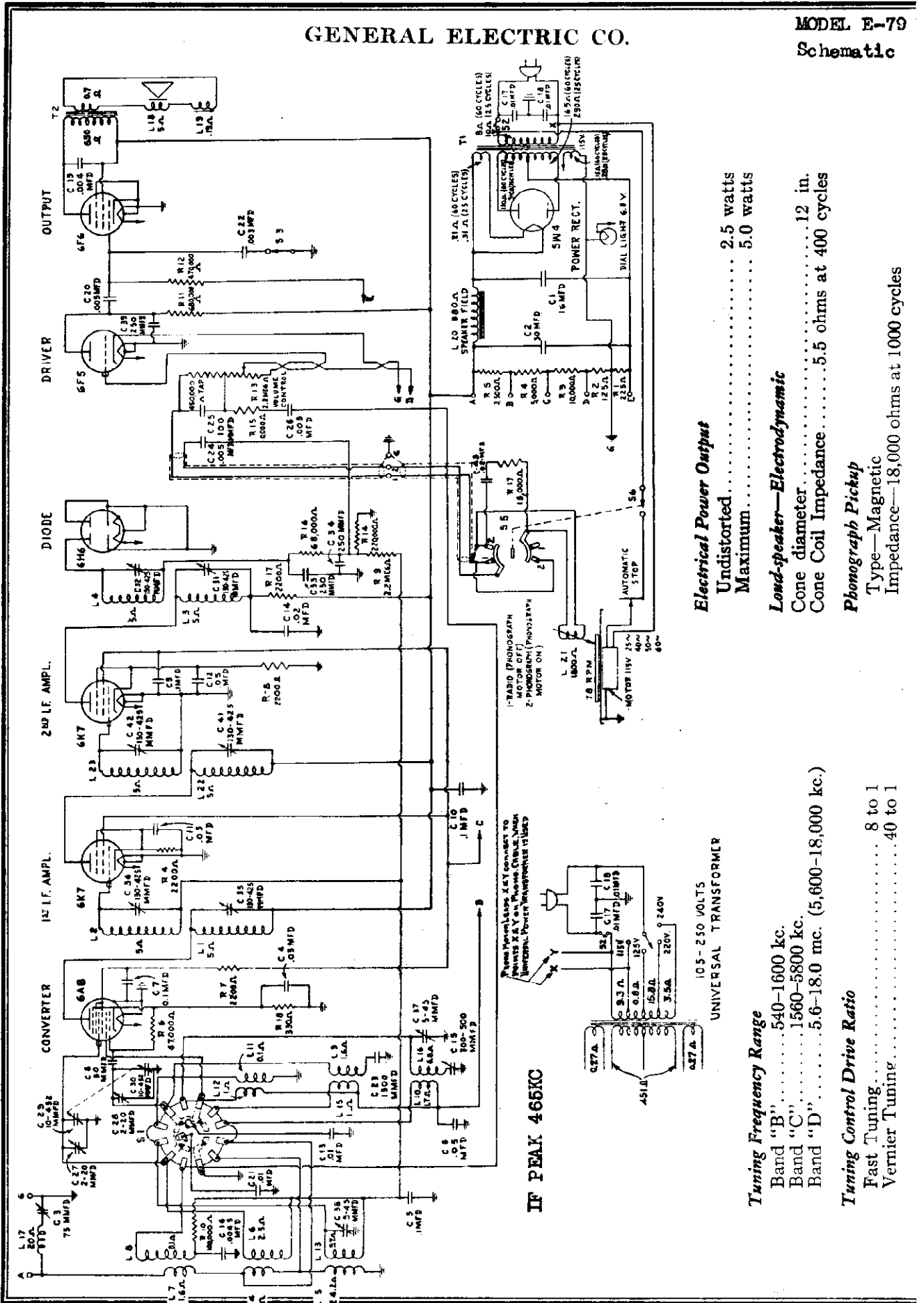
ELECTRICAL SPECIFICATIONS
Tuning Frequency Range: 540-1600 K.C.
Band 'B': 1600-3800 K.C.
Band 'D': 5600-16,000 K.C.
Maximum: 1.3 Watts
Mod. FB-72, FB-77: 2.3 Watts
Maximum: 1.0 Watts
Undistorted: 1.6 Watts
Maximum: 3-point

Diagnosis
A portion of the 1J6G output voltage is fed back to the audio input circuit through the resistor condenser network, C-49, C-29, R-3, R-11 and R-7. This feedback voltage is out of phase with the input and it serves to improve the frequency response and reduce distortion.
Greatest degeneration occurs at the lower settings of the volume control. As the volume is increased, the degeneration is reduced, making it possible to realize the full gain of the audio amplifier.

These receivers are equipped with a novel resonance indicator recently developed by General Electric. It consists of a light tuning indicator mounted on the side of the cabinet. When no signal is tuned in, the indicator will be amber in color, but as the receiver is tuned, it will change to green. Although this device is very sensitive, some signals may be too weak to cause a change to green. In such cases, the indicator will be indicated by the green portion of the indicator.
The Neon lamp and the resulting high plate current causes a voltage drop across R-20 (Fig. 2) which illuminates the Neon lamp brightly. When a signal is tuned in the AVC increases the 1E5G bias, lowers the plate current and the voltage drop across R-20, which causes the Neon lamp to go dark.
During listening periods, the silent tuning indicator S-6 shorts out the filaments of the green colorama

GENERAL ELECTRIC CO.

MODEL E-79
Schematic



Electrical Power Output
 Undistorted..... 2.5 watts
 Maximum..... 5.0 watts

Load-speaker—Electrodynamic
 Cone diameter.....12 in.
 Cone Coil Impedance.....5.5 ohms at 400 cycles

Phonograph Pickup
 Type—Magnetic
 Impedance—18,000 ohms at 1000 cycles

IF PEAK 465KC

Tuning Frequency Range
 Band "B".....540-1600 kc.
 Band "C".....1560-5800 kc.
 Band "D".....5.6-18.0 mc. (5,600-18,000 kc.)

Tuning Control Drive Ratio
 Fast Tuning..... 8 to 1
 Vernier Tuning..... 40 to 1

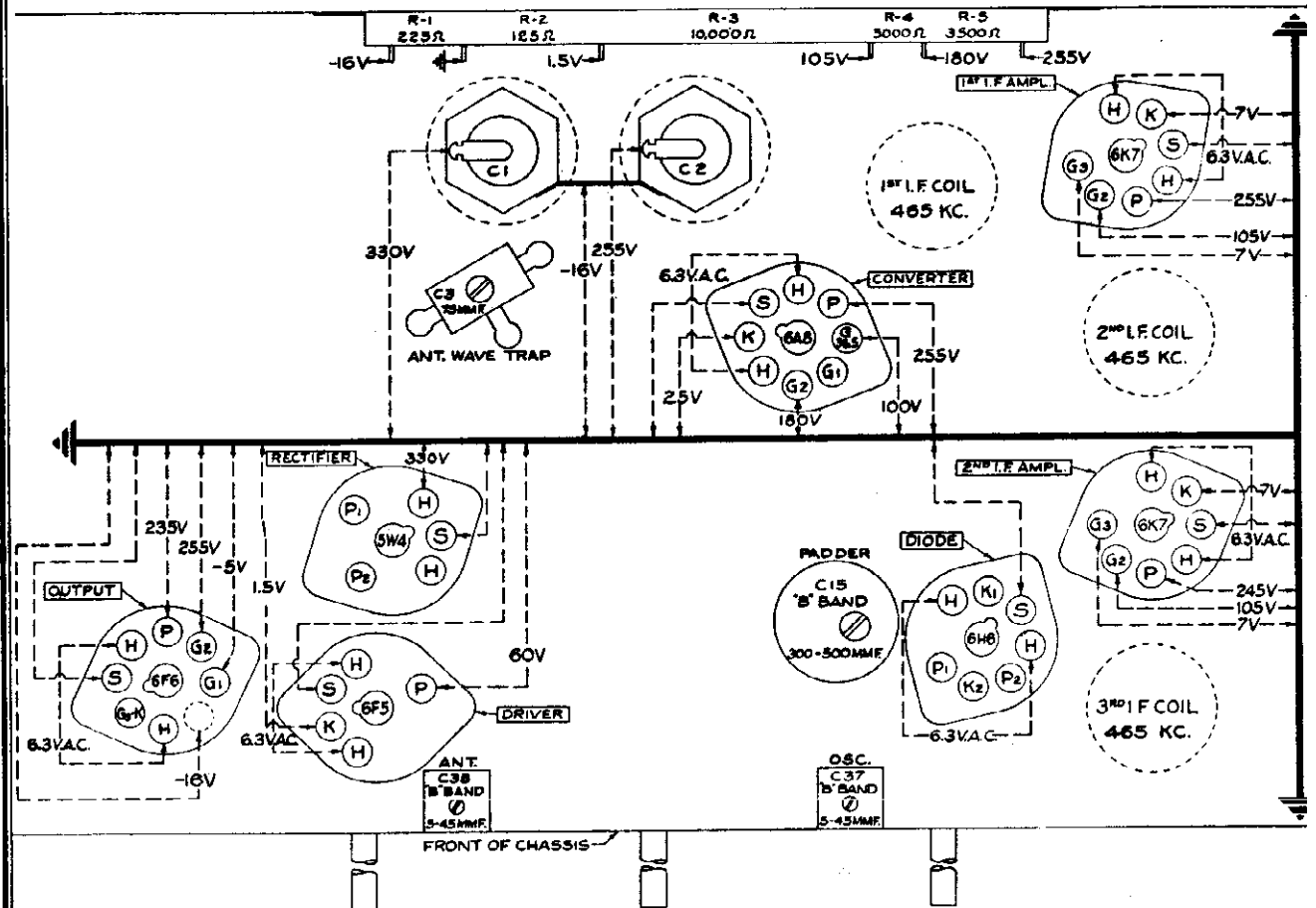
GENERAL ELECTRIC CO.

MODEL E-79
Voltage, Socket
Trimmers

SOCKET VOLTAGES

Tube No.	Cathode to Ground Volts D.C.	Screen Grid to Ground Volts D.C.	Plate to Ground Volts D.C.	Cathode Current M.A.	Heater Volts A.C.	
6A8	Oscillator	2.5	...	180	12.0	6.3
	Converter	...	100	255		
6K7 1st I. F. Amp.	7.0	105	255	9.0	6.3	
6K7 2nd I. F. Amp.	7.0	105	245	9.0	6.3	
6H6 Detector & AVC.	...	...	...	...	6.3
6F5 Audio Amplifier	1.5	...	*60	0.3	6.3	
6F6 Output	...	255	235	36.0	6.3	
5W4 Power Rectifier	300 D.C.	...	650/325 R.M.S.	70.0	5.0	

Measured at 115 volts supply. No signal input. Volume control maximum. Voltmeter 1000 ohms per volt; measured taken on highest scale giving accurate readable deflection.
*Supply voltage minus drop in load resistor.



VIEWED FROM UNDERSIDE OF CHASSIS
Fig. 3. Trimmer Location & Socket Voltages

MODEL E-79
Circuit Data
Alignment
Dial Data

GENERAL ELECTRIC CO.

To Replace Dial Scale or Reflector
Twist the supporting tabs at either end of the scale into alignment with the slots and remove the scale and reflector. Disengage the old scale from the mounting slots in alignment. Replace scale and reflector. The bracket and wings in the inner corner of each tab over the outer edge of the slot with which it is engaged.

To Adjust the "Automatic Verifier" Drive
The vernier drive used on this receiver includes a planetary reduction unit equipped with a clutch which automatically changes the reduction ratio. This clutch consists of a sleeve mounted on the knob shaft. This engagement should take place as the sleeve slides over the locking screw and move in the end of the sleeve engages with the cam surface on the cam shaft. This engagement should take place as the knob shaft is rotated. The locking screw and sleeve should be adjusted so that the sleeve will engage the cam surface and still allow complete release of the clutch.

REPLACING COILS
In case of an open or shorted pickup coil, the pickup assembly and by study of Fig. 6. It is important that the coils be replaced as previously explained after reassembly of the receiver. Only resin core solder should be used in soldering the coil leads to the lugs.

ADJUSTMENT OF DIAL MECHANISM
The dial mechanism is rigidly mounted to the frame of the tuning condenser by means of two removable, self-lapping screws. The complete assembly is rubber-mounted on rubber cushions at the bottom of the dial mechanism consists of the following parts:
1. Dial Scale.
2. Reflector.
3. Mounting Bracket.
4. Dial Pointer Drive Cable.
5. Cable Drum (mounted on condenser shaft).
6. Vernier Drive.
7. Two 1/8" Ball-Rension Springs.

ALIGNMENT FREQUENCIES
I. F. Band "D" 31,000 kc.
485 kc.
I. F. Band "B" 31,000 kc.
485 kc.
I. F. Band "C" 31,000 kc.
485 kc.
I. F. Band "E" 31,000 kc.
485 kc.
I. F. Band "F" 31,000 kc.
485 kc.

"D" Band (15-16.0 mc.)
Because of the R. F. circuit used in this receiver, the antenna must be aligned first. Set the frequency band switch to the "D" band position by the factor and reflector. Disengage the old scale from the mounting slots in alignment. Replace scale and reflector. The bracket and wings in the inner corner of each tab over the outer edge of the slot with which it is engaged.

"C" Band (1.5-5.0 mc.)
No separate trimmers are provided for adjustment of this band. The correct adjustment of the "D" band will automatically align the "C" band. The adjustment procedure for the "B" band follows immediately.

"B" Band (540-1600 kc.)
Set the frequency band switch to the broadcast position. Rotate the tuning condenser until the dial pointer indicates the test oscillator output. Adjust the test oscillator to the broadcast frequency (See Fig. 2). Adjust the broadcast oscillator trimmer for maximum output. This trimmer is the one nearest the volume control. When the oscillator has been properly adjusted, the antenna trimmer for maximum output. Hand adjust the antenna trimmer for maximum output. Necessary to maintain a small R. F. input from the test oscillator to avoid erratic action of the output indicator due to an automatic volume control action.

"A" Band (1.5-5.0 mc.)
Set the frequency band switch to the broadcast position. Rotate the tuning condenser until the dial pointer indicates the test oscillator output. Adjust the test oscillator to the broadcast frequency (See Fig. 2). Adjust the broadcast oscillator trimmer for maximum output. This trimmer is the one nearest the volume control. When the oscillator has been properly adjusted, the antenna trimmer for maximum output. Hand adjust the antenna trimmer for maximum output. Necessary to maintain a small R. F. input from the test oscillator to avoid erratic action of the output indicator due to an automatic volume control action.

"E" Band (1.5-5.0 mc.)
Set the frequency band switch to the broadcast position. Rotate the tuning condenser until the dial pointer indicates the test oscillator output. Adjust the test oscillator to the broadcast frequency (See Fig. 2). Adjust the broadcast oscillator trimmer for maximum output. This trimmer is the one nearest the volume control. When the oscillator has been properly adjusted, the antenna trimmer for maximum output. Hand adjust the antenna trimmer for maximum output. Necessary to maintain a small R. F. input from the test oscillator to avoid erratic action of the output indicator due to an automatic volume control action.

"F" Band (1.5-5.0 mc.)
Set the frequency band switch to the broadcast position. Rotate the tuning condenser until the dial pointer indicates the test oscillator output. Adjust the test oscillator to the broadcast frequency (See Fig. 2). Adjust the broadcast oscillator trimmer for maximum output. This trimmer is the one nearest the volume control. When the oscillator has been properly adjusted, the antenna trimmer for maximum output. Hand adjust the antenna trimmer for maximum output. Necessary to maintain a small R. F. input from the test oscillator to avoid erratic action of the output indicator due to an automatic volume control action.

ALIGNMENT FREQUENCIES
I. F. Band "D" 31,000 kc.
485 kc.
I. F. Band "B" 31,000 kc.
485 kc.
I. F. Band "C" 31,000 kc.
485 kc.
I. F. Band "E" 31,000 kc.
485 kc.
I. F. Band "F" 31,000 kc.
485 kc.

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GENERAL ELECTRIC CO.

MODEL E-79
Phono. Data

PHONOGRAPH

The phonograph mechanism in this receiver has been designed to be simple and foolproof. Under normal operating conditions, service difficulties should be negligible. Occasionally, however, certain adjustments may be required. These adjustments are explained in the following paragraphs.

MOTOR ADJUSTMENTS

The speed of the turntable motor is controlled by a governor which allows correct adjustment of the turntable rotation to 78 revolutions per minute. A pointer is provided under the turntable and the base plate is marked "F" and "S" to indicate direction to move pointer for faster or slower operation. A check of the turntable rotational speed may be made by placing a piece of paper under a record on the turntable and counting the number of times it rotates past a fixed point in one minute.

There is another type motor used in some sets of this model that does not have a speed control on the base plate. The speed of this motor is regulated by an adjustable collar on the governor. This is adjusted to 78 RPM at the factory and should not require attention.

The motor bearings and gears are properly lubricated for long operation under normal weather conditions. If the motor chatters or runs uneven, place a few drops of light machine oil on the governor felt.

TRIP MECHANISM

The trip mechanism is of simple design and consists of a latch bar connected to the motor switch and a trip lever. The latch is held closed by means of a spring between the latch bar and the trip lever. Be sure the parts work freely without binding.

The trip is actuated by an adjustable arm on the

trip lever. When the eccentric groove in the record swings the tonearm back and forth, it pushes the latch out of engagement.

MAGNETIC PICKUP

The pickup used in the phonograph is of an improved design. It is horizontally mounted in the tonearm and is held by a single set screw. The horseshoe magnet is fastened to the pole pieces by means of a set screw and clamp. The armature is centered by means of a split rubber block, which also provides a damping effect on the armature movement. The frequency response is uniform over a wide range.

Service operations which may be necessary on the pickup are as follows:

CENTERING ARMATURE

Refer to Fig. 6 showing the pickup inner structure. The armature (11) is shown in its proper relation to the magnet pole pieces, i.e., exactly centered. Whenever this centering adjustment has been disturbed, the screws (5) and (10) should be loosened and the armature rubber cushion (12) adjusted so the vertical axis of the armature is at right angles to the horizontal axis of the pole piece (8). Adjust the tension on the armature until there is a slight rocking motion. The spacing between the pole pieces and armature should be .0125 inch on each side.

DAMPING BLOCK

The top projection of the armature is imbedded in a rubber block (6) attached to the top of the pole pieces. This damping block acts as a mechanical filter to eliminate undesirable resonances and to cause the frequency response to be uniform. Should it be necessary to replace this damping block, it may be done by removing the yoke (7).

MAGNETIZING

The loss of magnetization will not occur when the pickup has received normal care, due to the fact that the magnet and pole pieces are one unit and the magnetic circuit remains closed at all times. When the pickup has been mishandled, subjected to a strong AC field, jolted or dropped, there may be an appreciable loss of magnetic strength, in which case it will be necessary to remagnetize the entire structure. This should be done by placing the pickup assembly on the poles of a standard pickup magnetizer and changing the pickup in accordance with the instructions accompanying the magnetizer. It is preferable to check the polarity of the pickup magnet and to remagnetize it so that the same polarity is maintained.

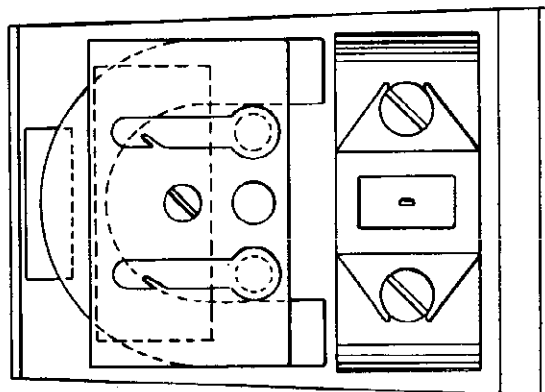


Fig. 5. Top View of Pickup

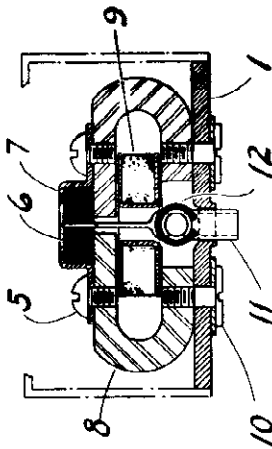


Fig. 6. Front View of Pickup

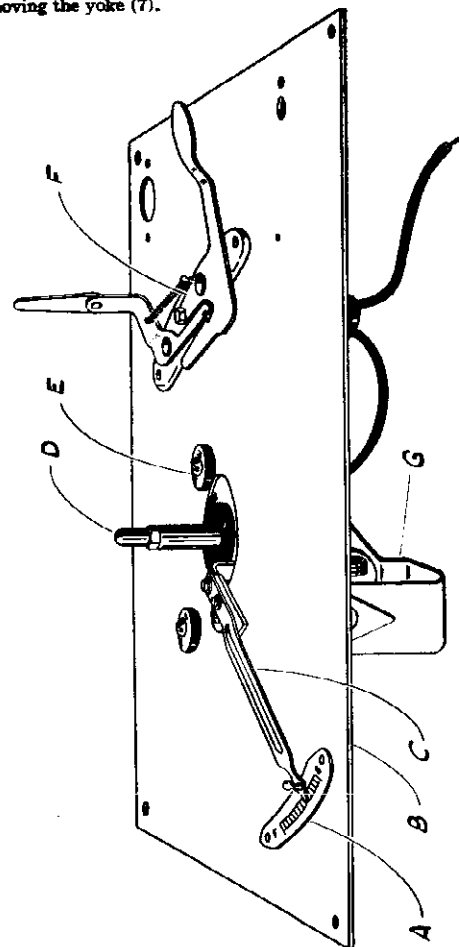


Fig. 4. Phonograph Motor Board

MODEL E-79

Parts

GENERAL ELECTRIC CO.

REPLACEMENT PARTS

INSIST ON GENUINE FACTORY-TESTED PARTS, WHICH MAY BE PURCHASED FROM AUTHORIZED DEALERS

Stock No.	Description	List Price	Stock No.	Description	List Price
*RB-026	BOARD—Antenna & Ground Terminal Board	\$0.10	RS-415	SPRING—Spring Bracket Supporting Cable Pulley (Pkg. of 2)	.10
RB-040	BOARD—Terminal Board Near Oscill. Padder	.10	RS-423	SPRING—Knob Spring (Push-on type) (Pkg. of 10)	.25
RB-054	BOARD—Terminal Board on Front Wall near Volume Control	.10	RS-858	SCREWS Set Screws for Dial Drive Drum (Pkg. of 10)	.10
RB-134	BRACKET—Dial Light Bracket	.15	RT-074	TRANSFORMER—Power Transformer, 115 volts, 50-60 cycles (T-1)	4.50
RB-135	BRACKET—Dial Support Bracket	.15	RT-075	TRANSFORMER—Power Transformer, 115 volts, 25-30 cycles (T-1)	9.35
RC-014	CAPACITOR—.003 mfd., 200 volt, Paper (C-22)	.25	RT-076	TRANSFORMER—Universal Power Transformer, 105-130 volts and 200-250 volts, 40-60 cycles (T-1)	8.50
RC-017	CAPACITOR—.0045 mfd., 200 volt, Paper (C-16)	.25	RT-233	TRANSFORMER—1st or 2nd I.F. Transformer (Complete) (L-1, L-2; C-25, C-36) (L-22, L-23; C-41, C-42)	1.50
RC-018	CAPACITOR—.004 mfd., 600 volt, Paper (C-19)	.30	RT-224	TRANSFORMER—3rd I.F. Transformer (Complete) (L-3, L-4; C-31, C-32)	1.75
*RC-024	CAPACITOR—.005 mfd., 200 volt, Paper (C-24)	.25	RV-014	VOLUME CONTROL—Volume Control and Power Switch, 2.2 meg. Total Res. (R-13, S-2)	1.15
*RC-029	CAPACITOR—.008 mfd., 400 volt, Paper (C-20)	.30	RW-005	WINDOW—Dial Window	.15
*RC-034	CAPACITOR—.01 mfd., 200 volt, Paper (C-21)	.35	*RW-101	WASHER—Felt Washers for Control Shafts (Pkg. of 10)	.45
RC-036	CAPACITOR—.008 mfd., 200 volt, Paper (C-26)	.25	*RW-102	WASHER—Insulating Washer for Mounting Electrolytic (Pkg. of 10)	.20
*RC-072	CAPACITOR—.05 mfd., 200 volt, Paper (C-12)	.25	RW-400	WAVE TRAP COMPLETE—(L-17, C-3)	.80
*RC-080	CAPACITOR—.16 mfd., 400 volt, Paper (C-14)	.26	RX-016	MOUNTING ASSEMBLY—Screws and Cushions for Mounting Tuning Condenser	.30
*RC-091	CAPACITOR—.05 mfd., 400 volt, Paper (C-6)	.30			
*RC-096	CAPACITOR—.1 mfd., 200 volt, Paper (C-5, C-13)	\$0.30			
*RC-123	CAPACITOR—.1 mfd., 400 volt, Paper (C-7, C-9, C-10)	.35			
RC-218	CAPACITOR—.50 mfd., Mica (C-8)	.25			
RC-235	CAPACITOR—100 mfd., Mica (C-25)	.25			
RC-281	CAPACITOR—250 mfd., Mica (C-33, C-34, C-39)	.35			
*RC-344	CAPACITOR—1300 mfd., Mica (C-22)	.35			
*RC-412	CAPACITOR—30 mfd., 280 volt, Wet Electrolytic (C-2)	1.20			
RC-413	CAPACITOR—.16 mfd., 340 volt, Wet Electrolytic (C-1)	1.25			
*RC-608	CAPACITOR—Oscillator Padder, 300-500 mfd., (C-15)	.40			
RC-618	CAPACITOR—Trimmer Capacitor (On Lower Front Wall) (C-37, C-38)	.25			
RC-710	CONDENSER—Two-gang Tuning Condenser, 10-452 mfd., (C-29, C-30)	3.60			
RC-754	CAPACITOR—Line Capacitor, .01-.01 mfd., 250 volt A.C. (C-17, C-18)	.40			
RC-815	CABLE—Dial Cable (Pkg. of 5)	.50			
*RC-854	CORD—Power Cord and Plug	.50			
RD-030	DRUM—Condenser Drive Drum	.40			
KD-032	DIAL—Dial Scale	.30			
RD-034	DRUM—Condenser Drive Drum	1.10			
RP-010	FOOT—Chassis Mounting Foot	.20			
*RG-001	GRID CAP—Control Grid Cap, Pkg. of 5	.10			
*RK-004	KNOB—Control Knob (Without Dot) (Pkg. of 5)	\$0.40			
*RK-005	KNOB—Control Knob (With Dot) (Pkg. of 5)	.75			
RL-121	COIL—R.F. Coil Band D (L-7, L-8)	.50			
RL-122	COIL—R.F. Coil Band B and C (L-5, L-13; L-6, L-14)	1.10			
RL-223	COIL—Osc. Coil Band D (L-11, L-12)	.70			
RL-224	COIL—Osc. Coil Band B and C (L-9, L-15; L-10, L-16)	1.00			
RP-042	PULLEY—Dial Pulley (Pkg. of 2)	.15			
RP-045	POINTER—Dial Pointer and Guide	.10			
RP-046	PLATE—R.F. Coil Unit End Plate with Shield	.25			
RQ-047	RESISTOR—330 ohms, 1/4 watt, Carbon (R-18) (Pkg. of 5)	.60			
RQ-067	RESISTOR—2200 ohms, 1/4 watt, Carbon (R-4, R-7, R-8) (Pkg. of 5)	.60			
*RQ-083	RESISTOR—10,000 ohms, 1/4 watt, Carbon (R-15) (Pkg. of 5)	.60			
RQ-089	RESISTOR—47,000 ohms, 1/4 watt, Carbon (R-6) (Pkg. of 5)	.60			
RQ-103	RESISTOR—68,000 ohms, 1/4 watt, Carbon (R-16) (Pkg. of 5)	.60			
*RQ-107	RESISTOR—100,000 ohms, 1/4 watt, Carbon (R-10) (Pkg. of 5)	.70			
RQ-115	RESISTOR—220,000 ohms, 1/4 watt, Carbon (R-14) (Pkg. of 5)	.70			
RQ-123	RESISTOR—470,000 ohms, 1/4 watt, Carbon (R-12) (Pkg. of 5)	.70			
RQ-127	RESISTOR—680,000 ohms, 1/4 watt, Carbon (R-11) (Pkg. of 5)	.70			
RQ-130	RESISTOR—2.2 megohms, 1/4 watt, Carbon (R-9) (Pkg. of 5)	.70			
RR-716	RESISTOR—Tapped Bleeder Resistor (R-1, R-2, R-3, R-4, R-5)	.90			
RR-005	REFLECTOR—Dial Light Reflector	.15			
RS-136	SHIELD—1st or 2nd I.F. Shield Can.	.20			
RS-137	SHIELD—3rd I.F. Shield Can.	.20			
RS-164	SHIELD—Chassis End Shield	.30			
*RS-200	SOCKET—8 Pin Tube Socket (Pkg. of 5)	.75			
*RS-204	SOCKET—5 Pin Tube Socket (Pkg. of 5)	.75			
RS-221	SWITCH—Tone Control Switch (S-3)	.30			
RS-222	SWITCH—Volume Control Switch (S-1)	1.25			

REPLACEMENT PARTS

INSIST ON GENUINE FACTORY-TESTED PARTS, WHICH MAY BE PURCHASED FROM AUTHORIZED DEALERS

Stock No.	Description	List Price
RK-002	KNOB—Phono radio switch knob (Pkg. of 5)	.50
RQ-087	RESISTOR—Phono radio switch resistor, 15,000 ohm 1/4 watt carbon (R-17) (Pkg. of 5)	.90
RPS-002	SWITCH—Phono radio switch with heat cut 1/2-32 (S-3, S-6)	1.10
	MISCELLANEOUS ASSEMBLIES	
RPB-005	BOARD—Terminal board for phono leads (R-1, R-2, R-3)	.15
RPC-011	CABLE—Phono radio switch cable with 3 lugs	.35
RPC-013	CORD—Phonograph power cord with female connector	.80
*RC-046	CAPACITOR—Phono radio switch capacitor for (32 mfd., 200 V.) (C-43)	.25
	PICKUP AND TONEARM ASSEMBLY	
RPA-007	ARM—Pickup arm complete (including base and tonearm mtg. bracket)	2.30
RPA-008	ARMATURE—Pick-up armature (11)	.30
RPB-009	BASE—Pick-up base plate (1)	.80
RPC-009	CABLE—Shaded pickup cable	1.80
RPC-010	CUSHION (1) (Pkg. of 5)	.25
RPL-800	COIL—Pick-up coil assembly (9)	1.50
RPP-011	PICKUP—Pickup unit complete (L-21) (Less tone arm)	5.40
RPS-028	SCREW—Needle clamp screw	.30

* indicates part also used on 1888 "A" line receiver. (Prices subject to change without notice)

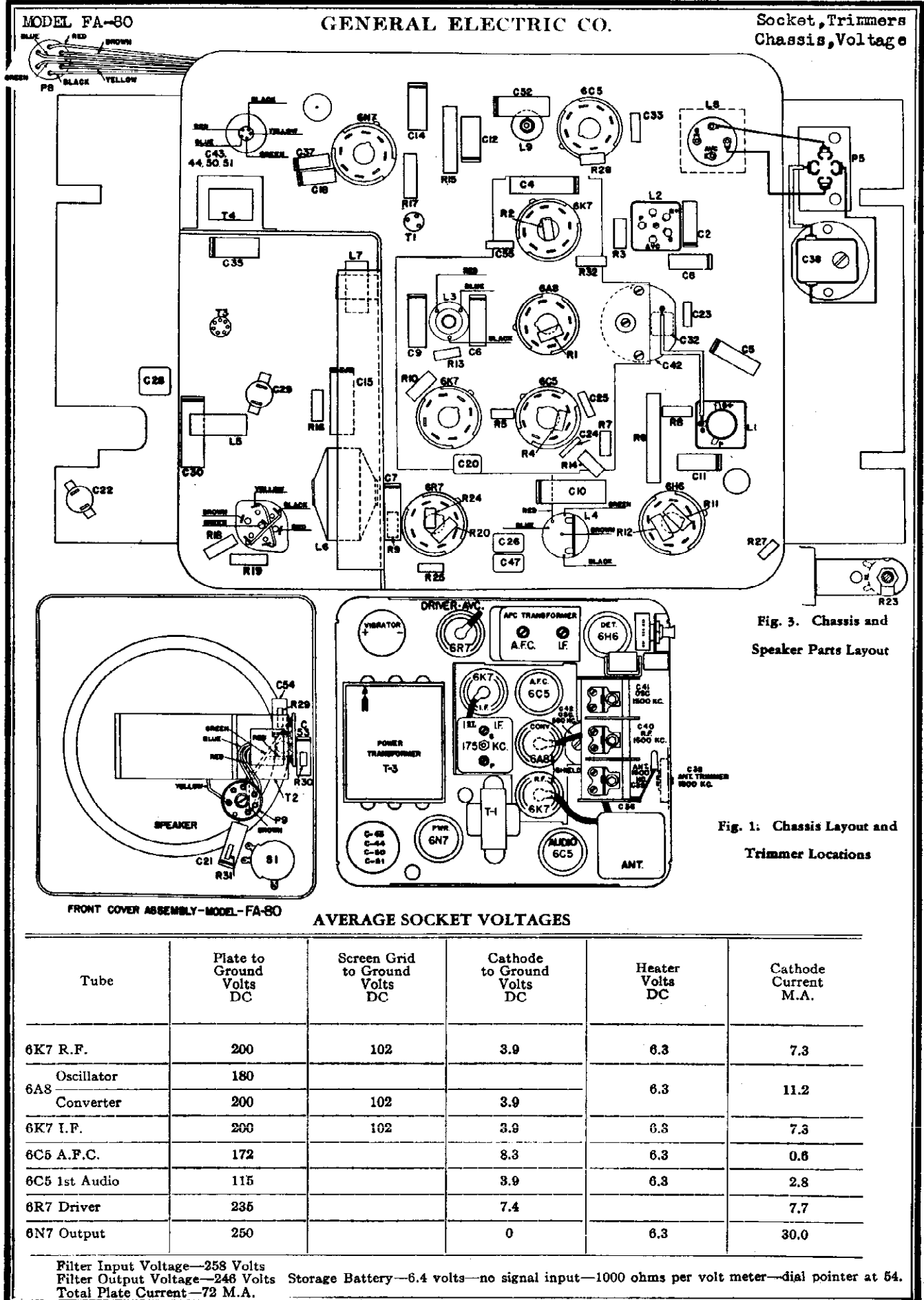


Fig. 3. Chassis and Speaker Parts Layout

Fig. 1. Chassis Layout and Trimmer Locations

MODEL FA-80

Parts

GENERAL ELECTRIC CO.

Stock No.	Description	List Price	Stock No.	Description	List Price
RF-202	FASTENER—Case cover snap fastener (Pkg. of 4)	\$0.10	RC-828	CABLE—20-inch drive cable	1.25
*RF-302	FUSE—20 amp fuse (Pkg. of 10)	1.00	RC-829	CABLE—18-inch drive cable	1.25
*RG-001	GRID CAP—Control grid cap (Pkg. of 5)	.10	RC-830	CABLE—24-inch drive cable	1.25
RK-014	KNOB—Tone control knob	.10	RK-015	KNOB—Control knobs and skirts (4 pieces) Specify Instrument Panel Control Kit Number	.45
RL-037	COIL—Antenna coil (L-8)	1.30	RL-916	LAMP—Pilot Lamp (Pkg. of 10)	1.50
RL-133	COIL—R.F. coil assembly (L-2)	1.30	RS-342	SWITCH—Power switch (Mounted on control head)	.30
RL-240	COIL—Osc. coil assembly (L-1)	.70			
RL-321	REACTOR—Line filter reactor (L-5)	.20			
RL-322	REACTOR—B+ reactor (L-7)	.25			
RL-323	REACTOR—Vibrator reactor (L-6)	.65			
RL-324	REACTOR—Filament reactor (L-9)	.35			
RL-325	REACTOR—Iron core reactor (T-4)	.95	RC-922	CONE—Speaker cone and voice coil (Including gaskets)	.90
RP-067	PLUG—Female antenna plug	.15	*RC-1950	CLAMP—Cone spider clamp and screw	.05
RP-068	PLUG—Male antenna plug	.15	*RP-012	PLUG—Female speaker plug	.20
RQ-497	RESISTOR—39,000 ohm, 1 W. Carbon (R-6)	.15	*RP-015	PLUG—Male speaker plug	.20
RQ-687	RESISTOR—15,000 ohm, 2 W. Carbon (R-15)	.35	RS-046	SPEAKER—6 1/2-in. type speaker (Complete with output transformer)	5.80
RQ-1016	RESISTOR—1200 ohm, 5 W. Vitreous (R-17)	.35	RT-425	TRANSFORMER—Output transformer (T-2)	1.30
RQ-1227	RESISTOR—47 ohm, 1/2 W. Carbon (R-16) (Pkg. of 5)	.70	RA-309	ASSEMBLY—Receiver mtg. studs, nuts and washers	\$0.20
RQ-1243	RESISTOR—220 ohm, 1/2 W. Carbon (R-2) (Pkg. of 5)	.70	*RB-008	BOARD—Terminal Board (2 lugs)	.10
RQ-1253	RESISTOR—560 ohm, 1/2 W. Carbon (R-10) (Pkg. of 5)	.70	*RB-013	BOARD—Terminal Board (under power transformer)	.10
RQ-1259	RESISTOR—1000 ohm, 1/2 W. Carbon (R-13) (Pkg. of 5)	.70	*RB-023	BOARD—Terminal Board (under gang condenser)	.10
RQ-1263	RESISTOR—1500 ohm, 1/2 W. Carbon (R-28) (Pkg. of 5)	.70	RB-057	BOARD—Terminal Board (under inter-stage transformer)	.10
RQ-1265	RESISTOR—1800 ohm, 1/2 W. Carbon (R-5, R-7) (Pkg. of 5)	.70	RB-603	BASE—Vibrator grounding base	.15
RQ-1277	RESISTOR—5600 ohm, 1/2 W. Carbon (R-27, R-29) (Pkg. of 5)	.70	RC-039	CAPACITOR—.01 mfd., 600 volt paper (C-18, C-37)	.25
RQ-1281	RESISTOR—8200 ohm, 1/2 W. Carbon (R-31) (Pkg. of 5)	.70	*RC-046	CAPACITOR—.02 mfd., 200 volt paper (C-11)	.25
RQ-1282	RESISTOR—9100 ohm, 1/2 W. Carbon (R-8) (Pkg. of 5)	.70	RC-051	CAPACITOR—.02 mfd., 1500 volt paper (C-15, C-30)	.30
RQ-1291	RESISTOR—22,000 ohm, 1/2 W. Carbon (R-24) (Pkg. of 5)	.70	*RC-072	CAPACITOR—.05 mfd., 200 volt paper (C-2, C-8, C-53)	.25
RQ-1297	RESISTOR—39,000 ohm, 1/2 W. Carbon (R-4) (Pkg. of 5)	.70	*RC-091	CAPACITOR—.05 mfd., 400 volt paper (C-7)	.30
RQ-1299	RESISTOR—47,000 ohm, 1/2 W. Carbon (R-1, R-22) (Pkg. of 5)	.70	RC-100	CAPACITOR—.1 mfd., 100 volt paper (C-6, C-9, C-54)	.30
RQ-1307	RESISTOR—100,000 ohm, 1/2 W. Carbon (R-21, R-25, R-30) (Pkg. of 5)	.70	RC-101	CAPACITOR—.1 mfd., 400 volt paper (C-21, C-35)	.35
RQ-1315	RESISTOR—220,000 ohm, 1/2 W. Carbon (R-3, R-32) (Pkg. of 5)	.70	*RC-123	CAPACITOR—.1 mfd., 400 volt paper (C-5, C-12, C-14)	.35
RQ-1323	RESISTOR—470,000 ohm, 1/2 W. Carbon (R-14) (Pkg. of 5)	.70	RC-156A	CAPACITOR—.5 mfd., 120 volt paper (C-22, C-29)	.45
RQ-1324	RESISTOR—510,000 ohm, 1/2 W. Carbon (R-11, R-12) (Pkg. of 5)	.70	RC-157A	CAPACITOR—.5 mfd., 200 volt interference filter capacitor	.45
RQ-1327	RESISTOR—680,000 ohm, 1/2 W. Carbon (R-9) (Pkg. of 5)	\$0.70	RC-160	CAPACITOR—.25 mfd., 100 volt paper (C-4)	.30
RQ-1331	RESISTOR—1 meg. 1/2 W. Carbon (R-20) (Pkg. of 5)	.70	RC-161	CAPACITOR—.5 mfd., 100 volt paper (C-10, C-52)	\$0.40
RR-1003	RESISTOR—100 ohm, 1 1/2 Watt W.W. (R-18, R-19) (Pkg. of 5)	.70	*RC-204	CAPACITOR—15 mmf., Mica (C-25)	.25
RS-170	SHIELD—Antenna coil shield	.20	*RC-235	CAPACITOR—100 mmf., Mica (C-23)	.25
RS-171	SHIELD—R.F. or oscillator coil shield	.15	*RC-261	CAPACITOR—250 mmf., Mica (C-20, C-26, C-47, C-55)	.25
RS-213	SOCKET—Vibrator socket (Pkg. of 5)	.75	*RC-296	CAPACITOR—500 mmf., Mica (C-24, C-32, C-33)	.25
RS-214	SOCKET—8 pin tube socket (Pkg. of 5)	.60	*RC-349	CAPACITOR—2000 mmf., Mica (C-28)	.30
RS-340	SWITCH—Tone control switch (S-1)	.50	RC-571	CAPACITOR—Dry Electrolytic condenser 10 mfd., 300 volt (C-43) 10 mfd., 25 volt (C-44) 5 mfd., 450 volt (C-50) 8 mfd., 450 volt (C-51)	1.75
RS-341	SWITCH—A.F.C. switch (S-2)	.70	RC-639	CAPACITOR—Antenna padder (C-38) 150-500 mmf.	.40
RS-503	SLEEVE—Fuse insulating sleeve	.05	RC-641	CAPACITOR—Oscillator padder 300-850 mmf. (C-42)	.40
RS-504	SUPPRESSOR—Ignition suppressor resistor	.35	RC-646	CAPACITOR—1st I.F. Double Trimmers (C-48, C-49)	.40
RT-234	TRANSFORMER—1st I.F. transformer (Complete) (L-3)	1.75	RC-716-14	CONDENSER—3-gang tuning condenser and trimmers (C-36, C-39, C-40, C-41)	4.60
RT-236	TRANSFORMER—2nd (A.F.C.) I.F. transformer (Complete) (L-4)	3.20	RC-825	CABLE—Antenna lead-in cable complete with plugs (P-1)	1.60
RT-506	TRANSFORMER—Audio input transformer (T-1)	1.40	RC-826	CABLE—Battery cable from set to fuse including connector	.20
RT-0610	TRANSFORMER—Power transformer (T-3)	3.80	RC-1955	CUSHION—Gang condenser rubber mounting cushion assembly	.20
RV-022	VOLUME CONTROL—1.0 megohm volume control (R-23)	.90	RD-200-14	DRIVE—Gang drive assembly gears, complete	.60
RV-200	VIBRATOR—Rectifier type vibrator	4.00			
	CONTROL HEAD ASSEMBLY				
RH-700	HEAD—Control head assembly (Not including drive cables)	4.25			
RC-827	CABLE—Battery cable from switch to fuse including connector	.25			

* Used on previous receivers. (Prices subject to change without notice.)

MODELS F-81, F-86
Voltage, Chassis

GENERAL ELECTRIC CO.
SOCKET VOLTAGES

Tube No.		Plate to Ground Volts D-c	Screen Grid to Ground Volts D-c	Cathode to Ground Volts D-c	Cathode Current M.A.	Heater Volts A-c
6K7	R.F. Amplifier	225	100	0	6.8	6.3
6A8	Oscillator	180	100	0	11.0	6.3
	Converter	225	100	0		
6K7	1st I.F. Amplifier	225	92	4.6	1.8	6.3
6K7	2nd I.F. Amplifier	200	92	4.0	5.6	6.3
6H6 Det. and AVC	Sig. Plate	0	....	....	....	6.3
	Delay Plate	-4.5	....	....	....
6F5	Audio Amplifier	137*	....	1.3	0.4	6.3
42	Output	237	250	14.5	34	6.3
80	Power Rectifier	....	....	Filament to ground 330	70	5.2

A-C line voltage—120 volts with transformer connected for 120-130-volt operation—no signal input—1000 ohms per volt meter-dial pointer at 530 K.C. on "B" band.

* Measured on 1000-volt scale.

Loud-speaker—Electrodynamic
Cone: Model F-81 8-inch
Model F-86 12-inch
Speaker Impedance 5.5 ohms at 400 cycles

Tuning Frequency Range
Band "B" 540-1620 kc.
Band "C" 1600-6000 kc.
Band "D" 5400-18,000 kc.

Tuning Control Drive Ratio
Fast Tuning10 to 1
Vernier Tuning55 to 1

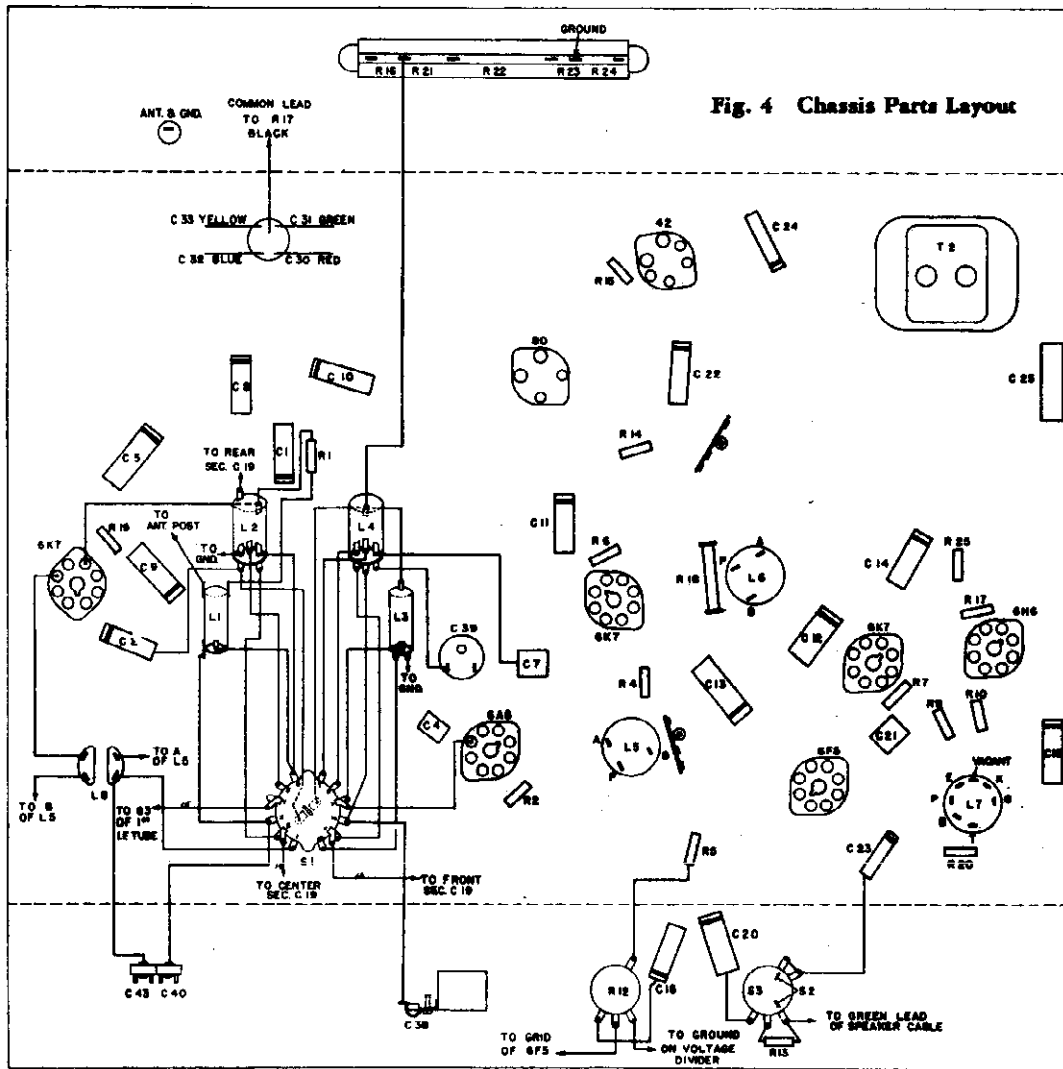


Fig. 4 Chassis Parts Layout

GENERAL ELECTRIC CO.

MODEL S F-81, F-86
Alignment, Trimmer
Socket

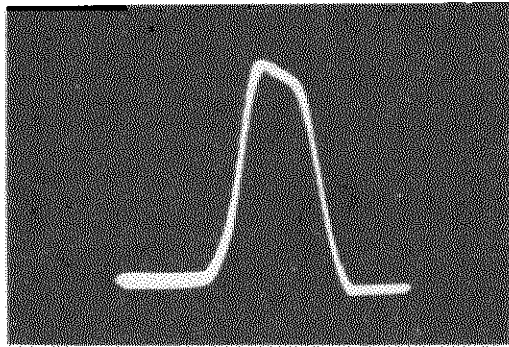


Fig. 1. Overall I.F. Curve

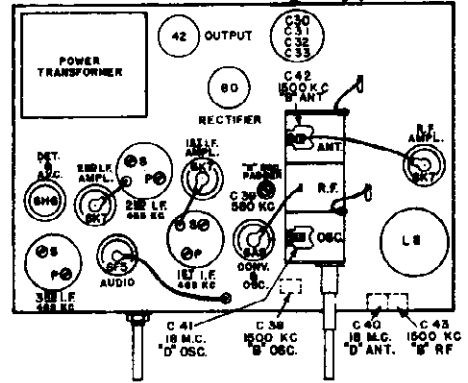


Fig. 2. Chassis Layout and Trimmer Location

ator. The grid lead should not be removed from the tube to which the input signal is applied when aligning the IF as this would remove the grid bias from the tube.

The alignment procedure is given in table form along with the trimmer location drawing, Fig. 2. A "dummy antenna" should be used in all alignments and is the capacitor or capacitor and resistor used in series with the signal generator.

Band Switch Setting	Input Frequency	Point of Input	Dummy Ant.	I.F. Alignment with Oscilloscope Trimmer	Remarks
1. Band "B"	465 K.C. Sweep	2nd I.F. Grid	.05 Mfd.	3rd I.F. Sec. (C-45) Pri. (C-44)	Gang condenser plates wide open—connect vertical input of oscilloscope to ground and the junction of R-9 and R-10 on 3rd I.F. transformer. Adjust trimmers for a single symmetrical curve of maximum amplitude. The resulting curve with input at converter grid is shown in Fig. 1.
2. Band "B"	465 K.C. Sweep	1st I.F. Grid	.05 Mfd.	2nd I.F. Sec. (C-37) Pri. (C-36)	
3. Band "B"	465 K.C. Sweep	Converter Grid	.05 Mfd.	1st I.F. Sec. (C-35) Pri. (C-34)	

I.F. Alignment with Output Meter

1. Band "B"	465 K.C. with Modulation	2nd I.F. Grid	.05 Mfd.	3rd I.F. Sec. (C-45) Pri. (C-44)	Gang condenser plates wide open—connect output meter across voice coil—keep input signal low and volume control at maximum. Adjust all trimmers in order mentioned for maximum output. Do not attempt an overall realignment after stage by stage alignment has been accomplished.
2. Band "B"	465 K.C. with Modulation	1st I.F. Grid	.05 Mfd.	2nd I.F. Sec. (C-37) Pri. (C-36)	
3. Band "B"	465 K.C. with Modulation	Converter Grid	.05 Mfd.	1st I.F. Sec. (C-35) Pri. (C-34)	

R.F. Alignment

1. Band "B"	18 M.C. with Modulation	Antenna Post	250 Mmf. 400 Ohms	Osc. (C-41) Ant. (C-40)	Close gang plates—adjust pointer to first line at left end of tuning scale.
2. Band "D"	1500 K.C. with Modulation	Antenna Post	250 Mmf. 400 Ohms	Osc. (C-38) R.F. (C-43) Ant. (C-42)	Connect output meter across voice coil—tone control on "Bass" position. The image of any "D" band signal should be heard 930 K.C. above input signal when (C-41) is on proper peak. Example: 15 M.C. image—15,930 K.C. Peak (C-40) while rocking the gang condenser.
3. Band "C"	No adjustment necessary	Antenna Post	250 Mmf. 400 Ohms	Osc. (C-39)	Peak trimmers for maximum output with a low input signal.
4. Band "B"	580 K.C. with Modulation	Antenna Post	250 Mmf. 400 Ohms	Osc. (C-39)	Adjust padder for maximum output in vicinity of 580 K.C. while rocking the gang condenser.
6. Band "B"	Repeat operation 4				

MODELS F-81, F-86
Dial Data, Notes
GENERAL ELECTRIC CO.
Power Supply

The power supply consists of an 80-type rectifier, power transformer, and the associated filter system; the speaker field acting as the filter choke.

The transformers on the "A" and "C" rating receivers have two primary taps so as to accommodate a range of voltages from 110-130 volts. As shipped from the factory the receivers have the power cord connected to the 120-130-volt tap of the transformer (black and red lead). If the normal voltage of the power supply is always below 115 volts, the connection of the power cord should be removed from the lead and soldered to the 110-120-volt tap (black and yellow lead). After changing the connection, tape the soldered joint as well as the exposed end of the unused lead. This change requires removal of the chassis from the cabinet.

Speaker

Two different types of voice coil suspensions are used in both the 8- and 12-in. speakers.

The 8-in. cone assemblies are designated as early and late production and are not interchangeable. The early production voice coil suspension is $4\frac{5}{8}$ inches between points of clamping, while the later production voice coil suspension is $2\frac{3}{4}$ inches between points of clamping.

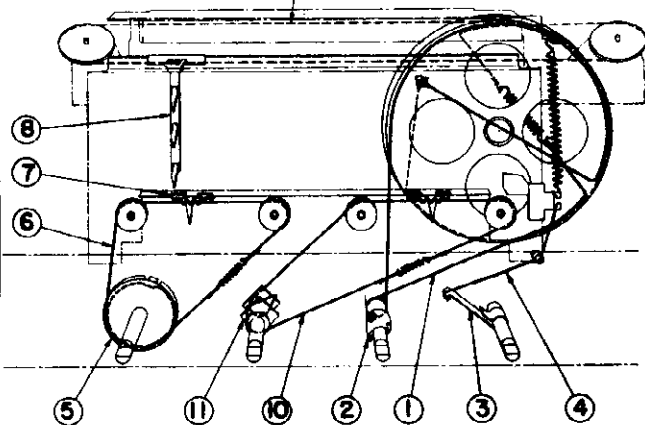
The 12-in. cone assemblies which were changed in design during production are interchangeable.

DIAL MECHANISM

The dial mechanism (Fig. 5) is rigidly mounted to the chassis by means of two brackets and four self-tapping screws. The dial pointer is operated by means of an "automatic vernier" reduction drive unit, mounted on the receiver chassis, and connected to the gang drive drum by a drive cord.

Motion imparted to the gang condenser rotor is transmitted through a series of pulleys and an interconnecting cable to the dial pointer slider which is supported on a rail in the rear of the dial scale. The following instructions should aid you in making any repairs to this mechanism.

9 Fig. 5. Dial Drive Mechanism


Tone Control

When the tone control is in the "normal position," a portion of the output voltage of the receiver is fed back through a resistor-capacitor network consisting of C-20, R-13, and R-5 to a tap on the volume control. This feedback voltage is out of phase with the input and the resulting degeneration reduces the speaker resonance boom due to pentode output, gives an extended and relatively flat response to a wide range of low frequencies, and reduces distortion arising in the audio amplifier. In the "bass" position, the tone control switch connects C-23 in series with R-20 across the diode load resistance (R-9), reducing the high frequency response. The "foreign" position of the switch shorts out capacitor C-20 and resistor R-13 from the above network and gives a frequency response best suited for short-wave reception. In the speech position, C-20 and R-13 are shorted out; C-23 is removed from the circuit, leaving R-5; thereby providing flat degeneration at all frequencies. This is the most desirable condition for the reception of programs predominating in speech. The tone control switching described can be traced on the schematic diagram shown in Fig. 3.

To Replace Pointer Cable and Drive Cable

Remove the dial scale, allowing ready access to the dial scale mechanism.

To replace the drive cord (1), set the drive drum to the relative position as shown in Fig. 5, loop the cord through the tab on the drum, then thread it down through the hole in the chassis and around the vernier drive as indicated. The other end of the cord is looped through one end of the tension spring in back of the drive drum.

To replace the wire pointer drive cord (9), set the drive drum to the relative position as shown in Fig. 5. Loop the cord through the tab on the drum, and thread it around the drive pulley and idler pulleys and back to the tension spring on the drive drum. With the gang condenser plates fully meshed, adjust the pointer (8) along the drive cord until it coincides with the end mark at the left-hand end of the scale. The scale may be slid into place to ascertain this correct position. After final adjustment is made, solder the pointer to the wire cable (9).

To Replace Tone Control Cable

Thread the cable (6) as shown in Fig. 5 around the drive pulley (5) and around the idler pulleys, fastening the ends to the tension spring. For adjustment; turn the pulley (5) to the extreme counterclockwise, setting the pointer (7) so it extends about $\frac{1}{8}$ in. over the left-hand edge of the rail. Crimp the pointer tab on the drive cable. A final adjustment of the pointer may be made by means of the drive pulley (5) with the dial scale in place.

To Replace Volume Control Cable

Thread the cable (10) around the drive pulley (11) as shown in Fig. 5. Fasten the loops of the cable into the tension spring. To adjust, turn the control to the extreme clockwise direction and set the pointer so that the right-hand side of the pointer rider coincides with the right-hand edge of the rail. Crimp the pointer tab on the drive cable. A final adjustment of this pointer may be made by adjusting the pulley (11) on the volume control shaft after the scale has been replaced.

Band and Indicator Control

The threading and assembly of the band indicator is self-explanatory from an inspection of Fig. 5.

To "Adjust Automatic Vernier" Drive

The vernier drive used on this receiver includes a planetary reduction unit equipped with a clutch which automatically changes the reduction ratio. This clutch consists of a sleeve mounted on the knob shaft. To adjust, loosen the locking screw and move the sleeve (2) axially along the shaft until the cam surface in the end of the sleeve engages with the pin in the knob shaft. This engagement should take place at a point on the cam surface as near to the stop as possible and still allow complete release of the clutch.

To Change Dial Lamps

Dial lamps are located at either end of the dial scale assembly. Remove the dial lamp bracket from the projection at the top of the dial mechanism and replace bulb. This may be accomplished without removing the chassis from the cabinet.

Coil System

L1 is the "D" band antenna coil. The "B" and "C" band antenna coils are wound on a single coil form designated as L2 in Fig. 3. The coil L3, tuned by the center section of the gang condenser C-19 and coupled to a 6K7 tube are the essential elements of an R.F. stage, used only on the "B" band. L3 and L4 are the oscillator coils for the "D," "C," and "B" bands respectively. The antenna secondary and oscillator plate coils on the next lower frequency band to the one in use are shunted out by the wave switch contacts which are connected to C-2 and the B+ lead respectively.

The various contact terminals of the wave-change switch are numbered from 1 to 16 to facilitate the tracing of the circuit to the switch.

GENERAL ELECTRIC CO.

MODELS F-81, F-86
Parts

Stock No.	Description	List Price	Stock No.	Description	List Price
*RB-026	BOARD—Ant. and gnd. terminal board...	\$0.10	*RS-200	SOCKET—8-pin Tube Socket (Pkg. of 5)	.75
*RB-040	BOARD—Terminal Board (3 lugs)	.10	RS-215	SOCKET—6-prong Tube Socket (Pkg. of 5)	.60
*RB-139	BRACKET—Gang condenser mtg. brackets	.15	RS-217	SOCKET—4-prong Glass Tube Socket (Pkg. of 5)	.50
RC-003	CAPACITOR—.001 Mfd., 200 V. Paper (C-23) (Close Tolerance)	.25	RS-350	SWITCH—Tone control and Power Switch (S-2, S-3)	1.10
*RC-017	CAPACITOR—.0045 Mfd., 200 V. Paper (C-1)	.25	RS-351	SWITCH—Band Change Switch (S-1)	1.30
*RC-023	CAPACITOR—.005 Mfd., 600 V. Paper (C-18)	.25	RT-0810	TRANSFORMER—Power Transformer, 110-130 volts, 50/60 cycles (T-2)	4.75
*RC-042	CAPACITOR—.01 Mfd., 1000 V. Paper (C-2, C-22, C-24)	.30	RT-0811	TRANSFORMER—Power Transformer Universal 50/60 cycles (T-2)	8.50
*RC-080	CAPACITOR—.02 Mfd., 400 V. Paper (C-15)	.25	RT-0812	TRANSFORMER—Power Transformer 110-130 V., 25/60 cycles (T-2)	8.00
*RC-091	CAPACITOR—.05 Mfd., 400 V. Paper (C-8, C-9, C-10, C-11, C-14)	.30	RT-233	TRANSFORMER—1st or 2nd IF Transformer	1.50
*RC-123	CAPACITOR—.01 Mfd., 400 V. Paper (C-12, C-20)	.35	RT-243	TRANSFORMER—3rd IF Transformer	1.60
*RC-150	CAPACITOR—.25 Mfd., 400 V. Paper (C-5, C-13)	.35	RV-030	VOLUME CONTROL—2 megohm control tapped at 5,000 ohms	.80
*RC-213	CAPACITOR—.50 Mmf., Mica (C-4)	.25	RW-014	WINDOW—Escutcheon Window and Rubber Mounting	.45
*RC-223	CAPACITOR—.75 Mmf., Mica (C-17)	.25	*RW-101	WASHER—Felt Washer for Control Shafts (Pkg. of 10)	.45
*RC-259	CAPACITOR—250 Mmf., Mica (C-21)	.30	RX-021	ASSEMBLY—Chassis Mounting Assembly	.10
*RC-336	CAPACITOR—1170 Mmf., Mica (C-7)	.30		SPEAKER ASSEMBLY F-81	
RC-569	CAPACITOR—12 Mfd., 450 V.; 8 Mfd., 400 V.; 8 Mfd., 350 V.; 10 Mfd., 25 V. dry electrolytic (C-30, C-31, C-32, C-33)	2.20	RC-924	CONE—8-in. Cone and Voice Coil Assembly (early production)	.90
*RC-618	CAPACITOR—"B" band oscillator trimmer (5-45 Mmf.) (C-38)	.25	RC-927	CONE—8-in. Cone and Voice Coil Assembly (late production)	.90
*RC-632	CAPACITOR—Double trimmer (3-40 Mmf.) (C-40, C-43)	.25	*RC-990	CLAMP—Voice Coil Spider Clamp (early production)	.05
*RC-634	CAPACITOR—"B" band padder (350-550 Mmf.) (C-39)	.35	RC-1967	CLAMP—Voice Coil Spider Clamp (late production)	.05
RC-635	CAPACITOR—Double trimmers, 1st or 2nd I.F. transformer (C-34, C-35, C-36, C-37)	.45	*RP-015	PLUG—Male speaker plug	.20
*RC-637	CAPACITOR—Double trimmer, 3rd I.F. (C-44, C-45, C-16)	.60	RS-058	SPEAKER—8-in. Speaker (complete)	6.00
RC-718	CONDENSER—3-gang tuning condenser (C-19) (Includes trimmers C-41, C-42)	4.20	*RS-416	SPRING—Voice Coil Leads Spring (Pkg. of 2)	.10
*RC-755	CAPACITOR—Line capacitor, .01-.01 Mfd., 250 V. A-C (C-25)	.40	RT-421	TRANSFORMER—Output Transformer	1.30
RC-849	CABLE—Speaker cable and plug	.55		SPEAKER ASSEMBLY F-86	
*RC-863	CORD—Power cord and plug	.55	RC-925	CONE—12-in. Cone and Voice Coil Assembly	1.25
RC-992	CUSHION—Gang condenser mtg. cushions (Pkg. of 3)	.10	*RC-991	CLAMP—12-in. Cone Spider Clamp and Screw	.05
RD-011	DRIVE—Vernier drive mechanism	1.55	*RP-015	PLUG—Male Speaker Plug	\$0.20
RE-016	ESCUTCHEON—Escutcheon plate	2.05	RS-057	SPEAKER—12-in. Speaker (complete)	6.80
*RF-002	FOOT—Chassis mtg. foot	.20	*RS-416	SPRING—Voice Coil Leads Spring (Pkg. of 2)	.10
*RF-008	FOOT—Chassis mtg. foot (red rubber)	.20	RT-421	TRANSFORMER—Output Transformer (T-1)	1.30
*RG-001	GRID CAP—Control grid clip (Pkg. of 5)	.10		DIAL SCALE MECHANISM	
RK-017	KNOB—Control knob (plain) (Pkg. of 5)	.40	RB-155	BRACKET—Band Change Indicator Bracket	.05
RK-018	KNOB—Control knob (band selector and tone control) (Pkg. of 5)	.40	RB-604	BUSHING—Volume Control Cable Drive Bushing	.10
*RL-035	COIL—Ant. coil band "D" (L-1)	.70	RC-846	CABLE—Volume Control Cable (Pkg. of 5)	.40
*RL-036	COIL—Ant. coil "B" and "C" band (L-2)	1.10	RC-847	CABLE—Tone Control Cable (Pkg. of 5)	.40
*RL-131	COIL—RF coil "B" band (L-8)	.75	RC-848	CABLE—Condenser Drum Drive Cable and Pointer Cable (Pkg. of 5)	.90
*RL-237	COIL—Osc. coil band "D" (L-3)	.70	*RD-013	DRUM—Condenser Drive Drum	.35
*RL-238	COIL—Osc. coil "B" and "C" band (L-4)	1.00	RD-053	DIAL—Dial Scale	\$1.40
RQ-1231	RESISTOR—68 ohms, ½ W. Carbon (R-25) (Pkg. of 5)	.70	RL-920	LAMP—Dial Lamp, .25 amp., 6.3 V. (Pkg. of 10)	1.50
RQ-1255	RESISTOR—680 ohm, ½ W. Carbon (R-7) (Pkg. of 5)	.70	*RP-049	PULLEY—Idler Pulley for Cond. Drive Cable	.15
RQ-1267	RESISTOR—2200 ohm, ½ W. Carbon (R-4) (Pkg. of 5)	.70	RP-073	POINTER—Volume or Tone Control Pointers (Pkg. of 5)	.10
RQ-1269	RESISTOR—2700 ohm, ½ W. Carbon (R-6) (Pkg. of 5)	.70	RP-075	PULLEY—Idler Pulley for Tone and Volume Control Cords (Pkg. of 6)	.20
RQ-1275	RESISTOR—4700 ohm, ½ W. Carbon (R-8) (Pkg. of 5)	.70	RP-076	PULLEY—Tone Control Drive Pulley	.15
RQ-1291	RESISTOR—22,000 ohm, ½ W. Carbon (R-5) (Pkg. of 5)	\$0.70	RP-077	POINTER—Dial Scale Pointer Assembly (Pkg. of 5)	.90
RQ-1299	RESISTOR—47,000 ohm, ½ W. Carbon (R-1, R-2, R-19) (Pkg. of 5)	.70	RS-218	SOCKET—Lamp Socket Assembly	.10
RQ-1303	RESISTOR—68,000 ohm, ½ W. Carbon (R-11, R-13) (Pkg. of 5)	.70	RS-401	SPRING—Tuning Drive Cord Tension Spring (Pkg. of 5)	.10
RQ-1307	RESISTOR—100,000 ohm, ½ W. Carbon (R-17) (Pkg. of 5)	.70	RS-426	SPRING—Volume or Tone Control Drive Cord Tension Spring	.10
RQ-1315	RESISTOR—220,000 ohm, ½ W. Carbon (R-9, R-14, R-20) (Pkg. of 5)	.70	RX-023	ASSEMBLY—Band Indicator Assembly (Includes cord, pointer, and spring)	.20
RQ-1323	RESISTOR—470,000 ohm, ½ W. Carbon (R-15) (Pkg. of 5)	.70		* Used on previous receivers.	
RQ-1331	RESISTOR—1.0 Megohm, ½ W. Carbon (R-10) (Pkg. of 5)	.70		(Prices subject to change without notice)	
RQ-1467	RESISTOR—2200 ohms, 1 W. Carbon (R-18)	.20			
RR-725	RESISTOR—Tapped bleeder resistor (R-16, R-21, R-22, R-23, R-24)	1.00			
RS-140	SHIELD—"B" Band RF Transformer Shield Can	.20			
RS-172	SHIELD—1st, 2nd, or 3rd I.F. Transformer Shield	.25			

MODEL E-115
Colorama Data
Dial Data, Voltage

GENERAL ELECTRIC CO.

GENERAL INFORMATION

The model E-115 is a three-band superheterodyne employing eleven G.E. Metal Tubes described above. It incorporates two stages of I.F., push-pull output, three-point tone control, and a high and low volume compensated volume control. Full wave rectification is obtained from two 5W4's connected as half-wave rectifiers. L1 is the "D" band antenna coil. L2 is the "B" and "C" band antenna coil. The rear section of the gang condenser, L3, and a 6K7 tube are the essential elements of an R.F. stage, used only on the "B" band. L4 and L5 are the oscillator coils for the "D", "B", and "C" bands respectively. The antenna secondary and oscillator plate coils on the next lower frequency band to the one in use are shunted out by the wave switch contacts which are connected to C3 and B4.

Colorama Tuning

This receiver is equipped with a novel tuning device which indicates the point of exact resonance by the color of the dial illumination. When no signal is tuned-in, the dial illumination is red, but as the receiver is tuned, a smooth change to green occurs. Powerful stations will produce the darkest green color. Weak stations may only change the dial illumination to pink. The point at which any station is exactly in tune is indicated by the greatest color change obtainable. The colored light is produced by a red and a green pilot bulb mounted behind the dial scale. These are controlled by a saturable reactor in a circuit which is shown in the schematic diagram, Fig. 2. The two bulbs are placed in series across one of the secondaries on the power transformer. In shunt with the green bulb is a reactor whose impedance is varied by a d-c coil wound on the same core. The plate current of the AVC controlled tubes flows through the d-c coil. At a condition of no-signal, the bias on the AVC controlled tubes is at minimum and their plate current is at maximum causing saturation of the reactor, which in turn shunts out and nearly extinguishes the green bulb. This causes most of the a-c supply voltage to be impressed across the RED bulb and its parallel resistor. At no signal, then, the dial is deepest red. When a station is tuned-in, the above conditions are reversed and the GREEN bulb is illuminated brightly. The impedance of the reactor changes in exact relationship with the incoming signal resulting in a smooth change from red to green or from green to red.

Phase Inverter

A 6C5, used as a phase-inverter, makes it possible to use push-pull output without the use of an interstage transformer. The audio signal from the volume control is impressed on the grid of the 6C5 audio amplifier. A portion of the 6C5 output is taken from a tap on one of the 6F6 grid resistors, and impressed on the grid of the phase inverter. (The ratio of R-19 and R-20 is chosen so that the excitation on the grid of the phase inverter is equal to that applied to the grid of the 6C5 audio amplifier.) Thus, the input signal to one of the 6F6's passes through two tubes while the input to the other 6F6 passes through one tube. As a result, the excitation on the 6F6 grids is 180 degrees out of phase, which is the requirement for push-pull operation.

ADJUSTMENT OF DIAL MECHANISM

The dial mechanism, (Fig. 4) is mounted to the chassis by means of two brackets and four self-tapping screws. Motion is imparted to the gang condenser rotor through a series of pulleys and an interconnecting cable to the dial pointer slider which is supported on a rail above the dial scale.

To Replace Drive Cable

Rotate the drive drum (14) counter-clockwise until the gang condenser plates are fully open. Place the end of the cable having an eyelet in slot (A). Thread the cable as shown in Fig. 4 making certain that the cable passes over the pin (B) and runs along the correct grooves, the looped end hooking over the tension spring (16). Check the position of the drive wheel (14) on the condenser shaft to make sure that the cable coming off the right-hand roller pulley lines up with the groove in the drive pulley. Also, as the condenser plates become fully meshed, the drive wheel (14) should just meet the bushing (D) of the reduction drive unit (13). With the drive wheel in this position, place the pointer on the rail (E) and, with the tip of the pointer (11) on the extreme left-hand dial scale division of Broadcast band, crimp the pointer tab on the drive cable.

To Adjust Pointer or Scale Calibration

Three positions of the dial pointer cable are provided on the drive drum (14) to adjust the dial pointer up or down scale. The position shown in Fig. 4 with the cable over pin (B) is the medium position. Changing the cable to the position between pins (B) and (C) moves the pointer down scale. The position below the pin (C) moves the pointer up scale from the medium position. With the gang plates closed, set the pointer at the extreme left-hand dial scale marking on the Broadcast band.

To Replace Scale

Remove the band change cable (12) by unhooking it from the fork (F) on bracket (3). Remove the end support bracket (8) held by a single self-tapping screw and withdraw the scale assembly from its housing. Replace the end caps (9) and (6) on the new scale and reassemble. Before reattaching the band change cable to the fork (F) the tension spring (7) should be given two full turns to provide proper tension for the cable.

To Adjust Rotation of Scale

The bracket arm (8) may be moved up or down by means of the set screw to give the correct position of the scale divisions with respect to the dial pointer. The pointer tip should slightly overlap the scale divisions.

To Change Dial Lamps

Lift the lamp bracket (17) from the housing (20) to which it is clipped. With the lamp bracket laid back horizontally, the lamps may be replaced.

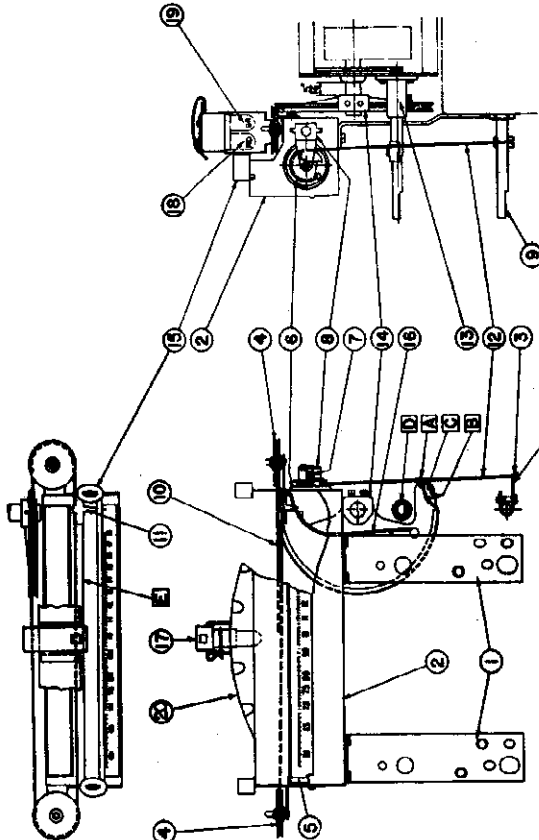


Fig. 4. Dial Mechanism

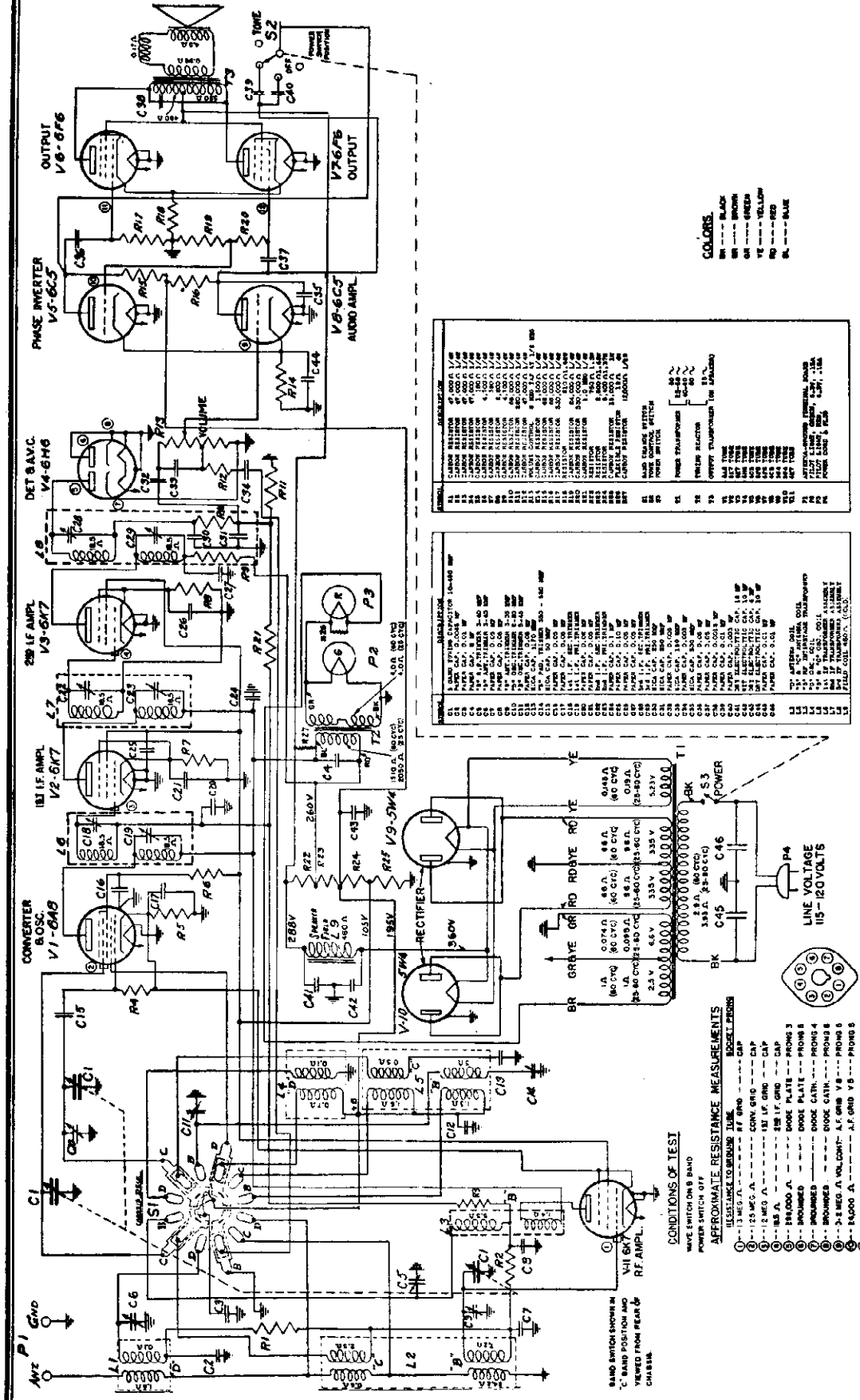
SOCKET VOLTAGES

Tube	Cathode to Ground Volts DC	Screen Grid to Cathode Volts DC	Plate to Grid Volts DC	Cathode Current M.A.	Heater Volts A.C.
Oscillator	.....	.....	100	10.0	6.3
Converter	8.5	98	285	8.5	6.3
6K7 1st I.F.	3.0	108	285	3.1	6.3
6K7 2nd I.F.	6.5	108	285	.....	6.3
6H6 Det. AVC	.....	.....	95	1.3	.....
6C5 1st A.P.	6.4	.....	280	43	6.3
6F6's Output	18	300	95	1.3	6.3
6C9 Inverter	6.4	.....	235 A-c EACH	65 EACH	5.0
6W4's Rectifiers	PH, to grid. 240	.....	285	8.5	6.3
6K7 R.F.	9.0	108	.....	.....	.....

AC line voltage 117—no signal input—1000 ohms per volt meter—dial pointer at 850 K.C.

GENERAL ELECTRIC CO.

MODEL E-11
Schematic
Resistance



COLORS:
BR --- BLACK
BN --- BROWN
OR --- ORANGE
YE --- YELLOW
RD --- RED
BL --- BLUE

RESISTANCE	RESISTANCE	RESISTANCE	RESISTANCE
R1	100K	R18	100K
R2	100K	R19	100K
R3	100K	R20	100K
R4	100K	R21	100K
R5	100K	R22	100K
R6	100K	R23	100K
R7	100K	R24	100K
R8	100K		
R9	100K		
R10	100K		
R11	100K		
R12	100K		
R13	100K		
R14	100K		
R15	100K		
R16	100K		
R17	100K		

INDUCTOR	INDUCTOR	INDUCTOR	INDUCTOR
L1	100UH	L4	100UH
L2	100UH	L5	100UH
L3	100UH	L6	100UH
L4	100UH	L7	100UH
L5	100UH		
L6	100UH		
L7	100UH		

Electrical Specifications

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Watts)
A	115-120	60	120
C	115-120	25-60	120

Fig. 2. Schematic Circuit Diagram

540-1660 K.C. Tuning Control Drive Ratio
 1600-6000 K.C. Fast tuning
 5400-18000 K.C. Vernier tuning
 Cone diameter.....12 inches
 Voice coil impedance—5.5 ohms at 400 cycles

Tuning Frequency Range

Band	Frequency Range
Band "B"	540-1660 K.C.
Band "C"	1600-6000 K.C.
Band "D"	5400-18000 K.C.
Intermediate Frequency	465 K.C.

MODEL E-115
Chassis Wiring

GENERAL ELECTRIC CO.

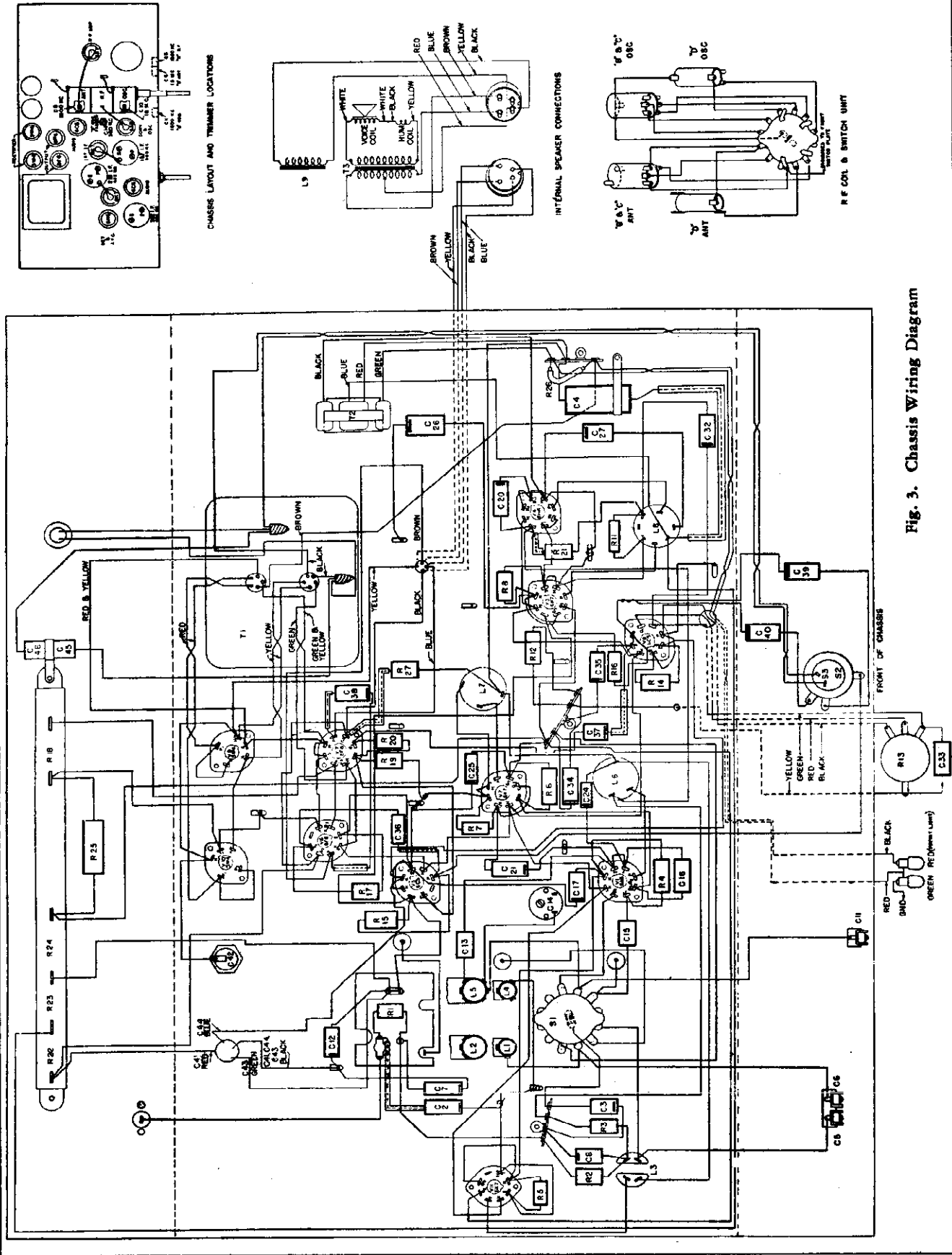


Fig. 3. Chassis Wiring Diagram

GENERAL ELECTRIC CO.

MODEL E-115
Alignment, Socket
Trimmers, Notes

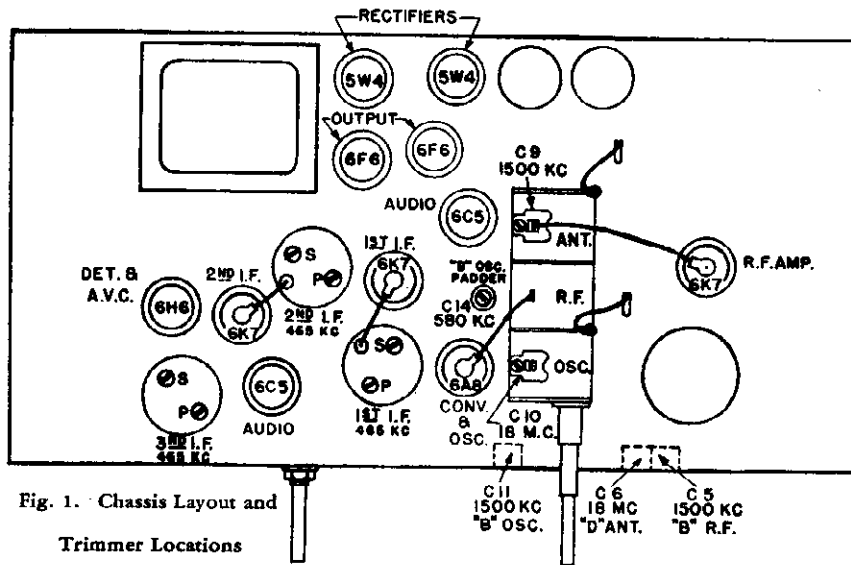


Fig. 1. Chassis Layout and Trimmer Locations

To realize all the performance built into these receivers at the factory, alignment using cathode ray equipment is to be preferred.

On the "D" band (5400 to 18,000 K.C.), the oscillator operates on the LOW frequency side of the incoming signal; therefore, adjust the oscillator trimmer until the second peak is reached as the trimmer is INCREASED in capacity. When the correct adjustment is made, it will be possible to tune the image of any signal on the "D" band 930 K.C. HIGHER than the signal if the input is sufficiently high. Example: The image of 15 M.C. should be heard at 15,970 K.C.

The alignment procedure is given in table form on page 3. The "Dummy Antenna" is the capacitor or capacitor and resistor used in series with the signal generator antenna lead.

ALIGNMENT PROCEDURE
IF ALIGNMENT WITH OSCILLOSCOPE

Band Switch Setting	Input Frequency	Point of Input	Dummy Ant.	Trimmer	Remarks
1 Band "B"	465 K.C. Sweep	1st IF Grid	.05 MFD or Larger	3rd IF Sec. (C-28) 3rd IF Pri. (C-29)	Gang condenser plates closed—connect audio input of oscilloscope to ground and to the junction of R-21, R-11—adjust for a single symmetrical curve of maximum amplitude.
2 Band "B"	465 K.C. Sweep	1st IF Grid	.05 MFD or Larger	2nd IF Sec. (C-22) 2nd IF Pri. (C-23)	
3 Band "B"	465 K.C. Sweep	Converter Grid	.05 MFD or Larger	1st IF Sec. (C-18) 1st IF Pri. (C-19)	

IF ALIGNMENT WITH OUTPUT METER

Band Switch Setting	Input Frequency	Point of Input	Dummy Ant.	Trimmer	Remarks
1 Band "B"	465 K.C. with 400-cycle modulation	1st IF Grid	.05 MFD or Larger	3rd IF Sec. (C-28) 3rd IF Pri. (C-29)	Gang condenser plates closed—connect output meter across Voice Coil—keep input signal low and volume control on as far as possible. Adjust all trimmers for maximum output.
2 Band "B"	465 K.C. with 400-cycle modulation	1st IF Grid	.05 MFD or Larger	2nd IF Sec. (C-22) 2nd IF Pri. (C-23)	
3 Band "B"	465 K.C. with 400-cycle modulation	Converter Grid	.05 MFD or Larger	1st IF Sec. (C-18) 1st IF Pri. (C-19)	

RF ALIGNMENT

Band Switch Setting	Input Frequency	Point of Input	Dummy Ant.	Trimmer	Remarks
1 Band "B"	No adjustments necessary	Antenna Post	250 MMF in Series	Oscillator (C-11) RF Ant. (C-5) Ant. (C-9)	Close gang plates—adjust pointer to first line at left end of tuning scale. Connect output meter across voice coil—tone control on "Bass" position—set osc. trimmer. Rock gang condenser when adjusting the antenna trimmer.
2 Band "D"	18 M.C. with 400-cycle modulation	Antenna Post	250 MMF in Series	Oscillator (C-11) RF Ant. (C-5) Ant. (C-9)	Peak trimmers for max. output with a low input signal.
3 Band "C"	1500 K.C. with 400-cycle modulation	Antenna Post	250 MMF in Series	Osc. Pad (C-14)	Adjust for maximum output in vicinity of 580 KC while rocking the gang.
4 Band "B"	580 K.C. with 400-cycle modulation	Antenna Post	250 MMF in Series	Oscillator (C-11)	
5 Band "B"	1600 K.C. with 400-cycle modulation	Antenna Post	250 MMF in Series	Oscillator (C-11)	

MODEL E-115

Parts

GENERAL ELECTRIC CO.

REPLACEMENT PARTS

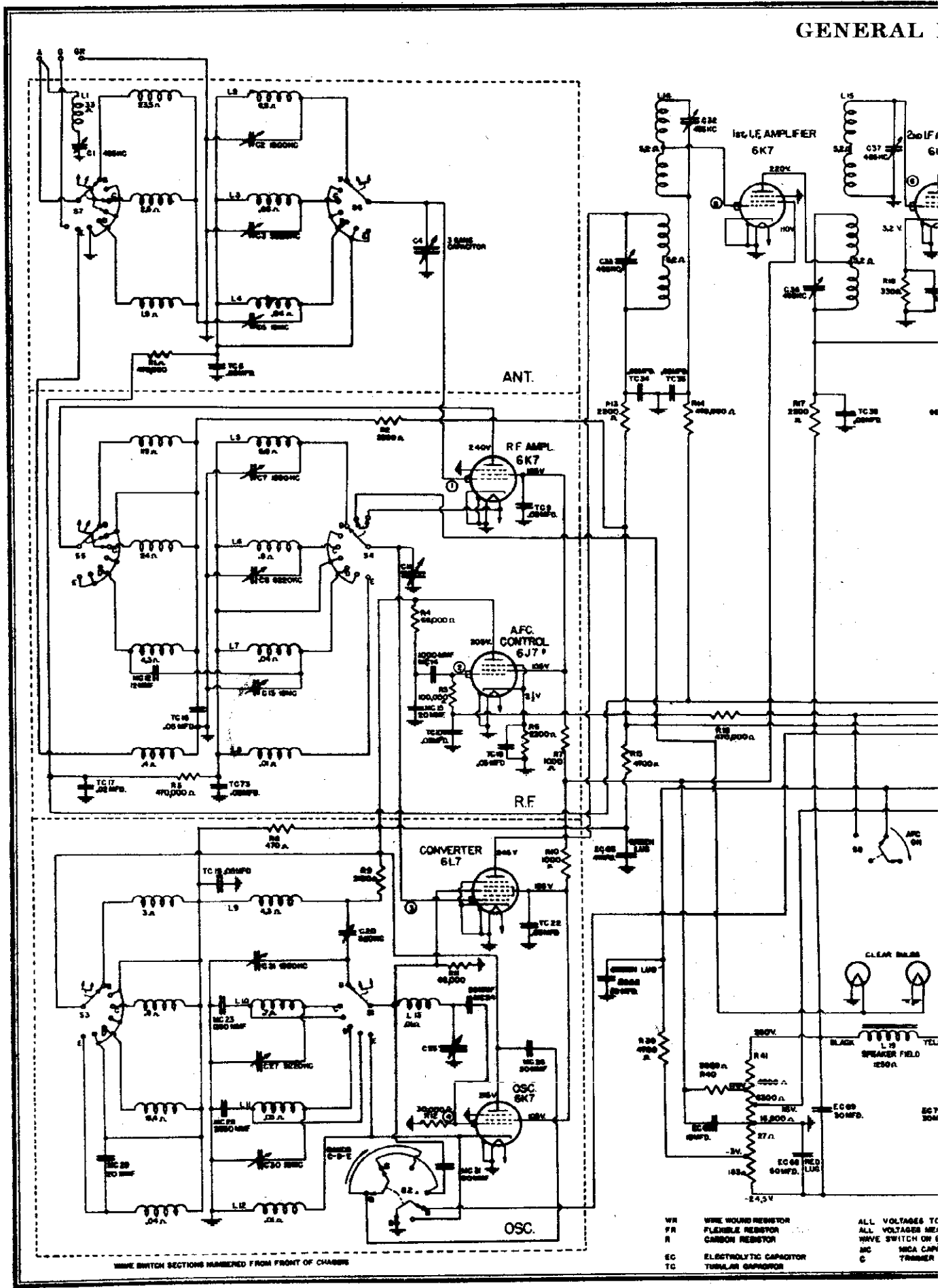
INSIST ON GENUINE FACTORY-TESTED PARTS, WHICH MAY BE PURCHASED FROM AUTHORIZED DEALERS

Stock No.	Description	List Price	Stock No.	Description	List Price
*RB-023	BOARD—Terminal Board (Near Electrolytic Cond.)	\$0.10	RC-195	CAPACITOR—.0015 Mfd. 1000 V. Paper (C-38)	\$0.25
*RB-026	BOARD—Ant. Ground Terminal Board	.10	RC-197	CAPACITOR—.005 Mfd. 200 V. Paper (C-32)	.25
*RB-040	BOARD—Terminal Board (4 Lugs)	.10	*RC-109	CAPACITOR—2 Mfd. 100 V. Paper (C-4)	.75
*RB-053	BOARD—Terminal Board (3 Lugs) Between 1st and 2nd IF Transformer	.10	*RC-218	CAPACITOR—50 Mmfd. Mica Capacitor (C-15)	.25
*RB-139	BRACKET—Gang Condenser Mtg. Brackets	.15	*RC-242	CAPACITOR—150 Mmf. Mica (C-33)	.25
*RC-014	CAPACITOR—.003 Mfd. 200 V. Paper (C-34)	.25	*RC-261	CAPACITOR—250 Mmfd. Mica (C-30, C-31)	.25
RC-015	CAPACITOR—.003 Mfd. 400 V. Paper (C-40)	.25	*RC-298	CAPACITOR—500 Mmf. Mica (C-35)	.30
*RC-017	CAPACITOR—.0045 Mfd. 200 V. Paper (C-2)	.25	RC-338	CAPACITOR—Mica "C" Band Padder 1170 Mmf. (C-13)	.30
RC-032	CAPACITOR—.01 Mfd. 200 V. Paper (C-3)	.25	*RC-405	CAPACITOR—10 Mfd. 480 V. Wet Electrolytic (C-42)	1.15
*RC-040	CAPACITOR—.01 Mfd. 400 V. Paper (C-39)	.35	RC-568	CAPACITOR—Dry Electrolytic 18 Mmfd. 4 Mfd., 10 Mfd. (C-41, C-43, C-44)	2.25
*RC-046	CAPACITOR—.02 Mfd. 200 V. Paper (C-20)	.25	*RC-618	CAPACITOR—"B" Band Osc. Trimmer (5-45 Mmf.) (C-11)	.25
*RC-072	CAPACITOR—.05 Mfd. 200 V. Paper (C-7, C-8, C-17, C-21, C-26)	.25	RC-632	CAPACITOR—Double "B" and "D" Band Trimmer Capacitors 3-40 Mfd. (C-5, C-6)	.25
RC-091	CAPACITOR—.05 Mfd. 400 V. Paper (C-12, C-16, C-27, C-36, C-37)	.30	RC-634	CAPACITOR—"B" Band Padding Capacitor 350-550 Mmf. (C-14)	.35
*RC-096	CAPACITOR—.1 Mfd. 200 V. Paper (C-25)	.30	RC-637	CAPACITOR—Double Trimmers 3rd IF Transformer (C-28, C-29)	.60
*RC-123	CAPACITOR—.1 Mfd. 400 V. Paper (C-24)	.35	RC-638	CAPACITOR—Double Trimmers 1st or 2nd IF Transformer (C-18, C-19, C-22, C-23)	.50
RC-715	CONDENSER—3 Gang Tuning Condenser (10-450 Mmf.) (Trimmed C-9, C-10) (C-1)	\$5.25	*RS-204	SOCKET—5 Pin Socket (Pkg. of 5)	\$0.75
*RC-755	CAPACITOR—Line Capacitors .01-.01 Mfd. 250 V. AC (C-45, C-46)	.40	RS-334	SWITCH—Band Change Switch (S-1)	1.25
RC-824	CABLE—Speaker Cable Complete with Plug	.55	RS-335	SWITCH—Tone Control and Power Switch (S-2, S-3)	1.00
*RC-860	CORD—Power Cord	.65	*RS-423	SPRING—Knob Spring "Push-on" Type (Pkg. of 10)	.25
RC-977	CUSHION—Gang Cond. Mtg. Cushions (Pkg. of 3)	.15	RT-093	TRANSFORMER—Power Transformer 115-120 V. 60 Cycles (T-1)	5.95
*RE-011	ESCUTCHEON—Escutcheon Plate (with 3/16" Screws)	1.25	RT-095	TRANSFORMER—Power Transformer 115-120 V. 25/60 Cycles (T-1)	10.95
*RF-006	FOOT—Chassis Mtg. Foot (white rubber)	.30	RT-231	TRANSFORMER—1st or 2nd IF Transformer (complete) (L-6, C-18, C-19) or (L-7, C-22, C-23)	1.50
*RF-008	FOOT—Chassis Mtg. Foot (red rubber)	.20	RT-232	TRANSFORMER—3rd IF Transformer (L-8, C-28, C-29)	1.75
*RG-001	GRID CAP—Control Grid Clip (Pkg. of 5)	.10	RV-020	VOLUME CONTROL—2 Megohm Volume Control (R-13)	.80
*RK-004	KNOB—Control Knob (push-on) (Pkg. of 5)	.40	RW-012	WINDOW—Escutcheon Window	.50
*RK-005	KNOB—Tone Control Knob (Pkg. of 5)	.70	*RW-101	WASHER—Felt washer for Control Shafts (Pkg. of 10)	.45
RL-035	COIL—Antenna Coil Band "D" (L-1)	.70	SPEAKER ASSEMBLY		
RL-036	COIL—Antenna Coil "B" and "C" (L-2)	1.15	*RC-910	CONE—12-in. Type Cone and Voice Coil	1.45
RL-131	COIL—RF Coil "B" Band (L-3)	.70	*RC-991	CLAMP—12-in. Cone Spider Clamp and Screw	.05
RL-237	COIL—Osc. Coil Band "D" (L-4)	.70	*RP-040	PLUG—Male Speaker Plug	.20
RL-238	COIL—Osc. Coil "B" and "C" Band (L-5)	1.00	RP-063	PLUG—Female Speaker Plug (includes 1 plug, 4 contacts, 1 eyelet, 1 washer)	.20
RL-315	REACTOR—Colorama Tuning Reactor 25 Cycle (T-2)	2.75	RS-041	SPEAKER—12-in. Type Speaker (complete with output transformer)	10.00
RL-316	REACTOR—Colorama Tuning Reactor 60 Cycle (T-2)	2.25	*RS-416	SPRING—Voice Coil Leads Spring (Pkg. of 2)	.10
RQ-041	RESISTOR—180 ohm 1/4 watt Carbon (R-5) (Pkg. of 5)	.60	*RT-401	TRANSFORMER—Output Transformer (T-3)	1.90
RQ-049	RESISTOR—390 ohm 1/4 watt Carbon (R-7) (Pkg. of 5)	.60	DIAL MECHANISM		
*RQ-063	RESISTOR—1,500 ohm 1/4 watt Carbon (R-14) (Pkg. of 5)	.60	*RB-137	BRACKET—Dial Mask and Reflector Box Support Bracket (1)	.20
*RQ-067	RESISTOR—2,900 ohm 1/4 watt Carbon (R-8) (Pkg. of 5)	.60	RB-151	BRACKET—Lamp Bracket Assembly (17)	.05
*RQ-075	RESISTOR—4,700 ohm 1/4 watt Carbon (R-6, R-9) (Pkg. of 5)	.60	RB-152	BRACKET—Band Change Bracket (3)	.05
RQ-092	RESISTOR—24,000 ohm 1/4 watt Carbon (R-19) (Pkg. of 5)	.60	RB-514	BOX—Scale Housing Box (2)	.70
*RQ-099	RESISTOR—47,000 ohm 1/4 watt Carbon (R-1, R-2, R-3, R-4, R-12) (Pkg. of 5)	.60	*RC-817	CABLE—Drive Cable (10) (Pkg. of 5)	.40
*RQ-103	RESISTOR—68,000 ohm 1/4 watt Carbon (R-10, R-15, R-16) (Pkg. of 5)	.60	*RC-818	CABLE—Band Change Cable (12) (Pkg. of 5)	.40
*RQ-115	RESISTOR—220,000 ohm 1/4 watt Carbon (R-11) (Pkg. of 5)	.70	*RC-993	CUSHION—Rubber Buffer Cushion (Dial) (15) (Pkg. of 2)	.10
*RQ-119	RESISTOR—330,000 ohm 1/4 watt Carbon (R-17, R-20) (Pkg. of 5)	.70	*RC-994	CAP—Scale Cap (Free end) (5)	.10
*RQ-131	RESISTOR—1.0 megohm 1/4 watt Carbon (R-21) (Pkg. of 5)	.70	*RC-995	CAP—Scale Cap (pulley end) (6)	.10
RQ-285	RESISTOR—12,000 ohm 1/4 watt Carbon (R-27) (Pkg. of 5)	.60	*RD-035	DRIVE—Tuning Condenser Reduction Drive Assembly (13)	1.10
*RQ-487	RESISTOR—15,000 ohm 1 watt Carbon (R-25) (Pkg. of 5)	1.00	RD-048	DIAL—Slide Rule Dial Scale	.65
RR-317	RESISTOR—19 ohm 4 watt Flexible Resistor (R-26)	.20	RL-908	LAMP—Colorama Tuning Green Lamp (19) (P-2) (Pkg. of 10)	1.50
RR-724	RESISTOR—Tapped Bleeder Resistance (R-18, R-22, R-23, R-24)	1.00	RL-909	LAMP—Colorama Tuning Red Lamp (18) (P-3) (Pkg. of 10)	1.50
RS-140	SHIELD—"B" Band RF Transformer Shield Can	.20	*RP-047	POINTER—Dial Pointer (Pkg. of 5) (11)	.25
RS-167	SHIELD—Shield Can for 1st or 2nd IF Transformer	.20	*RP-048	PULLEY—Gang Drive Pulley (14)	.35
RS-168	SHIELD—Shield Can for 3rd IF Transformer	.20	*RP-049	PULLEY—Drive Cord Idler Pulley (4)	.15
*RS-200	SOCKET—8 Pin Tube Socket (Pkg. of 5)	.75	RR-906	REFLECTOR—Lamp Reflector (20)	.50
			*RS-418	SPRING—Gang Drive Pulley Spring (16)	.05
			RS-424	SPRING—Dial Scale Spring (7)	.05
			RS-608	SUPPORT—Dial Scale Spring Support (8)	.05

* Indicates parts used on previous receivers.

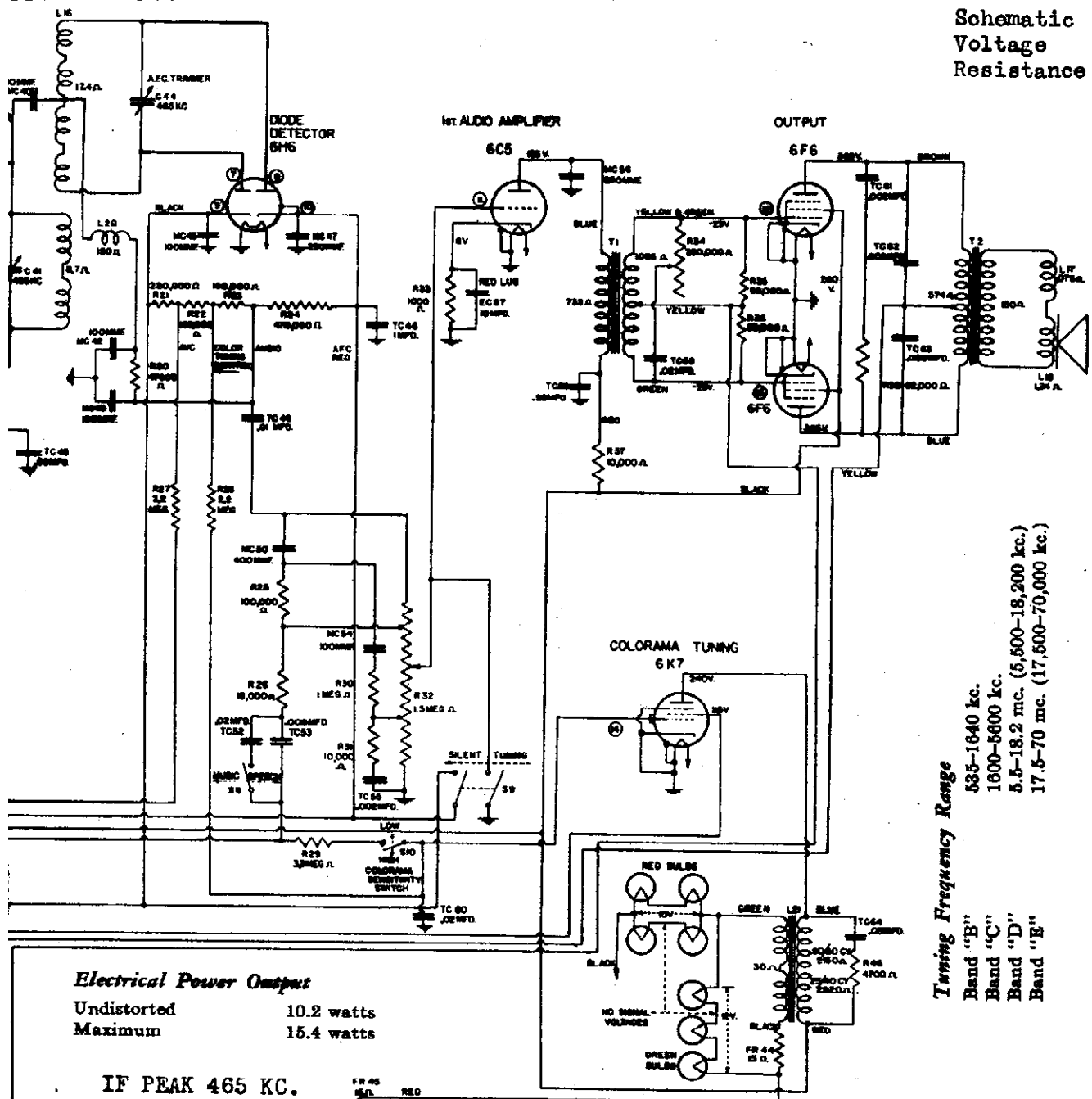
(Prices subject to change without notice)

GENERAL



ELECTRIC CO.

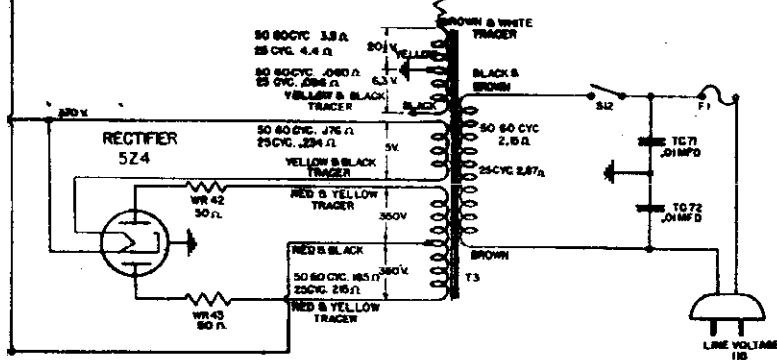
MODEL E-126
Schematic
Voltage
Resistance



Tuning Frequency Range
 Band "B" 53.5-1640 kc.
 Band "C" 1800-5800 kc.
 Band "D" 5.5-18.2 mc. (5,500-18,200 kc.)
 Band "E" 17.5-70 mc. (17,500-70,000 kc.)

Electrical Power Output
 Undistorted 10.2 watts
 Maximum 15.4 watts

IF PEAK 465 KC.



- APPROX. RES. TO GND.
- ① 25 MEG. Ω BY GND----- CAP
 - ② 34,000 Ω AFC OFF AFC GRID----- CAP
 - ③ 34,000 Ω AFC ON----- CAP
 - ④ 25 MEG. Ω----- CONN. GRID----- CAP
 - ⑤ 4700 Ω----- CONN. GRID----- CAP
 - ⑥ 2.5 MEG. Ω----- INT. LF. GRID----- CAP
 - ⑦ 5.2 Ω----- SH. LF. GRID----- CAP
 - ⑧ 250,000 Ω AFC OFF DIODE PLATE----- PRONG 3
 - ⑨ 580,000 Ω AFC ON----- DIODE PLATE----- PRONG 3
 - ⑩ 4700 Ω----- DIODE CATHODE----- PRONG 4
 - ⑪ 4700 Ω AFC OFF----- DIODE CATHODE----- PRONG 5
 - ⑫ 340,000 Ω AFC ON----- DIODE CATHODE----- PRONG 5
 - ⑬ 0-15 MEG. Ω GATED. S.T. SW. CLOSED BY AF GRID----- PRONG 5
 - ⑭ 700 Ω----- OUTPUT GRID----- PRONG 5
 - ⑮ 700 Ω----- OUTPUT GRID----- PRONG 5
 - ⑯ 1.2 MEG. Ω----- COLOR TUNING & CAP
 - ⑰ 1.2 MEG. Ω----- COLOR TUNING & CAP
- ♯ LOW COLOR SENSITIVITY
- CONDITIONS FOR TESTING RESISTANCE**
 WAVE SWITCH ON B BAND
 AFC SWITCH OFF (COUNTERCLOCKWISE)
 SILENT TUNING SWITCH OPEN (IN)
 COLORAMA SWITCH IN SENSITIVE POSITION (COUNTERCLOCKWISE)
 POWER SWITCH OFF

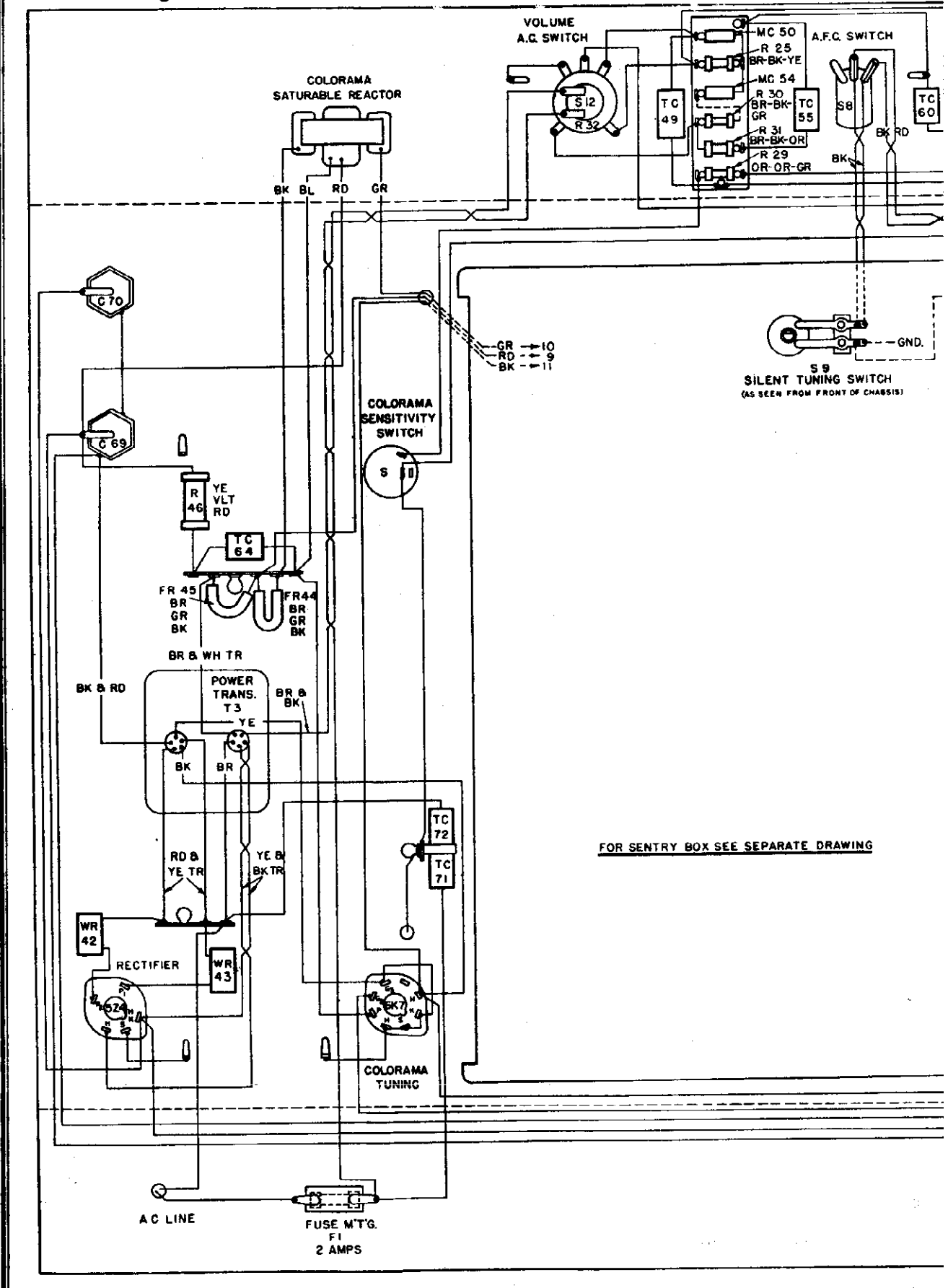
UNLESS OTHERWISE SPECIFIED.
 MET. & GND. TERMINALS SHORTED.



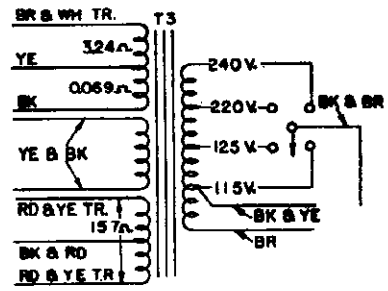
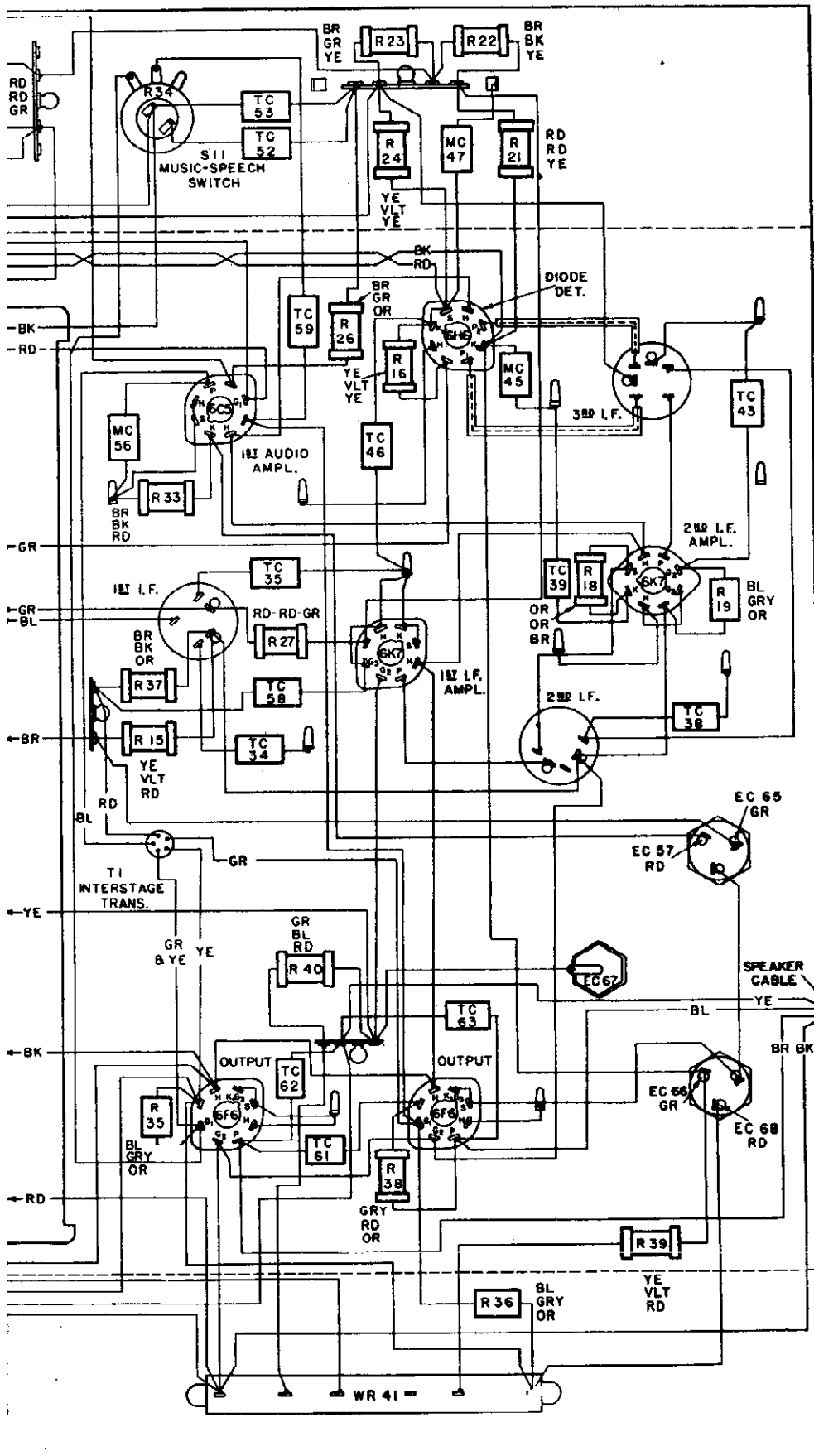
PRONG NUMBERS SHOWN FROM VIEW

MODEL E-126
Chassis Wiring

GENERA

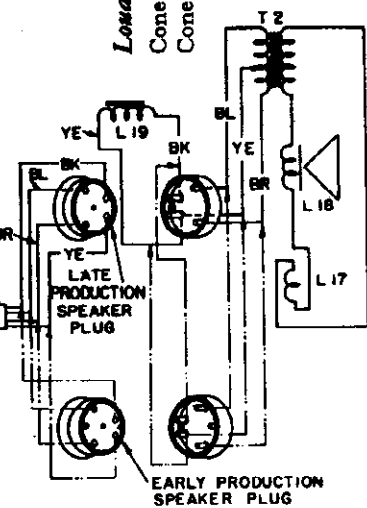


ELECTRIC CO.



INTERNAL CONNECTIONS OF UNIVERSAL TRANSFORMER FOR 105-250 VOLTS

Load-speaker—Electrodynamic
 Cone Diameter.....1.2 in.
 Cone Coil Impedance.....1.4 ohms at 400 volts



INTERNAL CONNECTIONS OF SPEAKER

COLOR CODE

BLACK	BK
BROWN	BR
RED	RD
ORANGE	OR
YELLOW	YE
GREEN	GR
BLUE	BL
VIOLET	VLT
GRAY	GRY
WHITE	WH

GENERAL ELECTRIC CO.

To Change the Dial Lamps

Make certain that the copper-plated hex head shipping screw (which secures the dial lamp bracket during shipment) has been removed before attempting to remove the dial lamp bracket (No. 17). Lift the lamp bracket from the tabs under which it is clipped. Care should be taken that the lamp leads do not put an undue strain upon the drive cable. With the lamp bracket lead laid back horizontally the lamps may be placed. When the lamp bracket is reinserted care should be exercised to avoid having the lamp leads foul the gang mechanism.

NOTE ALL CONNECTIONS MARKED
'M' ARE MADE DIRECT

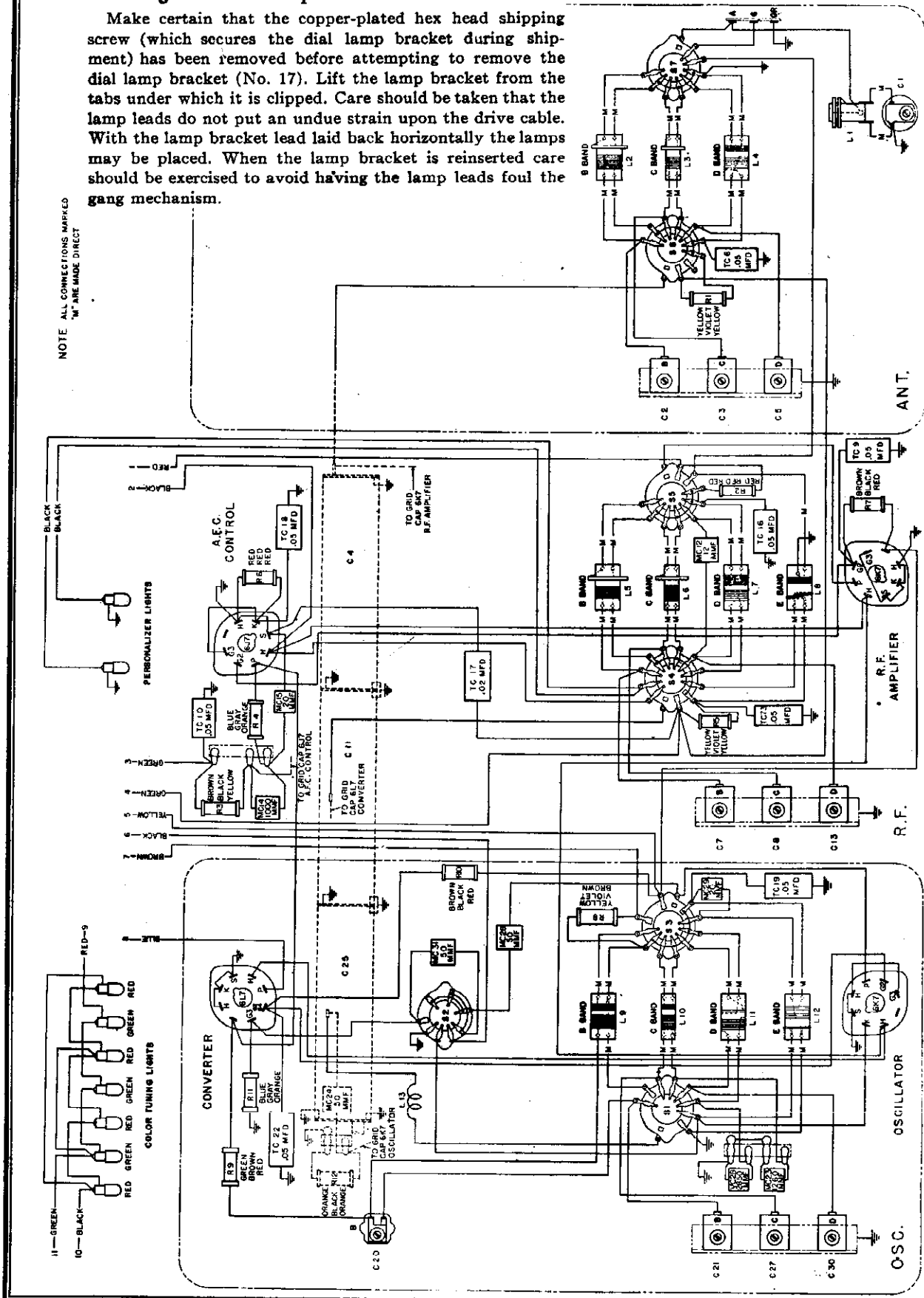


Fig. 1. "Sentry Box" Wiring Diagram

MODEL E-126
Socket, Trimmers
Voltage

GENERAL ELECTRIC CO.

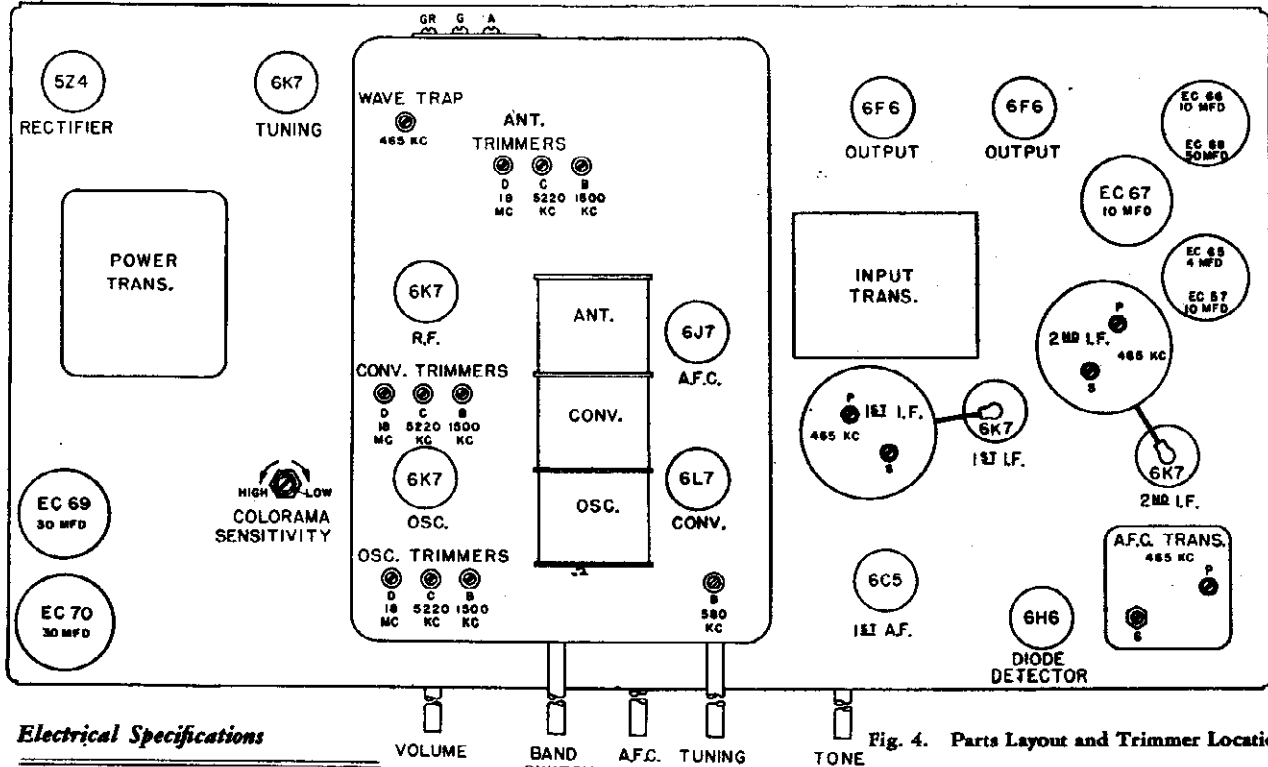


Fig. 4. Parts Layout and Trimmer Location

Electrical Specifications

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Watts)
A	115	50-60	120
C	115	25-60	120
V	105-130 and 200-250	40-60	125

NOTE.—Taps on universal transformers (Rating "V") are accessible by removing the cap cover on the top of the transformer.

SOCKET VOLTAGES

Tube No.	Cathode to Ground Volts D.C.	Screen Grid to Ground Volts D.C.	Plate to Ground Volts D.C.	Cathode Current M.A.	Heater Volts A.C.
6K7 R.F. Amp.	†	105	240	8.5	6.3
6L7 Converter	†	105	245	10.0	6.3
6K7 Oscillator	...	105	215	7.5	6.3
6K7 1st I. F. Amp.	†	110	220	9.5	6.3
6K7 2nd I. F. Amp.	3.0	105	220	10.0	6.3
6H6 Detector & AVC.	...	...	...	...	6.3
6C5 Audio Amplifier	6.0	...	185	5.6	6.3
6F6 Output	*	260	365	21.0	6.3
6F6 Output	*	260	365	21.0	6.3
6K7 Colorama Control	...	115	240	9.0	6.3
6J7 A.F.C.	2.5	105	205	1.0	6.3
5Z4 Rectifier	370 D.C.	...	700/350 R.M.S.	114.0	5.0

Measured at 115 volts supply. No signal input. Volume control maximum. Voltmeter 1000 ohms per volt. Measurements taken on highest scale giving accurate readable deflection.
† Grid bias at source -3 volts.
* Grid bias at source -23 volts.

Alignment Oscillograms

GENERAL ELECTRIC CO.

MODEL E-126
Dial Mechanism

Tuning Control Drive Ratio

Fast Tuning 8 to 1
Vernier Tuning 50 to 1

Physical Specifications

Model E-126
Height 41 in.
Width 27 1/4 in.
Depth 14 1/8 in.
Weight packed 124 lb.

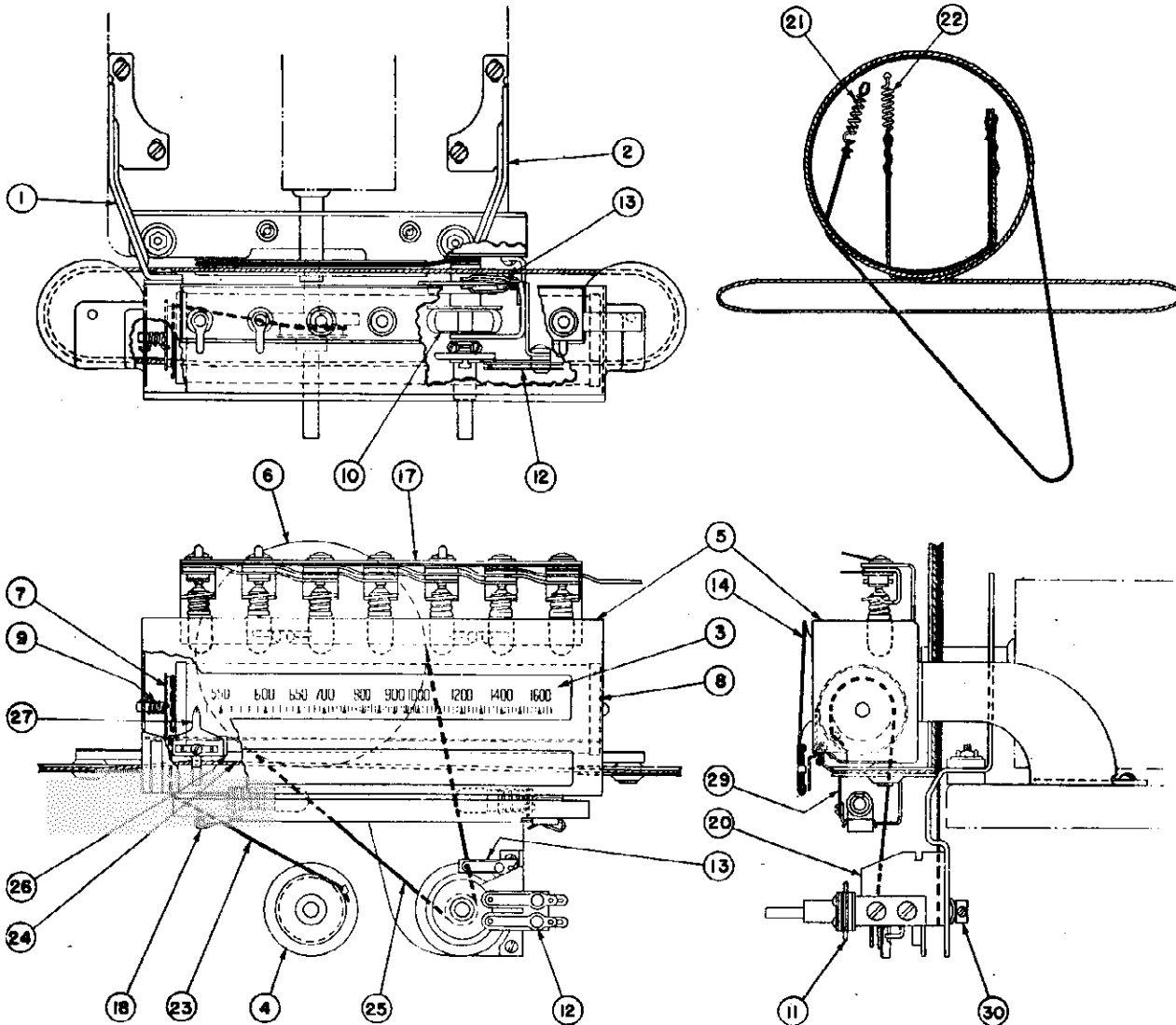


Fig. 7. Dial Drive Mechanism

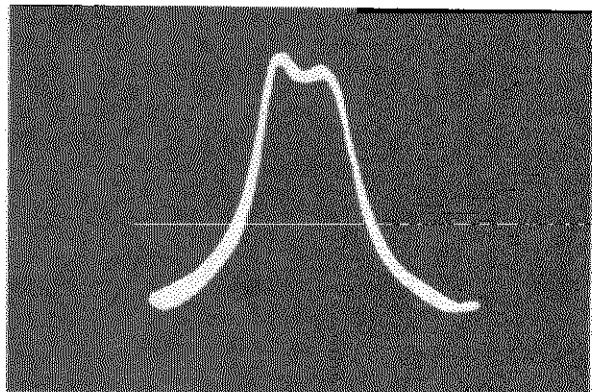


Fig. 5. Overall I. F. Curve

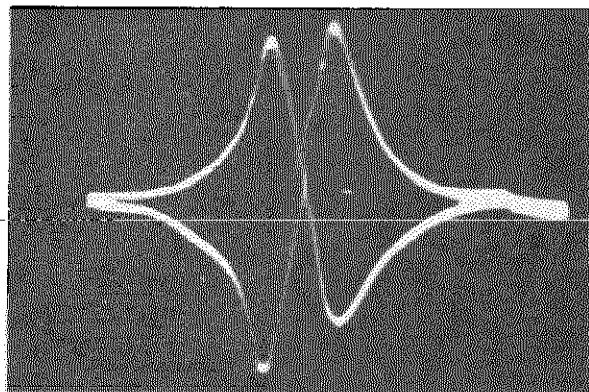


Fig. 6. AFC Trimmer Adjustment Curve

MODEL E-126
Alignment
Dial Notes

GENERAL ELECTRIC CO.

and the 465 kc. signal generator, it may be necessary to use a short antenna or to remove it entirely if the station is a strong local. Turn the AFC on and adjust the last I. F. as ordinary (AFC) trimmer to give zero beat. This adjustment is very critical and must be made with great care. When the adjustment is properly made, there will be no appreciable change from zero beat as the AFC switch is thrown off and on. This completes the alignment of the I. F. and AFC circuits. The alignment of the oscillator and R. F. circuits may be carried out in the usual manner. The AFC switch must remain in the "off" position.

ADJUSTMENT OF DIAL MECHANISM

The dial mechanism (Fig. 7) is rigidly mounted to the "Bentley Box" by means of two brackets and four screws. The pointer is operated by means of an "Automatic Vernier" reduction drive unit. Motion imparted to the gear condenser rotor is transmitted through a series of pulleys and an intermediate connecting cable to the dial pointer slider which is supported on a rail below the dial scale.

To Replace Cables

To replace cord or cable for the pointer or drive, the chassis should be removed from the cabinet and the dial mask (No. 14) removed from the dial scale box (No. 5). The black drive cord (No. 25) should run between the drum (No. 6) on the condenser and the drive pulley without crossing. Both the black cord (No. 25) and the bronze cable (No. 24) fasten on the same hook in the drum (No. 6) which is in front of the single lance on the outside diameter. The springs (21) and (22) are fastened on the ends of the cables after passing through the lances which are close together on the condenser drive drum. The light spring (No. 21) is on the bronze cable (No. 24) and the special spring-loop hooks into the hole in the drum next to the hook for the spring on the black cord (No. 25). The solid end of the cord or cable should be fastened first to the drum, the line should be then strung around the pulleys and drum, and lastly, the spring should be stretched into place.

To Adjust Pointer for Calibrations

The pointer (No. 37) is adjustable by removing the escutcheon plate and also the dial mask (No. 14) which is held by four screws. The screw in the center of the pointer (No. 27) can then be loosened and the pointer adjusted as needed.

To Replace Scale

The scale (No. 3) can be removed by taking off the escutcheon and the dial mask (No. 14) as for the adjustment of the pointer. The pointer (No. 27) is moved to the left-hand end, the scale is then pushed to the left and the right-hand end is pulled out with the aid of a small screw driver or a similar tool. When replacing the scale (No. 3) it is advisable to remove the cord (No. 23). The spring (No. 9) is put on the dial shaft and the shaft then inserted into the housing. The scale (No. 3), with the right-hand cap (No. 8) attached, is then inserted into the left-hand cap (No. 7) which is held in position by pushing on the shaft on the outside of the housing. After the scale (No. 3) is inserted it should be rotated from one to two times against the action of the torsion spring (No. 9). The cord (No. 23) is then replaced in the lance provided for it. It is advisable to have the band switch rotated so that the greatest length of cord possible is unwound from the lower pulley (No. 4) on the band switch shaft. It is best that the chassis be removed for the replacement of a scale. (It is important when replacing the chassis in the cabinet that the rubber grommets should be put in the chassis and not on the wood panel.)

To Adjust Reaction of the Scale

With the chassis out of the cabinet the scale (No. 3) can be adjusted to track properly on the various bands by loosening the set screw and rotating pulley (No. 4) on the band switch shaft.

Now set the test oscillator at 860 kc. and tune the receiver to resonance with this signal. Adjust the 860 kc. padding capacitor, C-26, rocking the tuning condenser back and forth through resonance at the padding capacitor, is adjusted and note the deflection of the tuning meter each time the receiver is tuned in this manner. Leave the padding capacitor set at the value which gives least deflection. Rotate the frequency dial to 465 kc. and set the test oscillator for this frequency. Check the alignment by again adjusting the Band "B" oscillator, R. F., and antenna trimmers for maximum deflection on the tuning meter.

BAND "C" (1600-5600 KC.)

With the test oscillator connected to the receiver as above, tune the receiver until the pointer is at 6200 on the "C" band scale. Set the test oscillator for operation on this frequency and, with the volume and tone controls set as above, adjust the band "C" oscillator, R. F., and antenna trimmer, respectively (see Fig. 4), to give maximum deflection on the output meter.

BAND "D" (5.5-18.2 MC.)

Turn the band switch to Band "D." Set the test oscillator at 18,000 kc. (18.0 mc.) and tune the receiver until the pointer coincides with the 18.0 mark. Adjust the Band "D" oscillator trimmer to give maximum output indication. It will probably be found that there will be two settings of the oscillator trimmer that will give an output response. The lower capacity setting of the trimmer is the one that should be used. To be sure that correct adjustment has been obtained, tune for the image signal at 17.07 mc. with the test oscillator at 18.0 mc. It may be necessary to increase the test oscillator output to obtain response at this point.

Return the receiver to 18.0 mc. and adjust Band "D" antenna and R. F. trimmers, respectively (C-5 and C-13) for maximum output indication. When adjusting the R. F. trimmer, C-13, rock the tuning condenser back and forth through resonance as in the 860 kc. padding capacitor adjustment. Alignment of the receiver is now complete as no adjustments are provided on band "E."

4. I. F. Alignment with Output Meter

Although the use of the cathode-ray oscilloscope for alignment purposes is to be preferred, it is possible to make the I. F. trimmer adjustments with reasonable accuracy using a 465 kc. signal generator and output meter.

Place a modulated signal of 465 kc. on the grid of the last I. F. (6K7) tube with the volume control set at maximum and the AFC switch turned off. Place a low range A. C. voltmeter or other output indicator across the voice coil of the loud-speaker. Adjust the output of the signal generator so that an indication of not more than two or three volts is obtained on the output meter.

Adjust and readjust the primary trimmer for maximum output and its secondary for minimum output. This latter adjustment will be very broad. Apply the signal input to the grid of the 1st I. F. (6K7) tube and adjust both primary and secondary trimmers for maximum output, reducing the input as necessary to obtain approximately the same output indication as before. Apply the signal input to the grid of the converter (6L7) tube and adjust both primary and secondary trimmers for maximum output indication in the same manner.

It is now necessary to make a fine adjustment of the secondary trimmer of the last I. F. (AFC) transformer which is as follows: without changing the frequency of the signal generator, place the input lead on the rubber insulation of the converter (6L7) grid lead. This will provide a small signal input through the capacity between the leads. Increase the input as necessary to obtain approximately the same output indication as before. The signal generator is provided with a means of removing the input lead. This should be done. However, the adjustment may be carried out satisfactorily even with a modulated generator signal.

Now tune in any broadcast signal in the usual manner and tune the receiver carefully for zero beat between the carrier

The volume control should be in an "off" or nearly off position. Apply a frequency modulated signal to the grid of the 1st I. F. amplifier tube through a 0.05 Mcfd. (RC-072) capacitor. Connect the vertical plates of the tuning condenser between ground and the junction point between R-23 and R-24, and with the AFC switch in the "off" position proceed to align the primary and secondary of the 2nd I. F. and the AFC I. F. transformer.

The object should be to make the two curves coincide with each other at the top and throughout their length with the maximum amplitude obtainable. This will require that all four I. F. trimmers be adjusted in the usual manner *excepting* the AFC secondary (assigned and) trimmer which will be adjusted for minimum amplitude before the curves will coincide properly. Fig. 5 gives the appearance of the curves when the alignment adjustments have been completed satisfactorily on this far. Apply the same frequency modulated input to the grid of the converter (6L7) tube through a 0.05 Mcfd. capacitor as before. Adjust the primary and secondary of the 1st I. F. transformer until the curves coincide and have the appearance of Fig. 6.

A further adjustment of the A. V. C. secondary (hexagonal nut) trimmer is necessary in order to complete the I. F. alignment satisfactorily. Apply the same signal to the grid of the second I. F. amplifier tube. Unsolder the ground end of TC-48 between ground and the 6H5 cathode-prong K2 (Fig. 3) or to the center terminal of the AFC switch.

Carefully adjust the AFC secondary trimmer until a curve is obtained which is similar to that shown in Fig. 9. Correct adjustment is made when the two sides of the curve are symmetrical and intersect exactly at the horizontal axis. No adjustment of the other I. F. trimmers should be made at this time.

If a metal aligning tool is used, the curve will change when the tool is withdrawn. Therefore, it is advisable to use a fiber tool which will not change its signaling adjustment. At any rate, the final curve should be as shown with aligning tool removed.

2. I. F. Wave Trap Alignment

Leave the band switch at Band "B" and tune receiver to about 1500 kc.

With the test oscillator set at 465 kc. apply this signal to the antenna terminal through a dummy antenna consisting of a 400-ohm resistor and 200-micro. capacitor in series.

With the 465-kc. signal applied to the antenna terminal, adjust the I. F. Wave Trap Trimmer for minimum output indication.

3. R. F. Alignment

First check the position of the dial pointer by rotating the tuning condenser to maximum capacity position, i. e., plates fully meshed. At this position, the pointer should coincide with the end mark at the left-hand end of the scale. If it does not, it may be set by loosening the pointer set screw and setting the pointer to its correct position. During R. F. alignment the AFC switch must be set in its "off" (counter-clockwise) position.

BAND "B" (535-1640 KC.)

Set the test oscillator for operation at 1600 kc. and connect its output to the antenna terminal of the receiver through the dummy antenna described under "I. F. Wave Trap Alignment." Tune the receiver until the pointer is at 1600 on the scale. Set the tone control for minimum high response and reduce the volume control setting so as to avoid excessive antenna response. Adjust the Band "B" oscillator, R. F., and antenna trimmers respectively (location shown on Fig. 4) to give maximum deflection on the output meter. Maintain the test oscillator output at the lowest level which will give an easily readable output indication.

ALIGNMENT PROCEDURE

The receiver should first be allowed to run for fifteen minutes in order to reach its approximate normal operating temperature. Before making any adjustments, it is wise to determine the correctness of the existing alignment. This may be done by applying a signal from Wave Trap to the coil in receiver and measuring Wave Trap into the coil in antenna. The tuning meter should be a rod of insulating material having a series of concentric metal attached to one end and small screw of finely divided iron connected to the opposite end. By inserting the metal rod end into the center of particular coil, the inductance of the coil is lowered, increasing its resonant frequency. Inserting the iron-filled end into the coil raises its inductance, lowering its resonant frequency. If the circuits are in exact alignment, inserting either end of the tuning wand in any coil will result in a decrease in output. When an increase in signal is obtained with the iron-filled end of the wand, a decrease in resonant frequency of that circuit by increasing its trimmer capacity is indicated. When an increase in signal is obtained with the metal ring, a decrease in trimmer capacity is indicated.

Changes Indicated by Wand

Wand	Signal	Trimmer adjustment required
Metal Ring	Increase	None
Iron filings	Increase	None
Metal Ring	Increase	Increase capacity
Iron filings	Increase	Increase capacity

Alignment Frequencies

I. F.	Band "B" Band "C" Band "D" Wave Trap
465 kc.	1500 kc. 5200 kc. 18,000 kc. 465 kc.

In order to align this receiver properly, it is necessary to have available the following test equipment:

1. A modulated test oscillator with frequencies available of 465, 580, 1500, 6200, and 18,000 kc.
 2. An output indicator, such as a high resistance ac-voltmeter with a maximum scale reading of 3 to 5 volts, or a neon lamp indicator.
 3. An alignment tool consisting of an insulating shaft with a small screwdriver blade.
 4. A tuning wand.
- To realize the full advantage of the performance built into these receivers at the factory, circuit alignment using cathode ray oscilloscope equipment is much to be preferred. The oscilloscopic method is particularly advantageous in aligning the I. F. tuned circuits.
- See Fig. 4 for location of all trimmer capacitors.

1. Visual Alignment of I. F.

For visual alignment it is necessary to vary the frequency of an unmodulated test oscillator signal over a range extending on both sides of the peak frequency. This variation must take place in synchronism with the horizontal traverse of the cathode ray beam on its screen. The frequency modulator must, therefore, provide means for synchronizing the periodic test frequency variation with the cathode ray horizontal deflection circuit. The test oscillator may advantageously have facilities for audio frequency amplitude modulation of a fixed radio frequency test signal, as well as for frequency modulation, but audio modulation is not required for visual I. F. alignment.

In place of an output meter across the speaker voice coil, the vertical plates of the cathode ray tube are connected across the load resistor of the diode rectifier. With the frequency modulator in operation in conjunction with the test oscillator, the response curve of the circuit under test will be then shown on the screen.

Set the tuning dial indicator at the low end of the broadcast band at some point where no signal is received, since an extraneous signal might interfere with the aligning process.

GENERAL ELECTRIC CO.

DESCRIPTION OF ELECTRICAL
CIRCUIT

Design features built into this receiver include the "Sentry Box"; separate coils for each frequency band; high efficiency converter with a separate oscillator; two stages of IP amplification for high sensitivity and selectivity; automatic volume control; automatic frequency control (AFC), silent tuning, bass and treble compensated volume control, music-speech switch operated in conjunction with a continuously variable tone control, and colorama tuning.

"Sentry Box"

The RF and oscillator sections of the receiver are contained in the "Sentry Box", which consists of a separately controlled and shielded, four band, antenna, RF and oscillator tuning unit. Individual coils are employed for each frequency range and are properly selected and connected into the circuit by the range switch. To avoid absorption effects, the range switch shorts all unused coils which might resonate at some frequency in the range being used. The section of the range switch controlling selection of the antenna coil primary also changes the antenna connection to these coils in such a manner as to maintain maximum signal transfer in each range. When the C, E, "V", Doublet Antenna System is connected to terminals "A" and "C" at the rear of the "Sentry Box", the range switch provides for the doublet operation in the short wave (D) band where this connection is advantageous, and for operation as a "T" antenna in all other bands. When a doublet antenna providing noise reduction on the broadcast band is used, it is essential that a link be connected between terminals "G" and "GR" at the back of the "Sentry Box" in order to obtain the desired action.

The antenna is coupled to the control grid of the 6K7 RF tube through the tuned antenna transformer selected by the range switch. Likewise, the output of the amplifier tube is coupled to the control grid of the 6L7 converter tube through the properly selected tuned RF transformer. The only exception to this procedure occurs when the receiver is operating on the ultra-short-wave "E" band, in which position the RF tube is disconnected from the circuit and the antenna coupled directly to the 6L7 grid through the tuned antenna transformer.

The oscillator circuit, with the exception of the ultra-short-wave "E" band, employs a 6J7 tube in a conventional tuned grid, plate feedback circuit. In the ultra-short-wave "E" band, the common impedance between the grid and plate circuits provided by the secondary of L12 in the cathode circuit of the 6K7 oscillator tube, is utilized to provide oscillation. An auxiliary feedback circuit composed of the primary of L-12 together with the capacitor, MC-29, is in the plate circuit of the oscillator tubes on the "E" band. These elements resonate slightly below the low frequency end of the "E" band and tend to improve the oscillator excitation at this end of the band. To minimize capacity effects, the tuned "E" band grid coil L-13 remains in the circuit at all times since its resistance is sufficiently low to permit this procedure. The grid coil of the broadcast "B" band oscillator returns to B plus rather than to ground in order to provide plate voltage for the 6J7 AFC tube. The 880-cc. padding capacitor, C-20, serves to isolate this voltage from the oscillator tuning condenser section. The oscillator signal which is maintained at a frequency 485 kc. higher than the incoming signal is capacity coupled to the injection grid of the 6L7 converter.

The 6J7 AFC tube is also located on the "Sentry Box" and is associated with the broadcast "B" band oscillator. A complete description of the operation of AFC is given in a later paragraph. The output of the converter is applied to the I.F. amplifier.

I. F. Amplifier

The intermediate frequency amplifier consists of a two-stage cascade section composed of three I.F. transformers and two 6K7 amplifier tubes. Each transformer has two tuned circuits which resonate at 465 kc. The third I.F. transformer is of special construction having the primary capacitive coupled to the midpoint of the secondary in order to provide the differential AFC voltage. The operation of this transformer is discussed in a special chapter on AFC.

Detector and AVC

The plates of the 6H6 twin diode are fed in push-pull by the secondary of the third I.F. transformer. Two balanced diode loads consisting of R-24 and the series resistance of R-21, R-22 and R-23 are provided. The AFC voltage is developed across the sum of all these resistors, R-22 and R-23. The audio frequency thus provided is transferred to the A.F. system for amplification and reproduction. The direct-current component of the rectified signal produces a voltage drop across the above three resistors. That existing across R-21 and R-22 is employed for operating the 6K7 "Colorama" tuning tube. Switch S-10 permits application of either full or partial voltage to the tube, thereby preventing control of the color indication in accordance with prevailing receiving conditions. A complete description of "Colorama" tuning is given in a later paragraph. The D.C. voltage developed across R-21 is utilized for automatic volume control action by employing the same to bias the R.F. amplifier, converter, and first I.F. amplifier tubes. Initial bias for these tubes is obtained by returning resistor, R-21, to the minus 3 volt tap of the voltage divider. The second I.F. tube receives no A.V.C. and is self-biased. This minimizes the possibility of non-linear distortion on strong signals.

Audio System

The audio voltage developed across the diode load is applied to the volume control, R-32, through the isolating capacitor, TC-49. This control is compensated by means of dual resistance-capacitance networks to provide the proper balance of high and low frequencies at different volume control settings. The movable arm on the volume control selects the amount of audio signal applied to the control grid of the 6C5 audio amplifier tube and thus regulates the output of the receiver. The output of the 6C5 audio tube is transformer coupled to the control grids of the two 6B6 output tubes which operate in a push-pull connection. The music-speech control consists of a switch actuated at one extreme of the tone control rotation corresponding to that providing maximum high note response. This provides better speech clarity by decreasing the bass compensation which is accomplished by shunting capacitor, TC-83, with short-wave bands by the switch S-2; hence the music-speech control is only effective in the broadcast "B" band. Continuously variable tone control is provided by capacitor, TC-50 and variable resistor R-34 shunting the grids of the push-pull output tubes.)

Silent Tuning

Silent tuning is provided by the switch S-9 which is actuated by the tuning knob of the receiver. Pulling the tuning knob out slightly closes switch S-9 and kills the audio output by grounding the 6C5 grid. The AFC is also removed by this operation which permits a sharp indication of resonance by noting the "Colorama" light. When a station has been satisfactorily located in this manner, the tuning knob is pushed in to its original position and the switch opened.

Power Supply

D.C. power for operation of the receiver is supplied by a power supply system employing a 5Z4 full-wave rectifier tube which, together with a suitable network of resistors and capacitors, supplies the required voltages and filtering action.

COLORAMA TUNING

These receivers are equipped with Color Tuning, a novel method which indicates approach to resonance by means of a change of color of the light illuminating the tuning scale.

The colored light is produced by a group of four red-stained pilot bulbs and a group of three green-stained bulbs behind the scale. At zero signal strength the red group is at full brilliance and the green invisibly dim. As the signal increases from zero, the red gets dimmer and the green brighter over a broad range until at extreme signal strength the green is fully bright and the red below visibility through the dial. Hence, as a station is tuned-in the color changes smoothly, and the maximum change in the green direction is an indication of resonance.

Weak stations will produce a small color change and strong stations a larger change. The difference in signal strength between the weakest and the strongest station likely to be listened to, has been found to be so great in different localities that the receivers have been equipped with a two-position sensitivity range switch for "sensitive" and "insensitive" settings of the color tuning. The switch is located near the power transformer on the chassis and may be reached from the rear of the cabinet. In the sensitive position, the weakest station to which the user can listen comfortably, above the general noise level, will shift the color to neutral white at resonance. Stronger stations give resonant points at bright green. In localities near a relatively large group of high-powered stations and having a high noise level, such as Chicago and New York, the range switch must be thrown to the insensitive position when standard outdoor antennas are used or else the color will be fixed green over so wide a band that resonance cannot be accurately found. The difference in sensitivity is about twenty to one. On short-wave bands, the band switch connects the color tuning to the sensitive setting and the switch on the chassis is insensitive. This is because practically all the short-wave signals are relatively weak. The insensitive setting is used only on the 585-1040 kc. band.

There is a group of four red and a group of three green pilot bulbs behind the scale. These are controlled by a Saturable Reactor in a circuit which is shown in the schematic diagram, Fig. 2. The saturable reactor is controlled by a D.C. coil which decreases its reactance smoothly from a high value at no D.C. to a very low value at maximum D.C. The saturable reactor acts very much like a dimming rheostat except that it is controlled by the D.C. plate current of a 6K7 tube used solely for that purpose. This tube receives for its bias a portion of the A.V.C. voltage of the set so that at no signal the bias is nearly zero. At this point, the plate current is at maximum; therefore, the red is brightest and the green invisibly dim.

SOME THINGS WHICH MAY AFFECT THE OPERATION OF COLOR TUNING ARE AS FOLLOWS:

Seven colored bulbs are used to give good diffusion of color over the scale; but if one of the seven fails, it unbalances the whole group and should be replaced immediately. The lamp socket assembly may be removed by reaching into the rear of the cabinet, pulling the lamp socket assembly up on its guides and drawing it partly out. (A shipping screw, which should be removed when the set is unpacked, may be needed to remove the first time.) There is enough slack in connecting wires to allow the assembly to be drawn forward. When the

socket assembly has been drawn far enough out for uncrewing the bulbs turn on the power switch and replace the bulbs which do not glow. All will not be bad as each group is in series (green) or series parallel (red). Take care the wires do not foul the tuning mechanism when the assembly is replaced. The colored lamps used for replacement **MUST ALL BE 6.3 VOLTS, 0.15 AMPERE LAMPS**. No other size will work.

If the red is unusually dim on no signal and the colored bulbs are all good, try removing the antenna. Next try replacing the 6K7 "Colorama" tube or replace the rectifier. Sometimes the antenna noise level is so high that it dims the red like a signal. If the tubes in the set become weak, or the set is out of alignment, or for any other reason loses its sensitivity, the color tuning will appear insensitive.

AUTOMATIC FREQUENCY CONTROL

These receivers employ automatic frequency control (AFC) which is a device for automatically controlling the oscillator frequency in such a way that, although the receiver is not exactly tuned to the signal being received, an intermediate frequency of 465 kc. will still be produced. This control of the oscillator frequency is secured by means of a 6J7 tube so connected to the oscillator that it draws a lagging current from the tank circuit and thus gives the effect of a shunt inductance. Variation of the D.C. grid bias on the 6J7 control tube will affect the mutual conductance of the tube, thereby changing the amount of lagging current drawn from the oscillator tank with a consequent effect of variation of the amount of shunt inductance connected across the oscillator coil. This alters the total inductance in the oscillator tuned circuit and changes its resonant frequency.

Grid bias for the 6J7 control tube which will vary in accordance with the amount of detuning of the receiver is obtained from the 6H6 diode rectifier operating in conjunction with its special I.F. transformer. This control voltage is the difference between the drop across resistor R-24, the load resistor for one diode section of the 6H6 diode rectifier, and the drop across resistors R-21, R-22 and R-23, which constitute the load resistance for the other diode section. When the receiver is correctly tuned to the incoming signal, the intermediate frequency produced will be 465 kc. which is the resonant frequency of the tuned circuit feeding the 6H6 diode rectifier. Under this condition each diode plate receives equal signal voltage and the D.C. voltage drops across the load resistors will be equal, giving no change in grid bias on the 6J7 control tube. If the receiver is so tuned that the intermediate frequency produced is above 465 kc. the signal voltage applied to diode plate No. 7 will exceed that applied to diode plate No. 8. In this case, the D.C. voltage drop across load resistor R-21, R-22 and R-23 will be larger than that across load resistor R-24 and a resultant voltage will be produced which will increase the 6J7 control tube grid bias lowering the mutual conductance of the tube and causing it to draw less current from the oscillator tank. This is the same effect that would be produced by increasing the amount of shunt inductance across the oscillator coil and the oscillator frequency is thereby lowered. The opposite takes place when the receiver is tuned so as to produce an intermediate frequency below 465 kc. Diode plate No. 8 then receives more signal voltage than diode plate No. 7 and the resultant voltage drop across the load resistors is such as to decrease the grid bias on the 6J7 control tube. This causes a larger current to be drawn from the oscillator tank circuit, the effect being the same as a decrease in shunt inductance which consequent increase in oscillator frequency to overcome the detuning.

MODEL E-126

Parts

GENERAL ELECTRIC CO.

REPLACEMENT PARTS

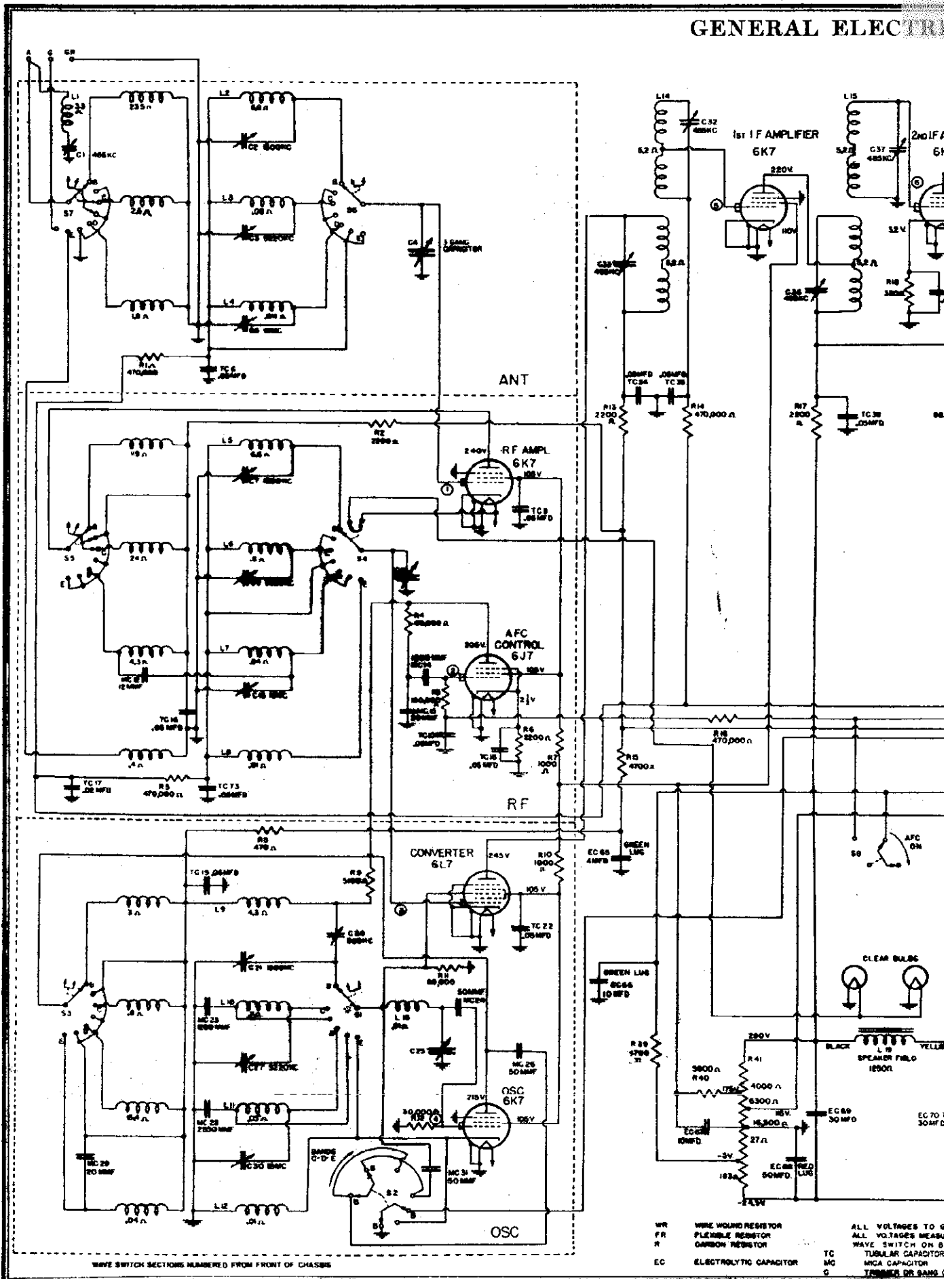
Insist on genuine factory-vented parts, which may be purchased from authorized dealers

Table with 4 columns: Stock No., Description, List Price, Stock No. (right side), Description (right side), List Price (right side). It lists various electrical components like capacitors, resistors, transformers, and speakers.

DIAL DRIVE MECHANISM

Table listing parts for the dial drive mechanism, including brackets, capacitors, coils, and switches.

* Indicate part also used on 1935 "A" line receivers. (Price subject to change without notice)
* Indicate part also used on 1936 "A" line receivers. (Price subject to change without notice)



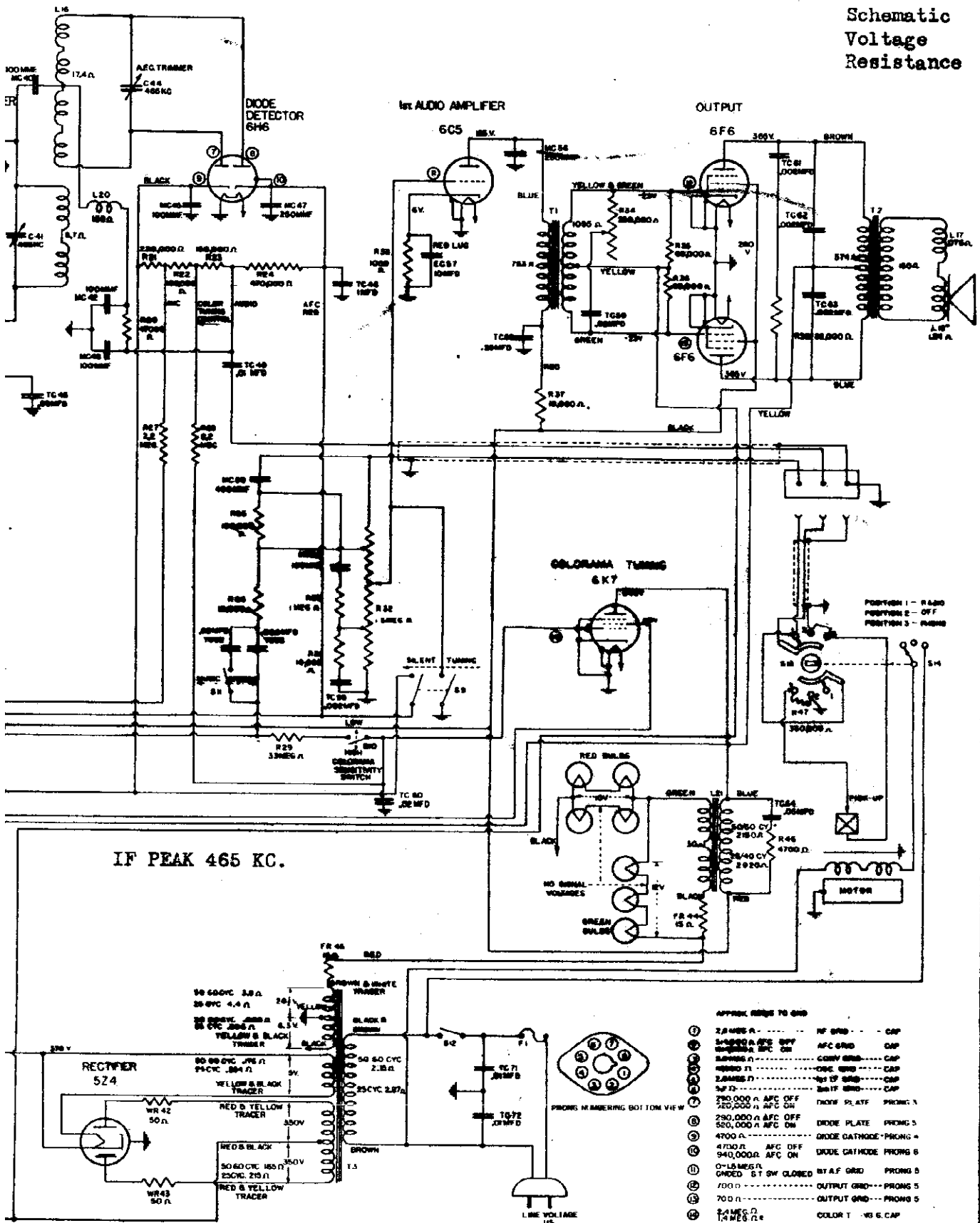
WAVE SWITCH SECTIONS NUMBERED FROM FRONT OF CHASSIS

WR WIRE WOUND RESISTOR
 FR FLEXIBLE RESISTOR
 R CARBON RESISTOR
 EC ELECTROLYTIC CAPACITOR
 TC TUBULAR CAPACITOR
 MC MICA CAPACITOR
 C TRIMMER OR SAMS

ALL VOLTAGES TO G
 ALL VOLTAGES MEAS.
 WAVE SWITCH ON B

CO.

MODEL E-129
Schematic
Voltage
Resistance



IF PEAK 465 KC.

APPLY WIRE TO GND

①	2.8 MEG. Ω	RF GRID	CAP
②	500,000 Ω	AFC GRID	CAP
③	500,000 Ω	CONV GRID	CAP
④	400,000 Ω	GRID	CAP
⑤	2.8 MEG. Ω	1ST 6F6	CAP
⑥	500 Ω	5F7	CAP
⑦	250,000 Ω	AFC OFF	TRAY PLATE PRONG 1
⑧	250,000 Ω	AFC ON	TRAY PLATE PRONG 2
⑨	4700 Ω	AFC OFF	DIODE CATHODE PRONG 4
⑩	4700 Ω	AFC ON	DIODE CATHODE PRONG 5
⑪	0-15 MEG. Ω	GRID	BT AF GRID PRONG 6
⑫	700 Ω	GRID	BT SW CLOSED
⑬	700 Ω	OUTPUT GRID	PRONG 5
⑭	700 Ω	OUTPUT GRID	PRONG 5
⑮	2.4 MEG. Ω	COLOR T	W3 C.CAP

A LOW COLOR SENSITIVITY

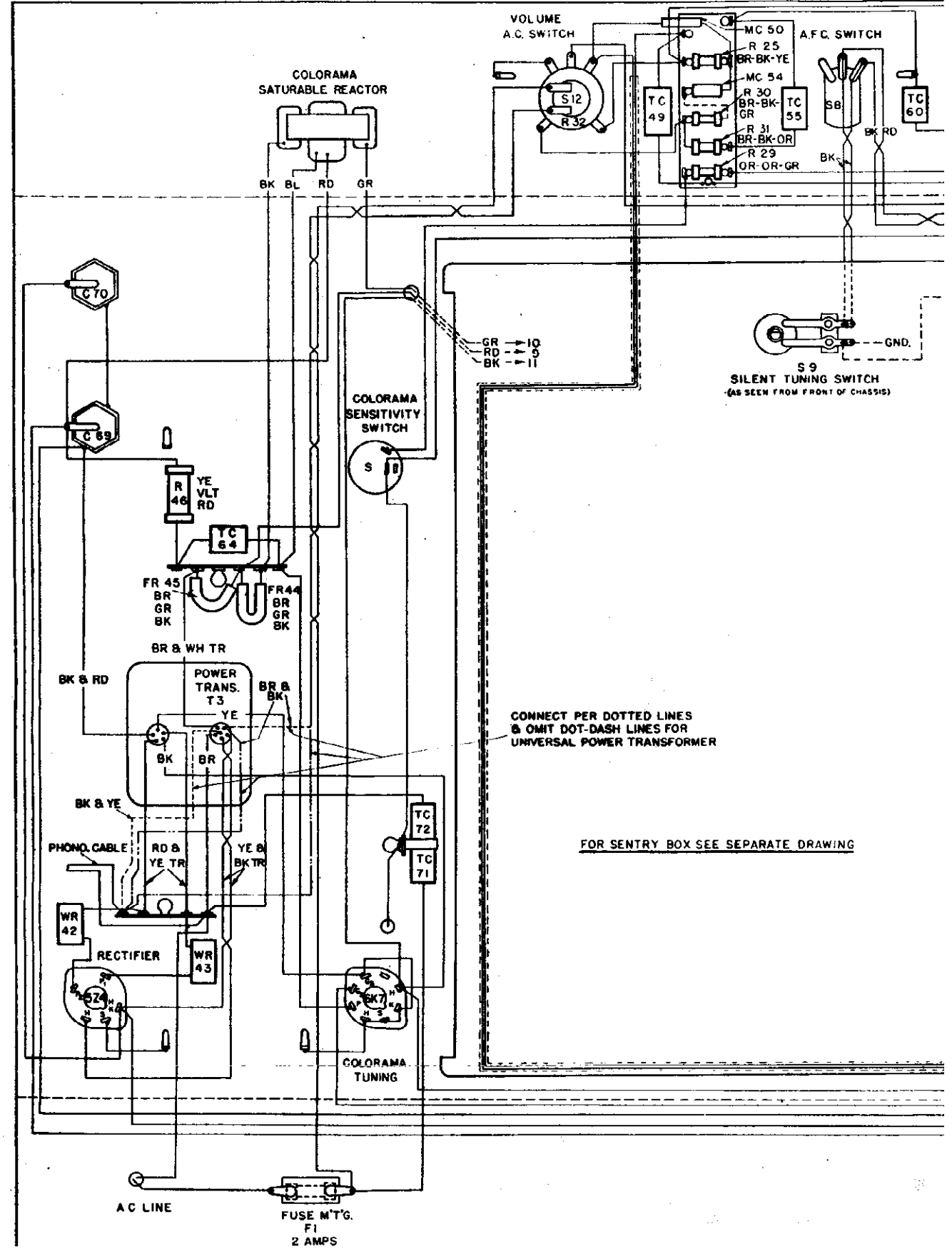
CONDITIONS FOR TESTING RESISTANCE
 WAVE SWITCH ON B BAND
 AFC SWITCH OFF (COUNTERCLOCKWISE)

UNLESS OTHERWISE SPECIFIED
 PARTS & GND TERMINALS SHORTED

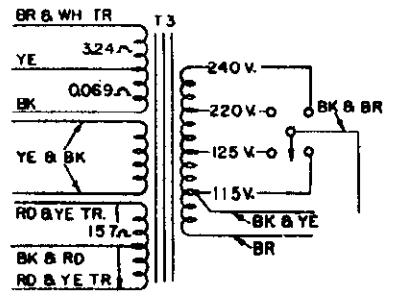
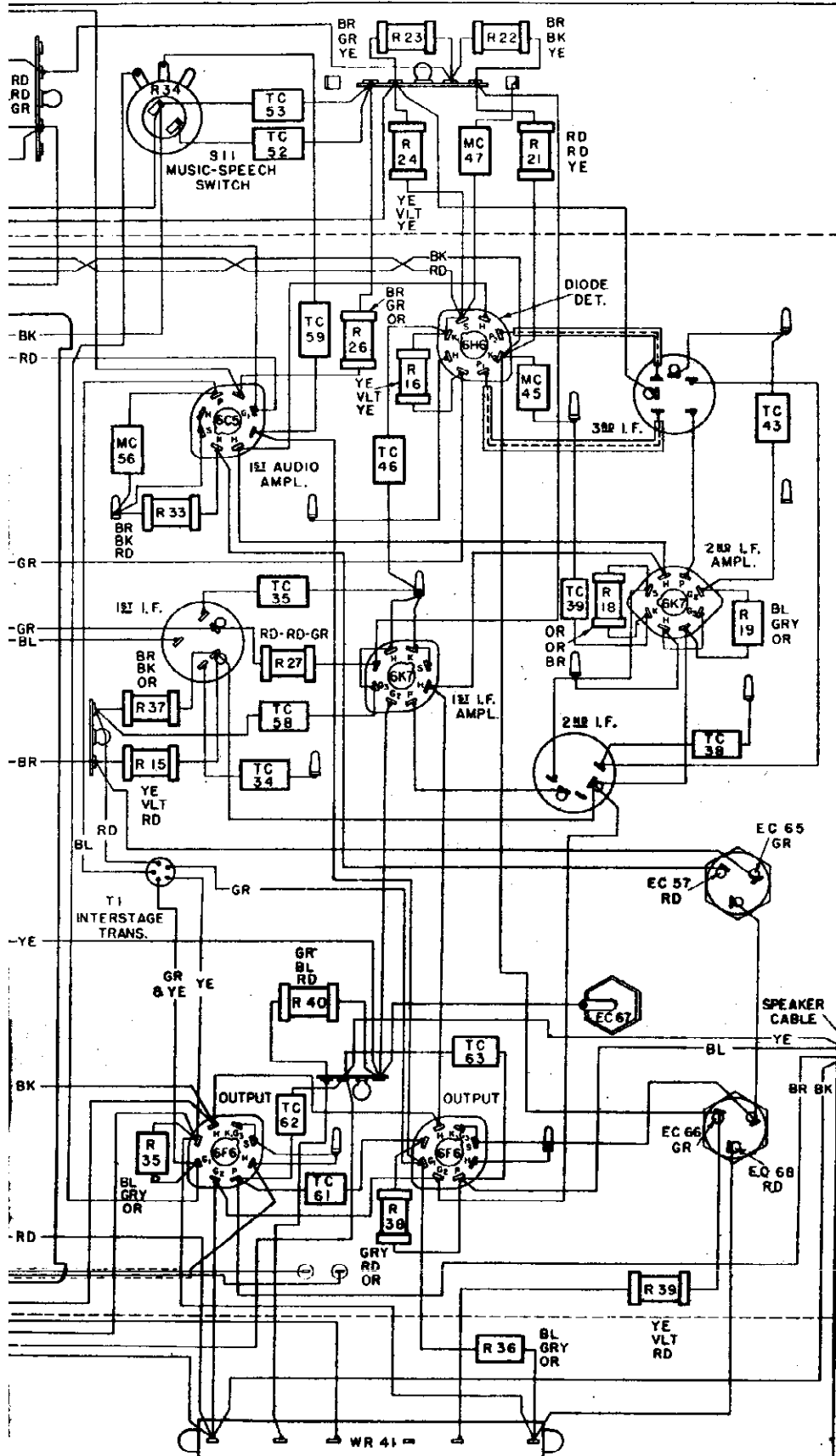
SILENT TUNING SWITCH OPEN (IN)
 COLORAMA SWITCH IN SENSITIVE POSITION (COUNTERCLOCKWISE)
 POWER SWITCH OFF

MODEL E-129
Chassis Wiring

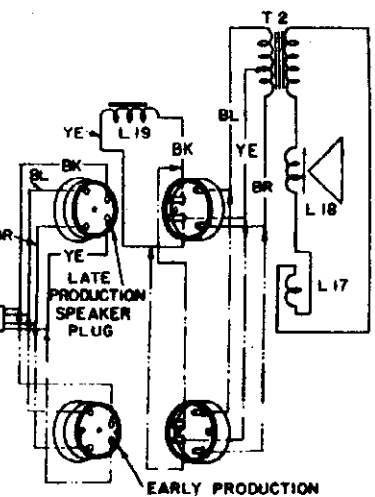
GENERAL



ELECTRIC CO.



INTERNAL CONNECTIONS OF UNIVERSAL TRANSFORMER FOR 105-250 VOLTS



INTERNAL CONNECTIONS OF SPEAKER

- COLOR CODE
- BLACK BK
 - BROWN BR
 - RED RD
 - ORANGE OR
 - YELLOW YE
 - GREEN GR
 - BLUE BL
 - VIOLET VLT
 - GRAY GRY
 - WHITE WH

GENERAL ELECTRIC CO.

Electrical Specifications

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Watts)
A 6	115	60	160
A 5	115	50	160
C 2	115	25	160
V 6	105-130/200-250	60	165
V 5	105-130/200-250	50	165
V 4	105-130/200-250	40	165

NOTE.—Taps on universal transformers (Rating "V") are accessible by removing the cap cover on the top of the transformer.

NOTE ALL CONNECTIONS MARKED "M" ARE MADE DIRECT

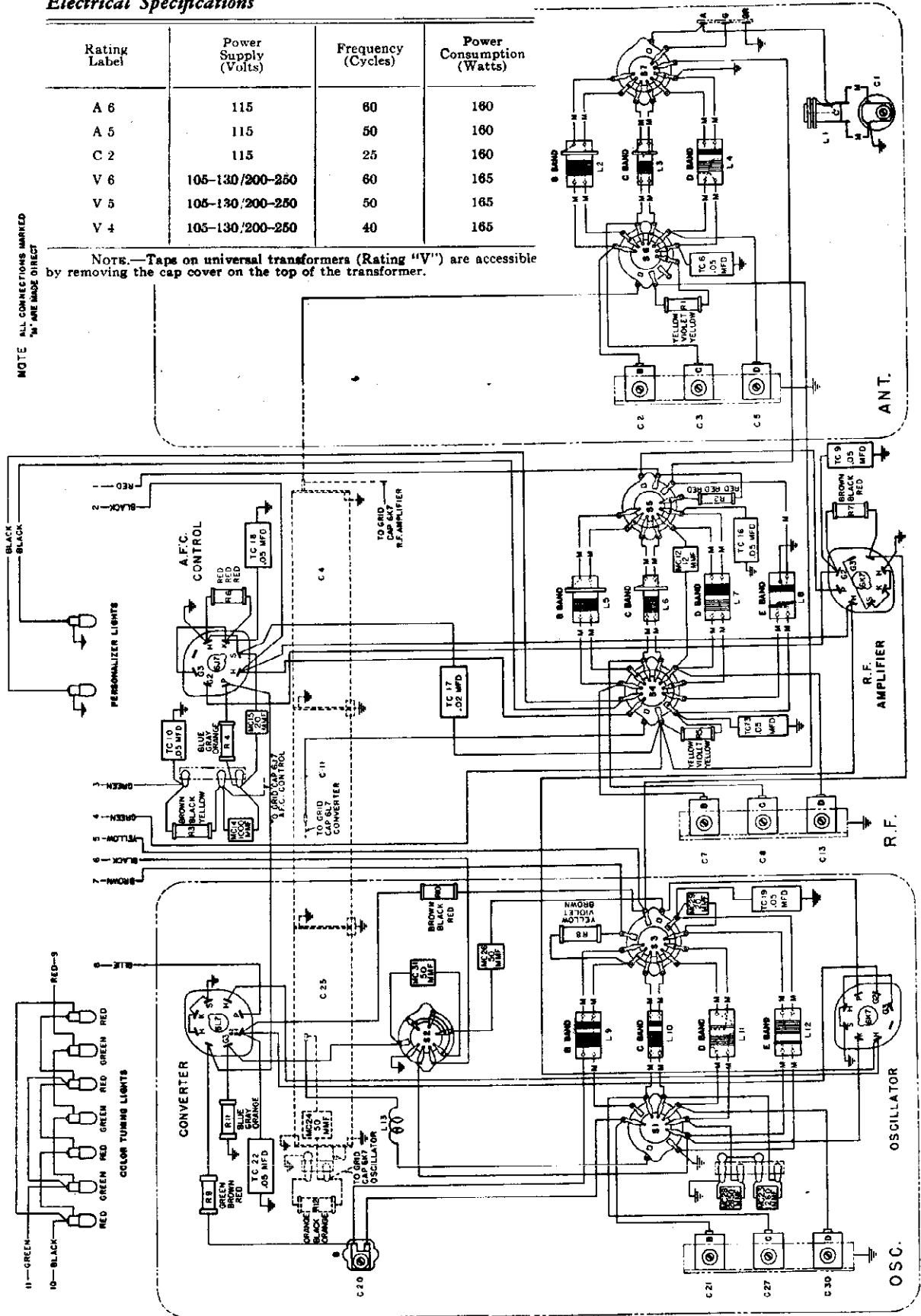


Fig. 1. "Sentry Box" Wiring Diagram

MODEL E-129

Dial Mechanism

GENERAL ELECTRIC CO.

Alignment Oscillograms

Tuning Frequency Range

Band "B"	535-1640 kc.
Band "C"	1600-5600 kc.
Band "D"	5.5-18.2 mc. (5,500-18,200 kc.)
Band "E"	17.5-70 mc. (17,500-70,000 kc.)

Tuning Control Drive Ratio

Fast Tuning	8 to 1
Vernier Tuning	50 to 1

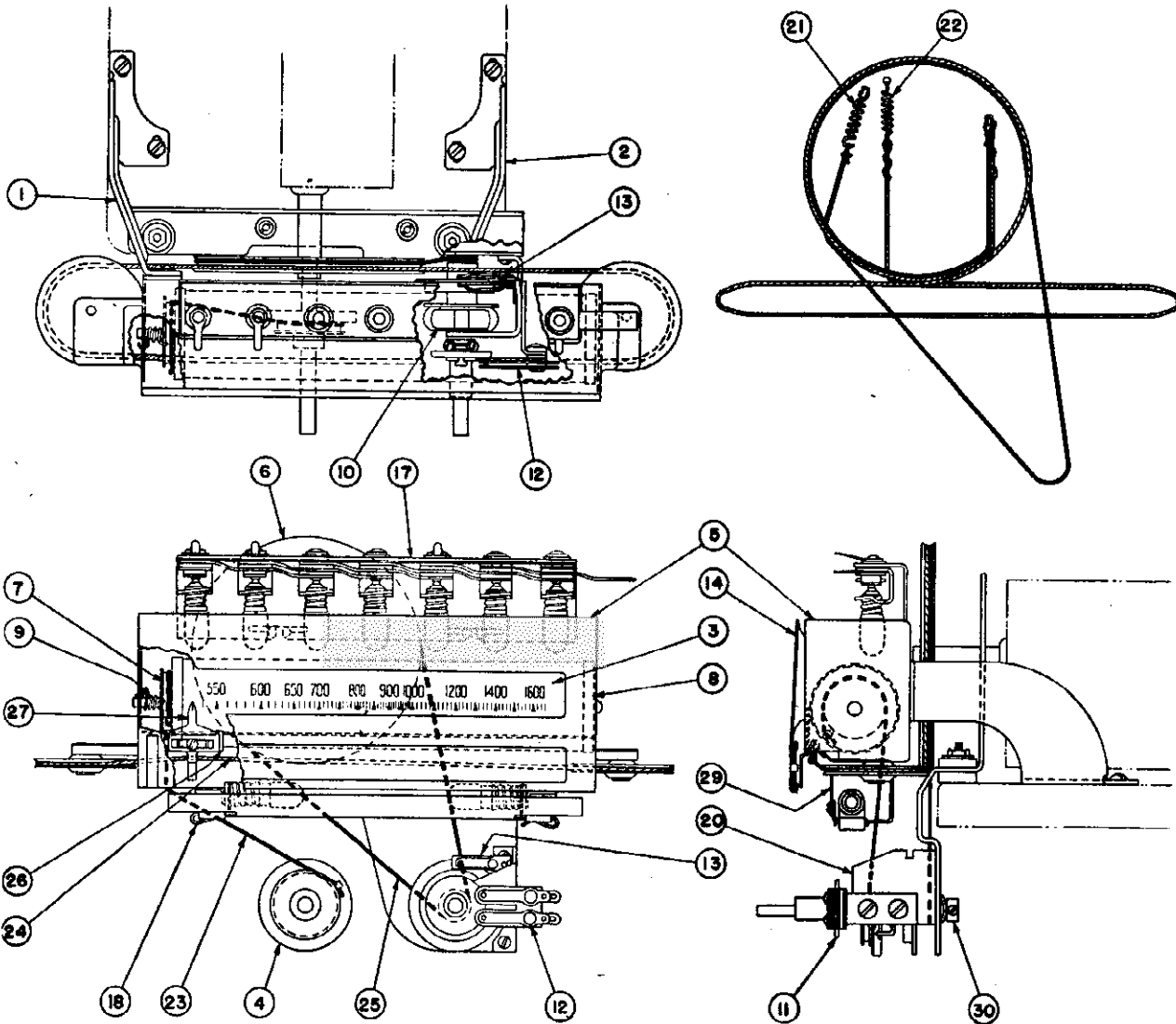


Fig. 7. Dial Drive Mechanism

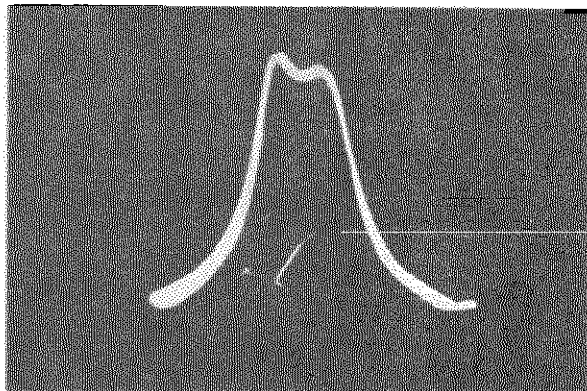


Fig. 5. Overall I. F. Curve

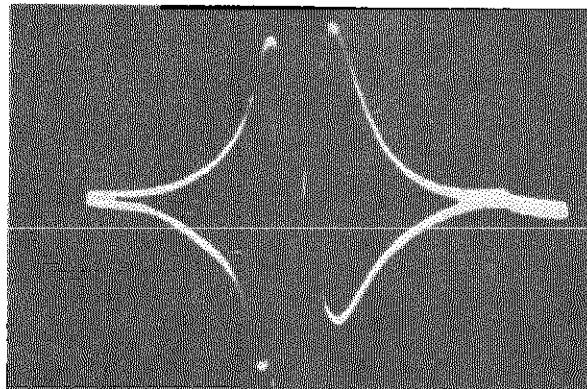


Fig. 6. AFC Trimmer Adjustment Curve

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MODEL E-129
Socket, Trimmer
Voltage

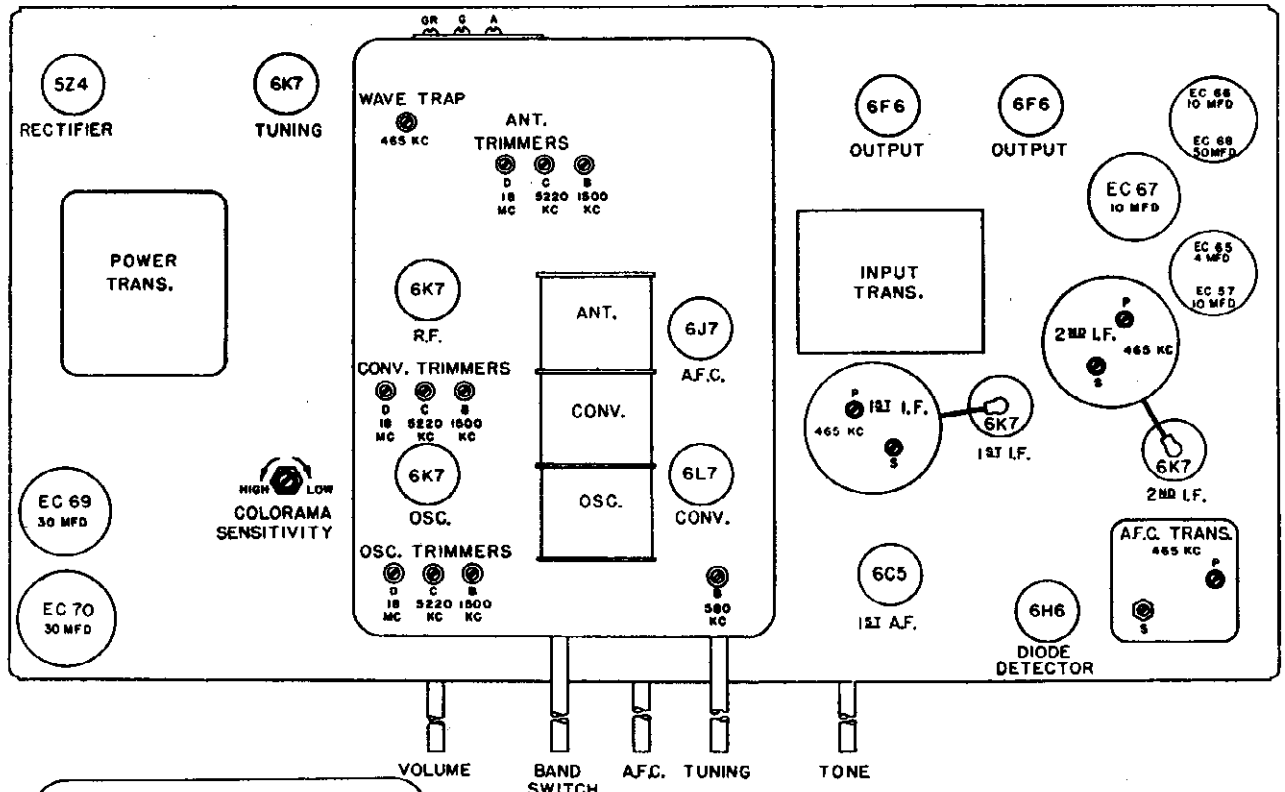
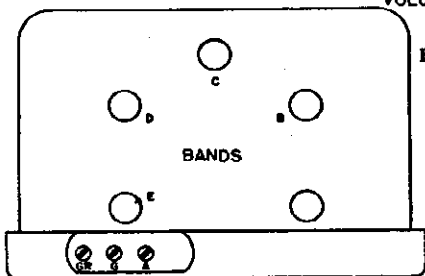


Fig. 4. Parts Layout and Trimmer Location



Electrical Power Output

Undistorted 10.2 watts
Maximum 15.4 watts

Loud-speaker—Electrodynamic

Cone Diameter..... 12 in.
Cone Coil Impedance..... 1.4 ohms at 400 cycles

SOCKET VOLTAGES

Tube No.	Cathode to Ground Volts D.C.	Screen Grid to Ground Volts D.C.	Plate to Ground Volts D.C.	Cathode Current M.A.	Heater Volts A.C.
6K7 R.F. Amp.	†	105	240	8.5	6.3
6L7 Converter	†	105	245	10.0	6.3
6K7 Oscillator	...	105	215	7.5	6.3
6K7 1st I. F. Amp.	†	110	220	9.5	6.3
6K7 2nd I. F. Amp.	3.0	105	220	10.0	6.3
6H6 Detector & AVC.	...	...	...	...	6.3
6C5 Audio Amplifier	6.0	...	185	5.6	6.3
6F6 Output	*	260	365	21.0	6.3
6F6 Output	*	260	365	21.0	6.3
6K7 Colorama Control	...	115	240	9.0	6.3
6J7 AFC.	2.5	105	205	1.0	6.3
5Z4 Rectifier	370 D.C.	...	700/350 R.M.S.	114.0	5.0

Measured at 115 volts supply. No signal input. Volume control maximum. Voltmeter 1000 ohms per volt. Measurements taken on highest scale giving accurate readable deflection.

† Grid bias at source—3 volts.

* Grid bias at source—23 volts.

MODEL E-129

Alignment

GENERAL ELECTRIC CO.

If the signal generator is provided with a means of removing the modulation, this should be done. However, the adjustment may be carried out satisfactorily even with a modulated generator signal.

Now tune in any broadcast zero beat in the usual manner and use the 485 kc. signal generator. It may be necessary to use a short antenna or to remove it entirely if the station is a strong local. Throw the AFC on zero beat, adjust the last I.F. secondary (AFC) trimmer to give zero beat. This adjustment is very critical and must be made with great care. When the adjustment is properly made, there will be no appreciable change from zero beat as the AFC switch is thrown off an on.

This completes the alignment of the I.F. and AFC circuits. The alignment of the oscillator and R.F. circuits may be carried out in the usual manner. The AFC switch must remain in the "off" position.

ADJUSTMENT OF DIAL MECHANISM

The dial mechanism (Fig. 7) is rigidly mounted to the "Bentley Box" by means of two brackets and four screws. The dial pointer is operated by means of an "Automatic Variable" reduction drive unit. Motion imparted to the gang condenser rotor is transmitted through a series of pulleys and an intermediate connecting cable to the dial pointer slider which is supported by a rail below the dial scale.

To Replace Cable

To replace cord or cable for the pointer or drive, the chassis should be removed from the cabinet and the dial mask (No. 14) removed from the dial scale box (No. 6). The black drive cord (No. 25) should run between the drum (No. 6) on the condenser and the drive pulley without crossing. Both the black cord (No. 25) and the bronze cable (No. 24) fasten on the same hook in the drum (No. 6) which is in front of the single lane on the outside diameter. The springs (31) and (32) are fastened on the ends of the cables after passing through the lanes which are close together on the condenser drive drum. The light spring (No. 21) is on the bronze cable (No. 24), and the special spring-loop hooks into the hole in the drum next to the hook for the spring on the black cord (No. 25). The solid end of the cord or cable should be fastened first to the drum, the line should be then strung around the pulleys and drum, and lastly, the spring should be stretched into place.

To Adjust Pointer for Calibration

The pointer (No. 27) is adjustable by removing the scotch-iron plate and also the dial mask (No. 14) which is held by four screws. The screw in the center of the pointer (No. 27) can then be loosened and the pointer adjusted as needed.

To Replace Scale

The scale (No. 3) can be removed by taking off the scotch-iron and the dial mask (No. 14) as for the adjustment of the pointer. The pointer (No. 27) is moved to the left-hand end, the scale is then pushed to the left and the right-hand end is pulled out with the aid of a small screw driver or a similar tool. When replacing the scale (No. 3) it is advisable to remove the cord (No. 23). The spring (No. 9) is put on the dial shaft and the shaft then inserted into the housing. The scale (No. 3), with the right-hand cap (No. 8) attached, is then inserted into the left-hand cap (No. 7) which is held in position by a screw on the shaft on the outside of the housing. After the scale (No. 3) is inserted it should be rotated from one to two turns against the action of the torsion spring (No. 9). The cord (No. 23) is then replaced in the lance provided for it. It is advisable to have the band switch rotated so that the greatest length of cord possible is unwound from the lower pulley (No. 4) on the band switch shaft. It is best that the chassis be removed for the replacement of a scale.

(It is important when replacing the chassis in the cabinet that the rubber grommets should be put in the chassis and not on the wood panel.)

side response. Adjust the Band "B" oscillator, R.F., and antenna trimmer respectively (location shown on Fig. 4) to give maximum deflection on the output meter. Maintain the test oscillator output at the lowest level which will give an easily readable output indication.

Now set the test oscillator at 580 kc. and tune the receiver to resonance with this signal. Adjust the 580 kc. padding capacitor, C-20, rocking the tuning condenser back and forth through resonance as the padding capacitor is adjusted and note the deflection of the tuning meter each time the receiver is tuned in this manner. Leave the padding capacitor at the setting which gives greatest deflection.

Retune the receiver to 1600 kc. and set the test oscillator for this frequency. Check the alignment by again adjusting the Band "B" oscillator, R.F. and antenna trimmers for maximum deflection on the tuning meter.

BAND "C" (1500-1600 KC.)

With the test oscillator connected to the receiver as above, tune the receiver until the pointer is at 1520 on the "C" band scale. Set the test oscillator for operation on this frequency and, with the volume of the controls set as above, adjust the band "C" oscillator, R.F., and antenna trimmers, respectively (see Fig. 4) to give maximum deflection on the output meter.

BAND "D" (5.18-2 MC.)

Turn the band switch to Band "D". Set the test oscillator at 18,000 kc. (18.0 mc.) and tune the receiver until the pointer coincides with the 18.0 mark. Adjust the Band "D" oscillator trimmer to give maximum output indication. It will probably be found that there will be two settings of the oscillator trimmer that will give an output response. The lower capacity setting of the trimmer is the one that should be used. To be sure that correct adjustment has been obtained, tune for the image signal at 17,070 kc. with the test oscillator at 18.0 mc. It may be necessary to increase the test oscillator output to obtain response at this point.

Retune the receiver to 18.0 mc. and adjust Band "D" antenna and R.F. trimmers, respectively (C-8 and C-13) for maximum output indication. When adjusting the R.F. trimmer, C-13, rock the tuning condenser back and forth through resonance at in the 580 kc. padding capacitor adjustment. Alignment of the receiver is now complete as no adjustments are provided on band "E".

4. I. F. Alignment with Output Meter

Although the use of the cathode-ray oscilloscope for alignment purposes is to be preferred, it is possible to make satisfactory R.F. adjustments with reasonable accuracy using a 485 kc. signal generator and output meter.

Place a modulated signal of 485 kc. on the grid of the last I.F. (8K7) tube with the volume control set at maximum and the AFC switch turned off. Place a range C, output meter or other output indicator across the volume coil of the loud-speaker. Adjust the output of the signal generator so that an indication of not more than two or three volts is obtained on the output meter.

Adjust and readjust the primary trimmer for maximum output and the secondary for minimum output. This latter adjustment will be very broad. Apply the signal input to the grid of the last I.F. (8K7) tube and adjust both primary and secondary trimmers for maximum output, reducing the input as necessary to obtain approximately the same output indication as before. Apply the signal input to the grid of the converter (6L7) tube and adjust both primary and secondary trimmers for maximum output indication in the same manner.

It is now necessary to make a fine adjustment of the secondary trimmer of the last I.F. (AFC) transformer which is as follows: without changing the frequency of the signal generator, place the input lead on the rubber insulation of the converter (6L7) grid lead. This will provide a small signal input through the capacity between the leads. Increase the attenuator setting if necessary to make the output audible.

Set the tuning dial indicator at the low end of the broadcast band at some point where no signal is received, since an excessive signal might interfere with the alignment process. The volume control should be in an "off" or nearly off position.

Apply a frequency modulated signal to the grid of the last I.F. amplifier tube through a 0.05 Mfd. (AC-075) capacitor. Connect the vertical plates of the oscilloscope between ground and the junction point between R-28 and R-24, and with the AFC switch in the "off" position proceed to align the primary and secondary of the last I.F. and the AFC I.F. trimmer.

The object should be to make the two curves coincide with each other at the top and throughout their length with the maximum amplitude obtainable. This will require that all four I.F. trimmers be adjusted in the usual manner excepting the AFC secondary (hexagonal) trimmer which must be adjusted for minimum amplitude before the curves will coincide properly. Fig. 5 gives the appearance of the curves when the alignment adjustments have been completed satisfactorily. Thus far, apply the same frequency modulated input to the grid of the converter (6L7) tube through a 0.05 mfd. capacitor as before. Adjust the primary and secondary of the last I.F. trimmer until the curves coincide and have the appearance of Fig. 6.

A further adjustment of the A.V.C. secondary (hexagonal) trimmer is necessary in order to complete the I.F. alignment satisfactorily. Apply the same signal to the grid of the second I.F. amplifier tube. Under the ground end of TC-46 and connect the vertical deflecting plates of the oscilloscope between ground and the 6B5 cathode prong K2 (Fig. 3) or to the center terminal of the AFC switch.

Carefully adjust the AFC secondary trimmer until a curve is obtained which is similar to that shown in Fig. 6. Correct adjustment is made when the two sides of the curve are symmetrical and intersect exactly at the horizontal axis. No adjustment of the other I.F. trimmers should be made at this time.

If a metal aligning tool is used, the curve will change when the tool is withdrawn. Therefore, it is advisable to use a fiber, lead-headed wrench for this aligning adjustment. At any rate, the final curve should be as shown with aligning tool removed.

2. I. F. Wave Trap Alignment

Leave the band switch at Band "B" and tune receiver to about 1600 kc.

With the test oscillator set at 485 kc. apply this signal to the antenna terminal through a dummy antenna consisting of a 400-ohm resistor and 250-microfarad capacitor in series. With the 485 kc. signal applied to the antenna terminal, adjust the I.F. Wave Trap Trimmer for minimum output indication.

3. R. F. Alignment

First check the position of the dial pointer by rotating the tuning condenser to maximum capacity position, i.e., plates fully meshed. At this position, the pointer should coincide with the end mark at the left-hand end of the scale. If it does not, it may be set by loosening the pointer set screw and setting the pointer to its correct position. During R.F. alignment the AFC switch must be set in its "off" (counter-clockwise) position.

BAND "B" (535-1640 KC.)

Set the test oscillator for operation at 1600 kc. and connect its output to the antenna terminal of the receiver through the dummy antenna described under "I.F. Wave Trap Alignment." Tune the receiver until the pointer is at 1500 on the scale. Set the tone control for minimum high response and reduce the volume control setting so as to avoid excessive

ALIGNMENT PROCEDURE

The receiver should first be allowed to run for fifteen minutes in order to reach its approximate normal operating temperature. Before making any adjustments, it is wise to determine the correctness of the existing alignment. This may be done by supplying a signal from the test oscillator to the receiver and inserting a "Tuning Wand" into the coil in material having a ring of nonmagnetic metal attached to one end, and a small core of finely divided iron compacted into the opposite end. By inserting the metal ring end into the center of a particular coil, the inductance of the coil is lowered, increasing its resonant frequency. Inserting the iron-filled rod into the coil raises its inductance, lowering its resonant frequency. If the circuits are in exact alignment, inserting either end of the tuning wand in any coil will result in a decrease in output. When an increase in signal is obtained with the iron-filled end of the wand, a decrease in resonant frequency of that circuit by increasing its trimmer capacity is indicated. When an increase in signal is obtained with the metal ring, a decrease in trimmer capacity is indicated.

Changes Indicated by Wand

Wand	Signal	Trimmer adjustment required
Metal Ring	Decrease	None
Iron Filled	Increase	
Metal Ring	Decrease	
Iron Filled	Increase	
Metal Ring	Decrease	Decrease capacity
Iron Filled	Increase	

Alignments Frequencies

I.F. Band "B" 520 kc. Band "C" 18,000 kc. Band "D" Wave Trap 465 kc. 580 kc. 1600 kc.

In order to align this receiver properly, it is necessary to have available the following test equipment:

- A modulated test oscillator with frequencies available of 485, 580, 1500, 5250 and 18,000 kc.
- An output indicator, such as a high resistance a-c voltmeter with a maximum scale reading of 3 to 5 volts, or a neon lamp indicator.
- An alignment tool consisting of an insulating shaft with a small screwdriver blade.
- A tuning wand.

To realize the full advantage of the performance built into these receivers the factory circuit alignment using cathode ray oscilloscope equipment is much to be preferred. The oscilloscope method is particularly advantageous in aligning the I.F. tuned circuits.

See Fig. 4 for location of all trimmer capacitors.

I. Visual Alignment of I. F.

For visual alignment it is necessary to vary the frequency of an unmodulated test oscillator signal over a range extending on both sides of the peak frequency. The receiver can then be placed in synchronism with the horizontal traverse of the cathode ray beam on its screen. The frequency modulator must, therefore, provide means for synchronizing the periodic frequency variation with the cathode ray horizontal deflection circuit. The test oscillator may advantageously have facilities for audio frequency amplitude modulation of a fixed radio frequency test signal, as well as for frequency modulation. But audio modulation is not required for visual I.F. alignment.

In place of an output meter across the speaker voice coil, the vertical plates of the cathode ray tube are connected across the load resistor of the diode rectifier. With the frequency modulator in operation in conjunction with the test oscillator, the resonance curve of the circuit under test will be then shown on the screen.

GENERAL ELECTRIC CO.

should be removed when the set is unpacked, may need to be removed the first time.) There is enough slack in connecting wires to allow the assembly to be drawn forward. When the socket assembly has been drawn far enough out for unscrewing the bulbs turn on the power switch and replace the bulbs which do not glow. All will not be bad as each group is in series (green) or series parallel (red). Take care the wires do not foul the tuning mechanism when the assembly is replaced. The colored lamps used for replacement *MUST ALL BE 4 1/2 VOLTS, 0.15 AMPERE LAMPS*. No other size will work.

If there is unusually dim on no signal and the colored bulbs are all good, try removing the antenna. Next try replacing the (R-7 "Colorama") tube or replace the rectifier. Sometimes the antenna noise level is so high that it dims the red like a signal. If the tubes in the set become weak, or the set is out of alignment, or for any other reason loses its sensitivity, the color tuning will appear insensitive.

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These receivers employ automatic frequency control (AFC) which is a device for automatically controlling the oscillator frequency in such a way that, although the receiver is not exactly tuned to the signal being received, an intermediate frequency of 465 kc. will still be produced. This control of the oscillator frequency is secured by means of a 6J7 tube so connected to the oscillator that it draws a lagging current from the tank circuit and thus gives the effect of a shunt inductance. Variation of the D.C. grid bias on the 6J7 control tube will affect the mutual conductance of the tube, thereby changing the amount of lagging current drawn from the oscillator tank with a consequent effect of variation of the amount of shunt inductance connected across the oscillator coil. This alters the total inductance in the oscillator tuned circuit and changes its resonant frequency.

Grid bias for the 6J7 control tube which will vary in accordance with the amount of detuning of the receiver is obtained from the 6H6 diode rectifier operating in conjunction with its special I.F. transformer. This control voltage is the difference between the drop across resistor R-24, the load resistor for one diode section of the 6H6 diode rectifier and the drop across resistors R-21, R-22 and R-23 which constitute the load resistance for the other diode section. When the receiver is correctly tuned to the incoming signal, the intermediate frequency produced will be 465 kc. which is the resonant frequency of the tuned circuit feeding the 6H6 diode rectifier. Under this condition each diode plate receives equal signal voltage and the D.C. voltage drops across the load resistors will be equal, giving no change in grid bias on the 6J7 control tube. If the receiver is so tuned that the intermediate frequency produced is above 465 kc. the signal voltage applied to diode plate No. 7 will exceed that applied to diode plate No. 8. In this case, the D.C. voltage drop across load resistor R-21, R-22 and R-23 will be larger than that across load resistor R-24 and a resultant voltage will be produced which will increase the 6J7 control tube grid bias lowering the mutual conductance of the tube and causing it to draw less current from the oscillator tank. This is the same effect that would be produced by increasing the amount of shunt inductance across the oscillator coil and the oscillator frequency is thereby lowered by the amount necessary to compensate for the detuning. The opposite takes place when the receiver is tuned so as to produce an intermediate frequency below 465 kc. Diode plate No. 8 then receives more signal voltage than diode plate No. 7 and the resultant voltage developed across the load resistors is such as to decrease the grid bias on the 6J7 control tube. This causes a larger current to be drawn from the oscillator tank circuit, the effect being the same as a decrease in shunt inductance with a consequent increase in oscillator frequency to overcome the detuning.

by this operation, which permits a sharp indication of resonance by seeing the "Colorama" lights. When a station has been satisfactorily located in this manner, the tuning knob is pushed in to its original position and the switch opened.

Power Supply

D.C. power for operation of the receiver is supplied by a power supply system employing a 6Z4 full-wave rectifier tube which, together with a suitable network of resistors and capacitors, supplies the required voltages and filtering action.

COLORAMA TUNING

These receivers are equipped with Color Tuning, a novel method which indicates approach to resonance by means of a change of color of the light illuminating the tuning scale.

The colored light is produced by a group of four red-stained pilot bulbs and a group of three green-stained bulbs behind the scale. At zero signal strength the red group is at full brilliance and the green invisibly dim. As the signal increases from zero, the red gets dimmer and the green brighter over a broad range until at extreme signal strength the green is fully bright and the red below visibility through the dial. Hence, as a station is tuned-in the color changes unambiguously, and the maximum change in the green direction is an indication of resonance.

Weak stations will produce a small color change and strong stations a larger change. The difference in signal strength between the weakest and the strongest station likely to be listened to, has been found to be so great in different localities that the receivers have been equipped with a two-position sensitivity range switch for "sensitive" and "insensitive" settings of the color tuning. The switch is located near the power transformer on the chassis and may be reached from the rear of the cabinet. In the sensitive position, the weakest station to which the user can listen comfortably above the general noise level, will shift the color to neutral white at resonance. Stronger stations give resonant points at high-powered stations and having a high noise level, such as Chicago and New York, the range switch must be thrown to the insensitive position. Standard outdoor antennas are used, or else the color will be fixed green over a wide band that resonance cannot be accurately found. The difference in sensitivity is about twenty to one. On short-wave bands the band switch connects the color tuning to the sensitive setting and the dial on all the short-wave signals are relatively weak. The intermediate setting is used only on the 535-1640 kc. band.

There is a group of four red and a group of three green pilot bulbs behind the scale. These are controlled by a saturable Reactor in a circuit which is shown in the schematic diagram, Fig. 2. The saturable reactor is controlled by a D.C. coil which decreases its reactance smoothly from a high value at no D.C. to a very low value at maximum D.C. The saturable reactor acts very much like a dimming rheostat except that it is controlled by the D.C. plate current of a 6K7 tube used solely for that purpose. This tube receives for its bias portion of the A.V.C. voltage of the set so that at no signal the bias is nearly zero. At this point, the plate current is at maximum; therefore, the red is brightest and the green invisibly dim.

SOME THINGS WHICH MAY AFFECT THE OPERATION OF COLOR TUNING ARE AS FOLLOWS:

Seven colored bulbs are used to give good diffusion of color over the scale; but if one of the seven fails it unbalances the whole group and should be replaced immediately. The lamp socket assembly may be removed by reaching into the rear of the cabinet, pulling the lamp socket assembly up on its guides and drawing it partly out. (A shipping screw, which

The 6J7 AFC tube is also located on the "Sentry Box" and is associated with the broadcast "B" band oscillator. A complete description of the operation of AFC is given in a later paragraph. The output of the converter is applied to the I.F. amplifier.

I. F. Amplifier

The intermediate frequency amplifier consists of a two-stage cascade section composed of three I.F. transformers and two 6K7 amplifier tubes. Each transformer has two tuned circuits which resonate at 465 kc. The third I.F. transformer is of special construction having the primary capacitor coupled to the midpoint of the secondary in order to provide the differential AFC voltage. The operation of this transformer is discussed in a special chapter on AFC.

Detector and AVC

The plates of the 6H6 twin diode are fed in push-pull by the secondary of the third I.F. transformer. Two balanced diode loads consisting of R-24 and the series resistance of R-21, R-22 and R-23 are provided. The AFC voltage is developed across the sum of all these resistors, while the audio voltage appears across the sum of R-21 and R-22 and R-23. The audio frequency thus provided is transferred to the A.F. system for amplification and reproduction. The direct-current component of the rectified signal produces a voltage drop across the above three resistors. That existing across R-21 and R-22 is employed for operating the 6K7 "Colorama" tuning tube. Switch S-10 permits application of either full or partial voltage to the tube, thereby permitting receiving conditions. A complete description of "Colorama" tuning is given in a later paragraph. The D.C. voltage developed across R-21 is utilized for automatic volume control action by employing the same to bias the R.F. amplifier, converter, and first I.F. amplifier tubes. Initial bias for these tubes is obtained by returning resistor R-21 to the minus 3 volt tap of the voltage divider. This second I.F. tube receives no A.V.C. and is self-biased. This minimizes the possibility of non-linear distortion on strong signals.

Audio System

The audio voltage developed across the diode load is applied to the volume control, R-30, through the isolating capacitor, TC-49. This control is compensated by means of dual resistance-capacitance networks to provide the proper balance of high and low frequencies at different volume control settings. The movable arm on the volume control selects the amount of audio signal applied to the control grid of the 6C5 audio amplifier tube and thus regulates the output of the receiver. The output of the 6C5 audio tube is transformer coupled to the control grids of the two 6F6 output tubes which operate in a push-pull connection.

The music-speech control consists of a switch actuated at one extreme of the tone control rotation corresponding to that providing maximum high note response. This provides better speech clarity by decreasing the bass compensation which is accomplished by shunting capacitor TC-53 with TC-52. The bass compensation is removed entirely on the short-wave bands by the switch S-2; hence the music-speech control is only effective in the broadcast "B" band. Continuously variable tone control is provided by capacitor TC-49 and variable resistor R-34 shunting the grids of the push-pull output tubes.

Silent Tuning

Silent tuning is provided by the switch S-9 which is actuated by the tuning knob of the receiver. Pulling the tuning knob out slightly closes switch S-9 and kills the audio output by grounding the 6C5 grid. The AFC is also removed

DESCRIPTION OF ELECTRICAL CIRCUIT

Model E-129 is a 12 metal tube receiver using a highly sensitive and selective superheterodyne circuit. In addition to the fundamental requirements of superheterodyne design it incorporates many noteworthy technical improvements which are of definite advantage in improving efficiency of performance and ease of operation.

Design features built into this receiver include the "Sentry Box"; separate coils for each frequency band; high efficiency converter with a separate oscillator; two stages of I.F. amplification for high sensitivity and selectivity; automatic volume control; automatic frequency control (AFC); silent tuning, bass and treble compensated volume control, music-speech switch operated in conjunction with a continuously variable tone control, and colorama tuning.

"Sentry Box"

The RF and oscillator sections of the receiver are contained in the "Sentry Box" which consists of a separately contained and shielded, four band, antenna, RF and oscillator tuning unit. Individual coils are employed for each frequency range and are properly selected and connected into the circuit by the range switch. To avoid absorption effects, the range switch shorts all unused coils which might resonate at some frequency in the range being used. The section of the range switch controlling section of the antenna coils in such a manner as to insure maximum signal transfer in each range. When the O.B. "v" Doubtless Antenna System is connected to terminals "A" and "G" at the rear of the "Sentry Box," the range switch provides for true doublet operation in the short wave (D) band where this connection is advantageous, and for operation as a "T" antenna in all other bands. When a doublet antenna providing noise reduction on the broadcast band is used, it is essential that a link be connected between terminals "C" and "CR" at the back of the "Sentry Box." In order to obtain the desired action.

The antenna is coupled to the control grid of the 6K7 RF tube through the tuned antenna transformer selected by the range switch. Likewise, the output of the amplifier tube is coupled to the control grid of the 6L7 converter tube through the property selected tuned RF transformer. The only exception to this procedure occurs when the receiver is operating on the ultra-short-wave "F" band, in which position the RF tube is disconnected from the circuit and the antenna coupled directly to the 6L7 grid through the tuned antenna transformer.

The oscillator circuit, with the exception of the ultra-short-wave "E" band, employs a 9J7 tube in a conventional tuned grid, plate feedback circuit. In the ultra-short-wave "E" band, the common impedance between the grid and plate circuits provided by the secondary of L12 in the cathode circuit of the 6K7 oscillator tube, is utilized to provide oscillation. An auxiliary feedback circuit composed of the primary of L-12 together with the capacitor, MC-29, is in the plate circuit of the oscillator tubes on the "E" band. These elements resonate slightly below the low frequency end of the "E" band and tend to improve the oscillator excitation at this end of the band. To minimize capacity effects, the tuned circuit of the 6K7 oscillator tube, is in the circuit at all times since its reactance is sufficiently low to permit this procedure. The grid coil of the broadcast "B" band oscillator plate voltage for the 6J7 AFC tube. The 580-kc. padding capacitor, C-20, serves to isolate this voltage from the oscillator tuning condenser section. The oscillator signal which is maintained at a frequency 465 kc. higher than the incoming signal is capacity coupled to the injection grid of the 6L7 converter.

MODEL E-129
Phonograph Data

GENERAL ELECTRIC CO.

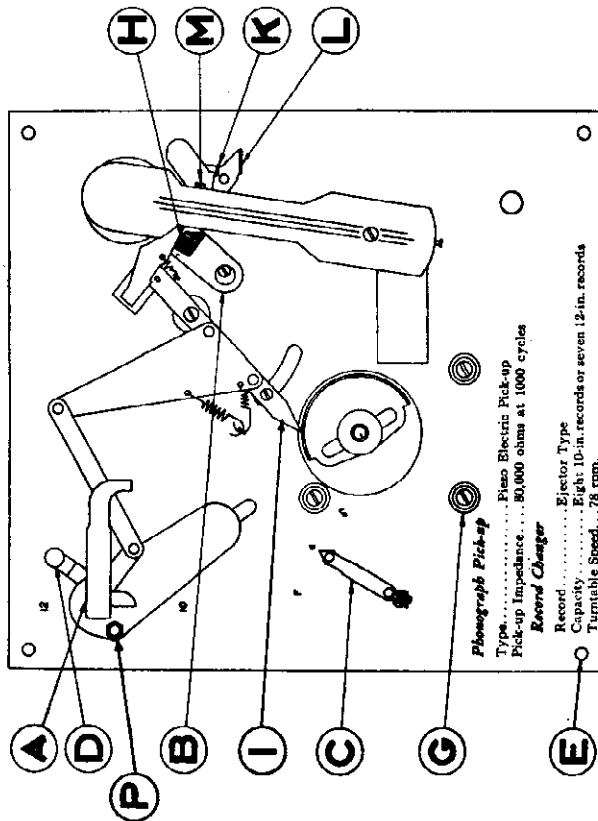


Fig. 8. Automatic Record Changer Mechanism

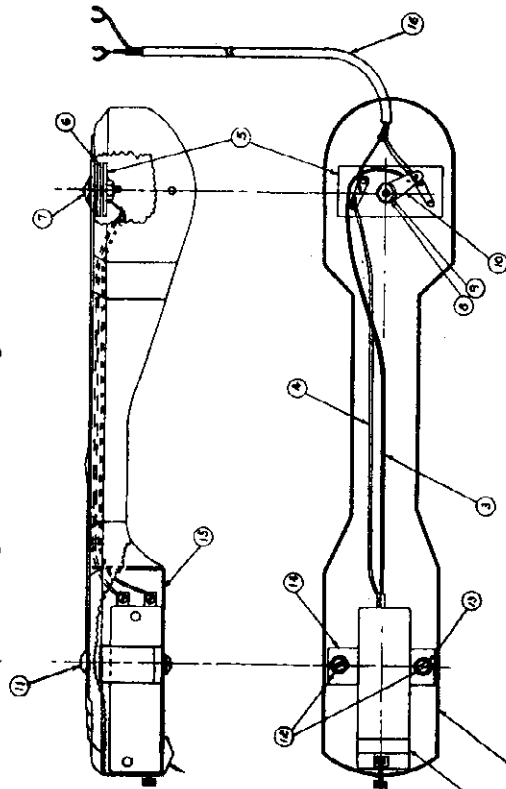


Fig. 9. Piano Electric Crystal Pick-up

The oval head machine screw, which serves as a pivot at the right-hand end of the lift lever (L), should be set at such a height to allow the lift lever to be raised by the latch bar and so the roller is able to pass under the end of the lift lever without binding and also without too much clearance.

Unloading Mechanism

The record changer is intended to be operated with at least one record on the turntable in order to prevent the needle from damaging the turntable coating.

This motor mounting screws (C) should be adjusted so that the depression of the leverable from the base plate to the top of one record is one inch.

The set screw and lock nut on the projecting member under the record removing arm (A) is provided for adjusting the elevation of the record separating and lifting finger. This screw should be adjusted so that the finger will remove the second record on the table but barely rise over, and not remove, the first record.

Record Lift Adjustments

To adjust the lift of a record while removing it from the turntable shaft and table the latch bar (I) should be placed in a position at its farthest protrusion toward the front of the arm mounted on the motor spindle. Place a record on the turntable separating finger and lever (A), the other side of the changer holds it while removing it. Let the other Adjust the lift by means of the eccentric head and nut (P) in the left of the record removing assembly until the center side of the record is off the turntable shaft and swings free of it.

Tone Arm Lowering

To adjust for the proper lowering of the tone arm on the edge of a 10-inch record (the difference for the 12-inch record is adjusted at the factory) the screw above the shelf on the right side of the tone arm is provided for moving the tone arm stop right or left until the needle will lower to approximately 1/8 in. from the edge of the record.

To adjust the proper vertical clearance of the tonearm's vertical pivot bearing, two jam nuts are provided on the end of the pivot sleeve, under the changer base plate. These nuts may be adjusted to take up unnecessary play.

Dash Pot Adjustment

Place the tonearm of the record changer in the position which results when the latch bar (I) is against the turntable motor cam at its furthest operating throw. (This position is the other extreme of the operating cycle as shown on Figure 8.) The tonearm stop should be against the cone-shaped cup of the dash pot, while in the 18-inch position.

Raise or lower the dash pot plunger by means of the two lock nuts which control the lift of the dash pot lever under the changer base plate. Adjust these two nuts so that there is a clearance of a post card thickness between the dash pot leather tip and the under-side of the tonearm shaft.

Lowering Speed of Dash Pot

The top of the dash pot is provided with a knurled screw cap for adjusting the lowering speed of the dash pot. In case the lowering speed is too fast, put a drop of light machine oil on this change above this cap and allow it to work into the felt packing gland. Tighten or loosen this cap to obtain the desired lowering speed.

Crystal Pick-up

The pick-up used in the phonograph unit is of the piezo-electric crystal type. The crystal cartridge (4), Fig. 9, is a factory sealed unit and no adjustments are provided. The pick-up and tonearm assembly should require very little servicing and if treated with reasonable care should perform its function without attention for long periods of time.

AUTOMATIC RECORD CHANGER

The record-changing mechanism used in this receiver has been designed to be simple and fool-proof. Under normal operating conditions, service difficulties should be negligible. Occasionally, however, certain adjustments may be required. These adjustments are explained in the following paragraphs. It is important when servicing the automatic record changer to have it placed on a level support. It is also important to refrain from forcing the mechanism if there is a tendency to bind or jam, since bent levers and possibly broken parts may result.

Operating Instructions and Service Adjustments

The record changer is designed to automatically play eight 10-inch or seven 12-inch standard 78 RPM phonograph records on one side. The last record remains on the turntable and repeats until most records are placed on the turntable or the mechanism is stopped.

To play 12-inch records, referring to Figure 8, pull the thumb stop (K) on the right-hand side of the tonearm forward, which allows the needle to locate on the edge of the record, also push the knob (D) at the left rear corner of the changer from 10 inch to 12 inch as marked on the base plate. Either 10-inch or 12-inch records may be repeated as often as desired by lifting the record removing arm (A) to an upright position.

To reject a record from the turntable while playing, pull the lever (L) at the right side of the turntable.

Motor Adjustments

The speed of the turntable motor is controlled by a governor which allows correct adjustment of the turntable rotation to 78 revolutions per minute. A pointer is provided, under the turntable and the base plate is marked "p. 78" to indicate direction to move pointer for faster or slower operation. A check of the turntable rotational speed may be made by placing a piece of paper under a record on the turntable and counting the number of times it rotates past a fixed point in one minute.

The motor bearings and gears are properly lubricated for long operation under normal weather conditions. If the motor chatters or runs uneven, place a few drops of light machine oil on the governor felt.

Trip Mechanism

While playing a record, the tonearm lifting mechanism (L) and the record removing arm (A) are held out of engagement with the motor cam by means of a latch which is formed by the vertical square pin in the pointed latch lever (I) and the notch in the side of the tonearm lift lever (L). This pin should engage the notch approximately one-half its depth, and is adjusted thus by means of an eccentric washer and screw in the trip lever (B) upon which is mounted the eccentric block (H).

The latch is held closed by means of a spring between the latch bar and the trip lever. Be sure the parts work freely without binding so that they will latch when the latch bar swings back past the notch after a record has been removed.

The record changer is designed to trip on an eccentric trip groove record. The eccentric trip is effected by means of a hardened steel pin which is pressed into the top of the tonearm lift crank. This pin ratchets over the top of the grooves in the eccentric block (H) on the trip lever (B). When the eccentric groove in the record swings the tonearm back and forth it pushes the latch out of engagement. Care should be taken to insure that there is at least 1/8 in. clearance for the end of the pin to raise over the ratchets to provide the ratchet action, when using a short phonograph needle riding on top of one record on the turntable.

MODEL E-155
Circuit Data

GENERAL ELECTRIC CO.

The rear of the cabinet. In the sensitive position, the weakest station to which the user can listen comfortably above the general noise level, will shift the color to neutral white at resonance. Stronger stations give bright green indications at resonance. In localities near a relatively large group of high-powered stations and having a high noise level, such as Chicago and New York, the range switch must be thrown to the insensitive position when standard out-door antennas are used, or else the color will be fixed green over so wide a range that resonance cannot be accurately found. The difference in sensitivity is about twenty to one. On short-wave bands the band switch connects the color tuning to the sensitive setting and the switch on the chassis is inoperative. This is because practically all the short-wave signals are relatively weak. The insensitive setting is used only on the 540-1920 kc. band.

There is a group of four red and a group of three green pilot bulbs behind the scale. These are controlled by a Saturable Reactor, L-22, in a circuit which is shown in the schematic diagram, Fig. 2. The saturable reactor is controlled by a D.C. coil which decreases its reactance smoothly from a high value at no D.C. to a very low value at maximum D.C. The saturable reactor acts very much like a dimming rheostat except that it is controlled by the D.C. plate current of the 6K7 tube used solely for that purpose. At this point the plate current is at maximum; therefore, the red is brightest and the green is dimmest.

Some things which may affect the operation of color tuning are as follows:

Seven colored bulbs are used to give good diffusion of color over the scale; but if one of the seven fails it unbalances the whole group and should be replaced immediately. The lamp socket assembly may be removed by reaching into the rear of the cabinet, pulling the lamp socket assembly up on its guides and drawing it partly out. A shipping screw, which should be removed when the set is unpacked, may need to be removed the first time. There is enough slack in connecting wires to allow the assembly to be drawn forward. When the socket assembly has been drawn far enough out for unscrewing the bulbs, turn on the power switch and replace the bulbs which do not glow. All will not be bad as each group is in series (green) or series parallel (red). Take care the wires do not foul the tuning mechanism when the assembly is replaced. The colored lamps used for replacement must all be 6.3 volts 0.15 ampere lamps. No other size will work.

If the red is unusually dim on no signal and the colored bulbs are all good, try removing the antenna. Next try replacing the 6K7 colorama tube, or replace the rectifier. Sometimes the antenna noise level is so high that it dims the red color like a signal. If the tubes in the set become weak, or the set is out of alignment, or for any other reason, loses sensitivity the color tuning will appear insensitive.

The output of the 6G5 first audio tube is resistance coupled to the control grid of the 6V6 second audio amplifier which is connected for triode operation. The output of this stage is transformer coupled to the control grids of the two 6L6 output tubes operating in a push-pull connection. The push-pull output stage is coupled to the loud-speaker through an impedance matching output transformer.

Degeneration

Audio degeneration is provided by applying a portion of the voice coil voltage to the cathode circuit of the 6V6 audio driver. This connection tends to flatten out the frequency characteristic of the audio and reproducing systems and decreases hum and non-linear distortion introduced by the audio amplifier.

The music-speech control consists of a switch actuated at one extreme of the tone control rotation corresponding to that providing maximum high note response. This provides better speech clarity by decreasing the bass compensation which is accomplished by shunting capacitor TC-56 with TC-57. The bass compensation is removed entirely on the short-wave and "A" bands by the switch S-2; hence the music-speech control is only effective in the broadcast (B) band. Continuously variable tone control is provided by capacitor TC-68 and a variable resistor R-38 shunting the grids of the push-pull output tubes.

Silent Tuning

Silent tuning is provided by the switch S-9 which is actuated by the tuning knob of the receiver. Pulling the tuning knob out closes the switch S-9 and silences the audio output by grounding the 6V6 control grid. The AFC is also removed by this operation which permits a sharp indication of resonance by noting the Colorama lights. When a station has been satisfactorily located in this manner, the tuning knob is pushed into its original position and the switch opened.

Power Supply

D. C. power for operation of the receiver is supplied by two 6Z4 tubes each operating as a half-wave rectifier. The output of the rectifiers is fed through a two-section filter tuning substantially pure D. C. to the voltage divider system from which taps supply correct voltages to the various receiver circuits.

Colorama Tuning

These receivers are equipped with Colorama Tuning, a novel method which indicates the approach to resonance by means of a change in the color of the light illuminating the tuning scale.

The colored light is produced by a group of four red-stained pilot bulbs and a group of three green-stained bulbs behind the scale. At zero signal strength the red group is at full brilliance and the green faintly dim. As the signal increases from zero, the red goes dimmer and the green brighter over a broad range until at extreme signal strength the green is fully bright and the red below visibility through the dial. Hence, as a station is tuned in the color changes smoothly, and the maximum change in the green direction is an indication of resonance.

Weak stations will produce a small color change and strong stations a larger change. The difference in signal strength between the weakest and the strongest station likely to be listened to, has been found to be so great in different localities that the receivers have been equipped with a two-position sensitivity range switch for "sensitive" and "insensitive" settings of the color tuning. The switch is located on the chassis near the power transformer and may be reached from

frequency 465 kc. higher than the incoming signal, is expected to be coupled to the injection grid of the 6L7 converter.

The 6I7 AFC tube is also located on the "Sentry Box" and is associated with the broadcast "B" band oscillator. A complete description of the operation of AFC is given in a later paragraph. The output of the converter is applied to the I. F. amplifier.

I. F. Amplifier

The intermediate frequency amplifier consists of a two-stage cascade section composed of three I. F. transformer and two 6K7 amplifier tubes. Each transformer has two tuned circuits which resonate at 465 kc. The third I. F. transformer is of special construction having a primary capacitor coupled to the midpoint of the secondary in order to provide the differential AFC voltage. The operation of this transformer is discussed in a special section on AFC.

Detector and AVC

The plates of the 6I6 twin diode are fed in push-pull by the secondary of the third I. F. transformer. Two diode loads consisting of R-24 and the series resistance of R-21, R-22, and R-23 are provided. The AFC voltage is developed across the sum of all these resistors, while the audio voltage appears across the sum of R-21, R-22, and R-23. A portion of the audio frequency thus provided is transferred to the A. F. system for amplification and reproduction. The direct current component of the rectified signal produces a voltage drop across the above three resistors. This voltage is employed to operate the 6K7 "Colorama" tuning tube. Switch S-11 permits the application of either full or partial voltage to the tube, thereby permitting control of the color indication in accordance with prevailing receiving conditions. A complete description of "Colorama" tuning is given in a later section. The D.C. voltage developed across R-21 and R-22 is utilized for automatic volume control action by employing the same to bias the R. F. amplifier, converter, and first I. F. amplifier tubes.

Initial control grid bias for these tubes is supplied by the delay bias diode under conditions of little or no signal. Under such conditions, this diode draws current through resistors R-21, R-22, and R-23, thereby maintaining the desired operating bias. When signal voltage above the level of the initial bias is applied, this diode ceases to draw current and the AVC diode takes over the biasing function.

The second I. F. tube receives no AVC and is self-biased. This minimizes the possibility of non-linear distortion on strong signals.

Noise Limiter

The other diode section of the auxiliary twin diode is employed as a transient noise-limiting device. This diode is so connected that its normal D. C. plate voltage has a value greater than the peak voltage of the audio signal applied through it to the manual volume control. Any transient signal of high voltage such as a static impulse will drive the plate negative, rendering the diode non-conducting and limiting the amount of transient voltage developed across the volume control.

Audio System

The manual volume control consists of a tapered potentiometer connected between the noise-limiting diode and the control grid of the 6G5 first audio amplifier. This control is tone-compensated by means of a resistance-capacitance network to provide proper balance of high and low notes at different volume control settings.

DESCRIPTION OF ELECTRICAL CIRCUIT

Model E-155 is a 15 metal tube receiver using a highly sensitive and selective superheterodyne circuit. In addition to the fundamental requirements of superheterodyne design it incorporates many noteworthy technical improvements which are of definite advantage in improving efficiency of performance and ease of operation.

Design features built into this receiver include the "Sentry Box"; separate coils for each frequency band; high efficiency converter with separate oscillator; two stages of I. F. amplification for high sensitivity and selectivity; automatic volume control; automatic frequency control (AFC); noise limiter; silent tuning; bass and treble compensation volume control; music-speech switch operated in conjunction with a continuously variable tone control; push-pull beam power tube output; audio degeneration; extra large electrodynamic speaker; and colorama tuning.

"Sentry Box"

The R. F. and oscillator sections of the receiver are contained in the "Sentry Box" which consists of a separately contained and shielded, five band antenna-R. F. oscillator tuning unit. Individual coils are employed for each frequency range and are properly selected and connected into the circuit by the range switch. To avoid absorption effects, the range switch starts all unused coils which might resonate at some frequency in the band being used. The section of the range switch controlling selection of the antenna coil primary also changes the antenna connection to these coils in such a manner as to insure maximum signal transfer in each range. When the G-E "Y" Double Antenna System is connected to terminals "A" and "G" at the rear of the "Sentry Box," the range switch provides for true doublet operation in the short wave "D" band where this connection is advantageous, and for operation as a "T" antenna in all other bands. When a doublet antenna providing noise reduction on the broadcast band is used, it is essential that a link be connected between terminals "G" and "GR" at the back of the "Sentry Box" in order to obtain the desired action.

The antenna is coupled to the control grid of the 6K7 R. F. tube through the tuned antenna transformer selected by the range switch. Likewise, the output of the R. F. amplifier tube is coupled to the control grid of the 6L7 converter tube through the properly selected tuned R. F. transformer. The only exceptions to this procedure occur when the receiver is operating on the "Long Wave" "A" band or the ultra short wave "E" band, in which positions the R. F. tube is disconnected from the circuit and the antenna coupled directly to the 6L7 grid through the tuned antenna transformer.

The oscillator circuit, with the exception of the ultra short wave "E" band, employs a 6J7 tube in a conventional tuned grid, plate feedback circuit. In the ultra short wave "E" band, the common impedance between the grid and plate circuits provided by the secondary of L-13 in the cathode circuit of the 6K7 oscillator tube is utilized to provide oscillation. An auxiliary feedback circuit, composed of the primary, L-13, together with the capacitor, MC-38, is in the plate circuit of the oscillator tube on the "E" band. These elements resonate slightly below the low frequency end of the "E" band and tend to improve the oscillator excitation at this end of the band. To minimize capacity effects, the tuned "E" band grid coil, L-16, remains in the circuit at all times since its resistance is sufficiently low to permit this procedure. The grid coil of the broadcast "B" band oscillator returns to a point rather than to ground in order to provide plate voltage for the 6I7 AFC tube. The 580 kc. padding capacitor, C-27, serves to isolate this voltage from the oscillator tuning control network to provide proper balance of high and low notes at different volume control settings.

Electrical Power Output

Undistorted: 20 watts
Maximum: 37.5 watts

Loud-speaker—Electrodynamic

Cone Diameter: 15 in.
Cone Coil Impedance 10 ohms at 400 cycles

The 6I7 AFC tube is also located on the "Sentry Box" and is associated with the broadcast "B" band oscillator. A complete description of the operation of AFC is given in a later paragraph. The output of the converter is applied to the I. F. amplifier.

I. F. Amplifier

The intermediate frequency amplifier consists of a two-stage cascade section composed of three I. F. transformer and two 6K7 amplifier tubes. Each transformer has two tuned circuits which resonate at 465 kc. The third I. F. transformer is of special construction having a primary capacitor coupled to the midpoint of the secondary in order to provide the differential AFC voltage. The operation of this transformer is discussed in a special section on AFC.

Detector and AVC

The plates of the 6I6 twin diode are fed in push-pull by the secondary of the third I. F. transformer. Two diode loads consisting of R-24 and the series resistance of R-21, R-22, and R-23 are provided. The AFC voltage is developed across the sum of all these resistors, while the audio voltage appears across the sum of R-21, R-22, and R-23. A portion of the audio frequency thus provided is transferred to the A. F. system for amplification and reproduction. The direct current component of the rectified signal produces a voltage drop across the above three resistors. This voltage is employed to operate the 6K7 "Colorama" tuning tube. Switch S-11 permits the application of either full or partial voltage to the tube, thereby permitting control of the color indication in accordance with prevailing receiving conditions. A complete description of "Colorama" tuning is given in a later section. The D.C. voltage developed across R-21 and R-22 is utilized for automatic volume control action by employing the same to bias the R. F. amplifier, converter, and first I. F. amplifier tubes.

Initial control grid bias for these tubes is supplied by the delay bias diode under conditions of little or no signal. Under such conditions, this diode draws current through resistors R-21, R-22, and R-23, thereby maintaining the desired operating bias. When signal voltage above the level of the initial bias is applied, this diode ceases to draw current and the AVC diode takes over the biasing function.

The second I. F. tube receives no AVC and is self-biased. This minimizes the possibility of non-linear distortion on strong signals.

Noise Limiter

The other diode section of the auxiliary twin diode is employed as a transient noise-limiting device. This diode is so connected that its normal D. C. plate voltage has a value greater than the peak voltage of the audio signal applied through it to the manual volume control. Any transient signal of high voltage such as a static impulse will drive the plate negative, rendering the diode non-conducting and limiting the amount of transient voltage developed across the volume control.

Audio System

The manual volume control consists of a tapered potentiometer connected between the noise-limiting diode and the control grid of the 6G5 first audio amplifier. This control is tone-compensated by means of a resistance-capacitance network to provide proper balance of high and low notes at different volume control settings.

frequency 465 kc. higher than the incoming signal, is expected to be coupled to the injection grid of the 6L7 converter.

The 6I7 AFC tube is also located on the "Sentry Box" and is associated with the broadcast "B" band oscillator. A complete description of the operation of AFC is given in a later paragraph. The output of the converter is applied to the I. F. amplifier.

I. F. Amplifier

The intermediate frequency amplifier consists of a two-stage cascade section composed of three I. F. transformer and two 6K7 amplifier tubes. Each transformer has two tuned circuits which resonate at 465 kc. The third I. F. transformer is of special construction having a primary capacitor coupled to the midpoint of the secondary in order to provide the differential AFC voltage. The operation of this transformer is discussed in a special section on AFC.

Detector and AVC

The plates of the 6I6 twin diode are fed in push-pull by the secondary of the third I. F. transformer. Two diode loads consisting of R-24 and the series resistance of R-21, R-22, and R-23 are provided. The AFC voltage is developed across the sum of all these resistors, while the audio voltage appears across the sum of R-21, R-22, and R-23. A portion of the audio frequency thus provided is transferred to the A. F. system for amplification and reproduction. The direct current component of the rectified signal produces a voltage drop across the above three resistors. This voltage is employed to operate the 6K7 "Colorama" tuning tube. Switch S-11 permits the application of either full or partial voltage to the tube, thereby permitting control of the color indication in accordance with prevailing receiving conditions. A complete description of "Colorama" tuning is given in a later section. The D.C. voltage developed across R-21 and R-22 is utilized for automatic volume control action by employing the same to bias the R. F. amplifier, converter, and first I. F. amplifier tubes.

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The second I. F. tube receives no AVC and is self-biased. This minimizes the possibility of non-linear distortion on strong signals.

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Audio System

The manual volume control consists of a tapered potentiometer connected between the noise-limiting diode and the control grid of the 6G5 first audio amplifier. This control is tone-compensated by means of a resistance-capacitance network to provide proper balance of high and low notes at different volume control settings.

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Detector and AVC

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Initial control grid bias for these tubes is supplied by the delay bias diode under conditions of little or no signal. Under such conditions, this diode draws current through resistors R-21, R-22, and R-23, thereby maintaining the desired operating bias. When signal voltage above the level of the initial bias is applied, this diode ceases to draw current and the AVC diode takes over the biasing function.

The second I. F. tube receives no AVC and is self-biased. This minimizes the possibility of non-linear distortion on strong signals.

Noise Limiter

The other diode section of the auxiliary twin diode is employed as a transient noise-limiting device. This diode is so connected that its normal D. C. plate voltage has a value greater than the peak voltage of the audio signal applied through it to the manual volume control. Any transient signal of high voltage such as a static impulse will drive the plate negative, rendering the diode non-conducting and limiting the amount of transient voltage developed across the volume control.

Audio System

The manual volume control consists of a tapered potentiometer connected between the noise-limiting diode and the control grid of the 6G5 first audio amplifier. This control is tone-compensated by means of a resistance-capacitance network to provide proper balance of high and low notes at different volume control settings.

GENERAL

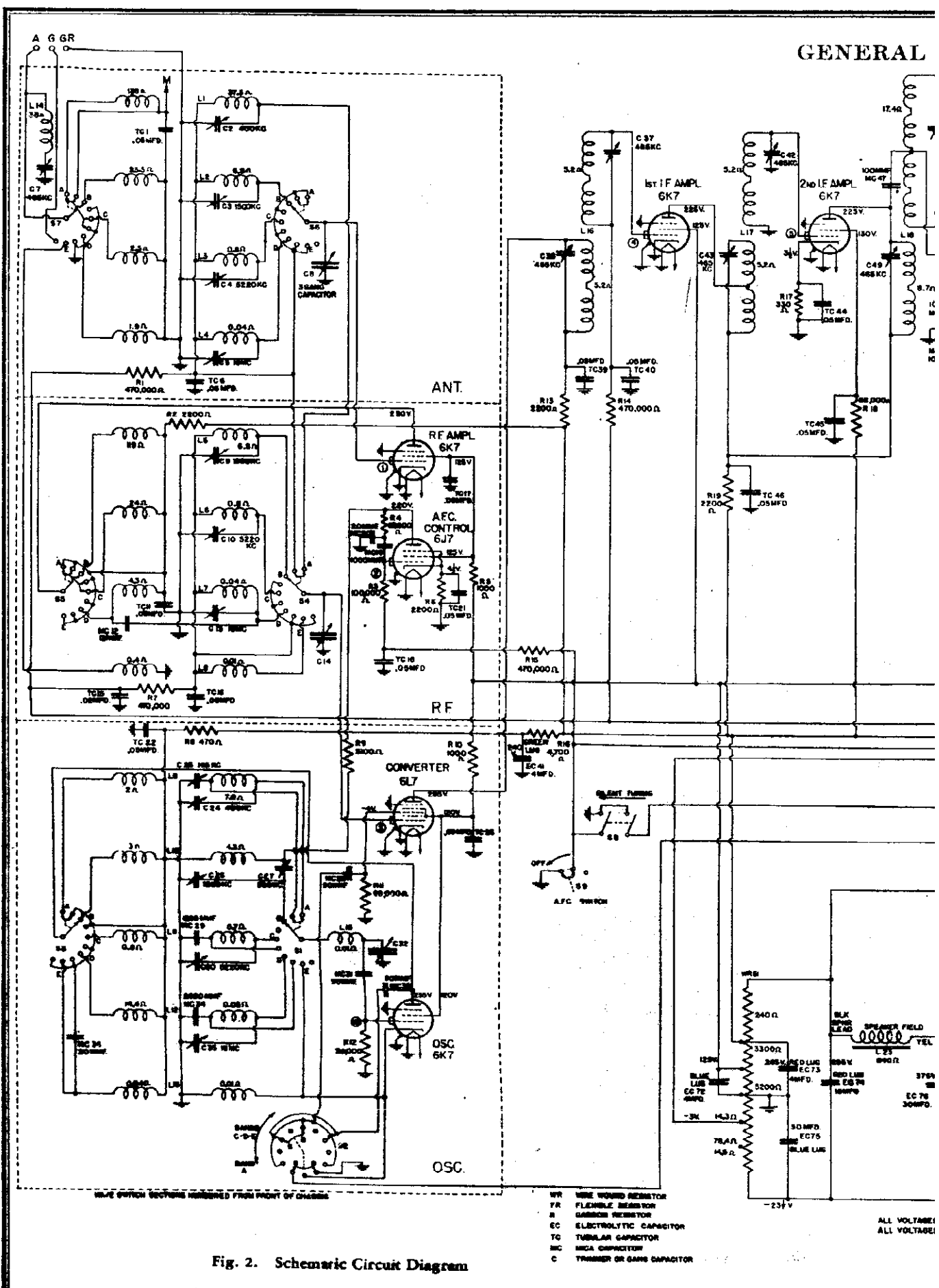


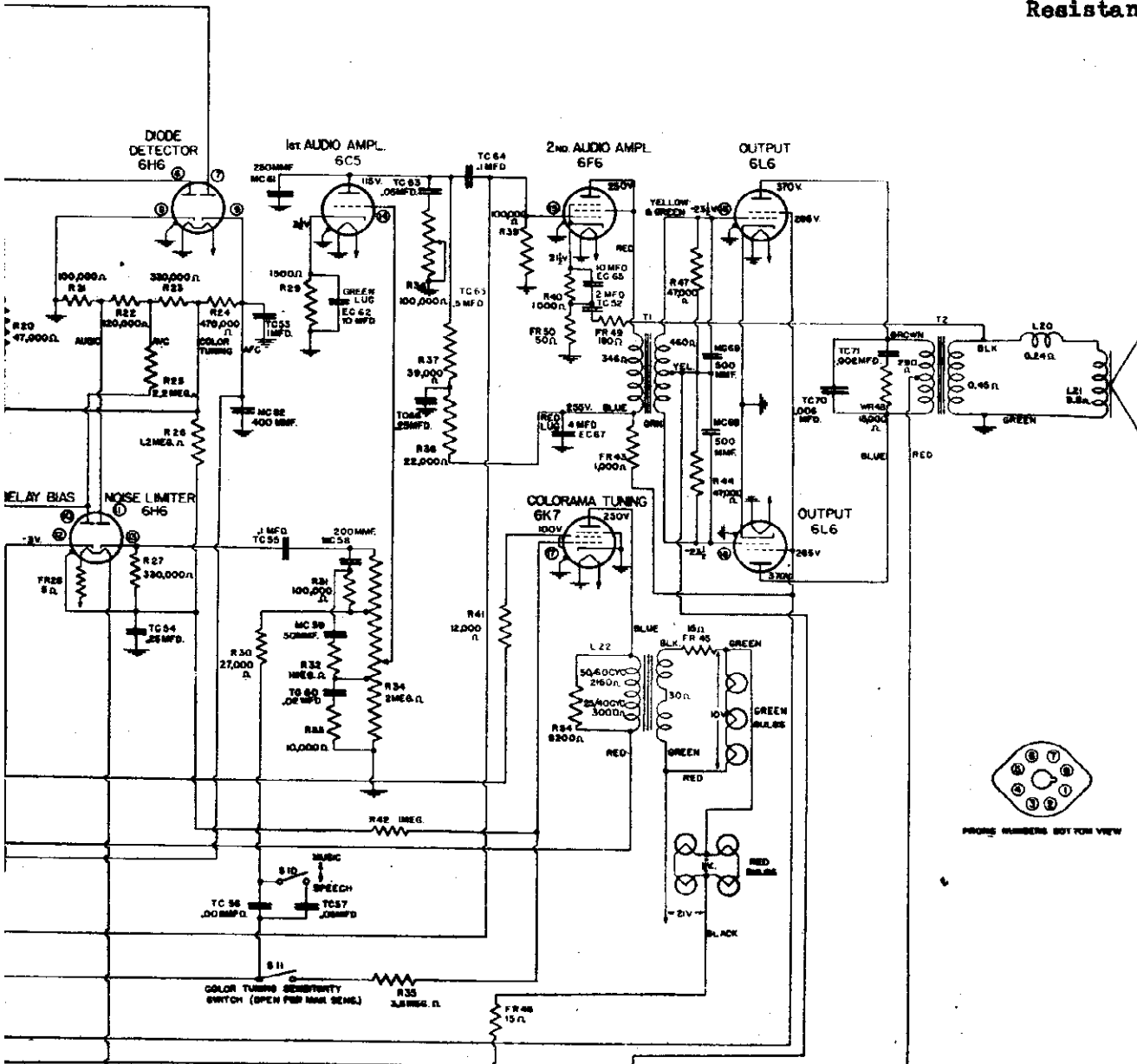
Fig. 2. Schematic Circuit Diagram

- WR WIRE WOUND RESISTOR
- FR FLEXIBLE RESISTOR
- R RESISTOR
- EC ELECTROLYTIC CAPACITOR
- TC TUBULAR CAPACITOR
- MC MICA CAPACITOR
- C TRIMMER OR GEAR CAPACITOR

ALL VOLTAGE!
ALL VOLTAGE!

ELECTRIC CO.

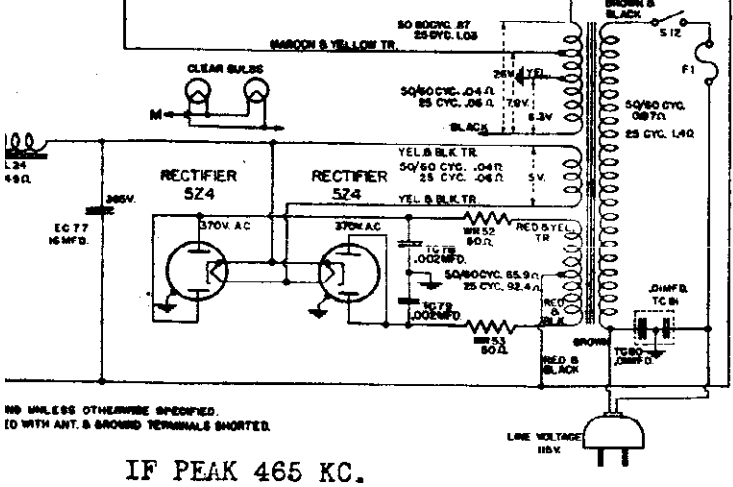
MODEL E-155
Schematic
Resistance



CONDITIONS OF TEST
 WAVE SWITCH ON B BAND
 AFC SWITCH OFF (COUNTERCLOCKWISE)
 SILENT TUNING SWITCH OPEN (M)
 COLORAMA SWITCH IN SENSITIVE POSITION (COUNTERCLOCKWISE)
 POWER SWITCH OFF

APPROXIMATE RESISTANCE MEASUREMENTS

RESISTANCE TO GROUND	TIME	SOCKET PRONG
① - 2.8 MEG. Ω	RT GRID	CAP
② - 1.8 MEG. Ω	AFC OFF	CAP
③ - 1.8 MEG. Ω	AFC ON	CAP
④ - 2.8 MEG. Ω	CONV. GRID	CAP
⑤ - 2.8 MEG. Ω	INT. LF GRID	CAP
⑥ - 8.2 Ω	2nd IF. GRID	CAP
⑦ - 300,000 Ω	AFC OFF	SH. DIODE PLATE-PRONG 3
⑧ - 300,000 Ω	AFC ON	SH. DIODE PLATE-PRONG 3
⑨ - GROUND	SH. DIODE CATH.	PRONG 4
⑩ - GROUND	AFC OFF	SH. DIODE CATH. PRONG 8
⑪ - 1 MEG. Ω	AFC ON	SH. DIODE CATH. PRONG 8
⑫ - 2 MEG. Ω	AFC DIODE PLATE-PRONG 5	
⑬ - 90,000 Ω	NOISE DIODE PLATE-PRONG 5	
⑭ - 4.3 Ω	AFC DIODE CATH. PRONG 8	
⑮ - 1.8 MEG. Ω	NOISE DIODE CATH. PRONG 4	
⑯ - 0.2 MEG. Ω	INT. A.F. GRID	PRONG 6 - ROTATE VOLUME CONTROL
⑰ - 100,000 Ω	1st IF. GRID	PRONG 5 - SILENT TUNING OFF
⑱ - GROUND	2nd A.F. GRID	PRONG 5 - SILENT TUNING ON
⑲ - 337 Ω	OUTPUT GRID	PRONG 6
⑳ - 2.5 MEG. Ω	COLOR TUNING C - CAP	COLOR TUNING SWITCH IN SENS. POS. C.CLOCKW.
㉑ - 1.4 MEG. Ω	COLOR TUNING G - CAP	COLOR TUNING SWITCH IN SENS. POS. C.CLOCKW.
㉒ - 337 Ω	OUTPUT GRID	PRONG 5
㉓ - 4700 Ω	OSC GRID	CAP



IF PEAK 465 KC.

NO UNLESS OTHERWISE SPECIFIED.
 ID WITH ANT. & GROUND TERMINALS SHORTED.

MODEL E-155
Chassis Wiring

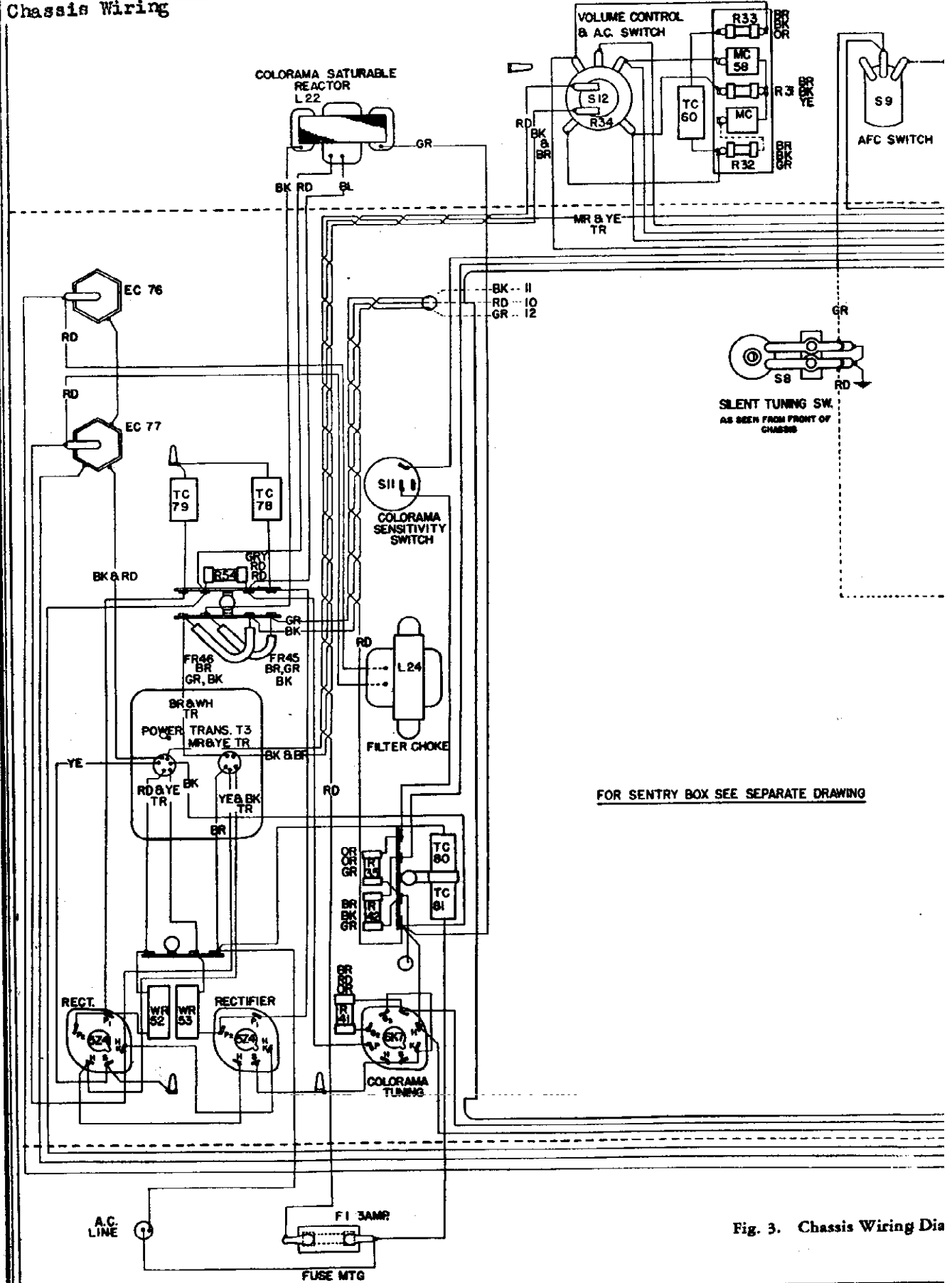
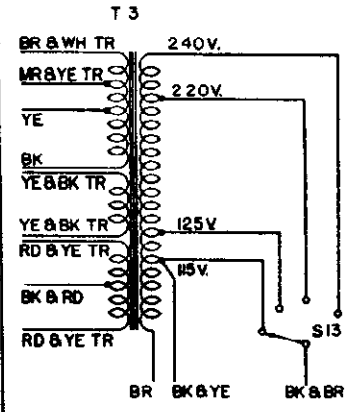
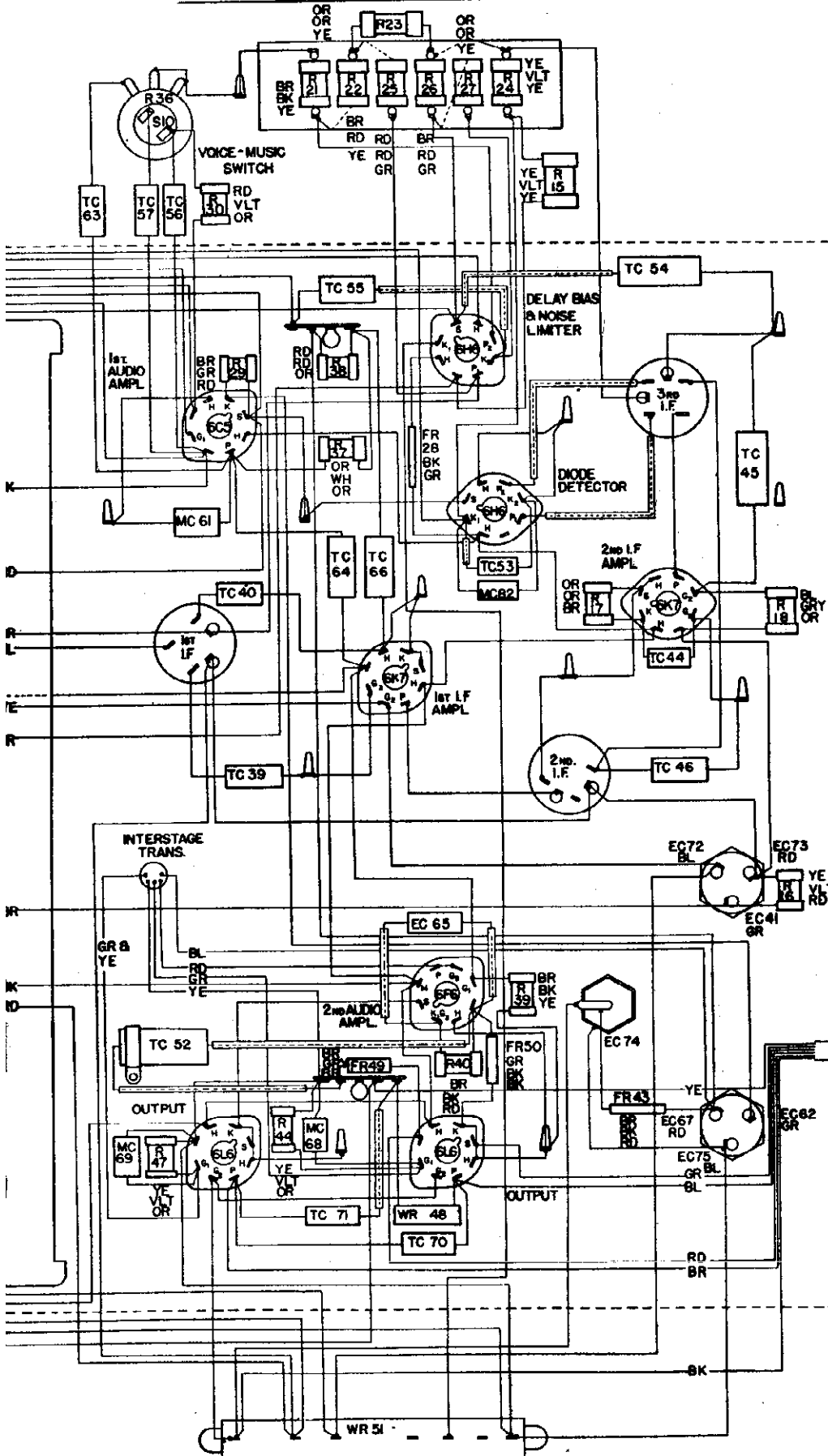
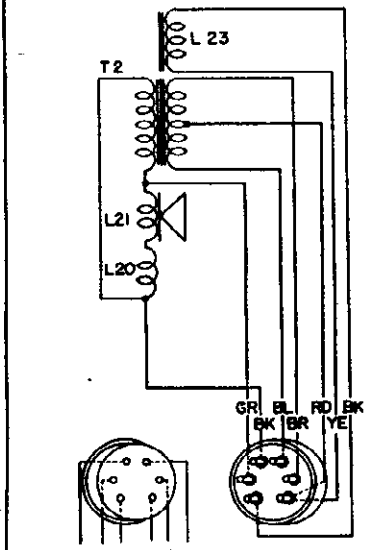


Fig. 3. Chassis Wiring Dia



INTERNAL CONNECTIONS FOR UNIVERSAL TRANSFORMER 105-250V.



INTERNAL SPEAKER CONNECTIONS

- COLORS**
- BK ----- BLACK
 - BR ----- BROWN
 - RD ----- RED
 - OR ----- ORANGE
 - YE ----- YELLOW
 - GR ----- GREEN
 - BL ----- BLUE
 - VLT ----- VIOLET
 - GRY ----- GRAY
 - WH ----- WHITE
 - MR ----- MAROON

MODEL E-155
Dial Mechanism
Alignment Oscillograms

GENERAL ELECTRIC CO.

Tuning Control Drive Ratio

Fast Tuning 8 to 1
Vernier Tuning 50 to 1

Tuning Frequency Range

Band "A" 140—420 kc.
Band "B" 540—1620 kc.
Band "C" 1610—5580 kc.
Band "D" 5.5—18.1 mc. (5500—18,100 kc.)
Band "E" 17.5—70.0 mc. (17,500—70,000 kc.)

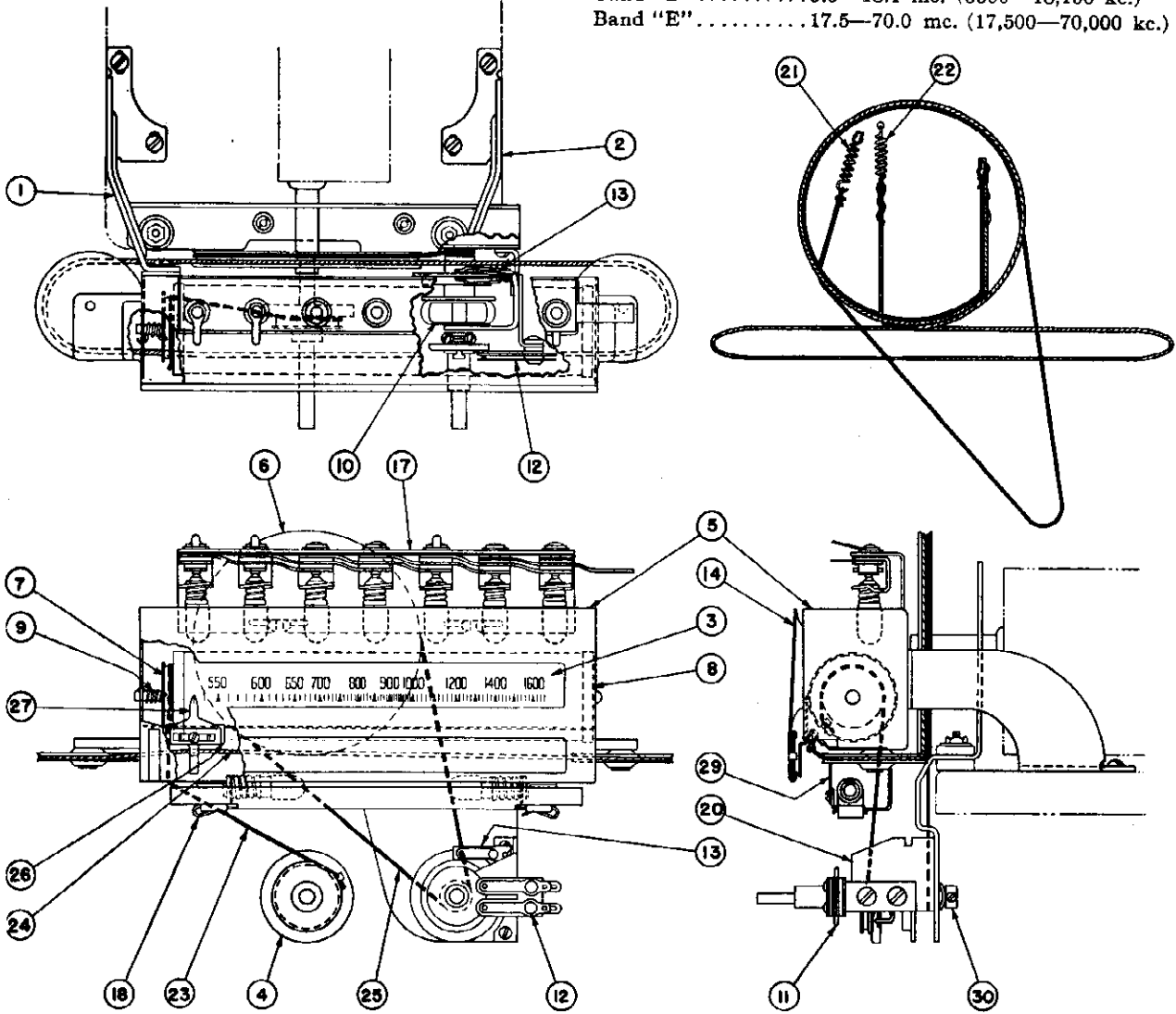


Fig. 7. Dial Mechanism

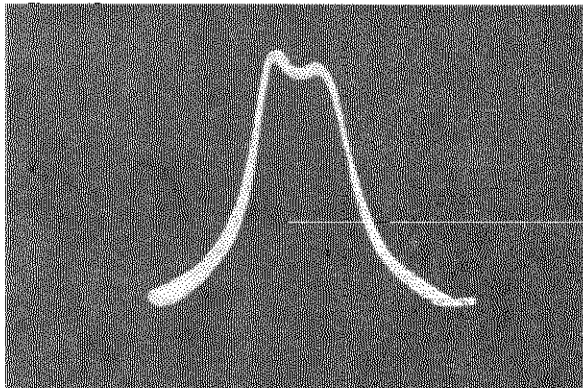


Fig. 5. Overall I.F. Curve

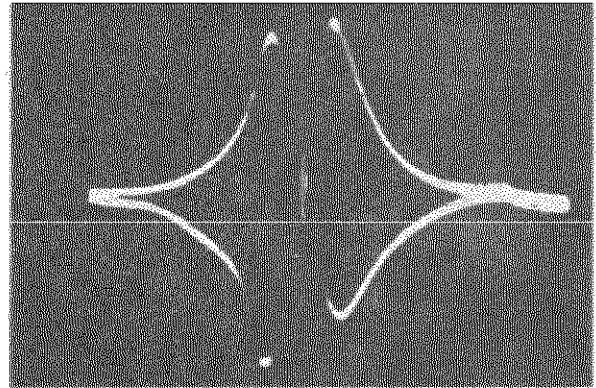


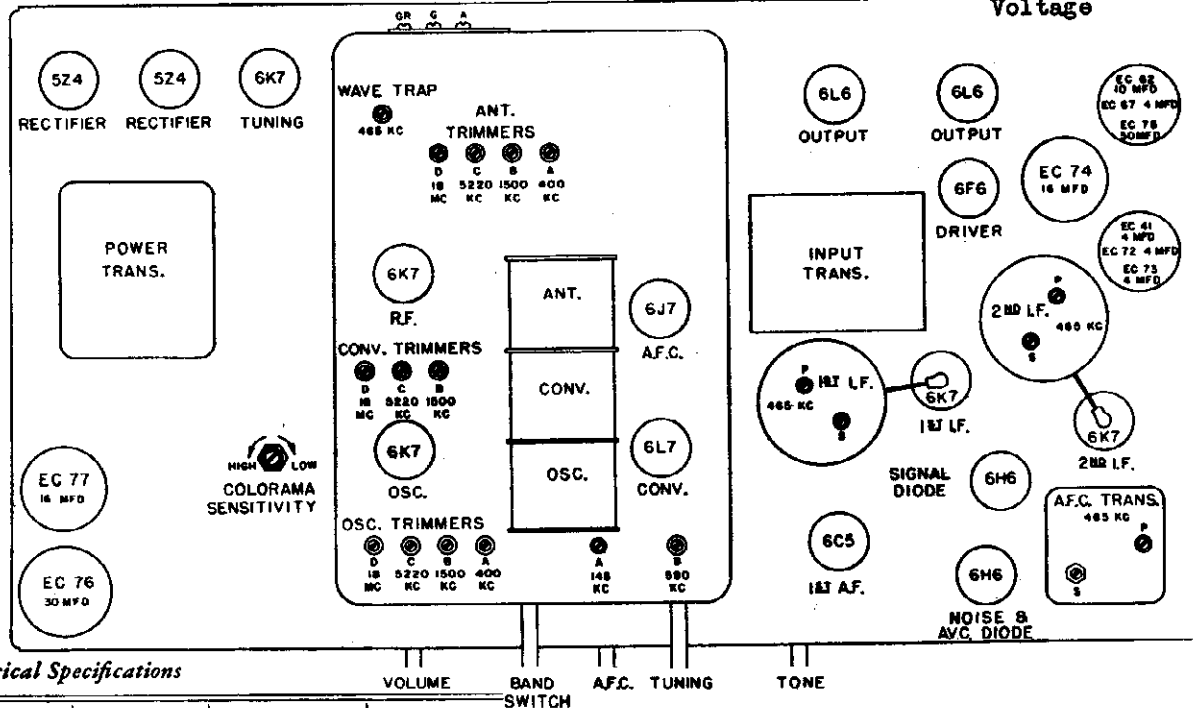
Fig. 6. AFC Adjustment Curve

(Curves taken with RCA Oscillograph Type TMV-122-B)

GENERAL ELECTRIC CO.

MODEL E-155
Socket, Trimmer
Voltage

Fig. 4. Chassis Layout and Trimmer Location



Electrical Specifications

Rating Label	Power Supply (Volts)	Frequency (Cycles)	Power Consumption (Watts)
A C V	115	50-60	195
	115 105-130 and 200-250	25-60	195
		40-60	200

Note: Taps on universal transformers (Rating "V") are accessible by removing the cap cover on the top of the transformer.

SOCKET VOLTAGES

Tube No.	Cathode to Ground Volts, D.C.	Screen Grid to Ground Volts, D.C.	Plate to Ground Volts, D.C.	Cathode Current M.A.	Heater Volts A.C.
6K7 R. F. Amp.	†	125	250	10.7	6.3
6L7 Converter	†	120	255	10.6	6.3
6K7 Oscillator	...	120	235	8.1	6.3
6K7 1st I. F.	†	125	225	10.6	6.3
6K7 2nd I. F.	3.5	130	225	10.2	6.3
6H6 Det. & AVC	...	...	...	...	6.3
6C5 1st Audio	3.5	...	*115	2.6	6.3
6F6 2nd Audio	21.5	...	250	25.0	6.3
6L6 Output	**	285	370	46.0	6.3
6L6 Output	**	285	370	46.0	6.3
6J7 AFC	4.5	125	220	2.3	6.3
6K7 Colorama Control	†	100	250	12.6	6.3
6H6 Limiter Control	...	...	...	...	6.3
5Z4 Rectifier	385 D.C.	...	370 RMS	105	5.0
5Z4 Rectifier	385 D.C.	...	370 RMS	105	5.0

Measured at 115 volts supply. No signal input. Volume control maximum. Voltmeter 1000 ohms per volt. Measurements taken on highest scale giving accurate readable deflection.
 * Supply voltage minus drop in load resistor.
 ** Grid bias at source—23.5 volts.
 † Grid bias at source—3.0 volts.

MODEL E-155

Alignment

GENERAL ELECTRIC CO.

ALIGNMENT PROCEDURE

The receiver should first be allowed to run for fifteen minutes in order to reach its approximate normal operating temperature. Before making any adjustments, it is wise to determine the correctness of the existing alignment. This may be done by supplying a signal to the receiver from the test oscillator at the alignment frequency and inserting a "Tuning Wand" into the coil involved. The tuning wand consists of a rod of insulating material having a ring of non-magnetic metal attached to one end, and a small core of finely divided iron compacted into the opposite end. By inserting the metal ring end into the center of the R. F. coil, the inductance of this coil is lowered, increasing its resonant frequency. Inserting the iron filled end into the coil raises its inductance, lowering its resonant frequency. If the R. F. circuits are in exact alignment, inserting either end of the tuning wand into the coil will result in a decrease in output. When an increase of signal is obtained with the iron-filled end of the wand, a decrease in resonant frequency of that circuit by increasing its trimmer capacity is indicated. When an increase of signal is obtained with the metal ring, a decrease in trimmer capacity is indicated.

Changes Indicated by Wand		
Wand	Signal	Trimmer Adjustment Required
Metal Ring	Decrease	None
Iron Filings	Increase	
Changes Indicated by Wand (Cont.)		
Wand	Signal	Trimmer Adjustment Required
Metal Ring	Increase	Decrease capacity
Iron Filings	Decrease	
Metal Ring	Decrease	Increase capacity
Iron Filings	Increase	

ALIGNMENT FREQUENCIES

I. F. Band "A" 465 kc. 145 kc. Band "B" 580 kc. Band "C" 5220 kc. Band "D" 18,000 kc. Wave Trap 465 kc. 1800 kc.

In order to align these receivers properly it is necessary to have available:

1. A modulated test oscillator capable of producing the above alignment frequencies.
2. An output indicator, such as a high resistance a-c voltmeter with a maximum scale reading of 3 to 5 volts, or a neon lamp indicator.
3. An alignment tool consisting of a fiber shaft screw-driver.
4. A tuning wand.

To realize the full advantage of the performance built into these receivers at the factory, circuit alignment using cathode ray oscilloscope equipment is much to be preferred. The oscilloscope method is particularly advantageous in aligning the I. F. tuned circuits.

The location of all alignment trimmer capacitors, as well as socket voltages, is shown in Fig. 4.

1. Visual Alignment of I. F.

For visual alignment it is necessary to vary the frequency of an unmodulated test oscillator signal over a range extending on both sides of the peak frequency. This variation must take place in synchronism with the horizontal traverse of the cathode ray beam on its screen. The frequency modulator must, therefore, provide means for synchronizing the periodic test frequency variation with the cathode ray horizontal deflection circuit. The test oscillator may advantageously have facilities for audio frequency amplitude modulation of a fixed radio frequency test signal, as well as for frequency modulation, but audio modulation is not required for visual I. F. alignment.

Instead of an output meter across the speaker voice coil, the vertical plates of the cathode ray tube are connected across the load resistor of the diode rectifier. With the frequency modulator in operation in conjunction with the test oscillator, the resonance curve of the circuit under test will be then shown on the screen.

Set the tuning dial indicator at the low end of the broadcast band at some point where no signal is received, since an extraneous signal might interfere with the aligning process. The volume control should be in an "off" or nearly off position. Apply a frequency modulated signal to the grid of the 1st I. F. amplifier tube through a .05 Mfd. (RC-072) capacitor, leaving the grid cap in place. Connect the vertical

plates of the oscilloscope between ground and the junction point between R-23 and R-24, and with the AFC switch in the "off" position proceed to align the primary and secondary of the 2nd I. F. and the AFC I. F. transformers.

The object should be to make the two curves coincide with each other at the top and throughout their length with the maximum amplitude obtainable. This will require that all four I. F. trimmers be adjusted in the usual manner *excepting the AFC secondary (hexagonal nut) trimmer which must be adjusted for minimum amplitude* before the curves will coincide properly. Fig. 5 gives the appearance of the curve when the alignment adjustments have been completed satisfactorily thus far. Apply the same frequency modulated input to the grid of the converter (6L7) tube through a .05 Mfd. capacitor as before. Adjust the primary and secondary of the 1st I. F. transformer until the curves coincide as before and have the appearance of Fig. 5.

A further adjustment of the AFC secondary (hexagonal nut) trimmer is necessary in order to complete the I. F. alignment satisfactorily. Apply the same signal to the grid of the second I. F. amplifier tube. Unsolder the ground end of TC-53 and connect the vertical deflecting plates of the oscilloscope between ground and the 6H6 cathode prong K1 (Fig. 3). Since the cathode prong is inaccessible, this connection can be made at the AFC switch center contact.

Carefully adjust the AFC secondary trimmer until a curve is obtained which is similar to that shown in Fig. 6. Correct adjustment is made when the two sides of the curve are symmetrical and intersect exactly at the horizontal axis. No adjustment of the other I. F. trimmer should be made at this time.

If a metal aligning tool is used, the curve will change when the tool is withdrawn. Therefore, it is advisable to use a fiber hex-headed wrench for this aligning adjustment. At any rate, the final curve should be as shown with aligning tool removed.

2. I. F. Wave Trap Alignment

Leave the band switch at Band "B" and tune receiver to about 1000 kc.

With the test oscillator set at 465 kc. apply this signal to the antenna terminal through a dummy antenna consisting of a 400 ohm resistor and 250 mmfd. capacitor in series. With the 465 kc. signal applied to the antenna terminal, adjust the I. F. Wave Trap Trimmer for *minimum* output indication.

3. R. F. Alignment

First check the position of the dial pointer by rotating the tuning condenser to maximum capacity position, i.e., plates fully meshed. At this position, the pointer should coincide with the end mark at the left-hand end of the scale. If it does not, it may be set by loosening the pointer set screw and setting the pointer to its correct position. During R.F. alignment the AFC switch *must* be set in its "off" (counter-clockwise) position.

Band "A" (140-420 Kc.)

Set the test oscillator for operation at 400 kc. and connect its output to the antenna terminal of the receiver through the dummy antenna described under I. F. Wave Trap Alignment. Tune the receiver until the pointer is at 400 on the scale. Set the tone control for minimum high response and reduce the volume control setting so as to avoid excessive noise response. Adjust the Band "A" oscillator and antenna trimmers respectively (see Fig. 4) to give maximum deflection on the output meter. Maintain the test oscillator at the lowest level which will give an easily readable output indication.

Now set the test oscillator at 145 kc. and tune the receiver to resonance with this signal. Adjust the 145 kc. padding capacitor rocking the tuning condenser back and forth through resonance as the padding capacitor is adjusted and note the deflection of the tuning meter each time the receiver is tuned in this manner. Leave the padding capacitor at the setting which gives greatest deflection.

Retune the receiver to 400 kc. and set the test oscillator for this frequency. Check the alignment by again adjusting the Band "A" oscillator and antenna trimmers for maximum deflection on the tuning meter.

Band "B" (340-1620 Kc.)

Set the test oscillator for operation at 1500 kc. and tune the receiver until the pointer is at 1500 on the scale. Adjust the Band "B" oscillator, R. F., and antenna trimmers respectively (see Fig. 4) to give maximum deflection on the output meter. Maintain the test oscillator output at the lowest level which

will give an easily readable output indication.

Now set the test oscillator at 580 kc. and tune the receiver to resonance with this signal. Adjust the 580 kc. padding capacitor, rocking the tuning condenser back and forth through resonance as the padding capacitor is adjusted and note the deflection of the tuning meter each time the receiver is tuned in this manner. Leave the padding capacitor at the setting which gives greatest deflection.

Retune the receiver to 1500 kc. and set the test oscillator for this frequency. Check the alignment by again adjusting the Band "B" oscillator, R. F. and antenna trimmers for maximum deflection on the tuning meter.

Band "C" (1610-5580 Kc.)

With the test oscillator connected to the receiver as above, tune the receiver until the pointer is at 5220 on the "C" band scale. Set the test oscillator for operation on this frequency and, with the volume and tone controls set as above, adjust the Band "C" oscillator, R. F. and antenna trimmers, respectively (see Fig. 4) to give maximum deflection on the output meter.

Band "D" (5-18.1 Mc.)

Turn the band switch to Band "D." Set the test oscillator at 18,000 kc. (18.0 Mc.) and tune the receiver until the pointer coincides with the 18.0 mark. Adjust the Band "D" oscillator trimmer, C-35, to give maximum output indication. It will probably be found that there will be two settings of the oscillator trimmer that will give an output response. The lower capacity setting of the trimmer is the one that should be used. To be sure that correct adjustment has been obtained, tune for the image signal at 17.07 Mc. with the test oscillator at 18.0 Mc. It may be necessary to increase the test oscillator output to obtain response at this point.

Retune the receiver to 18.0 Mc. and adjust Band "D" antenna and R. F. trimmers, respectively (see Fig. 4) for maximum output indication. When adjusting the R. F. trimmer rock the tuning condenser back and forth through resonance as in the 580 kc. padding capacitor adjustment. Alignment of the receiver is now complete as no adjustments are provided on band "E."

4. I. F. Alignment with Output Meter

Although the use of the cathode-ray oscilloscope for alignment purposes is to be preferred, it is possible to make the I. F. trimmer adjustments with reasonable accuracy using a 465 kc. signal generator and output meter.

Place a modulated signal of 465 kc. on the grid of the last I. F. (6K7) tube with the volume control set at maximum and the AFC switch turned off. Place a low range A.C. voltmeter or other output indicator across the voice coil of the loud-speaker. Adjust the output of the signal generator so that an indication of not more than two or three volts is obtained on the output meter.

Adjust and readjust the primary trimmer for maximum output and the secondary for *minimum* output. This latter adjustment will be very broad. Apply the signal input to the grid of the 1st I. F. (6K7) tube and adjust both primary and secondary trimmers for maximum output indication in the same manner as before.

It is now necessary to make a fine adjustment of the secondary trimmer of the last I. F. (AFC) transformer, which is as follows: without changing the frequency of the signal generator, place the input lead on the rubber insulation of the converter (6L7) grid lead. This will provide a small signal input through the capacity between the leads. Increase the attenuator setting if necessary to make the output audible. If the signal generator is provided with a means of removing the modulation, this should be done. However, the adjustment may be carried out satisfactorily even with a modulated generator signal.

Now tune in any broadcast signal in the usual manner and tune carefully for zero beat between this carrier and the 465 kc. signal generator. It may be necessary to use a short antenna or to remove it entirely if the station is a strong local. Throw the AFC on and adjust the last I. F. secondary (AFC) trimmer to give zero beat. This adjustment is very critical and must be made with great care. When the adjustment is properly made, there will be no appreciable change from zero beat as the AFC switch is thrown off and on. This completes the alignment of the I. F. and AFC circuits.

The alignment of the oscillator and R. F. circuits may be carried out in the usual manner. The AFC switch must remain in the off position.

GENERAL ELECTRIC CO.

MODEL E-155
Dial Data**ADJUSTMENT OF DIAL MECHANISM**

The dial mechanism (Fig. 7) is rigidly mounted to the "Sentry Box" by means of two brackets and four screws. The dial pointer is operated by means of an "Automatic Vernier" reduction drive unit. Motion imparted to the gang condenser rotor is transmitted through a series of pulleys and an interconnecting cable to the dial pointer slider which is supported on a rail below the dial scale.

To Replace Cables

To replace cord or cable for the pointer or drive, the chassis should be removed from the cabinet and the dial mask (No. 14) removed from the dial scale box (No. 5). The black drive cord (No. 25) should run between the drum (No. 6) on the condenser and the drive pulley without crossing. Both the black cord (No. 25) and the bronze cable (No. 24) fasten on the same hook in the drum (No. 6) which is in front of the single lance on the outside diameter. The springs (21) and (22) are fastened on the ends of the cables after passing through the lances which are close together on the condenser drive drum. The light spring (No. 21) is on the bronze cable (No. 24) and the special spring loop hooks into the hole in the drum next to the hook for the spring on the black cord (No. 25). The solid end of the cord or cable should be fastened first to the drum, the line should be then strung around the pulleys and drum and lastly, the spring should be stretched into place.

To Adjust Pointer for Calibration

The pointer (No. 27) is adjustable by removing the escutcheon plate and also the dial mask (No. 14) which is held by four screws. The screw in the center of the pointer (No. 27) can then be loosened and the pointer adjusted as needed.

To Replace Scale

The scale (No. 3) can be removed by taking off the escutcheon and the dial mask (No. 14) as for the adjustment of the pointer. The pointer (No. 27) is moved to the left-hand end, the scale is then pushed to the left and the right-hand end is pulled out with the aid of a small screwdriver or a similar tool. When replacing the scale (No. 3) it is advisable to remove the cord (No. 23). The spring (No. 9) is put on the dial shaft and the shaft then inserted into the housing. The scale (No. 3) with the right-hand cap (No. 8) attached is then inserted into the left-hand cap (No. 7) which is held in position by pulling on the shaft on the outside of the housing. After the scale (No. 3) is inserted it should be rotated from one to two turns against the action of the torsion spring (No. 9). The cord (No. 23) is then replaced in the lance provided for it. It is advisable to have the band switch rotated so that the greatest length of cord possible is unwound from the lower pulley (No. 4) on the band switch shaft. It is best that the chassis be removed for the replacement of a scale.

It is important when replacing the chassis in the cabinet that the rubber grommets should be put in the chassis and not on the wood pins.

To Adjust Rotation of the Scale

With the chassis out of the cabinet the scale (No. 3) can be adjusted to track properly on the various bands by loosening the set screw and rotating pulley (No. 4) on the band switch shaft.

To Change the Dial Lamps

Make certain that the copper-plated hex head shipping screw which secures the dial lamp bracket during shipment has been removed before attempting to remove the dial lamp bracket (No. 17). Lift the lamp bracket from the tabs under which it is clipped. Care should be taken that the lamp leads do not put an undue strain upon the drive cable. With the lamp bracket laid back horizontally the lamps may be replaced. When the lamp bracket is reinserted care should be exercised to avoid having the lamp leads foul the gang mechanism.

Automatic Frequency Control

Automatic frequency control (AFC) is a device for automatically controlling the oscillator frequency in such a way that, although the receiver is not exactly tuned to the signal being received, the correct intermediate frequency will still be produced. This control of the oscillator frequency is secured by means of the 6J7 AFC tube, so connected to the oscillator that it draws a lagging current from the tank circuit and thus gives the effect of a shunt inductance. Variation of the D.C. grid bias on the 6J7 control tube will affect the mutual conductance of the tube, thereby changing the amount of lagging current drawn from the oscillator tank with a consequent effect of variation of the amount of shunt inductance connected across the oscillator coil. This alters the total inductance in the oscillator tuned circuit and changes its resonant frequency.

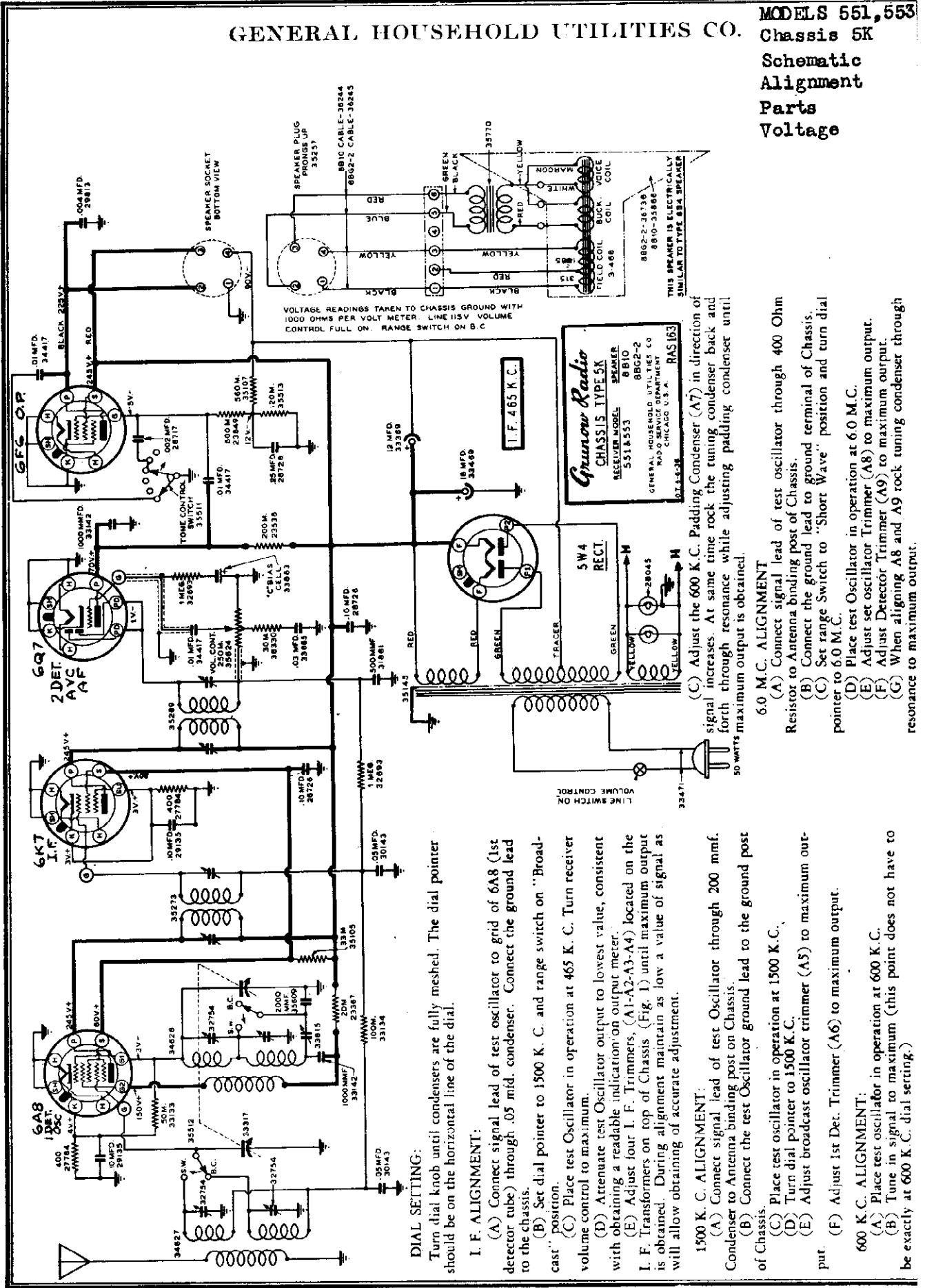
Grid bias for the 6J7 control tube, which will vary in accordance with the amount of detuning of the receiver, is obtained from the 6H6 diode rectifier operating in conjunction with its special I. F. transformer. This control voltage is the difference between the drop across resistor R-24, the load resistance for one diode section of the 6H6 diode rectifier, and the drop across resistors R-21, R-22 and R-23, which constitute the load resistance for the other diode section. When the receiver is correctly tuned to the incoming signal, the intermediate frequency produced will be 465 kc. which is the resonant frequency of the tuned circuit feeding the 6H6 diode rectifier. Under this condition each diode plate receives equal signal voltage and the D.C. voltage drops across the load resistors will be equal, giving no change in grid bias on the 6J7 control tube. If the receiver is so tuned that the intermediate frequency produced is above 465 kc., the signal voltage applied to diode plate No. 6 will exceed that applied to diode plate No. 7. In this case, the D.C. voltage drop across load resistance R-21, R-22 and R-23 will be larger than that across load resistor R-24 and a resultant voltage will be produced which will increase the 6J7 AFC tube grid bias, lowering the mutual conductance of the tube and causing it to draw less lagging current from the oscillator tank. This is the same effect as would be produced by increasing the amount of shunt inductance across the oscillator coil and the oscillator frequency is thereby lowered by the amount necessary to compensate for the detuning. The opposite takes place when the receiver is tuned so as to produce an intermediate frequency below 465 kc. Diode plate No. 6 then receives more signal voltage than diode plate No. 7 and the resultant voltage developed across the load resistance is such as to decrease the grid bias on the 6J7 AFC tube. This causes a larger current to be drawn from the oscillator tank circuit, which in effect is the same as a decrease in shunt inductance with its consequent increase in oscillator frequency to overcome the detuning.

Tubes

R. F. Amplifier.....	6K7 Triple-grid Super-control Amplifier
Converter.....	6L7 Pentagrid Converter
Oscillator.....	6K7 Triple-grid Super-control Amplifier
First I. F.....	6K7 Triple-grid Super-control Amplifier
Second I. F.....	6K7 Triple-grid Super-control Amplifier
Detector and AVC....	6H6 Twin Diode
1st Audio.....	6C5 Low Gain Triode
2nd Audio.....	6F6 Power Pentode
Output.....	(2) 6L6 Beam Amplifier Tetrode
AFC Control.....	6J7 Triple-grid Amplifier
Colorama Control....	6K7 Triple-grid Super-control Amplifier
Limiter Control.....	6H6 Twin Diode
Rectifier.....	(2) 5Z4 Full-wave Rectifier
Dial Lamps.....	6.3 V.—0.15 A. (4 red and 3 green)

GENERAL HOUSEHOLD UTILITIES CO.

MODELS 551, 553
Chassis 5K
Schematic
Alignment
Parts
Voltage



DIAL SETTING:

Turn dial knob until condensers are fully meshed. The dial pointer should be on the horizontal line of the dial.

I. F. ALIGNMENT:

- (A) Connect signal lead of test oscillator to grid of 6A8 (1st detector tube) through .05 mfd. condenser. Connect the ground lead to the chassis.
- (B) Set dial pointer to 1500 K. C. and range switch on "Broadcast" position.
- (C) Place test Oscillator in operation at 465 K. C. Turn receiver volume control to maximum.
- (D) Attenuate test Oscillator output to lowest value, consistent with obtaining a readable indication on output meter.
- (E) Adjust four I. F. Trimmers, (A1-A2-A3-A4) located on the I. F. Transformers on top of Chassis (Fig. 1) until maximum output is obtained. During alignment maintain as low a value of signal as will allow obtaining of accurate adjustment.

1500 K. C. ALIGNMENT:

- (A) Connect signal lead of test Oscillator through 200 mmf. Condenser to Antenna binding post on Chassis.
- (B) Connect the test Oscillator ground lead to the ground post of Chassis.
- (C) Place test oscillator in operation at 1500 K. C.
- (D) Turn dial pointer to 1500 K. C.
- (E) Adjust broadcast oscillator trimmer (A5) to maximum output.
- (F) Adjust 1st Det. Trimmer (A6) to maximum output.

600 K. C. ALIGNMENT:

- (A) Place test oscillator in operation at 600 K. C.
- (B) Tune in signal to maximum (this point does not have to be exactly at 600 K. C. dial setting.)

(C) Adjust the 600 K. C. Padding Condenser (A7) in direction of signal increases. At same time rock the tuning condenser back and forth through resonance while adjusting padding condenser until 50 WATTS maximum output is obtained.

6.0 M.C. ALIGNMENT

- (A) Connect signal lead of test oscillator through 400 Ohm Resistor to Antenna binding post of Chassis.
- (B) Connect the ground lead to ground terminal of Chassis.
- (C) Set range Switch to "Short Wave" position and turn dial pointer to 6.0 M.C.
- (D) Place test Oscillator in operation at 6.0 M.C.
- (E) Adjust set oscillator Trimmer (A8) to maximum output.
- (F) Adjust Detector Trimmer (A9) to maximum output.
- (G) When aligning A8 and A9 rock tuning condenser through resonance to maximum output.

VOLTAGE READINGS TAKEN TO CHASSIS GROUND WITH 1000 OHMS PER VOLT METER. LINE 115V. VOLUME CONTROL FULL ON. RANGE SWITCH ON B. C.

Grunow Radio
CHASSIS TYPE 5K
RECEIVER MODEL 551A553
SPEAKER MODEL 8B10
8BG2-2
GENERAL HOUSEHOLD UTILITIES CO.
RADIO SERVICE DEPARTMENT
CHICAGO U.S.A. RAS 163

THIS SPEAKER IS ELECTRICALLY SIMILAR TO TYPE 8B4 SPEAKER

MODELS 551, 553
 Chassis 5K
 Socket, Trimmers
 Chassis

GENERAL HOUSEHOLD UTILITIES CO.

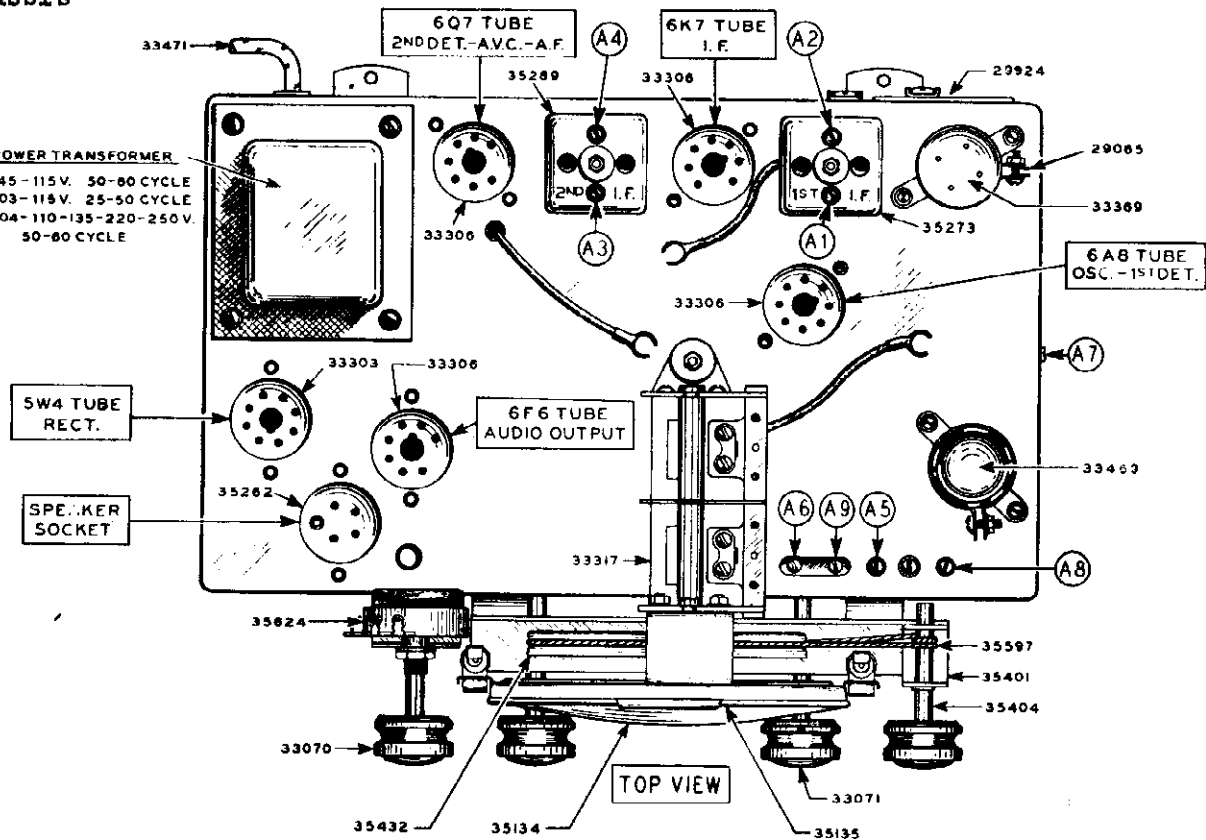


FIG. 1

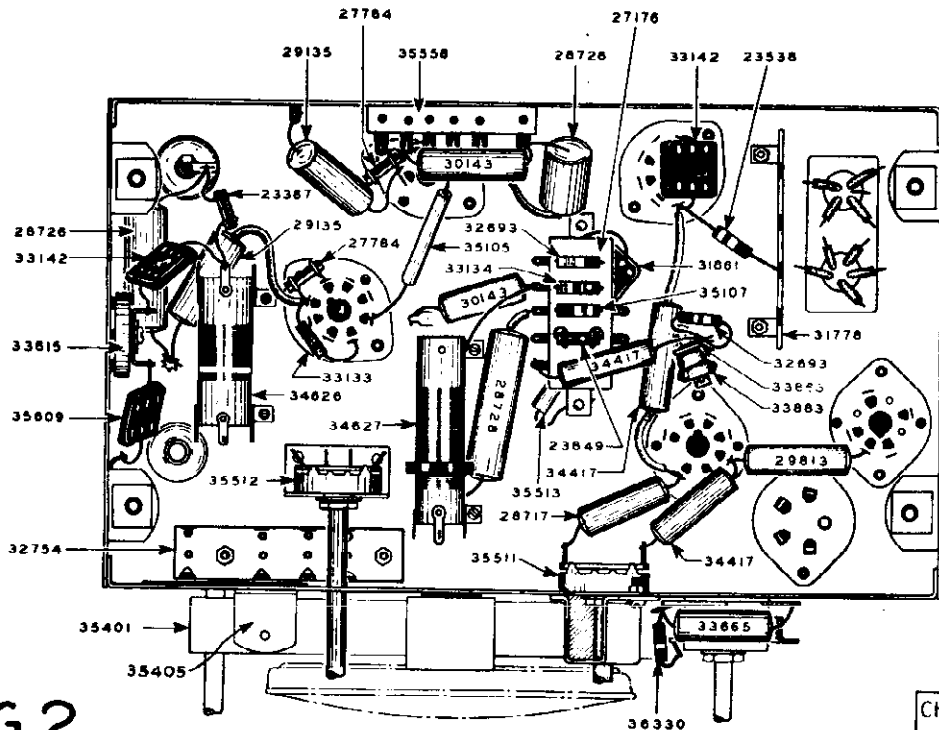


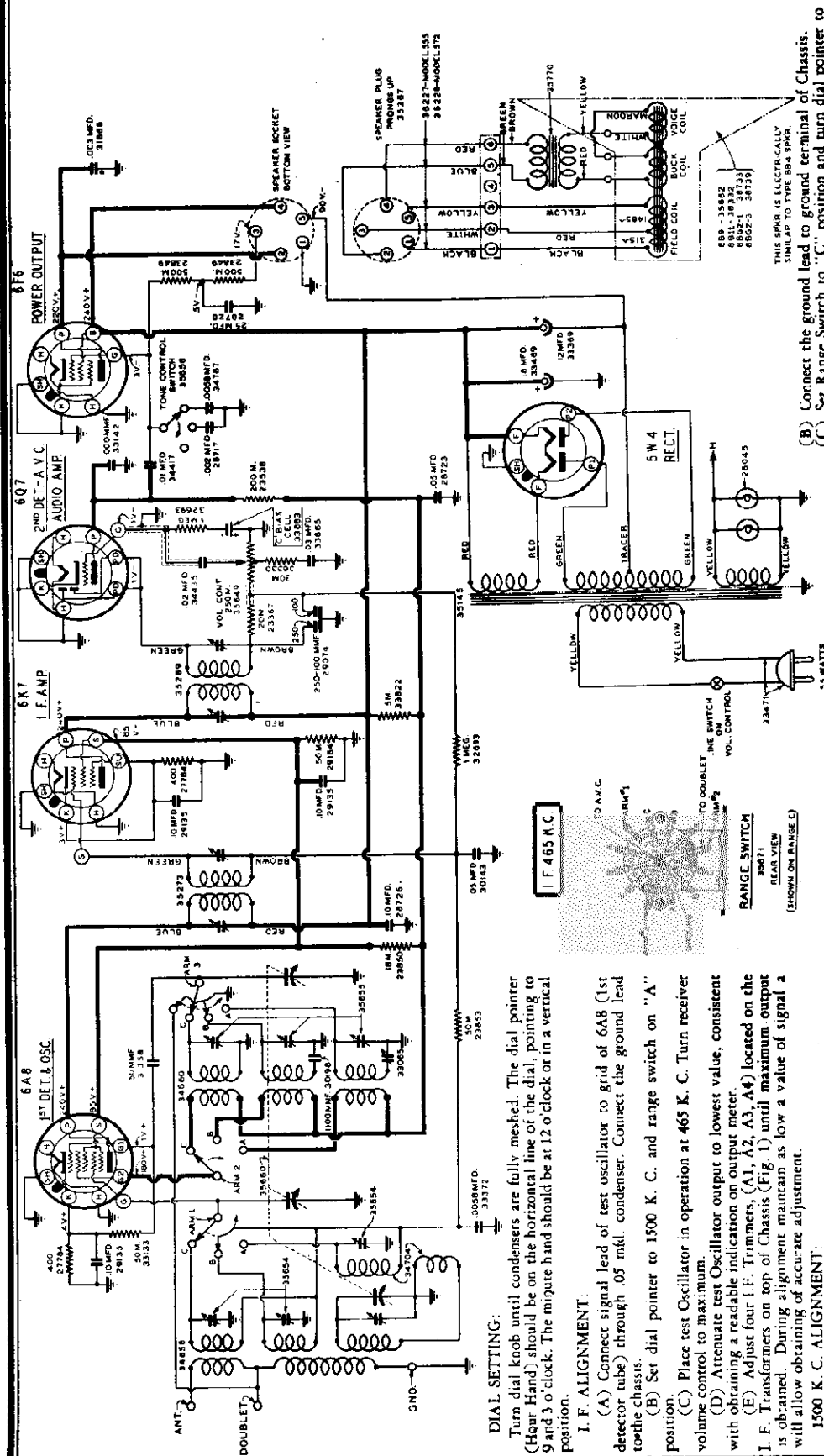
FIG. 2

BOTTOM VIEW

CHASSIS 5K
 AUG. 1936.
 RAS 182

GENERAL HOUSEHOLD UTILITIES CO.

MODELS 555, 572
 Chassis 5L
 Schematic, Voltage
 Alignment, Parts



DIAL SETTING:

Turn dial knob until condensers are fully meshed. The dial pointer (Hour Hand) should be on the horizontal line of the dial, pointing to 9 and 3 o'clock. The minute hand should be at 12 o'clock or in a vertical position.

I. F. ALIGNMENT:

- (A) Connect signal lead of test oscillator to grid of 6A8 (1st detector tube) through .05 mfd. condenser. Connect the ground lead to the chassis.
- (B) Set dial pointer to 1500 K. C. and range switch on "A" position.
- (C) Place test Oscillator in operation at 465 K. C. Turn receiver volume control to maximum.
- (D) Attenuate test Oscillator output to lowest value, consistent with obtaining a readable indication on output meter.
- (E) Adjust four I.F. Trimmers, (A1, A2, A3, A4) located on the I. F. Transformers on top of Chassis (Fig. 1) until maximum output is obtained. During alignment maintain as low a value of signal a will allow obtaining of accurate adjustment.

1500 K. C. ALIGNMENT:

- (A) Connect signal lead of test Oscillator through 200 mmf. Condenser to Antenna binding post on Chassis.
- (B) Connect the test Oscillator ground lead to the ground post of Chassis.
- (C) Place test oscillator in operation at 1500 K. C.
- (D) Turn dial pointer to 1500 K. C.
- (E) Adjust broadcast oscillator trimmer (A5) to maximum output.

- (F) Adjust 1st Detector Trimmer (A6) to maximum output.
- (G) Adjust Antenna Trimmer (A7) to maximum output.

600 K. C. ALIGNMENT:

- (A) Place test oscillator in operation at 600 K. C.
- (B) Tune in signal to maximum (this point does not have to be exactly at 600 K. C. dial setting).
- (C) Adjust the 600 K. C. Padding Condenser (A8) in direction of signal increases. At same time rock the tuning condenser back and forth through resonance while adjusting padding condenser until Resistor to Antenna binding post of Chassis.

- (B) Connect the ground lead to ground terminal of Chassis.
- (C) Set Range Switch to "C" position and turn dial pointer to 18 M. C.
- (D) Place test Oscillator in operation at 18 M. C.
- (E) Adjust set oscillator Trimmer (A11) to maximum output.
- (F) Adjust Detector Trimmer (A12) to maximum output.
- (G) On the 18 M. C. Oscillator Alignment it will be noted that there are two settings at which the signal will be received. Use the lower of the images for alignment point that is the setting giving most capacity or the point at which the trimmer screw is farthest in.

maximum output is obtained.
 5000 K. C. ALIGNMENT:
 (A) Set Range Switch to "B" position.
 (B) Place test Oscillators in operation at 5000 K. C.
 (C) Turn Dial Pointer to 5000 K. C.
 (D) Adjust Set Oscillator Trimmer (A9) to maximum output.
 (E) Adjust Detector Trimmer (A10) to maximum output.
 18 M. C. ALIGNMENT:
 (A) Connect signal lead of test oscillator through 400 Ohm Resistor to Antenna binding post of Chassis.

NOTES

- 1- TUBE SOCKETS SHOWN BOTTOM VIEW.
- 2- VOLTAGE READINGS TAKEN TO CHASSIS.
- VOLTMETER LINE-115X. VOLUME CONTROL FULL ON. RANGE SWITCH ON K BAND.

Grunow Radio
 CHASSIS TYPE 5L
 RECEIVER MODEL 555
 555 BBL1 ON 88C2-3
 572 BBL1 ON 88C2-1
 GENERAL SERVICE DIVISION
 CHICAGO U.S.A. RAS 184

MODELS 555, 572
 Chassis 5L
 Socket, Trimmers
 Chassis

GENERAL HOUSEHOLD UTILITIES CO.

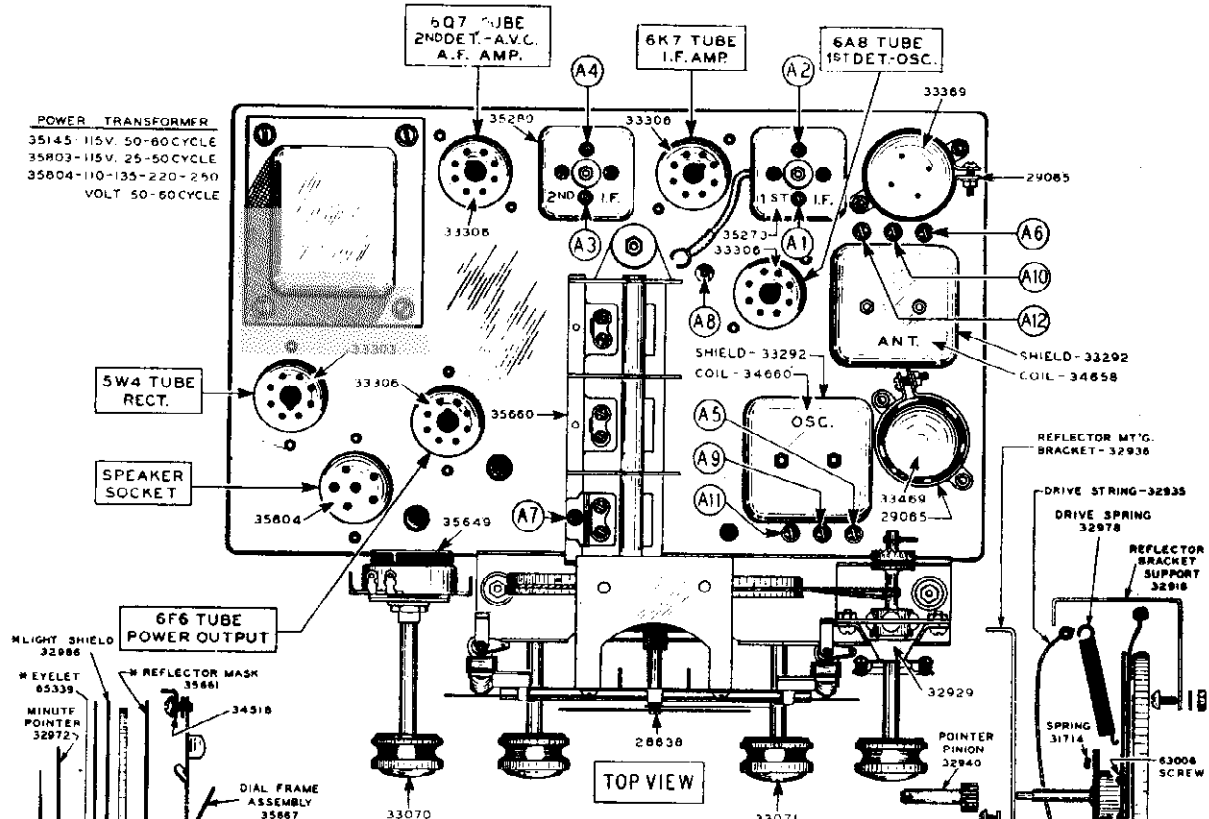


FIG. 1

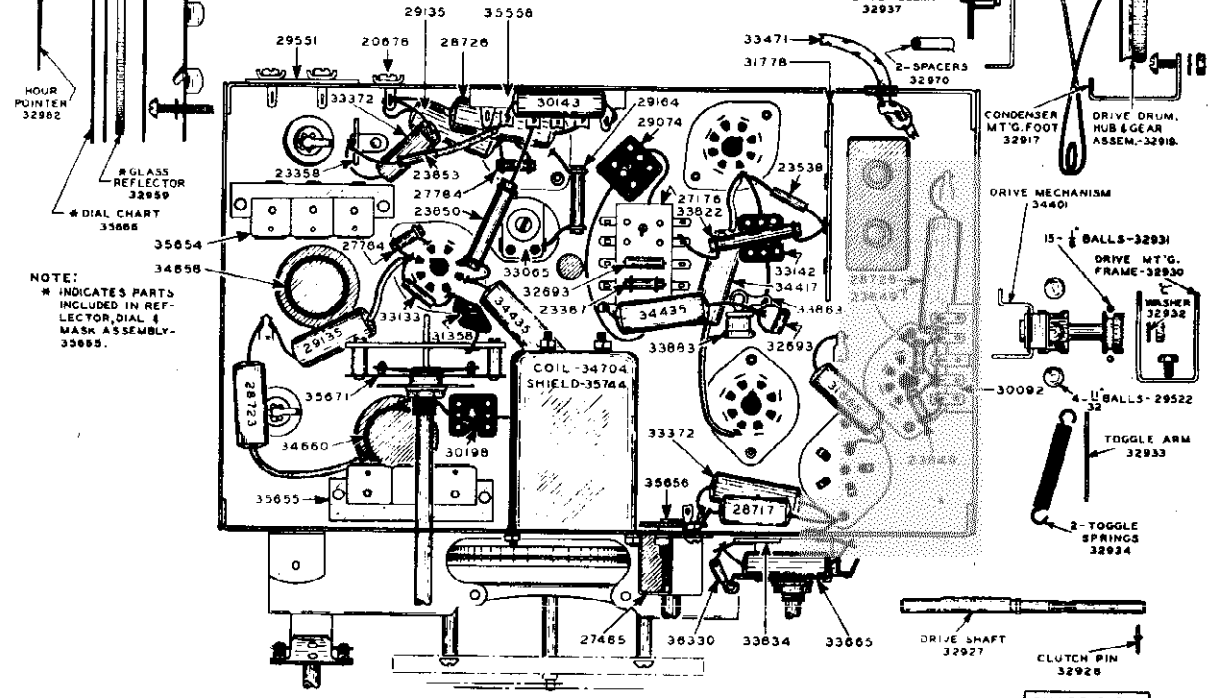


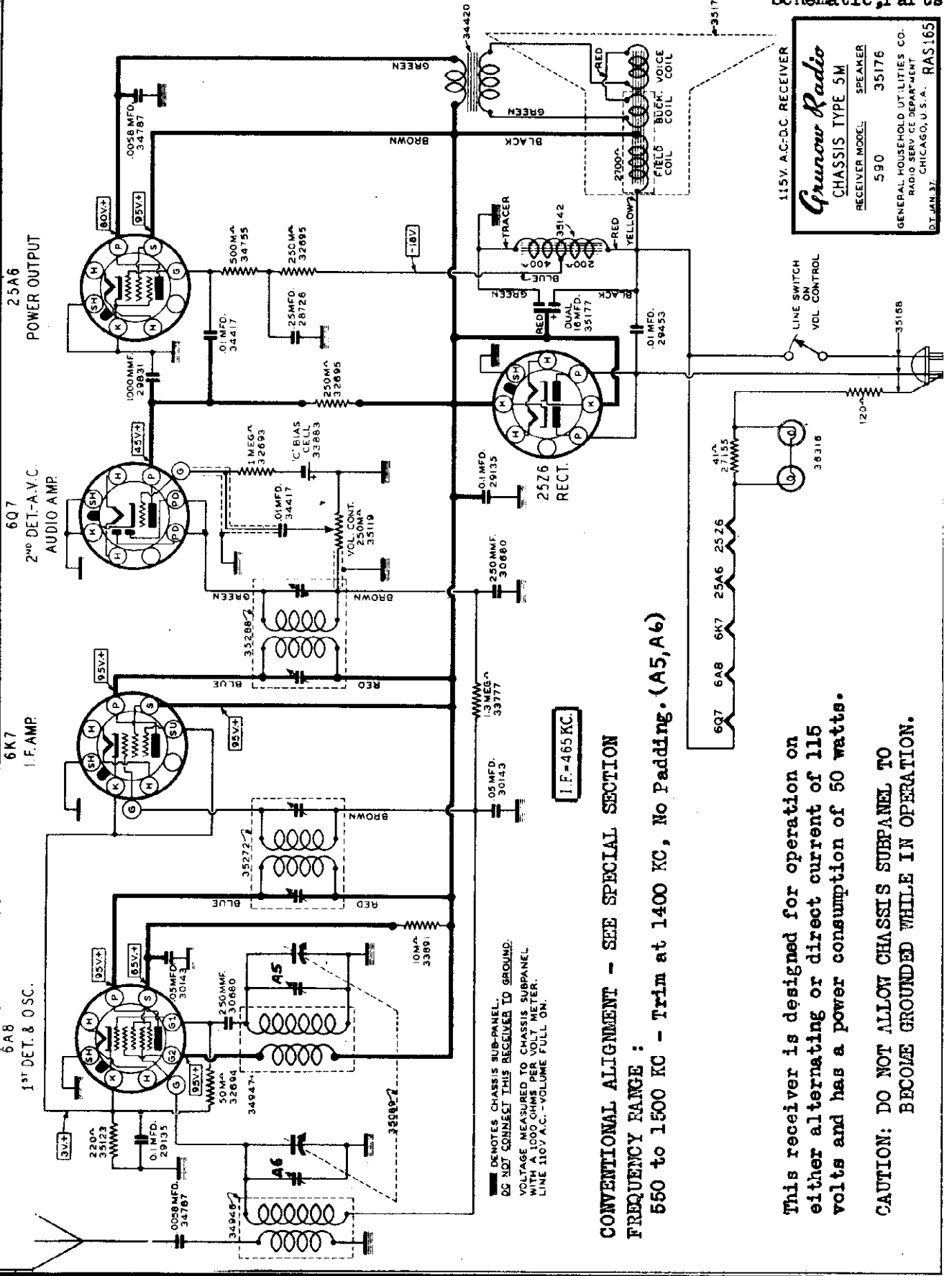
FIG. 2

CHASSIS 5-L
 JULY 1936
 RAS 181

Alignment, Voltage

GENERAL HOUSEHOLD UTILITIES CO.

MODEL 590
Chassis 5M
Schematic, Parts



115V. A.C.-D.C. RECEIVER

Grunow Radio
CHASSIS TYPE 5M

RECEIVER MODEL	590	SPEAKER	35176
CHASSIS	5M		

GENERAL HOUSEHOLD UTILITIES CO.
RADIO SERV. DEPARTMENT
CHICAGO, U.S.A. RAS 165
DT. JAN. 37.

CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION
FREQUENCY RANGE :
550 to 1500 KC - Trim at 1400 KC, No Padding. (A5, A6)

This receiver is designed for operation on either alternating or direct current of 115 volts and has a power consumption of 50 watts.

CAUTION: DO NOT ALLOW CHASSIS SUBPANEL TO BECOME GROUNDED WHILE IN OPERATION.

■ DENOTES CHASSIS SUB-PANEL.
DO NOT CONNECT THIS RECEIVER TO GROUND.
VOLTAGE MEASURED TO CHASSIS SUBPANEL
WITH A 1000 OHMS PER VOLT METER.
LINE 110V A.C. - VOLUME FULL ON.

MODEL 590

Chassis 5M

Socket, Trimmers

Chassis

GENERAL HOUSEHOLD UTILITIES CO.

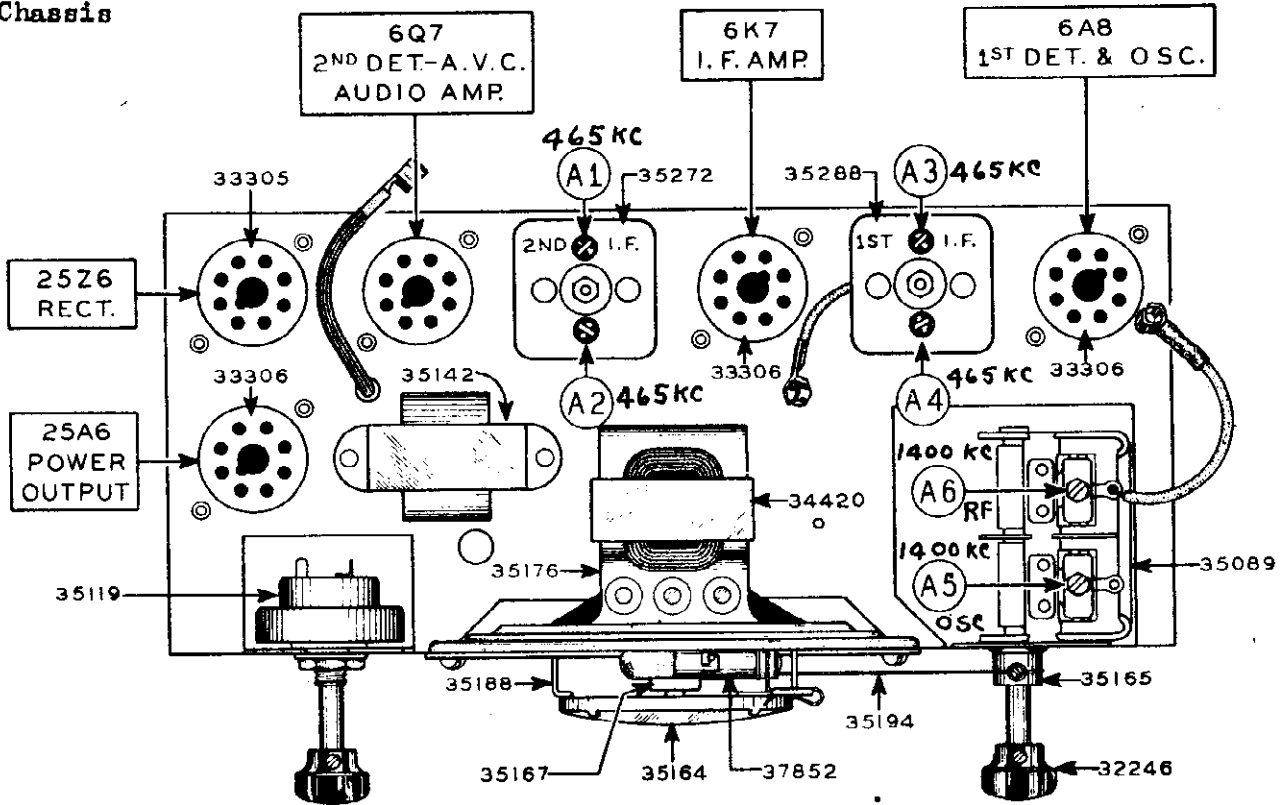


FIG. 1

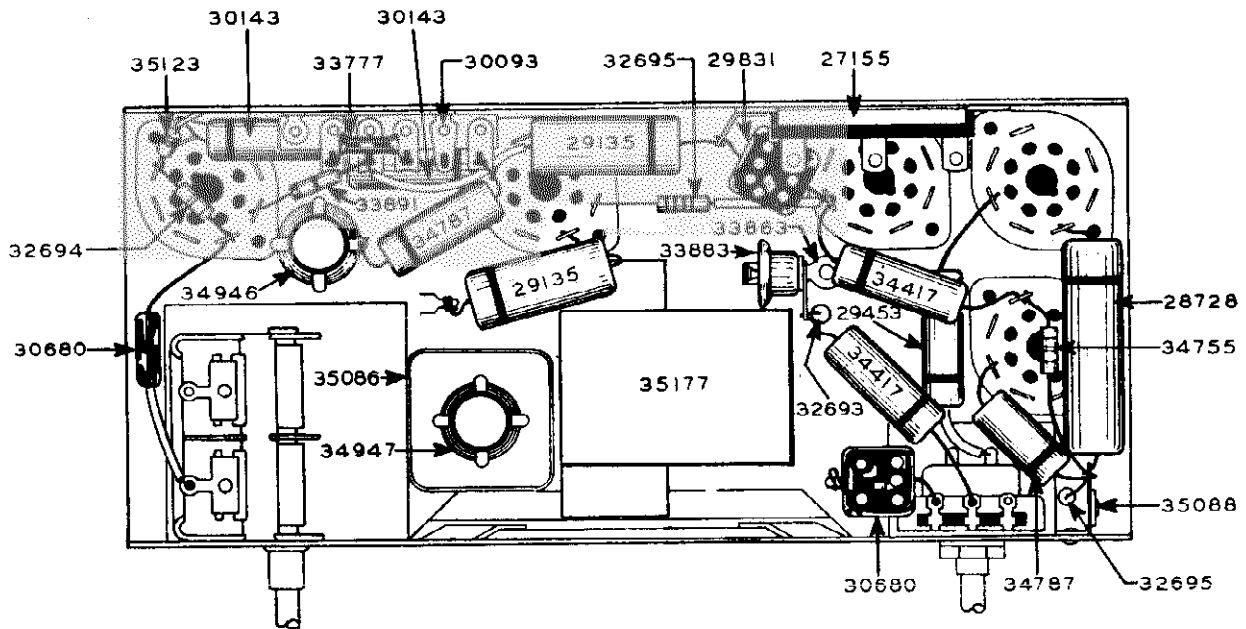


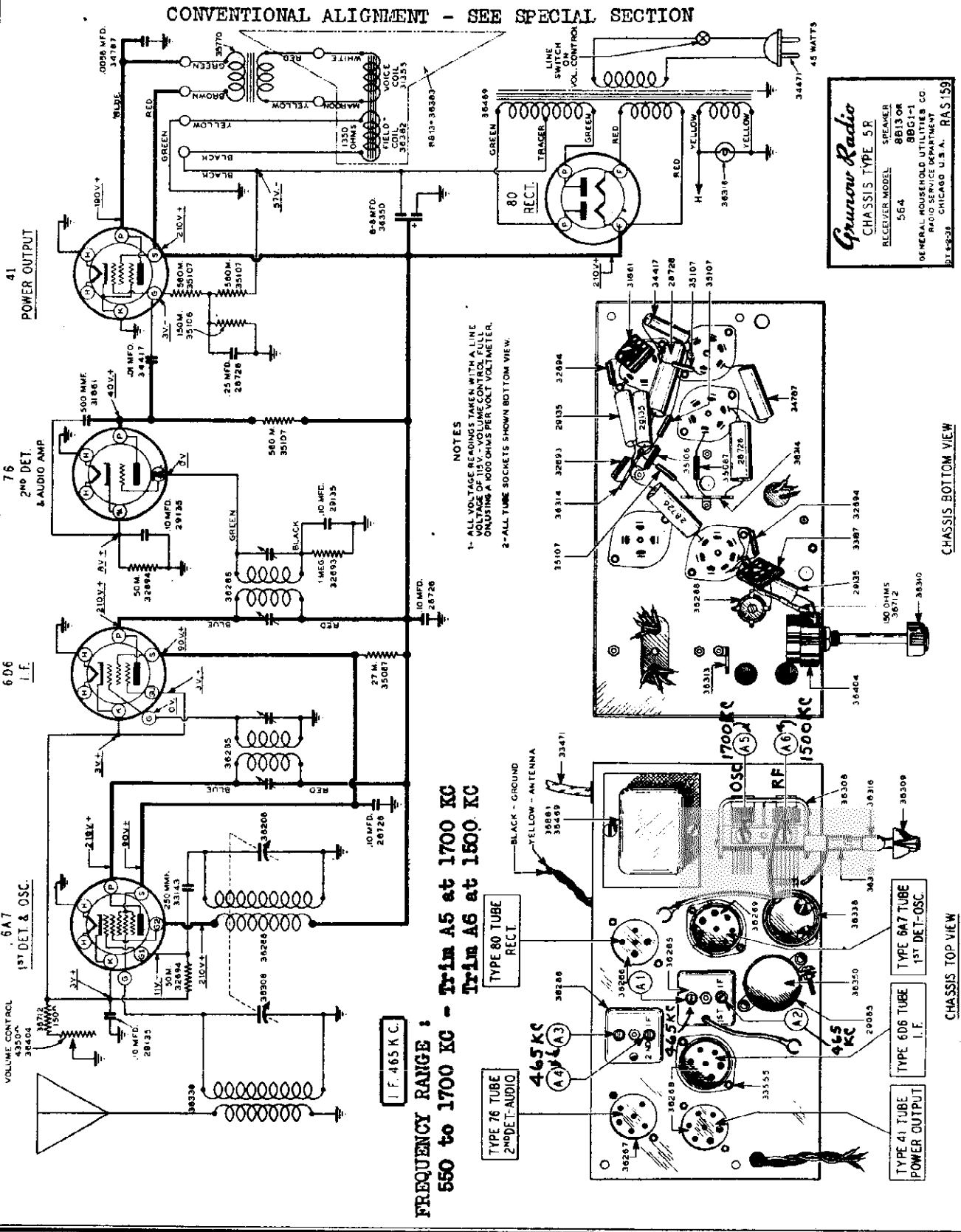
FIG. 2

CHASSIS TYPE 5M

Schematic, Voltage
Socket, Trimmers
Chassis, Parts
Alignment

GENERAL HOUSEHOLD UTILITIES CO.

MODEL 564
Chassis 5R



Grunow Radio
RECEIVER MODEL 564
CHASSIS TYPE 5R
SPEAKER 8B13 OR 8B11-1
GENERAL HOUSEHOLD UTILITIES CO.
PHO. CHICAGO U.S.A. RAS 159

GENERAL HOUSEHOLD UTILITIES CO.

MODEL 566
Chassis
MODEL 573
Chassis
Alignment

RE-ISSUE - JAN. 1937
THIS SUPERSEDES MANUAL OF PREVIOUS DATE.

SERVICE NOTES

Chassis Type S-S

Receiver Model 566

Speaker Type BBG1-1—BBG1-2

The following characteristics apply to the GRUNOW Radio—Chassis 5S:

This model is a 5 Tube Super-Heterodyne Dual Wave (540 to 1725 K.C. and 1725 to 4000 K.C.) Receiver, using 1-6A7 tube as 1st Detector and Oscillator, 1-6D6 tube as

SERVICE DATA

CONTINUITY AND VOLTAGE

Continuity and voltage readings should be taken from the underside of the chassis. The values given on the schematic diagram are average and allow the service man

an I. F. Amplifier, 1-76 tube as 2nd Detector and Audio Amplifier. The 41 output tube is a power amplified pentode and is capable of producing large power output with relatively small signal input. The rectifier tube is an 86, the output of which is well filtered through the action of the speaker field and the two 8 mfd. electrolytic condensers.

CONTINUITY AND VOLTAGE

Tube sockets on the schematic diagram (Fig. 3) are shown from view, each element being in its actual position in respect to the guide pin. The voltage measurements shown are average and were taken with a line voltage of 115 V., the volume control "full on" and the range switch in position "A" using a 1000 ohms per volt meter.

REPAIRS

When servicing this chassis it is IMPERATIVE that the service man make all parts replacements in EXACTLY the same way as the original part was located and connected. This applies particularly to ground points. All parts replacements in the R. F. end of the circuit must be exact duplicates of the originals, especially so in the case of coils, R. F. by-pass or coupling condensers. Any repairs in the R. F. circuit will make a complete realignment of the tuned circuit necessary.

BIAS CELL

This Chassis uses a "C" bias cell unit in the control grid

CIRCUIT ALIGNMENT PROCEDURE

1. HEATING
(A) Allow the receiver to heat up for a period of 20 to 30 minutes. This is necessary in order to eliminate possible alignment variations due to the thermal expansion and contraction of the chassis parts.
(B) Allow the signal generator to warm up in order to prevent frequency drift during alignment.

2. DIAL CALIBRATION

Turn the condenser until the pointer is fully marked, set the pointer (Hour Hand) to 9 and 3 on the outer edge of dial chart. Set the vernier pointer (Minute Hand) to the first point on 12.

3. SIGNAL GENERATOR ADJUSTMENT

During the entire alignment procedure, the signal input from the generator to the receiver must be continually attenuated at the generator as the various trimmers are brought into resonance. This is necessary in order to hold the signal at the lowest intensity so that the A. V. C. Circuit will remain at the most sensitive points.

4. I. F. ALIGNMENT

(A) Set the generator to 465 K.C. and connect the output lead of the 41 tube through the .05 Mfd. condenser to grid of 6A7 (1st Detector tube), connect the ground lead to the chassis.
(B) Set the receiver dial pointer to 600 K.C. the range switch to position "A" and turn the volume control full on.
(C) Connect the output meter across the two primary terminals on the output transformer.
(D) Adjust the I. F. Trimmers A1, A2, A3, and A4 to maximum output.

divisions or bands covering from 530 K.C. to 1750 K.C. on the "A" or Broadcast Band, 1750 K.C. to 5.5 M.C. on the "B" or Police Amateur Band and 5.5 M.C. to 18.2 M.C. on the "C" or Foreign Broadcast Band.

SERVICE DATA

of the 6Q7 tube. This type bias cell has an exceedingly long life but occasionally may have to be replaced. When replacing the cell note that the carbon or (+) side is connected to the ground side of all terminal clips. To check the bias cell a new cell or a 1 1/2 volt battery must be substituted, as the cell voltage cannot be measured with an ordinary voltmeter due to its low current rating.

CIRCUIT ALIGNMENT EQUIPMENT

Do not attempt to align the 9Q Chassis without the equipment specified below:

1. Signal Generator—A modulated oscillator capable of delivering from 465 K.C. to 18.2 M.C.
2. Alignment Tool—A non-metallic screw driver.
3. Dialing Amplifier—A 200 Mmf. Condenser (I. F. Alignment); 200 Mmf. Coupling Condenser (I. F. Alignment); 400 Ohm Carbon Resistor (Short Wave Alignment)
4. Output Meter—A meter of sufficient sensitivity to give a good deflection at very low signal input.

Note: The receiver should be aligned in a location free from local interference. A screen room is recommended.

CIRCUIT ALIGNMENT PROCEDURE

3. 1500 K.C. ALIGNMENT
(A) Set the generator to 1500 K.C. and connect the output to the antenna post on the chassis through the 200 Mmf. condenser to grid of 6A7 (1st Detector tube), connect the ground lead to the chassis.
(B) Set the receiver dial pointer to 1500 K.C.
(C) Adjust the trimmers (A1) Oscillator, (A6) Detector and (A7) Antenna to maximum output.

6. 600 K.C. ALIGNMENT
(A) Set generator to 600 K.C.
(B) Set receiver dial pointer to 600 K.C.
(C) Turn trimmer (A6) in direction of signal increase and at the same time rock tuning condenser slowly back and forth through resonance until the exact resonant point on both is obtained.

7. 5 M.C. ALIGNMENT

(A) Set generator to 5 M.C.
(B) Set receiver range switch to position "B" and dial pointer to 5 M.C.
(C) Adjust trimmer (A9) Oscillator and (A10) Antenna to maximum output.

8. 18 M.C. ALIGNMENT

(A) Set generator to 18 M.C. and connect the output to the chassis Antenna post through the 400 Ohm condenser to grid of 6A7 (1st Detector tube), connect the ground lead to the chassis.
(B) Set the receiver range switch to position "C" and the dial pointer to 18 M.C.
(C) Screw the Oscillator trimmer (A11) down tight and slowly back until signal is heard, then rock the tuning condenser back and forth through resonance until exact resonant point is determined.
(D) Adjust Antenna trimmer (A12) to maximum output.
(E) Readjust Oscillator trimmer (A11) to maximum output.

OCTOBER, 1936

SERVICE DATA

Chassis Type 5Q

Receiver Model 573

Grunow Radio

The following characteristics apply to the GRUNOW Radio—Chassis 5S:

This model is a 5 Tube Super-Heterodyne Dual Wave (540 to 1725 K.C. and 1725 to 4000 K.C.) Receiver, using 1-6A7 tube as 1st Detector and Oscillator, 1-6D6 tube as

SERVICE DATA

CONTINUITY AND VOLTAGE

Continuity and voltage readings should be taken from the underside of the chassis. The values given on the schematic diagram are average and allow the service man

an I. F. Amplifier, 1-76 tube as 2nd Detector and Audio Amplifier. The 41 output tube is a power amplified pentode and is capable of producing large power output with relatively small signal input. The rectifier tube is an 86, the output of which is well filtered through the action of the speaker field and the two 8 mfd. electrolytic condensers.

CONTINUITY AND VOLTAGE

Tube sockets on the schematic diagram (Fig. 3) are shown from view, each element being in its actual position in respect to the guide pin. The voltage measurements shown are average and were taken with a line voltage of 115 V., the volume control "full on" and the range switch in position "A" using a 1000 ohms per volt meter.

REPAIRS

When servicing this chassis it is IMPERATIVE that the service man make all parts replacements in EXACTLY the same way as the original part was located and connected. This applies particularly to ground points. All parts replacements in the R. F. end of the circuit must be exact duplicates of the originals, especially so in the case of coils, R. F. by-pass or coupling condensers. Any repairs in the R. F. circuit will make a complete realignment of the tuned circuit necessary.

BIAS CELL

This Chassis uses a "C" bias cell unit in the control grid

CIRCUIT ALIGNMENT PROCEDURE

1. HEATING
(A) Allow the receiver to heat up for a period of 20 to 30 minutes. This is necessary in order to eliminate possible alignment variations due to the thermal expansion and contraction of the chassis parts.
(B) Allow the signal generator to warm up in order to prevent frequency drift during alignment.

2. DIAL CALIBRATION

Turn the condenser until the pointer is fully marked, set the pointer (Hour Hand) to 9 and 3 on the outer edge of dial chart. Set the vernier pointer (Minute Hand) to the first point on 12.

3. SIGNAL GENERATOR ADJUSTMENT

During the entire alignment procedure, the signal input from the generator to the receiver must be continually attenuated at the generator as the various trimmers are brought into resonance. This is necessary in order to hold the signal at the lowest intensity so that the A. V. C. Circuit will remain at the most sensitive points.

4. I. F. ALIGNMENT

(A) Set the generator to 465 K.C. and connect the output lead of the 41 tube through the .05 Mfd. condenser to grid of 6A7 (1st Detector tube), connect the ground lead to the chassis.
(B) Set the receiver dial pointer to 600 K.C. the range switch to position "A" and turn the volume control full on.
(C) Connect the output meter across the two primary terminals on the output transformer.
(D) Adjust the I. F. Trimmers A1, A2, A3, and A4 to maximum output.

1. EQUIPMENT

A—Test Oscillator.
A modulated oscillator capable of producing signals at 465 K. C., 1500 K. C., 1000 K. C., 600 K. C. and 3500 K. C. is necessary for alignment of the 5S Grunow Receiver.
B—Output Meter.
This may be any of the standard output meters on the market, but should be sufficiently sensitive to provide a good deflection at low signal strength.

C—Coupling Meter.

Coupling condensers of .05 Mfd. and 200 Mmf. should be used when coupling oscillator to receiver during alignment as specified in following paragraphs.

2. DIAL SETTING.

Turn dial pointer until condensers are fully marked. The dial pointer should be on the horizontal line of the dial chart.

3. I. F. ALIGNMENT.

A—Connect signal lead of oscillator through .05 Mfd. condenser to grid of 6A7 (1st Detector tube), connect the ground lead to the chassis.

B—Place oscillator in operation at 465 K. C. and turn receiver Volume Control to maximum (Volume Control should remain at maximum during the entire alignment procedure and signal should be attenuated at oscillator to lowest value consistent with obtaining a readable indication on output meter).

MODEL 573

Chassis 5Q

Socket, Trimmers
Chassis

GENERAL HOUSEHOLD UTILITIES CO.

POWER TRANSFORMER
35145-115V. 50-60 CYCLE
35803-115V. 25-50 CYCLE
35804-115-135-220-250
VOLT 50-60 CYCLE

6F6 TUBE
POWER OUTPUT

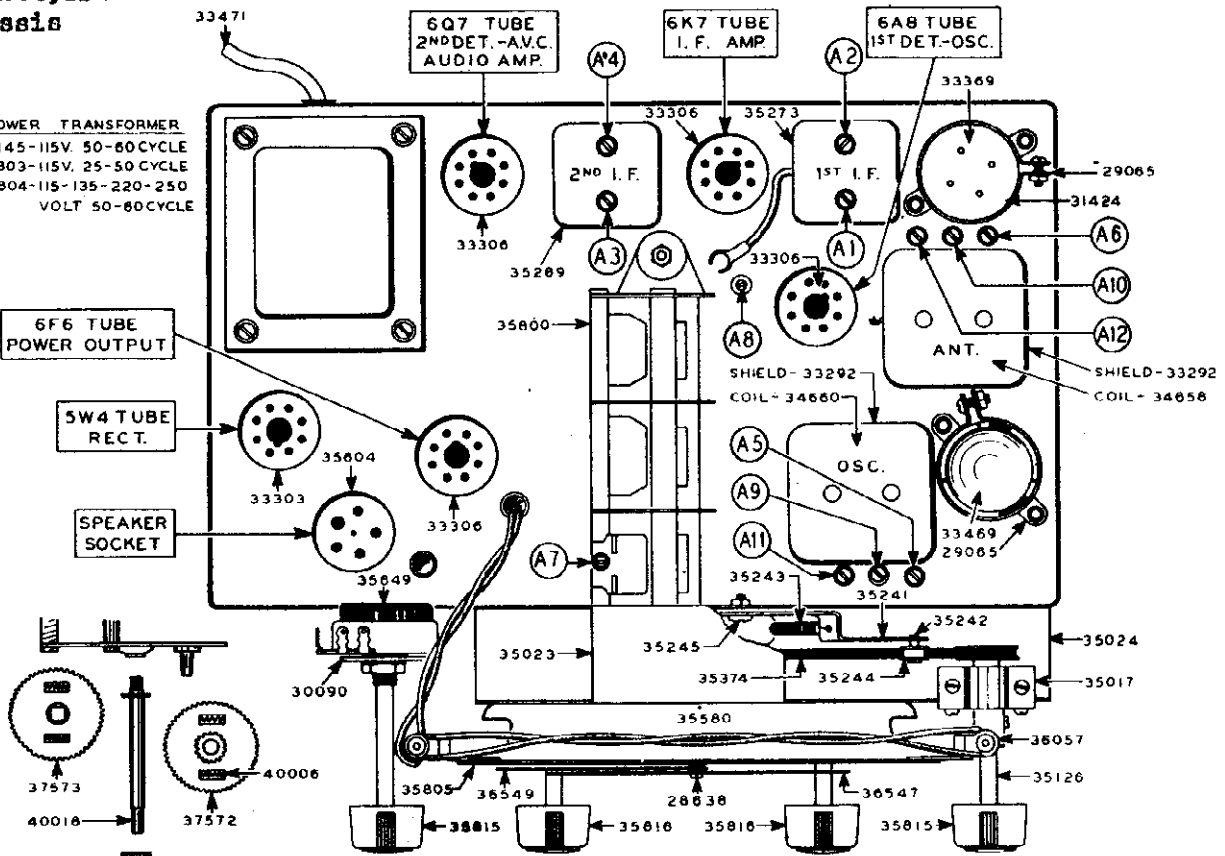
5W4 TUBE
RECT.

SPEAKER
SOCKET

6Q7 TUBE
2ND DET.-A.V.C.
AUDIO AMP.

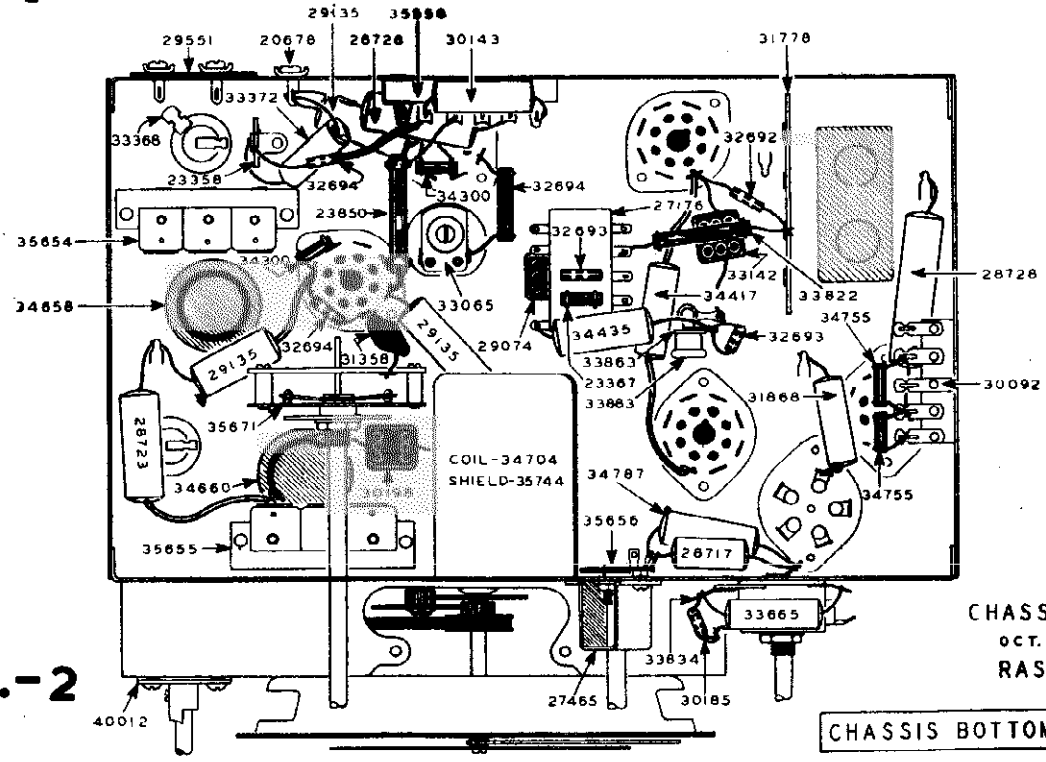
6K7 TUBE
I. F. AMP.

6A8 TUBE
1ST DET.-OSC.



CHASSIS TOP VIEW

FIG.-1



CHASSIS 5Q
OCT. 1936
RAS 194

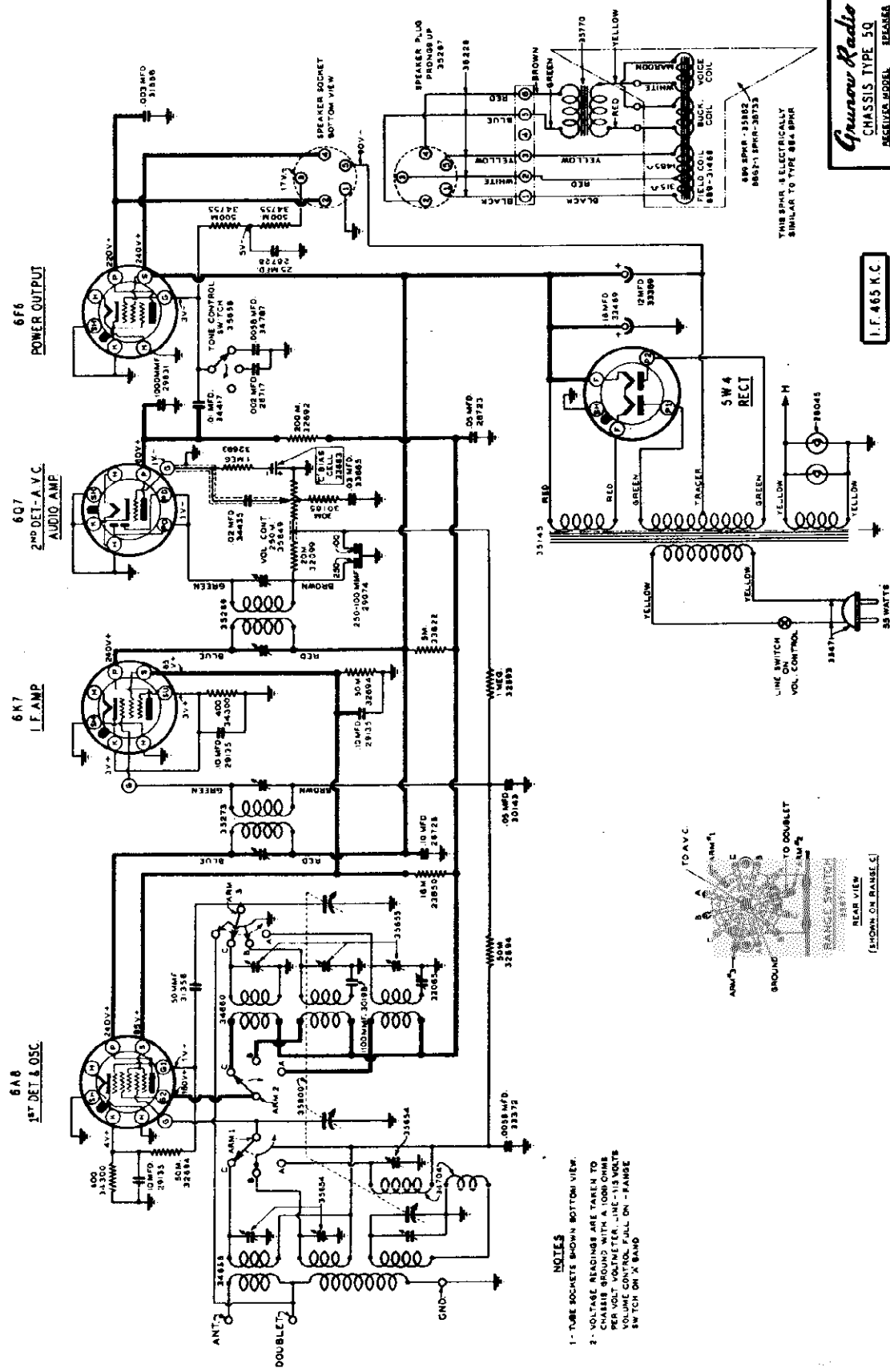
FIG.-2

CHASSIS BOTTOM VIEW

GENERAL HOUSEHOLD UTILITIES CO.

MODEL 573
Chassis 5 Q
Schematic
Parts, Voltag

Grunow Radio
CHASSIS TYPE 5Q
RECEIVER MODEL 573 809 08082-1
GENERAL HOUSEHOLD UTILITIES CO.
740 WEST WASHINGTON ST.
CHICAGO, U.S.A. RA5187



- NOTES**
- 1 - TUBE SOCKETS SHOWN BOTTOM VIEW.
 - 2 - VOLTAGE READINGS ARE TAKEN TO CHASSIS GROUND WITH A 1000 OHMS PER VOLT VOLTMETER. LINE-115 VOLTS VOLUME CONTROL FULL ON - RANGE SWITCH ON A BAND.

FIG.-3

MODELS 614, 618 Auto
Schematic, Parts
Socket, Trimmers
Chassis, Voltage

GENERAL HOUSEHOLD UTILITIES CO.

(PRICES SUBJECT TO CHANGE WITHOUT NOTICE)

PART NO.	DESCRIPTION	PRICE
28100	500M OHM EARLY SETS	.10
28101	500M OHM EARLY SETS	.10
28102	500M OHM EARLY SETS	.10
28103	500M OHM EARLY SETS	.10
28104	500M OHM EARLY SETS	.10
28105	500M OHM EARLY SETS	.10
28106	500M OHM EARLY SETS	.10
28107	500M OHM EARLY SETS	.10
28108	500M OHM EARLY SETS	.10
28109	500M OHM EARLY SETS	.10
28110	500M OHM EARLY SETS	.10
28111	500M OHM EARLY SETS	.10
28112	500M OHM EARLY SETS	.10
28113	500M OHM EARLY SETS	.10
28114	500M OHM EARLY SETS	.10
28115	500M OHM EARLY SETS	.10
28116	500M OHM EARLY SETS	.10
28117	500M OHM EARLY SETS	.10
28118	500M OHM EARLY SETS	.10
28119	500M OHM EARLY SETS	.10
28120	500M OHM EARLY SETS	.10
28121	500M OHM EARLY SETS	.10
28122	500M OHM EARLY SETS	.10
28123	500M OHM EARLY SETS	.10
28124	500M OHM EARLY SETS	.10
28125	500M OHM EARLY SETS	.10
28126	500M OHM EARLY SETS	.10
28127	500M OHM EARLY SETS	.10
28128	500M OHM EARLY SETS	.10
28129	500M OHM EARLY SETS	.10
28130	500M OHM EARLY SETS	.10
28131	500M OHM EARLY SETS	.10
28132	500M OHM EARLY SETS	.10
28133	500M OHM EARLY SETS	.10
28134	500M OHM EARLY SETS	.10
28135	500M OHM EARLY SETS	.10
28136	500M OHM EARLY SETS	.10
28137	500M OHM EARLY SETS	.10
28138	500M OHM EARLY SETS	.10
28139	500M OHM EARLY SETS	.10
28140	500M OHM EARLY SETS	.10
28141	500M OHM EARLY SETS	.10
28142	500M OHM EARLY SETS	.10
28143	500M OHM EARLY SETS	.10
28144	500M OHM EARLY SETS	.10
28145	500M OHM EARLY SETS	.10
28146	500M OHM EARLY SETS	.10
28147	500M OHM EARLY SETS	.10
28148	500M OHM EARLY SETS	.10
28149	500M OHM EARLY SETS	.10
28150	500M OHM EARLY SETS	.10
28151	500M OHM EARLY SETS	.10
28152	500M OHM EARLY SETS	.10
28153	500M OHM EARLY SETS	.10
28154	500M OHM EARLY SETS	.10
28155	500M OHM EARLY SETS	.10
28156	500M OHM EARLY SETS	.10
28157	500M OHM EARLY SETS	.10
28158	500M OHM EARLY SETS	.10
28159	500M OHM EARLY SETS	.10
28160	500M OHM EARLY SETS	.10
28161	500M OHM EARLY SETS	.10
28162	500M OHM EARLY SETS	.10
28163	500M OHM EARLY SETS	.10
28164	500M OHM EARLY SETS	.10
28165	500M OHM EARLY SETS	.10
28166	500M OHM EARLY SETS	.10
28167	500M OHM EARLY SETS	.10
28168	500M OHM EARLY SETS	.10
28169	500M OHM EARLY SETS	.10
28170	500M OHM EARLY SETS	.10
28171	500M OHM EARLY SETS	.10
28172	500M OHM EARLY SETS	.10
28173	500M OHM EARLY SETS	.10
28174	500M OHM EARLY SETS	.10
28175	500M OHM EARLY SETS	.10
28176	500M OHM EARLY SETS	.10
28177	500M OHM EARLY SETS	.10
28178	500M OHM EARLY SETS	.10
28179	500M OHM EARLY SETS	.10
28180	500M OHM EARLY SETS	.10
28181	500M OHM EARLY SETS	.10
28182	500M OHM EARLY SETS	.10
28183	500M OHM EARLY SETS	.10
28184	500M OHM EARLY SETS	.10
28185	500M OHM EARLY SETS	.10
28186	500M OHM EARLY SETS	.10
28187	500M OHM EARLY SETS	.10
28188	500M OHM EARLY SETS	.10
28189	500M OHM EARLY SETS	.10
28190	500M OHM EARLY SETS	.10
28191	500M OHM EARLY SETS	.10
28192	500M OHM EARLY SETS	.10
28193	500M OHM EARLY SETS	.10
28194	500M OHM EARLY SETS	.10
28195	500M OHM EARLY SETS	.10
28196	500M OHM EARLY SETS	.10
28197	500M OHM EARLY SETS	.10
28198	500M OHM EARLY SETS	.10
28199	500M OHM EARLY SETS	.10
28200	500M OHM EARLY SETS	.10
28201	500M OHM EARLY SETS	.10
28202	500M OHM EARLY SETS	.10
28203	500M OHM EARLY SETS	.10
28204	500M OHM EARLY SETS	.10
28205	500M OHM EARLY SETS	.10
28206	500M OHM EARLY SETS	.10
28207	500M OHM EARLY SETS	.10
28208	500M OHM EARLY SETS	.10
28209	500M OHM EARLY SETS	.10
28210	500M OHM EARLY SETS	.10
28211	500M OHM EARLY SETS	.10
28212	500M OHM EARLY SETS	.10
28213	500M OHM EARLY SETS	.10
28214	500M OHM EARLY SETS	.10
28215	500M OHM EARLY SETS	.10
28216	500M OHM EARLY SETS	.10
28217	500M OHM EARLY SETS	.10
28218	500M OHM EARLY SETS	.10
28219	500M OHM EARLY SETS	.10
28220	500M OHM EARLY SETS	.10
28221	500M OHM EARLY SETS	.10
28222	500M OHM EARLY SETS	.10
28223	500M OHM EARLY SETS	.10
28224	500M OHM EARLY SETS	.10
28225	500M OHM EARLY SETS	.10
28226	500M OHM EARLY SETS	.10
28227	500M OHM EARLY SETS	.10
28228	500M OHM EARLY SETS	.10
28229	500M OHM EARLY SETS	.10
28230	500M OHM EARLY SETS	.10
28231	500M OHM EARLY SETS	.10
28232	500M OHM EARLY SETS	.10
28233	500M OHM EARLY SETS	.10
28234	500M OHM EARLY SETS	.10
28235	500M OHM EARLY SETS	.10
28236	500M OHM EARLY SETS	.10
28237	500M OHM EARLY SETS	.10
28238	500M OHM EARLY SETS	.10
28239	500M OHM EARLY SETS	.10
28240	500M OHM EARLY SETS	.10
28241	500M OHM EARLY SETS	.10
28242	500M OHM EARLY SETS	.10
28243	500M OHM EARLY SETS	.10
28244	500M OHM EARLY SETS	.10
28245	500M OHM EARLY SETS	.10
28246	500M OHM EARLY SETS	.10
28247	500M OHM EARLY SETS	.10
28248	500M OHM EARLY SETS	.10
28249	500M OHM EARLY SETS	.10
28250	500M OHM EARLY SETS	.10
28251	500M OHM EARLY SETS	.10
28252	500M OHM EARLY SETS	.10
28253	500M OHM EARLY SETS	.10
28254	500M OHM EARLY SETS	.10
28255	500M OHM EARLY SETS	.10
28256	500M OHM EARLY SETS	.10
28257	500M OHM EARLY SETS	.10
28258	500M OHM EARLY SETS	.10
28259	500M OHM EARLY SETS	.10
28260	500M OHM EARLY SETS	.10
28261	500M OHM EARLY SETS	.10
28262	500M OHM EARLY SETS	.10
28263	500M OHM EARLY SETS	.10
28264	500M OHM EARLY SETS	.10
28265	500M OHM EARLY SETS	.10
28266	500M OHM EARLY SETS	.10
28267	500M OHM EARLY SETS	.10
28268	500M OHM EARLY SETS	.10
28269	500M OHM EARLY SETS	.10
28270	500M OHM EARLY SETS	.10
28271	500M OHM EARLY SETS	.10
28272	500M OHM EARLY SETS	.10
28273	500M OHM EARLY SETS	.10
28274	500M OHM EARLY SETS	.10
28275	500M OHM EARLY SETS	.10
28276	500M OHM EARLY SETS	.10
28277	500M OHM EARLY SETS	.10
28278	500M OHM EARLY SETS	.10
28279	500M OHM EARLY SETS	.10
28280	500M OHM EARLY SETS	.10
28281	500M OHM EARLY SETS	.10
28282	500M OHM EARLY SETS	.10
28283	500M OHM EARLY SETS	.10
28284	500M OHM EARLY SETS	.10
28285	500M OHM EARLY SETS	.10
28286	500M OHM EARLY SETS	.10
28287	500M OHM EARLY SETS	.10
28288	500M OHM EARLY SETS	.10
28289	500M OHM EARLY SETS	.10
28290	500M OHM EARLY SETS	.10
28291	500M OHM EARLY SETS	.10
28292	500M OHM EARLY SETS	.10
28293	500M OHM EARLY SETS	.10
28294	500M OHM EARLY SETS	.10
28295	500M OHM EARLY SETS	.10
28296	500M OHM EARLY SETS	.10
28297	500M OHM EARLY SETS	.10
28298	500M OHM EARLY SETS	.10
28299	500M OHM EARLY SETS	.10
28300	500M OHM EARLY SETS	.10

Grunow Radio
CHASSIS TYPE 614
RECEIVER MODELS 60B1-1
614 8D1 OR 3580B
618 8D1 OR 3580B
GENERAL HOUSEHOLD UTILITIES CO.
RADIO ENGINEERING DEPARTMENT
CHICAGO, U.S.A. RAS 153

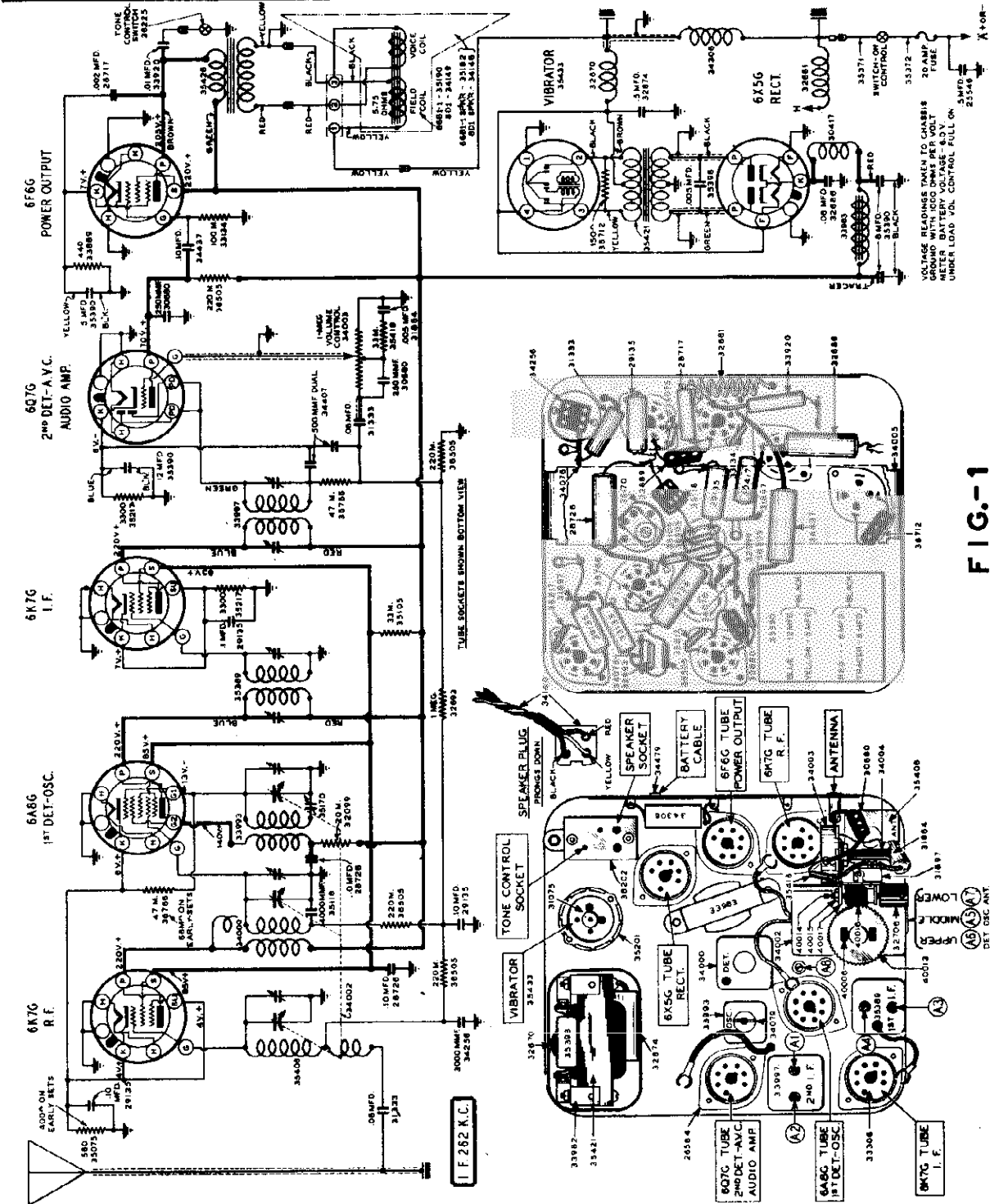


FIG.-1

GENERAL HOUSEHOLD UTILITIES CO.

MODEL 625 Auto Schematic, Parts Socket, Trimmers Voltage, Chassis

(PRICES SUBJECT TO CHANGE WITHOUT NOTICE)

PART NO.	DESCRIPTION	PRICE
32488	GREEN GRILL	.25
32489	TONE CONTROL knob	.25
32490	OSC. CONTROL knob	.25
32491	VOLUME CONTROL knob	.25
32492	REAR COVER-888	.25
32493	FRONT COVER-888	.25
32494	REAR COVER-888	.25
32495	FRONT COVER-888	.25
32496	REAR COVER-888	.25
32497	FRONT COVER-888	.25
32498	REAR COVER-888	.25
32499	FRONT COVER-888	.25
32500	REAR COVER-888	.25
32501	FRONT COVER-888	.25
32502	REAR COVER-888	.25
32503	FRONT COVER-888	.25
32504	REAR COVER-888	.25
32505	FRONT COVER-888	.25
32506	REAR COVER-888	.25
32507	FRONT COVER-888	.25
32508	REAR COVER-888	.25
32509	FRONT COVER-888	.25
32510	REAR COVER-888	.25
32511	FRONT COVER-888	.25
32512	REAR COVER-888	.25
32513	FRONT COVER-888	.25
32514	REAR COVER-888	.25
32515	FRONT COVER-888	.25
32516	REAR COVER-888	.25
32517	FRONT COVER-888	.25
32518	REAR COVER-888	.25
32519	FRONT COVER-888	.25
32520	REAR COVER-888	.25
32521	FRONT COVER-888	.25
32522	REAR COVER-888	.25
32523	FRONT COVER-888	.25
32524	REAR COVER-888	.25
32525	FRONT COVER-888	.25
32526	REAR COVER-888	.25
32527	FRONT COVER-888	.25
32528	REAR COVER-888	.25
32529	FRONT COVER-888	.25
32530	REAR COVER-888	.25
32531	FRONT COVER-888	.25
32532	REAR COVER-888	.25
32533	FRONT COVER-888	.25
32534	REAR COVER-888	.25
32535	FRONT COVER-888	.25
32536	REAR COVER-888	.25
32537	FRONT COVER-888	.25
32538	REAR COVER-888	.25
32539	FRONT COVER-888	.25
32540	REAR COVER-888	.25
32541	FRONT COVER-888	.25
32542	REAR COVER-888	.25
32543	FRONT COVER-888	.25
32544	REAR COVER-888	.25
32545	FRONT COVER-888	.25
32546	REAR COVER-888	.25
32547	FRONT COVER-888	.25
32548	REAR COVER-888	.25
32549	FRONT COVER-888	.25
32550	REAR COVER-888	.25
32551	FRONT COVER-888	.25
32552	REAR COVER-888	.25
32553	FRONT COVER-888	.25
32554	REAR COVER-888	.25
32555	FRONT COVER-888	.25
32556	REAR COVER-888	.25
32557	FRONT COVER-888	.25
32558	REAR COVER-888	.25
32559	FRONT COVER-888	.25
32560	REAR COVER-888	.25
32561	FRONT COVER-888	.25
32562	REAR COVER-888	.25
32563	FRONT COVER-888	.25
32564	REAR COVER-888	.25
32565	FRONT COVER-888	.25
32566	REAR COVER-888	.25
32567	FRONT COVER-888	.25
32568	REAR COVER-888	.25
32569	FRONT COVER-888	.25
32570	REAR COVER-888	.25
32571	FRONT COVER-888	.25
32572	REAR COVER-888	.25
32573	FRONT COVER-888	.25
32574	REAR COVER-888	.25
32575	FRONT COVER-888	.25
32576	REAR COVER-888	.25
32577	FRONT COVER-888	.25
32578	REAR COVER-888	.25
32579	FRONT COVER-888	.25
32580	REAR COVER-888	.25
32581	FRONT COVER-888	.25
32582	REAR COVER-888	.25
32583	FRONT COVER-888	.25
32584	REAR COVER-888	.25
32585	FRONT COVER-888	.25
32586	REAR COVER-888	.25
32587	FRONT COVER-888	.25
32588	REAR COVER-888	.25
32589	FRONT COVER-888	.25
32590	REAR COVER-888	.25
32591	FRONT COVER-888	.25
32592	REAR COVER-888	.25
32593	FRONT COVER-888	.25
32594	REAR COVER-888	.25
32595	FRONT COVER-888	.25
32596	REAR COVER-888	.25
32597	FRONT COVER-888	.25
32598	REAR COVER-888	.25
32599	FRONT COVER-888	.25
32600	REAR COVER-888	.25
32601	FRONT COVER-888	.25
32602	REAR COVER-888	.25
32603	FRONT COVER-888	.25
32604	REAR COVER-888	.25
32605	FRONT COVER-888	.25
32606	REAR COVER-888	.25
32607	FRONT COVER-888	.25
32608	REAR COVER-888	.25
32609	FRONT COVER-888	.25
32610	REAR COVER-888	.25
32611	FRONT COVER-888	.25
32612	REAR COVER-888	.25
32613	FRONT COVER-888	.25
32614	REAR COVER-888	.25
32615	FRONT COVER-888	.25
32616	REAR COVER-888	.25
32617	FRONT COVER-888	.25
32618	REAR COVER-888	.25
32619	FRONT COVER-888	.25
32620	REAR COVER-888	.25
32621	FRONT COVER-888	.25
32622	REAR COVER-888	.25
32623	FRONT COVER-888	.25
32624	REAR COVER-888	.25
32625	FRONT COVER-888	.25
32626	REAR COVER-888	.25
32627	FRONT COVER-888	.25
32628	REAR COVER-888	.25
32629	FRONT COVER-888	.25
32630	REAR COVER-888	.25
32631	FRONT COVER-888	.25
32632	REAR COVER-888	.25
32633	FRONT COVER-888	.25
32634	REAR COVER-888	.25
32635	FRONT COVER-888	.25
32636	REAR COVER-888	.25
32637	FRONT COVER-888	.25
32638	REAR COVER-888	.25
32639	FRONT COVER-888	.25
32640	REAR COVER-888	.25
32641	FRONT COVER-888	.25
32642	REAR COVER-888	.25
32643	FRONT COVER-888	.25
32644	REAR COVER-888	.25
32645	FRONT COVER-888	.25
32646	REAR COVER-888	.25
32647	FRONT COVER-888	.25
32648	REAR COVER-888	.25
32649	FRONT COVER-888	.25
32650	REAR COVER-888	.25
32651	FRONT COVER-888	.25
32652	REAR COVER-888	.25
32653	FRONT COVER-888	.25
32654	REAR COVER-888	.25
32655	FRONT COVER-888	.25
32656	REAR COVER-888	.25
32657	FRONT COVER-888	.25
32658	REAR COVER-888	.25
32659	FRONT COVER-888	.25
32660	REAR COVER-888	.25
32661	FRONT COVER-888	.25
32662	REAR COVER-888	.25
32663	FRONT COVER-888	.25
32664	REAR COVER-888	.25
32665	FRONT COVER-888	.25
32666	REAR COVER-888	.25
32667	FRONT COVER-888	.25
32668	REAR COVER-888	.25
32669	FRONT COVER-888	.25
32670	REAR COVER-888	.25
32671	FRONT COVER-888	.25
32672	REAR COVER-888	.25
32673	FRONT COVER-888	.25
32674	REAR COVER-888	.25
32675	FRONT COVER-888	.25
32676	REAR COVER-888	.25
32677	FRONT COVER-888	.25
32678	REAR COVER-888	.25
32679	FRONT COVER-888	.25
32680	REAR COVER-888	.25
32681	FRONT COVER-888	.25
32682	REAR COVER-888	.25
32683	FRONT COVER-888	.25
32684	REAR COVER-888	.25
32685	FRONT COVER-888	.25
32686	REAR COVER-888	.25
32687	FRONT COVER-888	.25
32688	REAR COVER-888	.25
32689	FRONT COVER-888	.25
32690	REAR COVER-888	.25
32691	FRONT COVER-888	.25
32692	REAR COVER-888	.25
32693	FRONT COVER-888	.25
32694	REAR COVER-888	.25
32695	FRONT COVER-888	.25
32696	REAR COVER-888	.25
32697	FRONT COVER-888	.25
32698	REAR COVER-888	.25
32699	FRONT COVER-888	.25
32700	REAR COVER-888	.25

Auto
Grunow Radio
CHASSIS TYPE 625
RECEIVER MODEL 625
GENERAL HOUSEHOLD UTILITIES CO.
RADIO SERVICE DEPARTMENT
CHICAGO U.S.A. RAS 396

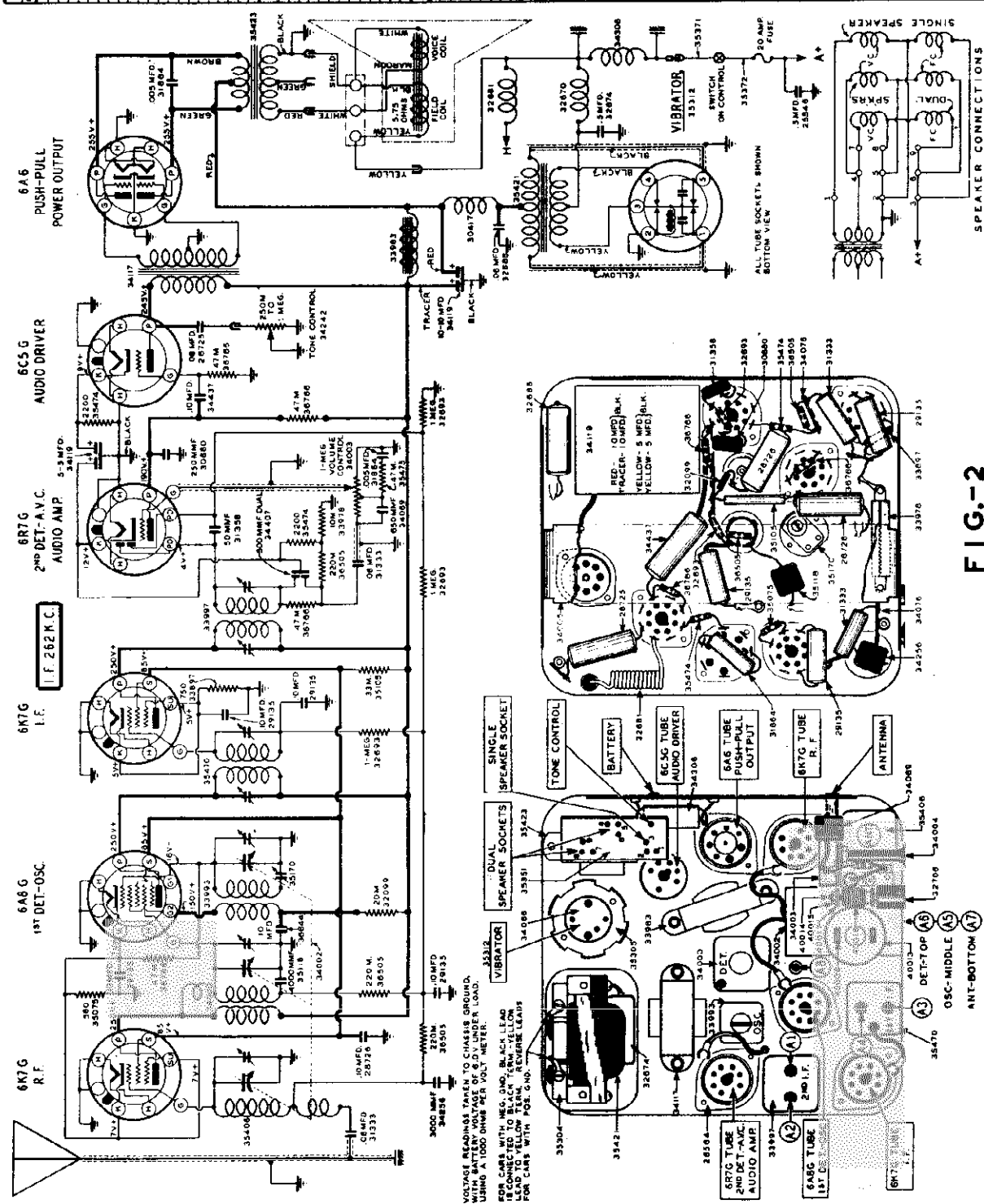


FIG.-2

MODELS 614, 618
MODEL 625
Alignment
Control Units

GENERAL HOUSEHOLD UTILITIES CO.

GRUNOW REMOTE CONTROL UNIT KITS
For Use on Grunow Auto Radio Models 614-618 and 625



NOVEMBER, 1938
SERVICE DATA

Auto Radio Models 614 - 618 - 625

GENERAL

Model 614 is a single unit remote control superheterodyne receiver using the following tubes: 6K7-G R.F. Amplifier, 6A8-G 1st Det. and Oscillator, 6K7-G L.F. Amplifier, 6Q7-G 2nd Det. A.V.C. and Audio Amplifier, 6F6-G Power Output, 6X5-G Rectifier; Vibrator is a non-synchronous plug-in type.

Model 618 is a double unit, remote control superheterodyne receiver using the same tubes as Model 614, with a separate speaker, either a dash type (8D1) or an overhead speaker. The overhead speaker can also be installed on the back of the front seat.

Model 625 is a double unit, remote control superheterodyne receiver with provision made for the addition of a second speaker (overhead type). This receiver uses the following tubes: 6K7-G R.F. Amp., 6A4-G 1st Det. and Osc., 6K7-G L.F. Amp., 6N7-G 2nd Det., A.V.C. and Audio Amp., 6C5-G Audio Driver, 6AG Push-Pull Power Output. Since this receiver uses a synchronous vibrator, make certain when installing, that polarity of receiver agrees with polarity of car. If it is necessary to reverse polarity, this may be done at the top of the vibrator transformer without removing chassis from its case (see Fig. 2).

CIRCUIT ALIGNMENT

- If alignment is found necessary, make all adjustments with the chassis in its case and use a calibrated test oscillator and an output meter. Allow chassis and test oscillator to warm up before making any adjustments.
1. PEAKING L.F. STAGES AT 262 K.C.
 - (a) Connect the ground lead of the test-oscillator to the chassis frame. Connect a .10 mfd. condenser in series with the signal lead and connect this lead to the grid cap of the 6A7 tube (leave grid clip in place.)
 - (b) Set the test-oscillator to exactly 262 K.C.
 - (c) Turn the volume control of the receiver full on.
 - (d) Adjust the L.F. trimmers A1, A2, A3, A4. In order to insure accurate setting of these trimmers, the adjustments should be repeated using the lowest oscillator output, that will give a reasonable deflection of the output meter pointer. Make all adjustments for maximum output.
 2. ALIGNING GANG CONDENSER AT 1560 AND 1460 K.C.
 - (a) Connect the signal lead of the test-oscillator to the antenna connection of the chassis, substituting a 250 mmfd. condenser for the .10 mfd. condenser. Turn the rotor plates of the gang condenser until they are completely out of mesh.
 3. ALIGNING AT 600 K.C.
 - (a) Change the test-oscillator to 600 K.C.
 - (b) Turn the condenser rotor plates until the 600 K.C. signal is tuned in at maximum.
 - (c) Adjust the antenna padding condenser A8 while rocking the condenser gang back and forth slightly until no further improvement in output can be obtained.
 - (d) It is well to return to 1400 K.C. and recheck at this frequency, then recheck 600 K.C. while rocking gang condenser.
- Caution*—On all of the above operations always use the lowest oscillator output that will give a reasonable deflection of the output meter in order to prevent the A.V.C. from leveling out the output as adjustments are made.

Kit No.	Make and Year of Car	Kit Price	Description	Kit No.	Make and Year of Car	Kit Price	Description
36100	ALL CARS	\$1.50	.....	36100	ALL CARS	\$1.50	.....
36101	1934-40	2.00	.....	36101	1934-40	2.00	.....
36102	1934-40	2.00	.....	36102	1934-40	2.00	.....
36103	1934-40	2.00	.....	36103	1934-40	2.00	.....
36104	1934-40	2.00	.....	36104	1934-40	2.00	.....
36105	1934-40	2.00	.....	36105	1934-40	2.00	.....
36106	1934-40	2.00	.....	36106	1934-40	2.00	.....
36107	1934-40	2.00	.....	36107	1934-40	2.00	.....
36108	1934-40	2.00	.....	36108	1934-40	2.00	.....
36109	1934-40	2.00	.....	36109	1934-40	2.00	.....
36110	1934-40	2.00	.....	36110	1934-40	2.00	.....
36111	1934-40	2.00	.....	36111	1934-40	2.00	.....
36112	1934-40	2.00	.....	36112	1934-40	2.00	.....
36113	1934-40	2.00	.....	36113	1934-40	2.00	.....
36114	1934-40	2.00	.....	36114	1934-40	2.00	.....
36115	1934-40	2.00	.....	36115	1934-40	2.00	.....
36116	1934-40	2.00	.....	36116	1934-40	2.00	.....
36117	1934-40	2.00	.....	36117	1934-40	2.00	.....
36118	1934-40	2.00	.....	36118	1934-40	2.00	.....
36119	1934-40	2.00	.....	36119	1934-40	2.00	.....
36120	1934-40	2.00	.....	36120	1934-40	2.00	.....
36121	1934-40	2.00	.....	36121	1934-40	2.00	.....
36122	1934-40	2.00	.....	36122	1934-40	2.00	.....
36123	1934-40	2.00	.....	36123	1934-40	2.00	.....
36124	1934-40	2.00	.....	36124	1934-40	2.00	.....
36125	1934-40	2.00	.....	36125	1934-40	2.00	.....
36126	1934-40	2.00	.....	36126	1934-40	2.00	.....
36127	1934-40	2.00	.....	36127	1934-40	2.00	.....
36128	1934-40	2.00	.....	36128	1934-40	2.00	.....
36129	1934-40	2.00	.....	36129	1934-40	2.00	.....
36130	1934-40	2.00	.....	36130	1934-40	2.00	.....
36131	1934-40	2.00	.....	36131	1934-40	2.00	.....
36132	1934-40	2.00	.....	36132	1934-40	2.00	.....
36133	1934-40	2.00	.....	36133	1934-40	2.00	.....
36134	1934-40	2.00	.....	36134	1934-40	2.00	.....
36135	1934-40	2.00	36135	1934-40	2.00
36136	1934-40	2.00	36136	1934-40	2.00
36137	1934-40	2.00	36137	1934-40	2.00
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36144	1934-40	2.00	36144	1934-40	2.00
36145	1934-40	2.00	36145	1934-40	2.00
36146	1934-40	2.00	36146	1934-40	2.00
36147	1934-40	2.00	.....	36147	1934-40	2.00	.....
36148	1934-40	2.00	.....	36148	1934-40	2.00	.....
36149	1934-40	2.00	.....	36149	1934-40	2.00	.....
36150	1934-40	2.00	.....	36150	1934-40	2.00	.....
36151	1934-40	2.00	.....	36151	1934-40	2.00	.....
36152	1934-40	2.00	.....	36152	1934-40	2.00	.....
36153	1934-40	2.00	.....	36153	1934-40	2.00	.....
36154	1934-40	2.00	.....	36154	1934-40	2.00	.....
36155	1934-40	2.00	.....	36155	1934-40	2.00	.....
36156	1934-40	2.00	.....	36156	1934-40	2.00	.....
36157	1934-40	2.00	.....	36157	1934-40	2.00	.....
36158	1934-40	2.00	.....	36158	1934-40	2.00	.....
36159	1934-40	2.00	.....	36159	1934-40	2.00	.....
36160	1934-40	2.00	.....	36160	1934-40	2.00	.....

PRICES SUBJECT TO CHANGE WITHOUT NOTICE
Grunow Twin-Type Auto Antenna
No. 35807

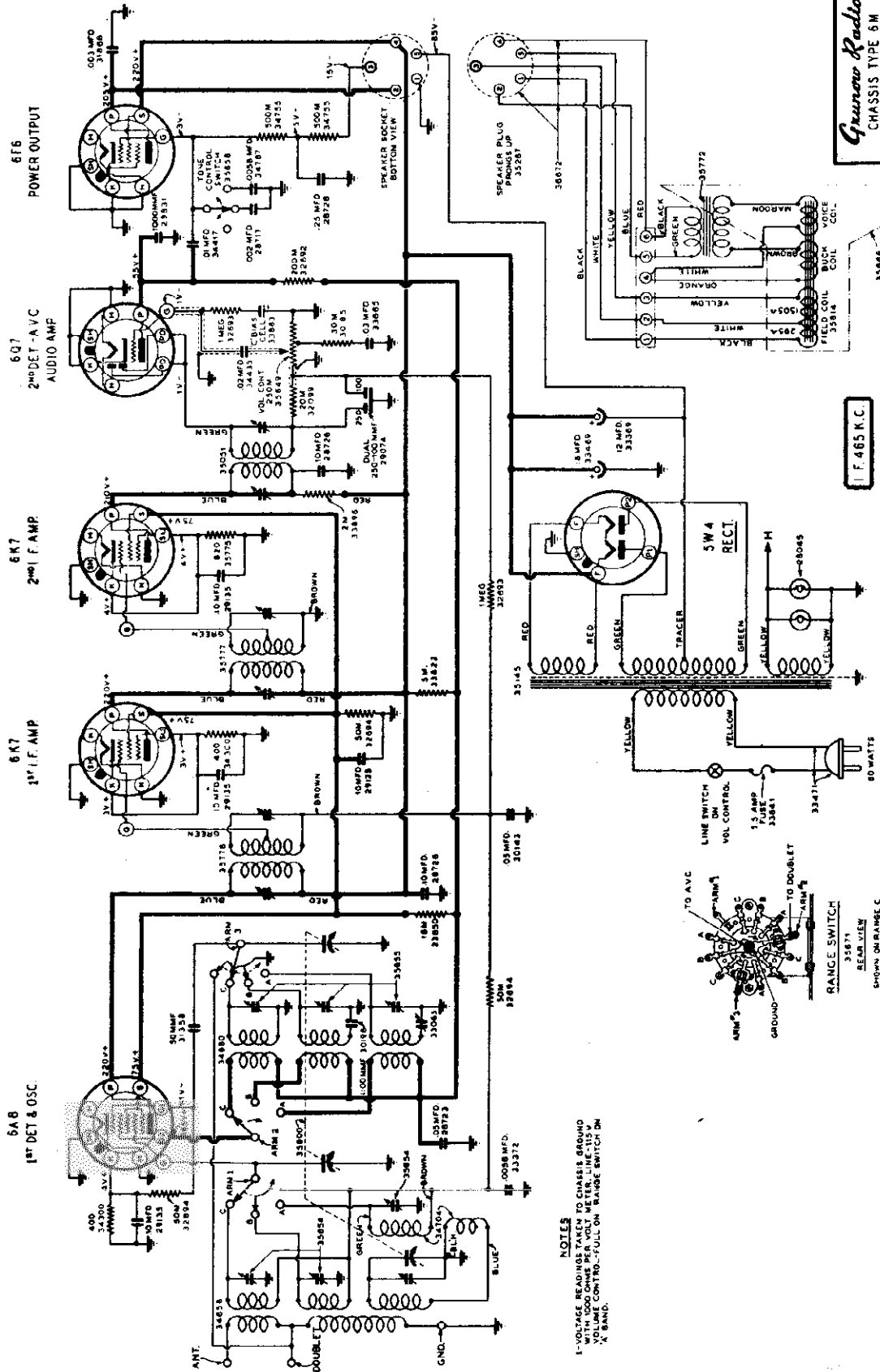
This Antenna is of the running board type, to be used with all Grunow Auto Receivers, on cars that do not have a built-in antenna, and cars of all steel or turret-top construction.
No. 35807 Grunow Auto Antenna...\$4.00

NO. 35808 - GRUNOW OVERHEAD SPEAKER COMPLETE 8.95 LIST

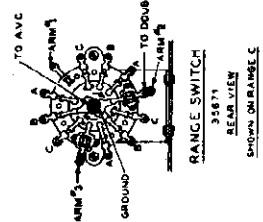
GENERAL HOUSEHOLD UTILITIES CO.

MODEL 631, 643
 Chassis 6M
 Schematic Part
 Voltage

Grunow Radio
 CHASSIS TYPE 6M
 RECEIVER MODEL 631
 831
 GENERAL HOUSEHOLD UTILITIES CO.
 PAUL SERVICE DEPARTMENT
 CHICAGO U.S.A. RAS168



F 465 K.C.



NOTES
 1-VOLTAGE READINGS TO CHASSIS GROUND
 WITH 100 OHMS PER VOLT METER.
 VOLUME CONTROL--FULL ON RANGE SWITCH ON
 A BAND.

FIG.-3

MODELS 631, 643

Chassis 6M

Socket, Trimmers
Chassis

GENERAL HOUSEHOLD UTILITIES CO.

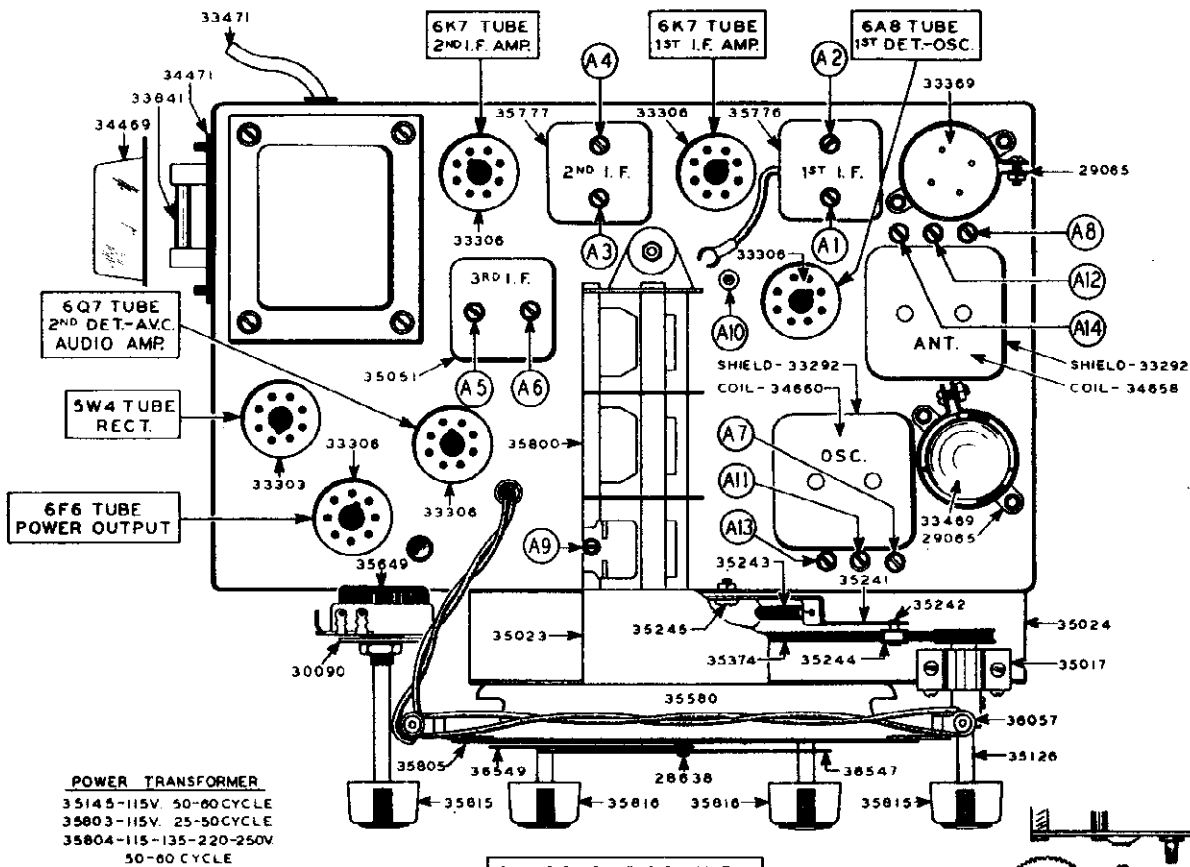


FIG.-1

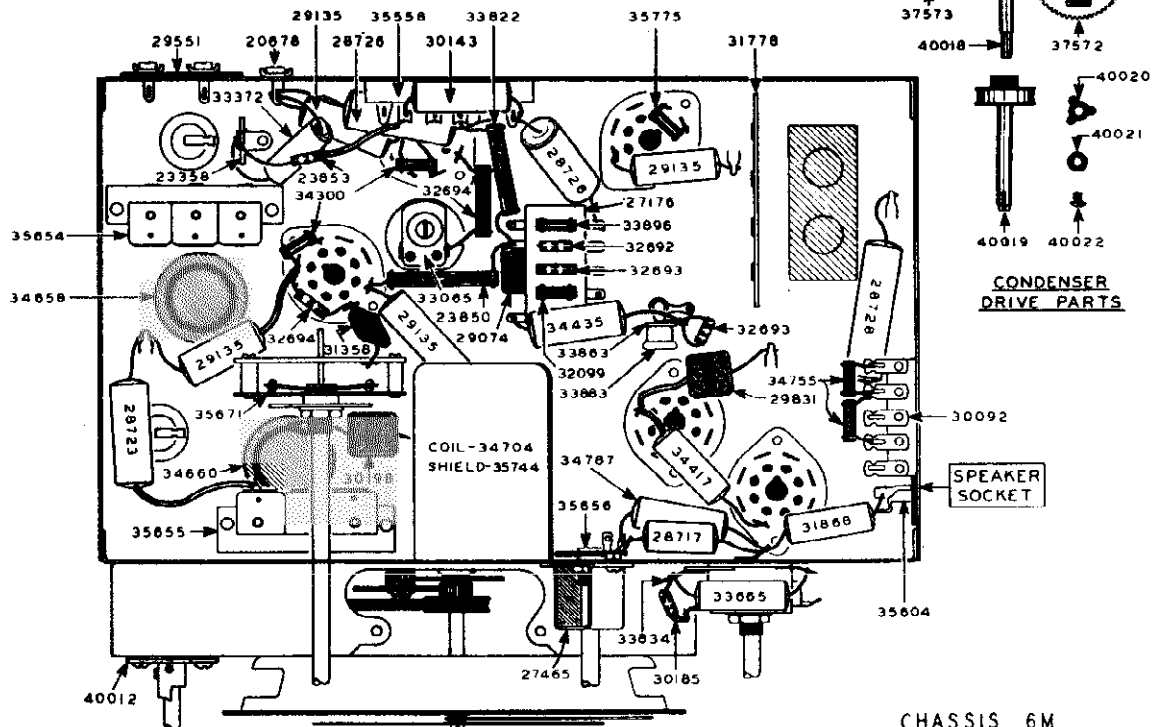


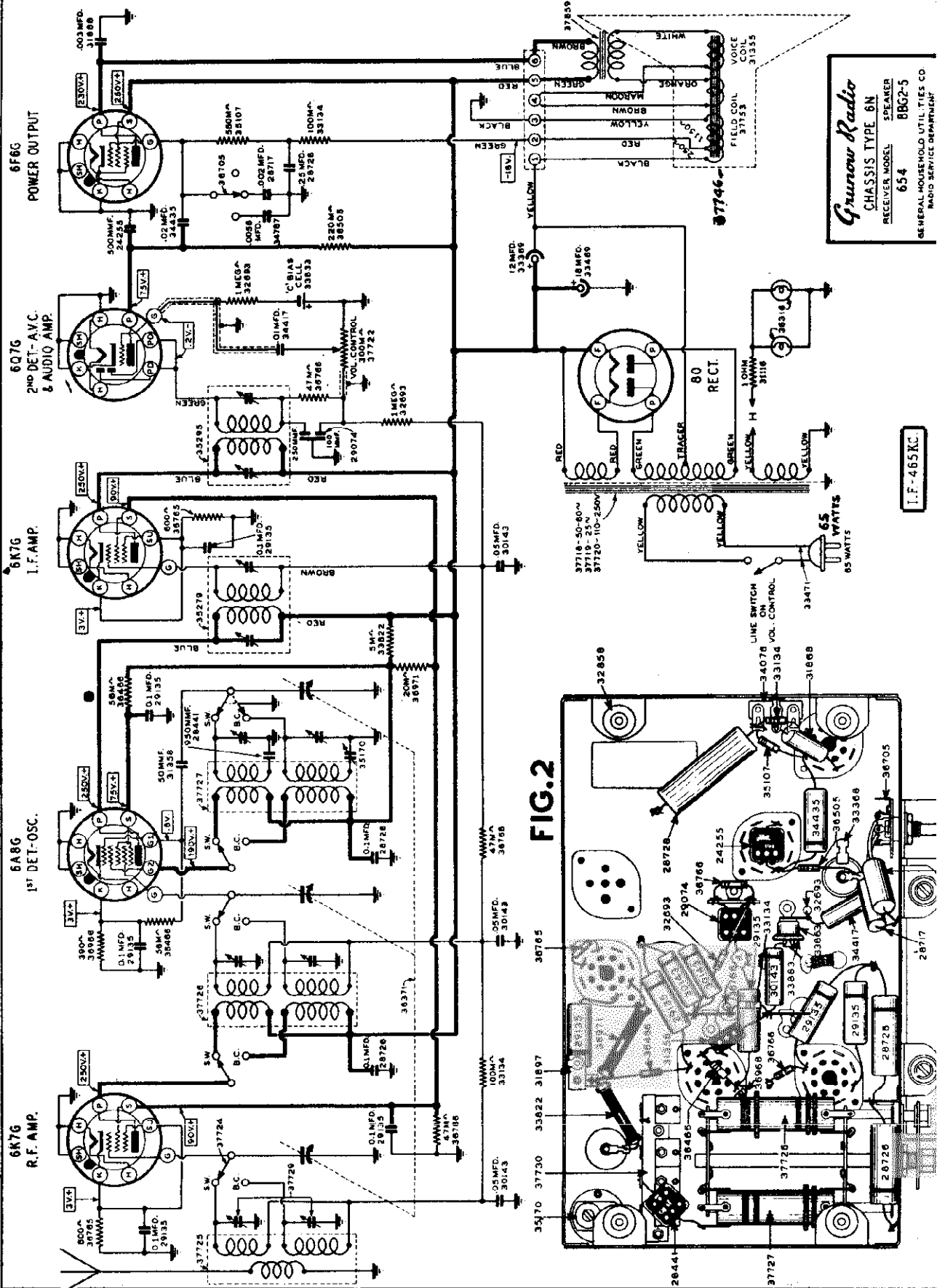
FIG.-2

CHASSIS BOTTOM VIEW

Schematic, Voltage Chassis

GENERAL HOUSEHOLD UTILITIES CO.

MODEL 65 Chassis



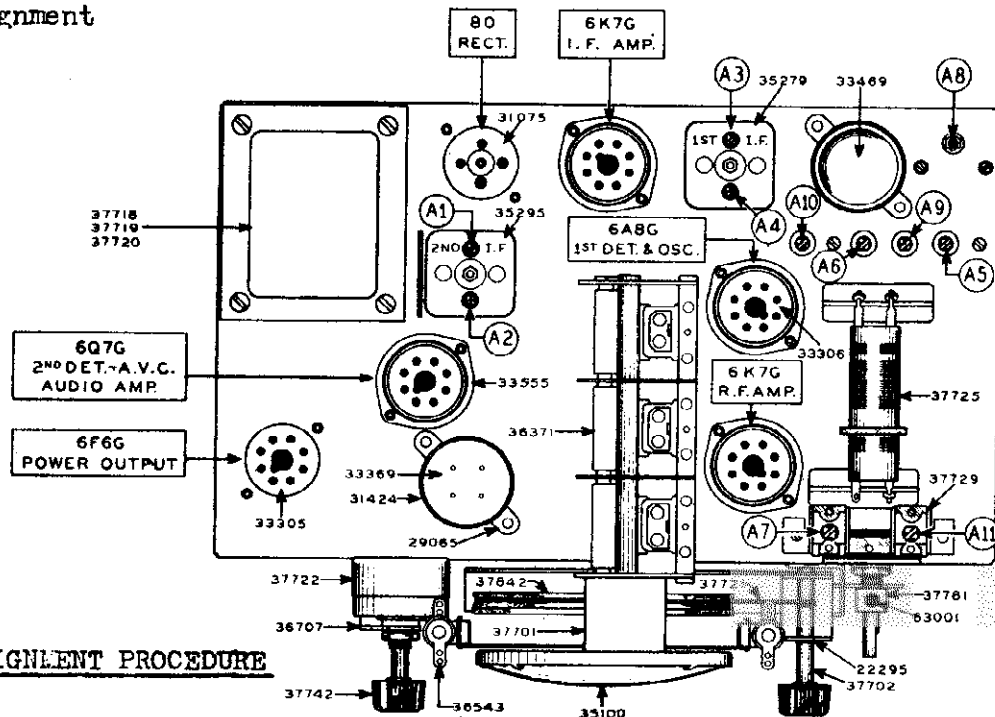
Grunow Radio
 CHASSIS TYPE 6N
 RECEIVER MODEL 654
 SPEAKER 8B62-5
 GENERAL HOUSEHOLD UTILITIES CO.
 RADIO SERVICE DEPARTMENT

I.F.-465XC

FIG. 2

MODEL 654
Chassis 6N
Socket, Trimmers
Alignment

GENERAL HOUSEHOLD UTILITIES CO.

ALIGNMENT PROCEDURE

This chassis utilizes a "C" bias cell in the control grid of the 6Q7 tube. To check the cell, a new one or a 1.5 volt battery must be substituted, as the cell voltage cannot be measured with an ordinary voltmeter due to its low current rating. When replacing the cell note that the carbon (+) side is connected to the ground side of the terminal clip.

ALIGNING I.F. STAGES AT 465 KC.

Connect the ground lead of the signal generator to the chassis sub-panel. Connect an .05 mfd. cond. in series with the signal lead and connect it to the grid clip of the 6A8 tube. Set sig. gen. at 465 KC and turn receiver volume full-on. Adjust I.F. trimmers A1, A2, A3 & A4 to maximum output. To insure accurate adjustment repeat the operation, using the lowest sig. gen. output that will give a readable deflection of the output meter.

DIAL CALIBRATION

With the condenser fully meshed the dial pointer should coincide with the horizontal line on the dial chart.

1400 KC. ALIGNMENT

Turn range switch knob to left. Connect a 200 mmf. condenser in series with the signal lead and connect the lead to the antenna wire. Set sig. gen. to 1400 KC. Turn condenser to 140 (1400) dial reading and adjust trimmers A5, A6 & A7 to maximum output.

600 KC. ALIGNMENT

Change sig. gen. to 600 KC. and tune in signal to maximum. (This point may not coincide exactly with 600 KC. dial reading). Adjust the 600 Kc. padder A8 while rocking the condenser gang slowly in direction of signal increase until no further improvement in output can be obtained.

SHORT WAVE ALIGNMENT

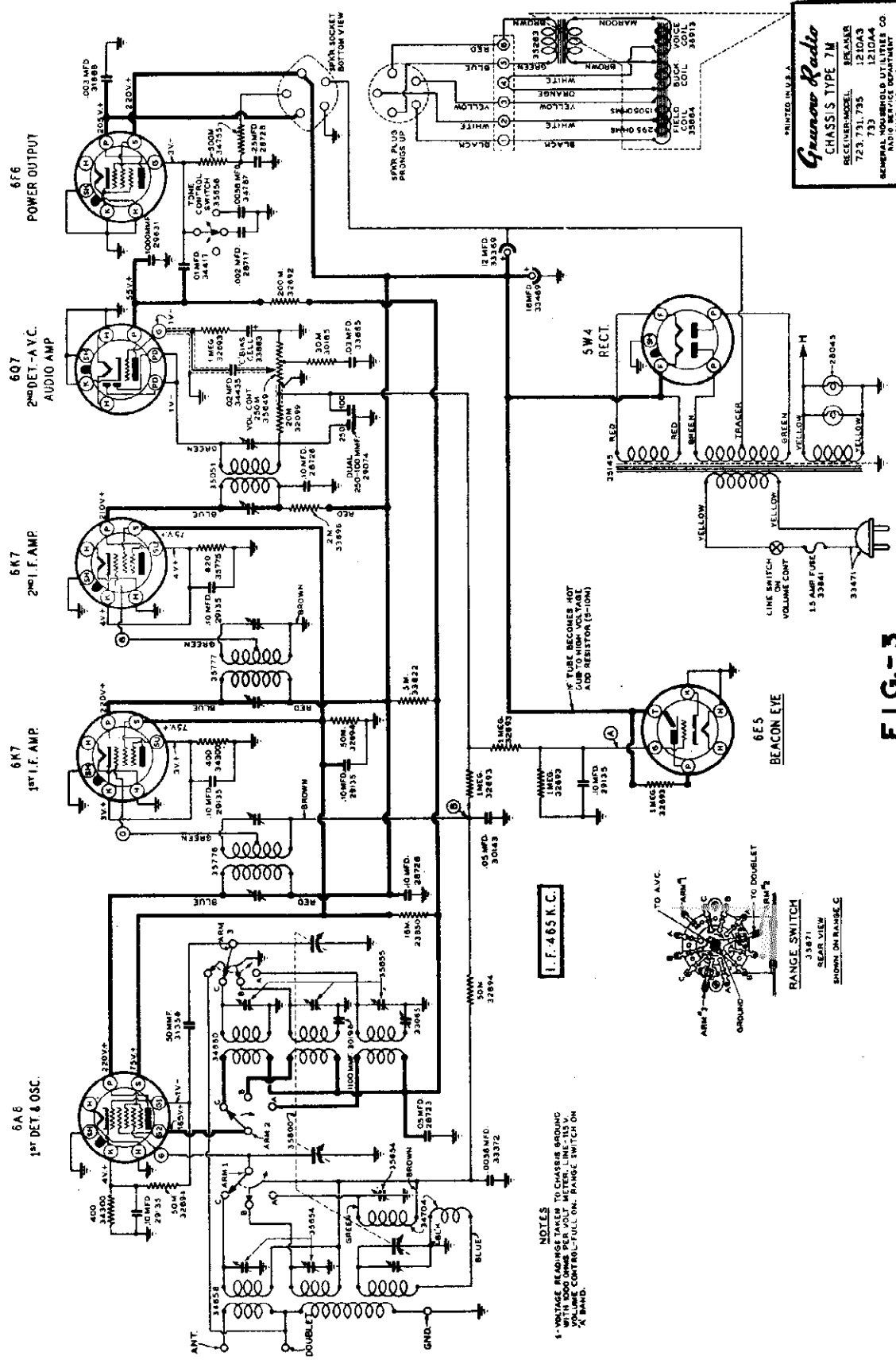
Turn range switch knob to right. Remove 200 mmf. condenser from signal lead and connect a 400 ohm carbon resistor in its place. Change signal gen. to 6 mc. dial reading, adjust trimmers A9, A10 & A11 to maximum output.

Note:- On all of the above operations use the lowest sig. gen. output that will give a readable deflection of the output meter in order to prevent the A. V. C. from levelling the output as adjustments are made.

Schematic, Voltage, Parts

GENERAL HOUSEHOLD UTILITIES CO.

Chassis 7M



PRINTED IN U.S.A.

Grunow Radio

CHASSIS TYPE 7M

RECEIVER MODEL 723, 731, 733, 735

RETAILER 1510A, 1510A, 1510A, 1510A

GENERAL HOUSEHOLD UTILITIES CO. RADIO SERVICE DEPARTMENT CHICAGO, U.S.A. PAS-169

I.F. 465 K.C.

NOTES

1- WITCHAMERE RANGE TAPED IN CHASSIS BEHIND VOLUME CONTROL - FULL ON - RANGE SWITCH ON X BAND.

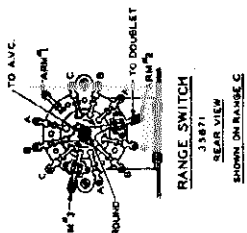
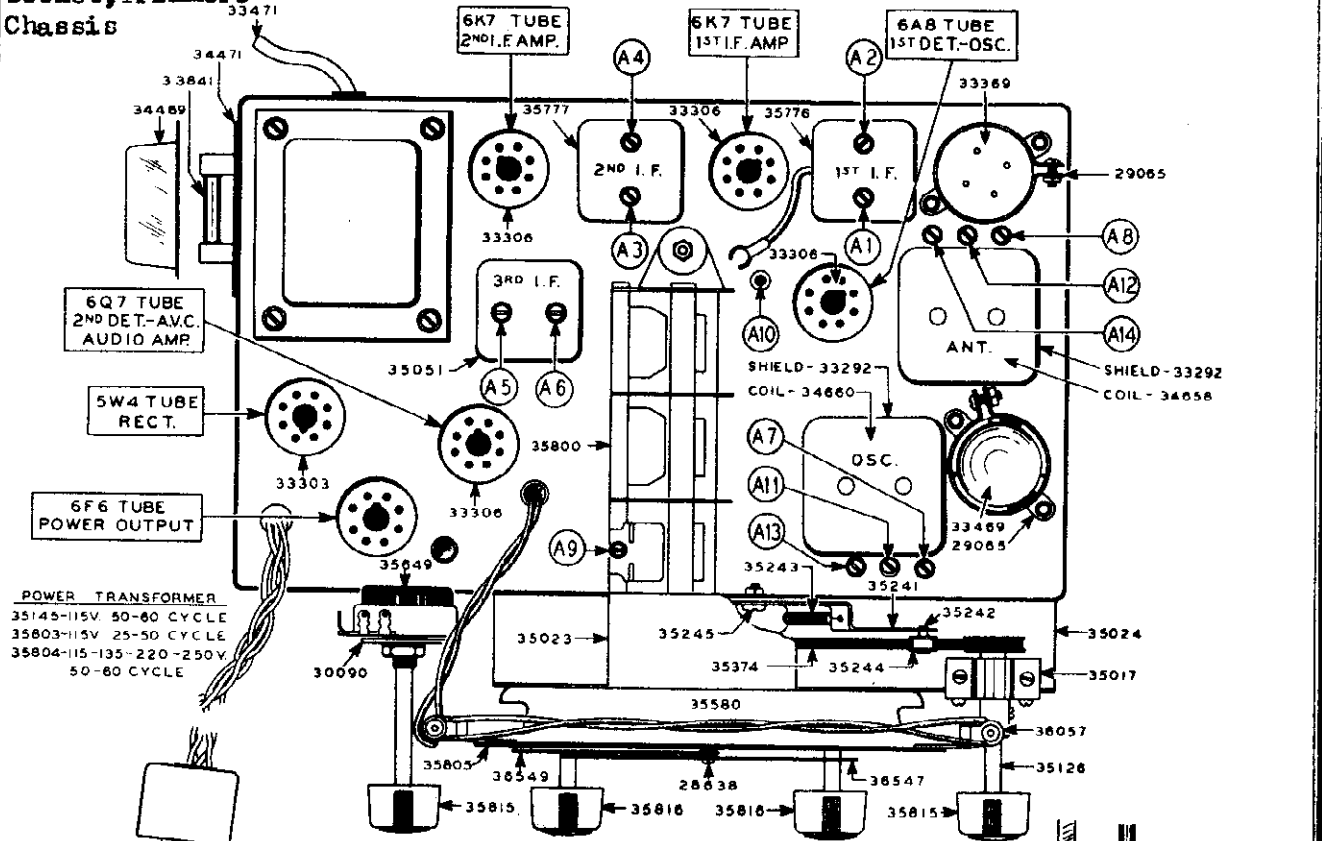


FIG.-3

MODELS 723, 731
733, 735
Socket, Trimmers
Chassis

GENERAL HOUSEHOLD UTILITIES CO.

Chassis 7M



CHASSIS TOP VIEW

FIG.-1

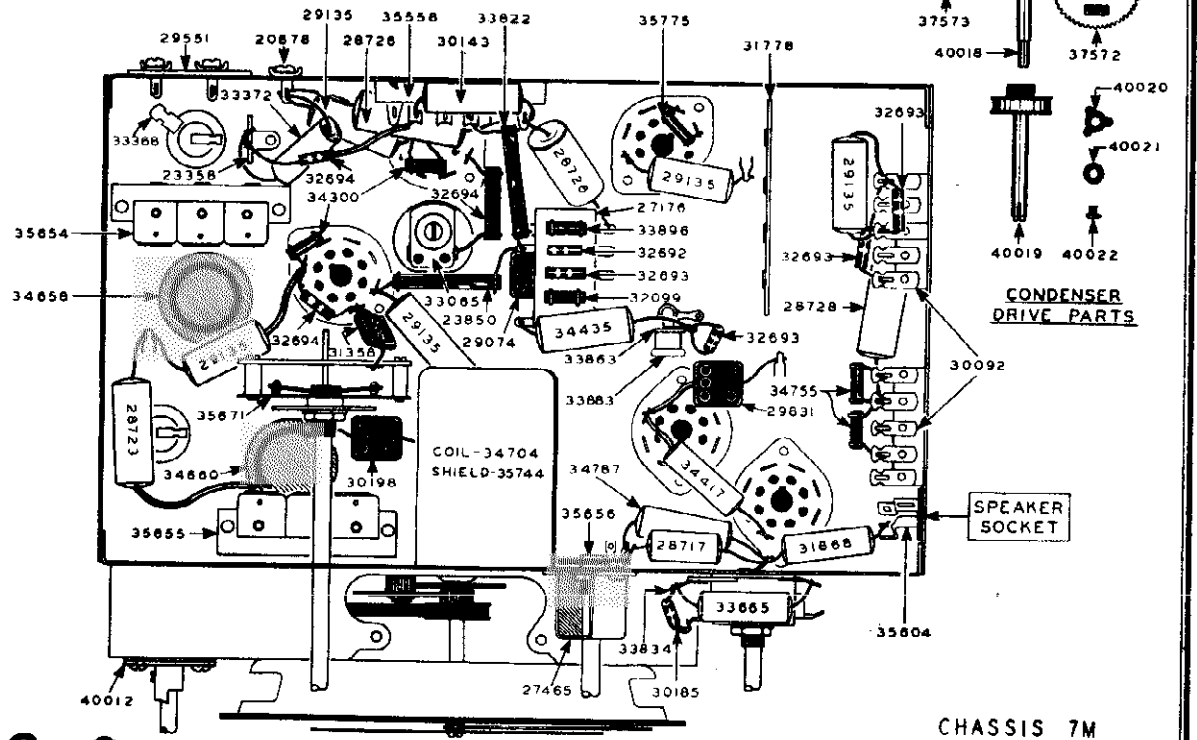


FIG.-2

CHASSIS BOTTOM VIEW

CHASSIS 7M
OCT. 1936
RAS 196



OCTOBER, 1936
SERVICE DATA

Chassis Type 7M
Receiver Model 725, 731, 725, 735
Speaker Type 1210A3-1210A4

The Grunow Chassis 7M is a seven tube, three band heterodyne receiver using 1-6E5 Beacon Eye tuning indicator, 1-6A8 1st Detector and Oscillator, 1-6K7 1st I. F. Amplifier, 1-6K2 2nd I. F. Amplifier, 1-6Q2 2nd Detector, A. V. C. and Audio Amplifier, 1-6F6 Power Output, and 1-5W4 Rectifier. The tuning range is divided into three divisions or bands covering from 550 K.C. to 1750 K.C. on "A," Broadcast Band, 1750 K.C. to 5.5 M.C. on the "B," Police Amateur Band, and 5.5 M.C. to 18.2 M.C. on the "C," Foreign Broadcast Band.

SERVICE DATA

CONTINUITY AND VOLTAGE
Tube sockets on the schematic diagram (Fig. 3) are shown both in their actual position in the chassis and in their correct position in the guide pin. The voltage measurements shown are average and were taken with a line voltage of 115 V., the voltmeter control "full on" and the range switch in position "A" using a 1000 ohm per volt meter.

REPAIRS
When servicing this chassis it is IMPERATIVE that the service man make all parts replacements in EXACTLY the same way as the original part was located and connected. This applies particularly to ground points. All parts replacements in the R. F. circuit must be exact duplicates of the originals, especially so in the case of coils, R. F. by-pass or coupling condensers. Any repairs in the R. F. circuit will make a complete re-alignment of the tuned circuit necessary.

BIAS CELL
This chassis uses a "C" bias cell unit in the control grid of the 6Q2 tube. This type bias cell has an exceedingly long life, but occasionally may have to be replaced. When replacing the cell note that the carbon or (+) side is connected to the ground side of all terminal clips. To check the bias cell a new cell or a 1 1/2 volt battery must be substituted, as the cell voltage cannot be measured with an ordinary voltmeter due to its low current rating.

CIRCUIT ALIGNMENT EQUIPMENT
Do not attempt to align the 6M Chassis without the equipment specified below:
1. Signal Generator—A modulated oscillator capable of delivering signals from 465 K.C. to 18.2 M.C.
2. Alignment Tool—A non-metallic screw driver.
3. Dummy Antenna—.05 Mfd. Condenser (I. F. Alignment); 200 Mmf. Condenser (Broadcast Alignment); 400 Ohm Carbon Resistor (Short Wave Alignment).
4. Output Meter—A meter of sufficient sensitivity to give a good deflection at very low signal input.

Note: The receiver should be aligned in a location free from local interference. A screen room is recommended.

CIRCUIT ALIGNMENT PROCEDURE

- 3. 1500 K.C. ALIGNMENT
(A) Set the generator to 1500 K.C. and connect the output to the antenna post on the chassis through the 200 Mmf. dummy.
(B) Set the receiver dial pointer to 1500 K.C.
(C) Adjust the trimmers (A7) Oscillator, (A8) Detector and (A9) Antenna to maximum output.
6. 600 K.C. ALIGNMENT
(A) Set generator to 600 K.C.
(B) Set receiver dial pointer to 600 K.C.
(C) Turn trimmer (A10) in direction of signal increase and at the same time rock tuning condenser slowly back and forth through resonance until the exact resonant point on both is obtained.

- 7. 5 M.C. ALIGNMENT
(A) Set generator to 5 M.C.
(B) Set receiver range switch to position "B" and dial pointer to 5 M.C.
(C) Adjust trimmer (A11) Oscillator and (A12) Antenna to maximum output.
8. 18 M.C. ALIGNMENT
(A) Set generator to 18 M.C. and connect the output to the chassis Antenna post through the 400 Ohm dummy.
(B) Set the receiver range switch to position "C" and the dial pointer to 18 M.C.
(C) Screw the Oscillator trimmer (A13) down tight and back off until signal is heard, then rock the tuning condenser slowly back and forth through resonance until exact resonant point is determined.
(D) Adjust Antenna trimmer (A14) to maximum output.
(E) Readjust Oscillator trimmer (A13) to maximum output.

- 1. HEATING
(A) Allow the receiver to heat up for a period of 20 to 30 minutes. This is necessary in order to eliminate possible alignment variations due to the thermal expansion and contraction of the capacitors and inductances.
(B) Allow the signal generator to warm up in order to prevent frequency drift during alignment.

- 2. DIAL CALIBRATION
Turn the condenser until the plates are fully meshed, set the pointer (Hour Hand) to 9 and 5 on the outer edge of dial chart. Set the vernier pointer (Minute Hand) to the line pointing to 12.

- 3. SIGNAL GENERATOR ADJUSTMENT
During the entire alignment procedure the signal input from the generator as the various trimmers are brought into resonance. This is necessary in order to hold the signal at the lowest intensity so that the A. V. C. Circuit will remain at the most sensitive point.

- 4. I. F. ALIGNMENT
(A) Set the generator to 465 K.C. and connect the output lead to the control grid of the 6A8 tube through the .05 Mfd. dummy and the generator ground to the chassis ground post.
(B) Set the receiver dial pointer to 600 K.C. and the range switch (C) Connect the output meter across the two primary terminals on the output transformer.
(D) Adjust the I. F. Trimmers A1, A2, A3, A4, A5, and A6 to maximum output.

OCTOBER, 1936
SERVICE DATA

Chassis Type 6M
Receiver Model 631-643

The Grunow Chassis 6M is a six tube, three band heterodyne receiver using 1-6A8 1st Detector and Oscillator, 1-6K7 1st I. F. Amplifier, 1-4K7 2nd I. F. Amplifier, 1-6Q2 2nd Detector, A. V. C. and Audio Amplifier, 1-6F6 Power Output, and 1-5W4 Rectifier. The tuning range is divided into three divisions or bands covering from 550 K.C. to 1750 K.C. on "A," Broadcast Band, 1750 K.C. to 5.5 M.C. on the "B," Police Amateur Band and 5.5 M.C. to 18.2 M.C. on the "C," Foreign Broadcast Band.

SERVICE DATA

CONTINUITY AND VOLTAGE
Tube sockets on the schematic diagram (Fig. 3) are shown both in their actual position in the chassis and in their correct position in the guide pin. The voltage measurements shown are average and were taken with a line voltage of 115 V., the voltmeter control "full on" and the range switch in position "A" using a 1000 ohm per volt meter.

REPAIRS
When servicing this chassis it is IMPERATIVE that the service man make all parts replacements in EXACTLY the same way as the original part was located and connected. This applies particularly to ground points. All parts replacements in the R. F. circuit must be exact duplicates of the originals, especially so in the case of coils, R. F. by-pass or coupling condensers. Any repairs in the R. F. circuit will make a complete re-alignment of the tuned circuit necessary.

BIAS CELL
This chassis uses a "C" bias cell unit in the control grid of the 6Q2 tube. This type bias cell has an exceedingly long life, but occasionally may have to be replaced. When replacing the cell note that the carbon or (+) side is connected to the ground side of all terminal clips. To check the bias cell a new cell or a 1 1/2 volt battery must be substituted, as the cell voltage cannot be measured with an ordinary voltmeter due to its low current rating.

CIRCUIT ALIGNMENT EQUIPMENT
Do not attempt to align the 6M Chassis without the equipment specified below:
1. Signal Generator—A modulated oscillator capable of delivering signals from 465 K.C. to 18.2 M.C.
2. Alignment Tool—A non-metallic screw driver.
3. Dummy Antenna—.05 Mfd. Condenser (I. F. Alignment); 200 Mmf. Condenser (Broadcast Alignment); 400 Ohm Carbon Resistor (Short Wave Alignment).
4. Output Meter—A meter of sufficient sensitivity to give a good deflection at very low signal input.

Note: The receiver should be aligned in a location free from local interference. A screen room is recommended.

CIRCUIT ALIGNMENT PROCEDURE

- 3. 1500 K.C. ALIGNMENT
(A) Set the generator to 1500 K.C. and connect the output to the antenna post on the chassis through the 200 Mmf. dummy.
(B) Set the receiver dial pointer to 1500 K.C.
(C) Adjust the trimmers (A7) Oscillator, (A8) Detector and (A9) Antenna to maximum output.
6. 600 K.C. ALIGNMENT
(A) Set generator to 600 K.C.
(B) Set receiver dial pointer to 600 K.C.
(C) Turn trimmer (A10) in direction of signal increase and at the same time rock tuning condenser slowly back and forth through resonance until the exact resonant point on both is obtained.

- 7. 5 M.C. ALIGNMENT
(A) Set generator to 5 M.C.
(B) Set receiver range switch to position "B" and dial pointer to 5 M.C.
(C) Adjust trimmer (A11) Oscillator and (A12) Antenna to maximum output.
8. 18 M.C. ALIGNMENT
(A) Set generator to 18 M.C. and connect the output to the chassis Antenna post through the 400 Ohm dummy.
(B) Set the receiver range switch to position "C" and the dial pointer to 18 M.C.
(C) Screw the Oscillator trimmer (A13) down tight and back off until signal is heard, then rock the tuning condenser slowly back and forth through resonance until exact resonant point is determined.
(D) Adjust Antenna trimmer (A14) to maximum output.
(E) Readjust Oscillator trimmer (A13) to maximum output.

- 1. HEATING
(A) Allow the receiver to heat up for a period of 20 to 30 minutes. This is necessary in order to eliminate possible alignment variations due to the thermal expansion and contraction of the capacitors and inductances.
(B) Allow the signal generator to warm up in order to prevent frequency drift during alignment.

- 2. DIAL CALIBRATION
Turn the condenser until the plates are fully meshed, set the pointer (Hour Hand) to 9 and 5 on the outer edge of dial chart. Set the vernier pointer (Minute Hand) to the line pointing to 12.

- 3. SIGNAL GENERATOR ADJUSTMENT
During the entire alignment procedure the signal input from the generator as the various trimmers are brought into resonance. This is necessary in order to hold the signal at the lowest intensity so that the A. V. C. Circuit will remain at the most sensitive point.

- 4. I. F. ALIGNMENT
(A) Set the generator to 465 K.C. and connect the output lead to the control grid of the 6A8 tube through the .05 Mfd. dummy and the generator ground to the chassis ground post.
(B) Set the receiver dial pointer to 600 K.C. and the range switch (C) Connect the output meter across the two primary terminals on the output transformer.
(D) Adjust the I. F. Trimmers A1, A2, A3, A4, A5, and A6 to maximum output.

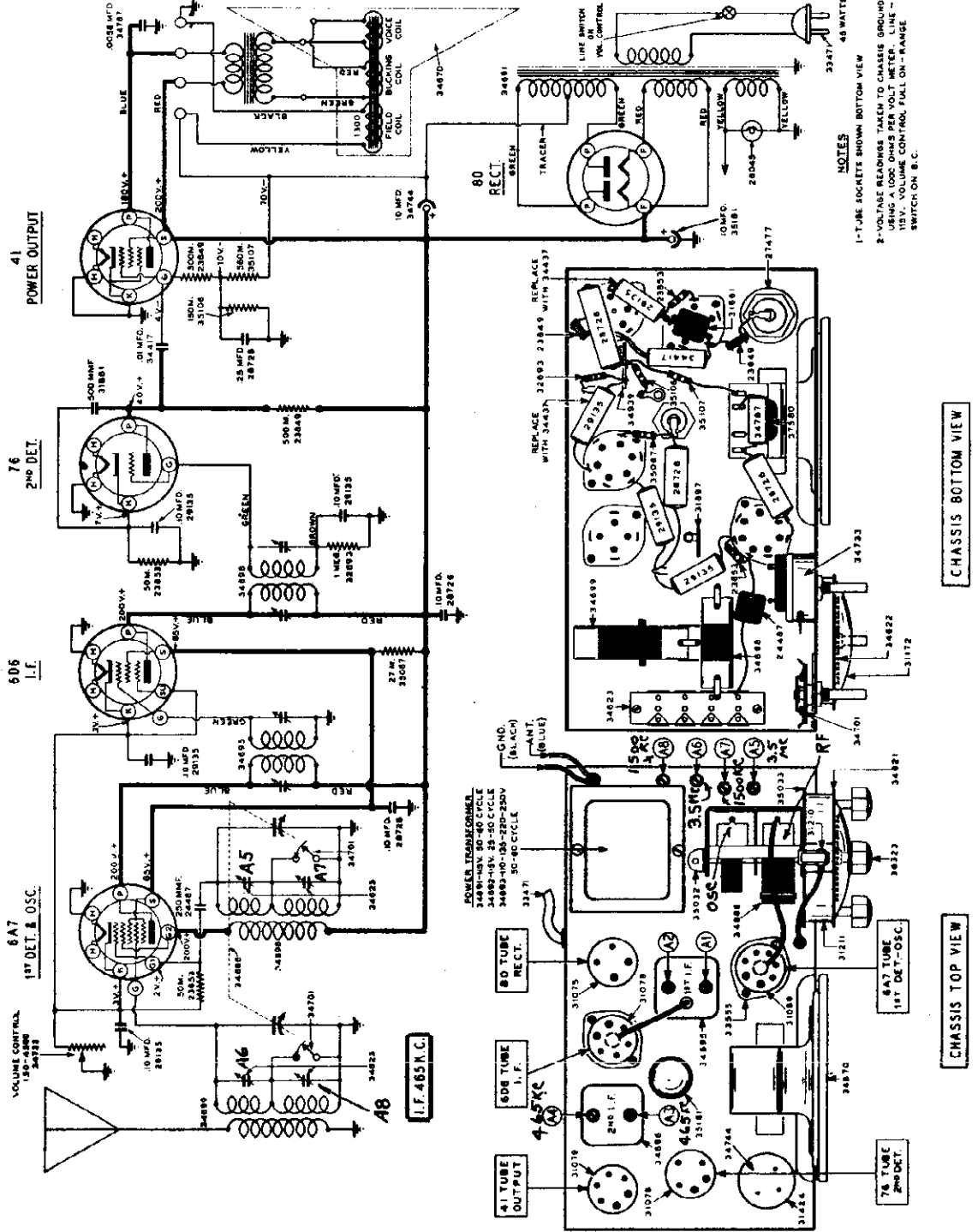
MODEL 532
Chassis 5H
Schematic, Voltage
Parts, Chassis
Socket, Trimmers
Alignment

GENERAL HOUSEHOLD UTILITIES CO.

PART NO.	DESCRIPTION	QTY.	PRICE
21845	RES. 1/2W. 100 OHMS	1	10
21846	RES. 1/2W. 200 OHMS	1	10
21847	RES. 1/2W. 500 OHMS	1	10
21848	RES. 1/2W. 1K OHMS	1	10
21849	RES. 1/2W. 2K OHMS	1	10
21850	RES. 1/2W. 5K OHMS	1	10
21851	RES. 1/2W. 10K OHMS	1	10
21852	RES. 1/2W. 20K OHMS	1	10
21853	RES. 1/2W. 50K OHMS	1	10
21854	RES. 1/2W. 100K OHMS	1	10
21855	RES. 1/2W. 200K OHMS	1	10
21856	RES. 1/2W. 500K OHMS	1	10
21857	RES. 1/2W. 1M OHMS	1	10
21858	RES. 1/2W. 2M OHMS	1	10
21859	RES. 1/2W. 5M OHMS	1	10
21860	RES. 1/2W. 10M OHMS	1	10
21861	RES. 1/2W. 20M OHMS	1	10
21862	RES. 1/2W. 50M OHMS	1	10
21863	RES. 1/2W. 100M OHMS	1	10
21864	RES. 1/2W. 200M OHMS	1	10
21865	RES. 1/2W. 500M OHMS	1	10
21866	RES. 1/2W. 1M OHMS	1	10
21867	RES. 1/2W. 2M OHMS	1	10
21868	RES. 1/2W. 5M OHMS	1	10
21869	RES. 1/2W. 10M OHMS	1	10
21870	RES. 1/2W. 20M OHMS	1	10
21871	RES. 1/2W. 50M OHMS	1	10
21872	RES. 1/2W. 100M OHMS	1	10
21873	RES. 1/2W. 200M OHMS	1	10
21874	RES. 1/2W. 500M OHMS	1	10
21875	RES. 1/2W. 1M OHMS	1	10
21876	RES. 1/2W. 2M OHMS	1	10
21877	RES. 1/2W. 5M OHMS	1	10
21878	RES. 1/2W. 10M OHMS	1	10
21879	RES. 1/2W. 20M OHMS	1	10
21880	RES. 1/2W. 50M OHMS	1	10
21881	RES. 1/2W. 100M OHMS	1	10
21882	RES. 1/2W. 200M OHMS	1	10
21883	RES. 1/2W. 500M OHMS	1	10
21884	RES. 1/2W. 1M OHMS	1	10
21885	RES. 1/2W. 2M OHMS	1	10
21886	RES. 1/2W. 5M OHMS	1	10
21887	RES. 1/2W. 10M OHMS	1	10
21888	RES. 1/2W. 20M OHMS	1	10
21889	RES. 1/2W. 50M OHMS	1	10
21890	RES. 1/2W. 100M OHMS	1	10
21891	RES. 1/2W. 200M OHMS	1	10
21892	RES. 1/2W. 500M OHMS	1	10
21893	RES. 1/2W. 1M OHMS	1	10
21894	RES. 1/2W. 2M OHMS	1	10
21895	RES. 1/2W. 5M OHMS	1	10
21896	RES. 1/2W. 10M OHMS	1	10
21897	RES. 1/2W. 20M OHMS	1	10
21898	RES. 1/2W. 50M OHMS	1	10
21899	RES. 1/2W. 100M OHMS	1	10
21900	RES. 1/2W. 200M OHMS	1	10
21901	RES. 1/2W. 500M OHMS	1	10
21902	RES. 1/2W. 1M OHMS	1	10
21903	RES. 1/2W. 2M OHMS	1	10
21904	RES. 1/2W. 5M OHMS	1	10
21905	RES. 1/2W. 10M OHMS	1	10
21906	RES. 1/2W. 20M OHMS	1	10
21907	RES. 1/2W. 50M OHMS	1	10
21908	RES. 1/2W. 100M OHMS	1	10
21909	RES. 1/2W. 200M OHMS	1	10
21910	RES. 1/2W. 500M OHMS	1	10
21911	RES. 1/2W. 1M OHMS	1	10
21912	RES. 1/2W. 2M OHMS	1	10
21913	RES. 1/2W. 5M OHMS	1	10
21914	RES. 1/2W. 10M OHMS	1	10
21915	RES. 1/2W. 20M OHMS	1	10
21916	RES. 1/2W. 50M OHMS	1	10
21917	RES. 1/2W. 100M OHMS	1	10
21918	RES. 1/2W. 200M OHMS	1	10
21919	RES. 1/2W. 500M OHMS	1	10
21920	RES. 1/2W. 1M OHMS	1	10
21921	RES. 1/2W. 2M OHMS	1	10
21922	RES. 1/2W. 5M OHMS	1	10
21923	RES. 1/2W. 10M OHMS	1	10
21924	RES. 1/2W. 20M OHMS	1	10
21925	RES. 1/2W. 50M OHMS	1	10
21926	RES. 1/2W. 100M OHMS	1	10
21927	RES. 1/2W. 200M OHMS	1	10
21928	RES. 1/2W. 500M OHMS	1	10
21929	RES. 1/2W. 1M OHMS	1	10
21930	RES. 1/2W. 2M OHMS	1	10
21931	RES. 1/2W. 5M OHMS	1	10
21932	RES. 1/2W. 10M OHMS	1	10
21933	RES. 1/2W. 20M OHMS	1	10
21934	RES. 1/2W. 50M OHMS	1	10
21935	RES. 1/2W. 100M OHMS	1	10
21936	RES. 1/2W. 200M OHMS	1	10
21937	RES. 1/2W. 500M OHMS	1	10
21938	RES. 1/2W. 1M OHMS	1	10
21939	RES. 1/2W. 2M OHMS	1	10
21940	RES. 1/2W. 5M OHMS	1	10
21941	RES. 1/2W. 10M OHMS	1	10
21942	RES. 1/2W. 20M OHMS	1	10
21943	RES. 1/2W. 50M OHMS	1	10
21944	RES. 1/2W. 100M OHMS	1	10
21945	RES. 1/2W. 200M OHMS	1	10
21946	RES. 1/2W. 500M OHMS	1	10
21947	RES. 1/2W. 1M OHMS	1	10
21948	RES. 1/2W. 2M OHMS	1	10
21949	RES. 1/2W. 5M OHMS	1	10
21950	RES. 1/2W. 10M OHMS	1	10
21951	RES. 1/2W. 20M OHMS	1	10
21952	RES. 1/2W. 50M OHMS	1	10
21953	RES. 1/2W. 100M OHMS	1	10
21954	RES. 1/2W. 200M OHMS	1	10
21955	RES. 1/2W. 500M OHMS	1	10
21956	RES. 1/2W. 1M OHMS	1	10
21957	RES. 1/2W. 2M OHMS	1	10
21958	RES. 1/2W. 5M OHMS	1	10
21959	RES. 1/2W. 10M OHMS	1	10
21960	RES. 1/2W. 20M OHMS	1	10
21961	RES. 1/2W. 50M OHMS	1	10
21962	RES. 1/2W. 100M OHMS	1	10
21963	RES. 1/2W. 200M OHMS	1	10
21964	RES. 1/2W. 500M OHMS	1	10
21965	RES. 1/2W. 1M OHMS	1	10
21966	RES. 1/2W. 2M OHMS	1	10
21967	RES. 1/2W. 5M OHMS	1	10
21968	RES. 1/2W. 10M OHMS	1	10
21969	RES. 1/2W. 20M OHMS	1	10
21970	RES. 1/2W. 50M OHMS	1	10
21971	RES. 1/2W. 100M OHMS	1	10
21972	RES. 1/2W. 200M OHMS	1	10
21973	RES. 1/2W. 500M OHMS	1	10
21974	RES. 1/2W. 1M OHMS	1	10
21975	RES. 1/2W. 2M OHMS	1	10
21976	RES. 1/2W. 5M OHMS	1	10
21977	RES. 1/2W. 10M OHMS	1	10
21978	RES. 1/2W. 20M OHMS	1	10
21979	RES. 1/2W. 50M OHMS	1	10
21980	RES. 1/2W. 100M OHMS	1	10
21981	RES. 1/2W. 200M OHMS	1	10
21982	RES. 1/2W. 500M OHMS	1	10
21983	RES. 1/2W. 1M OHMS	1	10
21984	RES. 1/2W. 2M OHMS	1	10
21985	RES. 1/2W. 5M OHMS	1	10
21986	RES. 1/2W. 10M OHMS	1	10
21987	RES. 1/2W. 20M OHMS	1	10
21988	RES. 1/2W. 50M OHMS	1	10
21989	RES. 1/2W. 100M OHMS	1	10
21990	RES. 1/2W. 200M OHMS	1	10
21991	RES. 1/2W. 500M OHMS	1	10
21992	RES. 1/2W. 1M OHMS	1	10
21993	RES. 1/2W. 2M OHMS	1	10
21994	RES. 1/2W. 5M OHMS	1	10
21995	RES. 1/2W. 10M OHMS	1	10
21996	RES. 1/2W. 20M OHMS	1	10
21997	RES. 1/2W. 50M OHMS	1	10
21998	RES. 1/2W. 100M OHMS	1	10
21999	RES. 1/2W. 200M OHMS	1	10
22000	RES. 1/2W. 500M OHMS	1	10

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Grunow Radio
CHASSIS TYPE 5H
RECEIVER MODEL 532
SPEAKER 34870
GENERAL HOUSEHOLD UTILITIES CO.
CHICAGO, ILL. U.S.A.
R45137



NOTES:
1-TUBE SOCKETS SHOWN BOTTOM VIEW
2-VOLTAGE READINGS TAKEN TO CHASSIS GROUND.
USING A 1000 OHMS PER VOLT METER. LINE
115V. VOLUME CONTROL FULL ON-RANGE
SWITCH ON B. C.

CONVENTIONAL ALIGNMENT-SEE SPECIAL SECTION
FREQUENCY RANGE:
540 to 1560 KC - Trim at 1500 KC, No Pad.(A7,A8)
1500 KC to 4.4 MC - Trim at 3.5 MC, No Pad.(A5,A6)

GENERAL HOUSEHOLD UTILITIES CO.

MODEL 711
Chassis 7NB
Schematic, Part
Voltage

5V BATTERY
Grunow Radio
CHASSIS TYPE 7NB
RECEIVER MODEL 711
GENERAL HOUSEHOLD UTILITIES CO.
RADIO SERVICE DEPARTMENT
CHICAGO, U.S.A. RAS17D

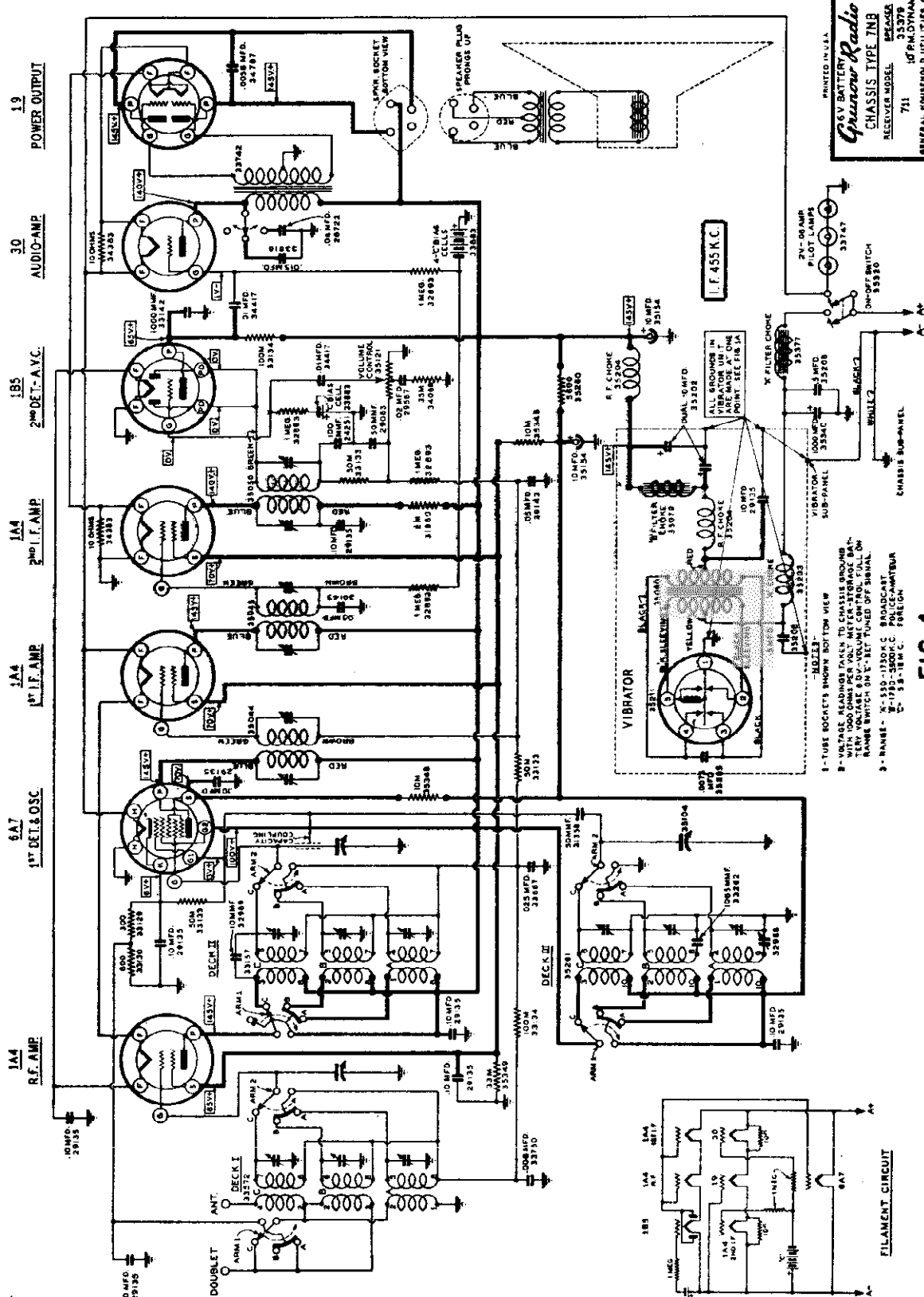
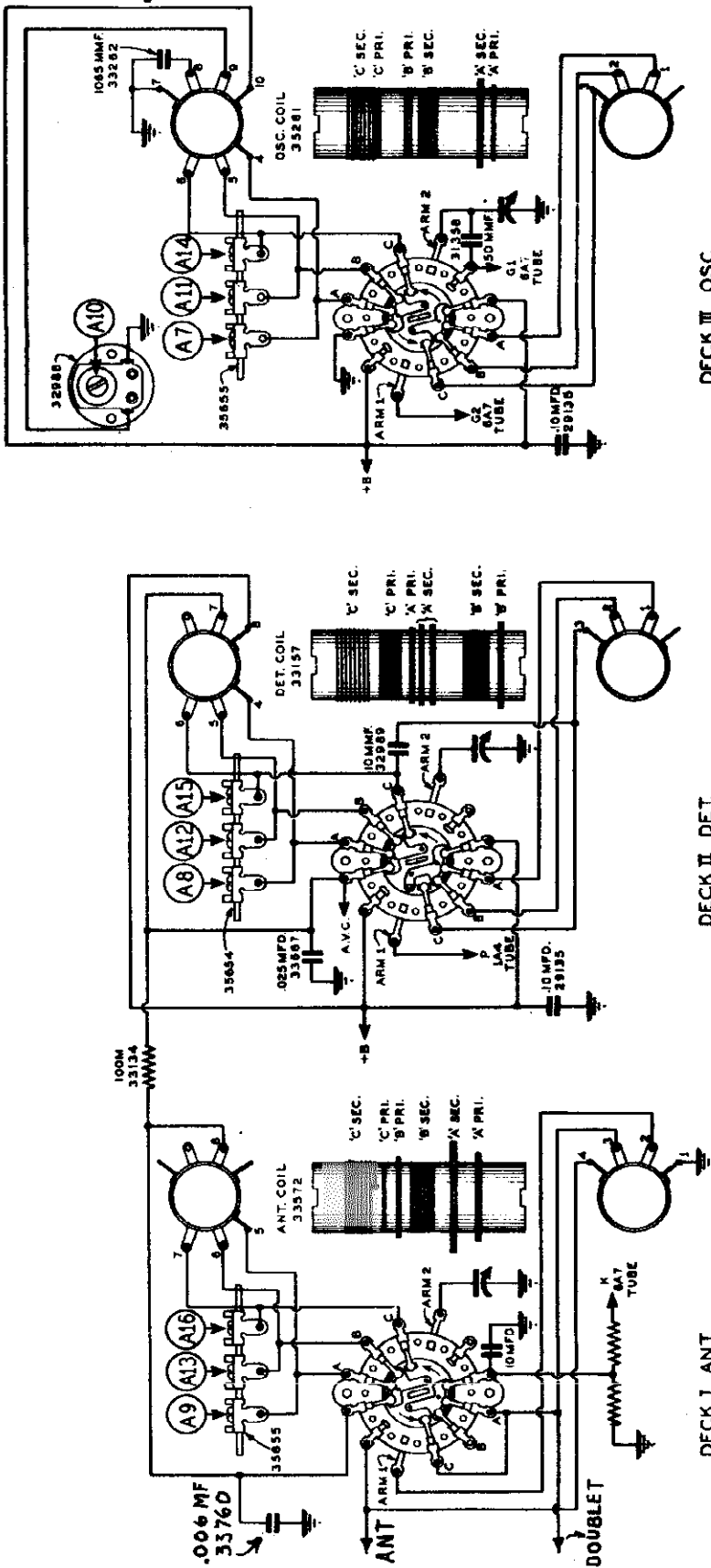


FIG. 4

MODEL 711
 Chassis 7NB
 Switch and Coil
 Assembly

GENERAL HOUSEHOLD UTILITIES CO.



DECK III OSC.

DECK II DET.

DECK I ANT.

SCHEMATIC DIAGRAM RANGE SWITCH & COIL ASSEMBLY

7NB

FIG. 3

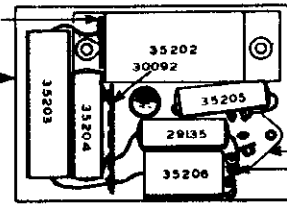
RAS 190

THE NUMBERS ON THE COIL LUGS CORRESPOND TO THOSE ON SCHEMATIC DIAGRAM, FIG. 4.

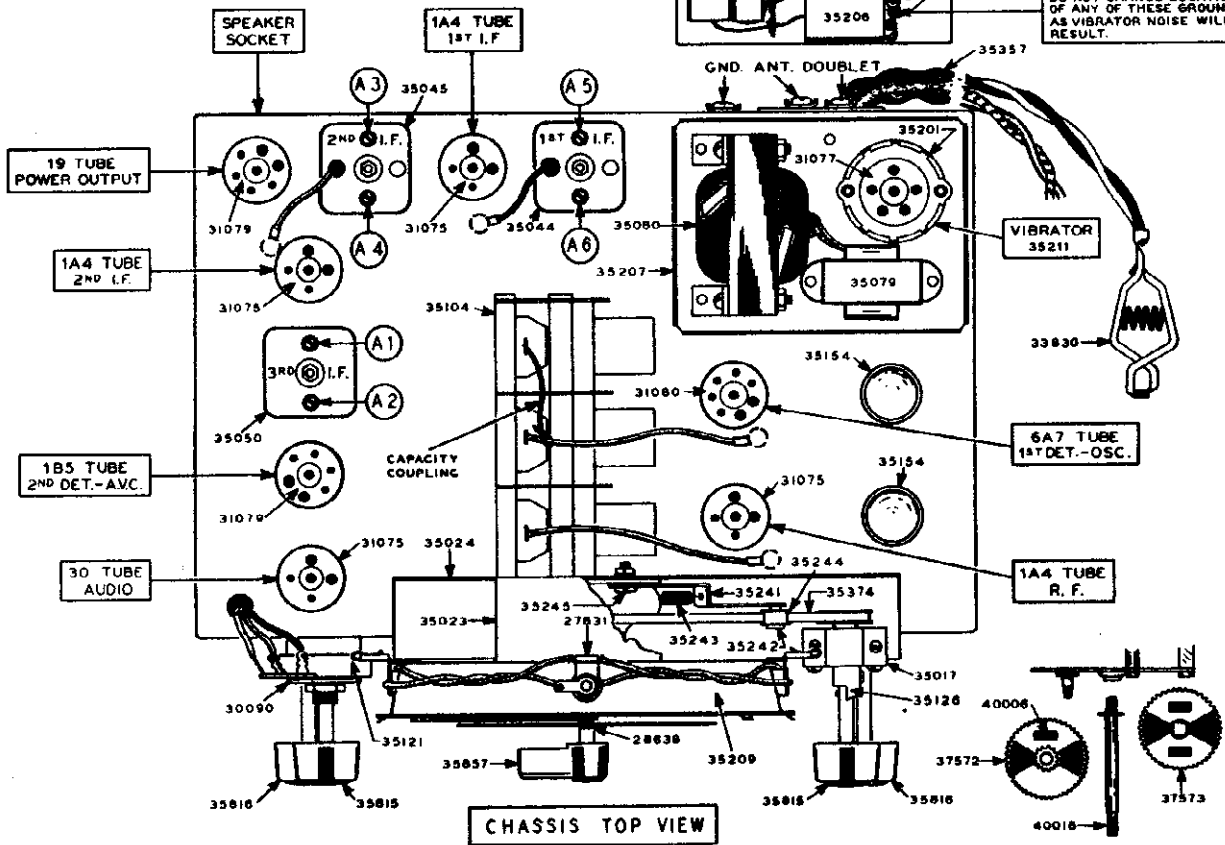
DT. SEPT. 9, 1936.

MODEL 711
GENERAL HOUSEHOLD UTILITIES CO. Chassis 7NB
Socket, Trimmers
Chassis, Vibrator

VIBRATOR UNIT ASSEM.
BOTTOM VIEW
FIG. 1A

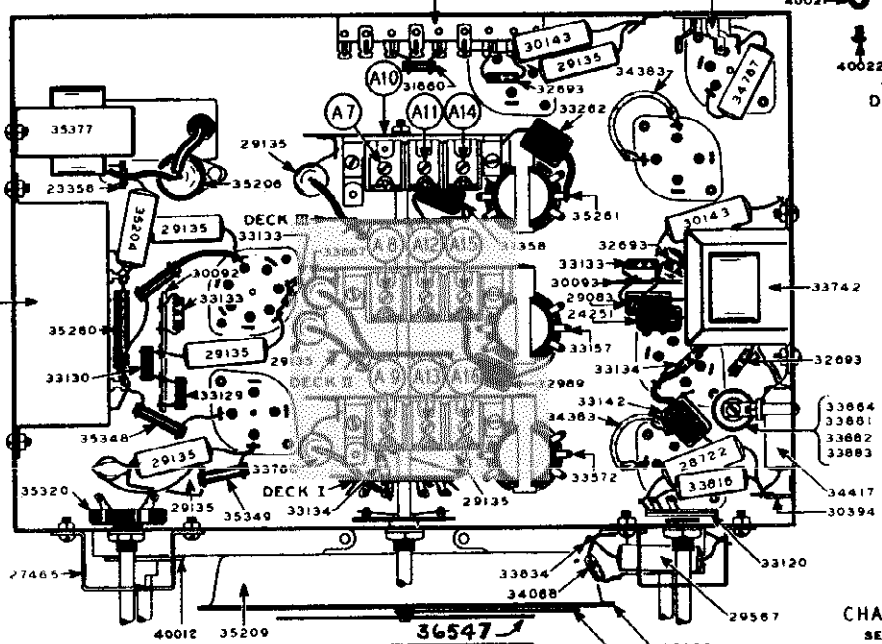


DO NOT CHANGE LOCATION
OF ANY OF THESE GROUNDS
AS VIBRATOR NOISE WILL
RESULT.



CHASSIS TOP VIEW

FIG. 1



CHASSIS BOTTOM VIEW

FIG. 2

CHASSIS 7NB
SEPT. 1936
RAS 189

MODEL 711

Chassis 7NB
Alignment

GENERAL HOUSEHOLD UTILITIES CO.

POWER SUPPLY UNIT

The Power or "B" voltage in this receiver is the popular six volt vibrator type which eliminates the use of "B" batteries and the vibrator is the "plug in" type ordinarily used in automobile receivers. The electrical layout and vibrator socket connections are shown schematically in Fig. 4. UNDER NO CONDITIONS SHALL THE COMMON GROUND POINT BE CHANGED IN THIS UNIT.

BIAS CELLS

The 7 NB Chassis uses "C" bias cell units in both the Detector A.V.C. and Audio Amplification Circuits, one in the Grid of the 1B5 tube and four in the Grid of the 30 tubes.

These cells may have to be replaced occasionally, and when doing so, note that the carbon or (+) side is connected to the ground side of the cell terminal clip.

An indication of a faulty cell will be distorted tone quality. This may be checked by the substitution of new cells in place of the old, or for testing purposes a "C" battery may be used—using a 1½ volt tap for a single cell or 4½ volts for the 4 unit cell.

This bias cell has a voltage of 1½ volts, but due to its low current output it cannot be measured by any ordinary volt meter.

REPAIRS

When servicing this chassis it is IMPERATIVE that the service man make all parts replacements in EXACTLY the same way as the original part was connected and located. This applies particularly to all ground points.

All parts replacements in the R.F. end of the circuit must be exact duplicates of the originals, especially so in the case of R.F. By-pass, or Coupling Condensers.

Any repairs in the R.F. circuit will make a complete realignment of the entire tuned circuit necessary.

ALIGNMENT PROCEDURE

Do not attempt to align the 7 NB Chassis without the proper equipment as the calibration, selectivity and sensitivity absolutely depend upon the conformance to the following instructions.

Alignment trimmer screws are plainly shown in the accompanying illustrations and are numbered in the order of procedure.

1. EQUIPMENT:

- (A) Test Oscillator.
- A modulated oscillator capable of producing signals at the I.F., Broadcast and Short-Wave frequencies.
- (B) Insulated Screw Driver—(All labels or fibre) about 6" long.
- (C) Output Meter.

A meter of sufficient sensitivity to provide a good deflection at low signal strength.

- (D) Dummy Antenna.
- .05 mfd. condenser (I.F. Alignment).
- 200 mfd. condenser (Broadcast Alignment).
- 400 Ohm carbon resistor (18 M.C. Alignment).
- (E) The receiver should be aligned in a location as free from local interference as possible, as static disturbances will cause difficulties in signing the Short-Wave section. A screen room is recommended in order to obtain the best results.

2. CALIBRATION OF THE DIAL:

Turn tuning knob until condensers are fully meshed. The dial pointer (Hour Hand) at this position must be set on the horizontal line of the dial, pointing to 9 and 3 o'clock.

The Band Spreading Pointer (Minute Hand) must be set to the vertical position, pointing to 12 o'clock.

3. Connect the chassis to a fully charged storage battery and allow the set to heat up for 30 to 30 minutes. This heating period is necessary in order to allow all coils and condensers to reach their normal temperatures so that when the alignment is complete, there will be no inductance or capacity changes due to thermal expansion or contraction.

Note: The above also applies to the oscillator.

4. I.F. ALIGNMENT:

(A) Connect signal lead of the oscillator to the control grid of the 6A7 First Detector Tube through a .05 mfd. condenser. Connect the oscillator ground to the chassis ground post.

(B) Set the dial pointer to 1400 K.C. and the range switch at position "A" (Standard Broadcast). Turn the volume control to maximum and tune control to high.

(C) Set the oscillator to 455 K.C. and adjust the signal to as low a value as can be read efficiently on the output meter.

(D) Adjust the I.F. Trimmers in sequence of numbering (1-2-3-4-5-6) until the maximum signal with the lowest input is obtained.

The signal input must be kept as low as possible in order to prevent any A.V.C. action in the receiver.

5. 1400 K.C. ALIGNMENT:

- (A) Set Oscillator to 1400 K.C.
- (B) Turn dial pointer to 1400 K.C. and range switch to position "A" (Broadcast Band).
- (C) Adjust Broadcast Oscillator Trimmer, (A7) Fig. 2, to maximum output.
- (D) Adjust Detector Trimmer, (A8) Fig. 2, to maximum output.

(E) Adjust Antenna Trimmer, (A9) Fig. 2, to maximum output.

6. 600 K.C. ALIGNMENT:

- (A) Set oscillator to 600 K.C.
- (B) Set chassis dial pointer to 600 K.C.
- (C) Adjust the 600 K.C. padding condenser, (A10) Fig. 2, in the direction of signal increase, at the same time rock the tuning condenser back and forth slowly so as to determine the exact point of greatest output.

7. Recheck the 1400 K.C. alignment (Operation 5.) This is necessary because the change in the capacity of the 600 K.C. padder may have slightly unbalanced the 1400 K.C. alignment.

8. 5000 K.C. ALIGNMENT:

- (A) Set oscillator to 5000 K.C.
- (B) Set the Range Switch to position "B" (Police Amateur Band).
- (C) Set the dial pointer to 5000 K.C.
- (D) Adjust the Oscillator Trimmer, (A11) Fig. 2, to maximum output.
- (E) Adjust the Detector Trimmer, (A12) Fig. 2, to maximum output.
- (F) Adjust Antenna Trimmer, (A13) Fig. 2, to maximum output.

9. 18 MEGACYCLE ALIGNMENT:

- (A) Set oscillator to 18 M.C. and connect the output lead to the chassis Antenna post through a 400 ohm resistor.
- (B) Set Range Switch on position "B" (Foreign Reception band).
- (C) Set the dial pointer to 18 M.C.
- (D) Adjust the Oscillator Trimmer, (A14) Fig. 2, to maximum output.
- (E) Adjust the Detector Trimmer, (A15) Fig. 2, to maximum output.
- (F) Adjust the Antenna Trimmer, (A16) Fig. 2, to maximum output.

Note: When adjusting the 18 M.C. Oscillator Trimmer, screw down tightly and then back off until signal is heard.

To obtain the utmost sensitivity on the 18 M.C. Band, it is necessary, when adjusting the Detector Trimmer (A15), to rock the tuning condenser slowly through resonance until the point of maximum output is determined. Return to the Oscillator Trimmer and make any necessary re-adjustment.

SERVICE NOTES

The GRUNOW 7 NB Chassis is a seven tube super-heterodyne receiver, with a vibrator type power supply designed to operate from a 6 volt battery. The major features are three Tuning Ranges, covering Standard Broadcast, Police, Amateur, and Foreign Broadcast bands, A.V.C., a Full Face "Band Spread" Dial and the new Permo-Flux Speaker.

SERVICE DATA

The three tuning ranges of the receiver cover, First, the Standard Broadcast Band (A) from 550 K.C. to 1750 K.C.; Second, the Police Amateur Band (B) from 1750 K.C. to 5500 K.C.; and Third, the Foreign Reception Band (C) from 5.5 M.C. to 18 M.C.

CONTINUITY AND VOLTAGE

Continuity and voltage measurements should be taken from the underside of the chassis. The values shown on the schematic diagram are based on an average and allow the service man to make a quick check of the chassis constants. All tube connections and sockets are shown on the schematic diagram as viewed from the bottom.

RANGE SWITCH

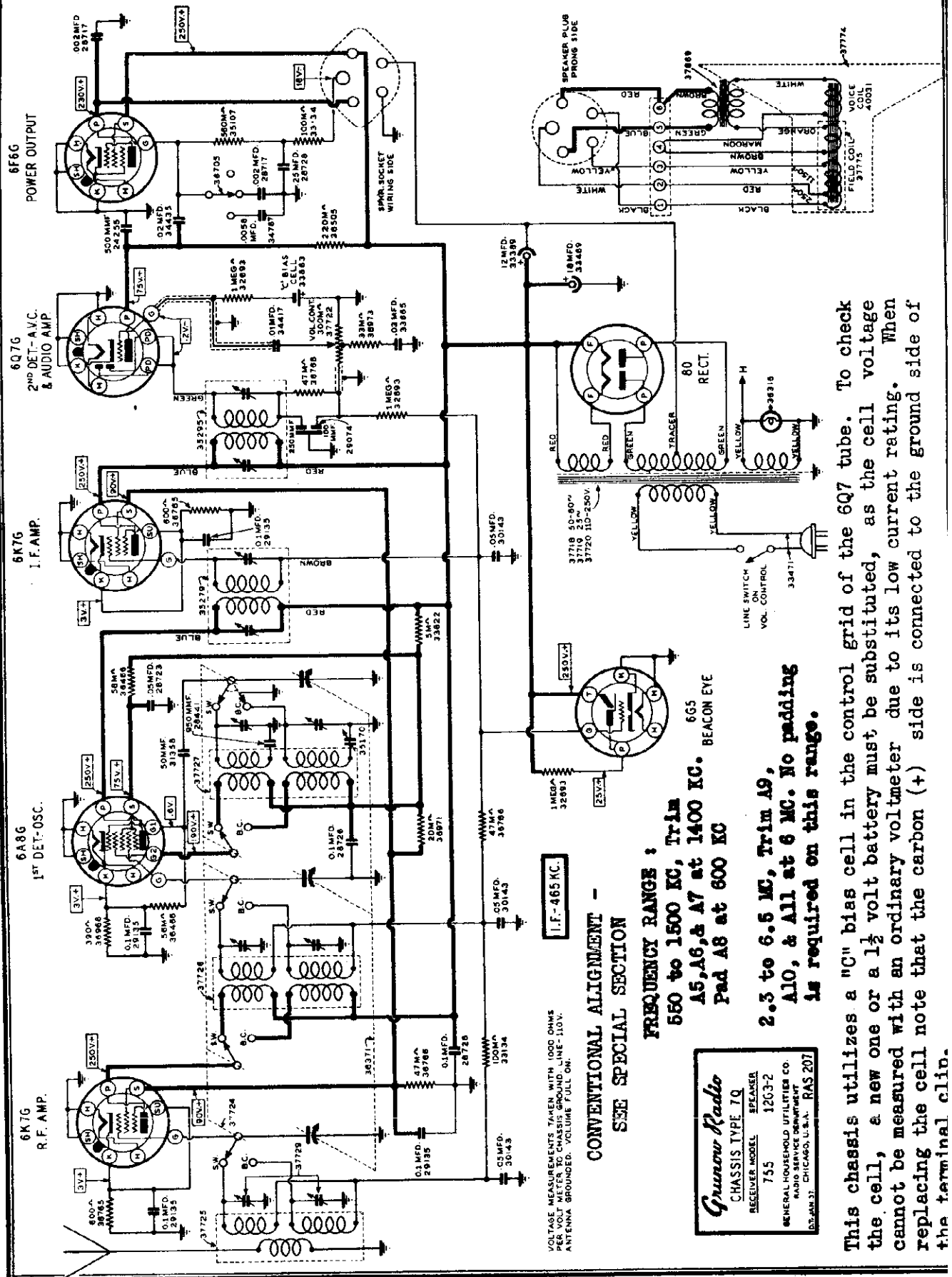
The Range Switch is a three deck multipole low contact resistance switch, used to connect the various coils into their proper circuits, and is designed to entirely isolate the coils, which are not in use, by grounding them. This method makes it possible for the receiver to operate on each of the three tuning ranges at a maximum sensitivity and selectivity.

The Range Switch and Coil Assembly is shown schematically (Fig. 3) with each section and the proper connections to the coil drawn separately so as to enable the service man to check or make necessary repairs with ease. All connection number designations are duplicated on the chassis schematic (Fig. 4).

Schematic, Voltage
Parts, Alignment

GENERAL HOUSEHOLD UTILITIES CO.

MODEL 755
Chassis 7Q



CONVENTIONAL ALIGNMENT -
SEE SPECIAL SECTION

FREQUENCY RANGE :
550 to 1500 KC, Trim
A5, A6, & A7 at 1400 KC.
Pad A8 at 600 KC

2.3 to 6.5 MC, Trim A9,
A10, & All at 6 MC. No padding
is required on this range.

Grunow Radio
RECEIVER MODEL 755
CHASSIS TYPE 7Q 1203-2
GENERAL HOUSEHOLD UTILITIES CO.
RADIO SERVICE DEPARTMENT
CHICAGO, U.S.A. RAS 207

This chassis utilizes a "C" bias cell in the control grid of the 6Q7 tube. To check the cell, a new one or a 1½ volt battery must be substituted, as the cell voltage cannot be measured with an ordinary voltmeter due to its low current rating. When replacing the cell note that the carbon (+) side is connected to the ground side of the terminal clip.

MODEL 755

Chassis 7Q

Socket, Trimmers

Chassis

GENERAL HOUSEHOLD UTILITIES CO.

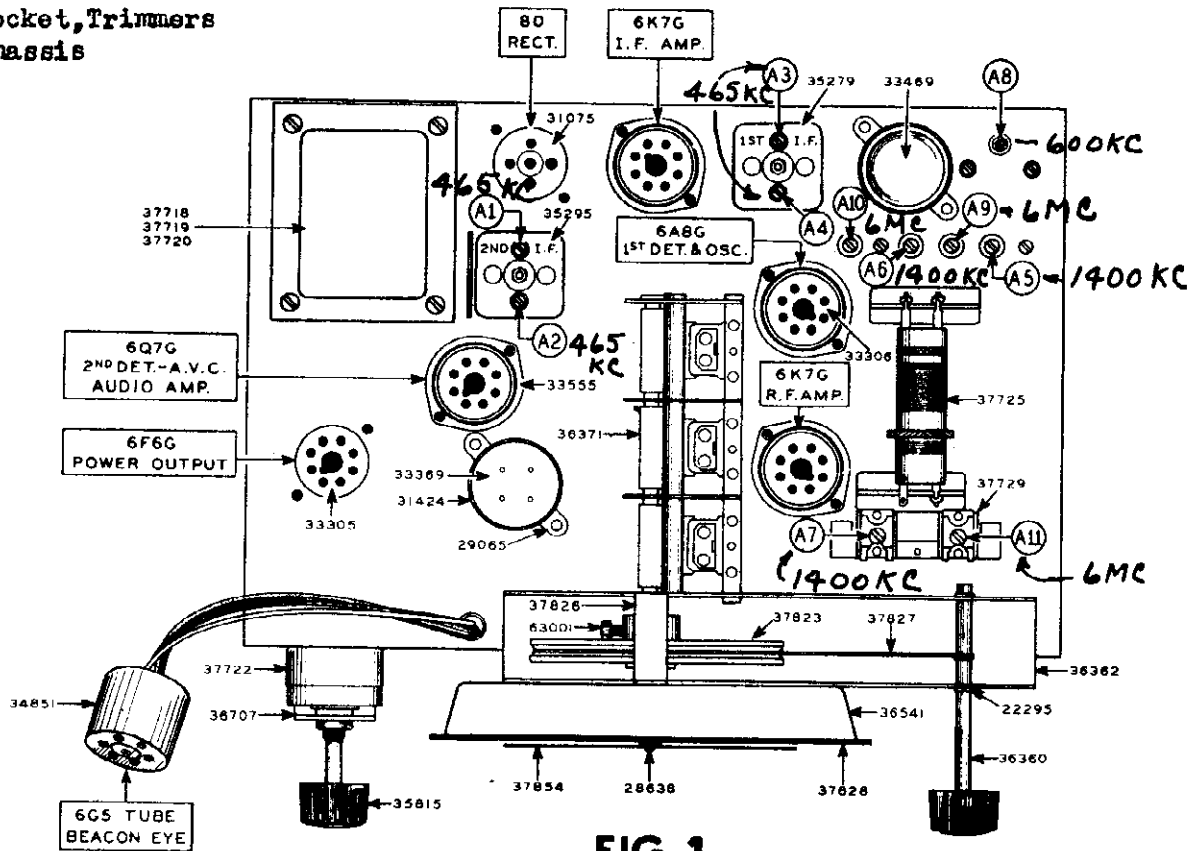


FIG. 1

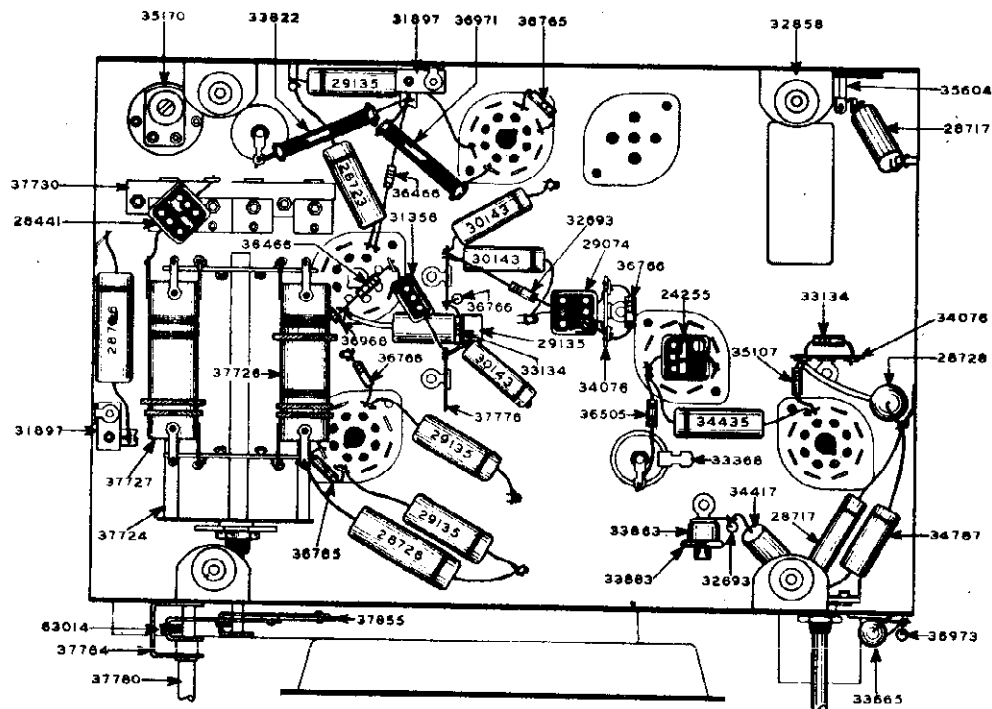


FIG. 2

CHASSIS TYPE 7Q

Schematic, Voltage, Parts

GENERAL HOUSEHOLD UTILITIES CO.

MODELS 823, 831, 833, 835

Chassis 8H

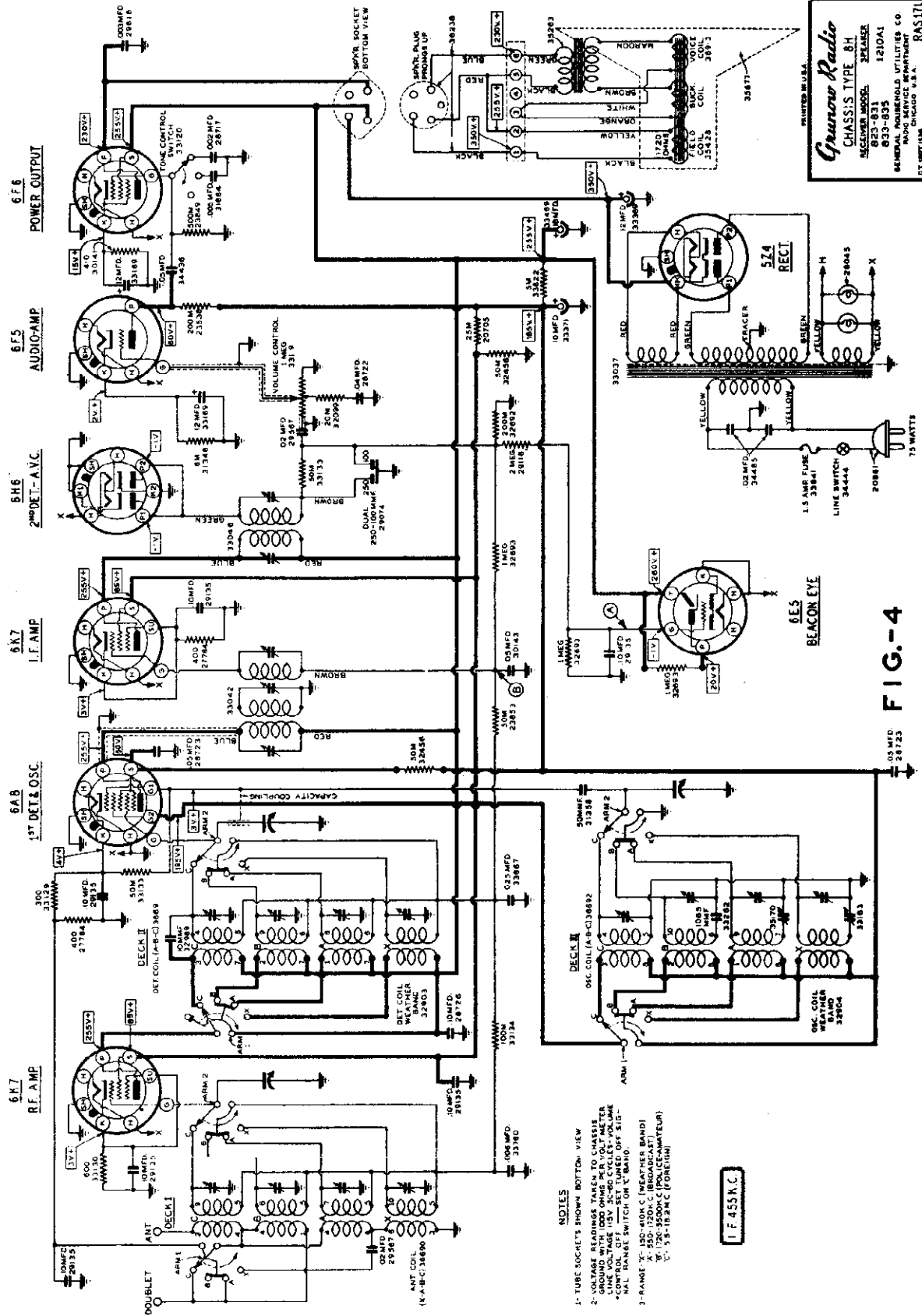


FIG-4

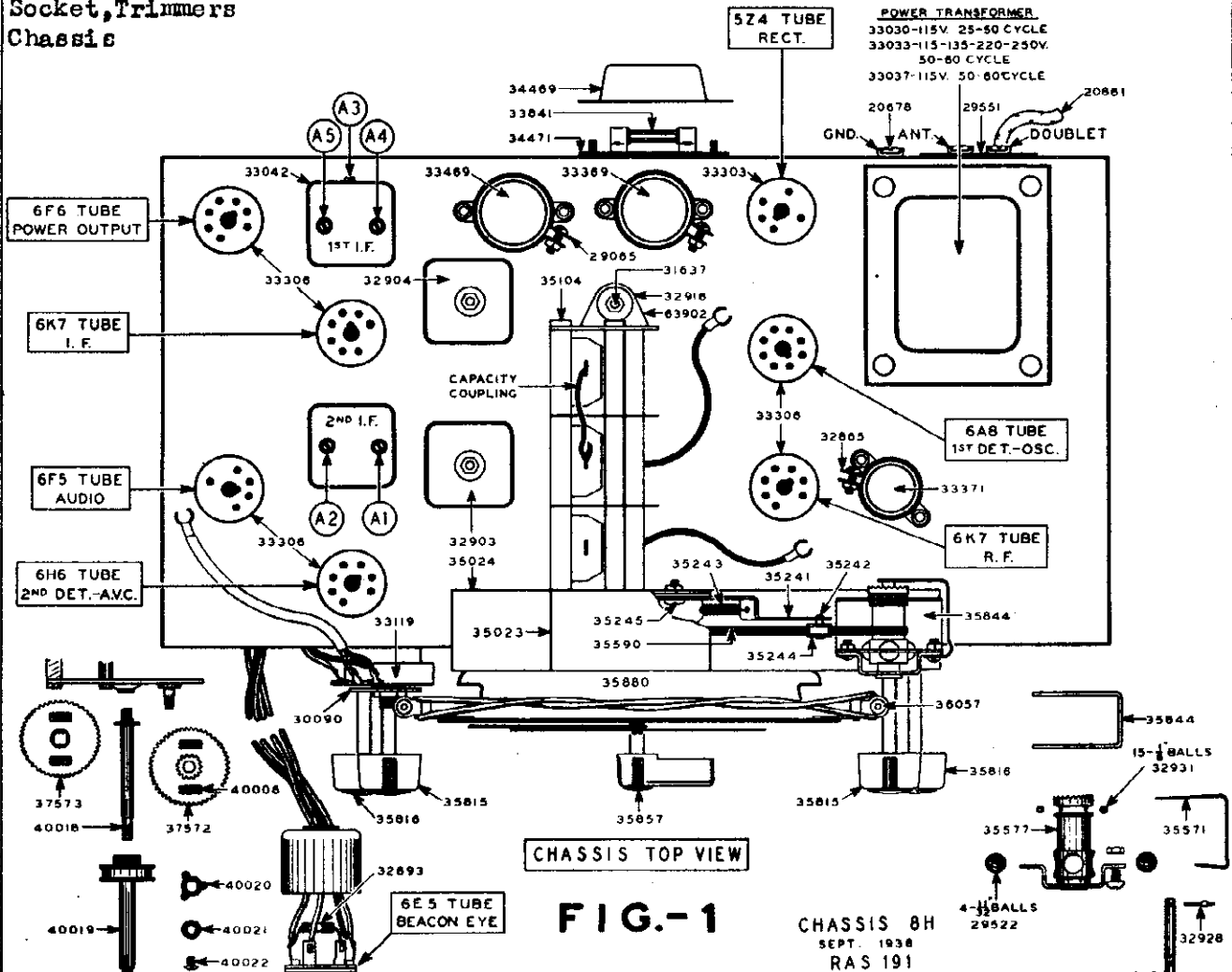
- NOTES
- 1- TUBE SOCKETS SHOWN BOTTOM VIEW
 - 2- VOLTAGE READINGS TAKEN TO CHASSIS GROUND WITH 1000 OHMS PER VOLTMETER
 - 3- RANGE "X" - 150-400 C (WEATHER BAND) TO 120-3500 C (BROADCAST BAND)
 - 4- RANGE "Y" - 5.2-18.2 M C (PHONE)

I.F. 455 K.C.

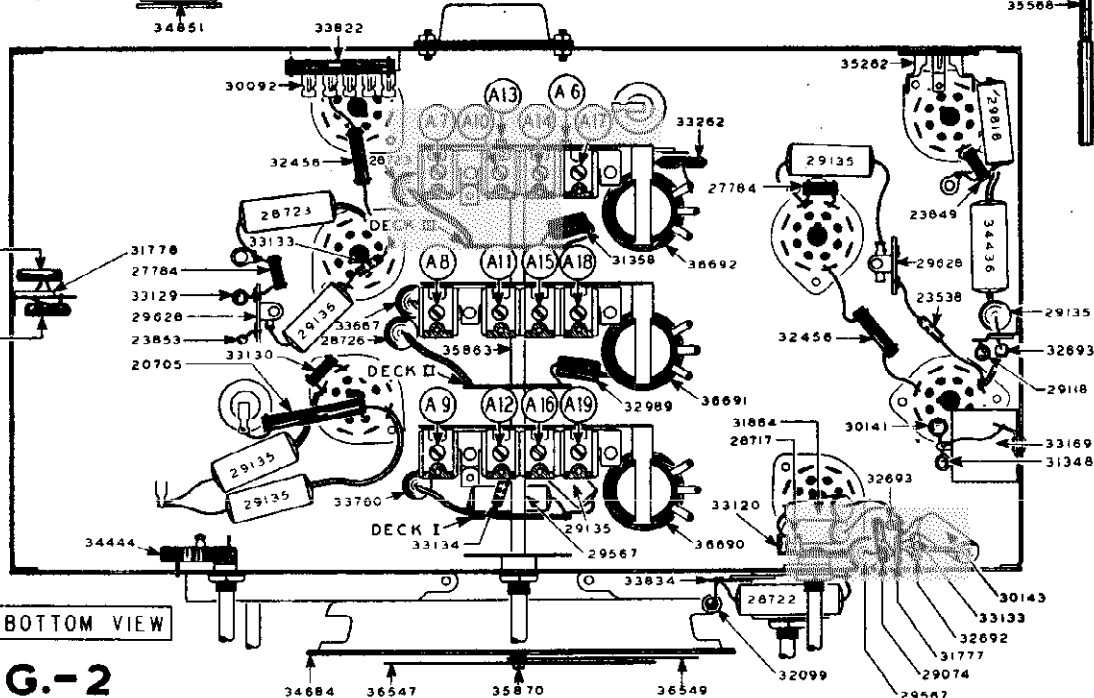
MODELS 823, 831
833, 835

GENERAL HOUSEHOLD UTILITIES CO.

Chassis 8H
Socket, Trimmers
Chassis



CHASSIS TOP VIEW
FIG.-1



CHASSIS BOTTOM VIEW
FIG.-2

GENERAL HOUSEHOLD UTILITIES CO.

Chassis 8H
Alignment

8. 1500 K. C. ALIGNMENT (BROADCAST BAND):
- Set the Generator to 1500 K. C.
 - Set the chassis range switch to position "A" and the dial pointer to 1500 K. C.
 - Adjust the Broadcast Oscillator Trimmer A10—Fig. 2—to maximum output.
 - Adjust the Broadcast Detector Trimmer A11—Fig. 2—to maximum output.
 - Adjust the Broadcast Antenna Trimmer A12—Fig. 2—to maximum output.
 - Adjust the Generator to 600 K. C.
 - Set the chassis dial pointer to 600 K. C.
 - Adjust the 600 K. C. Padding Compensator A13—Fig. 2—in the direction of signal increase—at the same time rock the tuning condenser slowly back and forth through resonance until to point of greatest output is obtained on both.
 - Realign 1500 K. C. as instructed in operation No. 8 to correct interaction changes in alignment.
11. 5 M. C. ALIGNMENT (POLICE-AMATEUR BAND):
- Set the generator to 5000 K. C. and connect through a 400 Ohm carbon resistor to the antenna post on the chassis.
 - Set the chassis range switch to position "B" and the dial pointer to 5 M. C.
 - Adjust the Oscillator Trimmer A14—Fig. 2—to maximum output.
 - Adjust the Detector Trimmer A15—Fig. 2—to maximum output.
 - Adjust the Antenna Trimmer A16—Fig. 2—to maximum output.
12. 18 M. C. ALIGNMENT (FOREIGN RECEPTION BAND):
- Set the generator to 18 M. C.
 - Set the chassis range switch to position "C" and the dial pointer to 18 M. C.
 - Adjust the Oscillator Trimmer A17—Fig. 2—to maximum output.
 - Adjust the Detector Trimmer A18—Fig. 2—to maximum output.
 - Adjust the Antenna Trimmer A19—Fig. 2—to maximum output.
- Note: To adjust Oscillator Trimmer correctly screw down tightly and then back off until signal is heard. To obtain the utmost sensitivity on the 18 M. C. Band, it is necessary, when adjusting the Detector Trimmer (A18), to rock the tuning condenser slowly through resonance until the point of maximum output is determined. Return to the Oscillator Trimmer and make any necessary readjustment.

- during the alignment operations.
3. DIAL CALIBRATION:
- Turn the tuning knob until the condensers are fully meshed and set the dial pointer (Hour Hand) to horizontal line pointing to 9 and 3 on the outer edge of the dial chart.
 - Then set the band spreading pointer (Minute Hand) to the vertical line pointing to 12.
4. 455 K. C.—I.F. ALIGNMENT:
- Set the generator to a frequency of 455 K. C., & Osc. tube and the ground lead to the ground post on the chassis.
 - Set the Hour Hand of the chassis to 1500 K. C., turn the volume control full on, set the range switch to the A or Broadcast position and the Tone control to position 1, counter-clockwise.
 - Connect the output meter across the primary terminals of the output transformer.
 - Adjust the I. F. Trimmers, located as shown in Fig. 1; in the order of their numbers, A1, A2, A3, A4 and A5, until the maximum sensitivity is obtained.
- During this and all following alignment operations the generator must be attenuated as the compensators are brought into resonance until the maximum output is obtained with the lowest possible input. This is necessary in order to hold the A. V. C. tube to its highest sensitivity, at which point only, can precise adjustments of the compensators be obtained.
5. 175 K. C. ALIGNMENT (WEATHER BAND):
- Set the generator to a frequency of 175 K. C. and connect the output to the Antenna post of the chassis through a 200 Mmf. condenser.
 - Set the chassis range switch to position "X" and the dial pointer to 175 K. C. on the dial chart.
 - Adjust the 175 K. C. Trimmer A6, as shown on Fig. 2, in the direction of signal increase and at the same time rock the tuning condenser slowly back and forth through resonance until the point of greatest output is obtained.
6. 350 K. C. ALIGNMENT (WEATHER BAND):
- Set the generator to 350 K. C.
 - Set the chassis dial pointer to 350 K. C.
 - Adjust the Oscillator Trimmer A7—Fig. 2—to maximum output.
 - Adjust the Detector Trimmer A8—Fig. 2—to maximum output.
 - Adjust the Antenna Trimmer A9—Fig. 2—to maximum output.
7. CHECK 175 K. C. ALIGNMENT so as to correct any alignment change which may have occurred due to the slight interaction between the 350 K. C. and 175 K. C. compensators.

- BEACON EYE SENSITIVITY ADJUSTMENTS
- The 6E5 Beacon Eye tube is designed to give the best results with the proper size antenna. However, where a full sized antenna cannot be erected or an inside antenna must be used, a type 6E5 Beacon Eye Tube can be substituted by making the following changes in the wiring of the circuit:
- Refer to schematic diagram Fig. 4 and disconnect the "Green" grid wire at point "A" and connect to point "B." This change can be made quickly and will give a maximum sensitivity on the weaker signals.
- REPAIRS
- When servicing this chassis it is IMPERATIVE that the service man make all parts replacements in EXACTLY the same way as the original part was connected and located. This applies particularly to all ground points.
- All parts replacements in the R. F. end of the circuit must be exact duplicates of the originals, especially so in the case of R. F., By-pass, or Coupling Condensers.
- Any repairs in the K. F. circuit will make a complete realignment of the entire tuned circuit necessary.
- ALIGNMENT PROCEDURE
- Do not attempt to align the 8H chassis without the proper equipment as the selectivity, sensitivity, and calibration depend absolutely upon the exact conformance to the following instructions. Each step in the alignment operation is given in its proper sequence and under no conditions should this order be changed.
1. EQUIPMENT:
- Signal Generator.
 - Modulated oscillator capable of generating signals of frequencies from 150 kilocycles to 18 Megacycles.
 - Non-Metallic screw driver (Alignment Tool).
 - An output meter of sufficient sensitivity to provide a good deflection at low signal input.
 - Dummy Antenna.
 - 50 Mfd. Condenser.
 - 200 Mmf. Condenser.
 - 400 Ohm Carbon Resistor.
2. HEATING:
- Connect the receiver to a 115 V. A. C. source and allow the chassis to warm up for a period of from 20 to 30 minutes. This is necessary in order to eliminate possible alignment variations due to the thermal expansion or contraction of the capacitors and inductances in the various tuned circuits.
 - The signal generator should also be warmed up before using in order to prevent any frequency changes

- SERVICE DATA
- The GRUNOW 8 H Chassis is an eight tube four band superheterodyne receiver using 1—6K7 R. F. amplifier, 1—6A8 first detector and oscillator, 1—6X7 I. F. amplifier, 1—6H6 second detector and A. V. C., 1—6E5 beacon eye, and 1—5Z4 rectifier.
- The frequency coverage is divided into four separate bands, the "X" or weather band 150 to 410 K. C., "A" or Standard Broadcast Band 550 to 1720 K. C., "B" or Police-Amateur Band, 1720 to 5500 K. C., and the Foreign Reception Band 5.5 M. C. to 18.5 M. C.
- CONTINUITY AND VOLTAGE
- Continuity and voltage measurements should be taken from the underside of the chassis in order to more easily follow the schematic diagram. All sockets are shown on the schematic diagram and have been drawn bottom view. Each element is enumerated and in the exact relationship to the tube guide pin in order to help the service man make a quick and correct check of the chassis constants.
- RANGE SWITCH AND COIL ASSEMBLY
- The range switch and coil assembly used on the 8H chassis has been designed to allow the receiver to operate on all four bands with maximum sensitivity and selectivity. Each set of coils when not in use is isolated from the coils in use by shorting both ends and grounding through a condenser. This method eliminates all possibilities of open end inductive losses and harmonic pickup.
- Schematic diagram Fig. 3 illustrates in detail each section of the range switch with its coil and the proper connections, whose enumerations are duplicated on the chassis schematic diagram.

Grunow Radio

SEPTEMBER 1936

SERVICE NOTES AND PARTS LIST

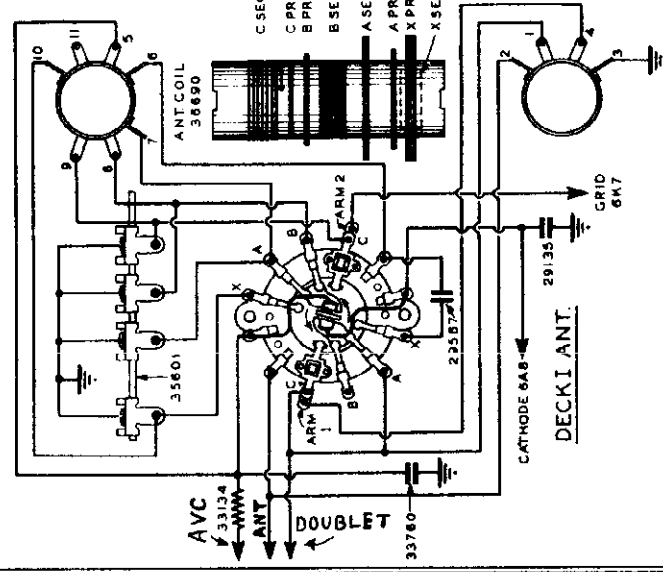
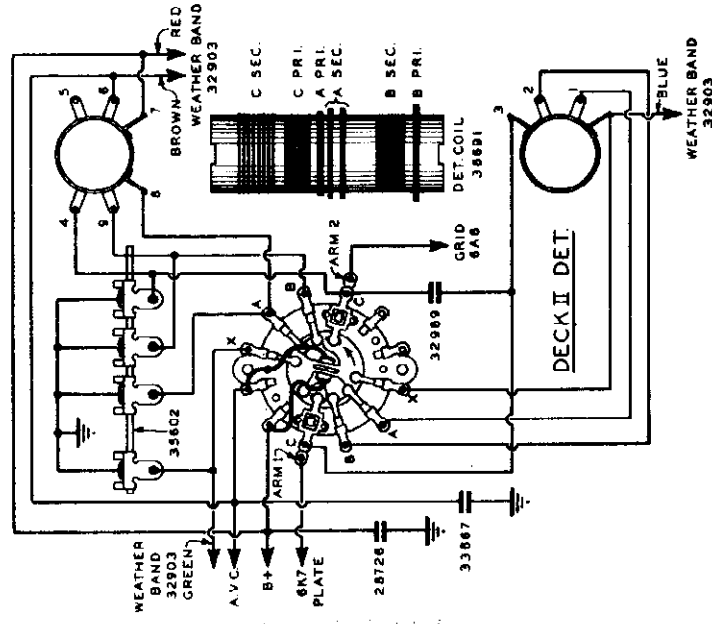
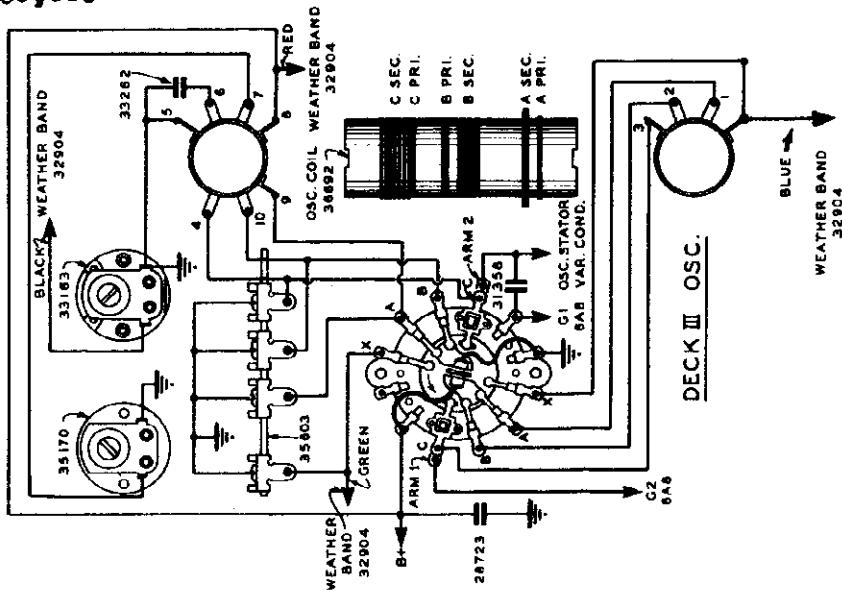
Chassis Type 8H
Receiver Model 823-831-833-835
Speaker Type 1210A1

MODELS 823,831
833,835

GENERAL HOUSEHOLD UTILITIES CO.

Switch & Coil
Assembly

MODEL
941



SCHEMATIC DIAGRAM RANGE SWITCH & COIL ASSEMBLY

THE NUMBERS ON THE COIL LUGS CORRESPOND TO THOSE SHOWN ON SCHEMATIC DIAGRAM, FIG. 4

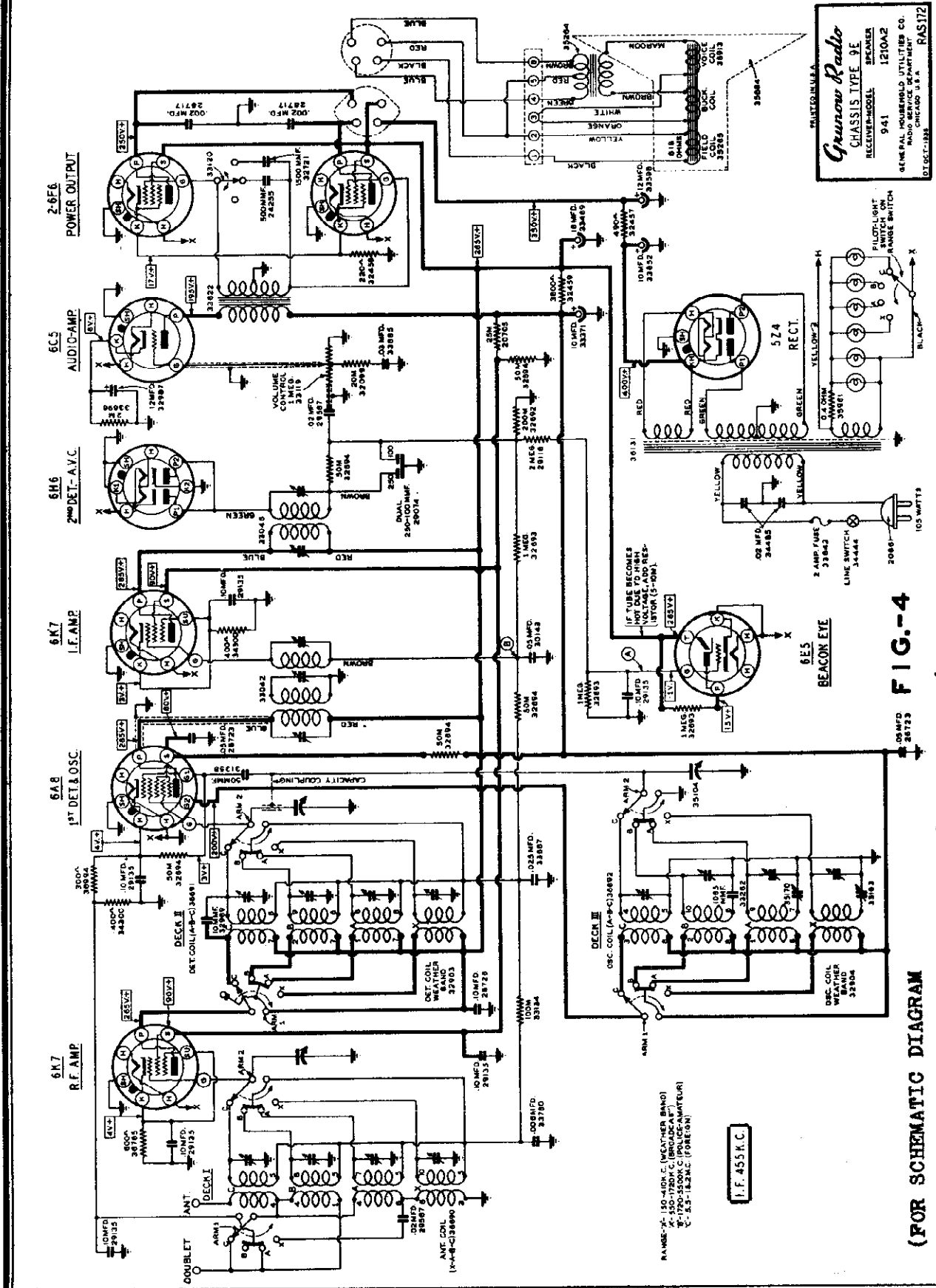
FIG.-3

RAS192

DT. SEPT. 26, 1936.

GENERAL HOUSEHOLD UTILITIES CO.

MODEL 941
Chassis 9E
Schematic, Voltage
Parts



MADE IN U.S.A.

Grunow Radio

CHASSIS TYPE 9E
RECEIVER MODEL 941
GENERAL HOUSEHOLD UTILITIES CO.
RADIO SERVICE DEPARTMENT
CHICAGO U.S.A.

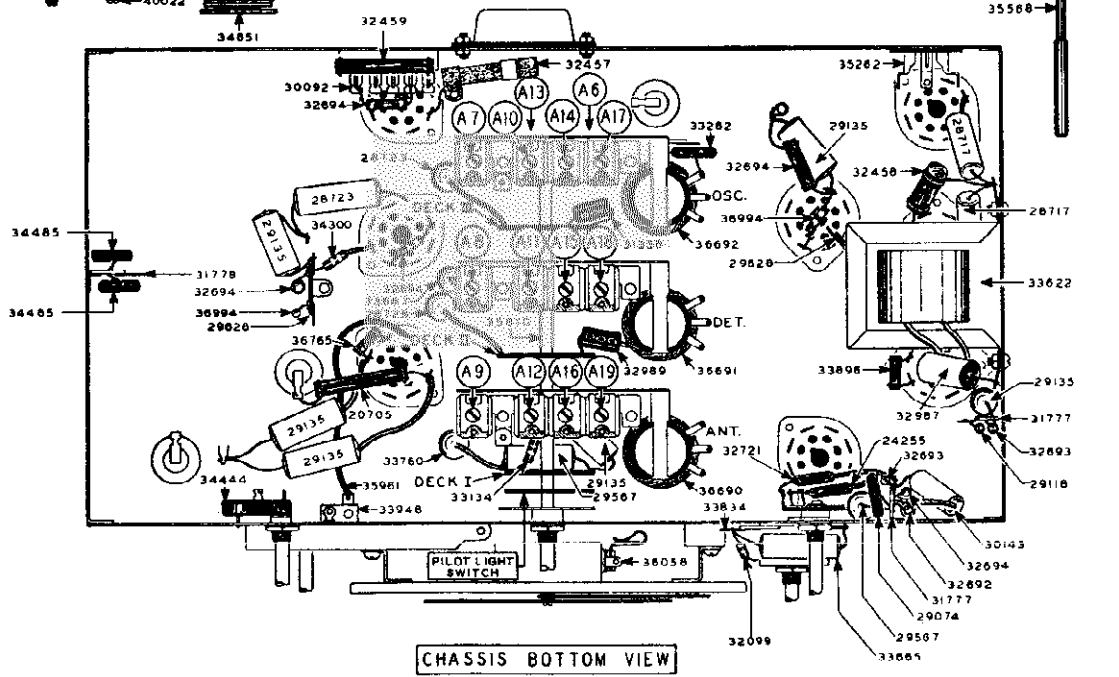
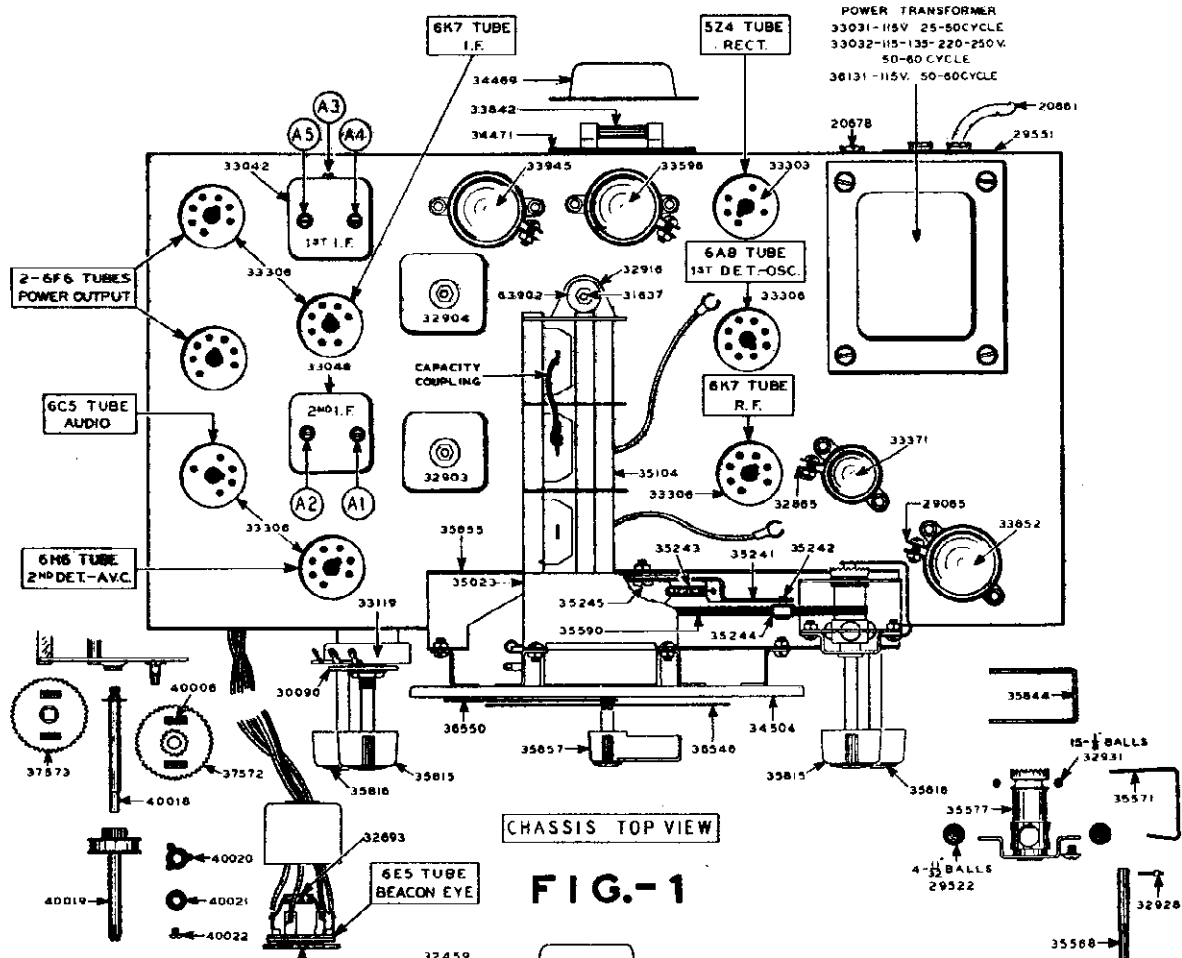
RAS172

FIG.-4

(FOR SCHEMATIC DIAGRAM OF RANGE SWITCH AND COIL ASSEMBLY, SEE INDEX)

MODEL 941
 Chassis 9E
 Socket, Trimmers
 Chassis

GENERAL HOUSEHOLD UTILITIES CO.



GENERAL HOUSEHOLD UTILITIES CO.

MODEL 941 Chassis 9E Alignment, Notes

INTRODUCTION

The Grunow Chassis 9E is a nine tube, four band receiver, using 1—6K7 R.F. Amplifier, 1—6A8 1st Detector and Oscillator, 1—6K7 I.F. Amplifier, 1—6H6 2nd Detector and A.V.C., 1—6C5 Audio Amplifier, 2—6F6 Power Output, 1—5Z4 Rectifier and 1—6E5 "Beacon Eye" Resonance Indicator.

The frequency coverage is divided into four separate tuning ranges or bands; the "X" Weather Band, 150 K.C. to 410 K.C.; "A" Broadcast Band, 550 K.C. to 1720 K.C.; "B" Police-Amateur Band, 1720 K.C. to 5.5 M.C., and the "C" Foreign Broadcast Band, 5.5 M.C. to 18.2 M.C.

**Chassis Type 9E
Receiver Model 941
Speaker Type 1210-A-2**

- (A) Set the generator to 350 K.C.
(B) Set the chassis dial pointer to 350 K.C.
(C) Adjust Oscillator trimmer A7, Detector trimmer A8, and Antenna trimmer A9 to maximum output.

7. Check 175 K.C. Alignment so as to correct any alignment change which may have occurred due to the slight inter-action between the 350 and 175 K.C. trimmers.

8. 1500 K.C. ALIGNMENT (Broadcast Band):

- (A) Set the generator to 1500 K.C.
(B) Set the chassis range switch to position "A" and the dial pointer to 1500 K.C.
(C) Adjust Oscillator trimmer A10, Detector trimmer A11, and Antenna trimmer A12 to maximum output.

9. 600 K.C. ALIGNMENT (Broadcast Band):

- (A) Set the generator to 600 K.C.
(B) Set the dial pointer to 600 K.C.
(C) Adjust the 600 K.C. padding compensator A13 in the direction of the signal increase—at the same time rock the tuning condenser slowly back and forth thru resonance until the point of greatest output is obtained.

10. Realign 1500 K.C. as instructed in operation No. 8 to correct inter-action changes in alignment.

11. 5 M.C. ALIGNMENT (Police-Amateur Band):

- (A) Set the generator to 5 M.C. and connect thru a 400 ohm carbon resistor to the antenna post on the chassis.
(B) Set the chassis range switch to position "B" and the dial pointer to 5 M.C.
(C) Adjust Oscillator trimmer A14, Detector trimmer A15 and Antenna trimmer A16 to maximum output.

To adjust Oscillator trimmer correctly, back trimmer A14 out as far as it will go (minimum capacity) then adjust until signal is heard.

12. 18 M.C. ALIGNMENT (Foreign Broadcast Band):

- (A) Set the generator to 18 M.C.
(B) Set the chassis range switch to position "C" and the dial pointer to 18 M.C.
(C) Adjust Oscillator trimmer A17, Detector trimmer A18 and Antenna trimmer A19 to maximum output.

Note: To adjust Oscillator trimmer correctly, screw down tightly and then back off until signal is heard. To obtain the utmost sensitivity on the 18 M.C. Band, it is necessary, when adjusting the Detector trimmer (A18) to rock the tuning condenser slowly thru resonance until the point of maximum output is determined. Return to the Oscillator trimmer and make any necessary readjustment.

Note: The receiver should be aligned in a location free from local interference. A screen room is recommended.

ALIGNMENT PROCEDURE

1. HEATING:

(A) Allow the receiver to heat up for a period of 20 to 30 minutes. This is necessary in order to eliminate possible alignment variations due to thermal expansion and contraction of capacitors and inductances.

(B) Allow the signal generator to warm up in order to prevent frequency drift during alignment.

2. DIAL CALIBRATION:

Turn the condenser until the plates are fully meshed, set the pointer (Hour Hand) to 9 and 3 on the outer edge of dial chart. Set the vernier pointer (Minute Hand) to the line pointing to 12.

3. SIGNAL GENERATOR ADJUSTMENT:

During the entire alignment procedure, the signal input from the generator to the receiver must be continually attenuated at the generator, as the various trimmers are brought into resonance. This is necessary in order to hold the signal at the lowest intensity so that the A.V.C. circuit will remain at the most sensitive point.

4. 455 K.C.—I.F. ALIGNMENT:

(A) Set the generator to a frequency of 455 K.C., connect the output to the control grid of the 6A8 1st Detector and Oscillator tube thru .05 mfd. dummy and the ground lead to the ground post on the chassis.

(B) Set the dial pointer to 600 K.C., turn the volume control full on, set the range switch to the "A" or Broadcast position and the tone control to position 3 clockwise.

(C) Connect the output meter across the primary terminals of the output transformer.

(D) Adjust the I.F. trimmers, located as shown in Fig. 1, in the order of their numbers, A1, A2, A3, A4 and A5, until maximum sensitivity is obtained.

5. 175 K.C. ALIGNMENT (Weather Band):

(A) Set the generator to a frequency of 175 K.C. and connect the output to the Antenna post of the chassis thru a 200 mmfd. dummy.

(B) Set the chassis range switch to position "X" and the dial pointer to 175 K.C. on the dial chart.

(C) Adjust the 175 K.C. trimmer A6, as shown on Fig. 2, in the direction of signal increase and at the same time rock the tuning condenser slowly back and forth thru resonance until the point of greatest output is obtained.

6. 350 K.C. ALIGNMENT (Weather Band):

SERVICE DATA

CONTINUITY AND VOLTAGE

Tube sockets on the schematic diagram (Fig. 4) are shown bottom view, each element being in its actual position in respect to the guide pin. The voltage measurements shown are average and were taken with a line voltage of 115 V., the volume control "full on" and the range switch in position "C" using a 1000 ohm per volt meter.

REPAIRS

When servicing this chassis it is IMPERATIVE that parts replacements are made in EXACTLY the same way as the original parts were located, and connected. This applies particularly to ground points.

All parts replacements in the R.F. end of the circuit must be exact duplicates of the originals, especially so in the case of coils, R.F. by-pass or coupling condensers.

Any repairs in the R.F. circuit will make a complete realignment of the tuned circuit necessary.

BEACON EYE SENSITIVITY ADJUSTMENTS

The 6E5 "Beacon Eye" tube is designed to give the best results with the proper size antenna. However, where a full size antenna cannot be erected or an inside antenna must be used, a type 6G5 tube can be substituted by making the following changes in the wiring of the circuit:

Refer to schematic diagram Fig. 4 and disconnect the "green" grid wire at point "A" and connect to point "B." This change can be made quickly and will give a maximum sensitivity on weaker signals.

HIGH LINE VOLTAGE

For use in localities having consistent high line voltage (120-130 V.) an extra primary lead has been provided on the Power Transformer. To make this change, merely remove the green lead from the terminal strip and connect the taped yellow lead to its place.

CIRCUIT ALIGNMENT EQUIPMENT

Do not attempt to align this chassis without the equipment specified below:

1. Signal Generator—
A modulated oscillator capable of delivering frequencies from 175 K.C. to 18.2 M.C.
2. Alignment Tool—
A non-metallic screw driver.
3. Dummy Antenna—.05 Mfd. Condenser (I.F. Alignment).
200 Mmfd. Condenser (Broadcast Alignment).
400 Ohm Carbon Resistor (Short Wave Alignment).
4. Output Meter—
A meter of sufficient sensitivity to give a good deflection at very low signal input.

MODEL 542

Chassis 5J

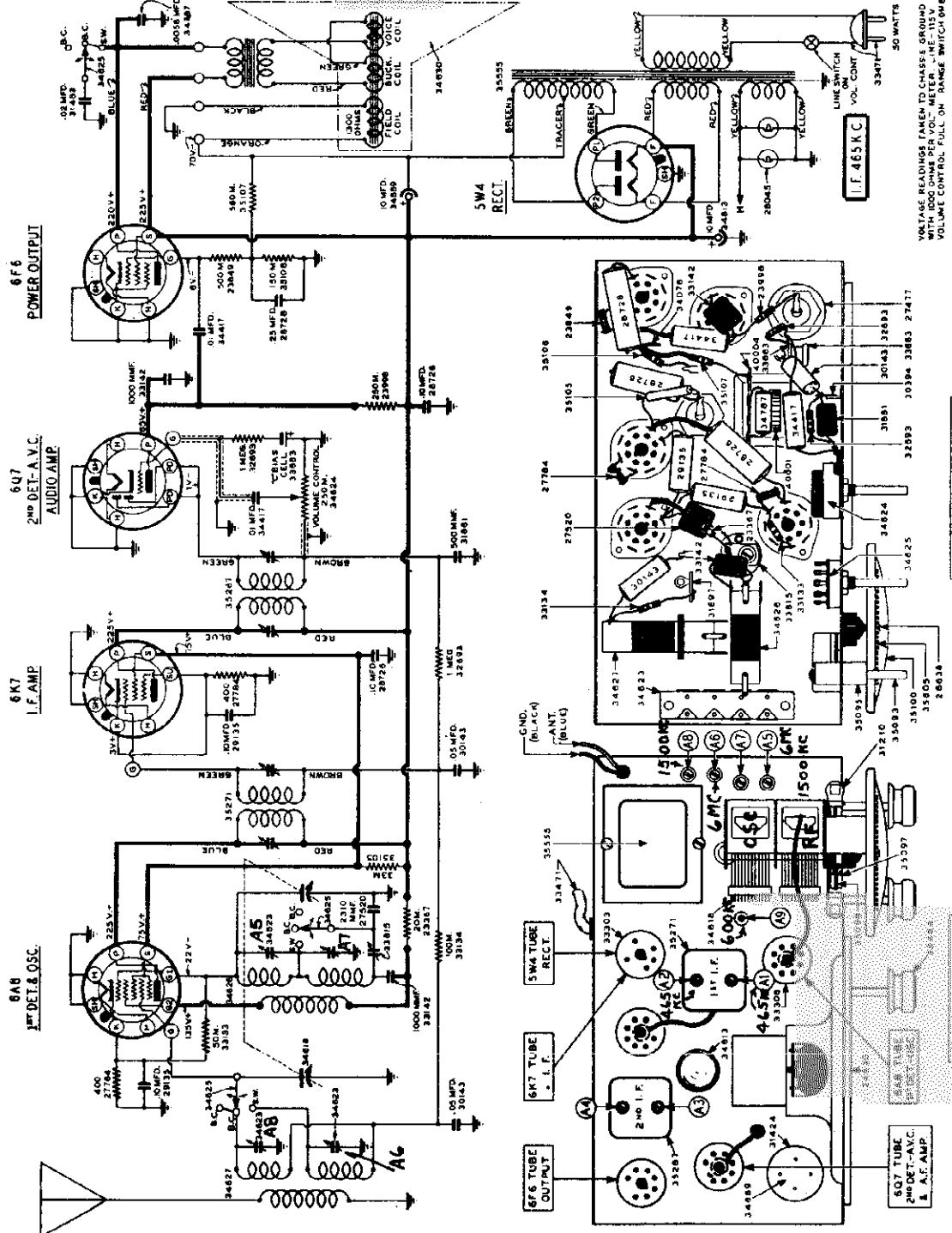
Schematic, Voltage
Socket, Trimmers, Parts
Alignment, Chassis

GENERAL HOUSEHOLD UTILITIES CO.

(PRICES SUBJECT TO CHANGE WITHOUT NOTICE)

PART NO.	DESCRIPTION	QUANTITY	PRICE
2285	5W4 RECT.	1	1.00
2286	6K7 I.F. AMP.	1	1.00
2287	6Q7 2ND DET.-A.V.C.	1	1.00
2288	6F6 POWER OUTPUT	1	1.00
2289	500M. CAP.	1	1.00
2290	150M. CAP.	1	1.00
2291	100M. CAP.	1	1.00
2292	50M. CAP.	1	1.00
2293	25M. CAP.	1	1.00
2294	10M. CAP.	1	1.00
2295	5M. CAP.	1	1.00
2296	1M. CAP.	1	1.00
2297	500K. CAP.	1	1.00
2298	250K. CAP.	1	1.00
2299	100K. CAP.	1	1.00
2300	50K. CAP.	1	1.00
2301	25K. CAP.	1	1.00
2302	10K. CAP.	1	1.00
2303	5K. CAP.	1	1.00
2304	1K. CAP.	1	1.00
2305	500. CAP.	1	1.00
2306	250. CAP.	1	1.00
2307	100. CAP.	1	1.00
2308	50. CAP.	1	1.00
2309	25. CAP.	1	1.00
2310	10. CAP.	1	1.00
2311	5. CAP.	1	1.00
2312	1. CAP.	1	1.00
2313	500. CAP.	1	1.00
2314	250. CAP.	1	1.00
2315	100. CAP.	1	1.00
2316	50. CAP.	1	1.00
2317	25. CAP.	1	1.00
2318	10. CAP.	1	1.00
2319	5. CAP.	1	1.00
2320	1. CAP.	1	1.00
2321	500. CAP.	1	1.00
2322	250. CAP.	1	1.00
2323	100. CAP.	1	1.00
2324	50. CAP.	1	1.00
2325	25. CAP.	1	1.00
2326	10. CAP.	1	1.00
2327	5. CAP.	1	1.00
2328	1. CAP.	1	1.00
2329	500. CAP.	1	1.00
2330	250. CAP.	1	1.00
2331	100. CAP.	1	1.00
2332	50. CAP.	1	1.00
2333	25. CAP.	1	1.00
2334	10. CAP.	1	1.00
2335	5. CAP.	1	1.00
2336	1. CAP.	1	1.00
2337	500. CAP.	1	1.00
2338	250. CAP.	1	1.00
2339	100. CAP.	1	1.00
2340	50. CAP.	1	1.00
2341	25. CAP.	1	1.00
2342	10. CAP.	1	1.00
2343	5. CAP.	1	1.00
2344	1. CAP.	1	1.00
2345	500. CAP.	1	1.00
2346	250. CAP.	1	1.00
2347	100. CAP.	1	1.00
2348	50. CAP.	1	1.00
2349	25. CAP.	1	1.00
2350	10. CAP.	1	1.00
2351	5. CAP.	1	1.00
2352	1. CAP.	1	1.00
2353	500. CAP.	1	1.00
2354	250. CAP.	1	1.00
2355	100. CAP.	1	1.00
2356	50. CAP.	1	1.00
2357	25. CAP.	1	1.00
2358	10. CAP.	1	1.00
2359	5. CAP.	1	1.00
2360	1. CAP.	1	1.00
2361	500. CAP.	1	1.00
2362	250. CAP.	1	1.00
2363	100. CAP.	1	1.00
2364	50. CAP.	1	1.00
2365	25. CAP.	1	1.00
2366	10. CAP.	1	1.00
2367	5. CAP.	1	1.00
2368	1. CAP.	1	1.00
2369	500. CAP.	1	1.00
2370	250. CAP.	1	1.00
2371	100. CAP.	1	1.00
2372	50. CAP.	1	1.00
2373	25. CAP.	1	1.00
2374	10. CAP.	1	1.00
2375	5. CAP.	1	1.00
2376	1. CAP.	1	1.00
2377	500. CAP.	1	1.00
2378	250. CAP.	1	1.00
2379	100. CAP.	1	1.00
2380	50. CAP.	1	1.00
2381	25. CAP.	1	1.00
2382	10. CAP.	1	1.00
2383	5. CAP.	1	1.00
2384	1. CAP.	1	1.00
2385	500. CAP.	1	1.00
2386	250. CAP.	1	1.00
2387	100. CAP.	1	1.00
2388	50. CAP.	1	1.00
2389	25. CAP.	1	1.00
2390	10. CAP.	1	1.00
2391	5. CAP.	1	1.00
2392	1. CAP.	1	1.00
2393	500. CAP.	1	1.00
2394	250. CAP.	1	1.00
2395	100. CAP.	1	1.00
2396	50. CAP.	1	1.00
2397	25. CAP.	1	1.00
2398	10. CAP.	1	1.00
2399	5. CAP.	1	1.00
2400	1. CAP.	1	1.00

Grunow Radio
CHASSIS TYPE 5J
RECEIVER MODEL 542
34830
GENERAL HOUSEHOLD UTILITIES CO.
RADIO SERVICE DEPARTMENT
CHICAGO U.S.A. RA5162



VOLTAGE READINGS TAKEN TO CHASSIS GROUND
RESISTANCE READINGS TAKEN TO LINE SWITCH
VOLUME CONTROL - FULL ON - RANGE SWITCH ON

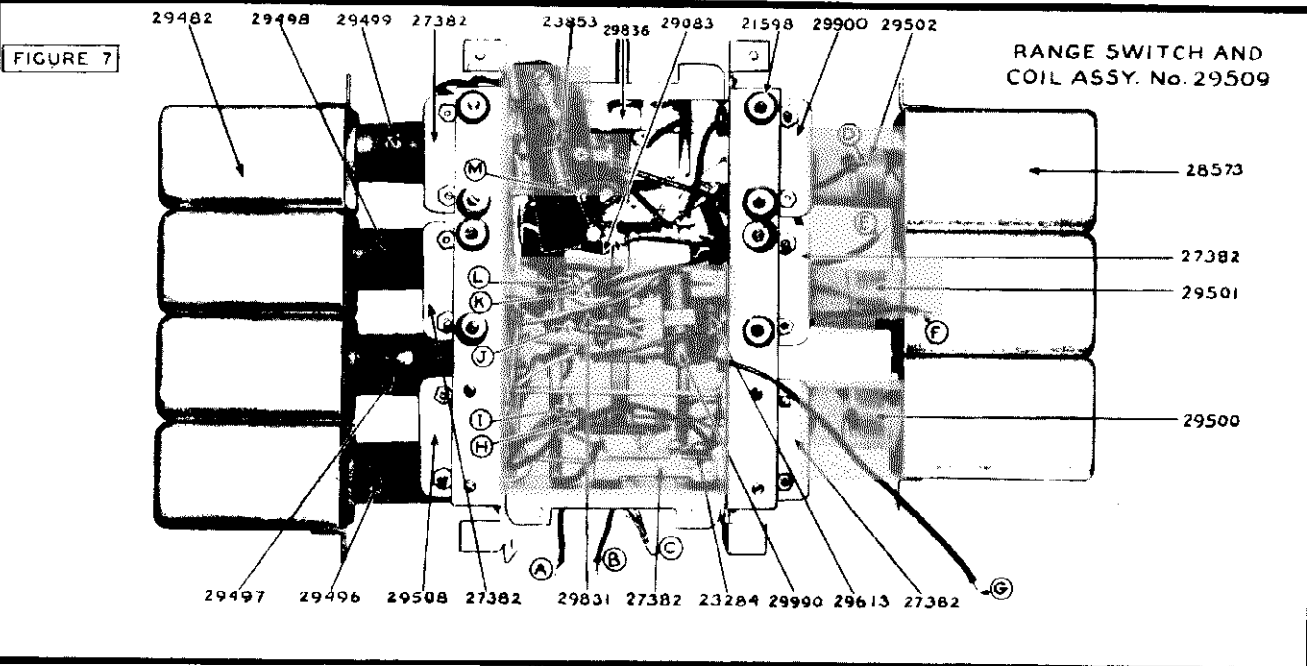
CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION
FREQUENCY RANGE :
540 to 1760 KC - Trim at 1500 KC, Pad at 600 KC
2.3 to 6.5 MC - Trim at 6 MC, No padding required

Switch & Coil Assembly

GENERAL HOUSEHOLD UTILITIES CO.

MODELS 1151, 1152

Chassis 11A



INTRODUCTION

The following characteristics apply to the Grunow Radio—Chassis Type 11A:

This model is an 11 tube superhetrodyne All Wave (540 to 21,500 K.C.) Receiver using 1-6D6 tube as an R.F. Amplifier, 1-6A7 tube as a 1st Detector or mixer, being electronically coupled to a 76 oscillator tube. 1-6D6 tube as an I.F. amplifier with a frequency of 262 K.C., 1-85 tube (double diode triode) used as a diode detector or signal rectifier, delayed automatic volume control (AVC) and audio amplifier. The 85 tube feeds a pair of 76 tubes, connected in parallel, these tubes act as a driver stage, driving a pair of 45 tubes in class A prime push pull, delivering an undistorted output of approximately 9 watts. The 76 driver tubes receive their bias through the 164 ohm section of the candohm resistor. Oscillation in the driver stage is prevented by the 100,000 ohm resistor in the grid of the second 76 tube. The 45 tubes receive their bias through the voltage drop in the speaker field. A separate 76 tube is used as the Signal Beacon or Beat Oscillator, plate voltage of the Signal Beacon being applied by closing the switch on the tone control. The rectifier tube is a 5Z3, the output of which is well filtered through the choke action of the speaker field, the tuned filter choke, and the 4-8 mfd. electrolytic condensers.

The broadcast section of the receiver consists of the following 4 tuned circuits: R.F. input, bi-selector, mixer input and oscillator. These circuits are tuned with a 4-gang variable condenser of rugged construction.

The short wave section of the receiver consists of 3 tuned circuits, the bi-selector being cut out to prevent losses when the receiver is working at the higher frequencies.

The Signal Beacon is a beat oscillator using a 76 tube, and is a feature of the 11A Chassis. When this tube is brought into operation it acts as a local oscillator and beats against the incoming signal. The presence of a station's signal will be indicated by a high pitched "whistle", becoming lower in pitch as "resonance", or exact tuning, is approached. The Signal Beacon note becomes very low and finally reaches zero; at this point the receiver is said to be tuned to "zero beat", which indicates that it is tuned exactly to the station. The Signal Beacon is also used to receive telegraph or continuous wave signals.

The remainder of the circuit is typical and has been designed along the lines of what is considered the best engineering practice to date. Parts are all oversize and of the finest quality.

MODELS 1151, 1152
Chassis 11A

GENERAL HOUSEHOLD UTILITIES CO.

Socket, Trimmers
Chassis

FIGURE 5

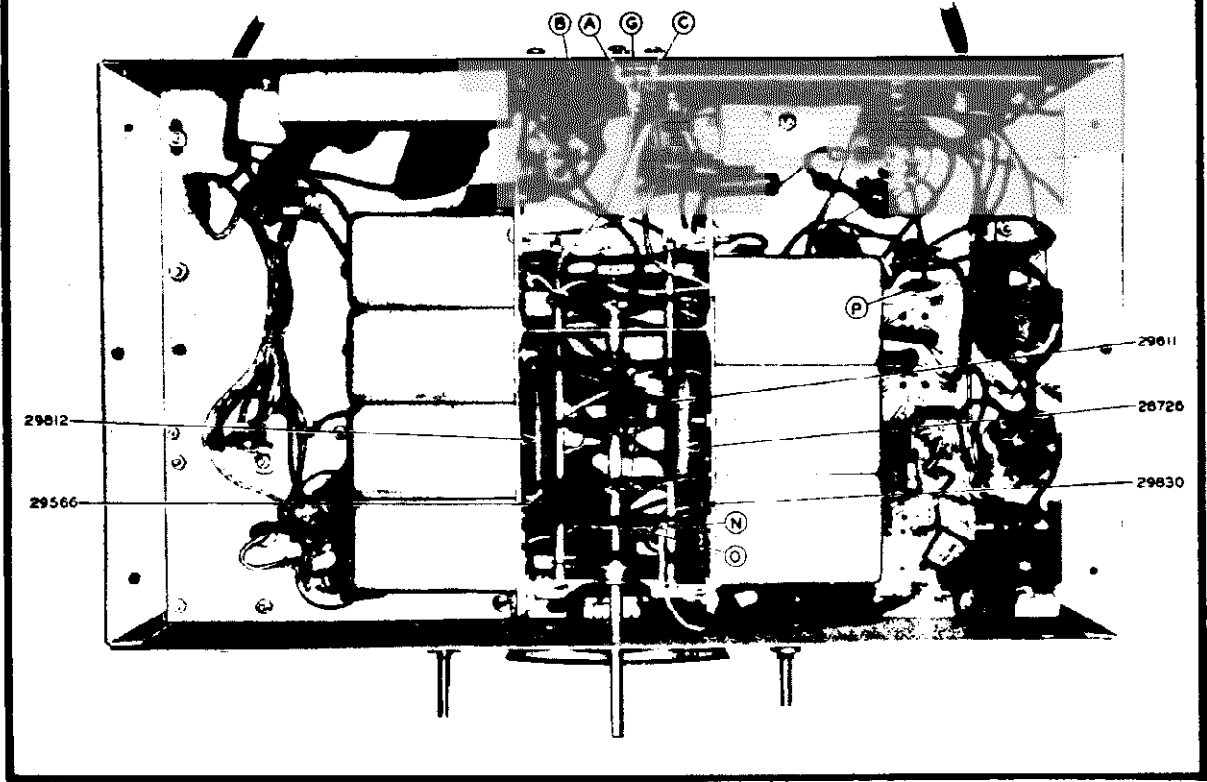
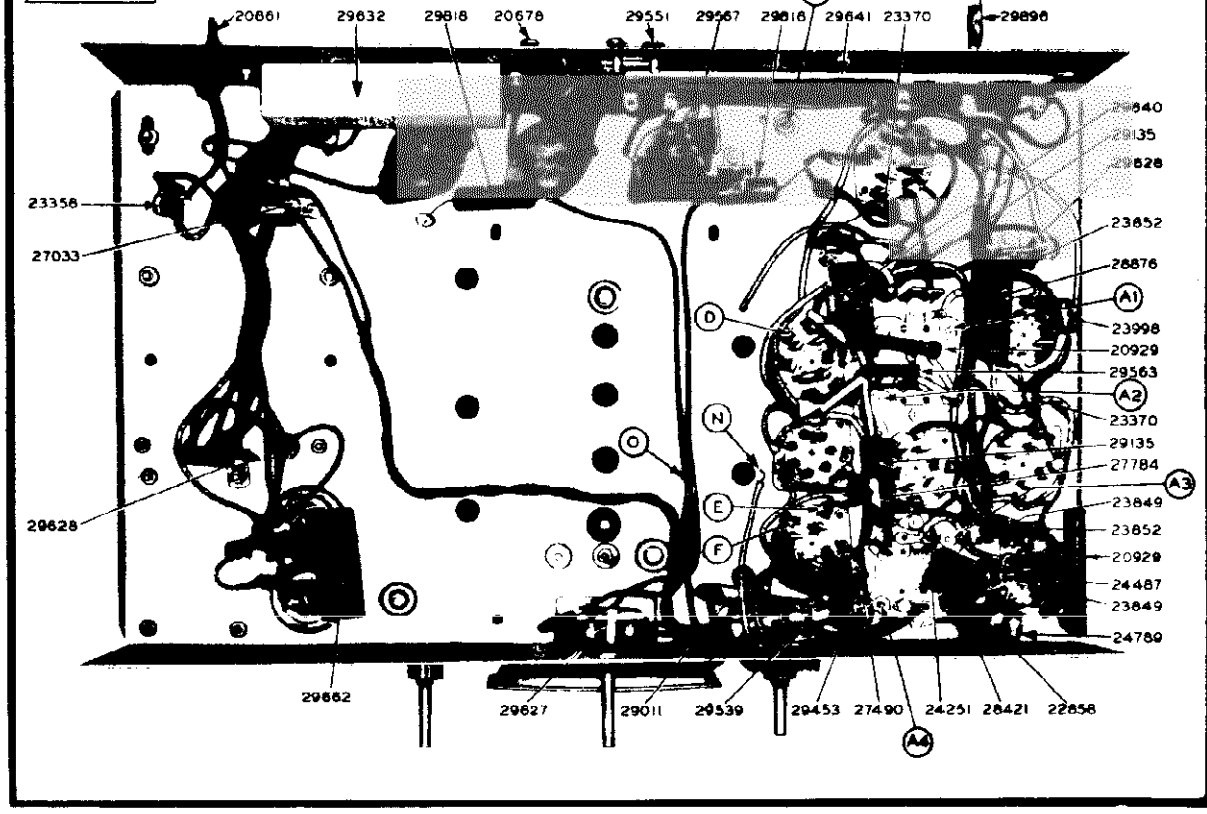
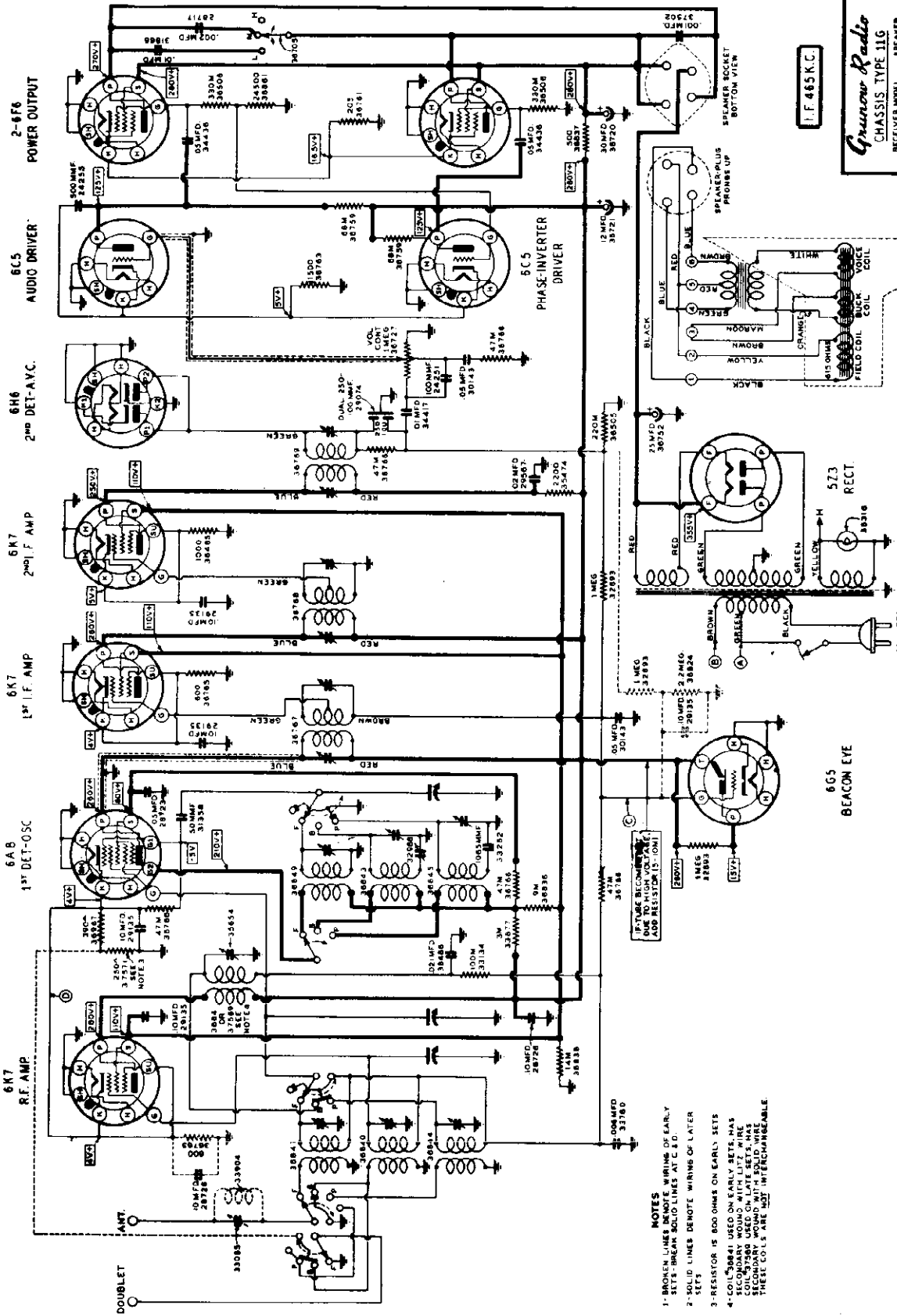


FIGURE 6



GENERAL HOUSEHOLD UTILITIES CO.

MODELS 119, 1191B
Chassis 119
Schematic, Voltage
Parts



Grunow Radio
CHASSIS TYPE 119

RECEIVER MODEL	1191	1191B	126A-1	126B-1
SPEAKER	126A-1	126B-1	126C-1	126D-1

GENERAL HOUSEHOLD UTILITIES CO.
RADIO SERVICE DEPARTMENT
MILWAUKEE, WISCONSIN, U.S.A. PAS173

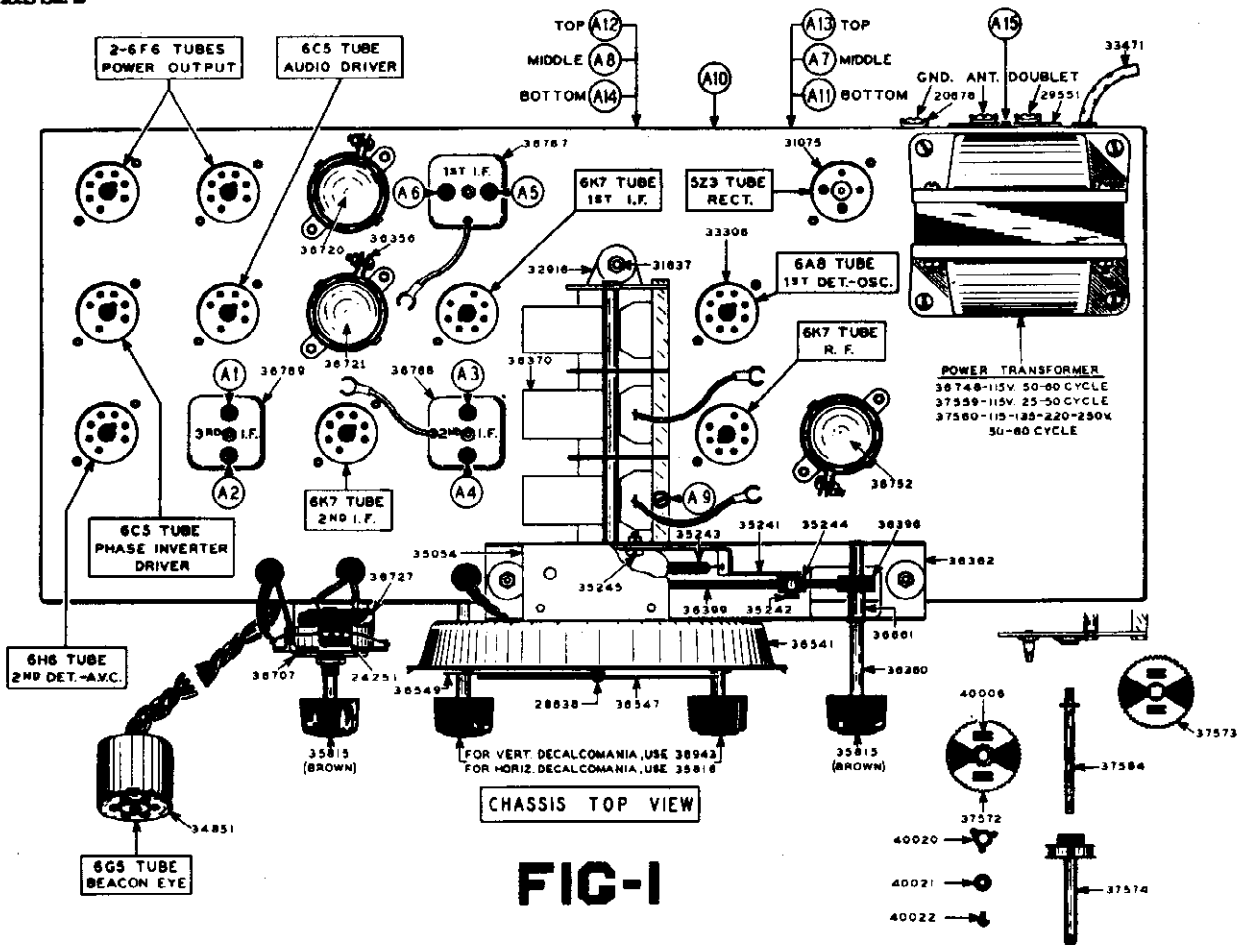
I.F. 465 K.C.

FIG.-3

- NOTES**
- 1- BROWN LINES DENOTE WIRING OF EARLY SETS - GREEN SOLID LINES AT C.P.D. SETS
 - 2- SOLID LINES DENOTE WIRINGS OF LATER SETS
 - 3- RESISTOR IS 100 OHMS ON EARLY SETS
 - 4- COIL "5841" USED ON EARLY SETS HAS COIL WINDING WOUND WITH LITE #16 CLOVE WIRE SECONDARY WOUND WITH #14 SOLID WIRE THESE COILS ARE NOT INTERCHANGEABLE

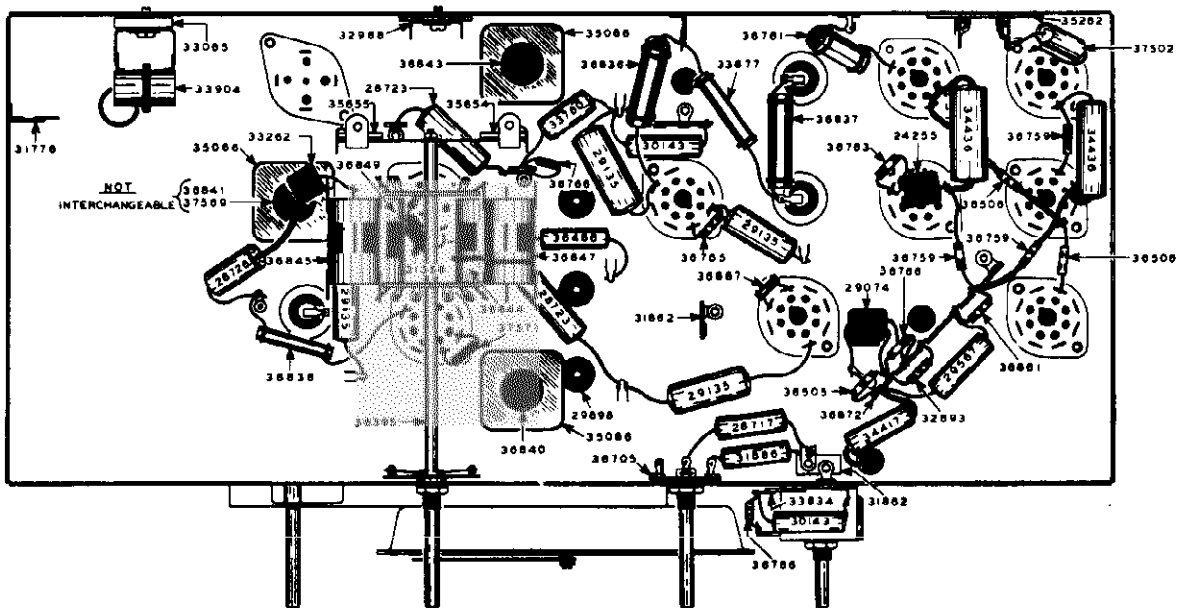
MODELS 1191, 1191B
Chassis 11G
Socket, Trimmers
Chassis

GENERAL HOUSEHOLD UTILITIES CO.



CHASSIS TOP VIEW

FIG-1



CHASSIS BOTTOM VIEW

FIG-2

CHASSIS 11G
AUG. 1938
RAS 188

OCTOBER, 1936
SERVICE DATA

Grunow Radio

Chassis Type 11G—Receiver Model 1191 and 1191-B—Speaker Type 12G4-1 or 12G3-1

GENERAL HOUSEHOLD UTILITIES COMPANY

FORM 36905-2

PRINTED IN U. S. A.

CHICAGO, ILLINOIS

INTRODUCTION

The Grunow Chassis 11G is an eleven tube, three band superheterodyne receiver with a full face band spread dial and a Beacon Eye tuning indicator.

CIRCUIT DESCRIPTION

The circuit and tube complement of the Grunow 11G Chassis is as follows: 1-6K7 R. F. Amplifier, 1-6A8 1st Detector and Oscillator, 1-6K7 1st I. F. Amplifier, 1-6K7 2nd I. F. Amplifier, 1-6H6 2nd Detector and A. V. C., 1-6C5 Phase Inverter Driver, 1-6C5 Audio Driver, 2-6F6 Power Output, 1-6G5 Beacon Eye and 1-5Z3 Rectifier.

Separate coils are used in the Antenna and Oscillator circuits for each tuning range and have a continuous frequency coverage from 545 K. C. to 1750 K. C. on the "B" Broadcast Band, 1750 K. C. to 5.8 M. C. on the "P" Police Amateur Band and 5.5 M. C. to 18.2 M. C. on the "F" Foreign Broadcast Band.

CONTINUITY AND VOLTAGE

Tube sockets on the schematic diagram (Fig. 3) are shown bottom view, each element being in its actual position in respect to the guide pin. The voltage measurements shown are average and were taken with

a line voltage of exactly 115V. the volume control full on and the range switch on position "B" using a 1000 ohms per volt meter.

REPAIRS

When servicing this chassis it is **IMPERATIVE** that the service man make all parts replacements in **EXACTLY** the same way as the original part was located and connected. This applies in particular to all ground points. All parts replacements in the R. F. end of the circuit must be exact duplicates of the originals especially so in the case of coils, R. F. by-pass or coupling condensers. Any repairs in the R. F. circuit will make a complete realignment of the entire tuned circuit necessary.

POWER TRANSFORMER

For use in localities having consistent high voltage (120-130 V.) an extra primary lead has been provided on the Power Transformer. Remove the one line switch lead which is soldered to the green transformer lead (A) and solder to the dummy lug (B) on which the brown transformer lead is soldered. The connections (A) and (B) are shown on the schematic diagram (Fig. 3).

CIRCUIT ALIGNMENT PROCEDURE

Do not attempt to align this chassis without the proper equipment as the sensitivity, selectivity, and calibration absolutely depend on the exact conformance to the following instructions. Each step in the alignment operation is given in its proper sequence and under no conditions should this order be changed. The chassis should be aligned in a location free from local interference (motors, flashers, automobile ignition, etc.) as high frequency disturbances will cause difficulty when the short wave section is adjusted. A screen room is recommended

1. EQUIPMENT

(A) Signal Generator.
A modulated oscillator capable of generating signals from 465 K. C. to 18 megacycles.

(B) Non-metallic screw-driver (Alignment Tool).

(C) Output Meter.

A standard type output meter with sufficient sensitivity to give a good deflection with a small signal input.

(D) Dummy Antenna.

.05 Mfd. condenser—(I. F. Alignment)

200 Mmfd. condenser—(Broadcast Alignment)

400 Ohm carbon resistor (Short Wave Alignment)

.002 Mfd. condenser (I. F. Rejector Filter Alignment)

2. HEATING

(A) Connect the receiver to a 115 V. source and allow the chassis to warm up to a period of 20 to 30 minutes. This is necessary to eliminate possible alignment variations due to thermal expansion and contraction of the capacitors and inductances in the various tuned circuits.

(B) The signal generator should be warmed up also in order to prevent any frequency changes during alignment.

3. DIAL CALIBRATION

(A) Turn the tuning knob until the condensers are fully meshed and set the dial pointer (Hour Hand) to the horizontal line pointing to 9 and 3 on the outer dial scale.

(B) Set the band spreading pointer (Minute Hand) to the vertical line pointing to 12.

Note: During all of the following alignment operations the signal generator must be attenuated as the compensators are brought into resonance until the maximum output is obtained with the lowest possible input. This is necessary in order to hold the A. V. C. tube to its highest sensitivity at which point only can precise adjustment of the trimmers be had.

4. I. F. ALIGNMENT

(A) Connect the Output Meter across the primary terminals of the output transformer.

(B) Set the signal generator to 465 K. C. and connect the output to the grid of the 6A8 oscillator tube through a .05 mfd. condenser. Connect the generator ground lead to the ground post on the receiver.

(C) Set the receiver range switch to position "B" the dial pointer to 600 K. C. and the volume control full on.

(D) Adjust the I. F. Trimmers A1, A2, A3, A4, A5, and A6 to maximum output.

5. 1500 K. C. ALIGNMENT

(A) Set the generator to 1500 K. C. and connect the output to the antenna post on the chassis through a 200 Mmfd. condenser.

(B) Set the receiver dial pointer to 1500 K. C.

(C) Adjust the trimmers A7-Oscillator, A8-Detector and A9-Antenna to maximum output.

6. 600 K. C. ALIGNMENT

(A) Set the generator to 600 K. C.

(B) Set the receiver dial to 600 K. C.

(C) Adjust the trimmer A10 to maximum output and at the same time rock the tuning condenser slowly back and forth through resonance until the exact resonant point is determined.

7. 5000 K. C. ALIGNMENT

(A) Set the generator to 5000 K. C. and connect the output to the Antenna post on the chassis through a 400 Ohm carbon resistor.

(B) Set the receiver dial pointer to 5000 K. C. and the range switch to position "P"

(C) Adjust the trimmers A11-Oscillator and A12-Detector to maximum output.

8. 18 M. C. ALIGNMENT

(A) Set generator to 18 M. C.

(B) Set receiver dial pointer to 18 M. C. and the range switch to position "F."

(C) Screw the Oscillator trimmer (A13) down tightly and slowly back off until signal is heard.

(D) Adjust the Antenna trimmer (A14) to maximum output and at the same time rock the tuning condenser slowly back and forth through resonance until the exact resonant point is determined.

(E) Return to Oscillator trimmer (A13) and repeat operations C. & D.

9. REJECTOR FILTER ALIGNMENT

(A) On 11G chassis having the I. F. Rejector Filter the trimmer will be found on the rear of the chassis near the antenna post.

(B) This filter is aligned at a frequency of 465 K. C. and must NOT be peaked until the rest of the circuit has been completely aligned.

(C) Set generator to 465 K. C. and connect the output to the antenna binding post on the receiver through a .002 mfd. condenser.

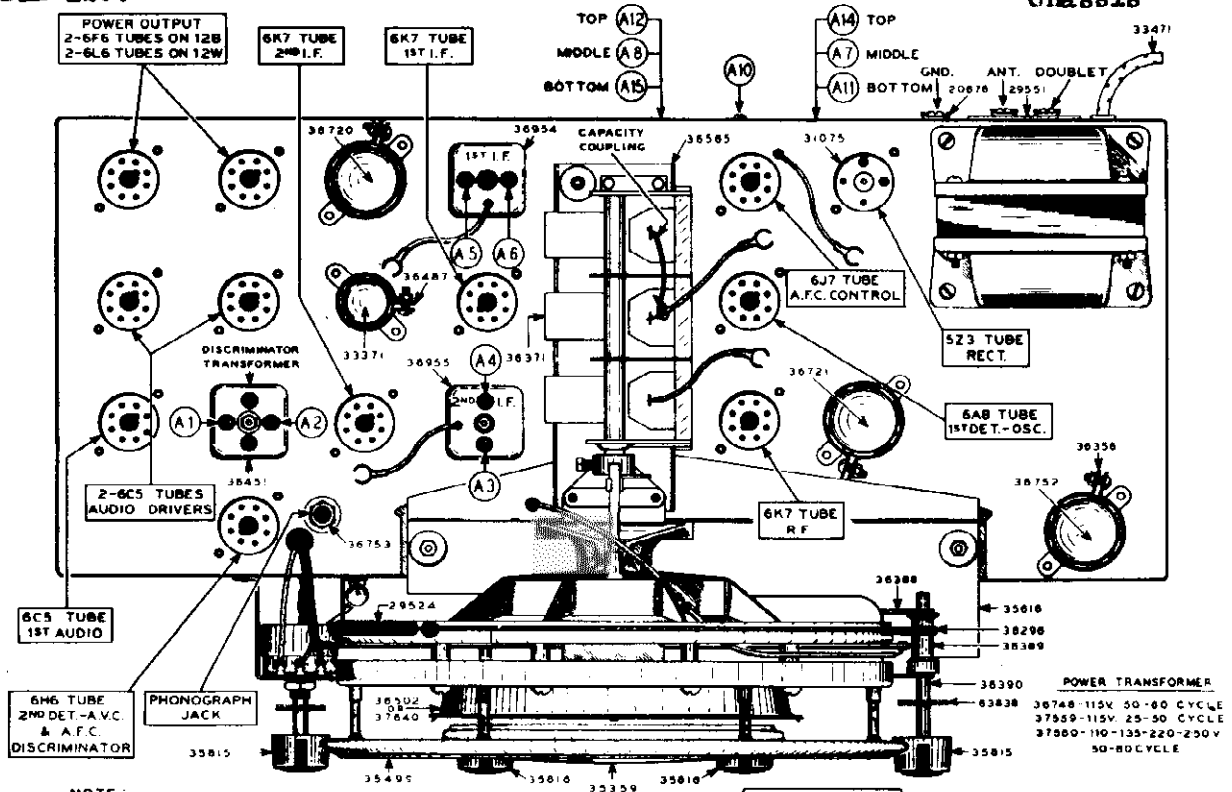
(D) Set the receiver dial pointer to 600 K. C. and the range switch to position "B."

(E) With a strong signal input adjust the trimmer to a *minimum* reading on the output meter.

MODEL 1291
Chassis 12B
MODEL 1297

GENERAL HOUSEHOLD UTILITIES CO.

Chassis 12W
Socket, Trimmers
Chassis



NOTE:
ALL TUBE SOCKETS ARE
#33308 - EXCEPT RECT.
TUBE.

CHASSIS TOP VIEW

FIG.-1

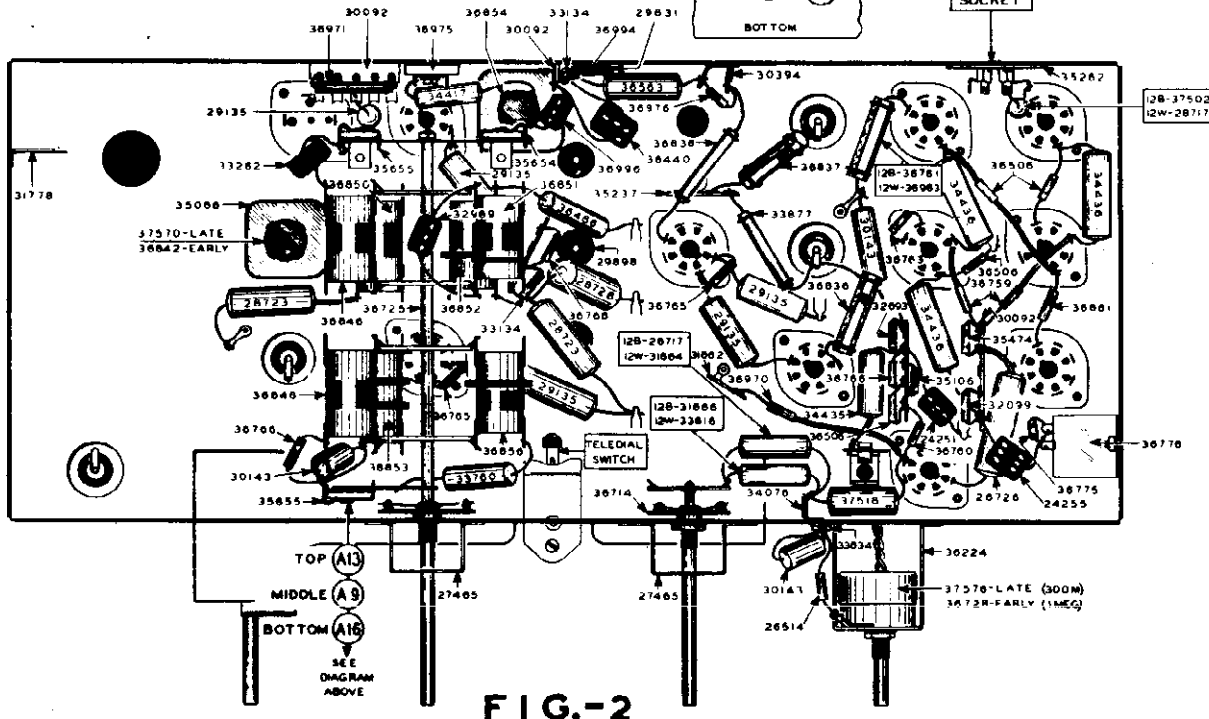


FIG.-2

CHASSIS BOTTOM VIEW

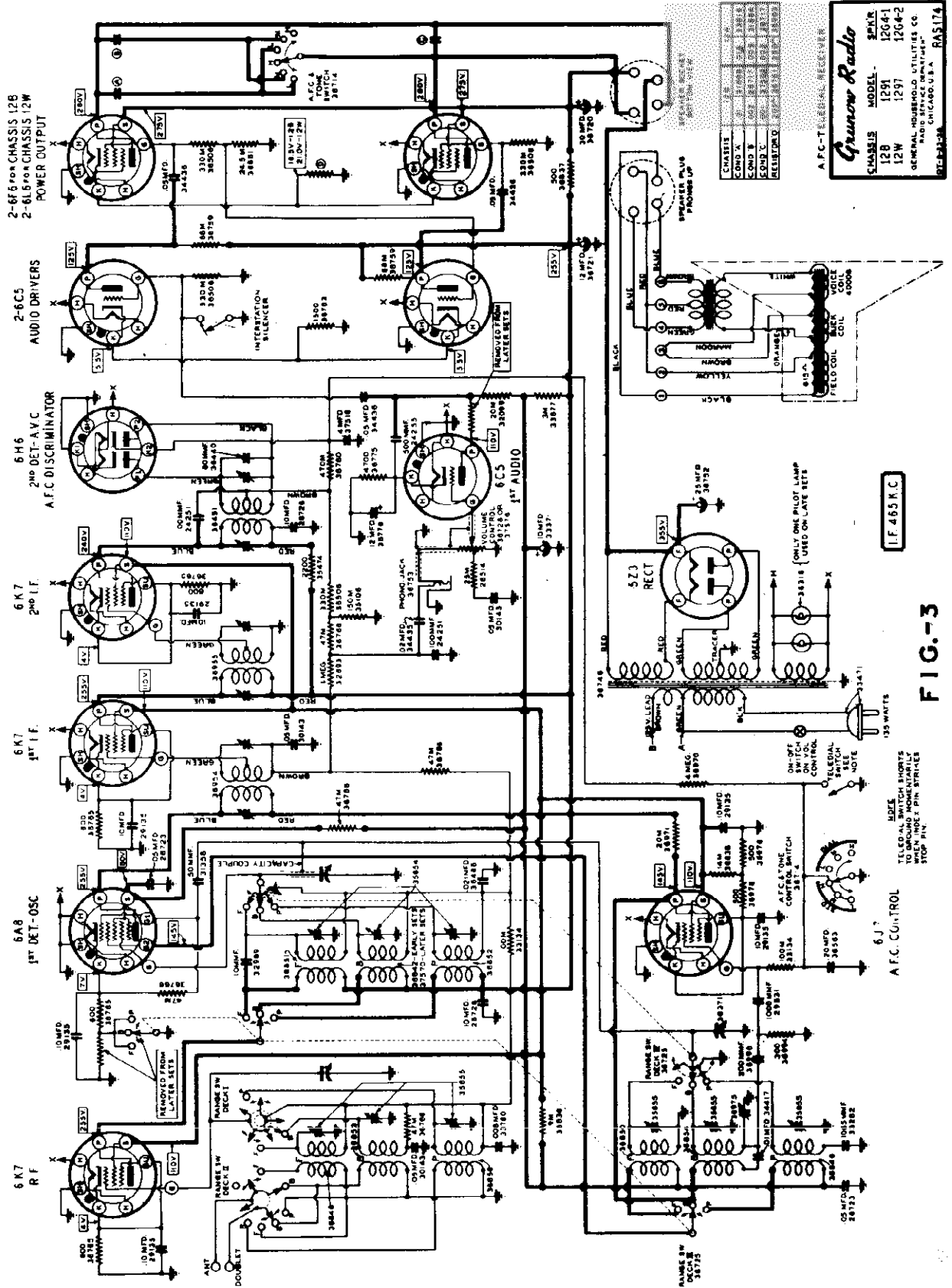
CHASSIS 12B & 12W
AUGUST - 1936
RAS 187

Schematic, Parts Voltage

GENERAL HOUSEHOLD UTILITIES CO.

MODEL 1291 Chassis 12B
MODEL 1297 Chassis 12W

The GRUNOW Chassis 12B and 12W are twelve tube, three band superheterodyne receivers, incorporating a combination mechanical and automatic tuning system.



MODEL 1201
Chassis 12B
MODEL 1297
Chassis 12W

GENERAL HOUSEHOLD UTILITIES CO.

Alignment
Teledial Parts

CIRCUIT ALIGNMENT PROCEDURE

Do not attempt to align this chassis without the proper equipment as the sensitivity, selectivity, and calibration absolutely depend on the exact conformance to the following instructions. Each step in the alignment operation is given in its proper sequence and under no conditions should this order be changed. The chassis should be aligned in a location free from local interference (motors, flashers, automobile ignition, etc.) as high frequency disturbances will cause difficulty when the short wave section is adjusted. A screen room is recommended.

1. EQUIPMENT.

- (A) Signal Generator.
- (B) A modulated oscillator capable of generating signals from 465 K.C. to 18 Mcgacycles, having an output of at least .10 volt.
- (C) Non-metallic screw-driver (Alignment Tool).
- (D) Output Meter.
- (E) A standard type output meter with sufficient sensitivity to give a good deflection with a small signal input.
- (F) Discriminator Meter.

A galvanometer with sufficient sensitivity to read the current swing of the discriminator circuit. A type No. 699 Weston Galvanometer or equivalent is recommended. It is also suggested that a variable shunt of approximately 200 Ohms (wire wound rheostat) be connected across the galvanometer until approximate balance is reached. The shunt will also act as a safety device and "keeper" when the meter is not in use.

(E) Dummy Antenna.

- .05 Mfd. condenser (I.F. Alignment).
- 200 Mmfd. condenser (Broadcast Alignment).
- 400 Ohm carbon resistor (Short Wave Alignment).

2. HEATING.

- (A) Connect the receiver to a 115 V. A.C. source and allow the chassis to warm up for a period of 20 to 30 minutes. This is necessary to eliminate possible alignment variations due to thermal expansion or contraction of the capacitors and inductances in the various tuned circuits.
- (B) The signal generator should be warmed up also, in order to prevent any frequency changes during alignment.

3. DIAL CALIBRATION.

- (A) Turn the tuning knob until the condensers are fully meshed and set the dial pointer (Hour Hand) to the horizontal line pointing to 9 and 3 on the outer dial scale.
- (B) Set the band spreading pointer (Minute Hand) to the vertical line, pointing to 12.

4. DISCRIMINATOR ALIGNMENT.

- (A) Set the signal-generator to a frequency of 465 K.C., connect the output through an .05 mfd. condenser to the control grid of the 6K7-2nd I. F. tube. Connect

the ground lead to the ground post on the chassis.

- (B) Turn range switch to broadcast position (B), turn volume control full off and set dial pointer to 600 K.C.
- (G) Adjust Discriminator primary (A1 or A2) to maximum swing on galvanometer (either positive or negative).

(H) Re-align secondary trimmer to position of zero current. Check signal-generator to be sure frequency has not changed. Do not re-adjust primary unless the entire operation above is repeated.

- (I) Vary the frequency of the signal-generator to be certain that discriminator pointer rests at zero at exactly 465 K.C. Check to determine the maximum current on both sides of resonance—maximum positive current should equal maximum negative current.

Note: Discriminator alignment as outlined above is the accepted and most satisfactory method of obtaining an accurate adjustment. However, if a signal-generator of at least 10 volt output is not available, fair results can be obtained by introducing the signal through the grid of the 6A8 tube. If this method is used, the A.F.C. switch must be on "STD." position (A.F.C. circuit inoperative). This method is not recommended for best results.

5. I.F. ALIGNMENT—465 K.C.

- (A) Set the signal-generator to a frequency of 465 K.C., connect the output through an .05 Mfd. condenser to the control grid of the 6A8-1st Detector-Oscillator tube and the ground lead to the ground post on the chassis.
- (B) Adjust the I.F. Trimmers A3, A4, A5 and A6 to maximum output and at the same time attenuate the signal at the generator so as to have a minimum signal input to the receiver at all times during this and the following operations.

6. 1500 K.C. ALIGNMENT.

- (A) Connect the output of the generator to the antenna post of the receiver through a 200 Mmfd. condenser and set the frequency at 1500 K.C.
- (B) Set the dial pointer of the receiver to 1500 K.C.
- (C) Adjust broadcast trimmers (A7) Oscillator, (A8) Detector and (A9) Antenna to maximum output.
- (C) Connect the galvanometer to the two cathodes of the 6H6 Discriminator Tube.

- (D) Attenuate signal-generator to maximum output, being certain that the frequency remains at 465 K.C.
- (E) Determine primary and secondary of Discriminator transformer (A1 or A2) by touching the trimmer screws with a metal screw driver. When the metal comes in contact with the screw on the secondary trimmer, the galvanometer will fluctuate.

- (F) With alignment tool back off trimmer screw of Discriminator secondary (A1 or A2) until trimmer is wide open.

7. 600 K.C. ALIGNMENT.

- (A) Set the generator frequency to 600 K.C.
- (B) Set the receiver dial pointer to 600 K.C.
- (C) Adjust the 600 K.C. padder (A10) in direction of signal increase and at the same time rock tuning condenser back and forth through resonance; until the point of exact resonance is determined. This point does not have to be exactly 600 K.C. dial setting.

- 8. Repeat 1500 K.C. alignment operation No. 6, to correct any slight change which may have occurred due to the variation of the 600 K.C. padder.

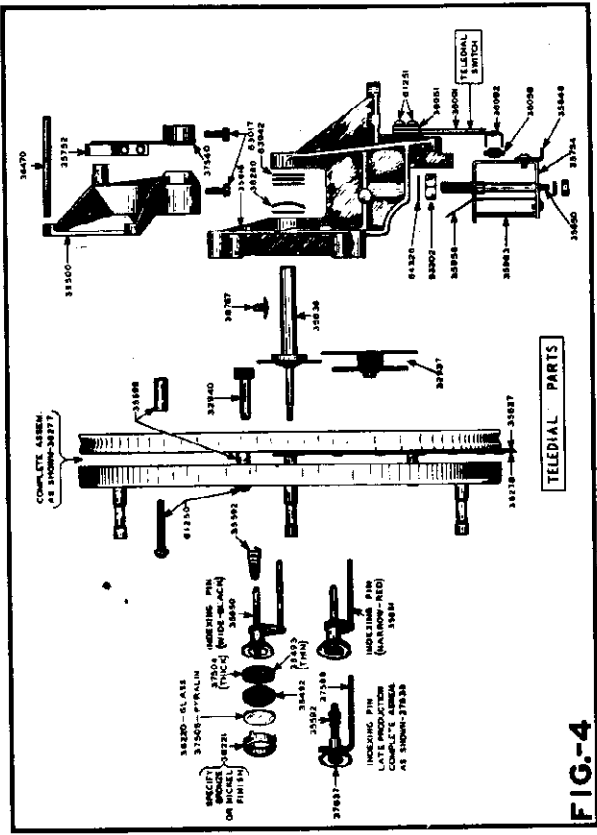
9. 5000 K.C. ALIGNMENT.

- (A) Set the generator to 5000 K.C. and connect the output to the antenna post of the receiver through a 400 Ohm carbon resistor.
- (B) Set the receiver range switch to the Police-Amateur position and the dial pointer to 5000 K.C.

- (C) Adjust the trimmers (A11) Oscillator, (A12) Detector and (A13) Antenna to maximum output. When adjusting (A11) use signal with least capacity—trimmer farthest open.

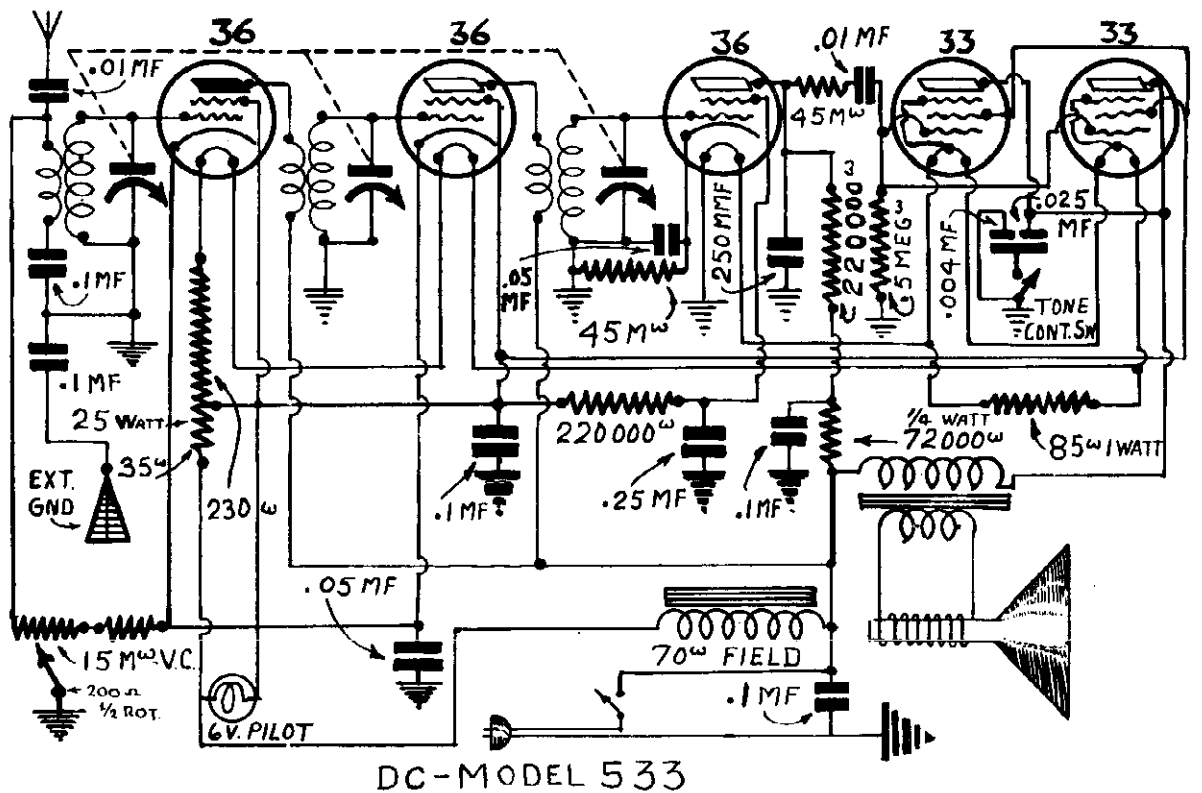
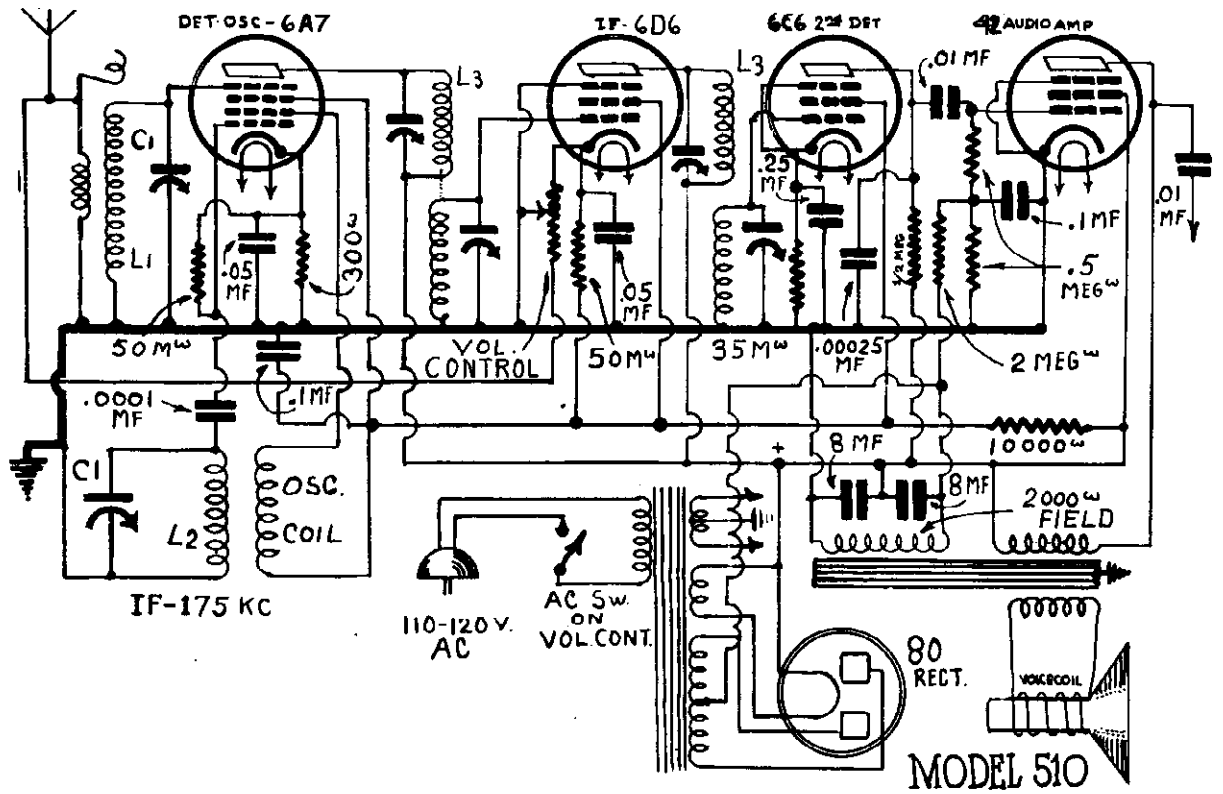
10. 18 M.C. ALIGNMENT.

- (A) Set generator to 18 M.C.
- (B) Set the receiver range switch to the Foreign Broadcast position and the dial pointer to 18 M.C.
- (C) Screw Oscillator Trimmer (A14) down tightly and then back off until signal is heard. Adjust to maximum output.
- (D) Adjust the Detector Trimmer (A15) and at the same time rock the tuning condenser slowly back and forth through resonance until the point of maximum output is determined.
- (E) Return to Oscillator Trimmer (A14) and re-adjust, if calibration has changed.
- (F) Adjust Antenna Trimmer (A16) until maximum output is obtained.



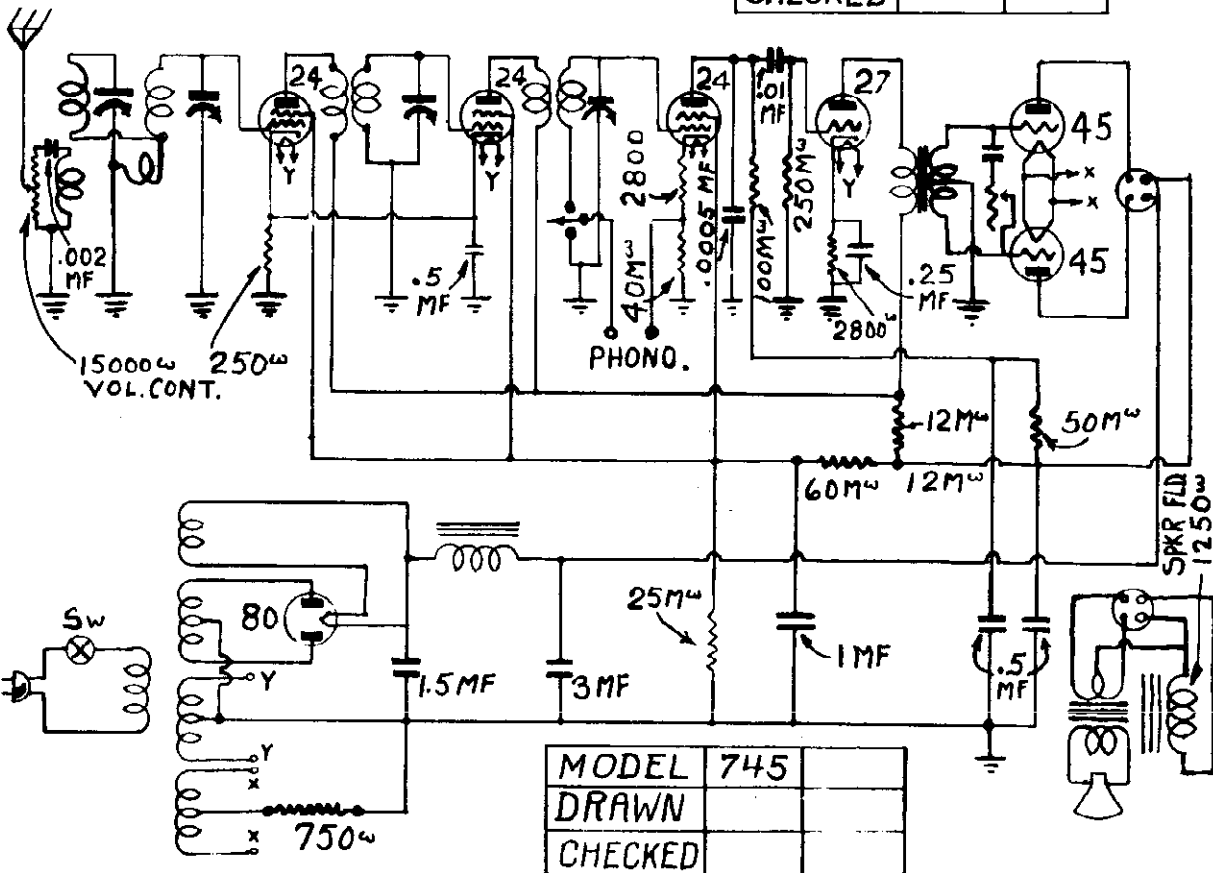
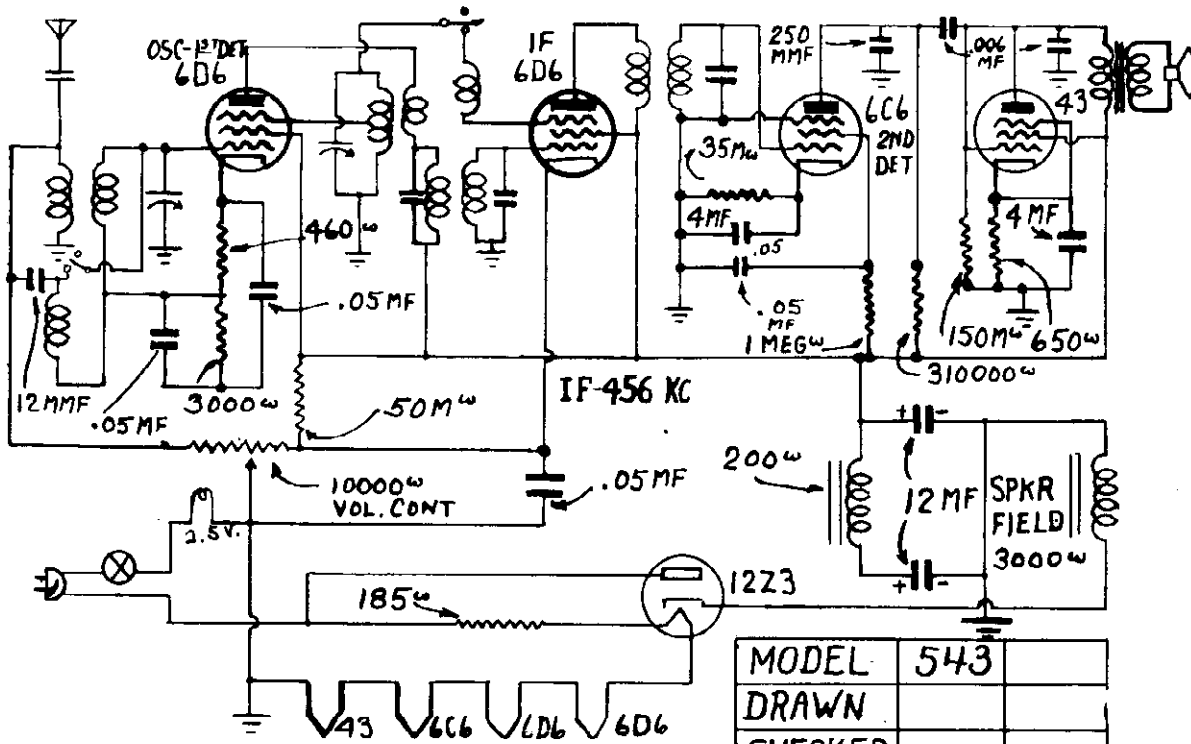
GENERAL TELEV. & RADIO CORP.

MODEL 510
MODEL 533
Schematic



MODEL 543
 MODEL 745
 Schematics

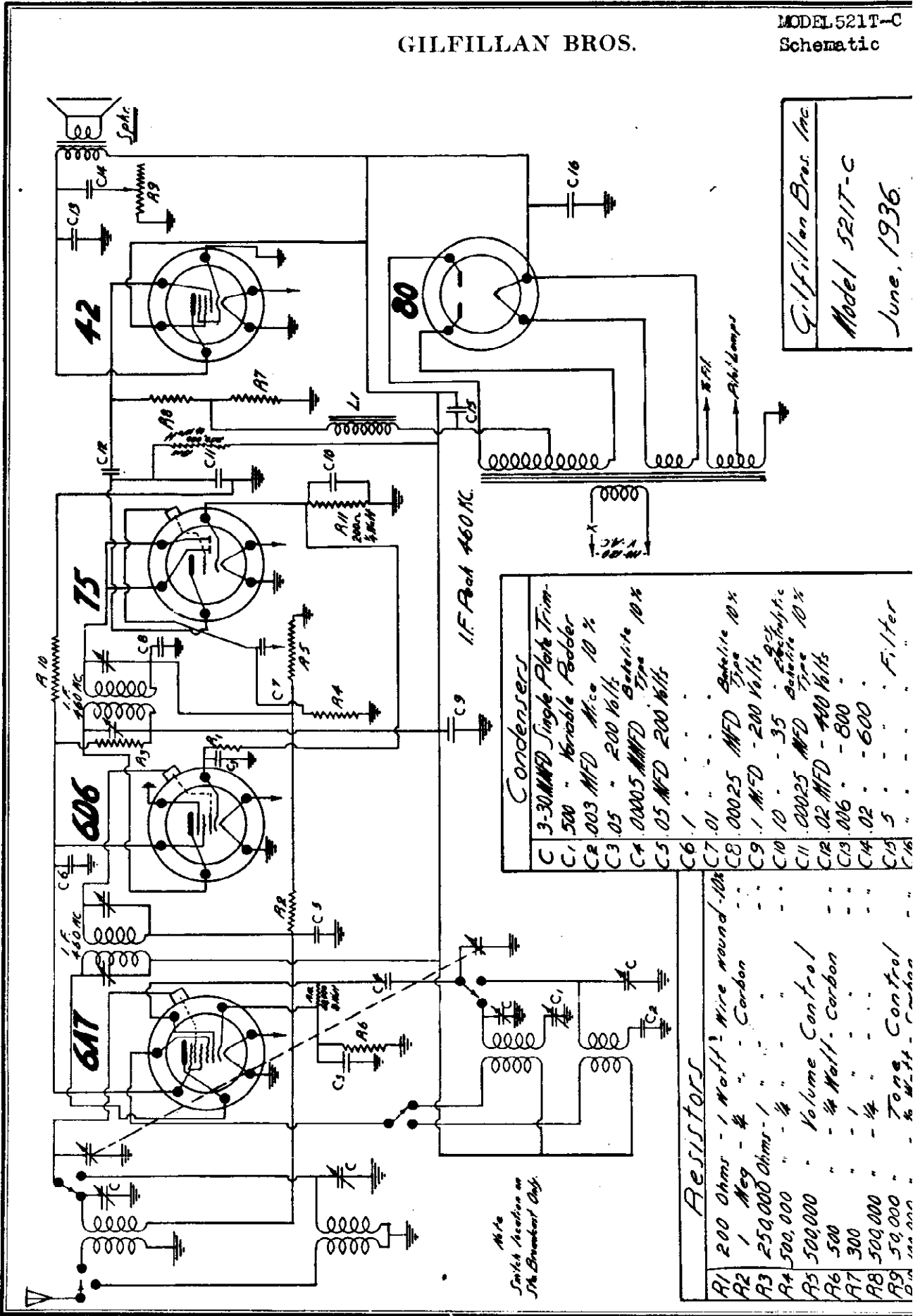
GENERAL TELEV. & RADIO CORP.



GILFILLAN BROS.

MODEL 521T-C
Schematic

Gilfillan Bros. Inc.
Model 521T-C
June, 1936.



CONDENSERS

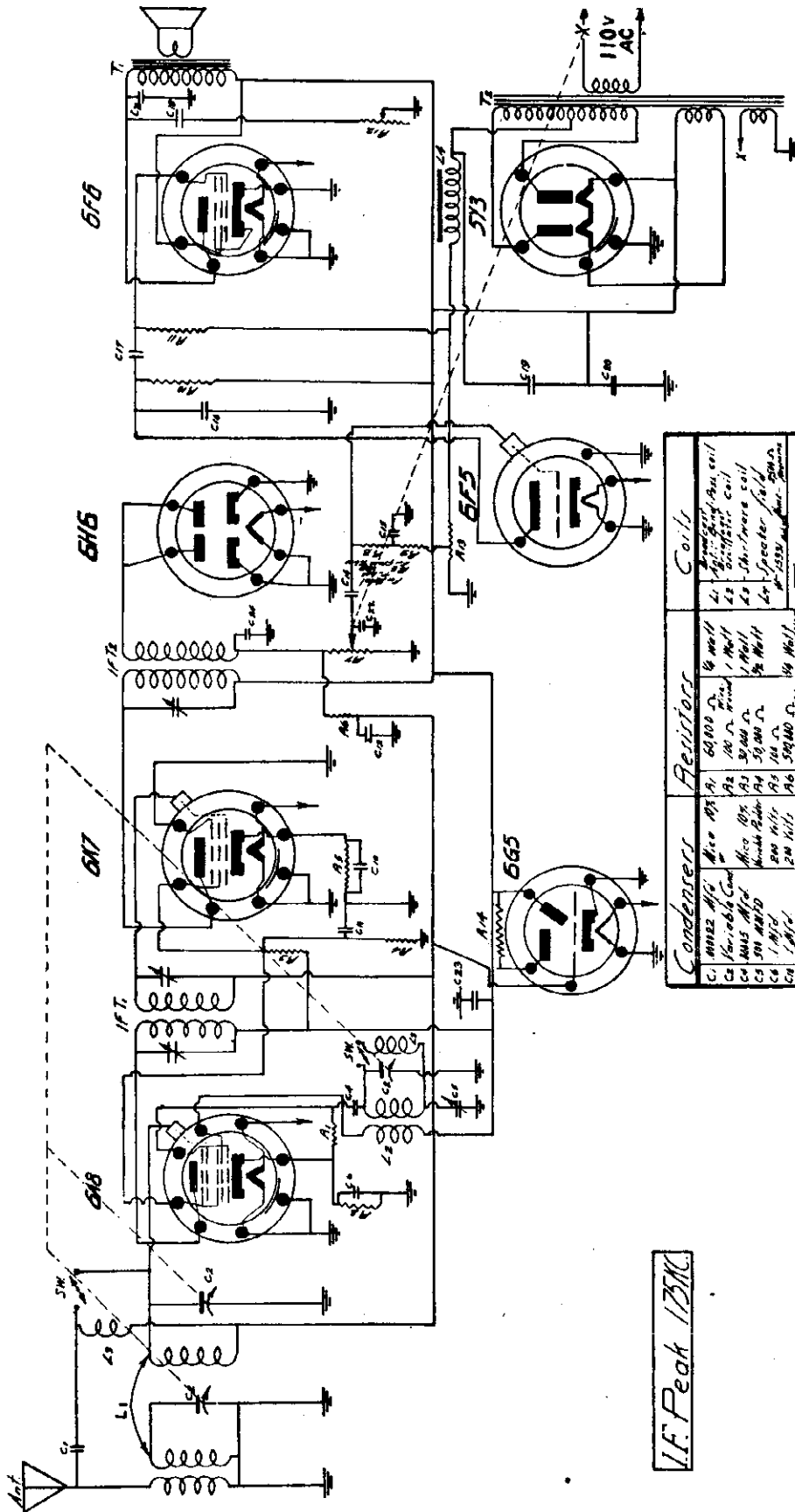
C	3-30 MFD	Single Plate Trim-
C1	500	Variable Padder
C2	0.03 MFD	Mica 10%
C3	0.5	200 Volts
C4	0.0005 MFD	Beholite 10%
C5	0.5 MFD	200 Volts
C6	1	
C7	0.1	Beholite 10%
C8	0.0025 MFD	Type
C9	1 MFD	200 Volts
C10	10	35 Beholite
C11	0.0025 MFD	Type 10%
C12	0.2 MFD	400 Volts
C13	0.06	800
C14	0.2	600
C15	5	Filter
C16		

RESISTORS

R1	200 Ohms	1 Watt	Wire wound
R2	1 Meg	1/4	Carbon
R3	250,000 Ohms	1/4	Carbon
R4	500,000		
R5	500,000		Volume Control
R6	500		1/4 Watt
R7	300		Carbon
R8	500,000		
R9	50,000		1/4
R10	100,000		Tone Control
			1/4 Watt
			Carbon

MODEL 711T
Schematic

GILFILLAN BROS.



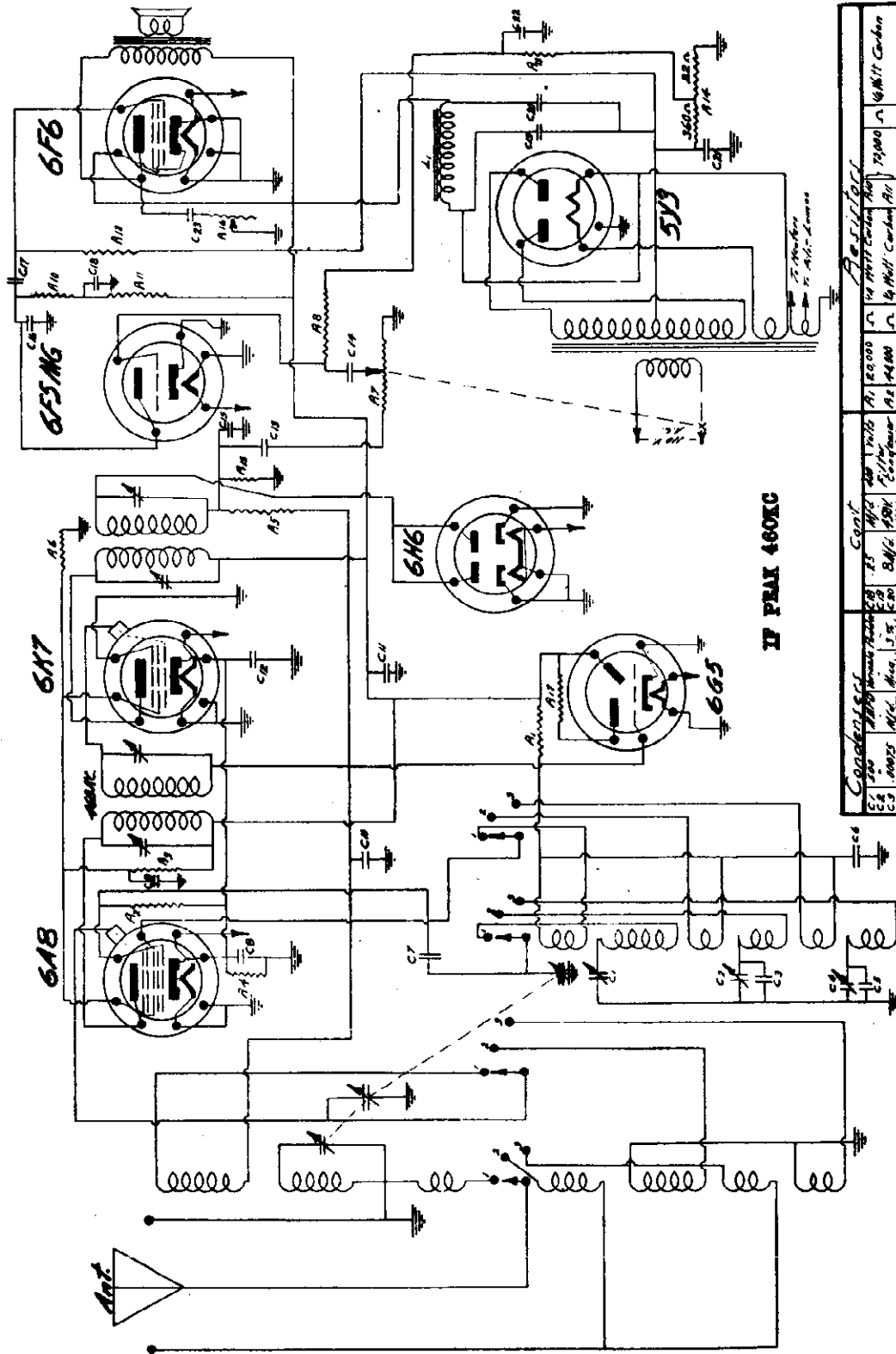
Condensers		Resistors		Coils	
C1	4000 MFD	R1	50,000 Ω	L1	Antenna coil
C2	4000 MFD	R2	50,000 Ω	L2	AF coil
C3	4000 MFD	R3	50,000 Ω	L3	AF coil
C4	4000 MFD	R4	50,000 Ω	L4	AF coil
C5	4000 MFD	R5	50,000 Ω	L5	AF coil
C6	4000 MFD	R6	50,000 Ω	L6	AF coil
C7	4000 MFD	R7	50,000 Ω	L7	AF coil
C8	4000 MFD	R8	50,000 Ω	L8	AF coil
C9	4000 MFD	R9	50,000 Ω	L9	AF coil
C10	4000 MFD	R10	50,000 Ω	L10	AF coil
C11	4000 MFD	R11	50,000 Ω	L11	AF coil
C12	4000 MFD	R12	50,000 Ω	L12	AF coil
C13	4000 MFD	R13	50,000 Ω	L13	AF coil
C14	4000 MFD	R14	50,000 Ω	L14	AF coil
C15	4000 MFD	R15	50,000 Ω	L15	AF coil
C16	4000 MFD	R16	50,000 Ω	L16	AF coil
C17	4000 MFD	R17	50,000 Ω	L17	AF coil
C18	4000 MFD	R18	50,000 Ω	L18	AF coil
C19	4000 MFD	R19	50,000 Ω	L19	AF coil
C20	4000 MFD	R20	50,000 Ω	L20	AF coil
C21	4000 MFD	R21	50,000 Ω	L21	AF coil
C22	4000 MFD	R22	50,000 Ω	L22	AF coil
C23	4000 MFD	R23	50,000 Ω	L23	AF coil
C24	4000 MFD	R24	50,000 Ω	L24	AF coil
C25	4000 MFD	R25	50,000 Ω	L25	AF coil
C26	4000 MFD	R26	50,000 Ω	L26	AF coil
C27	4000 MFD	R27	50,000 Ω	L27	AF coil
C28	4000 MFD	R28	50,000 Ω	L28	AF coil
C29	4000 MFD	R29	50,000 Ω	L29	AF coil
C30	4000 MFD	R30	50,000 Ω	L30	AF coil
C31	4000 MFD	R31	50,000 Ω	L31	AF coil
C32	4000 MFD	R32	50,000 Ω	L32	AF coil
C33	4000 MFD	R33	50,000 Ω	L33	AF coil
C34	4000 MFD	R34	50,000 Ω	L34	AF coil
C35	4000 MFD	R35	50,000 Ω	L35	AF coil
C36	4000 MFD	R36	50,000 Ω	L36	AF coil
C37	4000 MFD	R37	50,000 Ω	L37	AF coil
C38	4000 MFD	R38	50,000 Ω	L38	AF coil
C39	4000 MFD	R39	50,000 Ω	L39	AF coil
C40	4000 MFD	R40	50,000 Ω	L40	AF coil
C41	4000 MFD	R41	50,000 Ω	L41	AF coil
C42	4000 MFD	R42	50,000 Ω	L42	AF coil
C43	4000 MFD	R43	50,000 Ω	L43	AF coil
C44	4000 MFD	R44	50,000 Ω	L44	AF coil
C45	4000 MFD	R45	50,000 Ω	L45	AF coil
C46	4000 MFD	R46	50,000 Ω	L46	AF coil
C47	4000 MFD	R47	50,000 Ω	L47	AF coil
C48	4000 MFD	R48	50,000 Ω	L48	AF coil
C49	4000 MFD	R49	50,000 Ω	L49	AF coil
C50	4000 MFD	R50	50,000 Ω	L50	AF coil

I.F. Peak 135K

GILFILLAN BROS. INC.
Model - 711T
Date - 9/2/36

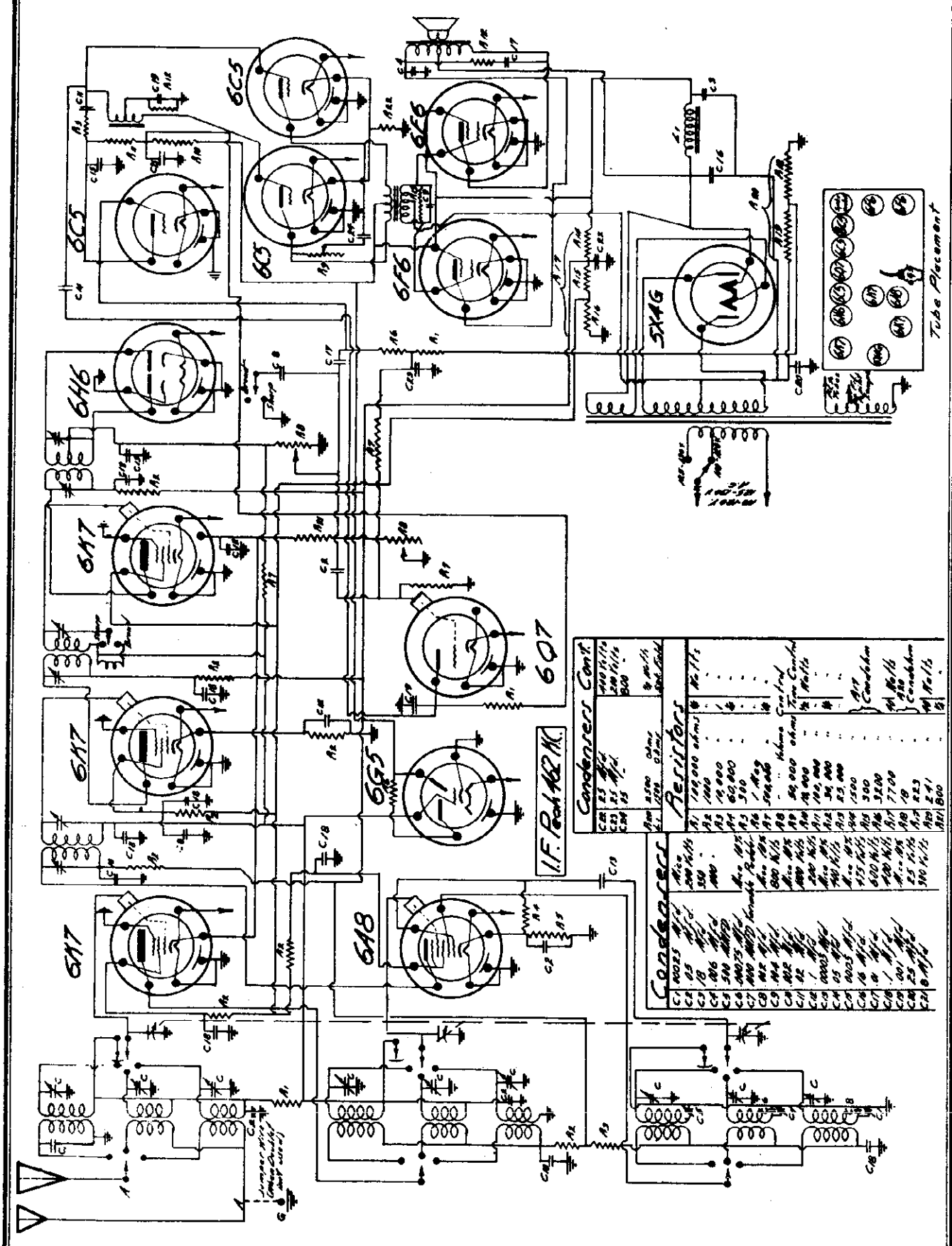
GILFILLAN BROS.

MODEL 731T-C
Schematic



CONDENSERS		COILS		RESISTORS	
C1	500	25	100	A1	20,000
C2	1000	50	200	A2	40,000
C3	500	100	500	A3	10,000
C4	100	200	1000	A4	200
C5	500	500	2000	A5	500
C6	100	1000	5000	A6	1000
C7	500	2000	10000	A7	1000
C8	1000	5000	20000	A8	1000
C9	5000	10000	50000	A9	1000
C10	10000	20000	100000	A10	1000
C11	20000	50000	200000	A11	1000
C12	50000	100000	500000	A12	1000
C13	100000	200000	1000000	A13	1000
C14	200000	500000	2000000	A14	1000
C15	500000	1000000	5000000	A15	1000
C16	1000000	2000000	10000000	A16	1000
C17	2000000	5000000	20000000	A17	1000

GILFILLAN BROS. INC.
Model 731T-C
Engr. Dept.
Oct. 5th 1936



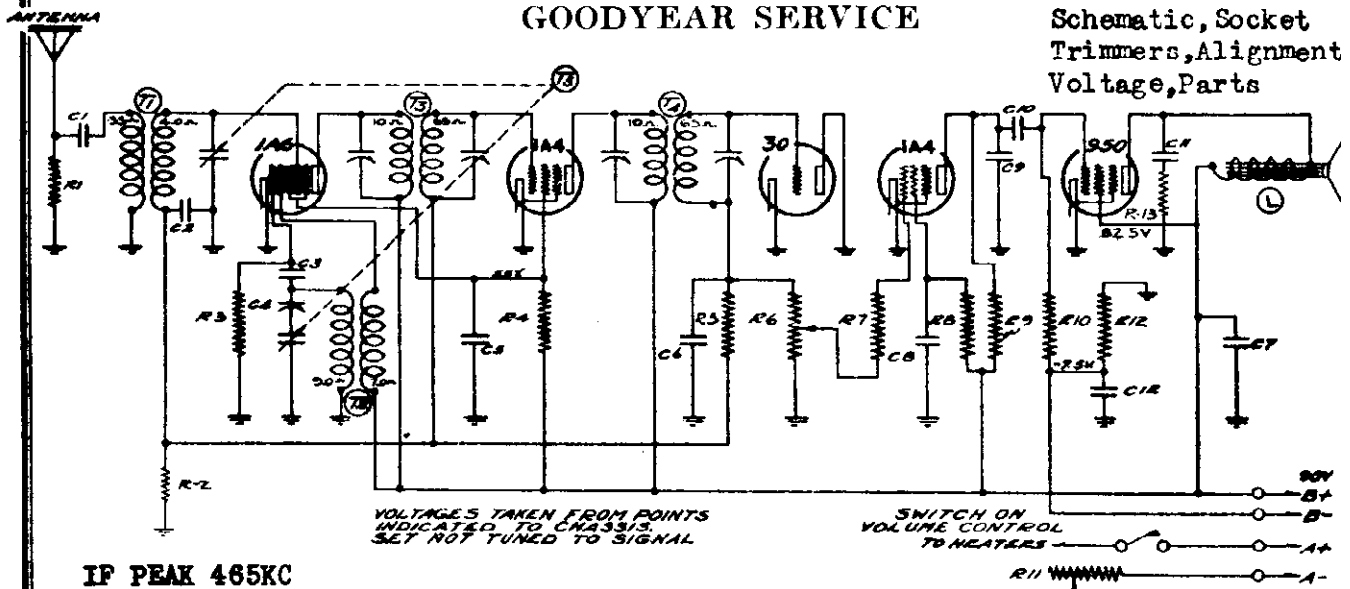
Tube Placement

I.F. Pot 422 K

Condensers Cont.		Resistors	
C1 0.0025 Mfd.	100 K Ω	R1 100,000 ohms	100 K Ω
C2 0.005 Mfd.	500 K Ω	R2 1,000	500
C3 0.01 Mfd.	1,000	R3 10,000	10,000
C4 0.015 Mfd.	2,000	R4 50,000	50,000
C5 0.02 Mfd.	3,000	R5 100,000	100,000
C6 0.025 Mfd.	4,000	R6 500	500
C7 0.03 Mfd.	5,000	R7 10,000	10,000
C8 0.035 Mfd.	6,000	R8 50,000	50,000
C9 0.04 Mfd.	7,000	R9 100,000	100,000
C10 0.045 Mfd.	8,000	R10 500	500
C11 0.05 Mfd.	9,000	R11 10,000	10,000
C12 0.055 Mfd.	10,000	R12 50,000	50,000
C13 0.06 Mfd.	11,000	R13 100,000	100,000
C14 0.065 Mfd.	12,000	R14 500	500
C15 0.07 Mfd.	13,000	R15 10,000	10,000
C16 0.075 Mfd.	14,000	R16 50,000	50,000
C17 0.08 Mfd.	15,000	R17 100,000	100,000
C18 0.085 Mfd.	16,000	R18 500	500
C19 0.09 Mfd.	17,000	R19 10,000	10,000
C20 0.095 Mfd.	18,000	R20 50,000	50,000
C21 0.1 Mfd.	19,000	R21 100,000	100,000
C22 0.105 Mfd.	20,000	R22 500	500
C23 0.11 Mfd.	21,000	R23 10,000	10,000
C24 0.115 Mfd.	22,000	R24 50,000	50,000
C25 0.12 Mfd.	23,000	R25 100,000	100,000

GOODYEAR SERVICE

MODEL 523
Schematic, Socket
Trimmers, Alignment
Voltage, Parts



IF PEAK 465KC

No.	Part No.	RESISTORS	Description
R1'	130-17	10M Ohm	- 1/3 W. - 20% - Carbon
R2	130-38	2 meg	- 1/3 W. - 20% - Carbon
R3	130-52	50M	- 1/3 W. - 20% - Carbon
R4	130-17	10M	- 1/3 W. - 20% - Carbon
R5	130-38	2 meg	- 1/3 W. - 20% - Carbon
R6	101-69	1 meg	- Volume Control -
R7	130-52	50M	- 1/3 W. - 20% - Carbon
R8	130-19	1 meg	- 1/3 W. - 20% - Carbon
R9	130-9	200M ohm	1/3 W. - 20% - Carbon
R10	130-19	1 meg	- 1/3 W. - 20% - Carbon
R11	101-44	475	- Rheostat
R12	130-93	450	- 1/3 W. - 10% - Carbon
R13	130-52	50M	- 1/3 W. - 20% - Carbon
CONDENSERS			
C1	100-11	.01 x 400 v.	- 25%
C2	100-22	.05 x 200 v.	- 25%
C3	129-12	.00025 Mica	- MT - 20%
C4	124-14	Series Pad	
C5	100-9	.05 x 200 v.	- 25%
C6	129-5	.0001 Mica	- MT - 20%
C7	100-48	.25 x 200 v.	
C8	100-9	.05 x 200 v.	- 25%
C9	129-2	.0005 Mica	- MT - 20%
C10	100-11	.01 x 400 v.	- 25%
C11	100-11	.01 x 400 v.	- 25%
C12	119-22	10.0 mfd. x 25 v.	- Working Voltage
PARTS			
T1	111-46	Antenna Coil	
T2	110-36	Oscillator Coil	
T3	108-67	Input I. F. Coil - 46 kc.	
T4	108-68	Output I. F. Coil - 465 kc.	
T5	102-42	Two Gang Condenser	
L	114-71	Eight Inch Magnetic Speaker	

DESCRIPTION

TUBES:

The tube complement of this chassis is as follows:
 1 Type 1A6—first detector oscillator.
 1 Type 1A4—I.F. amplifier. 465 K. C.
 1 Type 30—second detector. A. V. C.
 1 Type 1A4—audio.
 1 Type 950—output.

FOR BEST OPERATION THIS RECEIVER MUST HAVE AN OUTSIDE AERIAL NOT OVER FIFTY FEET LONG INCLUDING THE LEAD IN.

The following batteries are needed.
 2.....45 volt "B" Batteries.

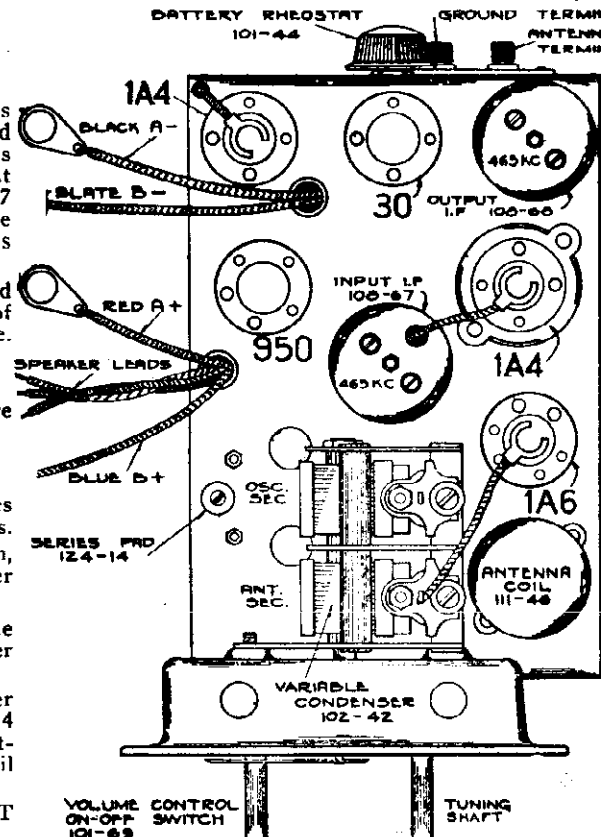
1.....3 Volt Dry "A" Battery or 2 Volt Storage Battery.

ALIGNING I.F. TRANSFORMERS: (465 K.C.)

1. With volume control full on and with variable condenser at its minimum capacity position, plates entirely out of mesh, and with external oscillator set at 465 K.C. connected in series with a .1 mfd. condenser, to the grid of the 1A6 tube (cap at top of tube), adjust I.F. transformers, parts number 108-67 and 108-68, to resonance. Both of these transformers have two (2) adjustments each, they are accessible from the tops of the cans (for location see top view).
 Use as a resonance indicator an output meter connected across the outside terminals of the speaker or by means of an adapter to the plate and screen of the type 950 output tube. Maximum deflection of the volt meter indicates resonance.
 Use only enough signal to get a readily readable output.
 A low range output meter or the low scale of a multi-range meter should be used.

BROADCAST BAND ALIGNMENT:

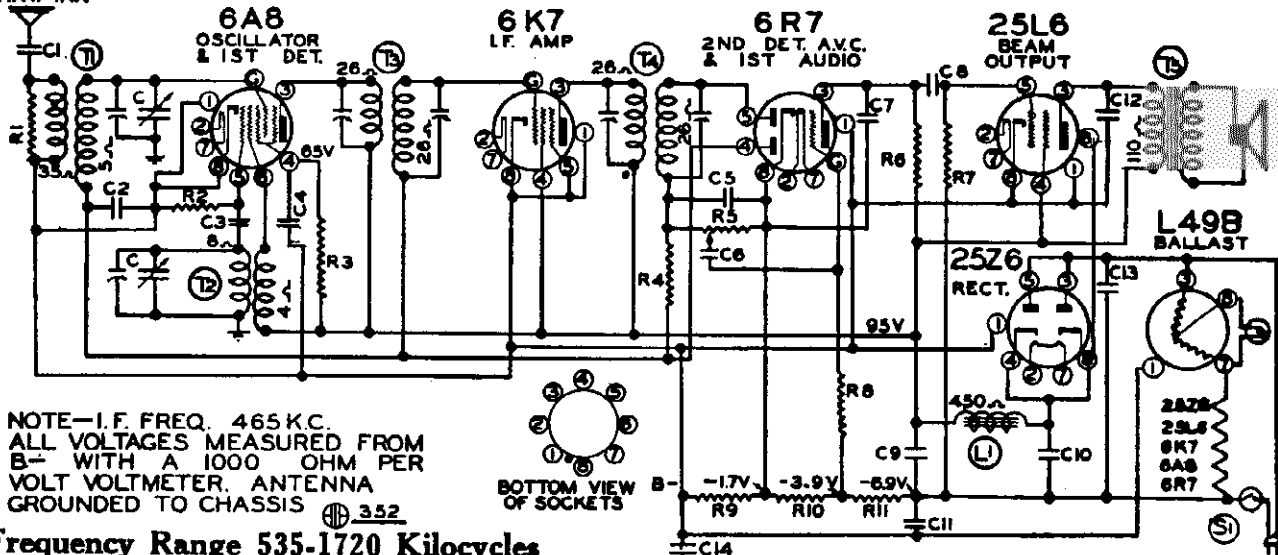
1. Set external oscillator to 1720 K.C. and connect it in series with a 200 mmfd. condenser to the antenna and ground posts.
 (a) With variable condenser in its minimum capacity position, plates entirely out of mesh, adjust oscillator trimmer (rear section of variable condenser) to resonance.
 (b) Re-set external oscillator to 1400 K.C. Rotate variable condenser, pick up signal and adjust antenna trimmer (front section of variable condenser) to resonance.
 (c) Re -set external oscillator to 600 K.C., move dial pointer to 600 K.C., and adjust series pad, part number 124-14 (see top view), to resonance. While making this adjustment, slowly rock variable condenser to and fro until maximum output is obtained.
 (d) Check for sensitivity at 1400, 1000, 600 K.C. DO NOT BEND PLATES.



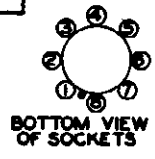
MODEL 602

Schematic, Socket, Trimmers,

GOODYEAR SERVICE



NOTE—I.F. FREQ. 465 K.C.
ALL VOLTAGES MEASURED FROM B- WITH A 1000 OHM PER VOLT VOLTMETER. ANTENNA GROUNDED TO CHASSIS



Frequency Range 535-1720 Kilocycles

RESISTORS			CONDENSERS			PARTS		
No.	Part No.	Description	No.	Part No.	Description	No.	Part No.	Description
R1	130-17	10M ohm - 1/3 w. 20%	C	102-48	2 gang variable	T1	111-58B	Antenna Coil Complete
R2	130-12	50M ohm - 1/3 w. 20%	C1	100-25	.002 x 600	T2	110-46	Oscillator Coil Complete
R3	130-149	15M ohm - 1/3 w. 20%	C2	100-9	.05 x 200	T3	108-82B	Input I. F. Complete
R4	130-4	3 meg ohm - 1/3 w. 20%	C3	129-12	.00025 Mica	T4	108-83B	Output I. F. Complete
R5	101-77	Volume Control (1 Meg)	C4	100-22	.05 x 200	T5	114-71	Dynamic Speaker
R6	130-12	50M ohm - 1/3 w. 20%	C5	129-5	.0001 Mica	L1		450 ohm speaker field
R7	130-20	100M ohm - 1/3 w. 20%	C6	100-11	.01 x 400	S1		Switch on Volume Control
R8	130-19	1 megohm - 1/3 w. 20%	C7	129-2	.0005 Mica			
R9	106-38	30 ohm	C8	100-22	.05 x 200			
R10	106-38	40 ohm	C9	119-39	20 mfd. lytic - 100 w.v.			
R11	106-38	55 ohm	C10	119-39	15 mfd. lytic - 100 w.v.			
R9, R10, and R11 in one unit			C11	100-20	.1 x 200			

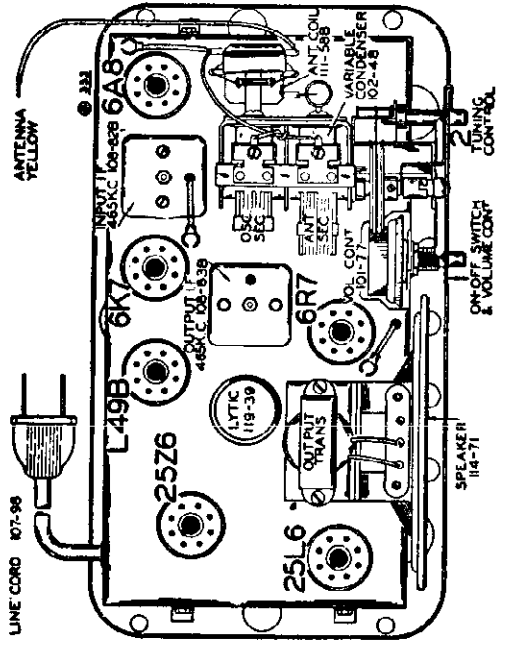
ALIGNING I.F. TRANSFORMERS: (465 K. C.):

- Part No. 108-83B Output I.F. Transformer
 - Part No. 108-82B Input I.F. Transformer
- These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see Fig. 1).
- With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
 - Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 6K7G tube, and adjust the output I.F. transformer (No. 108-83B) to resonance.
 - Move oscillator output clip from grid of 6K7G to grid of 6A8G and adjust input I.F. transformer (No. 108-82B) to resonance.
 - With oscillator still connected to 6A8G, readjust output I.F. transformer (108-83B) if necessary.

- The type and function of each tube is as follows:
- Type 6A8G Pentagrid Mixer, First Detector-oscillator.
 - Type 6K7G Remote Cut-Off Pentode, I.F. Amplifier (K.C.)
 - Type 6R7G. Duplex Diode Triode Second Detector, and First Audio.
 - Type 25L6G Beam Output Amplifier.
 - Type 25Z6G High Vacuum Rectifier.
 - Type L49B Ballast Tube.

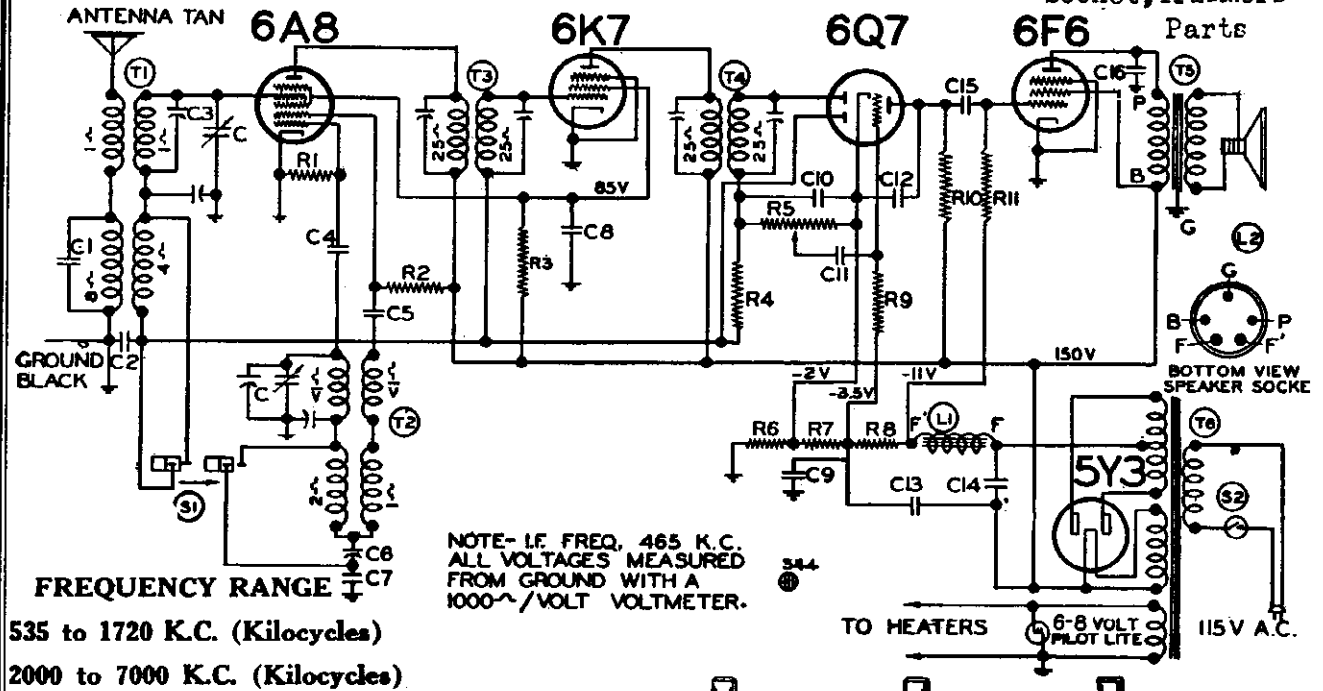
R.F. ALIGNMENT: (535-1720 K.C.)

- With gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 200 mmf. condenser to the antenna lead and chassis ground and make the following adjustments:
 - With external oscillator set at 1720 kilocycles, adjust oscillator trimmer to resonance. This adjustment is on the top of rear section of variable gang condenser. (See Fig. 1).
 - Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance. (Top of front section of gang condenser).
 - Check sensitivity at 600 and 1000 kilocycles.



GOODYEAR SERVICE

MODEL 588
Schematic, Voltage
Socket, Trimmers
Parts



FREQUENCY RANGE
535 to 1720 K.C. (Kilocycles)
2000 to 7000 K.C. (Kilocycles)

No. Part No. Description

CONDENSERS

C1	129-12	.0025 - Mica 20%
C2	100-22	.05 x 200 25%
C3	124-39	Adjustable Condenser 2-20 mmf.
C4	129-5	.0001 - Mica 20%
C5	100-37	.003 x 600 v. 10%
C6	124-38	Series Pad - 600 mmf.
C7	129-74	.0015 Mica 2 1/2 %
C8	100-1	.1 x 400 v. 50% - 10%
C9	100-20	.1 x 200 v. 25%
C10	129-5	.0001 Mica 20%
C11	100-11	.01 x 400 v. 25%
C12	129-2	.0005 Mica 20%
C13	119-38	5 mfd. 200 w. v. Black
C14	119-38	5 mfd. 250 w. v. Brown
C15	100-11	.01 x 400 v. 25%
C16	100-19	.006 x 600 v. 25%

C13 and C14 - in one unit.

RESISTORS

R1	130-12	50M ohm - 1/3 w. 20%
R2	130-17	10M ohm - 1/3 w. 20%
R3	130-149	15M ohm - 1/3 w. 20%
R4	130-4	3 megohm - 1/3 w. 20%
R5	101-71	1 megohm - Volume control
R6	106-35	65 ohm - Muter
R7	106-35	45 ohm - Muter
R8	106-35	220 ohm - Muter
R9	130-4	3 megohm - 1/3 w. 20%
R10	130-9	200M ohm - 1/3 w. 20%
R11	130-3	500M ohm - 1/3 w. 20%

R6, R7 and R8 in one unit

PARTS

T1	111-75	Antenna coil complete
T2	110-60	Oscillator coil complete
T3	108-104	Input I.F. Assembly complete
T4	108-103	Output I.F. Assembly complete
T5		Output Transformer
T6	104-60B	Power Transformer
L1		2000 ohm - speaker field
L2	114-61	Dynamic speaker
S1	125-27	Wave change switch
S2		Switch on Volume Control

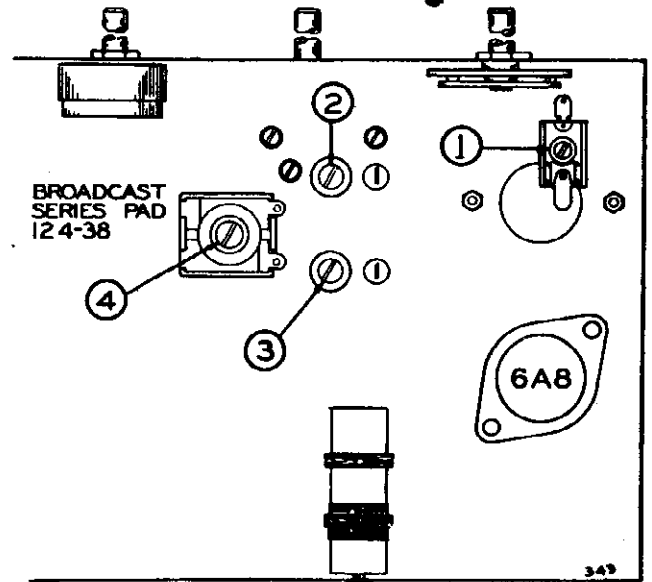
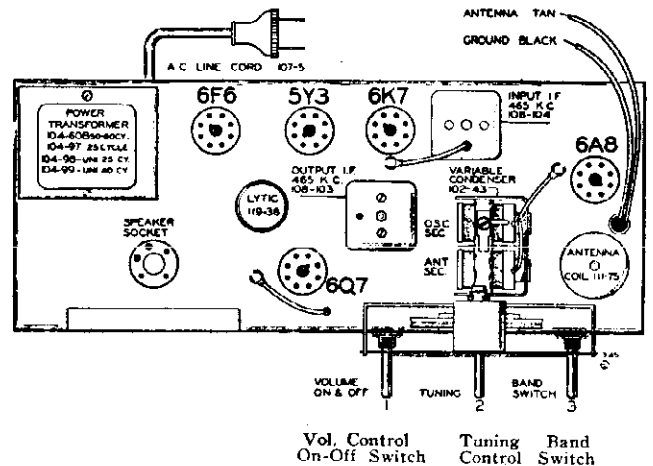


FIG. 3.—BOTTOM VIEW SHOWING TRIMMERS



MODEL 588

Alignment, Notes

GOODYEAR SERVICE

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between the plate and screen terminals of the type 6F6G output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-103 Output I.F. Transformer

Part No. 108-104 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser in its minimum capacity position, plates entirely out of mesh, make the following adjustments:

(a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6K7G tube, and adjust the output I.F. transformer (No. 108-103) to resonance.

(b) With "Dummy 1" still connected, move oscillator output clip from grid of 6K7G to grid cap of 6A8G and adjust input I.F. transformer (No. 108-104) to resonance.

SHORT WAVE BAND ALIGNMENT:

2000 to 7000 Kilocycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 6 megacycles and connected in series with "Dummy 3" to the antenna and ground leads, make the following adjustments:

(a) Move dial pointer to 6 megacycles and adjust short wave oscillator trimmer to resonance.

This adjustment is the trimmer mounted on the top of rear section of the variable gang condenser (see Fig. 1, top view).

(b) Adjust short wave antenna trimmer (Adjustment Number 1), to resonance (see Fig. 3, bottom view).

BROADCAST BAND ALIGNMENT:

535 to 1720 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with

"Dummy 2" to antenna and ground leads make following adjustments:

(a) Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance. (Adjustment number 3, see bottom view of chassis, Fig. 3).

(b) Re-set external oscillator to 1400 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (adjustment number 2), to resonance.

(c) Re-set external oscillator to 600 K.C., and adjust broadcast series pad (adjustment number 4), to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3).

(d) Repeat adjustments "a" and "b" until sensitivity is at its maximum.

(e) Check for tracking and sensitivity at 1400, 1000, and 600 kilocycles. Under no circumstances bend plates of variable condenser sections to correct tracking.

ANTENNA AND GROUND LEADS:

For the best results an outside antenna approximately 75-100 feet long including the lead-in should be used. It should be erected as high as possible and as far from surrounding objects as practical. Both the antenna and lead-in should be placed at right angles to street car lines and incoming power lines and as far from any electrical apparatus which may be in the vicinity (such as elevator motors) as practical.

An inside antenna is not recommended, although it occasionally may serve as a temporary installation especially near powerful broadcasting stations. This type of antenna, however, will not be satisfactory in buildings of steel construction.

Reception on the short wave band can be sometimes improved by means of an approved doublet antenna.

This radio will operate without a ground; however, a good ground by means of an approved clamp to water or steam (not gas) pipes or to a pipe driven in the ground will often reduce noise pick-up.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

DESCRIPTION:

The tube complement of this chassis consists of the following octal base glass tubes which are interchangeable with metal tubes:

1—Type 6A8G Pentagrid mixer, first detector-oscillator.

1—Type 6K7G Remote cut-off pentode I.F. amplifier (465 K.C.)

1—Type 6Q7G duplex diode triode second detector, A.V.C. and audio.

1—Type 6F6G—pentode output amplifier.

1—Type 5Y3G or 5W4—high vacuum rectifier.

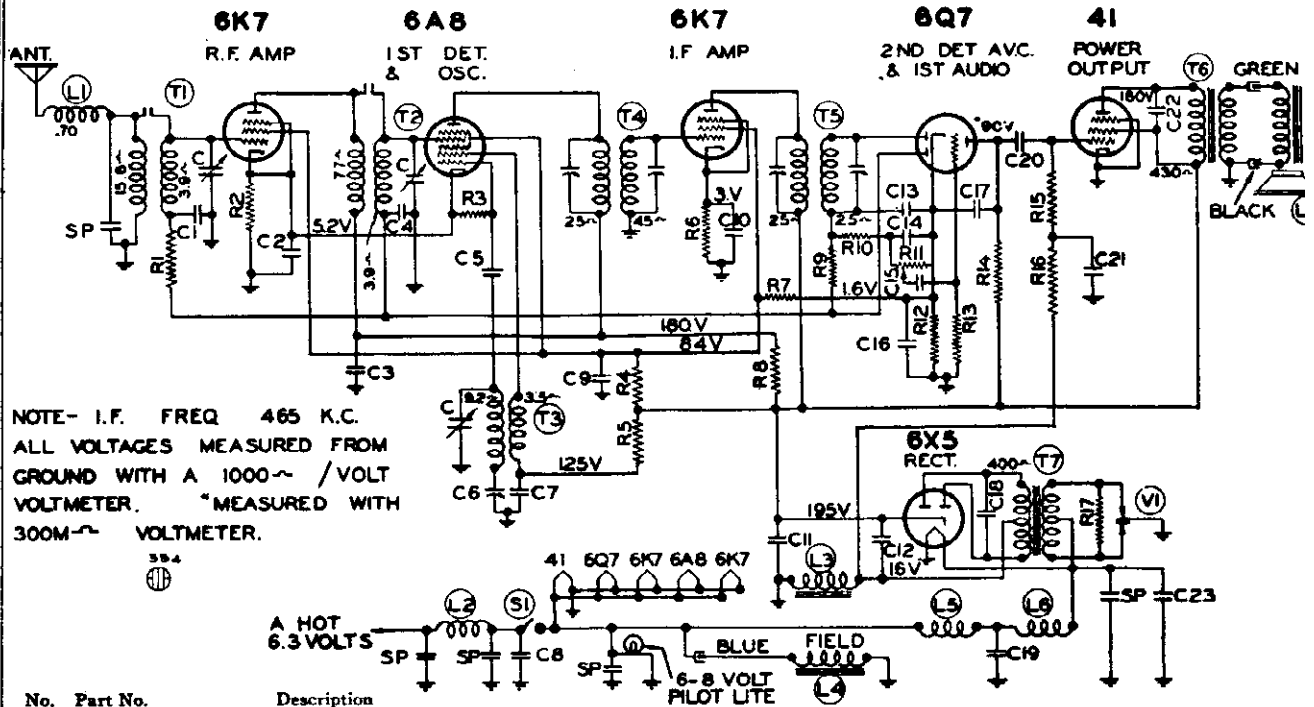
Transformers are available and chassis are sometimes equipped with universal transformers for operation on 25, 40 and 60 cycles and with primary taps for 108, 127, 150, 225, and 260 volts, (see instructions) and also sometimes equipped with 25 cycle transformers with 105-115 volt or 220 volt primaries, not universals.

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

Socket, Trimmers
Alignment, Parts

GOODYEAR SERVICE

MODEL 661
Schematic, Voltag



NOTE- I.F. FREQ 465 K.C.
ALL VOLTAGES MEASURED FROM
GROUND WITH A 1000- /VOLT
VOLTMETER. *MEASURED WITH
300M- VOLTMETER.

No. Part No. Description

CONDENSERS

C	102-26	3 Gang Variable Condenser
C1	100-63	.05 x 200v. 50 - 10%
C2	100-63	.1 x 200v. 50 - 10%
C3	100-13	.05 x 400v. 25%
C4	100-22	.05 x 200v. 25%
C5	129-42	.00025 Mica - 20%
C6	124-37	Series Pad
C7	100-20	.1 x 200 v. 25%
C8	100-31	.5 x 120 v. 10 50%
C9	100-62	.25 x 200 v. 50 - 10%
C10	100-20	.1 x 200 v. 25%
C11	119-37	8 mfd. lytic 300 wv.
C12	119-37	4 mfd. lytic 300 wv.
C13	129-5	.0001 Mica 20%
C14	129-5	.0001 Mica 20%
C15	100-11	.01 x 400 v. 25%
C16	100-11	.01 x 400 v. 25%
C17	129-5	.0001 Mica 20%
C18	100-58	.005 x 1200 v. 20 - 10%
C19	100-31	.5 x 120 v. - 10 50%
C20	100-11	.01 x 400 v. 25%
C21	100-62	.25 x 200 v. 50 - 10%
C22	100-54	.006 x 600 v. 25%
C23	100-31	.5 x 120 v. - 10 50%

RESISTORS

R1	130-20	100M - 1/3 w. - 20%
R2	130-54	500 ohm - 1/3 w. - 20%
R3	130-12A	50M ohm - 1/3 w. insulated 20%
R4	130-16S	15M ohm - 1 w. - 20%
R5	130-131A	20M ohm - 1/2 w. - insulated - 10%
R6	130-24	400 ohm - 1/3 w. - 20%
R7	130-139A	40M ohm - 1/3 w. Insulated - 20%
R8	130-31A	1500 ohm - 1/3 w. insulated - 20%
R9	130-19	1 megohm - 1/3 w. - 20%
R10	130-52	50M ohm - 1/3 w. - 20%
R11	101-41	500M ohm - Volume Control
R12	130-153	700 ohm - 1/3 w. - 20%
R13	130-19	1 megohm - 1/3 w. - 20%
R14	130-11A	250M - 1/3 w. Insulated - 20%
R15	130-5A	300M ohm - 1/3 w. insulated - 20%
R16	130-11A	250M ohm - 1/3 w. insulated - 20%
R17	130-84	200 ohm - 1/3 w. insulated - 20%

PARTS

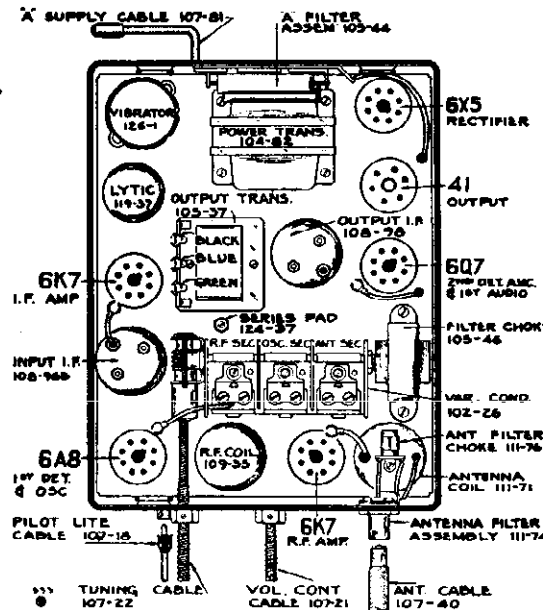
T1	111-71	Antenna Coil Complete
T2	109-35	R.F. Coil Complete
T3	110-57	Oscillator Coil Complete
T4	108-96B	Input I.F. Complete
T5	108-98	Output I. F. Complete
T6	105-37	Output Transformer
T7	104-82	Power Transformer
L1	111-76	Antenna Filter Choke
L2	105-26	"A" Choke
L3	105-46	"B" Filter Choke, 335 ohm
L4		Speaker Field, 4 ohm
L5	105-24	"A" Choke
L6	105-19	"A" Choke
L7	114-59	Dynamic Speaker
S1		Switch on Volume Control
V1	126-1	Vibrator

SP Spark Plate
C1, C2 in same block
C11 and C12 in same block
C9 and C21 in same block

BROADCAST ALIGNMENT

1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. in series with broadcast dummy to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance. (This adjustment is on the middle section of the three-gang condenser—see top view, Fig. 2).
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust R.F. and antenna trimmers to resonance (see top view, Fig. 2).
4. Re-set test oscillator to 600 K.C. and rotate variable condenser to and fro, at the same time adjusting series pad for maximum gain. This adjustment is accessible from the top of chassis—see top view.
5. Go back and check 1400 K.C. If adjustment is made here, check 600 K.C. again. Check for sensitivity at 1000 K.C.

CONVENTIONAL ALIGNMENT-
(see special section)

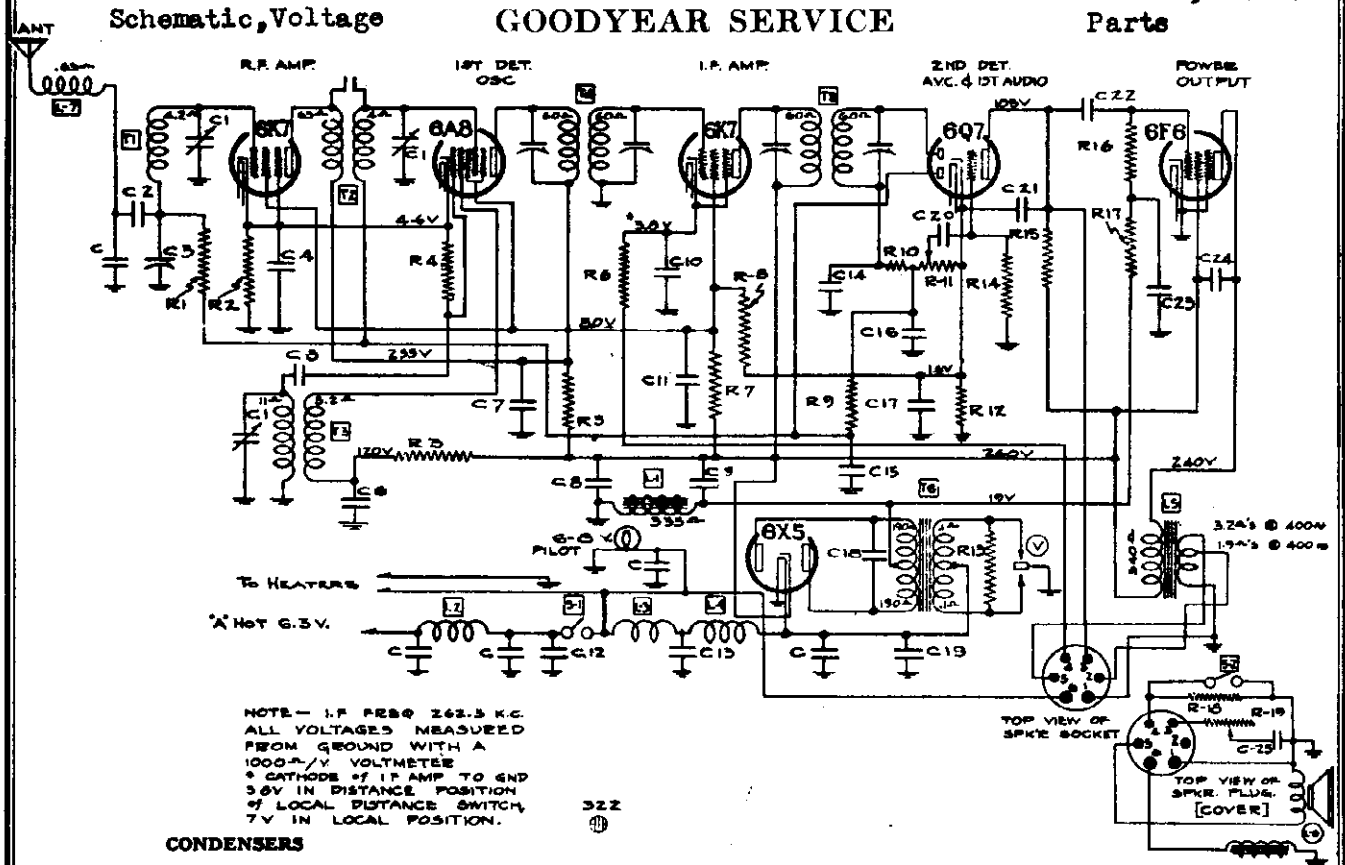


MODEL 667

Schematic, Voltage

GOODYEAR SERVICE

Socket, Trimmers
Parts



NOTE - I.F. FREQ 262.5 KC
ALL VOLTAGES MEASURED FROM GROUND WITH A 1000- Ω /V VOLTMETER
+ CATHODE OF I.F. AMP TO END 3.6V IN DISTANCE POSITION OF LOCAL DISTANCE SWITCH, 7V IN LOCAL POSITION.

CONDENSERS

C	Spark Plate
C1	102-45 3 Gang Condenser
C2	129-73 .002 Mica - MW-W - 10%
C3	124-36 Series Pad
C4	116-20 .1 x 200 v. - 20%
C5	129-12 .00025 Mica - MT - 20%
C6	116-19 .1 x 400 - 20%
C7	116-19 .1 x 400 - 20%
C8	119-34 8. mfd. - 350 W v.
C9	119-34 4 mfd. 350 W v.
C10	116-19 .05 x 200 v. - 20%
C11	116-20 .25 x 200 v. - 20%
C12	100-31 .5 x 120 v. - 10-50% - Braid leads
C13	100-31 .5 x 120 v. - 10-50%
C14	129-5 .0001 Ceramicon - 20%
C15	116-19 .05 x 200 v. - 20%
C16	129-5 .0001 Ceramicon - 20%
C17	116-20 .02 x 200 - 20%
C18	100-36 .01 x 1400 v. - 20% - 10% "A"
C19	100-31 .5 x 120 v. - 10% - 50%
C20	116-20 .02 x 200 - 20%
C21	129-5 .0001 Ceramicon - 20%
C22	100-55 .01 x 400 - 25%
C23	100-48 .25 x 200 - 20%
C24	100-54 .006 x 600 - 25%
C25	100-11 .01 x 400 - 25%
C4, C11, C17, C20	All in Block 116-20
C7, C6, C10, C15	All in Block 116-19

RESISTORS

R1	130-141 250M ohm - 1/3 w. Insulated	L7	111-76
R2	130-54 500 ohm - 1/3 w.	T1	111-73
R3	130-138 50M ohm - 1/2 w. Insulated	T2	109-36
R4	130-52 50M ohm - 1/3 w.	T3	110-59
R5	130-137 1500 ohm - 1/3 w. Insulated	T4	108-101
R6	130-154 1000 ohm - 1/3 w. Insulated	T5	108-102
R7	130-143 30M ohm - 1.2 w.	T6	104-83
R8	130-139 40M ohm - 1/3 w. Insulated	L1	105-39
R9	130-19 1 meg - 1/3 w.	L2	105-26
R10	130-162 50M ohm - 1/3 w. Insulated	L3	105-24
R11	101-73 250M ohm - Volume Control	L4	105-19
R12	130-153 700 ohm - 1/3 w.	L5	105-40
R13	130-84 200 ohm - 1/3 w.	L6	114-62
		S1	
		S2	125-28

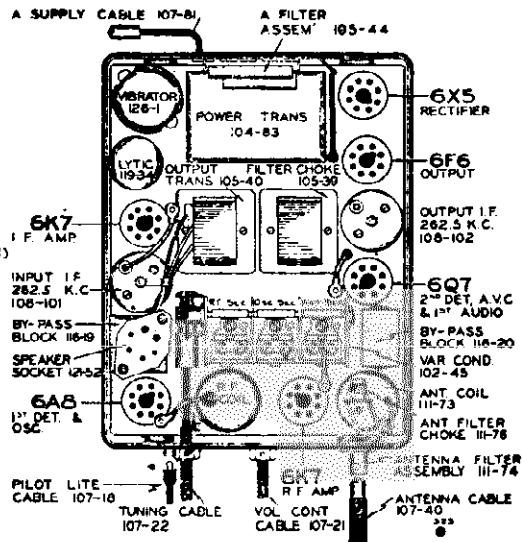
CONNECTIONS TO BATTERY

The battery cable, number 107-82, (red wire with fuse receptacle at one end and terminal lug at other end) must be connected to battery terminal of ammeter. At the same time connect ammeter capacitor, number 148-3, to battery terminal of ammeter, other end of condenser to any convenient grounded screw on back of instrument panel. Make certain that insulating sleeve is slipped over fuse when fuse is placed in receptacle, before connecting to short battery cable from receiver.

When connected properly, the discharge due to current drawn by the receiver should not indicate on the ammeter. This is important, since if improperly connected, as shown by the deflection of ammeter, additional motor interference may be encountered.

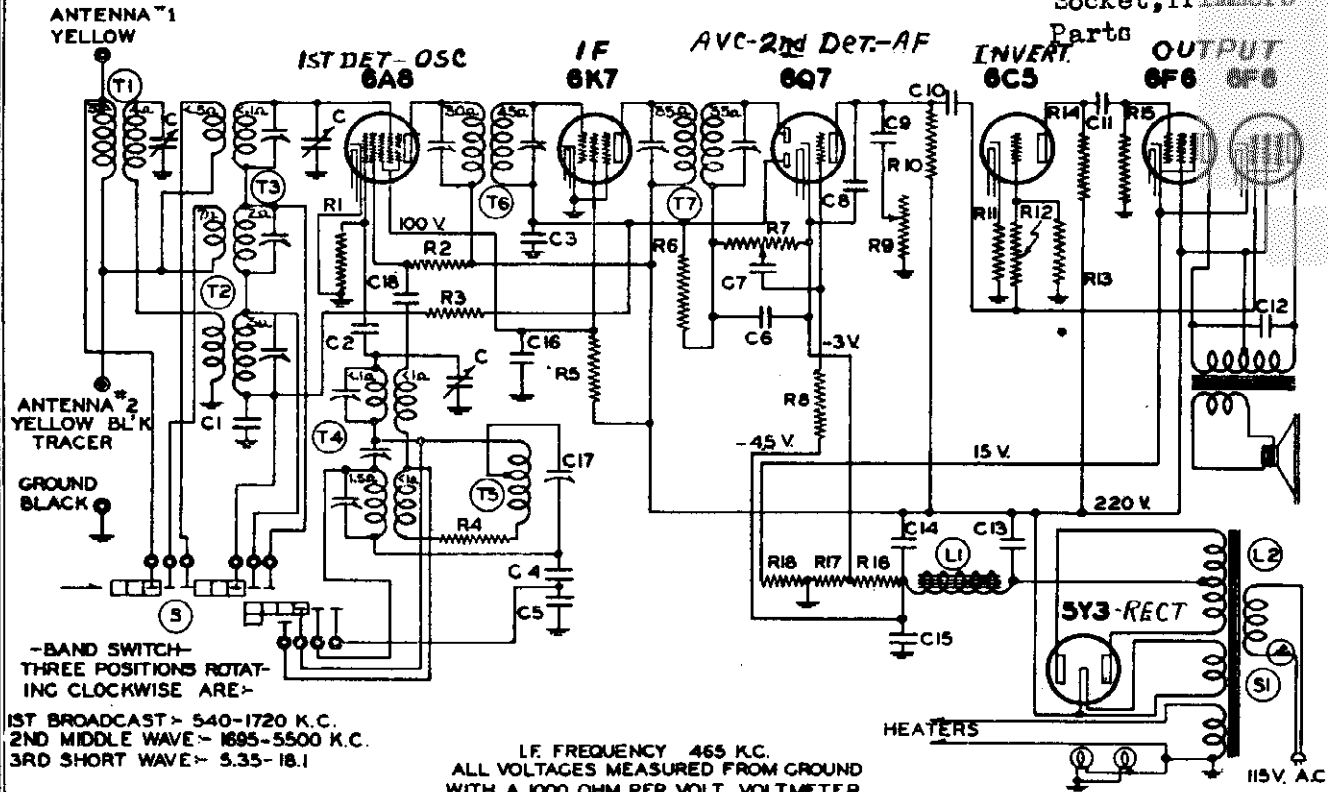
PARTS

L7	111-76	Antenna Filter Choke Assembly
T1	111-73	Antenna Coil Complete
T2	109-36	R.F. Coil Complete
T3	110-59	Oscillator Coil Complete
T4	108-101	I.F. Input
T5	108-102	I.F. Output
T6	104-83	Power Transformer
L1	105-39	Filter Choke (335 ohms)
L2	105-26	"A" Choke
L3	105-24	"A" Choke
L4	105-19	"A" Choke
L5	105-40	Output transformer
L6	114-62	Speaker Dynamic
S1		Switch on Volume Control
S2	125-28	Sensitivity switch.



GOODYEAR SERVICE

MODEL 741
Schematic, Voltage
Socket, Trimmers
Parts



No. Part No. Description

RESISTORS

R1	130-12	50M ohms - 1/3 w.
R2	130-48	15M ohms - 1/3 w.
R3	130-103	100M ohms - 1/3 w.
R4	130-27	50 ohms - 1/3 w.
R5	130-96	25M ohms - 1/2 w.
R6	130-4	3 megohm - 1/3 w.
R7	101-74	1 megohm - Volume Control
R8	130-4	3 megohm - 1/3 w.
R9	101-75	300M ohms - Tone Control
R10	130-100	150M ohms - 1/3 w.
R11	130-22	5M ohms - 1/3 w.
R12	130-163	400M ohms - 1/3 w.
R13	130-103	100M ohms - 1/3 w.
R14	130-12	50M ohms - 1/3 w.
R15	130-100	150M ohms - 1/3 w.
R16	106-37	20 ohms - Muter
R17	106-37	42 ohms - Muter
R18	106-37	250 ohms - Muter

NOTE: R16, R17 and R18 in one unit, No. 106-37

CONDENSERS

C1	100-22	.05 x 200 v.
C2	129-39	.00005 Mica
C3	100-22	.05 x 200 v.
C4	129-55	.0034 Mica
C5	129-54	.003 Mica
C6	129-5	.0001 Mica
C7	100-11	.01 x 400 v.
C8	129-2	.0005 Mica
C9	100-57	.006 x 600 v.
C10	100-26	.02 x 400 v.
C11	100-26	.02 x 400 v.
C12	100-12	.003 x 600 v.
C13	103-6	8 mfd. x 350 v.
C14	103-14	16 mfd. x 250 v.
C15	100-20	.1 x 200 v.
C16	100-39	.1 x 400 v.
C17	124-35	Adjustable Padder - Working Capacity 740 mmf.
C18	100-12	.003 x 600 v.

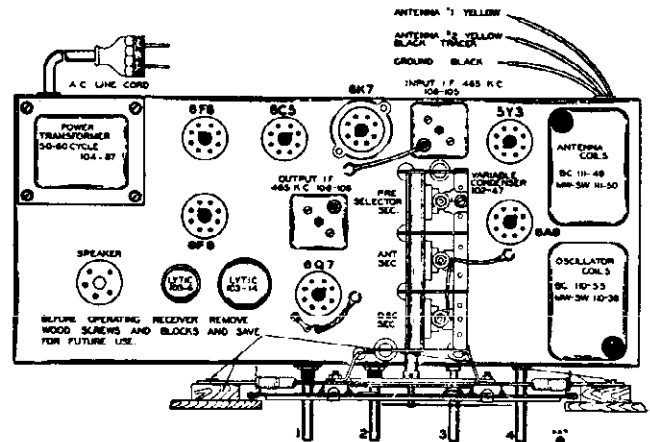
BAND

Broadcast	540 to 1720 K.C. (Kilocycles)
Middle Wave	1690 to 5500 K.C. (Kilocycles)
Short Wave	5.35 to 18.1 M.C. (Megacycles)

FREQUENCY RANGE

PARTS

C	102-46	One section of three gang condenser
T1	111-51	B.C. Pre-Selector
T2	111-49	B.C. Antenna Coil Assembly
T3	111-50	MW - SW Antenna Coil Assembly
T4	110-39	MW - SW Oscillator Coil Assembly
T5	110-55	B.C. Oscillator Coil Assembly
T6	108-105	Input I.F. - 465 kc.
T7	108-106	Output I.F. - 465 kc.
L1	114-66	6" Speaker (Field Resistance 900 ohms)
L2	104-87	Power Transformer (60 cycle) 115 volts
S	125-17	Band Switch
S1	101-74	On-off Switch on volume control.



Vol. Control Tone Tuning Band
On-Off Switch Control Control Switch

FIG. 1—TOP VIEW

MODEL 741

Alignment, Trimmers

GOODYEAR SERVICE

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between the plate and cathode terminals of the 5 prong speaker socket. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3".

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108-106 Output I.F. Transformer
Part No. 108-105 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

(a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6K7 tube, and adjust the output I.F. transformer (No. 108-106) to resonance.

(b) With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap of 6A8G and adjust input I.F. transformer (No. 108-105) to resonance.

BROADCAST BAND ALIGNMENT:

540 to 1720 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with "Dummy 2" to tan antenna lead and black ground lead, make following adjustments:

(a) Set external oscillator to 1720 K.C. and adjust broadcast oscillator trimmer to resonance (adjustment number 1; see bottom view of coil assembly, Fig. 3.)

(b) Re-set external oscillator to 1550 K.C., rotate variable gang condenser and pick up signal. Adjust broadcast antenna trimmer (Adjustment number 4) to resonance; also adjust preselector trimmer which is mounted on the top of the rear section of the three gang variable tuning condenser to resonance. (See top view of chassis, Fig. 1, for location of this adjustment.)

(c) Re-set external oscillator to 600 K.C., and adjust broadcast series pad to resonance by rotating condenser to approximately 600 K.C., rocking it slowly to and fro until by adjusting series pad maximum output is attained. This adjustment is located on the bottom of the chassis directly under the variable gang condenser. (See bottom view of chassis, Fig. 3.)

(d) Repeat adjustments "a" and "b" until sensitivity is at its maximum.

(e) Check for tracking and sensitivity at 1000 kilocycles. Under no circumstances bend plates of variable condenser sections to correct tracking.

SHORT WAVE BAND ALIGNMENT:

5.35 to 18.1 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:

(a) Move dial pointer to 17 megacycles and adjust short wave oscillator (Adjustment number 3) and short wave

antenna (Adjustment number 6) to resonance.

(b) Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check sensitivity.

(c) Re-set external oscillator and check set at 18.1 megacycles and 5.3 megacycles for band coverage.

NOTE: It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental. An example of this is an image of a fundamental 18.3 megacycle signal appears near 17.4 megacycles.

MIDDLE WAVE BAND ALIGNMENT:

1690 to 5500 Kilocycles

1. With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5000 kilocycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:

(a) Move dial pointer to 5000 kilocycles and adjust middle wave oscillator (Adjustment number 2) and middle wave antenna (Adjustment number 5) to resonance.

(b) Re-set external oscillator to 1800 kilocycles and pick up signal by rotating variable condenser and check sensitivity.

(c) Re-set external oscillator and check set at 5400 kilocycles and 1700 kilocycles for band coverage.

(d) Recheck broadcast band alignment.

ANTENNA AND GROUND LEADS:

You will notice three wires coming out of the back of the chassis, — the yellow wire and the black with yellow tracer wire are used for doublet antenna connections. The black wire is the ground connection.

For conventional types of antennas connect the yellow wire to the antenna lead and the yellow with black tracer and the black wire together to the ground lead.

When a doublet antenna is used connect the yellow wire and the yellow with black tracer wire to the doublet antenna and the solid black wire to the ground lead. (See Fig. 1—Top View, page 2).

ANTENNA:

For the best results an outside antenna approximately 75-100 feet long including the lead-in should be used. It should be erected as high as possible and as far from surrounding objects as practical. Both the antenna and lead-in should be placed at right angles to street car lines and incoming power lines and as far from any electrical apparatus which may be in the vicinity (such as elevator motors) as practical.

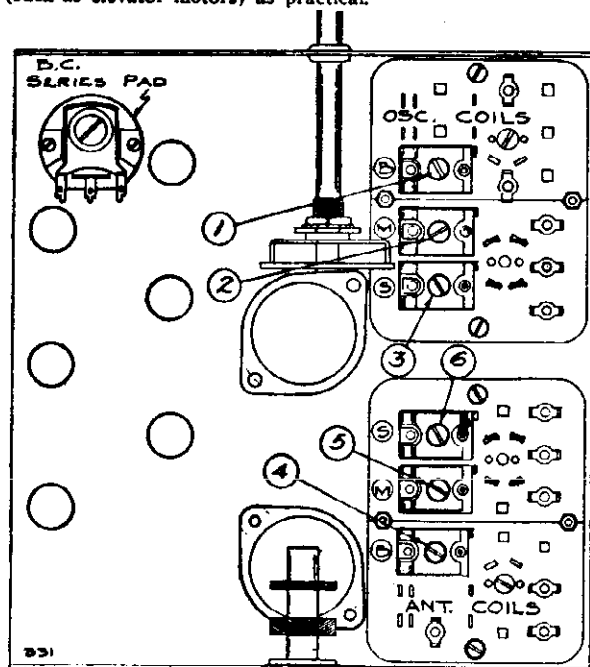
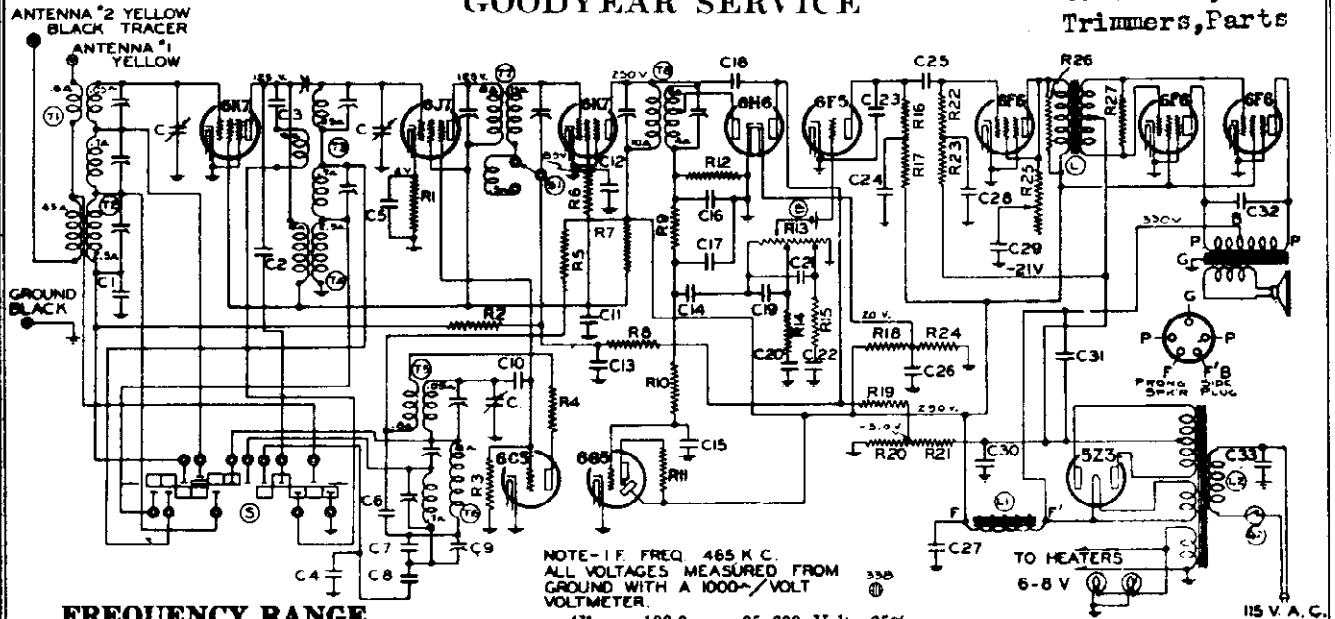


FIG. 3.—BOTTOM VIEW SHOWING TRIMMERS

GOODYEAR SERVICE

MODEL 1173
Schematic, Socket
Trimmers, Parts



FREQUENCY RANGE

- 535 to 1720 K.C. (Kilocycles)
- 1690 to 5300 K.C. (Kilocycles)
- 5.3 to 18.1 M.C. (Megacycles)

R1	130-129	2500 Ohm—1/3 Watt—10%—Carbon
R2	130-20	100M Ohm—1/3 Watt—20%—Carbon
R3	130-12	50M Ohm—1/3 Watt—20%—Carbon
R4	130-60	10M Ohm—1/3 Watt—20%—Carbon
R5	130-77	10M Ohm—1 Watt—20%—Carbon
R6	130-76	30M Ohm—1/3 Watt—20%—Carbon
R7	130-88	10M Ohm—2 Watt—20%—Wire Wound
R8	130-19	1 Megohm—1/3 Watt—20%—Carbon
R9	130-20	100M Ohm—1/3 Watt—20%—Carbon
R10	130-4	3 Megohm—1/3 Watt—20%—Carbon
R11	130-110	1 Megohm—1/10 Watt—10%—Carbon
R12	130-20	100M Ohm—1/3 Watt—20%—Carbon
R13	101-76	1 Megohm—Volume Control
R14	130-22	5M Ohm—1/3 Watt—20%—Carbon
R15	130-85	3M Ohm—1/3 Watt—20%—Carbon
R16	130-20	100M Ohm—1/3 Watt—20%—Carbon
R17	130-20	100M Ohm—1/3 Watt—20%—Carbon
R18	130-130	100M Ohm—1/2 Watt—10%—Carbon
R19	130-3	500M Ohm—1/3 Watt—20%—Carbon
R20	106-31	30 Ohm—Muter
R21	106-31	175 Ohm—Muter
R22	130-45	250M Ohm—1/3 Watt—20%—Carbon
R23	130-45	250M Ohm—1/3 Watt—20%—Carbon
R24	130-82	10M Ohm—1/3 Watt—10%—Carbon
R25	101-62	5000 Ohm—Tone Control
R26	130-131	20M Ohm—1/2 Watt—10%—Carbon
R27	130-21	20M Ohm—1/3 Watt—20%—Carbon

Note—R-20 and R21 in one unit No. 106-31.

NOTE—IF FREQ. 465 K.C.
ALL VOLTAGES MEASURED FROM
GROUND WITH A 1000-VOLT
VOLT-METER.

C1	100-9	.05x200 Volt—25%
C2	129-59	.0003 Mica—5%—MT-O
C3	129-39	.00005 Mica—20%—MT-O
C4	129-69	.0023 Mica—2 1/2%—MT-O
C5	100-9	.05x200 Volt—25%
C6	100-13	.05x400 Volt—25%
C7	129-57	.005 Mica—5%—MT-O
C8	129-55	.0034 Mica—2 1/2%—MT-O
C9	124-34	200 Mmf. Working Cap. Adju
C10	129-31	.000025 Mica—15%—MT-O
C11	100-41	.25x400 Volt—20%
C12	100-11	.01x400 Volt—25%
C13	100-9	.05x200 Volt—25%
C14	100-22	.05x200 Volt—25%
C15	100-11	.01x400 Volt—25%
C16	129-60	.00015 Mica—20%—MT-O
C17	129-60	.00015 Mica—20%—MT-O
C18	129-3	.00002 Mica—20%—MT-O
C19	129-2	.0065 Mica—20%—MT-O
C20	100-22	.05x200 Volt—25%
C21	129-60	.00015 Mica—20%—MT-O
C22	100-22	.05x200 Volt—25%
C23	129.5	.0001 Mica—20%—MT-O
C24	100-20	.1x200 Volt—25%
C25	100-13	.05x400 Volt—25%
C26	100-19	.006x600 Volt—25%
C27	103-8	14 Mfd.—400 Volt—Electrolytic
C28	100-20	.1x200 Volt—25%
C29	100-45	.1x600 Volt—25%
C30	100-20	.1x200 Volt—25%
C31	103-10	30 Mfd. — 450 Volt — Electrolytic
C32	100-32	.0005x1000 Volt—20%
C33	100-61	.02x600 Volt—Bakelite Micamold

PARTS

- 116-22 Bias Cell
- 102-37 One Section of Three Gang Condenser.
- 111-54 MW and SW Antenna Coil Assem.
- 111-55 Broadcast Antenna Coil Assem.
- 109-29 MW and SW R.F. Coil Assem.
- 109-30 Broadcast R.F. Coil
- 110-42 MW and SW Osc. Coil Assem.
- 110-43 Broadcast Osc. Coil Assem.
- 108-64 Input I.F. Coil—465 KC.
- 108-63 Output I.F. Coil—465 KC.
- 105-33 Audio Transformer
- 114-47 Speaker (Field Resistance 1225 Ohm)
- 104-72 Power Transformer (50-60 Cycle)

- B1 116-22 Bias Cell
- C 102-37 One Section of Three Gang Condenser.
- T1 111-54 MW and SW Antenna Coil Assem.
- T2 111-55 Broadcast Antenna Coil Assem.
- T3 109-29 MW and SW R.F. Coil Assem.
- T4 109-30 Broadcast R.F. Coil
- T5 110-42 MW and SW Osc. Coil Assem.
- T6 110-43 Broadcast Osc. Coil Assem.
- T7 108-64 Input I.F. Coil—465 KC.
- T8 108-63 Output I.F. Coil—465 KC.
- L 105-33 Audio Transformer
- L1 114-47 Speaker (Field Resistance 1225 Ohm)
- L2 104-72 Power Transformer (50-60 Cycle)

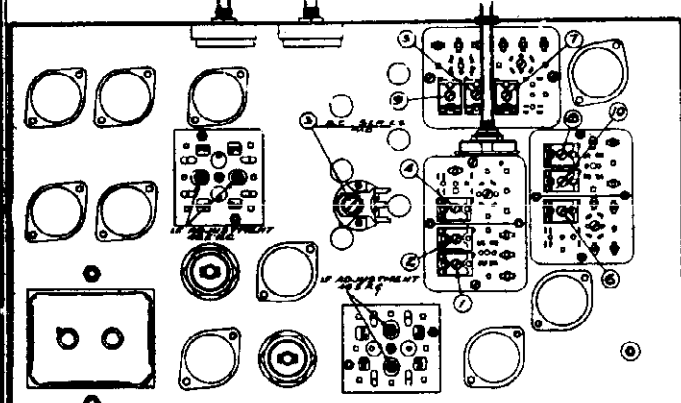
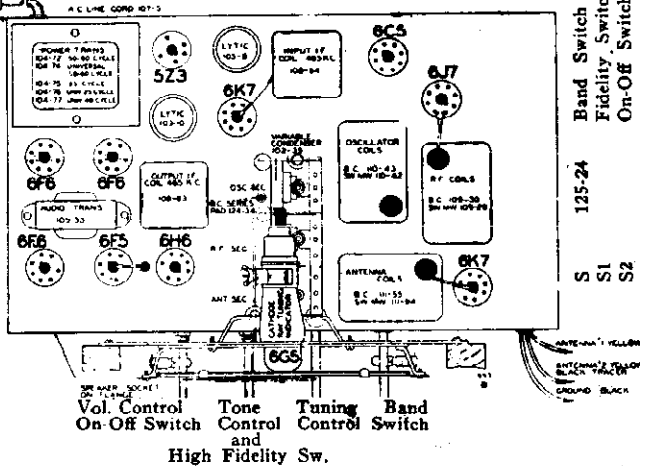


FIG. 3.—BOTTOM VIEW SHOWING TRIMMERS



MODEL 1173

Alignment, Notes

GOODYEAR SERVICE

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between the plate and cathode terminals of the 5 prong speaker socket. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of the multi-range meter should be used.

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1," "Dummy 2," and "Dummy 3."

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 minfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

ALIGNING I.F. TRANSFORMERS (465 K.C.)

Part No. 108-63 Output I.F. Transformer
Part No. 108-64 Input I. F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the underside of chassis (see bottom view Fig. 3).

1. With volume control full on, (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), the tone control on "Hi" part of the sharp position (as much right rotation as possible without operating the Hi Fidelity switch), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

- Connect external oscillator set at 465 kilocycles, in series with "Dummy 1," to the control grid cap of the type 6K7 tube, located between the two I.F. transformers, and adjust the output I.F. transformer 108-63 to resonance.
- With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap to 6J7 and adjust input I.F. transformer (108-64) to resonance.
- With oscillator still connected to 6J7, re-adjust output I.F. transformer if necessary.

BROADCAST BAND ALIGNMENT:

535 to 1720 Kilocycles

1. With band changing switch in the broadcast position, extreme left of its rotation, and with external oscillator set at 600 kilocycles and connected in series with "Dummy 2" to the tan antenna and black ground lead, make the following adjustments:

- Adjust broadcast series pad (adjustment number 3) to resonance with oscillator. Keep set in tune with oscillator by slowly rocking to and fro the variable condenser until maximum output is obtained. Note: This adjustment is accessible from the top of the chassis and is located between the variable condenser and the 108-63 output I.F. transformer. See top view, Fig. 1.
- Re-set external oscillator to 1400 K.C., move dial pointer to 1400 K.C. and adjust oscillator (adjustment number 4), R.F. (adjustment number 6) and antenna (adjustment number 7) to resonance. See bottom view for location of these adjustments, Fig. 3.
- Repeat adjustments "a" and "b" until sensitivity is at its maximum.
- Check for tracking and sensitivity at 1000 kilocycles. Under no circumstances bend plates of variable condenser to correct tracking.

SHORT WAVE BAND ALIGNMENT:

5.3 to 18.1 Megacycles

1. With band changing switch in the short wave position, extreme right of its rotation, and with external oscillator

set at 17 megacycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:

- Move dial pointer to 17 megacycles and adjust short wave oscillator (adjustment number 1), short wave R.F. (adjustment number 8) and short wave antenna (adjustment number 9) to resonance.
- Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check for sensitivity.

NOTE: It is extremely necessary in making all of these adjustments that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental on the receiver dial. As an example of this a fundamental 18.3 megacycle can be tuned in not only at 18.3 on the dial, but also at approximately 17.4 megacycles.

MIDDLE WAVE BAND ALIGNMENT:

1690 to 5300 Kilocycles

1. With band changing switch in the middle wave position, center of its rotation, and with external oscillator set at 5 M.C. and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:

- Rotate condenser, pick up signal and adjust middle wave R.F. (adjustment number 10), middle wave antenna (adjustment number 5) and middle wave oscillator (adjustment number 2) to resonance.
- Re-check broadcast alignment and if it is found necessary to re-adjust either R.F. or antenna trimmers, repeat the 17 M.C. short wave and 5 M.C. middle wave adjustments.

ANTENNA AND GROUND LEADS:

You will notice three wires coming out of the back of the chassis, — the yellow wire and the yellow with black tracer wire are used for doublet antenna connections. The black wire is the ground connection.

For conventional types of antennas connect the yellow wire to the antenna lead and the yellow with black tracer and the black wire together to the ground lead.

When a doublet antenna is used connect the yellow wire and the yellow with black tracer wire to the doublet antenna and the solid black wire to the ground lead. (See Fig. 1—Top View, page 2).

ANTENNA:

For the best results an outside antenna approximately 75-100 feet long including the lead-in should be used. It should be erected as high as possible and as far from surrounding objects as practical. Both the antenna and lead-in should be placed at right angles to street car lines and incoming power lines and as far from any electrical apparatus which may be in the vicinity (such as elevator motors) as practical.

DESCRIPTION:

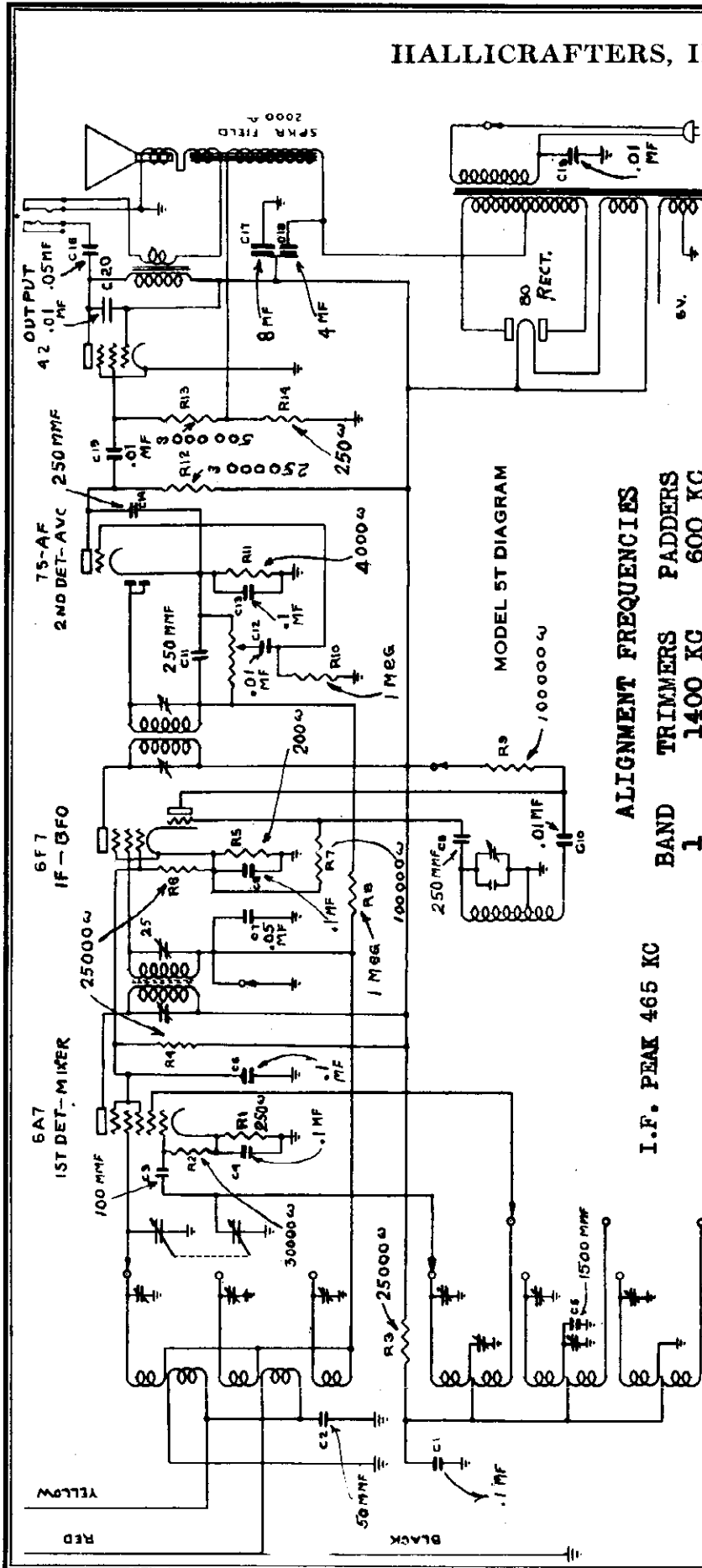
The tube complement of this chassis consists of the following metal and octal base glass tubes which are interchangeable with metal tubes:

- 1—Type 6K7 Remote cut-off pentode R.F. amplifier
- 1—Type 6J7 Pentode first detector
- 1—Type 6C5 Oscillator
- 1—Type 6K7 Remote cut-off pentode I.F. amplifier (465 K.C.)
- 1—Type 6H6 Duplex diode second detector and A.V.C.
- 1—Type 6F5 First audio amplifier
- 1—Type 6F6 Triode driver stage
- 2—Type 6F6 Class AB Output pentodes in push-pull
- 1—Type 5Z3 High vacuum rectifier
- 1—Type 6G5 Cathode Ray Tuning Indicator.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 25, 40 and 60 cycles and with primary taps for 108, 127, 150, 225, and 260 volts, (see instructions) and also sometimes equipped with 25 cycle transformers with 105-115 volt or 220 volt primaries, not universals.

HALLICRAFTERS, INC.

MODEL 5T, Sky Buddy Schematic, Alignment Trimmers



ALIGNMENT FREQUENCIES

BAND	TRIMMERS	PADDERS
1	1400 KC	600 KC
2	4000 KC	1800 KC
3	14000 KC	NONE

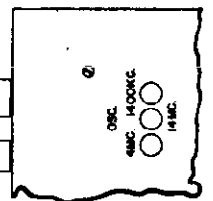
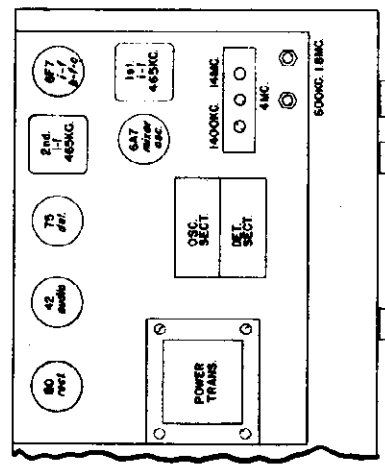
I.F. PEAK 465 KC

CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION

The 1936 Sky-Buddy receiver is a three band receiver tuning the frequencies as follows:

- No. 1 Band - 1680 KC to 545 KC
- No. 2 Band - 1680 KC to 5.5 MC
- No. 3 Band - 5.5 MC to 16 MC

It includes three sets of antenna coils and three oscillator coils.

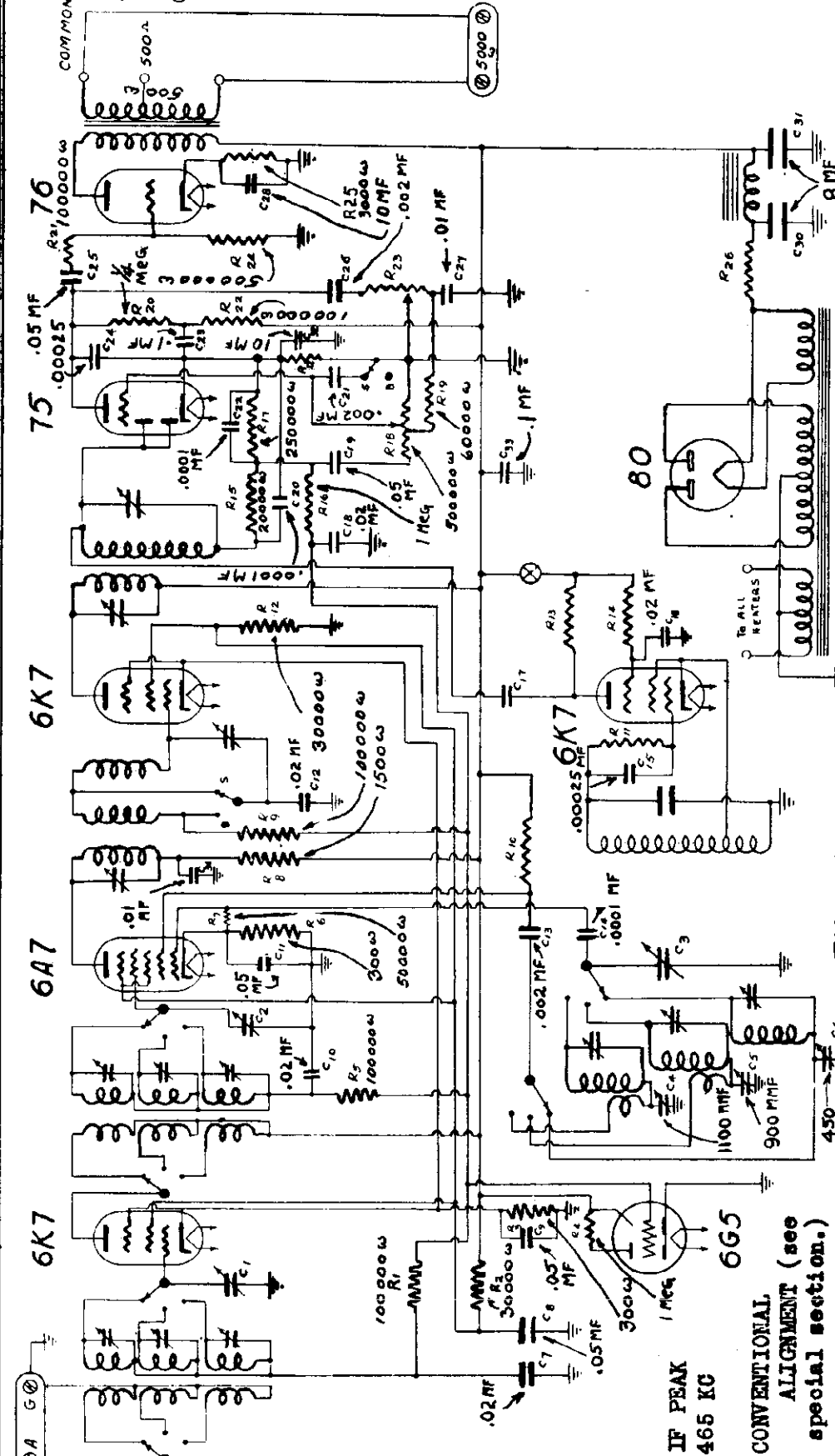


BOTTOM VIEW

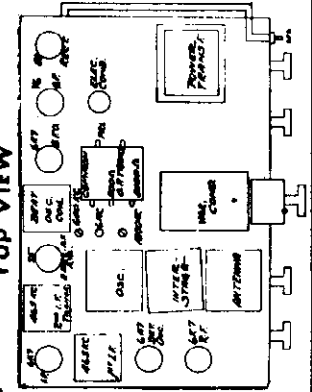
TOP VIEW

HALLICRAFTERS, INC.

MODEL H8PA
Schematic, Socket
Trimmers, Alignment



Tuning range of this receiver is as follows:
 Band No. 1 - 1.7 to .545 megacycles
 Band No. 2 - 5.4 to 1.68 megacycles
 Band No. 3 - 17. to 5.7 megacycles
 Range # 1 aligned at 1400 KC and 600 IC
 Range # 2 " " 4500 KC " 1800 IC
 Range # 3 " " 15000 IC " 6000 KC



the HALLICRAFTERS inc
CHICAGO III.

Schematic Model: H8PA
 Drawn by: R.J.H.
 Checked by: J.H.
 Approved by: K.W.M.
 Rev. S.C.S. 73 495 CALL REWORKED BY A.F.C.
 BY HAND CHANGED BY PASS CH. ADDED. A.H.B. M.L.T.
 BY HAND CH. ADDED. JAN. 2-2-37

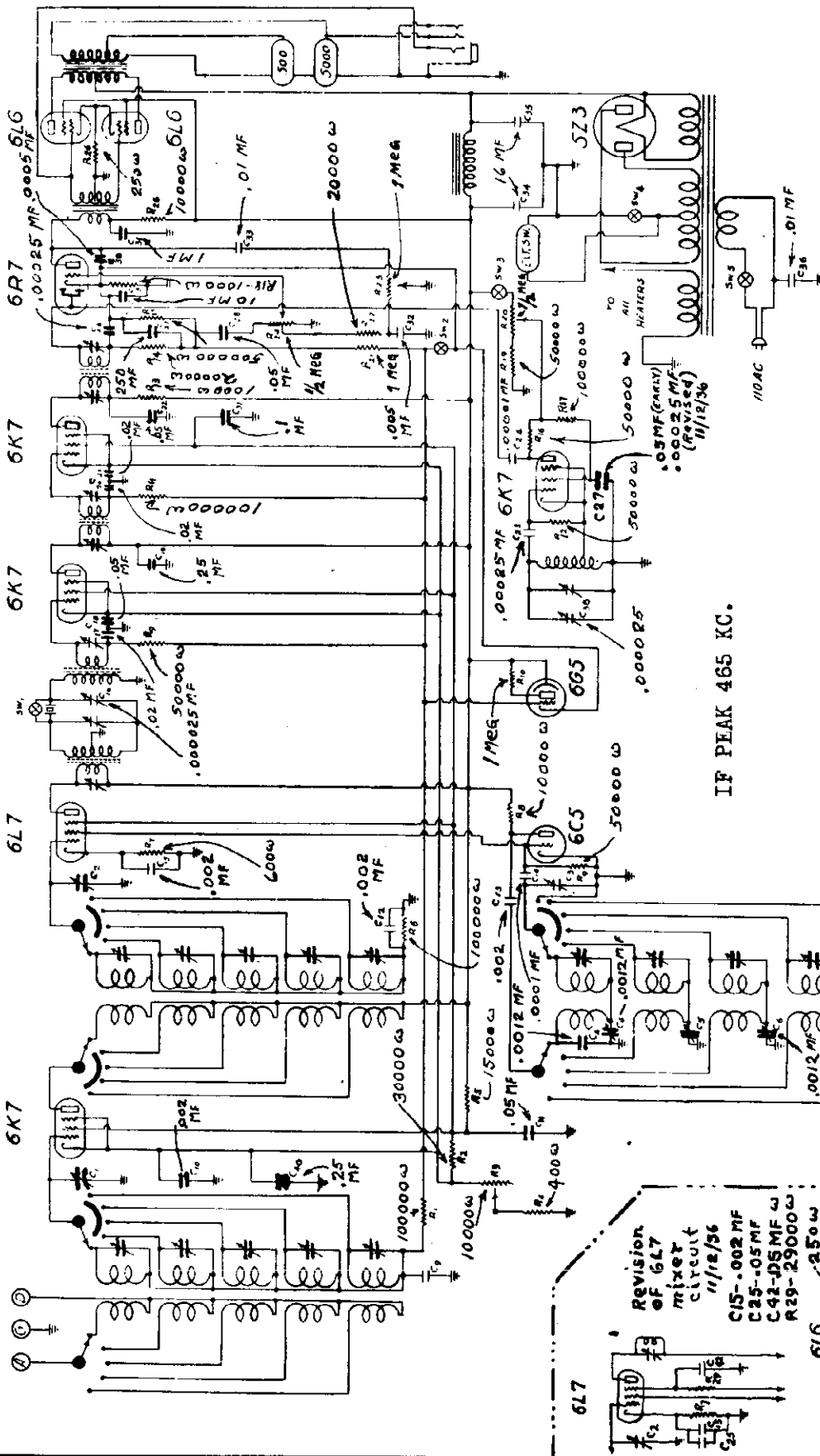
IF PEAK
465 KC
 CONVENTIONAL
ALIGNMENT (see
special section.)

Schematics, Changes

MODEL S11, Super Sky Rider 1937

HALLICRAFTERS, INC.

Early and Late

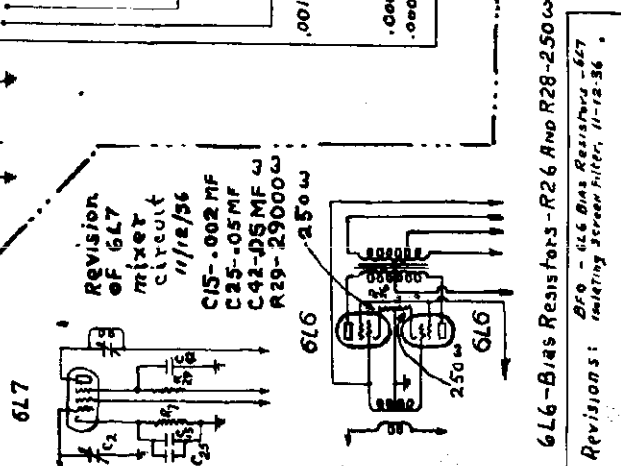


the **HALLICRAFTERS inc.**
CHICAGO III.
 Schematic Model S11 Super-Skyrider
 Drawn by :- R.J.H. 10-6-36
 Checked by :- P.Henry 10-7-36
 Approved by :- X.W. Miller 10-7-36

The new 1937 Super SKYRIDER is a 5 band 11 tube superheterodyne receiver covering the following frequency ranges.

No.	Band	545 KC to 1230 KC
No. 1	Band	545 KC to 1230 KC
No. 2	"	1.18 MC to 2.85 MC
No. 3	"	2.75 MC to 6.82 MC
No. 4	"	6.75 MC to 16.40 MC
No. 5	"	15.40 MC to 38.10 MC

IF PEAK 465 KC.



MODEL S11, Super Sky Rider 1937
 MODEL S15, Sky Challenger
 Alignment

HALLICRAFTERS, INC.

MODEL S12, Commercial
 Alignment Sky Rider

**ALIGNMENT FOR MODELS S11 (SUPER-SKY-RIDER 1937)
 and MODEL S15 (SKY CHALLENGER)**

INTERMEDIATE FREQUENCY ALIGNMENT

If the receiver is equipped with a crystal, use the crystal in a separate oscillator.
 If the receiver is used without a crystal set the signal generator at 455 KC before alignment, turn off the AVC, BFO, and Crystal switches. Set the RF and Audio gain controls at maximum. Set crystal phasing condenser for maximum noise level. Do not remove bottom plate from the chassis.
 Remove 6C5 Oscillator tube from socket, and connect the signal generator output directly to grid of 6L7 list detector.
 Adjust all IF transformers for maximum output.

RF ALIGNMENT

Check dial - at maximum capacity of gang condenser the dial should stop so that "0" on the main tuning dial should be opposite "0" on the vernier scale.
 Set band spread condenser at minimum capacity or so that it reads 200 degrees.
 Replace 6C5 oscillator tube and connect signal generator output through 400 ohm resistor to antenna and ground posts on receiver. (Leave Jumper connected.)
 Set dial of receiver to 600 KC of Band #1, and set signal generator to 600 KC. Now adjust .6 MC pad on top of chassis until signal is resonated.
 Reset dial and signal generator to 1100 KC. Adjust 1.1 MC Dec. trimmer condenser beneath the chassis until this signal is properly resonated. Now adjust RF and Detector trimmers for maximum gain. Now reset dial and signal generator to 600 KC and re-pad. It may be necessary to pad and trim at 600 KC and 1100 KC a few times as a change of capacity at one end will affect the other end. Re-check on RF and Detector trimmers and peak for maximum gain.

BAND #2

Follow same procedure as on Band #1 except pad (above chassis) at 1.5 MC. Trim at 2.6 MC

BAND #3

Same procedure as before except pad oscillator at 3 MC. Trim at 6 MC. Hook the gang condenser when making these adjustments.

BAND #4

Pad oscillator at 7 MC. Trim at 14 MC. Hook gang condenser during adjustment

BAND #5

Pad oscillator at 17 MC and Trim at 34 MC. Hook gang condenser as before.

It may be necessary to go through the above procedure several times before maximum performance is secured. A small change at each end of each Band will affect the other end.
 When making adjustments on this receiver back off on RF gain leaving the AF gain at maximum at all times.

Be sure and turn the trimmers all the way in (clockwise) except as noted below, and back off to find the signal. On air-dielectric trimmers, capacity is reduced when turning the screws in a clockwise direction.
 Detector trimmers on Band #4 and #5 should be backed out all the way and screwed clockwise to find the signal. This will assist in eliminating phasing in the wrong direction or side.
 Be sure to check images on Bands #3, #4, and #5. These images will fall approximately 1.0 MC lower in frequency on all Bands.

ALIGNMENT FOR MODEL S12 (COMMERCIAL-SKY-RIDER)

INTERMEDIATE FREQUENCY ALIGNMENT

If the receiver is equipped with a crystal, use the crystal in a separate oscillator. If the receiver is not an S12 model, set the generator for 1600 KC. Before alignment, turn off the AVC, BFO, and Crystal Switches. Set the RF and Audio controls at maximum. Set crystal phasing condenser for maximum noise level. Do not remove the bottom plate from the chassis.
 Remove 6C5 oscillator tube from the chassis, and connect the signal generator output directly to the grid of the 6L7 list detector.
 Adjust all IF transformers for maximum output.

RF ALIGNMENT - BAND #1

Check dial - at maximum capacity of gang condenser the dial should stop so that "0" on the main tuning dial should be opposite "0" on the vernier scale.
 Set Band Spread condenser at minimum capacity or so that it reads 200 degrees.
 Replace 6C5 oscillator tube in receiver, and connect signal generator output through 400 ohm resistance to antenna and ground posts on receiver. (Jumper should remain connected.)
 Set signal generator for 115 KC, put receiver on Band #1 and set dial to a reading of 115 KC.

Adjust the 115 KC pad on top of chassis until signal is resonated.
 NOTE: On Band #1 and #2 it is necessary to adjust detector and RF trimmers each time oscillator trimmer is changed.

Reset dial to 250 KC and reset signal generator to same frequency.
 Adjust 250 KC Dec. trimmer condenser beneath the chassis until the signal is properly resonated. Now adjust RF and detector trimmers for maximum gain. Now reset dial and signal generator to 115 KC and re-pad above chassis.

It may be necessary to pad and trim at 115 KC and 250 KC a few times as a change of capacity at one end will affect the other end. Re-check on RF and the detector trimmers and peak for maximum gain.
 Hook main tuning condenser during the course of these adjustments.

BAND #2

Follow same procedure as on Band #1 except pad (above chassis) at 275 KC and set signal generator at 275 KC. Peak RF and trim at 550 KC. Hook main condenser.

BAND #3

Same procedure as before except pad oscillator at 700 KC, trim at 1400 KC. with signal generator set at 700 KC. Hook main tuning condenser during procedure.

BAND #4

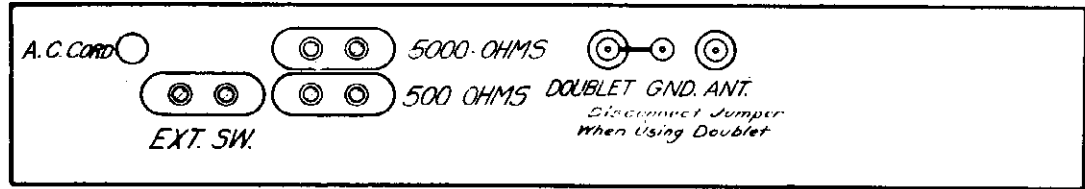
Same procedure as before except pad oscillator at 1.9 MC. with signal generator set at 1.9 MC. Peak RF and detector trimmers for maximum gain. Trim at 3.8 MC.
 Hook main tuning condenser when making the adjustments.

BAND #5

Same procedure as before. Pad oscillator at 5 MC with signal generator set at 5 MC. Adjust RF and detector trimmers for maximum gain, hooking the gang condenser while adjusting. Trim at 10 MC
 It may be necessary to repeat the above adjustments several times before maximum performance is obtained. When making adjustments on this receiver back off on RF gain leaving AF gain at maximum at all times.

Be sure and turn trimmers all the way in (clockwise) (except as noted below) and back out to find the signal. On these air-dielectric trimmers, capacity is reduced in clockwise direction. Check for images on Band #5, 5600 KC lower.

MODEL S11, Super Sky Rider 1937
 HALLICRAFTERS, INC. Socket, Trimmers



MODEL S-11

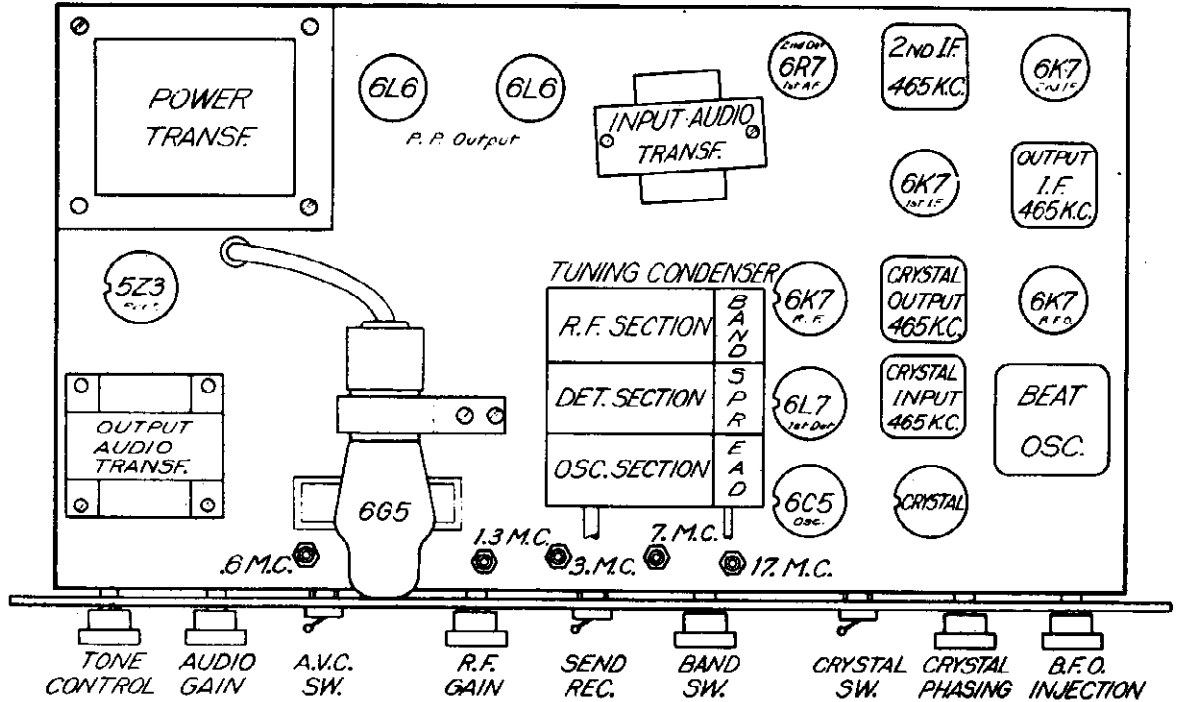


Fig. 1

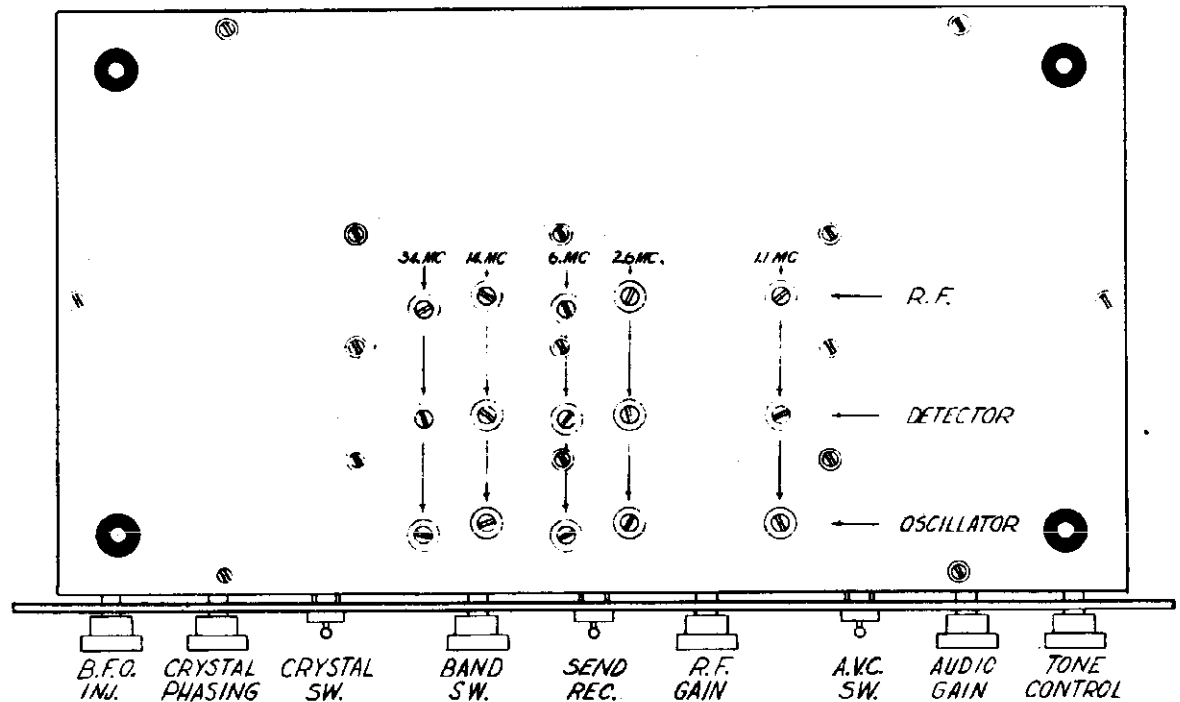
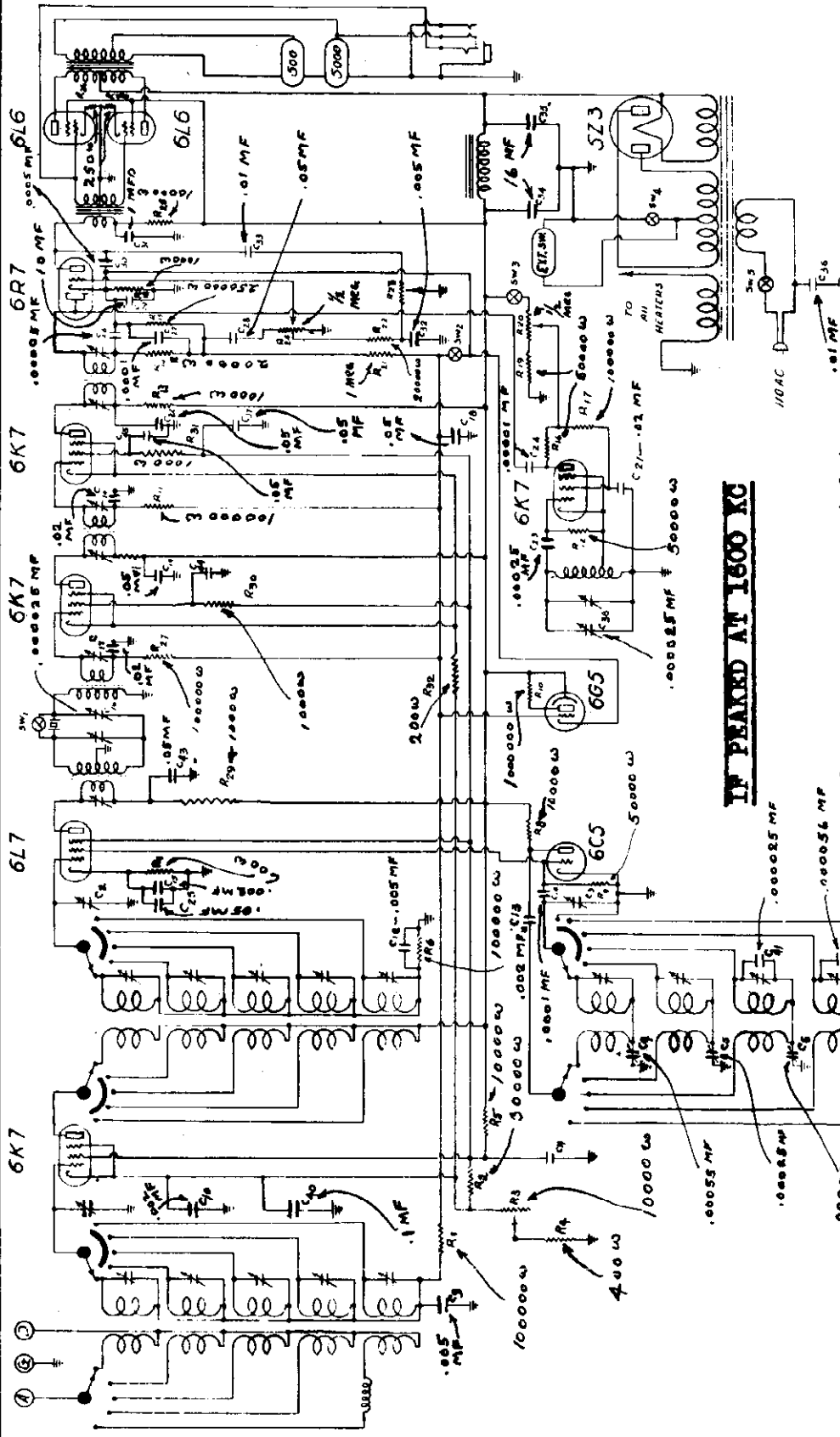


Fig. 2

MODEL S12, Commercial Sky Rider
Schematic

HALLICRAFTERS, INC.



IF PEAKED AT 1600 KC

The new 1937 Sky Rider Commercial is a 5 Band 11 tube superheterodyne receiver covering the following frequency ranges.

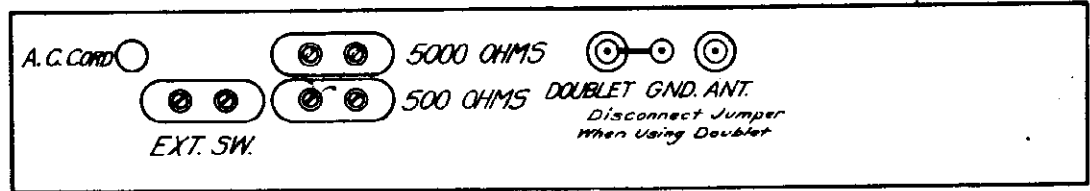
No. 1 Band	-- 110KC to 250KC
No. 2 "	-- 250KC to 610KC
No. 3 "	-- 600KC to 1530KC
No. 4 "	-- 1,715KC to 4300KC
No. 5 "	-- 4300KC to 11,500KC

the **HALLICRAFTERS** inc.
CHICAGO III.
Schematic Model S12 Commercial
Drawn by :- R.J.H. 12-7-36
Checked by :- H.Henry 12-7-36
Approved by :- K.W. Miller 12-8-36

Socket, Trimmers

MODEL S12, Commercial Sky Ride

HALLICRAFTERS, INC.



MODEL S-12

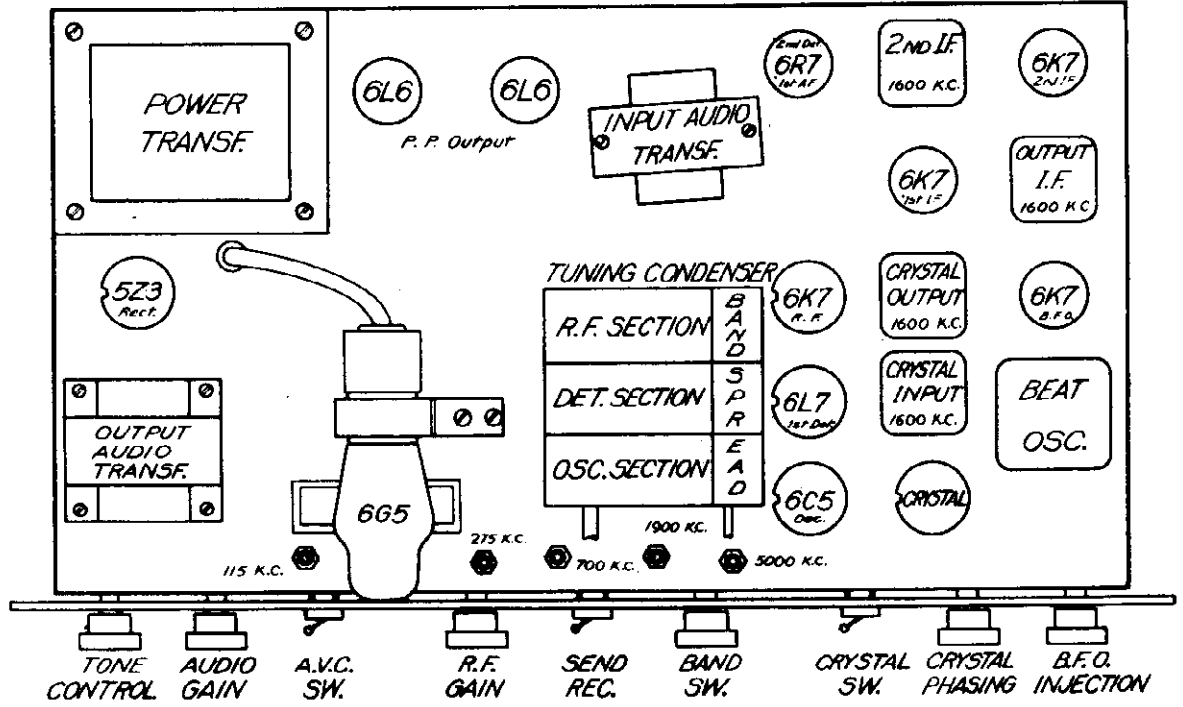


Fig. 1

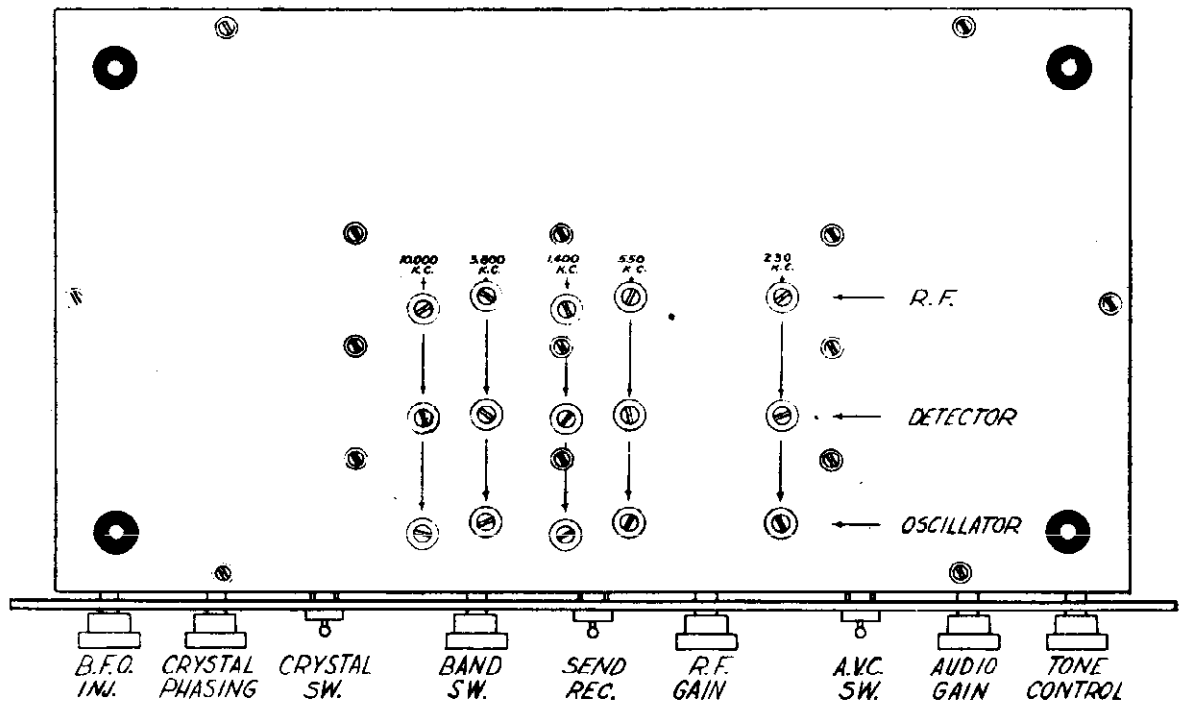
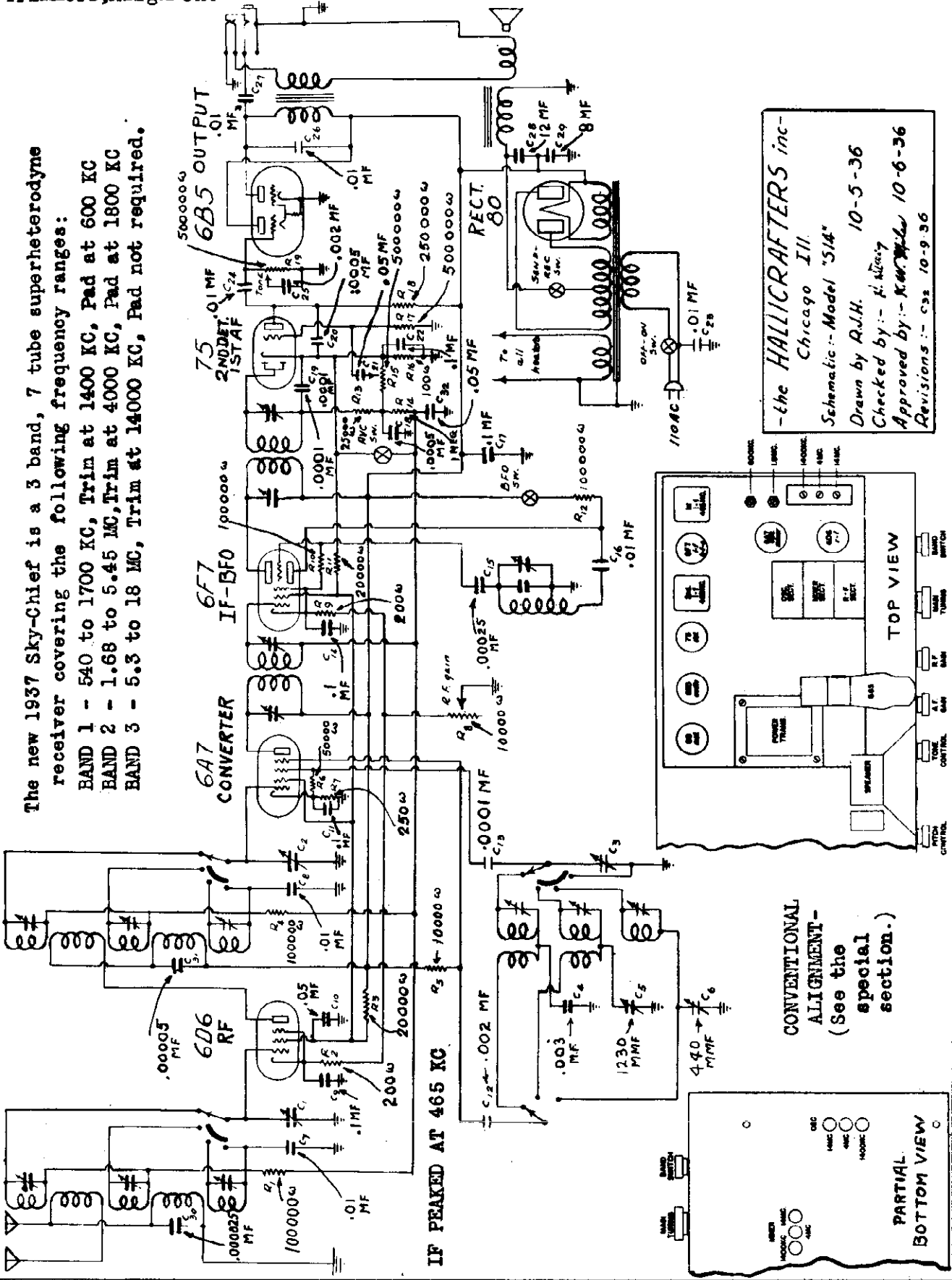


Fig. 2

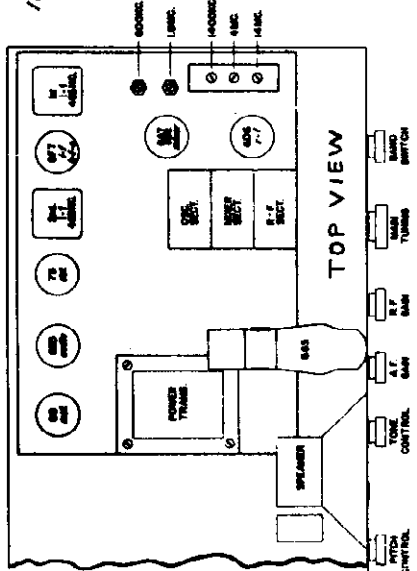
MODEL S14, Sky Chief
Schematic, Socket
Trimmers, Alignment

HALLICRAFTERS, INC.

The new 1937 Sky-Chief is a 3 band, 7 tube superheterodyne receiver covering the following frequency ranges:
 BAND 1 - 540 to 1700 KC, Trim at 1400 KC, Pad at 600 KC
 BAND 2 - 1.68 to 5.45 MC, Trim at 4000 KC, Pad at 1800 KC
 BAND 3 - 5.3 to 18 MC, Trim at 14000 KC, Pad not required.



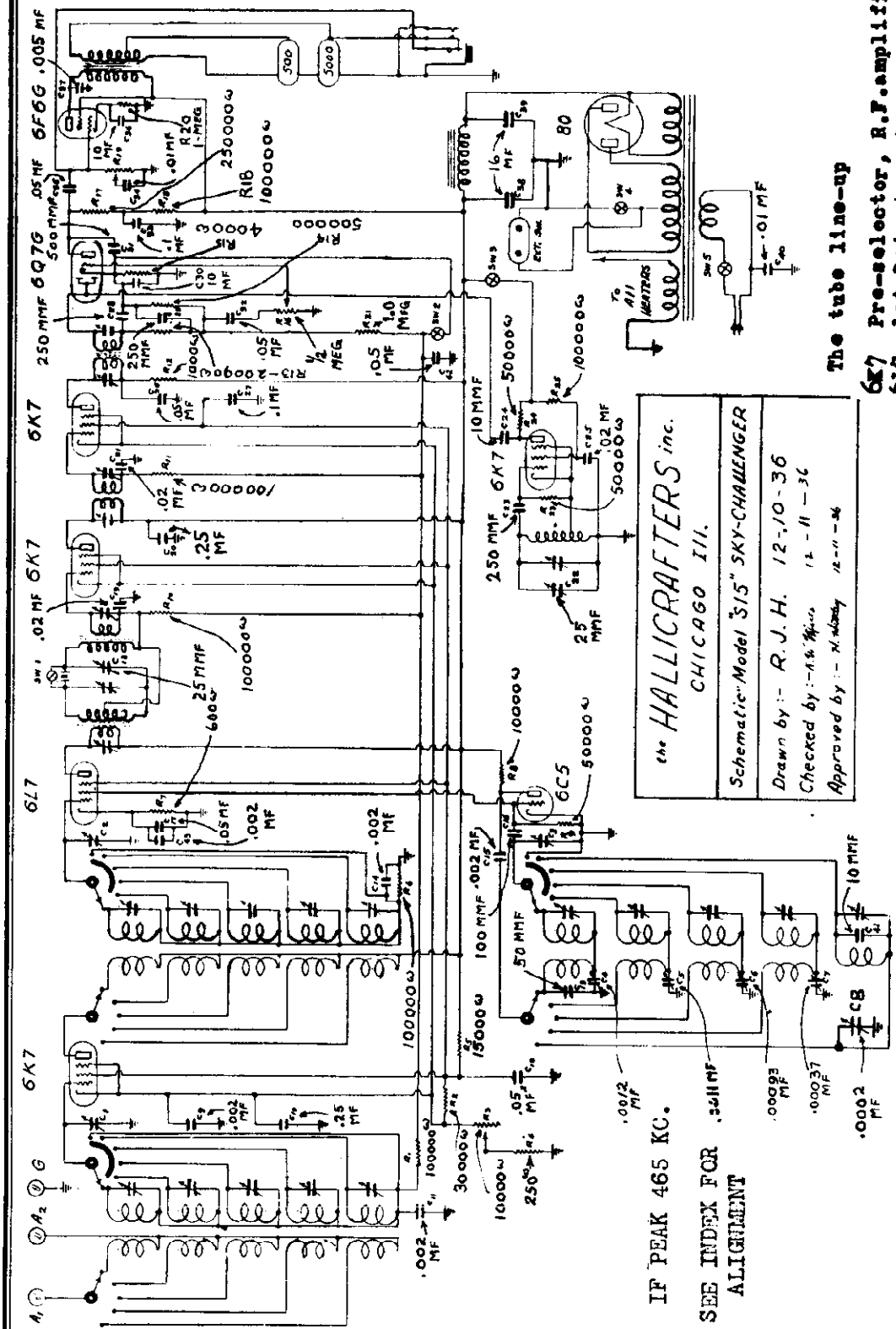
-the HALLICRAFTERS inc-
 Chicago Ill.
 Schematic - Model "S14"
 Drawn by R.J.H. 10-5-36
 Checked by - R. Almy
 Approved by - K.W. Miller 10-6-36
 Revisions - csa 10-9-36



CONVENTIONAL ALIGNMENT -
 (See the special section.)

HALLICRAFTERS, INC.

MODEL S15, Sky Challenger
Schematic



the **HALLICRAFTERS inc.**
CHICAGO III.
Schematic Model S15 SKY-CHALLENGER
Drawn by: R. J. H. 12-10-36
Checked by: - H. W. - 12-11-36
Approved by: - M. - 12-11-36

IF PEAK 465 KC.
SEE INDEX FOR ALIGNMENT

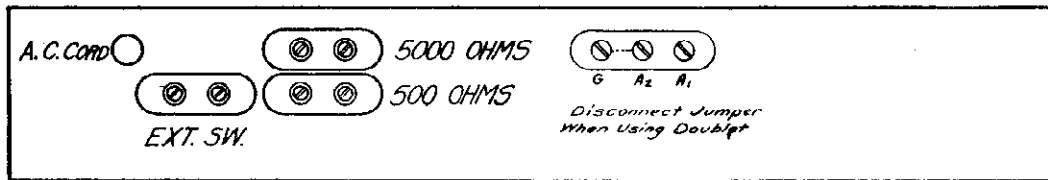
- The tube line-up
- 6K7 Pre-selector, R.F. amplifier
 - 6L7 1st Detector-mixer
 - 6Q7G Signal frequency oscillator
 - 6K7 1st I.F. amplifier
 - 6K7 2nd I.F. amplifier
 - 6Q7G 2nd detector; A.V.C.; 1st stage of audio
 - 6F6G 2nd audio stage
 - 6K7 Beat oscillator
 - 80 Full-wave rectifier

The new 1937 SKY CHALLENGER is a 5 band, 9 tube superheterodyne receiver covering the following frequency ranges.

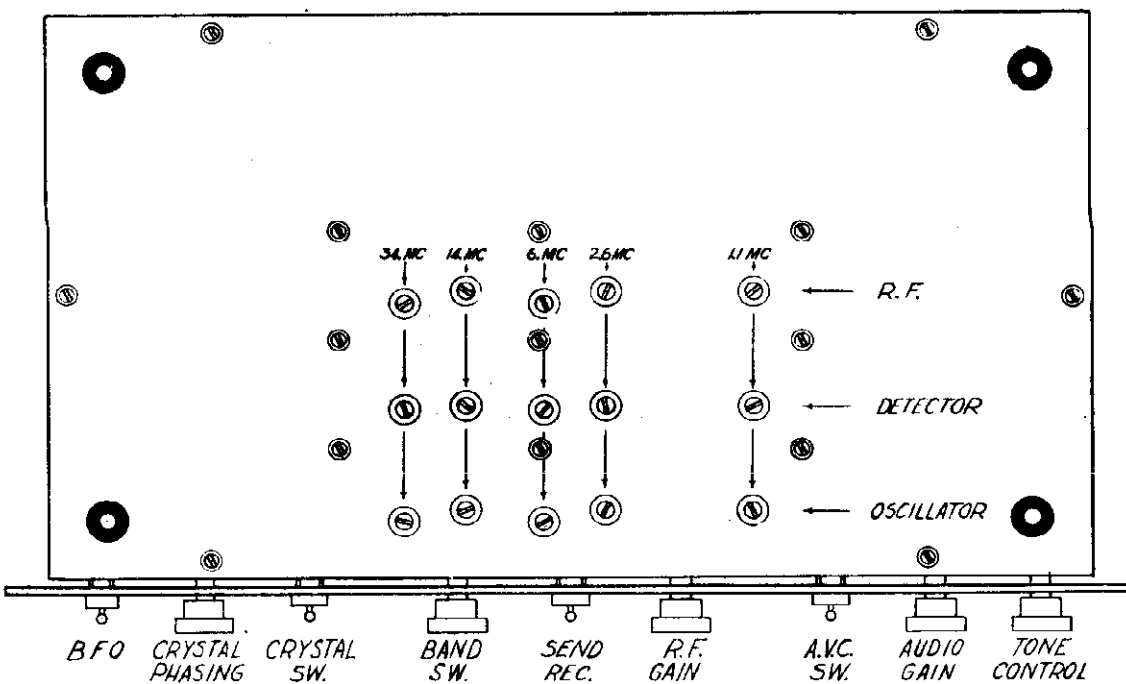
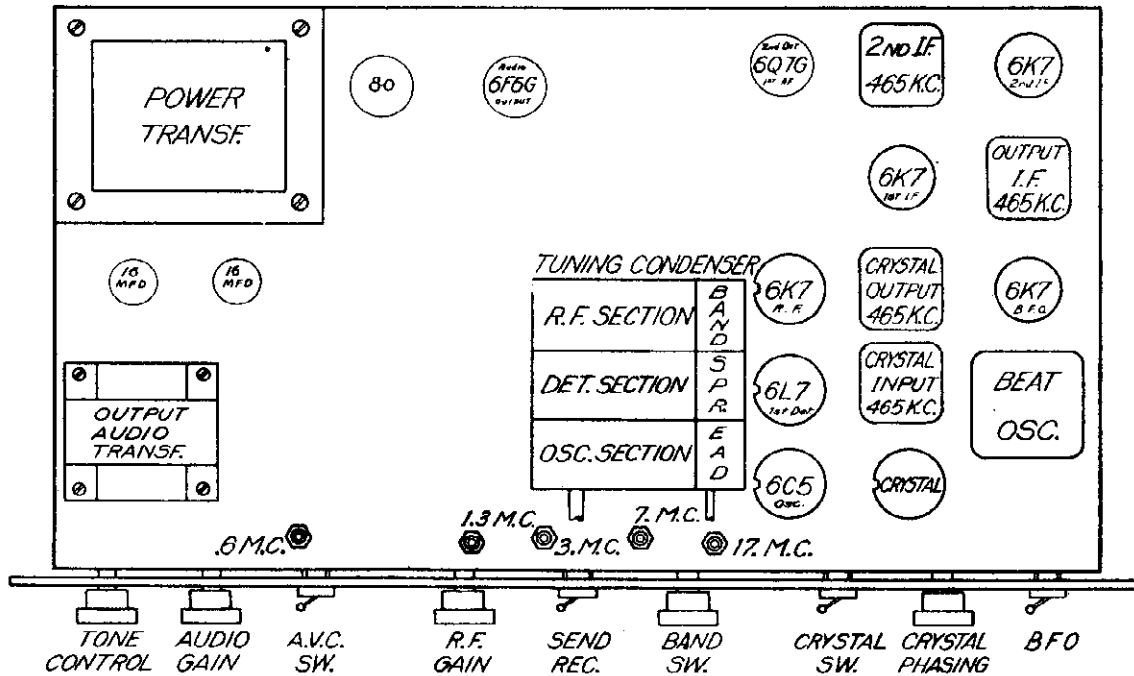
No. 1 Band	--	545	KC	to	1230	KC	(550 to 243 meters.)
No. 2 "	--	1.18	MC	to	2.85	MC	(254 to 105 meters.)
No. 3 "	--	2.75	MC	to	6.82	MC	(109 to 44 meters.)
No. 4 "	--	6.75	MC	to	16.40	MC	(45 to 18.3 meters.)
No. 5 "	--	15.40	MC	to	38.10	MC	(19.5 to 7.85 meters.)

MODEL S15, Sky Challenger
 Socket, Trimmers

HALLICRAFTERS, INC.

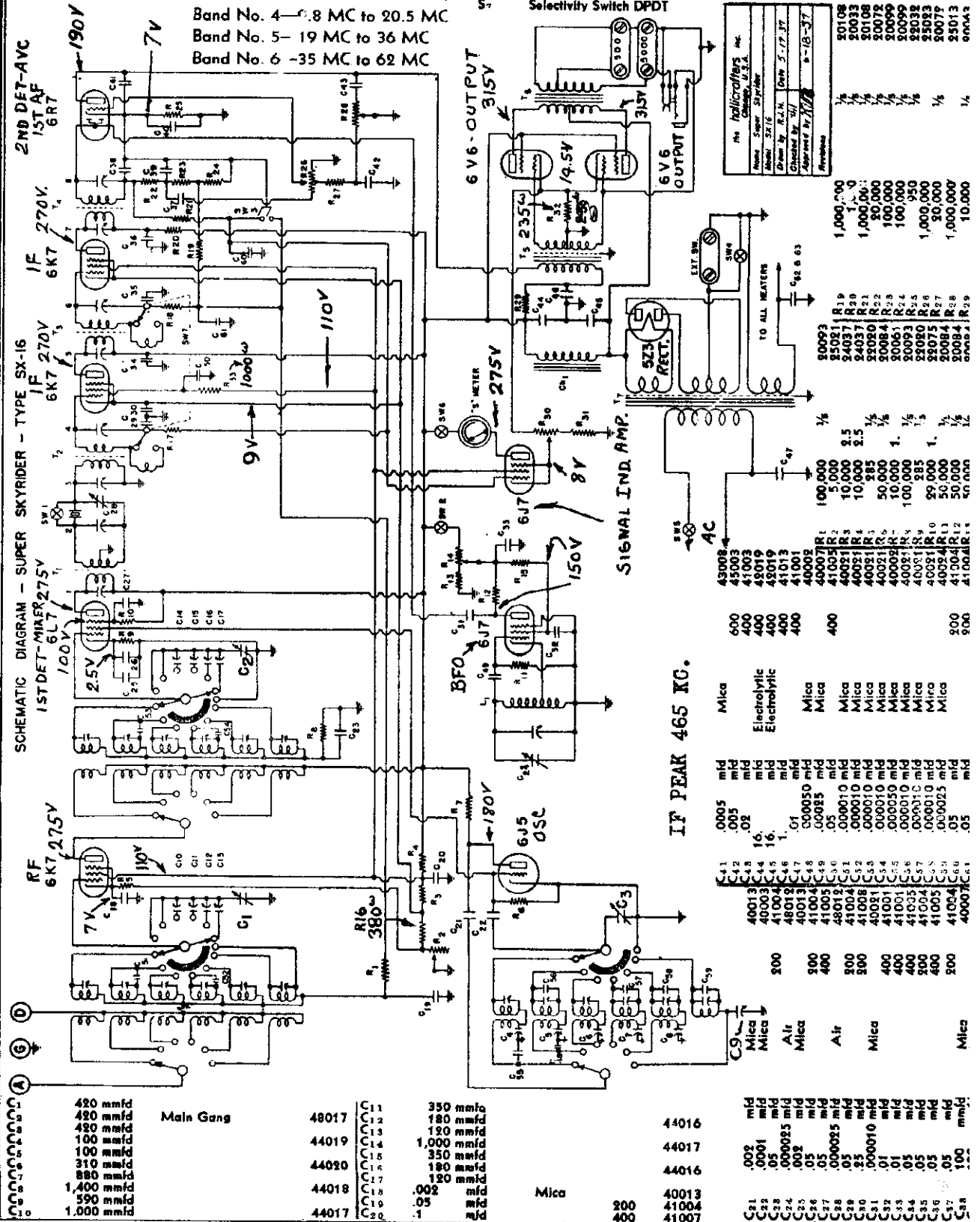


MODEL S-15



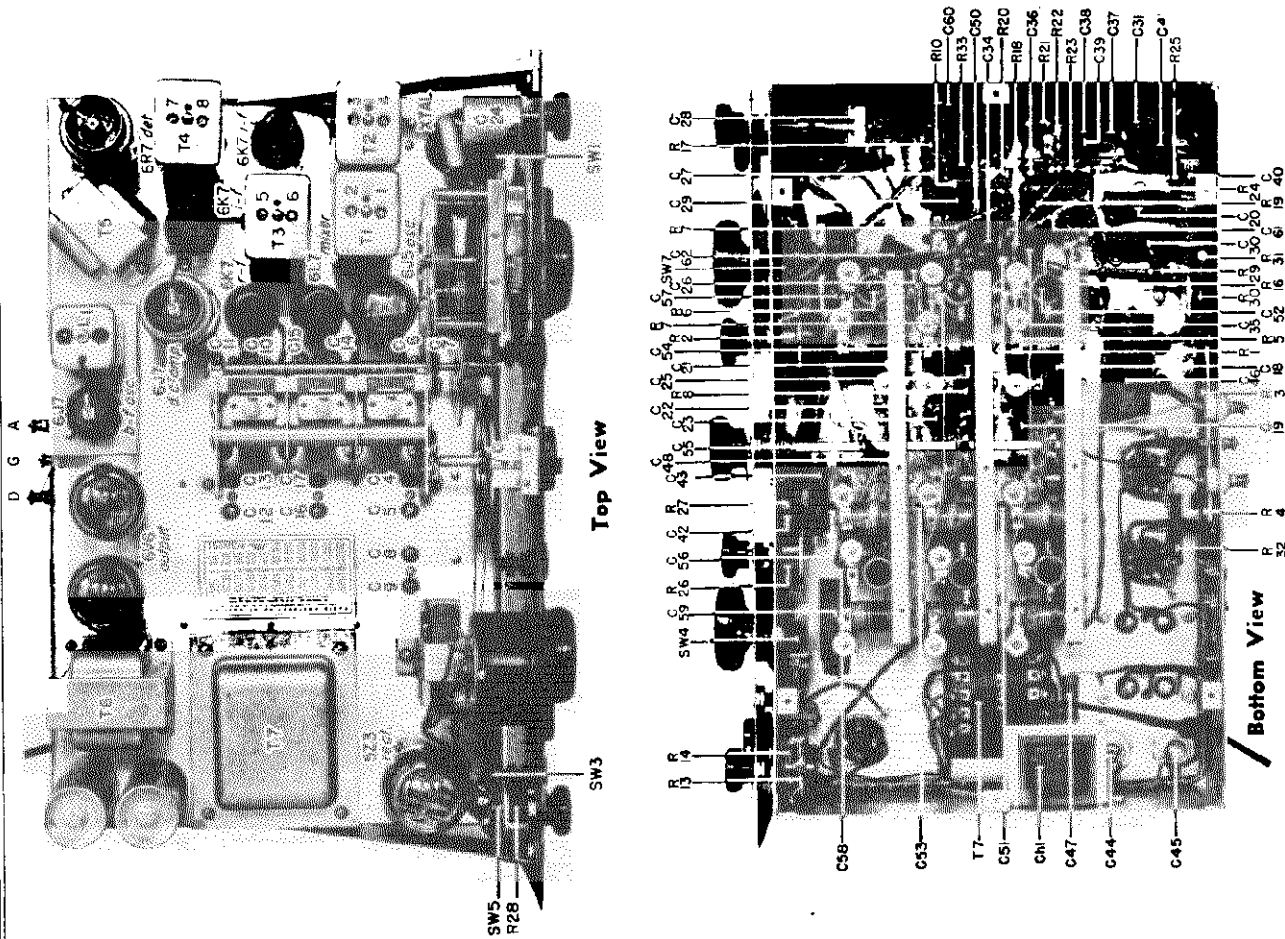
Band No. 1— 545 KC to 1555 KC
 Band No. 2— 1545 KC to 4300 KC
 Band No. 3— 4.7 MC to 10.2 MC
 Band No. 4— 8 MC to 20.5 MC
 Band No. 5— 19 MC to 36 MC
 Band No. 6— 35 MC to 62 MC

- S₁ Crystal Switch SPST
- S₂ Beat Osc. Switch on B.F.O. Injection Control
- S₃ A.V.C. Switch DPST
- S₄ Send-Receive Switch SPST
- S₅ A.C. Switch on Tone Control
- S₆ Meter Switch on R.F. Gain Control
- S₇ Selectivity Switch DPDT



MODEL SX16, Super Sky Rider 1938

Socket, Trimmers, Alignment HALLICRAFTERS, INC.

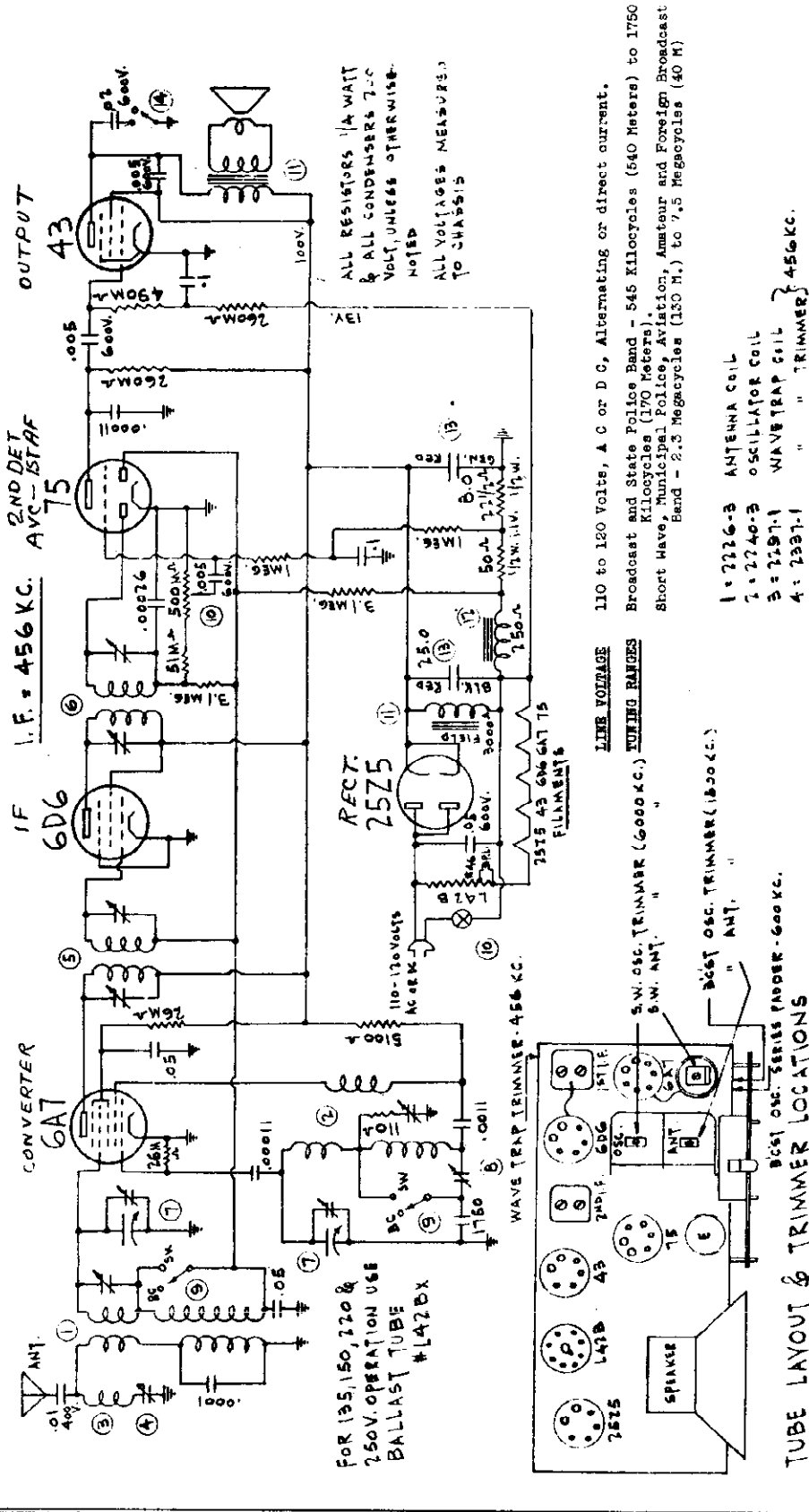


R. F. ALIGNMENT

OPR.	BAND	RECEIVER DIAL SETTING	SIGNAL GENERATOR FREQUENCY	ADJUST Osc. WITH	TRIMMERS ADJ. FOR MAX GAIN	ADJUST Osc. WITH	PADDERS ADJ. FOR MAX GAIN
1	1	600kc	600kc	-----	-----	C9	-----
2	1	1400kc	1400kc	CA	CB - Cc	-----	-----
3	2	1800kc	1800kc	-----	-----	C8	-----
4	2	4000kc	4000kc	Cd	CE - CF	-----	-----
5	3	5000kc	5000kc	-----	-----	C6	C14 - C10
6	3	9000kc	9000kc	Ce	CH - CI	-----	-----
7	4	10,000kc	10,000kc	-----	-----	C7	C15 - C11
8	4	18,000kc	18,000kc	CJ	CK - CL	-----	-----
9	5	20,000kc	10,000kc	-----	-----	C5	C16 - C12
10	5	30,000kc	10,000kc	Cm	CN - Co	-----	-----
11	6	40,000kc	20,000kc	-----	-----	C4	C17 - C13
12	6	60,000kc	20,000kc	Cp	Cq - CR	-----	-----

HALSON RADIO MFG. CORP.

MODEL 25
Schematic, Socket
Trimmers, Alignment
Parts, Voltage

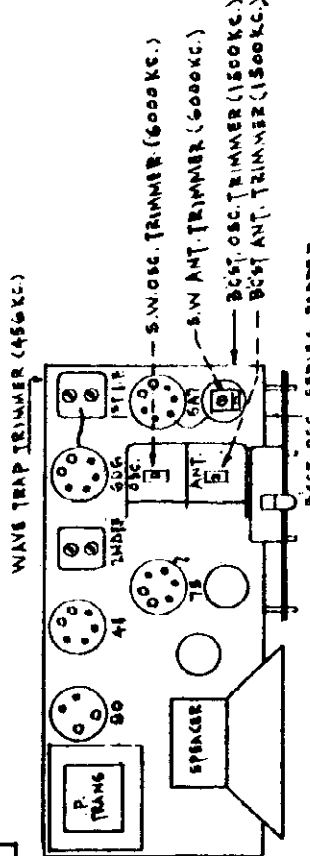
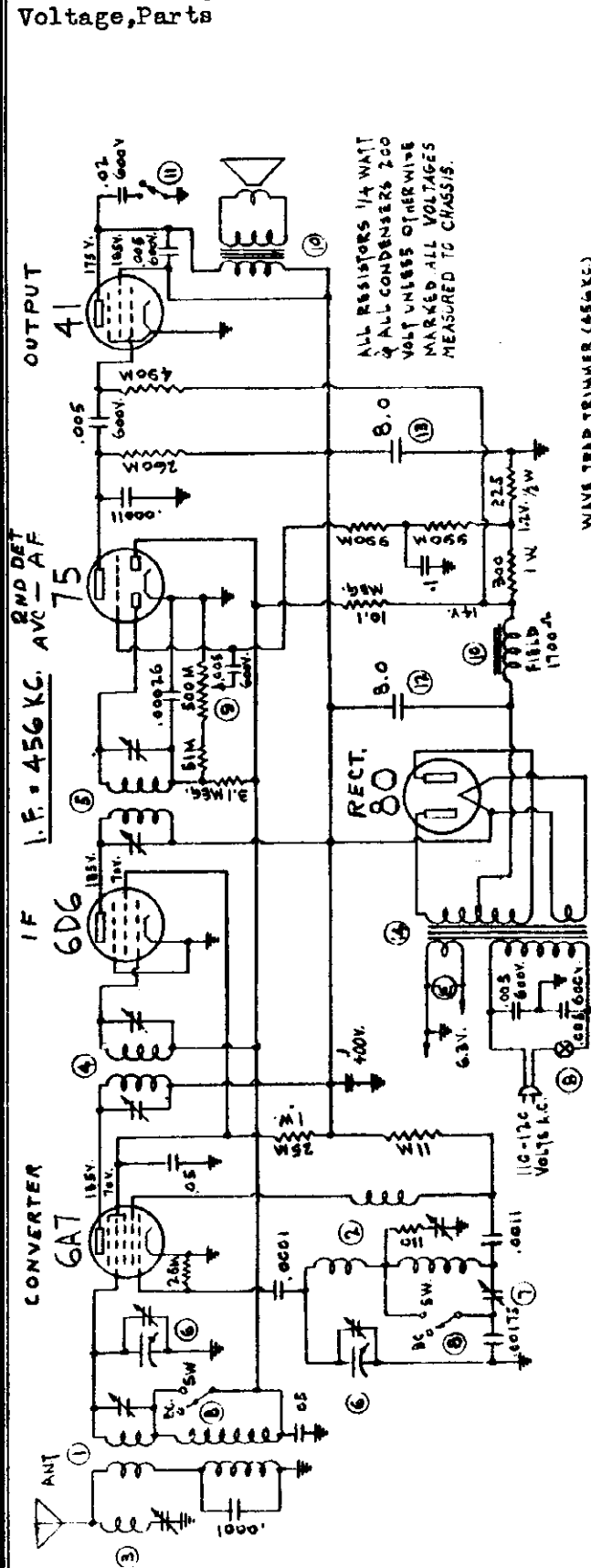


- 1) Set service oscillator to 456 kilocycles and connect the output lead to the top grid of the 6AT. Adjust the intermediate frequency trimmers for maximum response.
- 2) Connect oscillator set at 456 kc. to the antenna lead through a .0002 mfd. condenser band switch in the broadcast position, and adjust the wave trap trimmer for minimum signal.
- 3) Set the oscillator for 6 megacycles (6000 kc.), band switch in the short wave position, dial pointer set for 6 mc. calibration and adjust the short wave oscillator trimmer until the signal is heard.
- 4) Turn the band switch to the broadcast band, set the dial to 1500 kc. calibration. Feed a 1500 kc. signal from the test oscillator through the antenna, and adjust the broadcast osc. trimmer until the signal is heard, then adjust the broadcast ant. trimmer for maximum response.
- 5) Set the test oscillator to 600 kc. and adjust the broadcast osc. series padder for maximum response by simultaneously adjusting the padder and rocking the tuning dial.
- 6) Repeat procedure numbers 4 and 5 for greater accuracy.
- 7) Turn the set to the S. W. band, set the test oscillator to 6000 kc., tune in the

MODEL 35

Schematic, Socket
Trimmers, Alignment
Voltage, Parts

HALSON RADIO MFG. CORP.



TUBE LAYOUT & TRIMMER LOCATIONS

- 5 - 1B4BK 2ND IF TRANS.
- 6 - 2335 VARIABLE CONDENSER 420MMFD.
- 7 - 1G21-I PADDER CONDENSER
- 8 - 2254-2 RANGE SWITCH
- 9 - 1908-D-2 VOLUME CONTROL & SWITCH
- 10 - 2272 SPEAKER ASSEMBLY
- 11 - 1439B4 TONE CONTROL SWITCH
- 12 - 2270 ELECTROLYTIC COND (NET) 8MFD. 350V.
- 13 - 2271 " " " 250V.
- 14 - 2274 POWER TRANSFORMER - 60 CYCLE

MODEL 35

LINE VOLTAGE 110 to 120 Volts alternating current only.

TUNING RANGES Broadcast and State Police Band - 545 Kilocycles (540 Meters) to 1750 Kilocycles (170 Meters).
Short Wave, Municipal Police, Aviation, Amateur and Foreign Broadcast Band - 2.3 Megacycles (130 H.) to 7.5 Megacycles (40 H.).

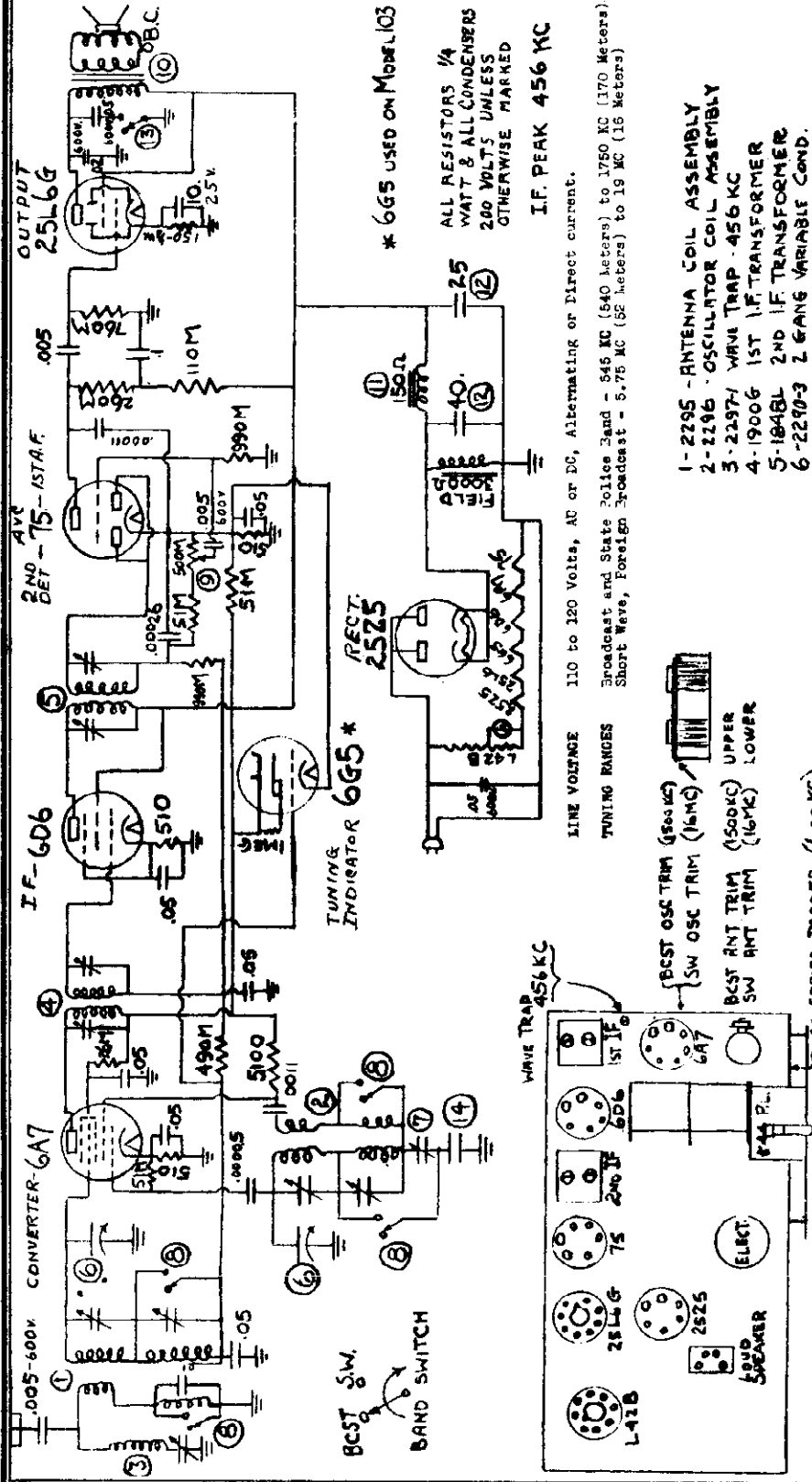
ALIGNMENT PROCEDURE

- 1) Set service oscillator to 456 kilocycles and connect the output lead to the top grid of the 6A7. Adjust the intermediate frequency trimmers for maximum response.
- 2) Connect oscillator, set at 456 kc. to the antenna lead through a .0002 mfd. condenser, band switch in the broadcast position, and adjust the wave trap trimmer for minimum signal.
- 3) Set the oscillator for 6 megacycles (8000 kc.), band switch in the short wave position, dial pointer set for 6 mc. calibration and adjust the short wave oscillator trimmer until the signal is heard.
- 4) Turn the band switch to the broadcast band, set the dial to 1500 kc. calibration. Feed a 1500 kc. signal from the test oscillator through the antenna, and adjust the broadcast osc. trimmer until the signal is heard, then adjust the broadcast ant. trimmer for maximum response.
- 5) Set the test oscillator to 600 kc. and adjust the broadcast osc. series padder for maximum response by simultaneously adjusting the padder and rocking the tuning dial.
- 6) Repeat procedure numbers 4 and 5 for greater accuracy.
- 7) Turn the set to the S. W. band, set the test oscillator to 8000 kc., tune in the signal with the set and adjust the S. W. antenna trimmer for maximum response.

- 1 - 2274-3 ANTENNA COIL
- 2 - 2274-3 OSCILLATOR COIL
- 3 - 2274-1 WAVE TRAP 456 KC.
- 4 - 1908-F 1ST I.F. TRANS. 456 KC.

HALSON RADIO MFG. CORP.

MODELS 102, 103
Schematic, Socket
Alignment, Trim
Parts

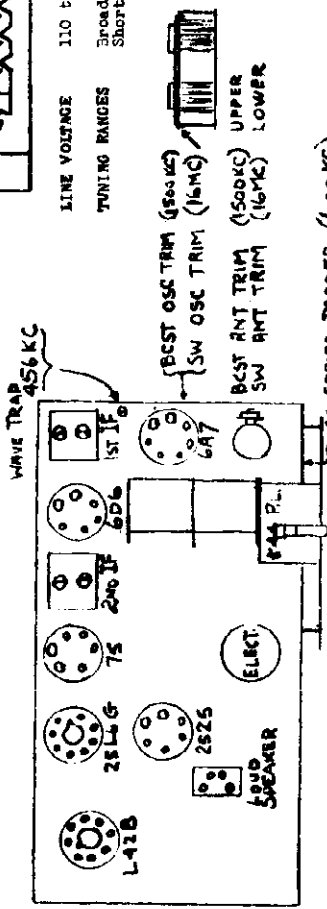


* 6G5 USED ON MODEL 103
ALL RESISTORS 1/4 WATT & ALL CONDENSERS 200 VOLTS UNLESS OTHERWISE MARKED
IF. PEAK 456 KC

LINE VOLTAGE 110 to 120 Volts, AC or DC, Alternating or Direct current.
Broadcast and State Police Band - 545 KC (540 Meters) to 1750 KC (170 Meters)
Short Wave, Foreign Broadcast - 5.75 MC (52 Meters) to 19 MC (15 Meters)

- 1-2295 - ANTENNA COIL ASSEMBLY
- 2-2296 - OSCILLATOR COIL ASSEMBLY
- 3-2297 - WAVE TRAP - 456 KC
- 4-19006 1ST I.F. TRANSFORMER
- 5-1848L 2ND I.F. TRANSFORMER
- 6-2270-3 2 GANG VARIABLE COND.
- 7-16241 PADDER CONDENSER
- 8-22941 RANGE SWITCH
- 9-1908D2 VOLUME CONTROL - SWITCH
- 10-22991 SPEAKER ASSEMBLY
- 11-2301 FILTER CHOKE
- 12-2302 ELECTROLYTIC COND. -150V.
- 13-149184 TONE CONTROL SWITCH
- 14-2320 MICA COND. 3200MMF ±5%

FOR 135, 150, 220, 250 VOLT OPERATION
USE BALLAST TUBE NO L428X



TUBE LAYOUT AND TRIMMER LOCATION

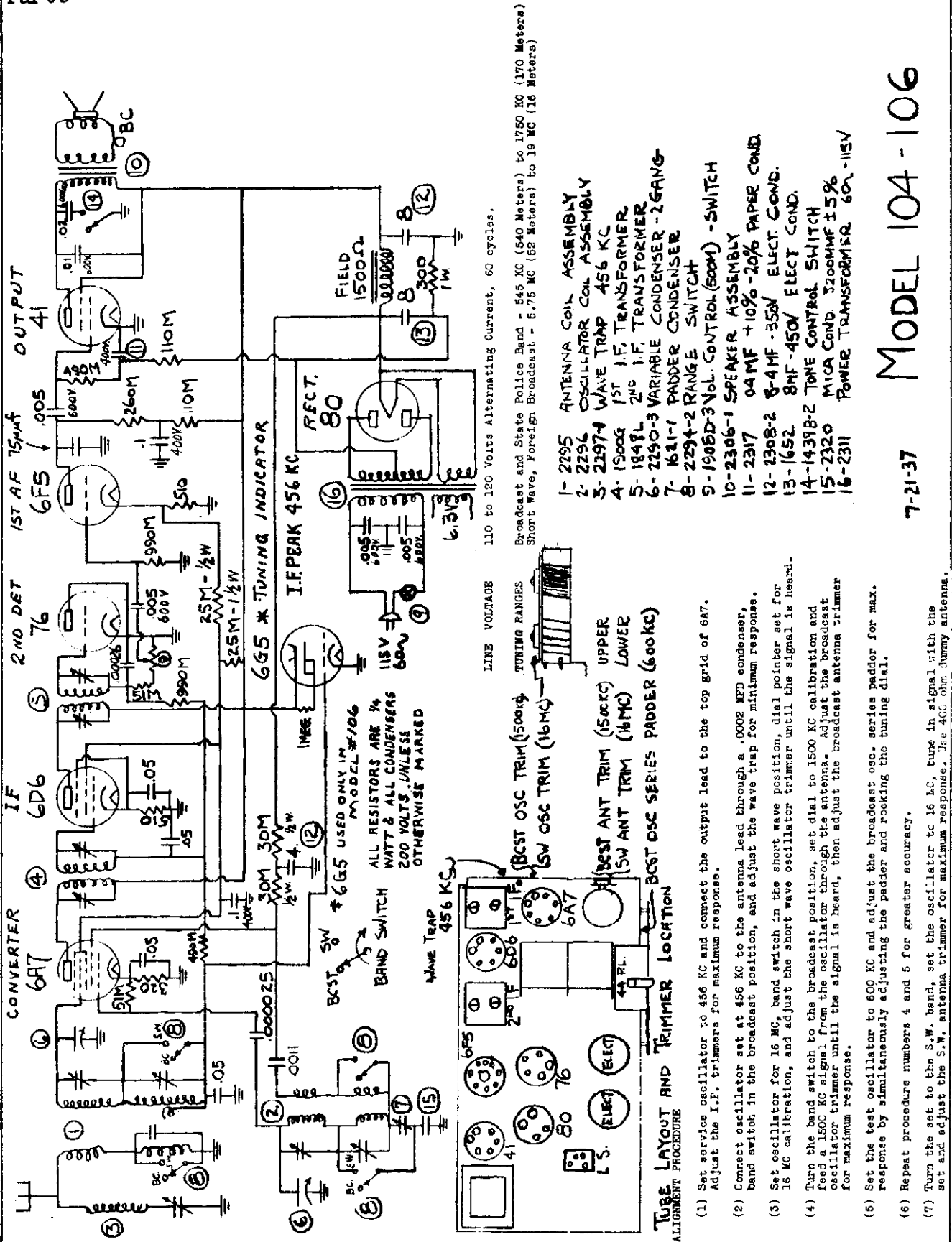
ALIGNMENT PROCEDURE -

- (1) Set service oscillator to 456 KC and connect the output lead to the top grid of 6A7. Adjust the I.F. trimmers for maximum response.
- (2) Connect oscillator set at 456 KC to the antenna lead through a .0002 MFD condenser, band switch in the broadcast position, and adjust the wave trap for minimum response.
- (3) Set oscillator for 16 MC, band switch in the short wave position, dial pointer set for 16 MC calibration, and adjust the short wave oscillator trimmer until the signal is heard.
- (4) Turn the band switch to the broadcast position, set dial to 1500 KC calibration and feed a 1500 KC signal from the oscillator through the antenna. Adjust the broadcast oscillator trimmer until the signal is heard, then adjust the broadcast antenna trimmer for maximum response.
- (5) Set the test oscillator to 600 KC and adjust the broadcast osc. series padder for max. response by simultaneously adjusting the padder and rocking the tuning dial.
- (6) Repeat procedure numbers 4 and 5 for greater accuracy.

M... 109 10 Z

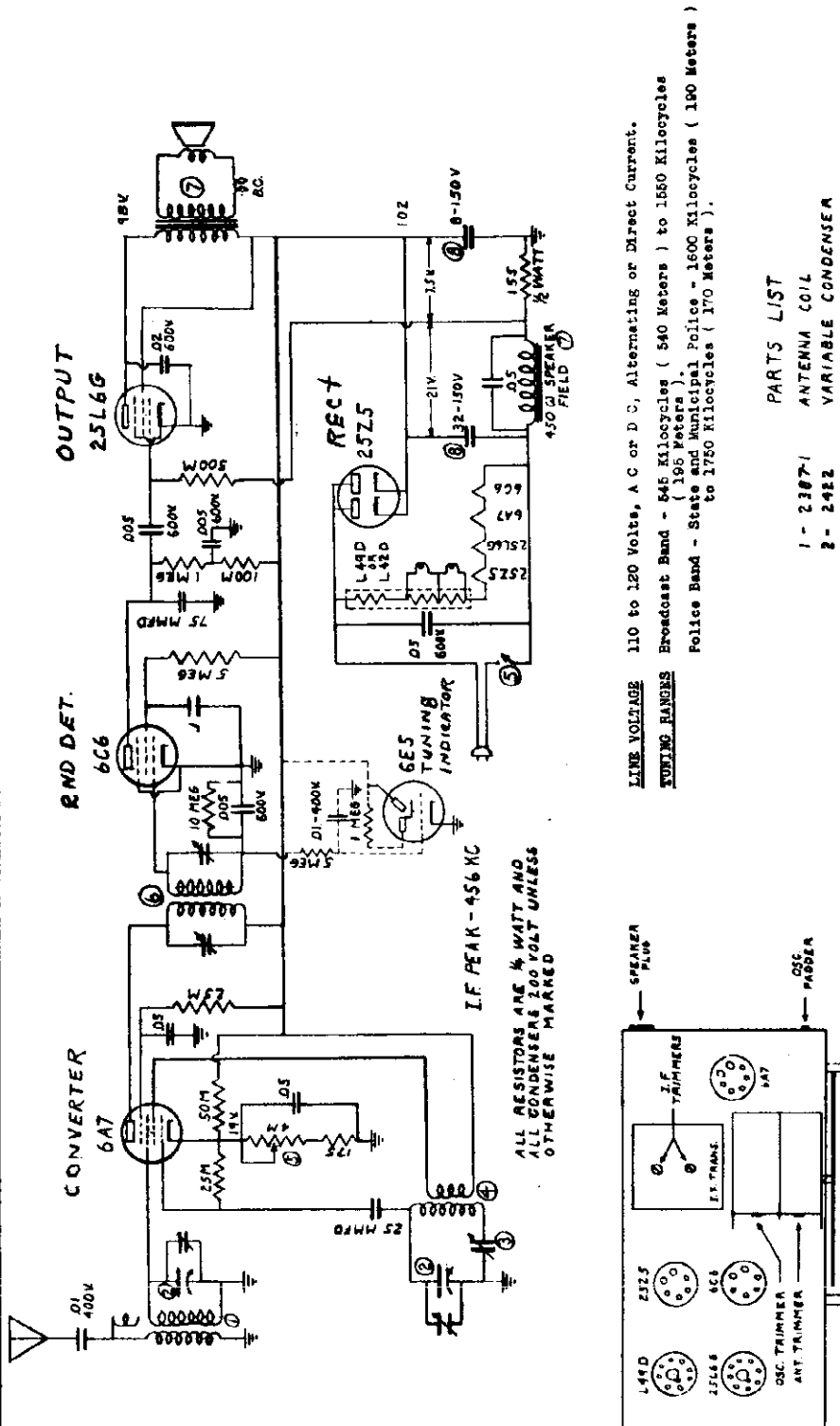
MODELS 104, 106
Schematic, Socket
Trimmers, Alignment
Parts

HALSON RADIO MFG. CORP.



7-21-37 MODEL 104-106

HALSON RADIO MFG. CORP.



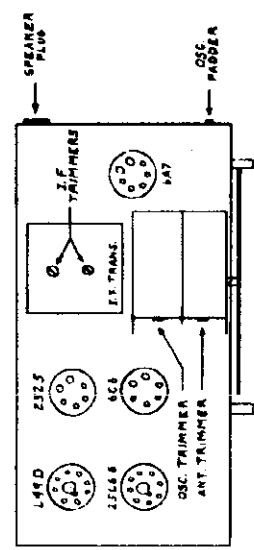
PARTS LIST

- 1 - 2387-1 ANTENNA COIL
- 2 - 2422 VARIABLE CONDENSER
- 3 - 1621-1 PADDER CONDENSER
- 4 - 2388-1 OSCILLATOR COIL
- 5 - 2202-2A VOLUME CONTROL & SWITCH
- 6 - 2410 I.F. TRANSFORMER
- 7 - 2346 SPEAKER ASSEMBLY
- 8 - 2412 ELECTROLYTIC CONDENSER

DOTTED LINES ARE 6ES CONNECTIONS IN MODEL 162 ONLY

MODEL 161 - 162

TUBE LAYOUT AND TRIMMER LOCATION

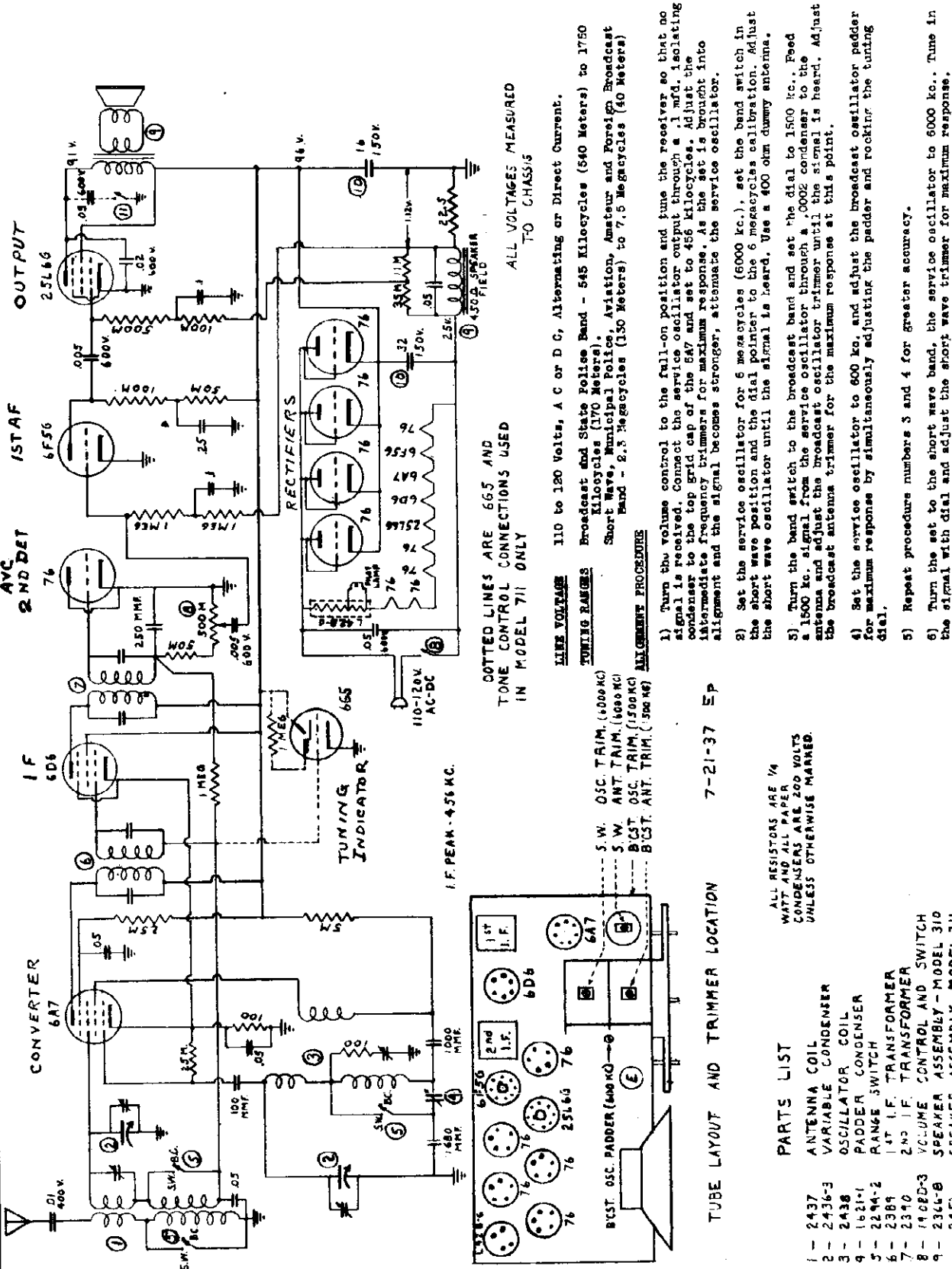


ALIGNMENT PROCEDURE

- 1) Turn the volume control to the full on position and tune the receiver so that no signal is received. Connect the service oscillator output through a .1 mfd. isolating condenser to the top grid cap of the 6A7 and set to 466 kilocycles. Adjust the intermediate frequency trimmers for the maximum response. As the set is brought into line and the signal becomes stronger, attenuate the service oscillator.
- 2) Set the dial pointer to the 1600 kilocycle calibration. Feed a 1500 kilocycle signal from the service oscillator through a .0002 condenser to the antenna. Adjust the oscillator trimmer until the signal is heard, then adjust the antenna condenser trimmer for maximum response.
- 3) Set the service oscillator to 600 kilocycles and adjust the oscillator series padder for maximum response by simultaneously adjusting the padder and rocking the tuning control.

MODELS 310, 711
Schematic, Socket
Trimmers, Alignment
Voltage, Parts

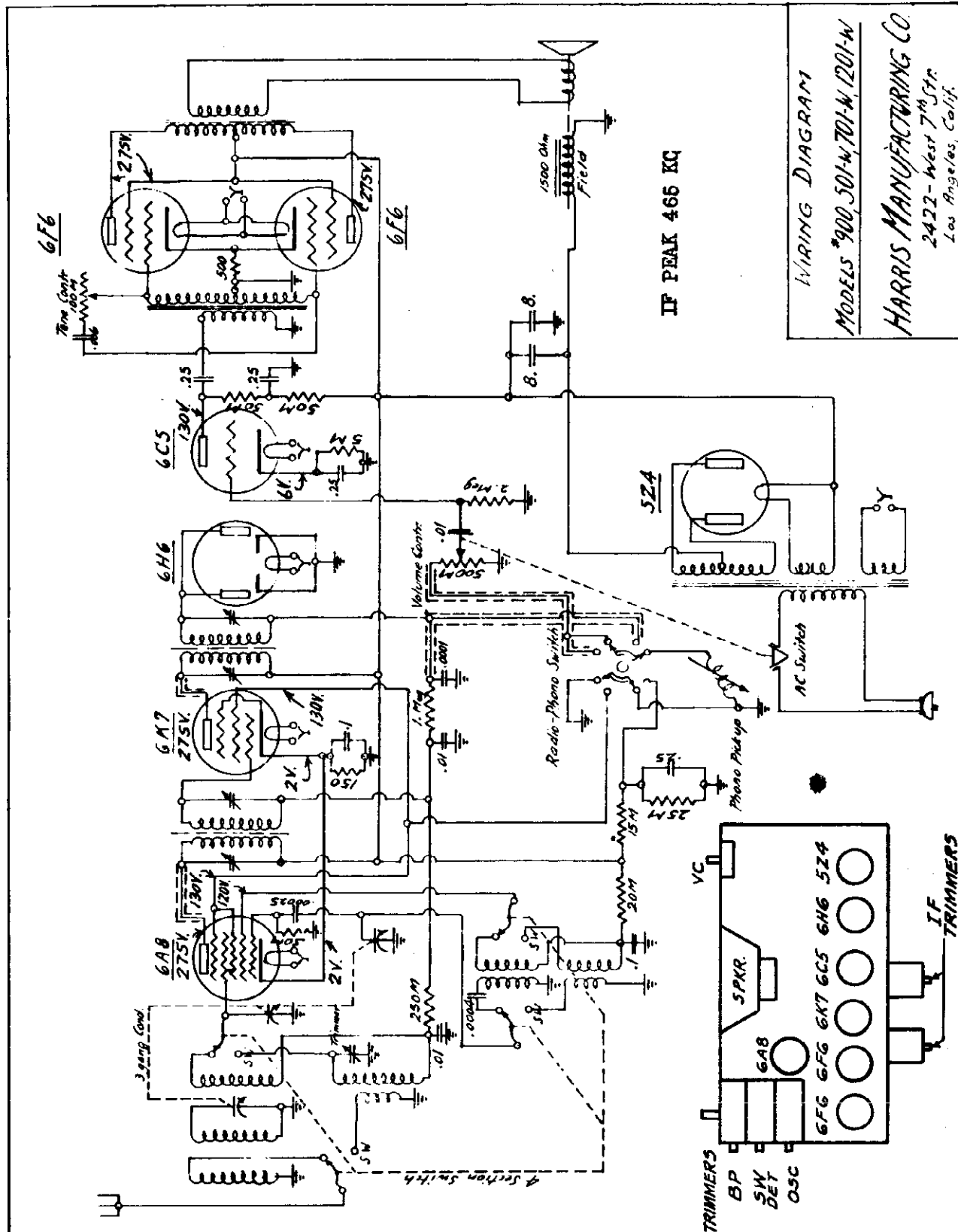
HALSON RADIO MFG. CORP.



MODEL 310-711

MODELS 501W, 701W, 900
1201W
Schematic, Socket
Trimmers, Voltage

HARRIS MFG. CO.



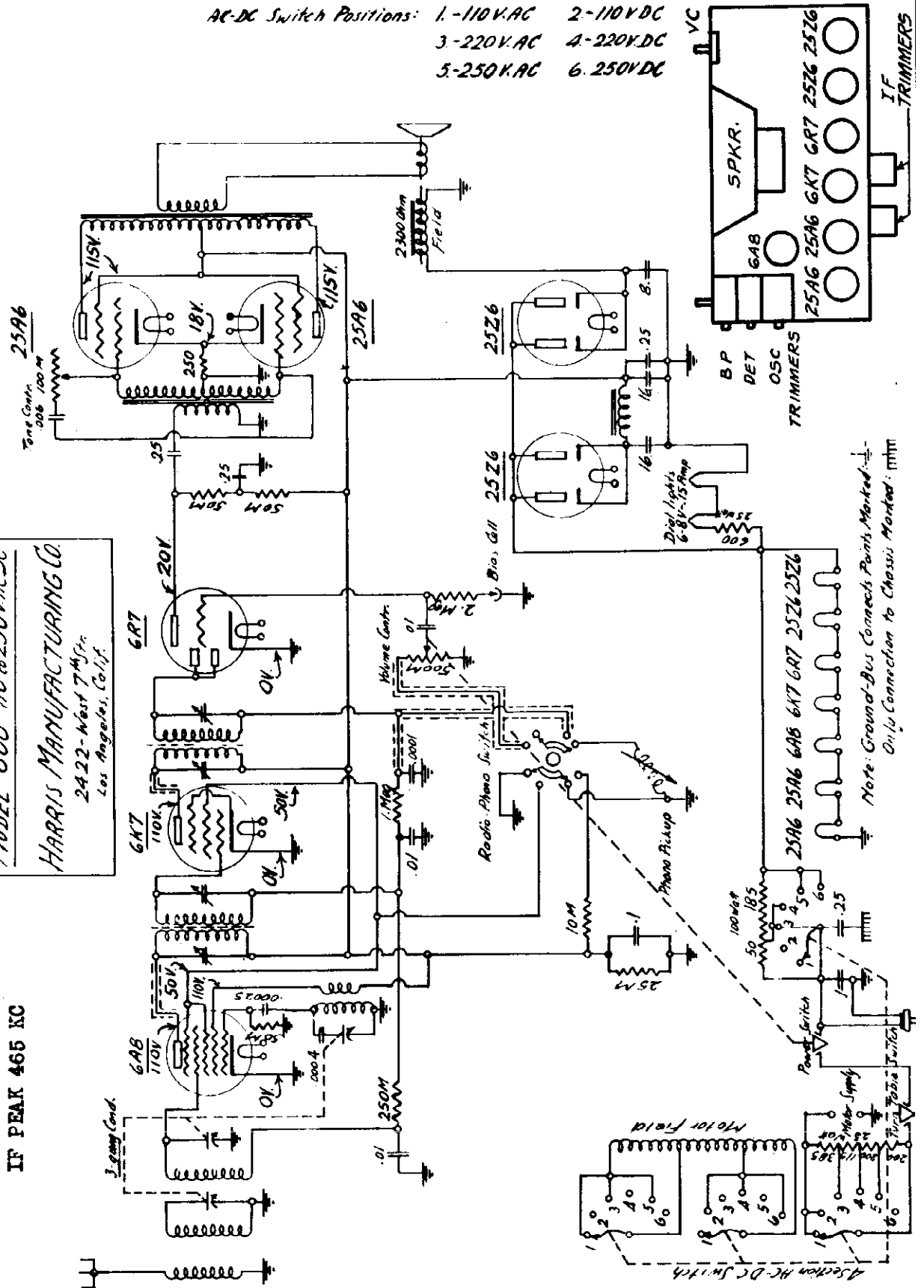
HARRIS MFG. CO.

MODEL 800
Schematic, Socket
Trimmers, Voltage

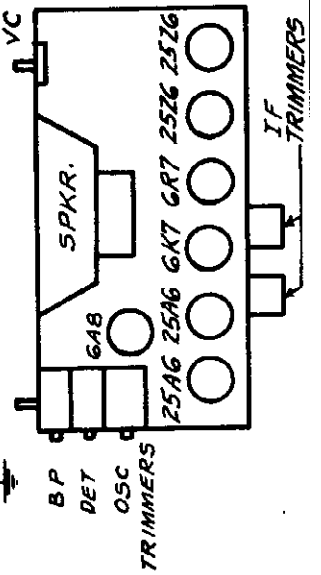
AC-DC Switch Positions: 1-110V AC 2-110V DC
3-220V AC 4-220V DC
5-250V AC 6-250V DC

WIRING DIAGRAM
MODEL # 800 - 110 to 250V AC DC
HARRIS MANUFACTURING CO.
2422 - West 7th St.
Los Angeles, Calif.

IF PEAK 465 KC



Note: Ground-Bus Connects Points Marked -
Only Connection to Chassis Marked -



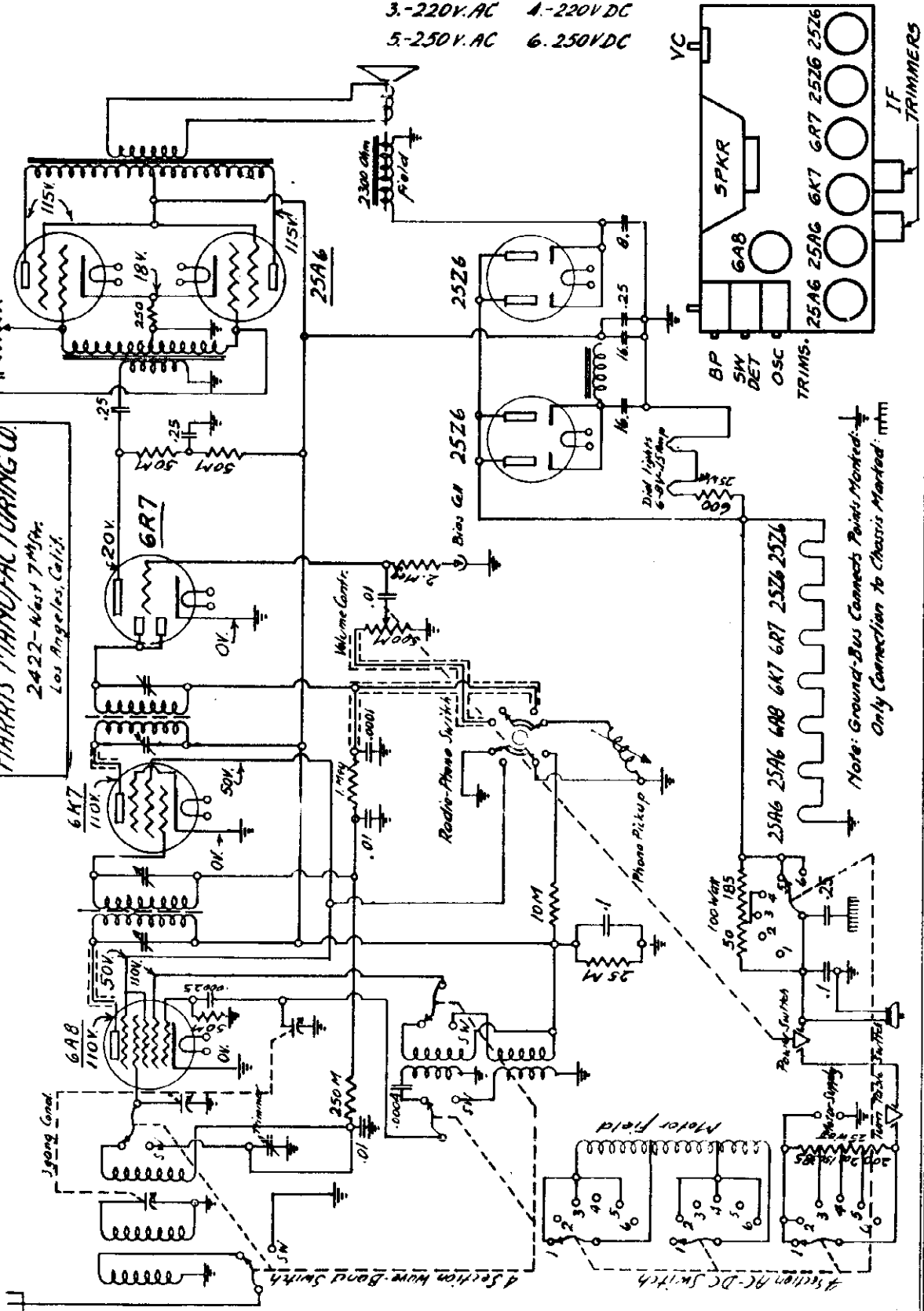
MODEL 1000
Schematic, Voltage
Socket, Trimmers

HARRIS MFG. CO.

AC-DC Switch Positions: 1.-110V.AC 2.-110V.DC
3.-220V.AC 4.-220V.DC
5.-250V.AC 6.-250V.DC

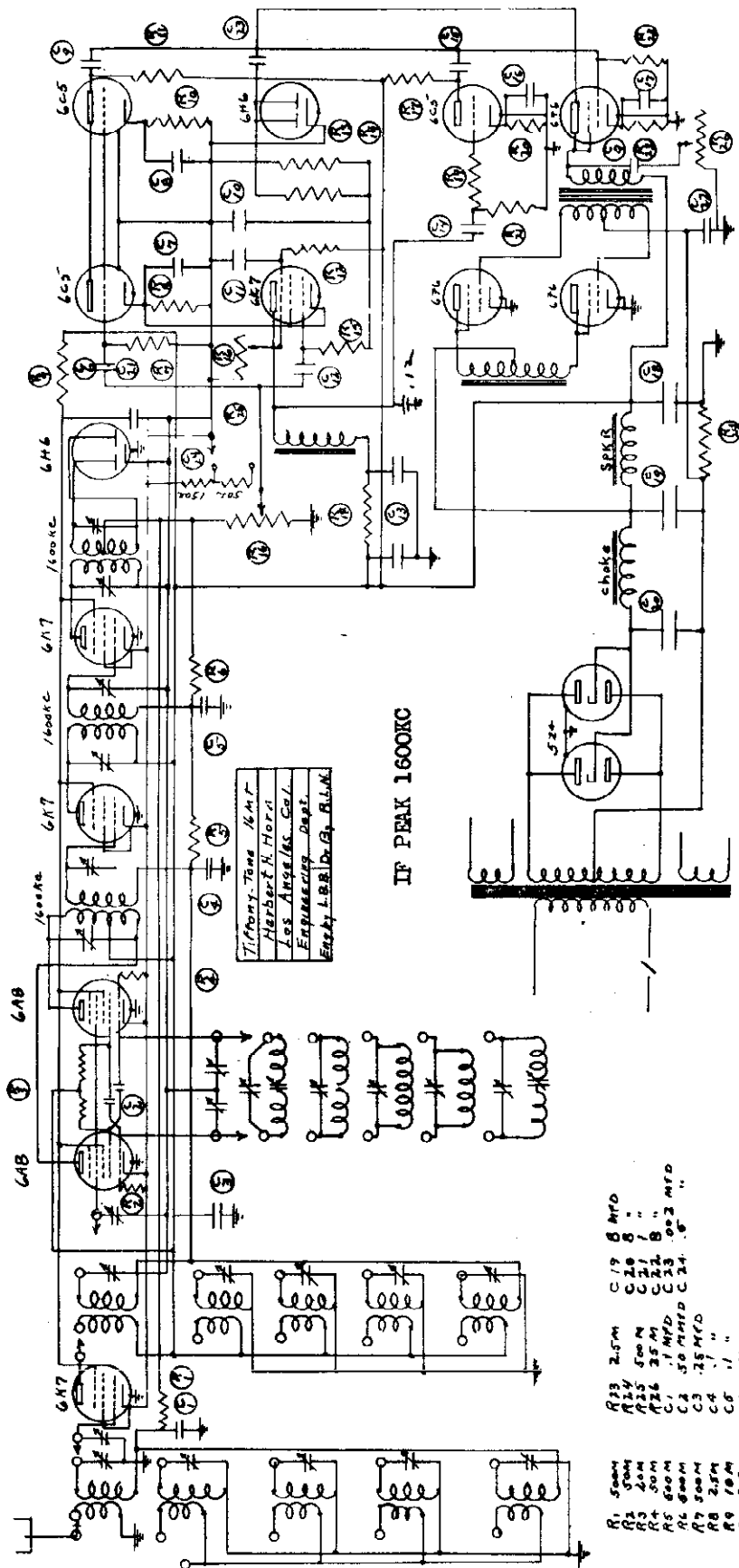
WIRING DIAGRAM
MODEL 1000-110 to 250V AC-DC
HARRIS MANUFACTURING CO.
2422- West 7th St.
Los Angeles, Calif.

IF PEAK 465 KC



Note: Ground-Bus Connects Point-Marked
Only Connection to Chassis Marked

HERBERT H. HORN



Tiffany-Tone Radio
Herbert H. Horn
Los Angeles, Cal.
Expanding Dept.
Engby L.B.B. Co. B.L.M.

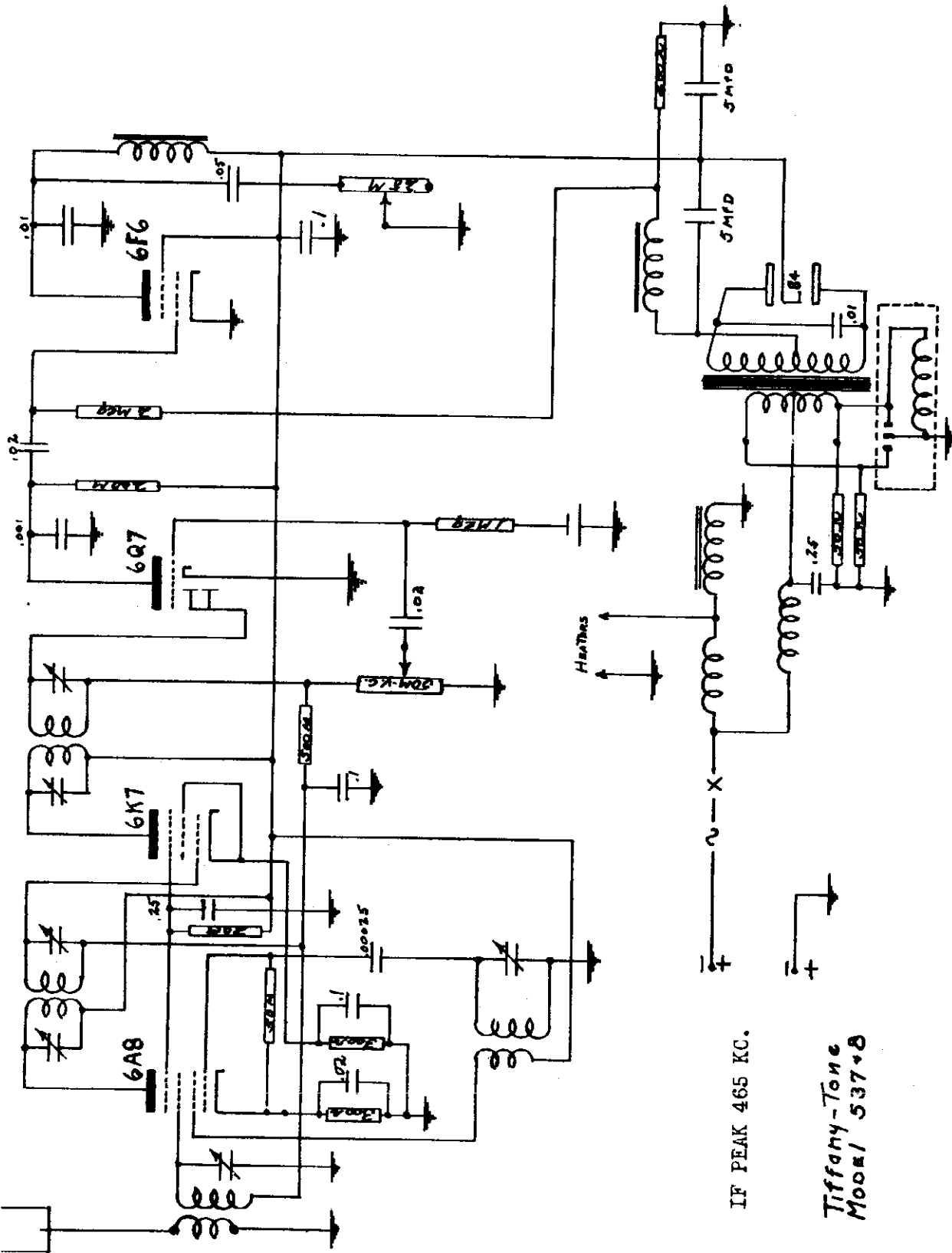
IF PEAK 1600KC

- | | | | |
|-----|------|-----|------------|
| R1 | 500Ω | C19 | 8 MFD |
| R2 | 25M | C20 | 8 " |
| R3 | 25M | C21 | 8 " |
| R4 | 500Ω | C22 | 8 " |
| R5 | 500Ω | C23 | 8 " 25 MFD |
| R6 | 500Ω | C24 | 8 " |
| R7 | 500Ω | C25 | 8 " |
| R8 | 500Ω | C26 | 8 " |
| R9 | 500Ω | C27 | 8 " |
| R10 | 500Ω | C28 | 8 " |
| R11 | 500Ω | C29 | 8 " |
| R12 | 500Ω | C30 | 8 " |
| R13 | 500Ω | C31 | 8 " |
| R14 | 500Ω | C32 | 8 " |
| R15 | 500Ω | C33 | 8 " |
| R16 | 500Ω | C34 | 8 " |
| R17 | 500Ω | C35 | 8 " |
| R18 | 500Ω | C36 | 8 " |
| R19 | 500Ω | C37 | 8 " |
| R20 | 500Ω | C38 | 8 " |
| R21 | 500Ω | C39 | 8 " |
| R22 | 500Ω | C40 | 8 " |

MODELS 537, 538

Schematic

HERBERT H. HORN

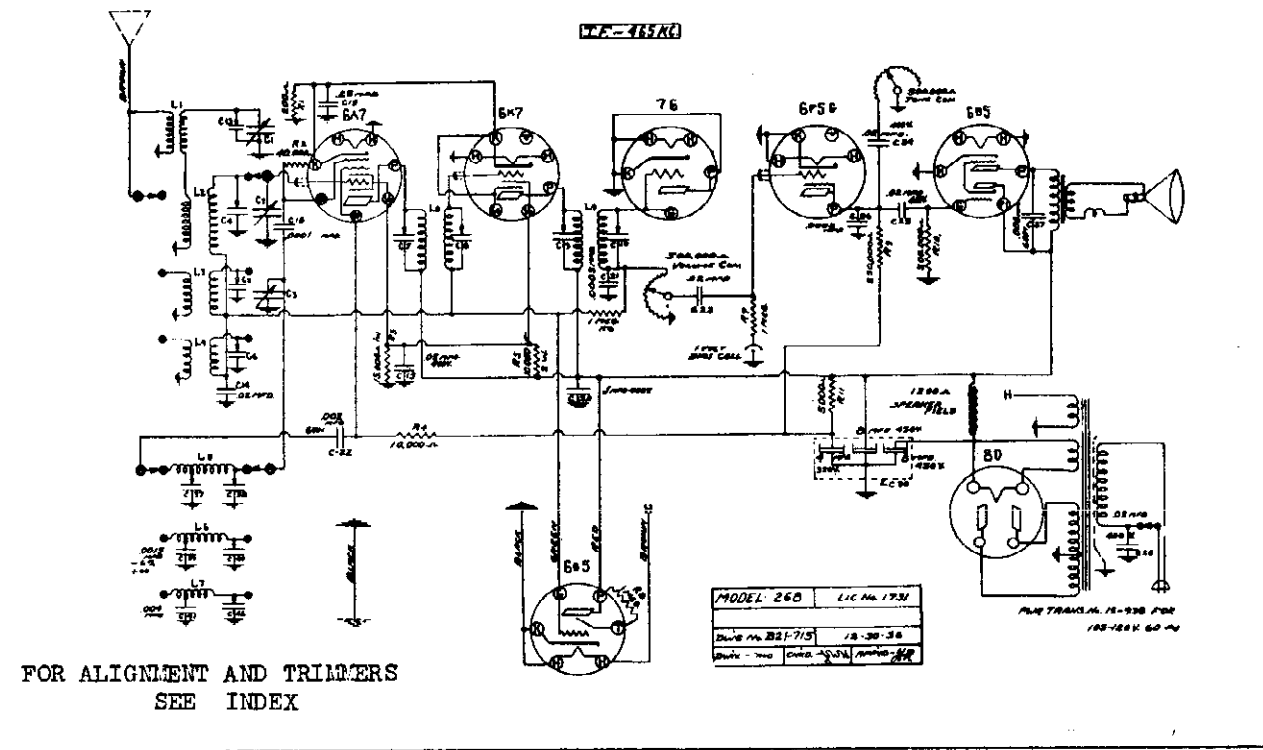
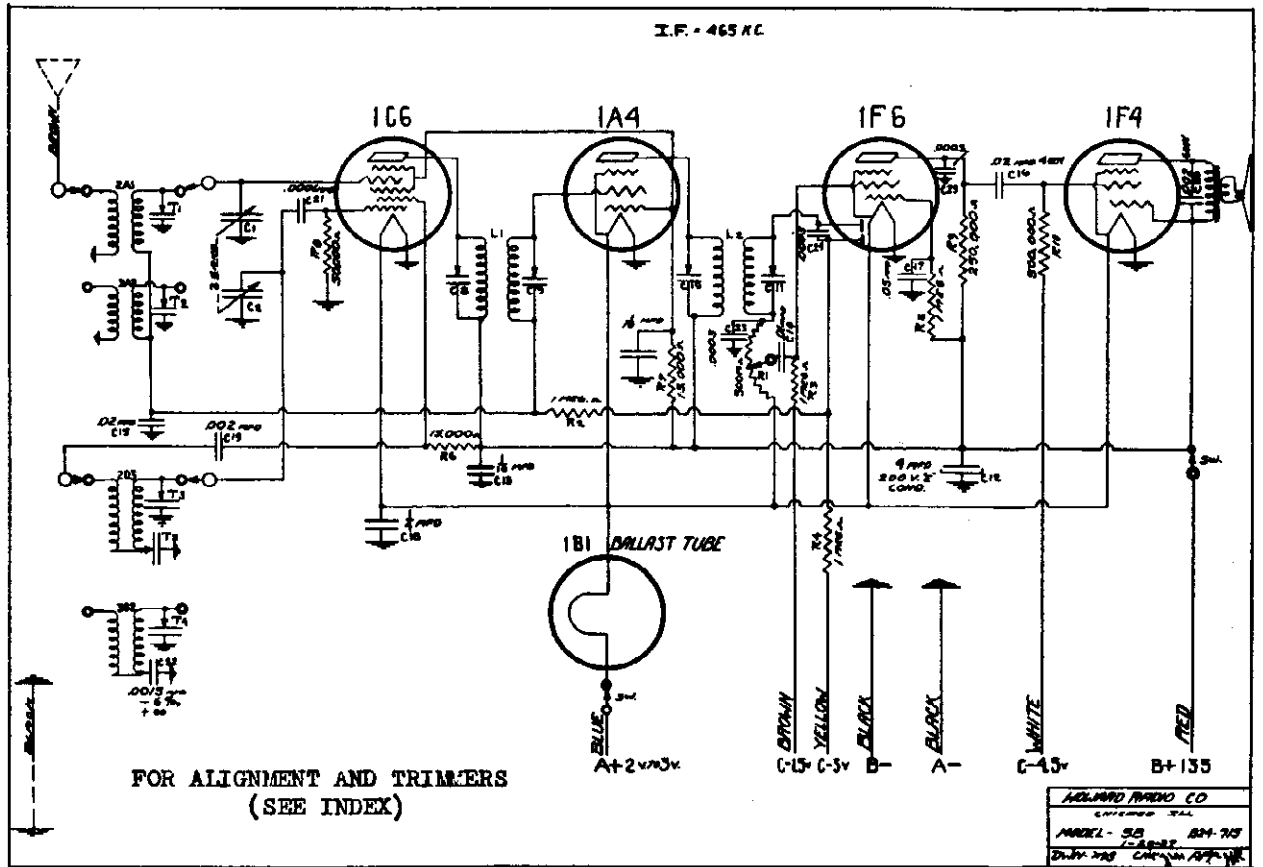


IF PEAK 465 KC.

Tiffany-Tone
Model 537-8

HOWARD RADIO CO.

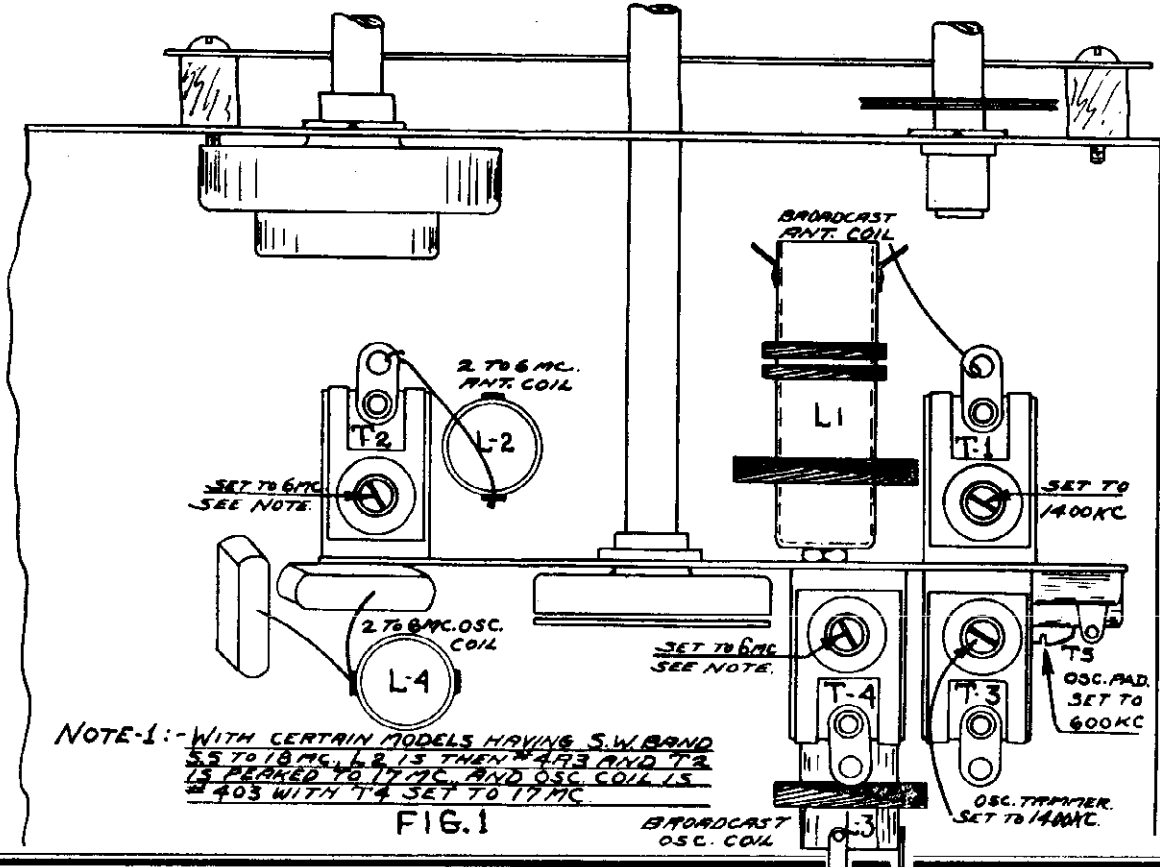
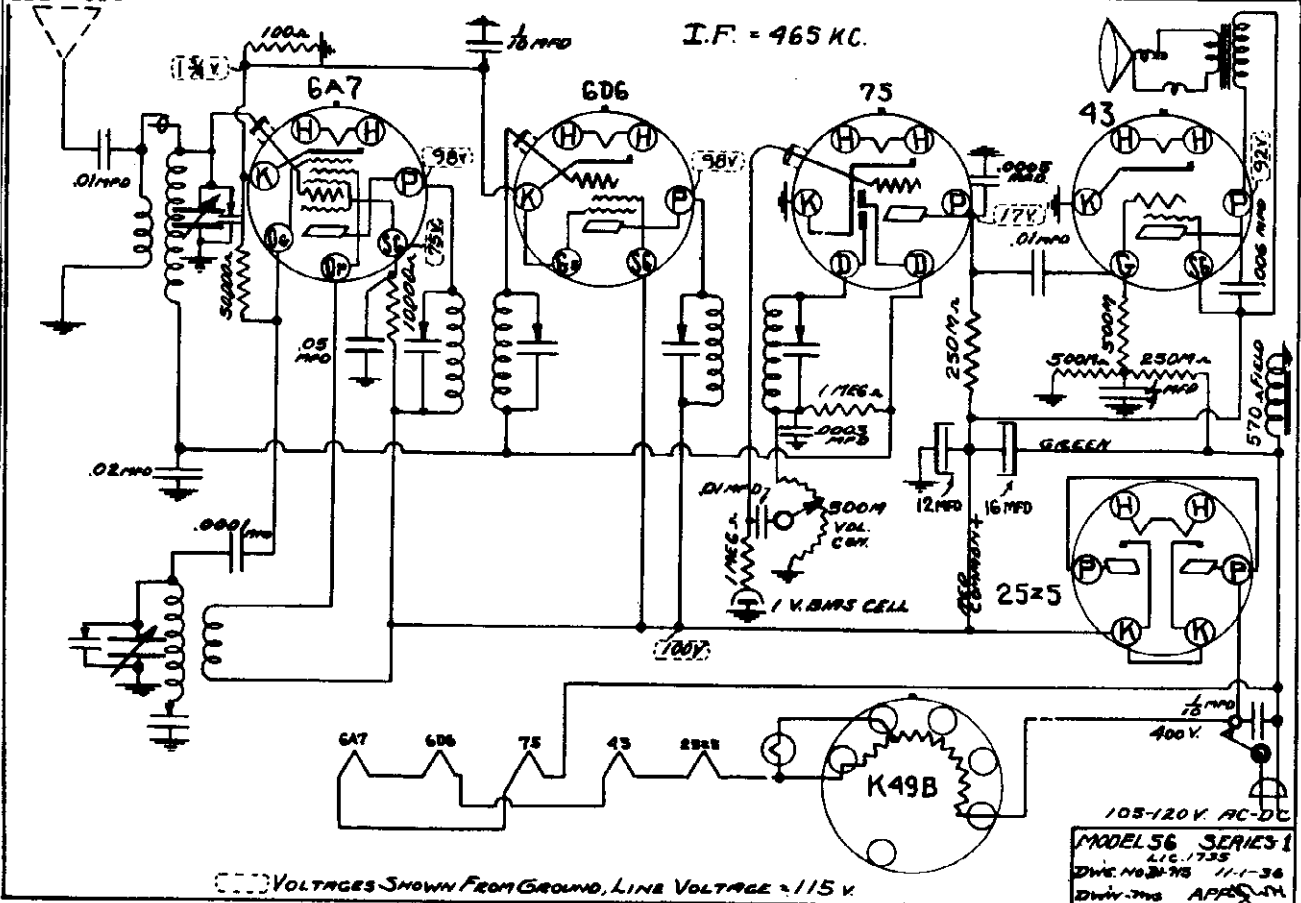
MODEL 5B
MODEL 268
Schematic



MODEL 56
Schematic, Voltage
MODELS 5B, 256, 259, S256, S259
Trimmers

HOWARD RADIO CO.

I.F. = 465 KC.



HOWARD RADIO CO.

Peak oscillator trimmer T5 to 1400 KC from the signal generator.

Peak antenna trimmer T1 to 1400 KC after adjusting oscillator.

Set dial hand to 600 KC and adjust oscillator padding condenser T5 to 600 KC.

IV. MODELS S256 AND S259 WITH A 5.5 TO 15 MC BAND ALIGN AS FOLLOWS:

Tune dial hand to 17 megacycles.

NOTE: FOR ADJUSTMENT AT 17 MEGACYCLES THE OUTPUT FROM THE SIGNAL GENERATOR MUST NOT BE COUPLED DIRECT TO THE ANTENNA LEAD OF THE SET. FOR TRUE ALIGNMENT, SURETCH OUT THE RADIO ANTENNA LEAD IN SUCH A MANNER THAT IT WILL PICK UP THE SO CALLED "WILD" SIGNAL OF 17 MEGACYCLES EMITTING FROM THE GENERATOR. IT IS ALSO IMPORTANT THAT THIS SIGNAL ONLY BE STRONG ENOUGH TO JUST BE HEARD.

When the above set-up is arranged peak oscillator T4 to the 17 megacycle peak signal.

After adjusting the oscillator trimmer, peak the S.W. antenna condenser T2 to 17 megacycles.

NOTE: After adjusting the short wave band at 17 megacycles, the signal generator output to antenna should be increased and receiver dial advanced to .9 megacycle lower and note if test oscillator signal is heard.

In case there is no response the oscillator trimmers have been pulled down too tightly. The trimmers should be released until this condition exists then go back to original point of alignment - reduce antenna input voltage and correct the trimmer adjustment.

EXAMPLE: The receiver has been adjusted to 17 megacycles. Tune receiver to approximately 16.9 MC.

If no signal is heard, let oscillator trimmer off until it is heard at 16.9 MC and forth at 16.9 MC.

Reduce signal voltage from generator, go back to 17 MC and slightly correct this last trimmer adjustment.

V. SERVICE NOTES

Seal all trimmers after their final adjustment.

The normal voltage readings of the circuits are shown on the schematic diagram of the set.

In any instance when microphonism is present, first check the dial frame and do not let it or any part of the dial touch the inside of the front panel.

Should the calibrated dial card on Models S-256 and S-259 be moved at any time, be sure and relocate it far enough to the right (when facing the front of the set) otherwise the calibration lines will not be true at various points on the dial.

Be sure that the trimmer settings are made to the true fundamental signal from the generator and not to a harmonic or image frequency.

THE ALIGNMENT PROCEDURE

MODELS 256, 259, S256, S259 AND 5B

The following alignment instructions are given with the assumption that the service station has a signal generator capable of accurately covering the range of the receiver.

The only other apparatus necessary is a meter connected, in the output stage to indicate resonance. This can be an 0 to 5 volt AC meter connected across the voice coil of the speaker or preferably an output meter connected in the plate circuit of the power tube in series with an 8 Mfd. paper condenser.

I. THE I. F. STAGES

The intermediate frequency stages are aligned in the usual manner on Models 256, S259 and 5B by feeding 465 KC into the grid of the mixer tube after removing grid cap, placing a series resistor of 500,000 ohms from tube grid to the cap and a series condenser from the tube grid to the hot lead from the signal generator. NOTE WITH MODELS 256 AND S256 LEAVE GRID CAP ON THE MIXER TUBE, TURN BAND SWITCH TO BROADCAST BAND POSITION AND VARIABLE CONDENSER ALL THE WAY OUT TO MINIMUM CAPACITY.

The sensitivity of the I. F. system alone for Models 256, S256, 259 and S259 will be about 25 to 50 Microvolts for a 50 Milliwatt output, and about 125 Microvolts for Model 5B.

The two trimmers in each of the I. F. Cans should be very carefully peaked to resonance as they are very critical and will greatly affect the performance of the set.

Always use as low an output as possible from the signal generator when making the various adjustments.

II. THE S. W. BAND 2 TO 6 MEGACYCLES

SEE SECTION IV FOR MODELS WITH A 5.5 TO 15 MC BAND

First check the position of the dial hand by rotating the condenser plates to full capacity. At this point the dial hand should be straight across in line with the lines dividing the scale in half. If the hand is off position, remove dial glass to get at the screw holding the hand.

With the dial hand set to 6 megacycles and the band switch in the short wave position (all the way to the right) see Figure 1 and peak trimmer T4 of the oscillator circuit to 6 megacycles.

After adjustment of the oscillator trimmer, peak trimmer T5 to 6 megacycles from the generator.

III. THE BROADCAST BAND

Turn wave band switch all the way to left and dial hand set to 1400 KC (the top scale). The signal generator may be coupled direct to the antenna lead on this band, through a standard 200 MAFD condenser.

MODELS 68 Revised
268,266
Socket, Trimmers

HOWARD RADIO CO.

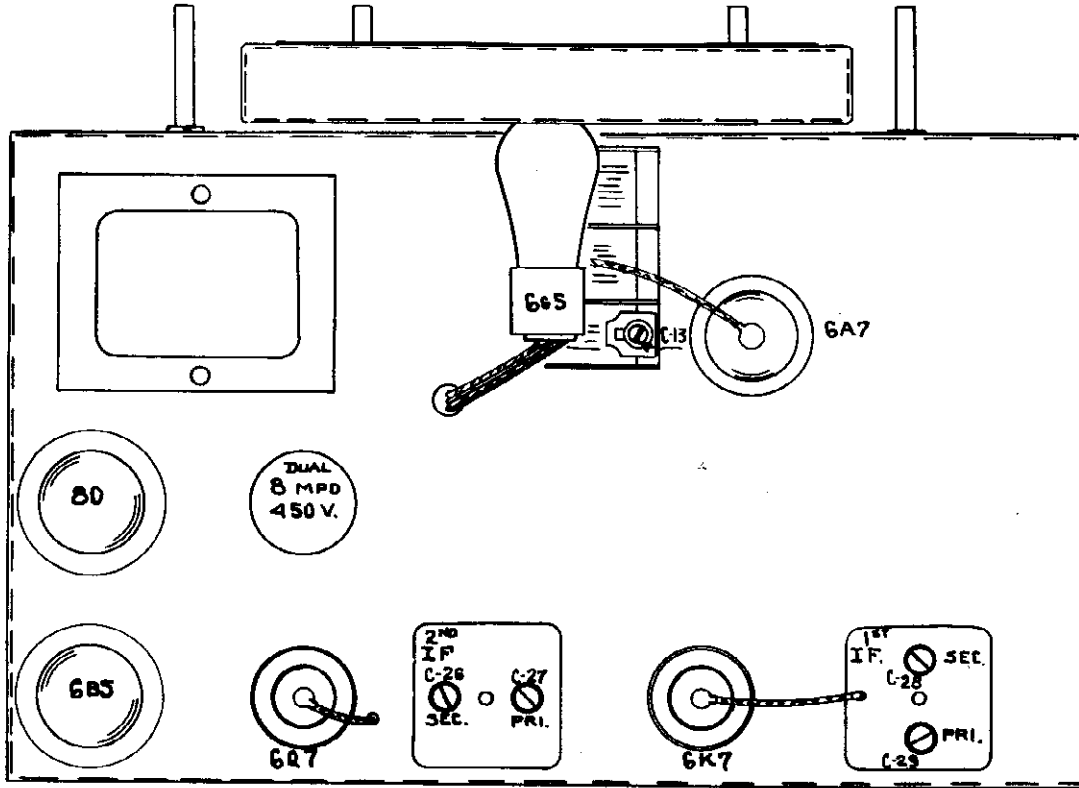


FIG. 2

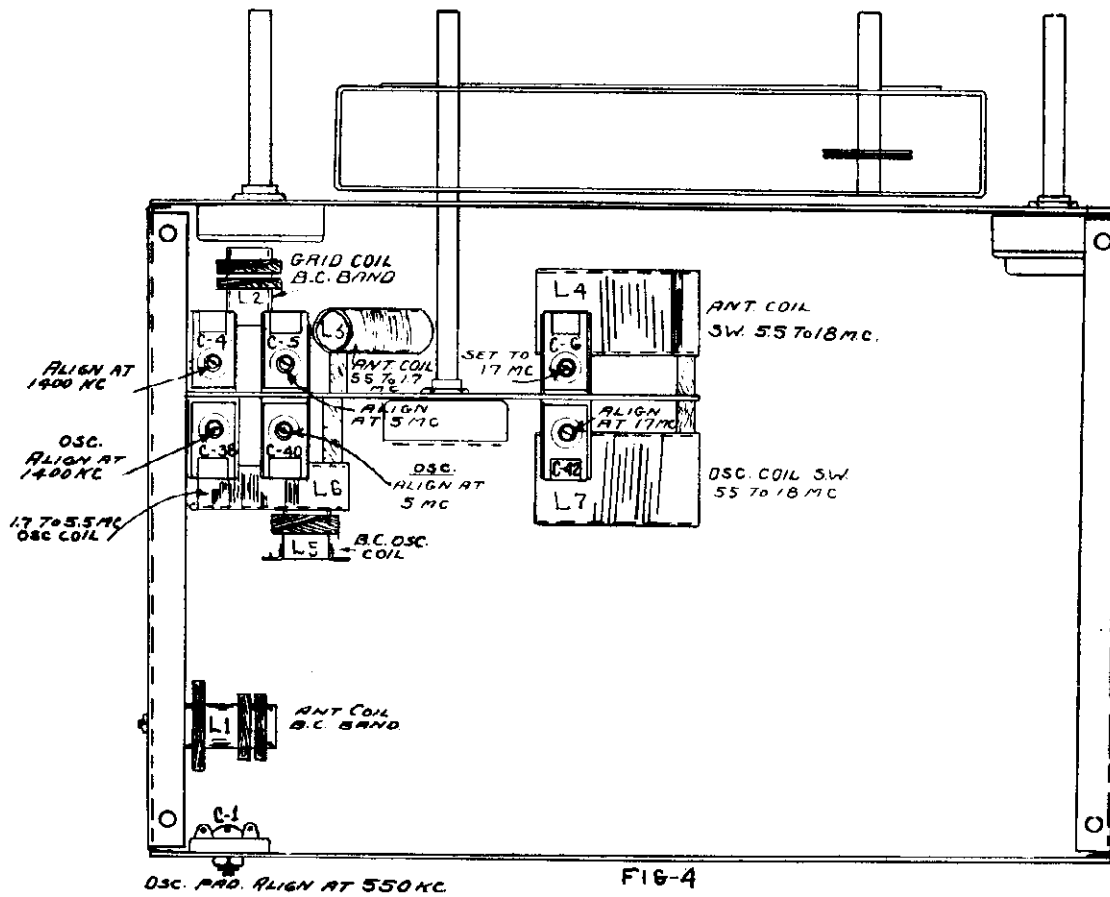
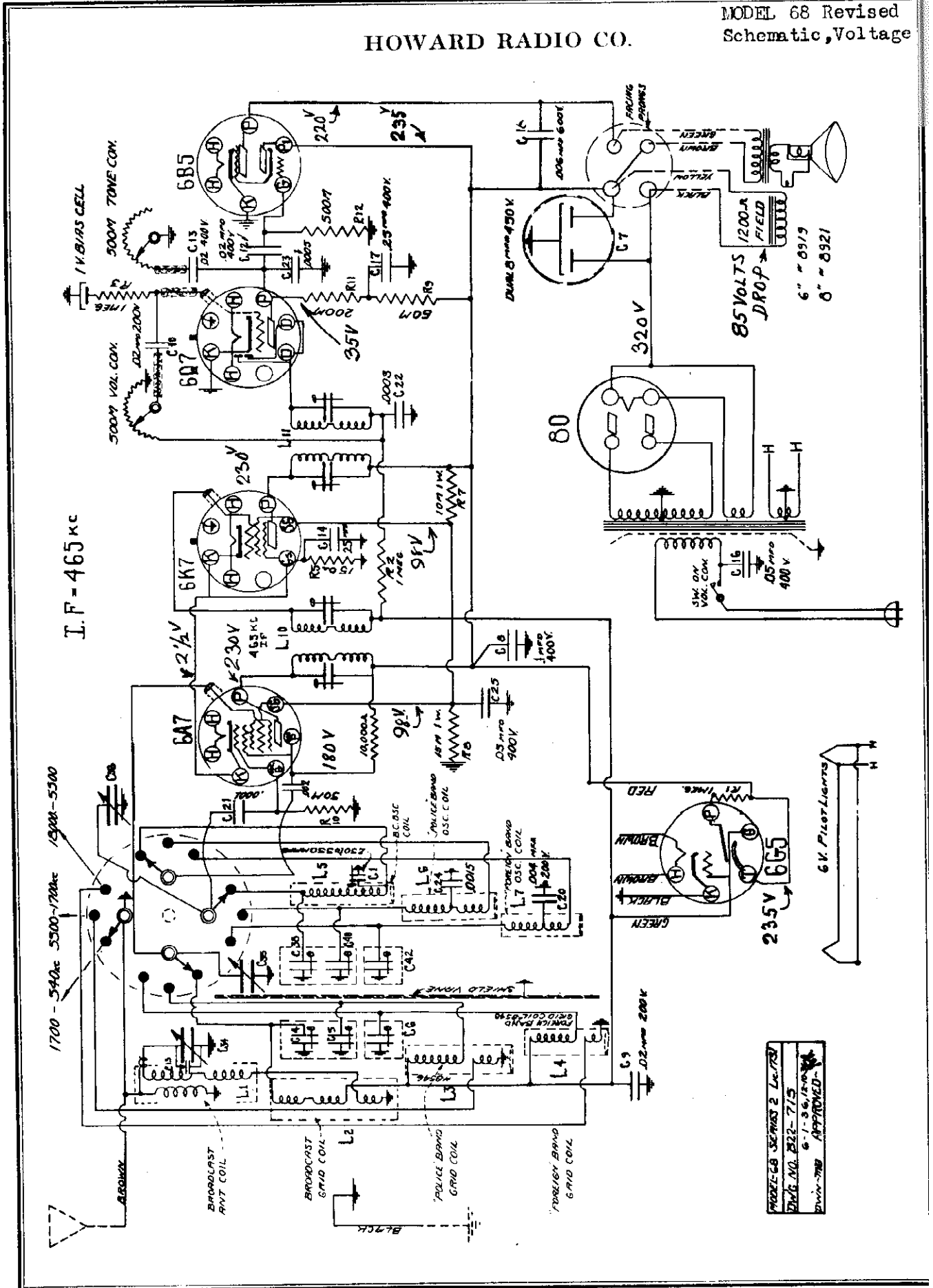


FIG. 4

HOWARD RADIO CO.



I. F. = 465 KC

MODEL 68 SCHEMATIC 2 Ltr. 1/33
DATE NO. 222-715
DATE 1-30-33
APPROVED

MODELS 68 Revised
266,268
Alignment

HOWARD RADIO CO.

NOTE: After adjusting the two high bands at 17 megacycles and 5 megacycles the test oscillator input to antenna should be increased and receiver dial advanced to .9 megacycle lower and note if test oscillator signal is heard.

In case there is no response, the oscillator trimmers have been pulled down too tightly. The trimmers should be released until this condition exists, then go back to original point of alignment - reduce antenna input voltage and correct the trimmer adjustment.

EXAMPLE: The receiver has been adjusted to 17 megacycles. Tune receiver to approximately 16.9 M.C.

Increase oscillator signal by "opening up" the attenuator. Move the dial back and forth at 16.9 M.C.

If no signal is heard, let oscillator trimmer off until it is heard at 16.9 M.C.

Reduce signal voltage from generator, go back to 17 M.C. and slightly correct this last trimmer adjustment.

The same thing applies to the 5 M.C. adjustment.

IV. THE ALIGNMENT OF THE BROADCAST BAND

1. Set Band Switch to the 550-1700 K.C. band, and the hand to 1400 K.C.
2. Peak oscillator trimmer C-38 to 1400 K.C., then the R.F. Trimmer C-4 and the antenna stage trimmer C-13 on the variable condenser to 1400 K.C.
3. Rotate dial hand to 550 K.C. and adjust padding condenser C-37 to 550 K.C.
4. Re-check dial at 1400 K.C. as mentioned in (1) and (2).
5. Points in the middle of the dial may be checked and if necessary the plates of the oscillator section of the variable condenser (back section) may be bent for alignment.

V. NOTES

1. Seal all trimmers after their final adjustment.
2. Be sure that the settings are being made to the true fundamental signal from the oscillator and not on a harmonic or image frequency.
3. The normal voltage readings at the sockets are given in a separate chart on the following pages.
4. It is advisable to check the position of the tuning eye tube to make certain that it is not pushed against the inside of the dial card. With the adjustment screw on the bracket, allow a small amount of clearance between the end of the tube and the dial to avoid any possibility of the heat from the tube affecting the dial card.

THE ALIGNMENT PROCEDURE

The following alignment instructions are given with the assumption that the Service Station has a signal generator capable of accurately covering the range of the receiver.

The only other apparatus necessary is a meter connected in the output stage to indicate resonance. This can be an 0 to 3 Volt AC meter connected across the voice coil of the speaker or preferably an output meter connected in the plate circuit of the power tube in series with an 8 Mfd. paper condenser.

I. THE I.F. STAGES

The intermediate frequency stages are aligned in the usual manner by feeding 465 K.C. into the grid of the mixer tube 6A7.

The two trimmers in each of the I.F. cans should be very carefully peaked to resonance as they are very critical and will greatly affect the performance of the set. These are trimmers Nos. C-26, 27, 28, 29 on Figure 2.

Always use as low an output as possible from the signal generator when making the various adjustments.

The sensitivity of the I.F. system alone will be found to be between 15 and 20 Microvolts.

II. ALIGNMENT OF THE SHORT WAVE BAND 5.5 TO 18 M.C.

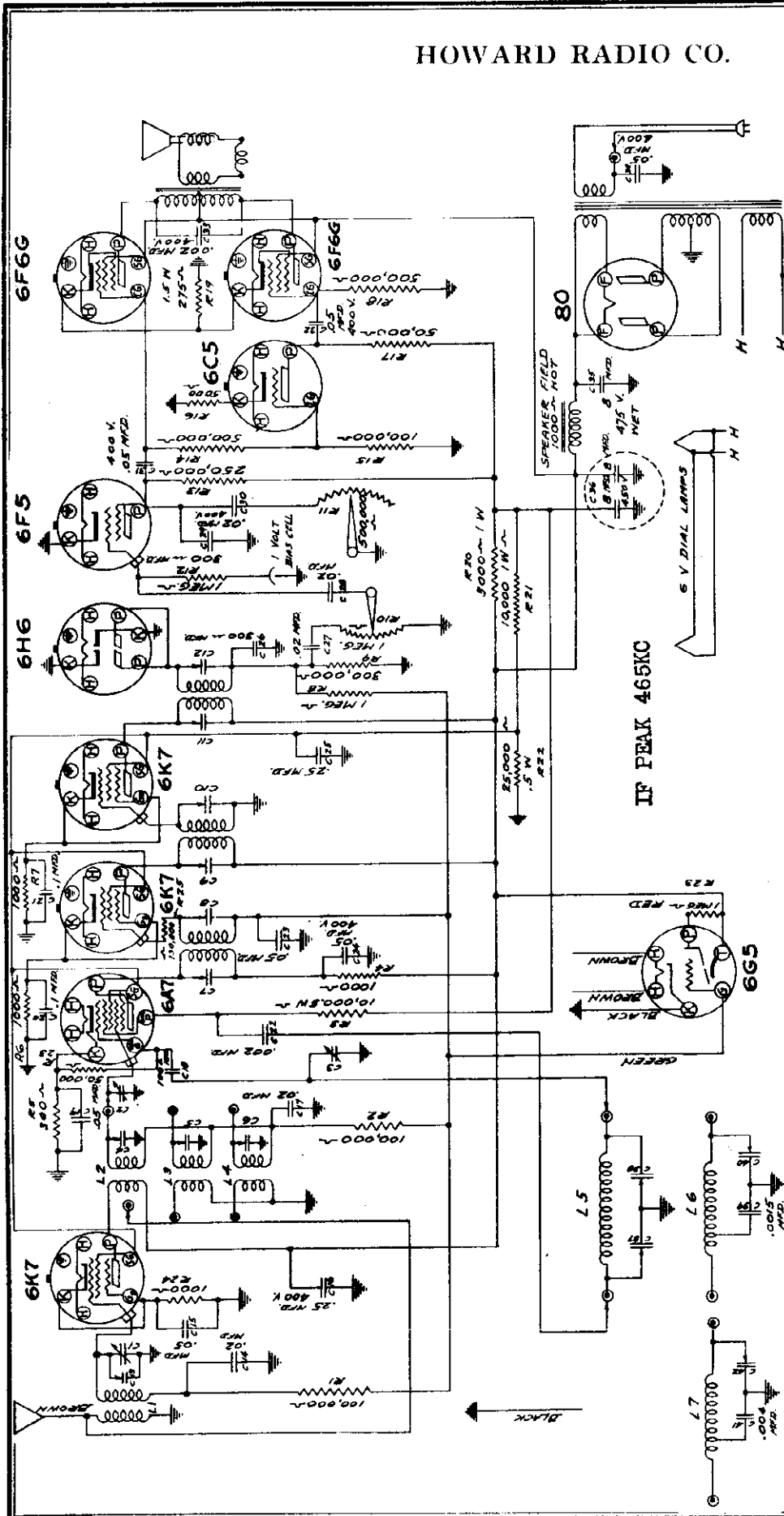
First check the position of the dial hand by rotating the variable condenser to full capacity. The hand then should be in line with the lines that divide the dial in half. If the hand is off position it can be lined up by loosening the center screw.

1. Turn band switch all the way to the right for the 5.5 to 18 M.C. Band (Yellow), and set dial hand to 17 M.C.
2. Refer to Figure 3 and with a 17 M.C. signal from the generator, peak oscillator, trimmer condenser C-42 to 17 M.C.
3. Adjust trimmer C-6 of the antenna circuit to 17 M.C. after the above mentioned oscillator trimmer has been set.

III. ALIGNMENT OF SHORT WAVE BAND 1.7 TO 5.5 M.C.

1. With the band switch in the middle position, (Blue) and the dial hand set to 5 M.C., peak trimmer C-40 of the oscillator circuit to 5 M.C.
2. Adjust antenna stage trimmer C-5 to 5 M.C. after the above oscillator trimmer has been set.

HOWARD RADIO CO.



218

MODEL 118	LICENSE # 1731
DATE NO. B-12-715	DATE 10-2-1934
DRAWN BY [Signature]	APPROVED BY [Signature]

6K7	I.F.	250	97	4
6H6	Diode	-	-	-
6F5	Audio	75	-	6
6C5	Audio	130	-	18
6F6G	PP Output	242	245	18
80	Rectifier	H.V. OFF RECTIFIER = 340 VOLTS DROP ACROSS SPEAKER FIELD=90 VOLTS		

VOLTAGE READINGS TAKEN FROM GROUND WITH LINE VOLTAGE AT 115 VOLTS NO SIGNAL IN ANTENNA

TUBE	POSITION	PLATE	S.G.	CATHODE
6K7	Antenna Stage	250	97	2
6A7	Mixer	250	97	4
6K7	I.F.	250	97	4

MODELS 118, 218
Socket, Trimmers

HOWARD RADIO CO.

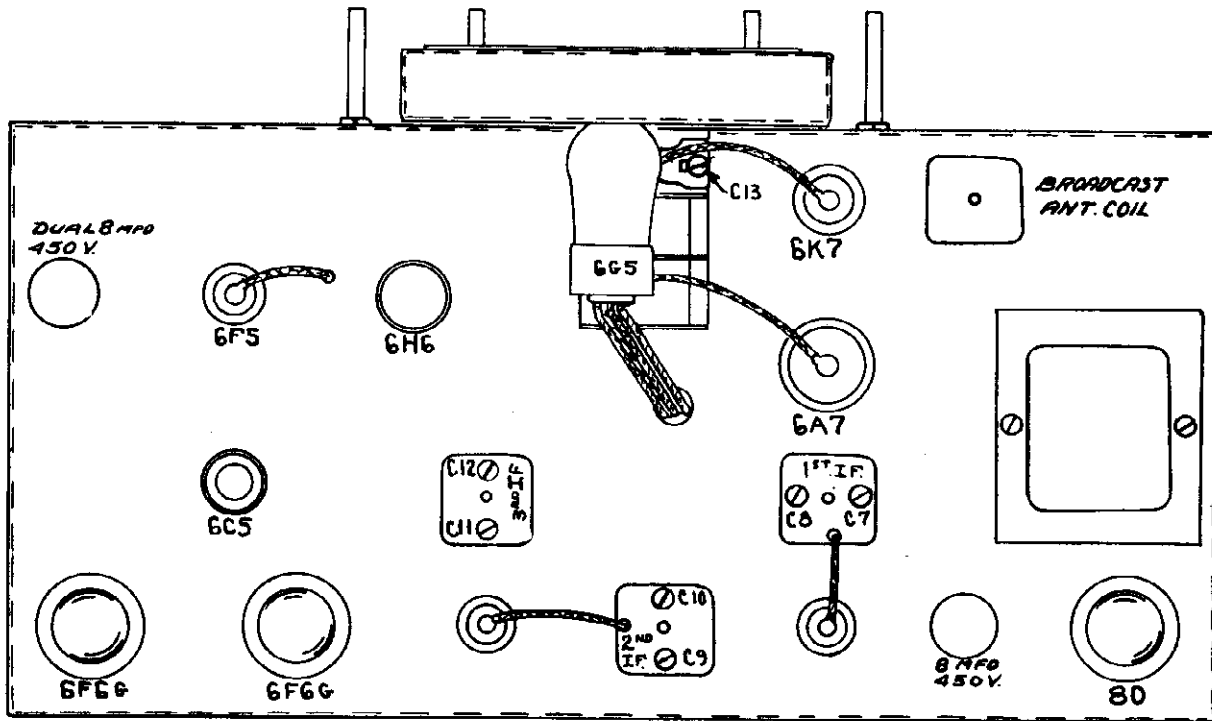


FIG. 1

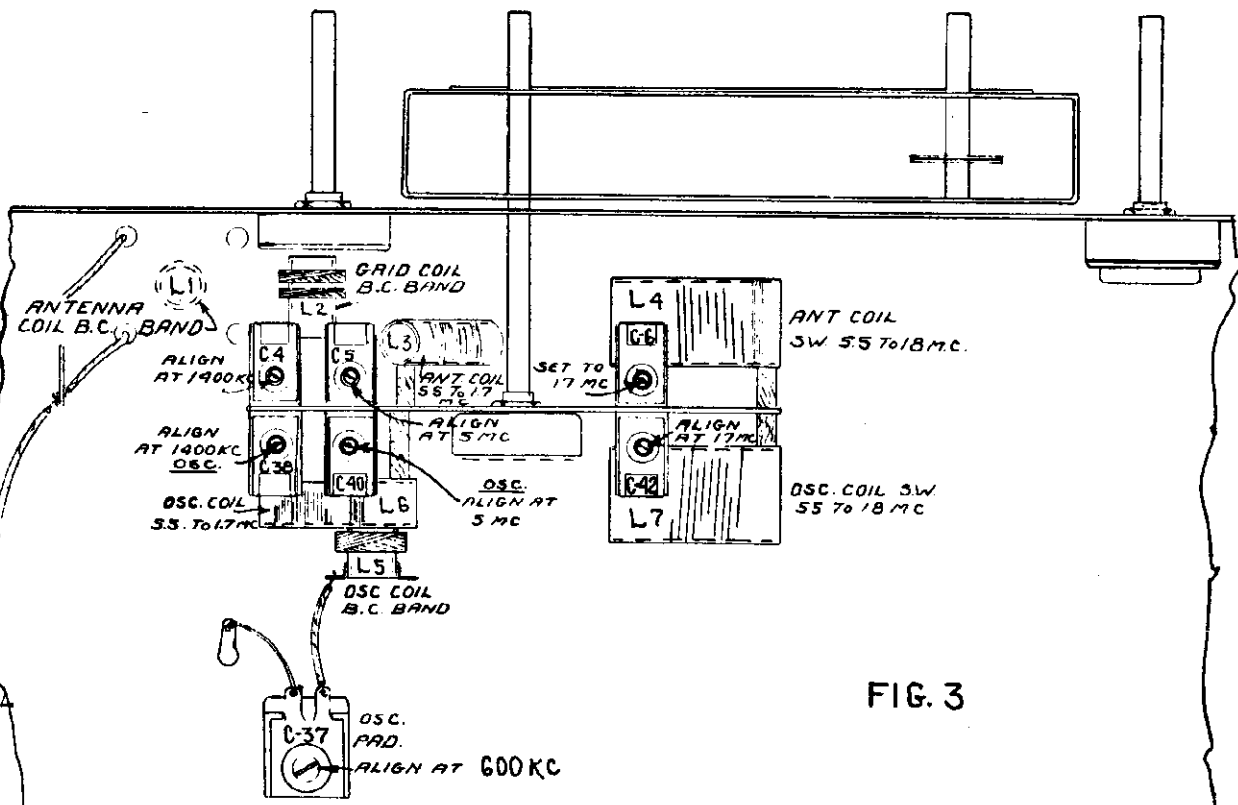


FIG. 3

HOWARD RADIO CO.

MODEL S 118, 218
Alignment

NOTE: After adjusting the two high bands at 17 megacycles and 5 megacycles the test oscillator input to antenna should be increased and receiver dial advanced to .9 megacycle lower and note if test oscillator signal is heard.

In case there is no response, the oscillator trimmers have been pulled down too tightly. The trimmers should be released until this condition exists, then go back to original point of alignment - reduce antenna input voltage and correct the trimmer adjustment.

EXAMPLE: The receiver has been adjusted to 17 megacycles. Tune receiver to approximately 16.9 M.C.

Increase oscillator signal by "opening up" the attenuator. Move the dial back and forth at 16.9 M.C.

If no signal is heard, let oscillator trimmer off until it is heard at 16.9 M.C.

Reduce signal voltage from generator, go back to 17 M.C. and slightly correct this last trimmer adjustment.

The same thing applies to the 5 M.C. adjustment.

IV. THE ALIGNMENT OF THE BROADCAST BAND

1. Set Band Switch to the 550-1700 K.C. band, and the hand to 1400 K.C.
2. Peak oscillator trimmer C-38 to 1400 K.C., then the R.F. Trimmer C-4 and the antenna stage trimmer C-13 on the variable condenser to 1400 K.C.
3. Rotate dial hand to 600 K.C. and adjust padding condenser C-37 to 600 K.C.
4. Re-Check dial at 1400 K.C. as mentioned in (1) and (2).
5. Points in the middle of the dial may be checked and if necessary the plates of the oscillator section of the variable condenser (back section) may be bent for alignment.

V. NOTES

1. With certain Model 118's a 40,000 ohm resistor will be found located from oscillator grid to cathode of the 6A7 in place of 50,000.
2. Be sure that the settings are being made to the true fundamental signal from the oscillator and not on a harmonic or image frequency.
3. The normal voltage readings at the sockets are given in a separate chart on the following pages.
4. It is advisable to check the position of the tuning eye tube to make certain that it is not pushed against the inside of the dial card. With the adjustment screw on the bracket, allow a small amount of clearance between the end of the tube and the dial to avoid any possibility of the heat from the tube affecting the dial card.

THE ALIGNMENT PROCEDURE

The following alignment instructions are given with the assumption that the Service Station has a signal generator capable of accurately covering the range of the receiver.

The only other apparatus necessary is a meter connected in the output stage to indicate resonance. This can be an 0 to 3 Volt AC meter connected across the voice coil of the speaker or preferably an output meter connected in the plate circuit of the power tube in series with an 8 Mfd. paper condenser.

I. THE I.F. STAGES

The intermediate frequency stages are aligned in the usual manner by feeding 465 K.C. into the grid of the mixer tube 6A7. Remove grid cap, place series resistor of 500,000 ohms from the tube grid to the cap and a series condenser from the tube grid to the "hot" lead from the signal generator.

The two trimmers in each of the I.F. cans should be very carefully peaked to resonance as they are very critical and will greatly affect the performance of the set. These are trimmers Nos. C-7, C-8, C-9, C-10, C-11 and C-12 (See Fig. 1)

Always use as low an output as possible from the signal generator when making the various adjustments.

The sensitivity of the I.F. system alone will be found to be between 15 and 20 Microvolts.

II. ALIGNMENT OF THE SHORT WAVE BAND 5.5 TO 18 M.C.

First check the position of the dial hand by rotating the variable condenser to full capacity. The hand then should be in line with the lines that divide the dial in half. If the hand is off position it can be lined up by loosening the center screw.

1. Turn band switch all the way to the right for the 5.5 to 18 M.C. Band (Yellow), and set dial hand to 17 M.C.
2. Refer to Figure 3 and with a 17 M.C. signal from the generator, peak oscillator, trimmer condenser C-42 to 17 M.C.
3. Adjust trimmer C-6 of the antenna circuit to 17 M.C. after the above mentioned oscillator trimmer has been set. Watch this adjustment that it will not "drag" the oscillator.

III. ALIGNMENT OF SHORT WAVE BAND 1.7 to 5.5 M.C.

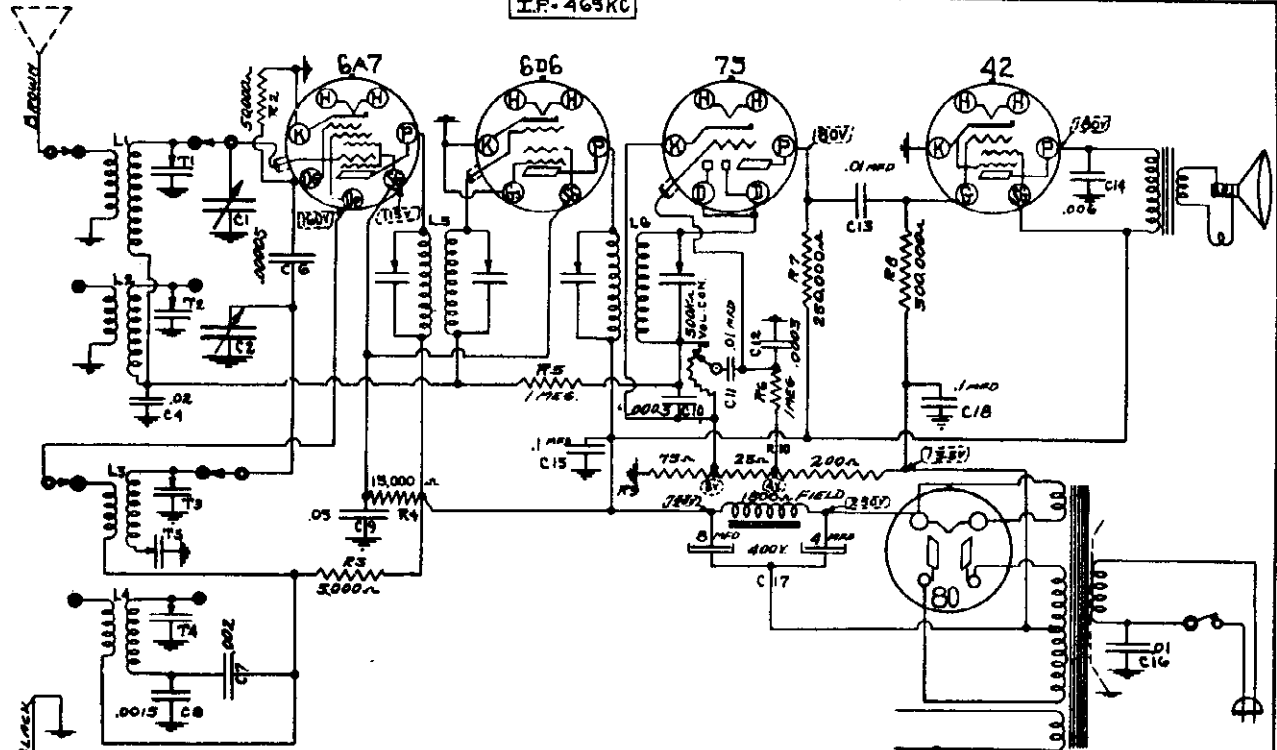
1. With the band switch in the middle position, (Blue) and the dial hand set to 5 M.C., peak trimmer C-40 of the oscillator circuit to 5 M.C.
2. Adjust Antenna Stage trimmer C-5 to 5 M.C. after the above oscillator trimmer has been set.

MODEL 256
MODEL S-256

HOWARD RADIO CO.

Schematics

I.F. 465KC

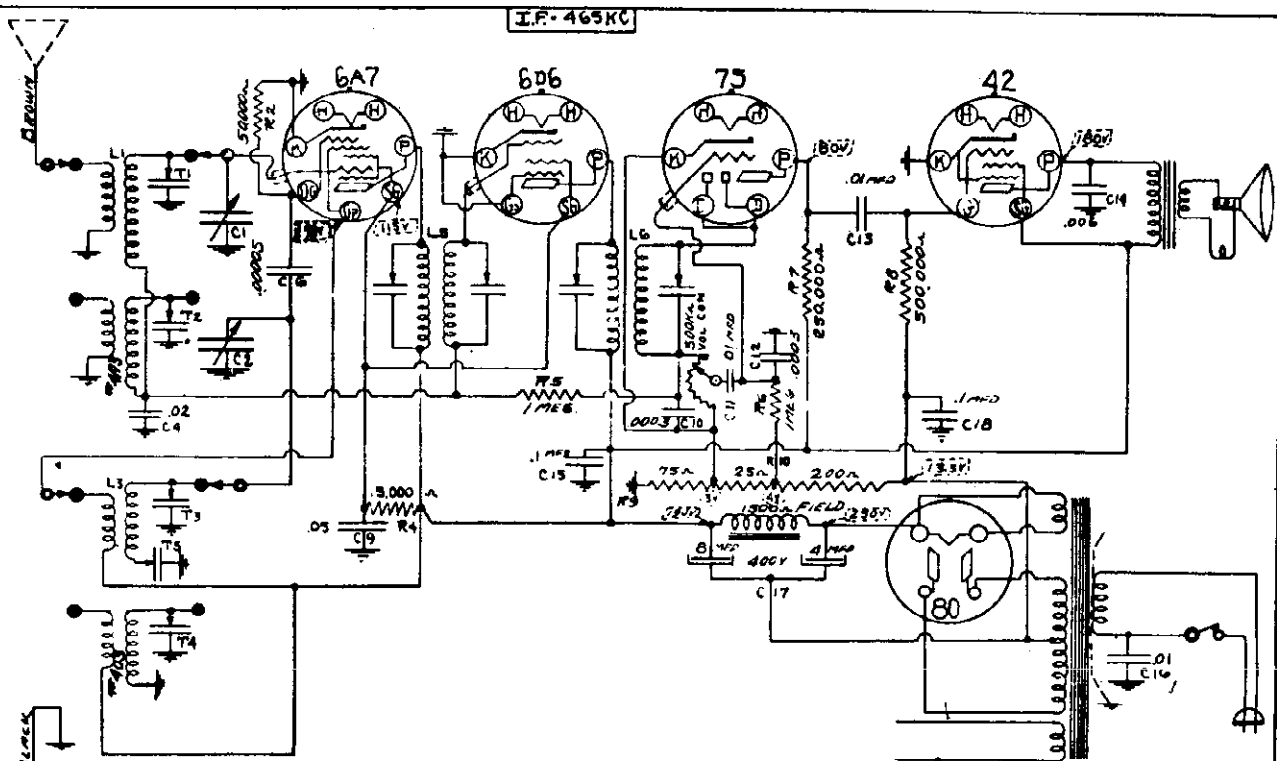


- TWO BANDS -
 (1) - 540 TO 1700KC BROADCAST.
 (2) - 2 TO 6.5 MC. SHARP-TUNE

VOLTAGES AS SHOWN [...] TAKEN FROM GROUND, LINE VOLTAGE - 117V. AC.

MODEL-256		SERIES-1
Z-1 - 37	Z-1 C - 751	DWG. No. C20-715
DATE - 7-20	CHK'D - SWA	APP'D - HHL

I.F. 465KC



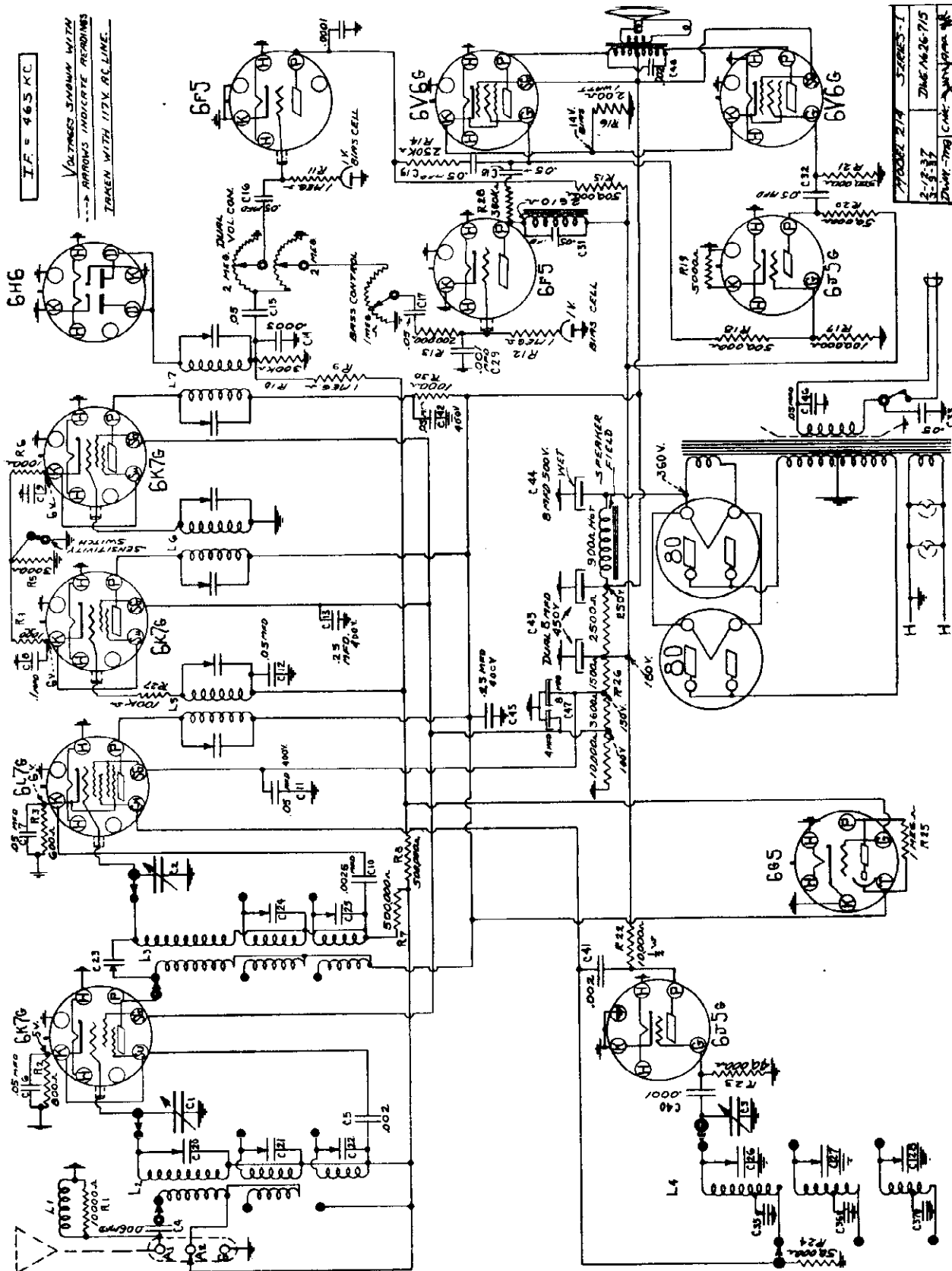
- TWO BANDS -
 (1) - 540 TO 1700KC BROADCAST.
 (2) - 55 TO 18 MC. SHARP-TUNE

VOLTAGES AS SHOWN [...] TAKEN FROM GROUND, LINE VOLTAGE - 117V. AC.

MODEL-S-256		SERIES-1
Z-1 - 37	Z-1 C - 751	DWG. No. C21-715
DATE - 7-20	CHK'D - SWA	APP'D - HHL

HOWARD RADIO CO.

MODEL 214
Schematic
Voltage



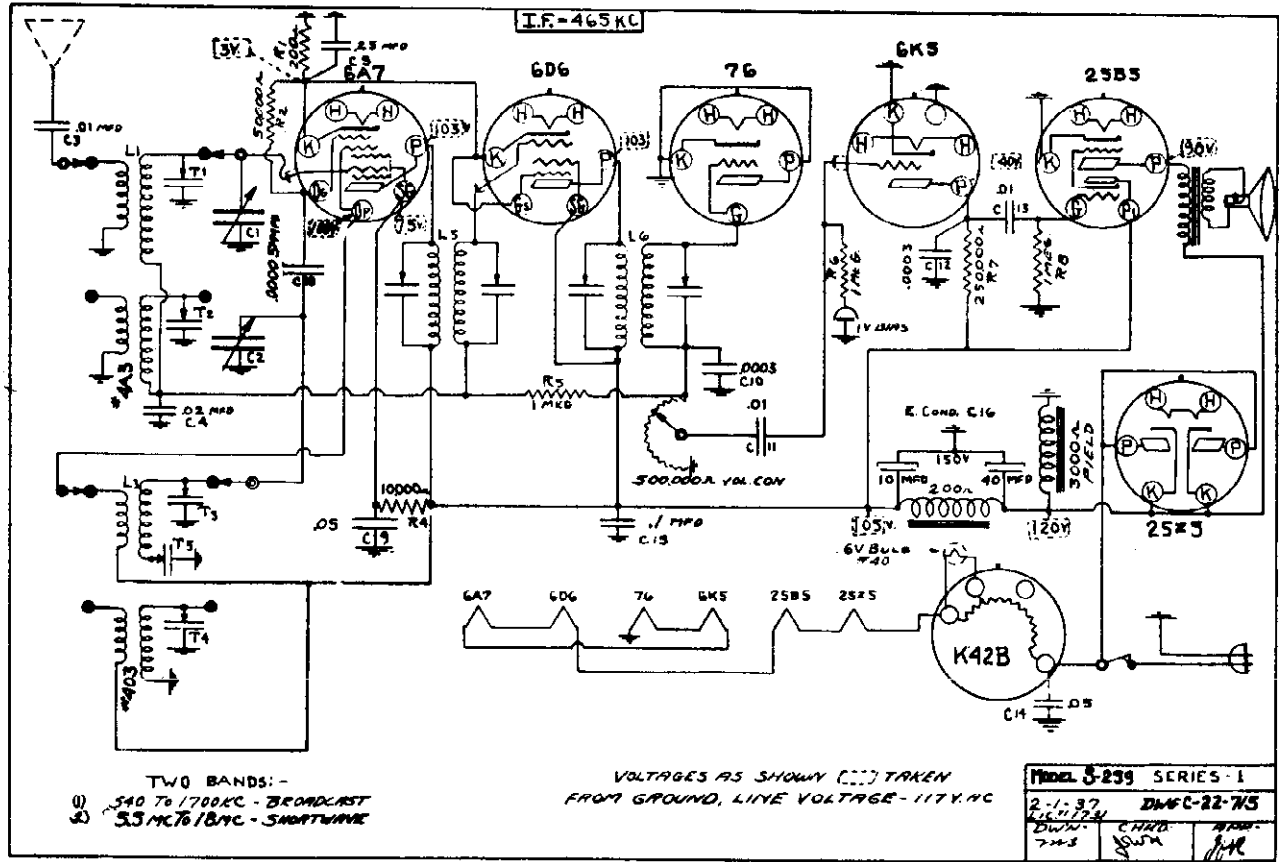
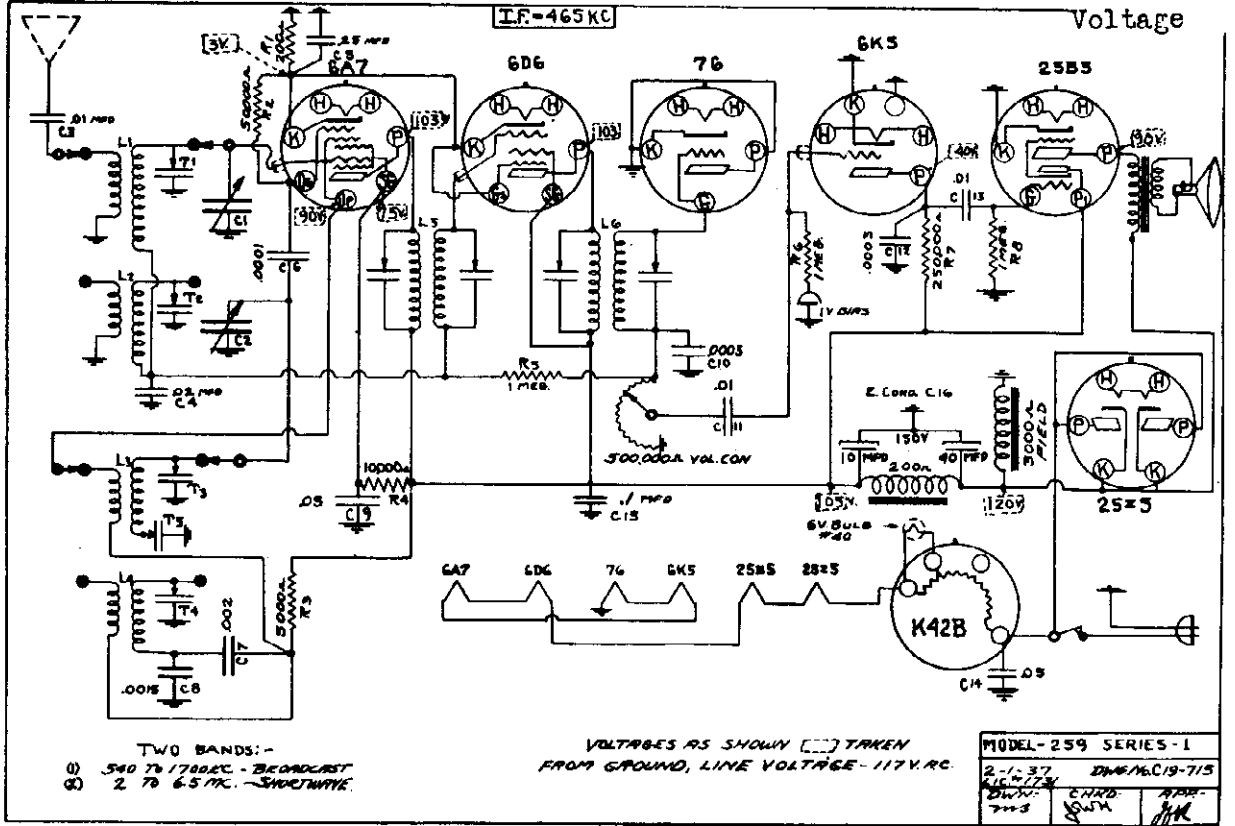
IF. = 46.5 KC.

VOLTAGES SHOWN WITH
--> ARROWS INDICATE READINGS
TAKEN WITH 117V AC LINE.

70001-214 SERIES-1
2-3-37
ZINC PLATE 715
DWAR-789 Cont. J. W. P. Co.

HOWARD RADIO CO.

MODEL 259
MODEL S-2
Schematics
Voltage



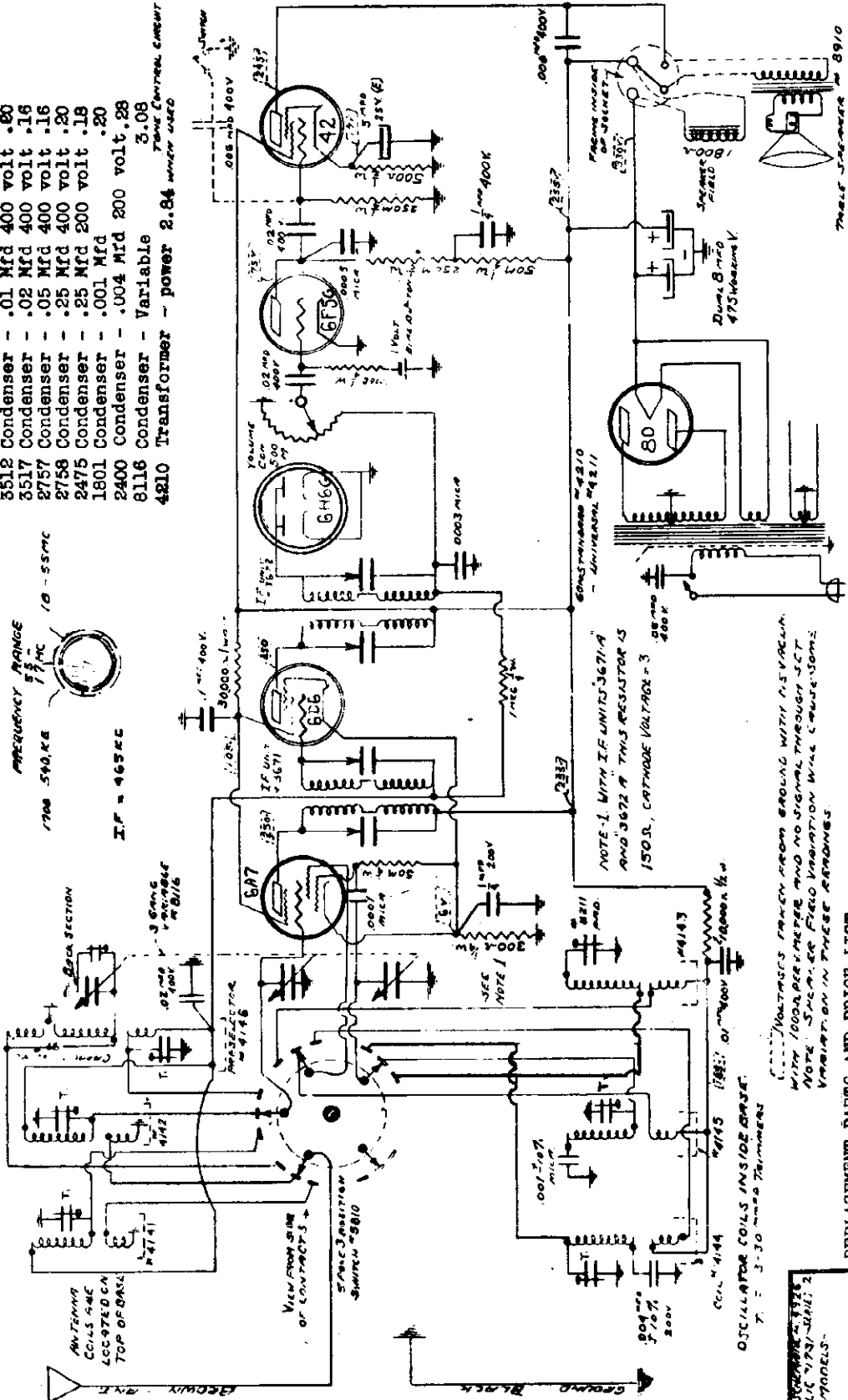
HOWARD RADIO CO.

MODELS 626, 1626
67C, 67T

8817 Condenser	- Dual 8-475 Volt Electrolytic	1.28
8211 Condenser	- Trimmer 5 Plate	.40
3127 Condenser	- Single Trimmer 3-30 MMFD	.12
3003 Condenser	- 5 Mfd. Electrolytic	.40
2756 Condenser	- .1 Mfd 400 volt	.20

Schematic
Voltage, Parts

3512 Condenser	- .01 Mfd 400 volt	.20
3517 Condenser	- .02 Mfd 400 volt	.16
2757 Condenser	- .05 Mfd 400 volt	.16
2758 Condenser	- .25 Mfd 400 volt	.20
2475 Condenser	- .25 Mfd 200 volt	.18
1801 Condenser	- .001 Mfd	.20
2400 Condenser	- .004 Mfd 200 volt	.28
8116 Condenser	- Variable	3.08
4810 Transformer	- power 2.84 when used	7.00



REPLACEMENT PARTS AND PRICE LIST

PART NO.	DESCRIPTION	PRICE
3671-A	Coil - 1st. I.F. Assembly, complete	1.20
3672-A	Coil - 2nd. I.F. Assembly, complete	1.20
4141	Coil - Antenna, 5.5 MC	.58
4142	Coil - Antenna, 1.7 MC	.34
4143	Coil - Oscillator	.30
4144	Coil - Oscillator, 5.5 MC	.60
4145	Coil - Oscillator, 1.7 MC	.40
4146	Coil - B.C. Antenna preslector	.72
3515	Condenser - .006 Mfd 400 volt	.24
2366	Condenser - .0001 Mfd	.12
8304	Condenser - .0003 Mfd	.16
2280	Condenser - .0005 Mfd	.12
3635	Resistor - 1 Megohm 1/2 Watt	.11
1824	Resistor - 250M ohms, 1/2 Watt	.11
1843	Resistor - 50M ohms, 1/2 Watt	.14
3349	Resistor - 30M ohms, 1/2 Watt	.12
1890	Resistor - 10M ohms, 1/2 Watt	.12
1817	Resistor - 500 ohms, 1/2 Watt	.11

PRICES SUBJECT
TO CHANGE
WITHOUT NOTICE

NOTE: VOLTAGES TAKEN FROM GRID WITH 1.5 VOLTS.
WITH 1000 PERCENTAGE AND NO SIGNAL THROUGH SET.
NOTE: SLOWER FIELD VARIATION WILL CAUSE SOME
VARIATION IN THESE READINGS.

MODELS 626, 1626
67C, 67T

HOWARD RADIO CO.

Alignment

Peak oscillator trimmer C-10 to 5 M.C. from test oscillator. And Ant. coil trimmer C-6 to same frequency.

NOTE: After adjusting the two high bands at 17 megacycles and 5 megacycles the test oscillator input to antenna should be increased and receiver dial advanced to .9 megacycle lower and note if test oscillator signal is heard.

In case there is no response the oscillator trimmers have been pulled down too tightly. The trimmers should be released until this condition exists then go back to original point of alignment - reduce antenna input voltage and correct the trimmer adjustment.

EXAMPLE: The receiver has been adjusted to 17 megacycles. Tune receiver to approximately 16.9 M.C.

Increase oscillator signal by "opening up" the alternator. Move the dial back and forth at 16.9 M.C.

If no signal is heard, let oscillator trimmer off until it is heard at 16.9 M.C.

Reduce signal voltage from generator, go back to 17 M.C. and slightly correct this last trimmer adjustment.

The same thing applies to the 5 M.C. adjustment.

IV THE BROADCAST BAND

1. Turn wave band switch all the way to left and dial hand set to 1400 KC (the top scale).

2. Peak oscillator trimmer C-9 to 1400 KC, the Antenna preselector C-12 (variable condenser trimmer) to 1400 KC, and trimmer C-5 to 1400 KC.

3. Set dial hand to 550 KC and adjust oscillator padding condenser C-8 to 550 KC.

4. Recheck dial at 1400 KC as in number (1) and (2).

5. Points in the middle of the dial may be checked and if necessary the plates of the front section of variable condenser may be bent for alignment.

V NOTES.

1. Seal all trimmers after their final adjustment.
2. Be sure that the settings are being made to the true fundamental signal from the oscillator and not on a harmonic or image frequency.
3. Refer to the schematic for the voltages at the tube sockets.

THE ALIGNMENT PROCEDURE

The following alignment instructions are given with the assumption that the service station has an oscillator capable of accurately covering the range of the receiver.

The only other apparatus necessary is a meter connected in the output stage to indicate resonance. This can be 0 to 3 volt AC meter connected across the voice coil of the speaker or preferably an output meter connected in the plate circuit of the 42 power tube in series with an 8 MFD paper condenser.

I THE I. F. STAGES

The I.F.'s are aligned by the usual system of feeding the intermediate frequency of 465KC into the grid of the 6A7 tube.

The two trimmers in each of the I.F. cans should be very carefully peaked to resonance as they are very critical and will greatly affect the performance of the set. These are trimmers number C1, C2, C3, C4. (See pictorial diagram).

The sensitivity of the I.F. stages will be 40 microvolts or better.

Always use as low an output as possible from the test oscillator in making the various adjustments.

II ALIGNMENT OF SHORTWAVE BAND 5.5 TO 18 M.C.

First check the position of the dial hand by rotating the condenser shaft to the left to full capacity. At this point the dial hand should be straight across in line with the lines dividing the scale in half. If the hand is off position it can be easily lined up by loosening the set screw behind the dial card in the drive hub.

1. Set the test oscillator to 17 megacycles.

2. Turn wave band switch all the way to right for highest S.W. band, and set dial hand to 17 M.C.

3. Peak trimmer condenser C-11 of the oscillator coil (See pictorial 6-2) to resonance with 17 M.C. fed into antenna.

4. Peak Ant. coil trimmer C-7 at same setting to 17 M.C.

III SHORT WAVE BAND 1.7 TO 5.5 M.C.

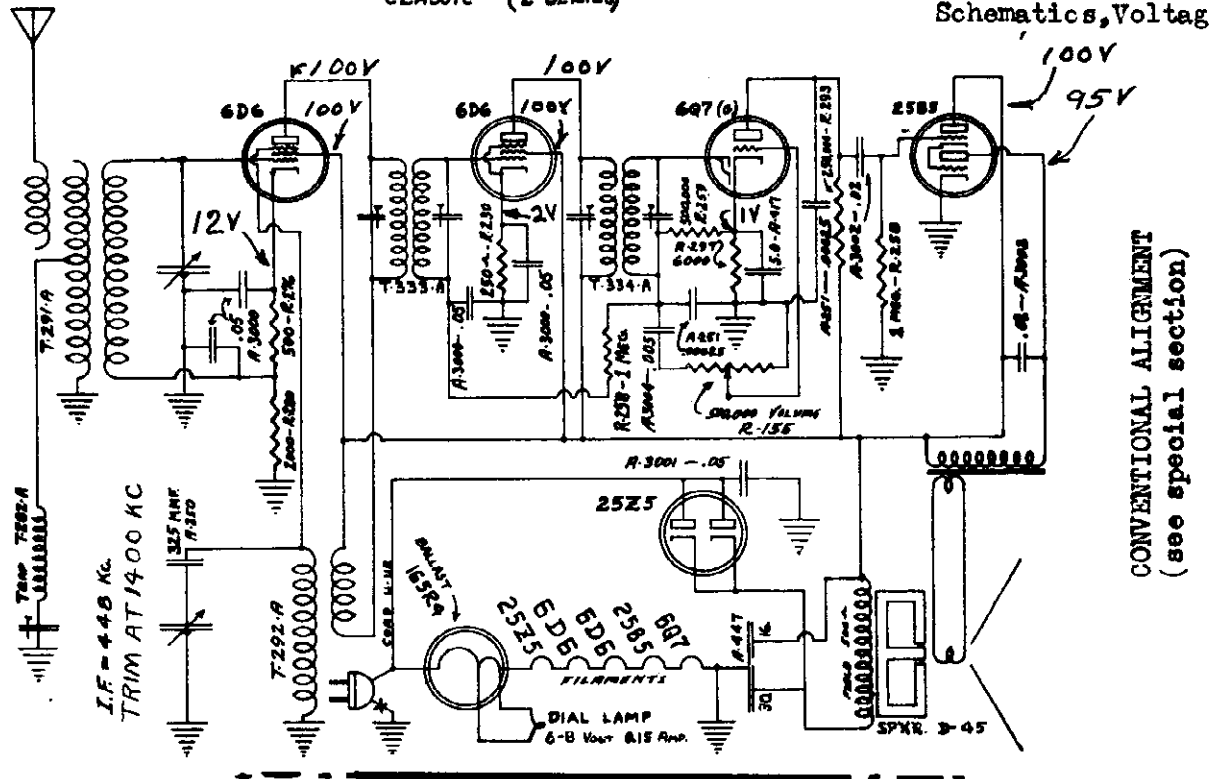
1. Turn wave switch to middle position.

2. Set dial hand to 5 megacycles on the 1.7 to 5.5 M.C. inner scale.

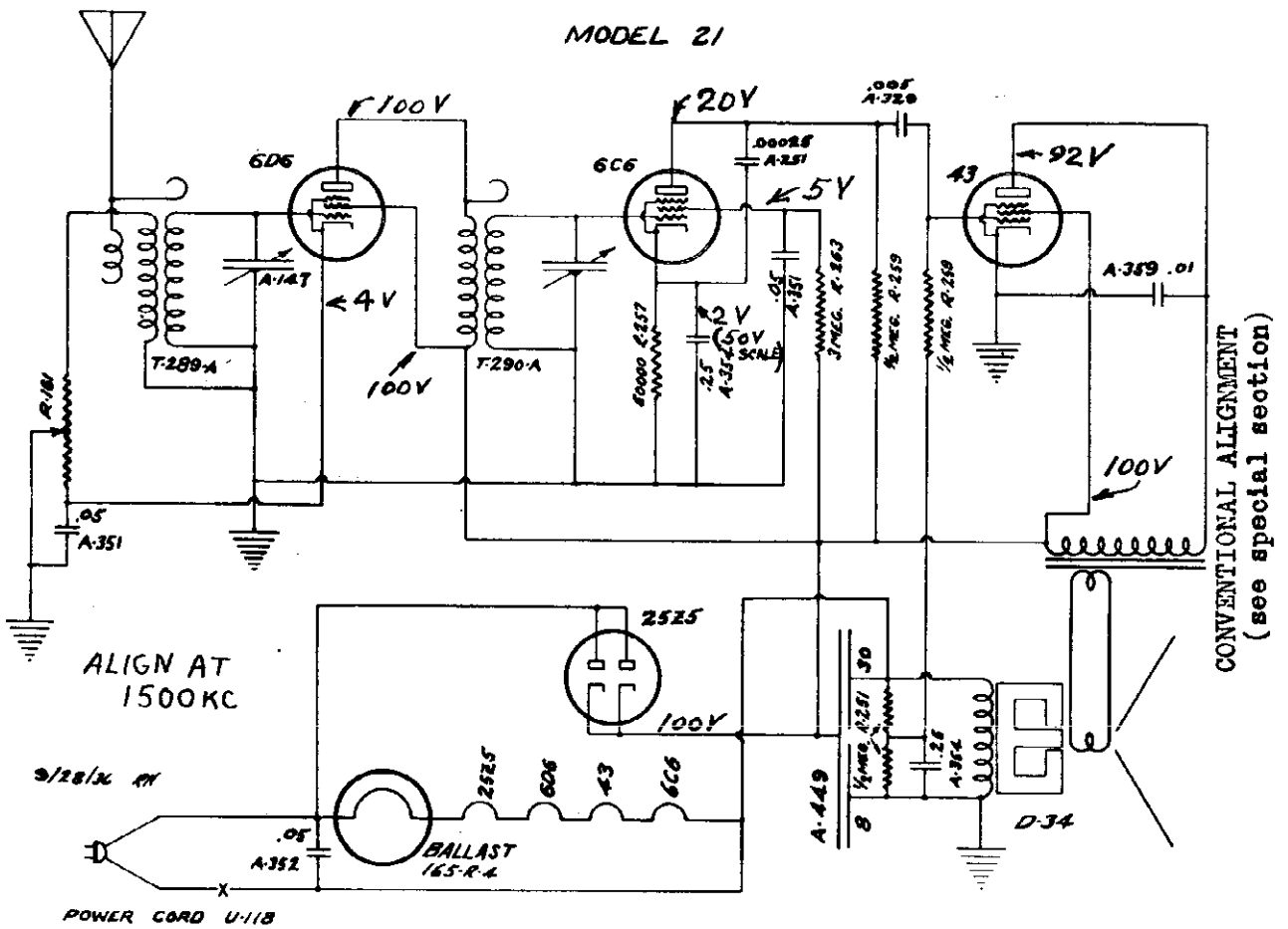
INTERNATIONAL RADIO CORP.

MODELS 10,11,12,13
14,15,16
Chassis L, "Classic"
MODELS 21,22,23
Schematics, Voltage

"CLASSIC" (L SERIES)

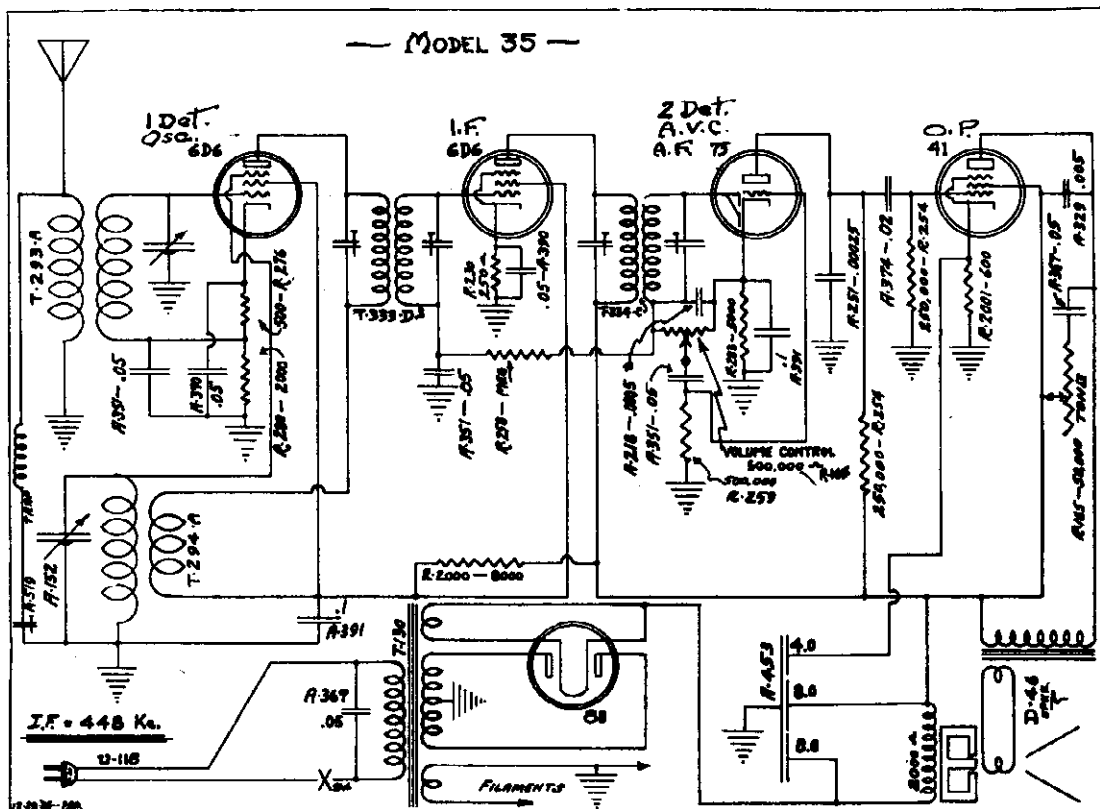


MODEL 21



MODEL 35
Schematic
Voltage, Alignment

INTERNATIONAL RADIO CORP.



ESSENTIAL DATA: The intermediate frequency employed is 448 Kc. The oscillator frequency is 448 kilocycles higher than the signal frequency. Aligning should be done on the following frequencies: 1,400, 1,000, and 600 Kc.

INTERMEDIATES: To align the I.F. circuits, set the signal generator to 448 Kc. and feed its modulated signal direct to the antenna. Adjust the first I.F. transformer trimmers for maximum meter reading. Go over both adjustments at least three or four times for accuracy. Repeat this process on the second I.F. transformer. If adjustments are not made accurately, selectivity will be poor and I.F. oscillation may result. Finally, adjust the trimmer on the tuned wave trap for minimum meter reading.

BROADCAST BAND: Turn the dial to 1400 Kc. and feed a *very weak* 1400 Kc. modulated signal from your signal generator to the antenna. Adjust the Broadcast oscillator trimmer for maximum reading. Then peak Broadcast antenna trimmer to this oscillator setting.

There is no adjustable padder condenser in this model so resonance on lower frequencies is accomplished by bending plates on tuning condensers.

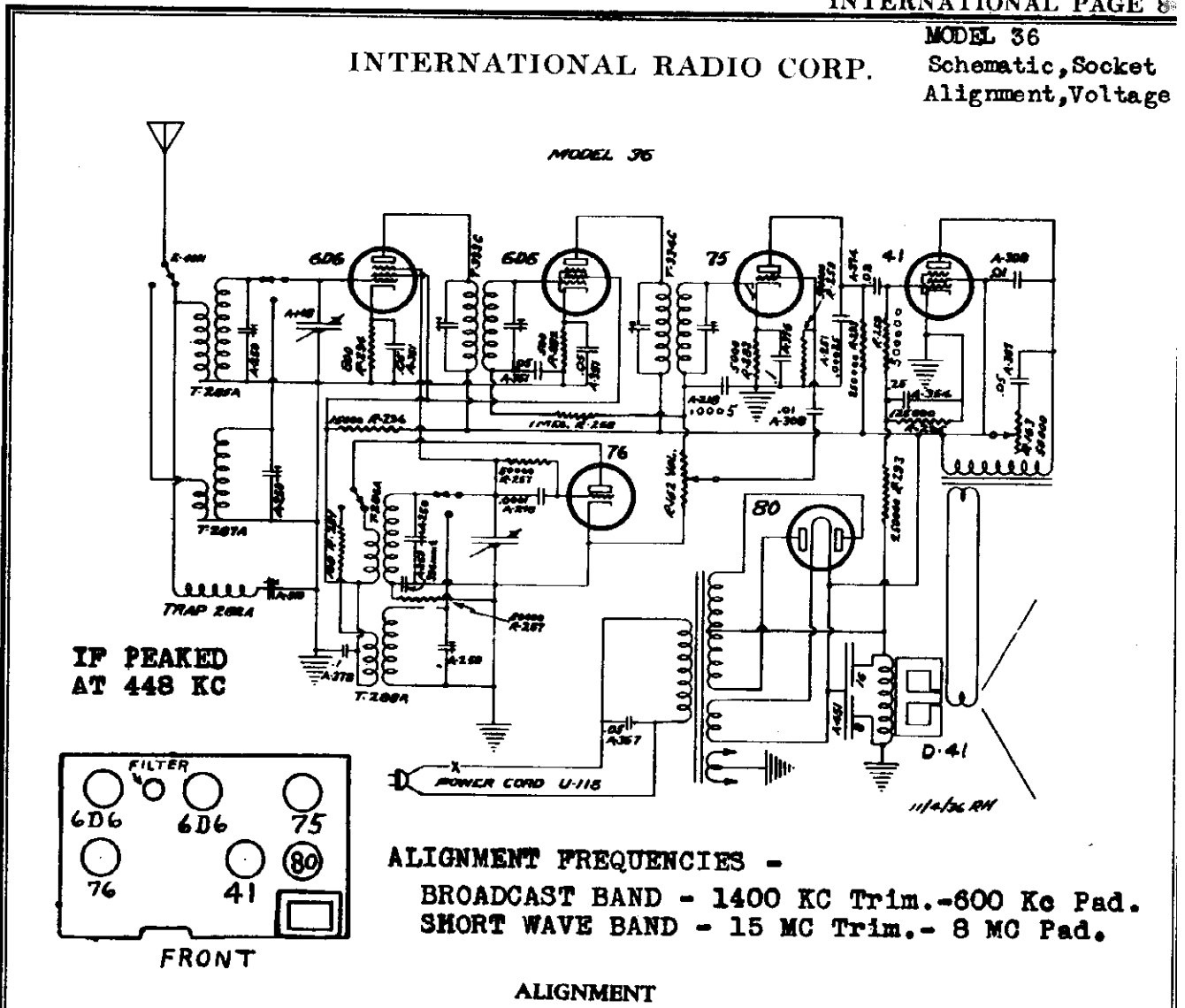
AVERAGE SOCKET VOLTAGES

Tube	Position	Ek	Eg ₁	Eg ₂	Ep
6D6	Det-Osc.	18	0	110	110
6D6	I.F.	1.7*	1.7*	110	180
75	2nd Det. A.V.C.—A.F.	1*	—	—	90
41	Output	10	—	180	170
80	Rectifier	—	—	—	250 A.C.

Line 118 volts 10% variation allowable. Measurements made from tube prongs to circuit ground and made with 1,000 ohms per volt instrument on 500 volt scale, except figures with * which are on 5 volt.

INTERNATIONAL RADIO CORP.

MODEL 36
Schematic, Socket
Alignment, Voltage



The four trimmers on the bottom of the chassis are, reading from the side of the chassis by switch toward the center, Short wave antenna, Broadcast antenna, Short wave oscillator and Broadcast oscillator.

INTERMEDIATES: To align the I.F. circuits, set the signal generator to 448 Kc. and feed its modulated signal direct to the antenna. Adjust the first I.F. transformer trimmers for maximum meter reading. Go over both adjustments at least three or four times for accuracy. Repeat this process on the second I.F. transformer. If adjustments are not made accurately, selectivity will be poor and I.F. oscillation may result. Finally, adjust the trimmer on the tuned wave trap for minimum meter reading.

BROADCAST BAND: Place the band change switch on Broadcast position. Turn the dial to 1400 Kc. and feed a very weak 1400 Kc. modulated signal from your signal generator to the antenna. Adjust the Broadcast oscillator trimmer for maximum reading. Then peak Broadcast antenna trimmer to this oscillator setting.

Turn dial and signal generator to 600 Kc. and rock the padder into correct adjustment. This is accomplished by very slowly adjusting the padder condenser and at the same time turning the dial slightly back and forth across 600 Kc. until an adjustment is obtained producing maximum output. Go back to 1400 Kc. and readjust the oscillator trimmer slightly if necessary. Then recheck padder at 600 Kc.

SHORT WAVE BAND: Place the band change switch on the Short Wave position. Turn the dial to 15 megacycles and feed a very weak 15 megacycle modulated signal from your signal generator to the antenna. Adjust the S.W. oscillator trimmer for maximum reading on the output meter. This trimmer should not be touched again when checking alignment on other frequencies. Then peak S.W. antenna trimmer to this oscillator setting.

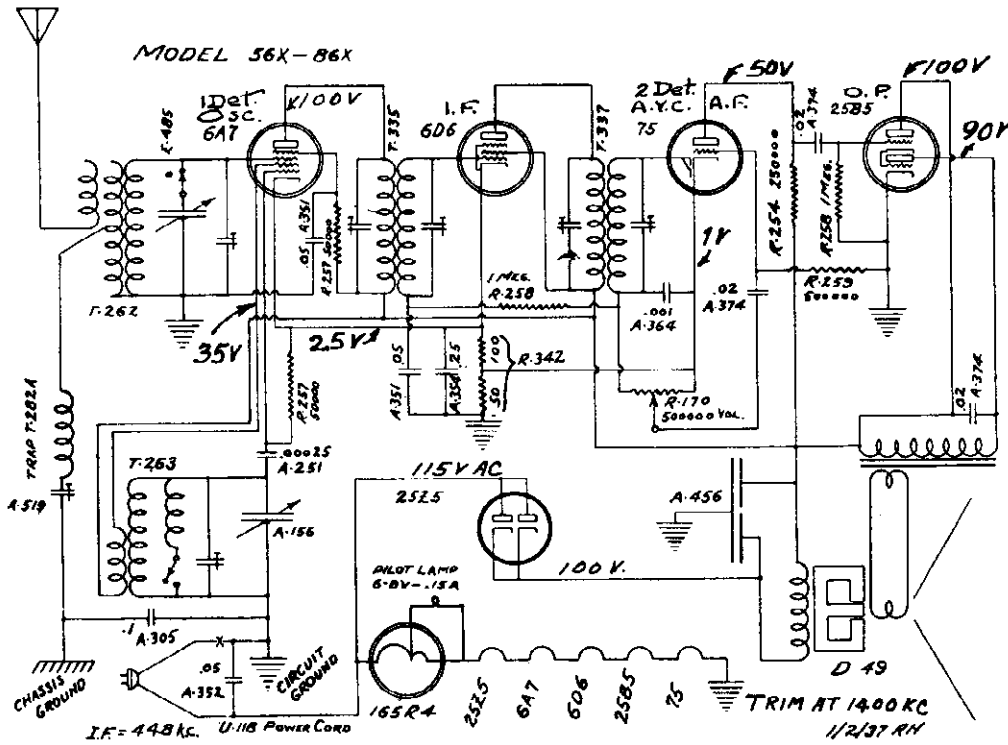
Instead of bending condenser plates at 8 megacycles alignment is accomplished by spreading or crowding turns on the S.W. detector coil. If much crowding or spreading is necessary it is advisable to go back and recheck at 15 megacycles.

AVERAGE SOCKET VOLTAGES

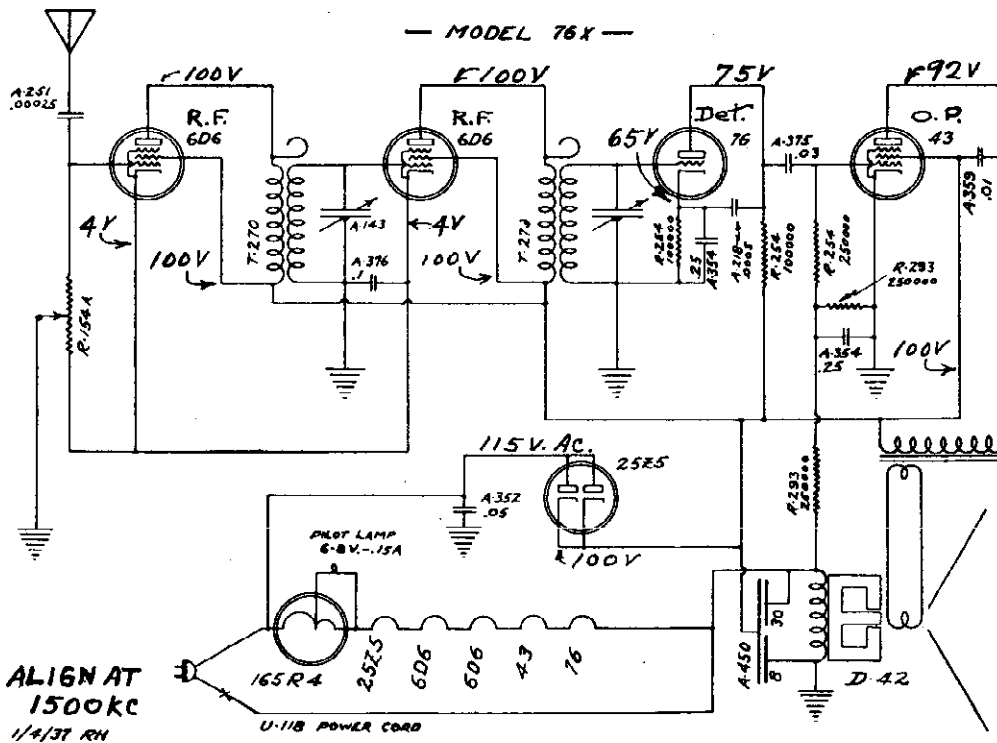
Tube	Position	E_k	E_{g_1}	E_{g_2}	E_p
76	Oscillator	0	-	-	100
6D6	Detector	4	0	100	230
6D6	I.F.	4.5	4.5	100	230
75	2nd Det. A.V.C.-A.F.	1	-	-	100
41	Output	0	-	230	225
80	Rectifier	-	-	-	118 AC

MODELS 56X, 86X
MODELS 76X, 676X
Schematics, Voltage

INTERNATIONAL RADIO CORP.



CONVENTIONAL ALIGNMENT
(see special section)

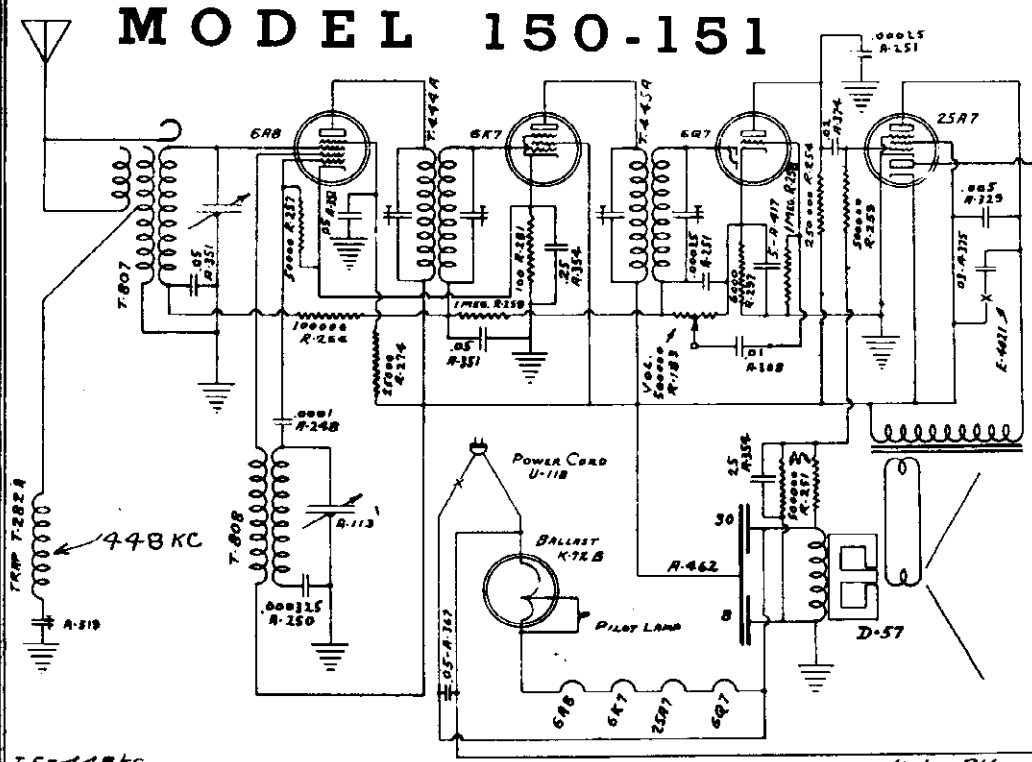


CONVENTIONAL ALIGNMENT
(see special section)

INTERNATIONAL RADIO CORP.

MODELS 150,151
Schematic, Socket
Voltage, Alignment

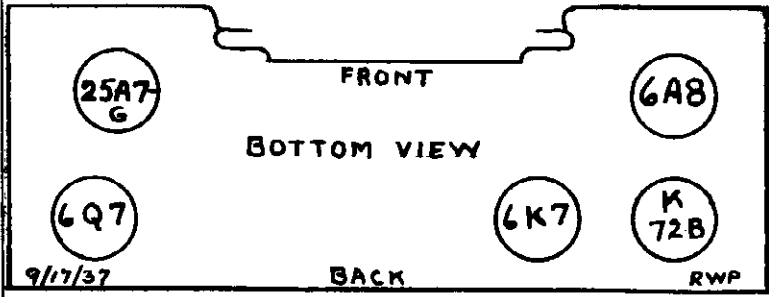
MODEL 150-151



- The following tubes are employed:
- 6A8 — 1st Detector-Oscillator
 - 6K7 — I.F. Amplifier
 - 6Q7 — 2nd Detector—A.V.C.—A.F.
 - K72B — Ballast
 - 25A7G — Pentode Output and Rectifier

I.F. = 448 kc

6/15/37 RH



CONVENTIONAL ALIGNMENT
SEE THE SPECIAL SECTION

FREQUENCY RANGE - BROADCAST BAND
Trim OSC and ANT trimmers at 1400 KC. Resonance at 600 KC (padding) is accomplished by bending the rotor plates of the gang condenser.

AVERAGE SOCKET VOLTAGES

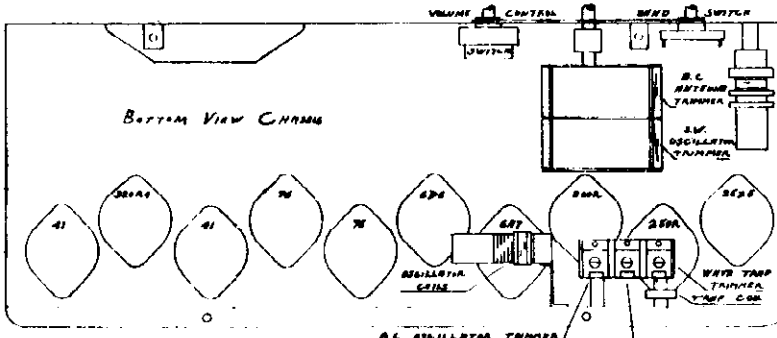
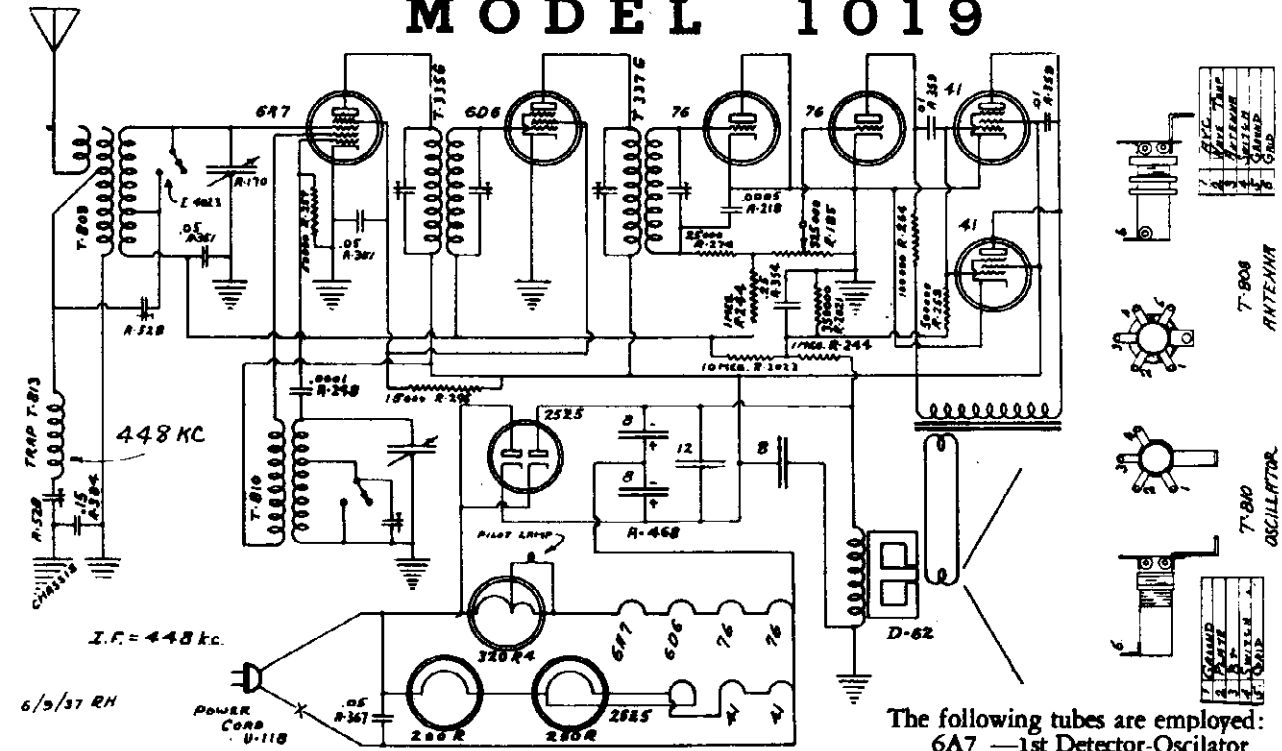
Tube	Position	Rectifier							
		Ek	Eg	Ega	Egs	Esu	Ep	Ep	Ek
6A8	Det.-Osc.	1.5	0	100	50	—	100	—	—
6K7	I.F.	1.5	0	—	100	1.5	100	—	—
6Q7	2nd Det. A.V.C. 1st audio	1	0	—	—	—	*35	—	—
25A7G	Output Rectifier	0	13	—	100	—	100	118 A.C.	100

Line voltage 118 volts, 10% variation allowable. Measurements made from tube prongs to circuit ground and made with 1000 ohms per volt instrument on 250 volt scale.
* through .25 megohm

MODEL 1019
Schematic, Socket
Trimmers, Voltage
Alignment

INTERNATIONAL RADIO CORP.

MODEL 1019



- The following tubes are employed:
- 6A7 — 1st Detector-Oscillator
 - 6D6 — I.F. Amplifier
 - 76 — 2nd Detector
 - 76 — 1st Audio
 - 41 — Audio Output
 - 200R — Ballast tube
 - 25Z5 — Rectifier
 - 250R — Ballast tube
 - 320R4 — Regulator tube

FREQUENCY RANGES - SHORT WAVE-
 Trim OSC and ANT at 6 MC
BROADCAST - Trim OSC and ANT
 at 1400 KC, pad at 600 KC
 by bending plates
 of gang condenser.

AVERAGE SOCKET VOLTAGES

Tube	Position	Ek	Eg	Ega	Egs	Esu	Ep
6A7	Det.-Osc.	0	*-1.5	165	90	—	165
6D6	I.F.	0	*-1.5	—	90	0	165
76	2nd Det.	0	*-.45	—	—	—	0
76	1st Audio	0	‡	—	—	—	‡35
41	Output	0	*-12.5	—	165	—	160
41	Output	0	*-12.5	—	165	—	160
25Z5	Rect.	165	—	—	—	—	AC

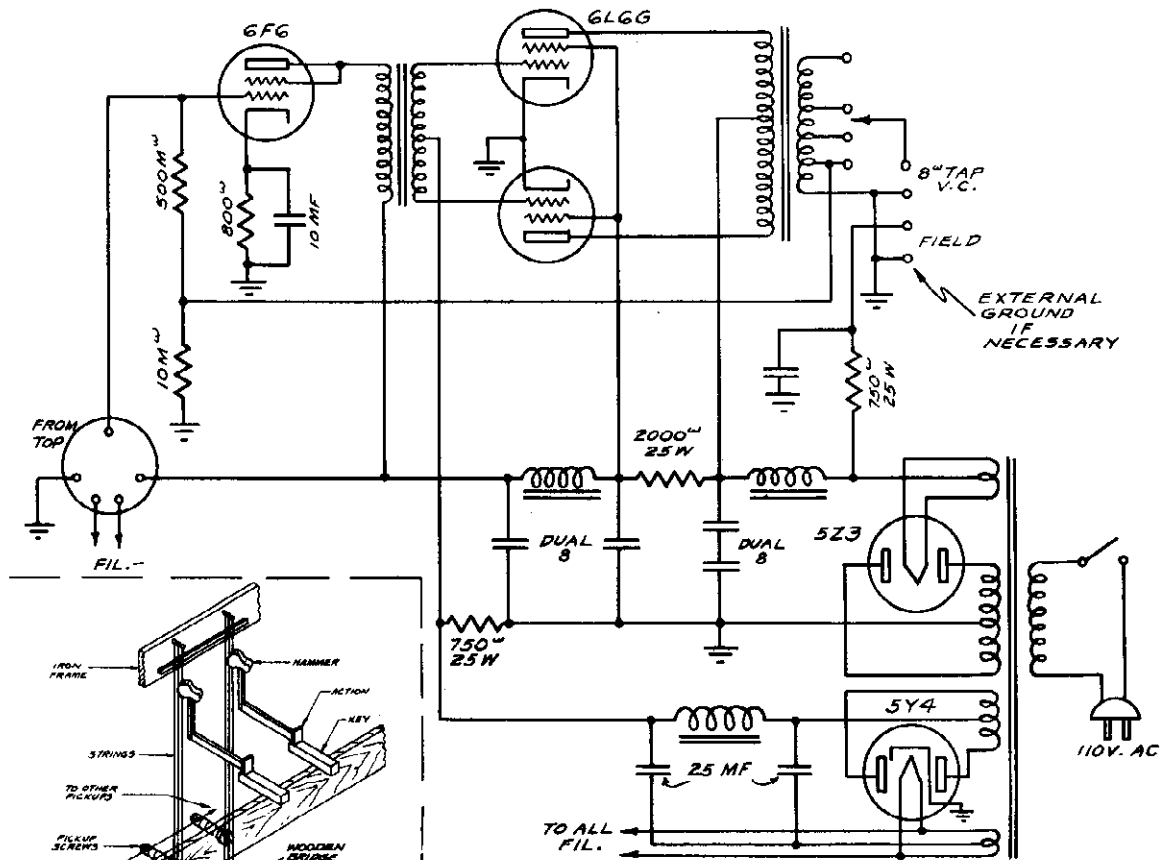
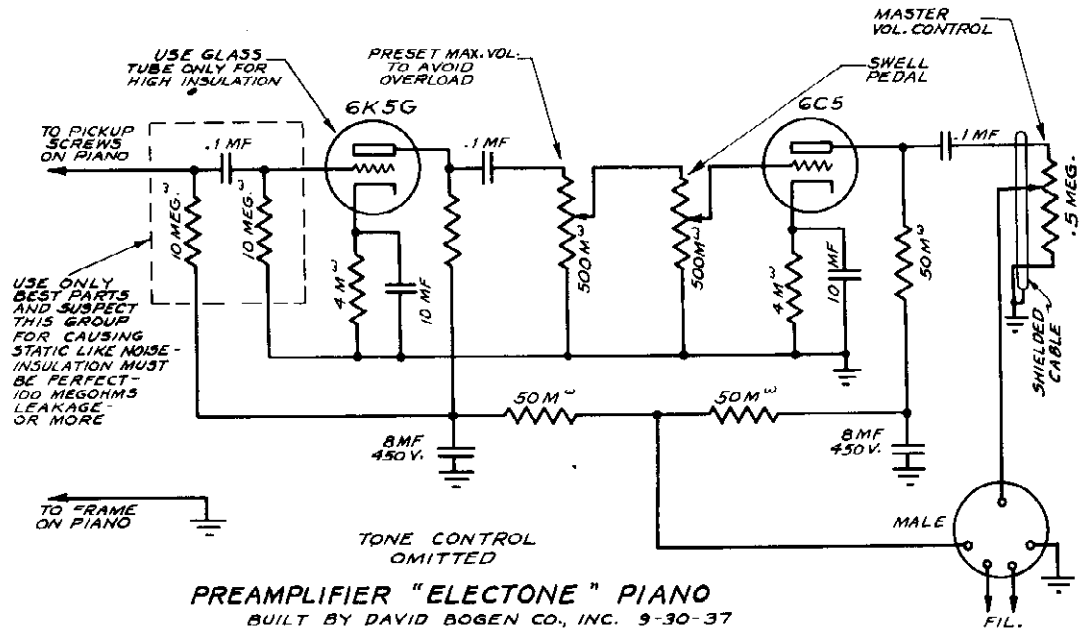
Line voltage 118 volts, 10% variation allowable. Measurements made from tube prong to circuit ground with 1000 ohms per volt instrument on 250 volt scale.

* Not measurable—calculate from 50 volt drop across speaker field.
 † Through .1 megohm ‡ Diode biased

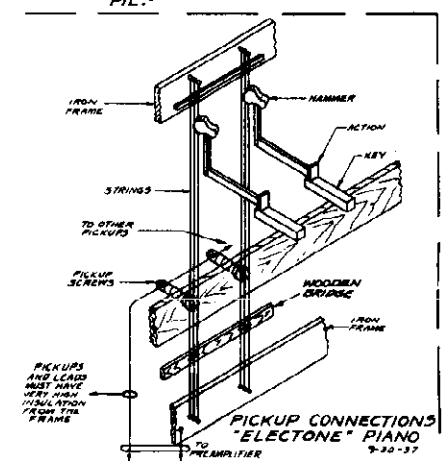
CONVENTIONAL ALIGNMENT - SEE THE SPECIAL SECTION.

Schematics
Pick-up Connections

MODEL Electone Piano
KRAKAUER BROS. Preamplifier, Power Amplifier



POWER AMPLIFIER "ELECTONE" PIANO
MADE BY DAVID BOGEN CO., INC.
40 WATT INVERSE FEED BACK
FIXED BIAS
9-30-37



MODEL Electone Piano
Service Notes

KRAKAUER BROS.

AMPLIFIER CIRCUITS:

The output transformer is especially designed and if it is damaged, an exact replacement is necessary.

The tone control is subject to wide variations according to individual requirements. Some forms depend on the cathode by-pass for control; therefore, replace this component with exact value.

Use only glass tubes in the input, as the leakage is less, and only glass tubes in the output, because of the possibility of a short to the shell.

NOISE ELIMINATION:

First suspect dirt on the pick-up screws. These are insulated with lacquer, but this is not perfect. Clean with a vacuum-cleaner with blower attachment, which should be run for a few minutes so that the hose will be free from dirt. A thin strip of paper can be worked between the strings and the pick-up screws to remove stubborn particles of dirt.

Moisture may get into the wooden strip supporting the pick-up screws. This can be dried by placing in the bottom of the piano a $\frac{1}{2}$ pint fruit jar which is $\frac{1}{3}$ filled with calcium chloride. This should be renewed when it disintegrates. When the strip is dry it should be oiled with Nujol.

Another source of noise may be leakage in the input group (the two 10-megohm resistors and the .1-mf condenser). Replace with the best components obtainable. In severe climates place these three components in a small cardboard pill-box and fill it with paraffine wax, bringing out the leads so they can be readily connected to their proper points.

HUM:

Hum may be due to trouble in the filters, unmatched output tubes, or a poor bias rectifier, if trouble is confined to the amplifier.

Electrostatic pick-up to screws is shielded by the back-board of the piano. This board must make good contact with the ground clamps. If proper contact can not be established, cover the back-board with tin-foil shellaced in place and grounded.

REGULATING PICK-UP SCREWS:

This must be done with the help of a professional piano tuner who must be a tone regulator. The tuner should tone regulate the piano very soft, paying attention to evenness of tone and not evenness of volume. Then he can strike the notes, telling the serviceman at the rear of the piano, if the pick-up screws need adjustment. Turn screws to right to make louder -- to the left to make softer. Take care that screws are not turned too far to the right, so that the strings will touch screw when a very hard blow is struck on the key.

These screws should ordinarily need no attention during the life of the piano. Only in case of buckling of the mechanism or tampering need these be touched.

SETTING MASTER LEVEL CONTROL:

The striking of the hammer on the strings sets up tremendous transients in the electrical circuit which last a small fraction of a second. These tend to overload the amplifier and when the average output of the amplifier is 3 or 4 watts, the transients may be of the order of several hundred watts. Accordingly, a 40-watt amplifier is used for low average power. Do not set the screw-driver type volume control too high. The instrument is not supposed to sound much louder than an ordinary acoustic piano.

Overload causes rattling similar to speaker cone rattles. Do not blame the speaker until you are sure.

SWELL PEDAL ADJUSTMENT:

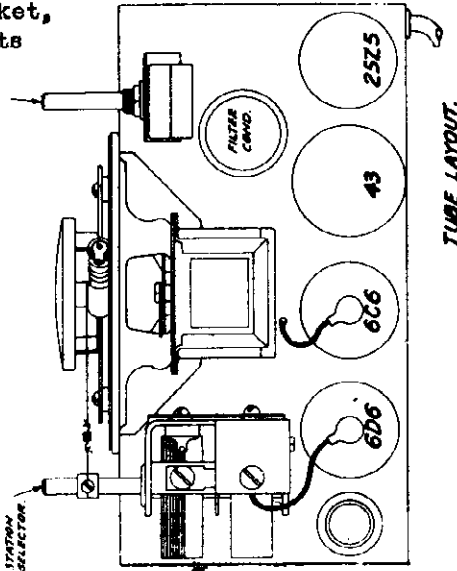
The mechanical connection from the swell pedal to its control should be set so that with the pedal completely depressed, the sound from the speaker is just not noticeable.

NOTE:

Special parts and further service information may be obtained from Krakauer Brothers, 191 Cypress Ave., New York City.

LAFAYETTE RADIO MFG. CO.

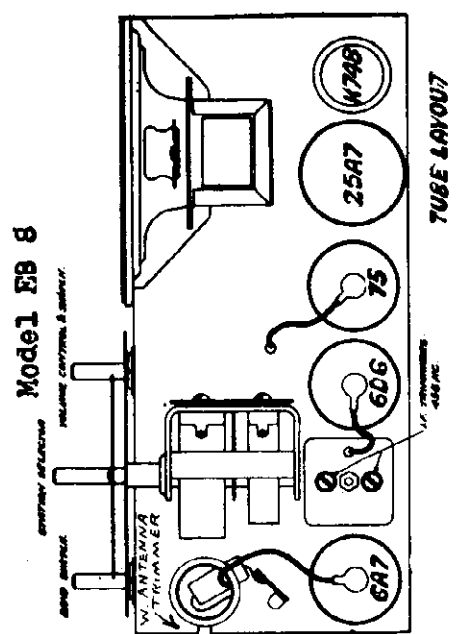
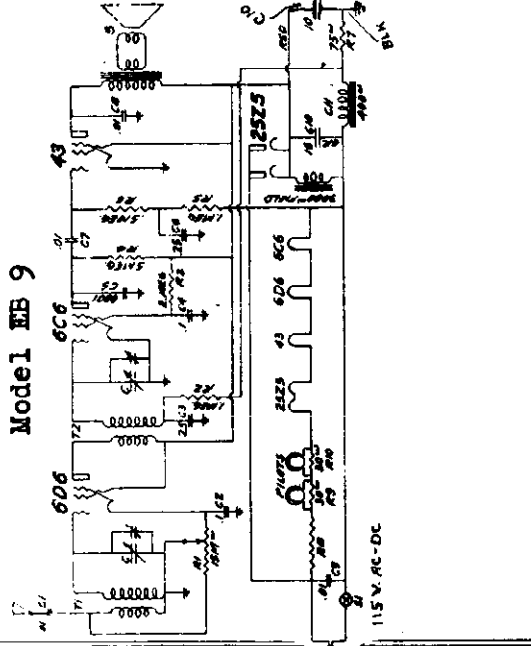
MODEL EB8
MODEL EB9
Schematics
Socket,
Parts



REPLACEMENT PARTS LIST

In Ordering Always State Model, Description, & Part No.

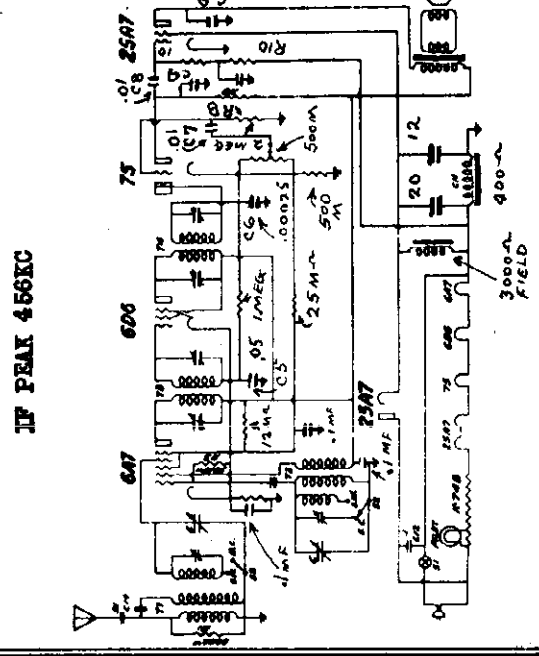
Part #	Description	Letter
1500-A	Antenna Coil	B1
3894-A	R.F. Coil	B2
5000-A	Load Speaker	S
6201-C	Choke	C1
3206-A	Tuning Condenser .0001 Mf.	C2
	Variable Condenser .01 Mf. 200 V.	C1, C7, C8
	" " 1 Mf. 200 V.	C2, C4
	" " 25 Mf. 200 V.	C3, C6
4808-A	Filter Condenser 15 & 10 Mf.	C10
4108-A	Volume Control & Switch	R1, S1
	Carbon Resistor 1. meg., 1 watt	R2, R6
	" " 2. meg., 1 watt	R3
	" " .5 meg., 1 watt	R4, R8
	" " 75" 1 watt	R7
4682-A	Armored Resistor .50" 1/2"	R9, R10
4654-A	Resistance Cord	RE
4461-F	Pilot Bulb	
4501-D	Antenna Cord	



REPLACEMENT PARTS LIST

In Ordering Always State Model, Part No. & Description

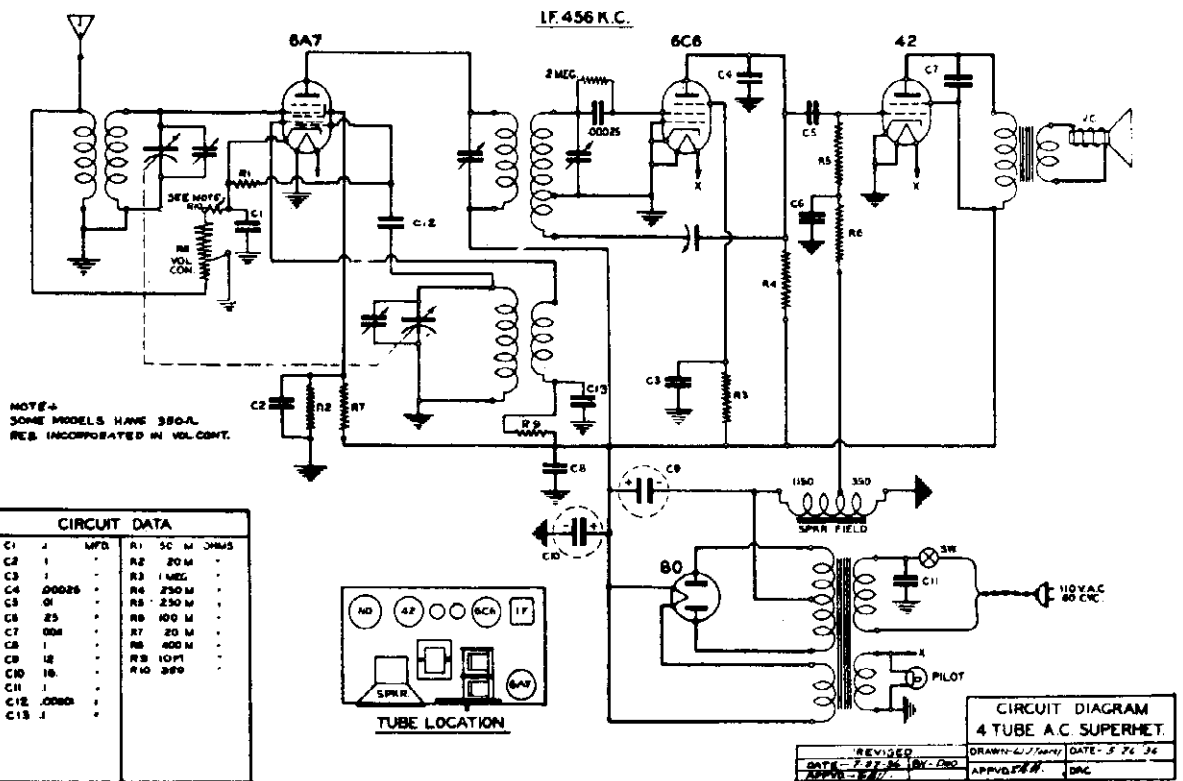
Part #	Description	Letter
1500-A	Antenna Coil	B1
4008-A	Oscillator Coil	B2
3108-A	1st I.F. Coil	B3
1107-A	2nd I.F. Coil	B4
4401-B	Choke	C1
4808-A	Filter Condenser	C2
4808-C	Load Resistor	C3
4808-D	1st I.F. Coil	C4
4808-E	Volume Control & Switch	C5
4808-F	2nd I.F. Coil	C6
4808-G	Tuning Condenser	C7
	Micro Condenser .00025 Mf.	C8
	Micro Condenser .0005 Mf.	C9
	Variable Condenser 1 Mf. 200 V.	C10, C11
	Variable Resistor 15 & 10 Mf.	C12
4601-B	Filter Condenser 20 & 10 Mf.	C13
	Resistor 5000" 1/2 watt	R1
	" " 500" 1/2 watt	R2
	" " 150" 1/2 watt	R3
	" " 150" 1/2 watt	R4
	" " 150" 1/2 watt	R5
	" " 150" 1/2 watt	R6
	" " 150" 1/2 watt	R7
	" " 150" 1/2 watt	R8
	" " 150" 1/2 watt	R9
	" " 150" 1/2 watt	R10
4601-C	Antenna Cord	



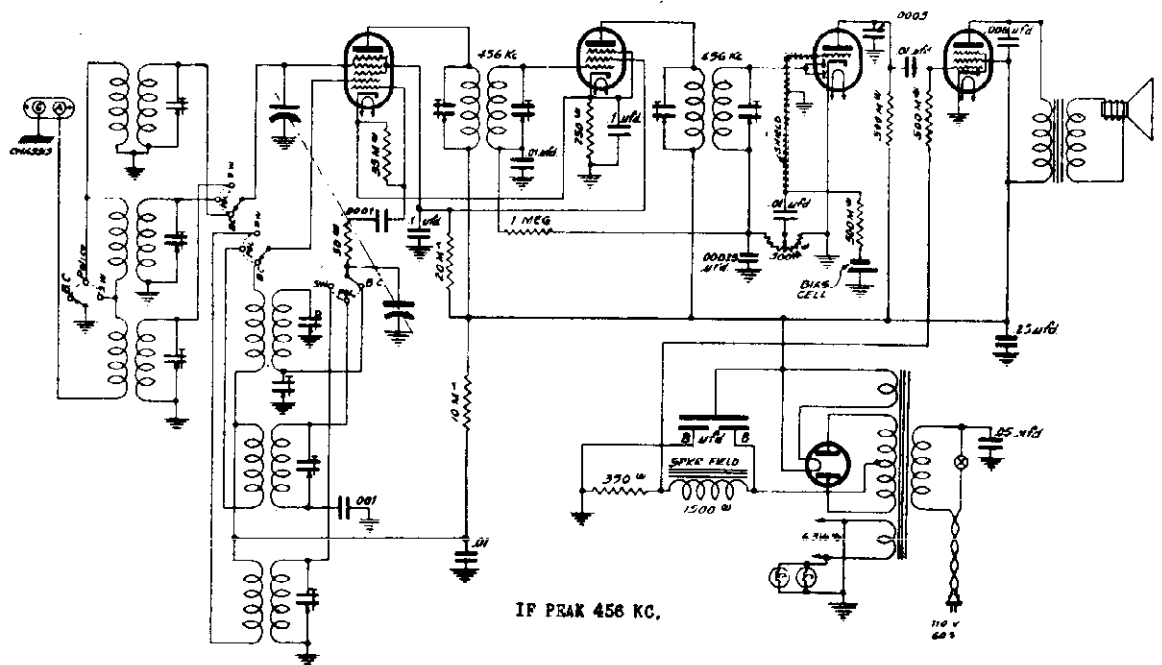
LAFAYETTE RADIO MFG. CO.

MODEL D10
MODEL D11
Schematics

MODEL D 10

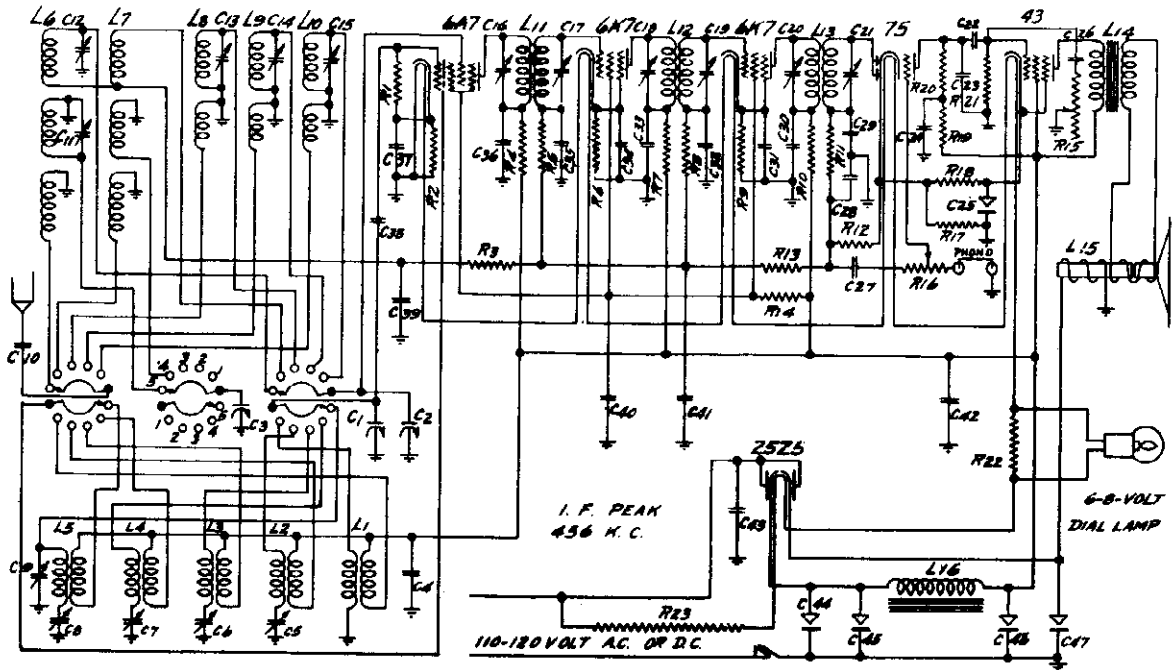


MODEL D 11

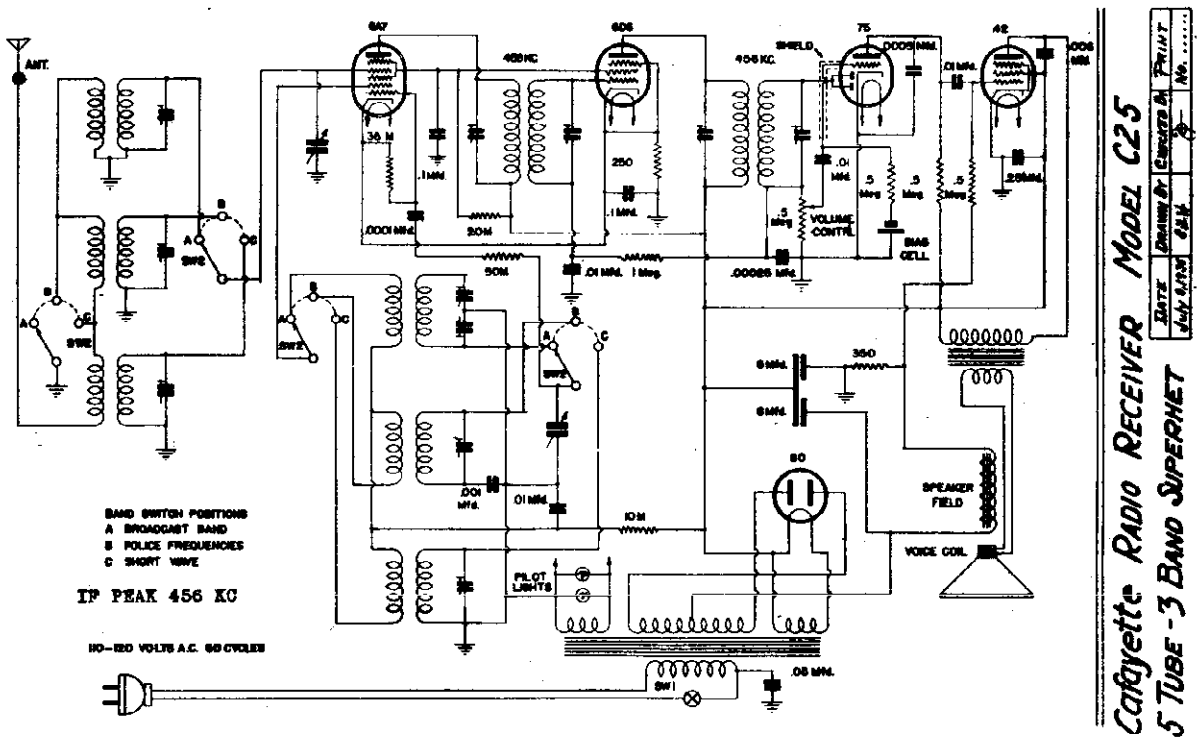


MODEL A18
MODEL C25
Schematics

LAFAYETTE RADIO MFG. CO.

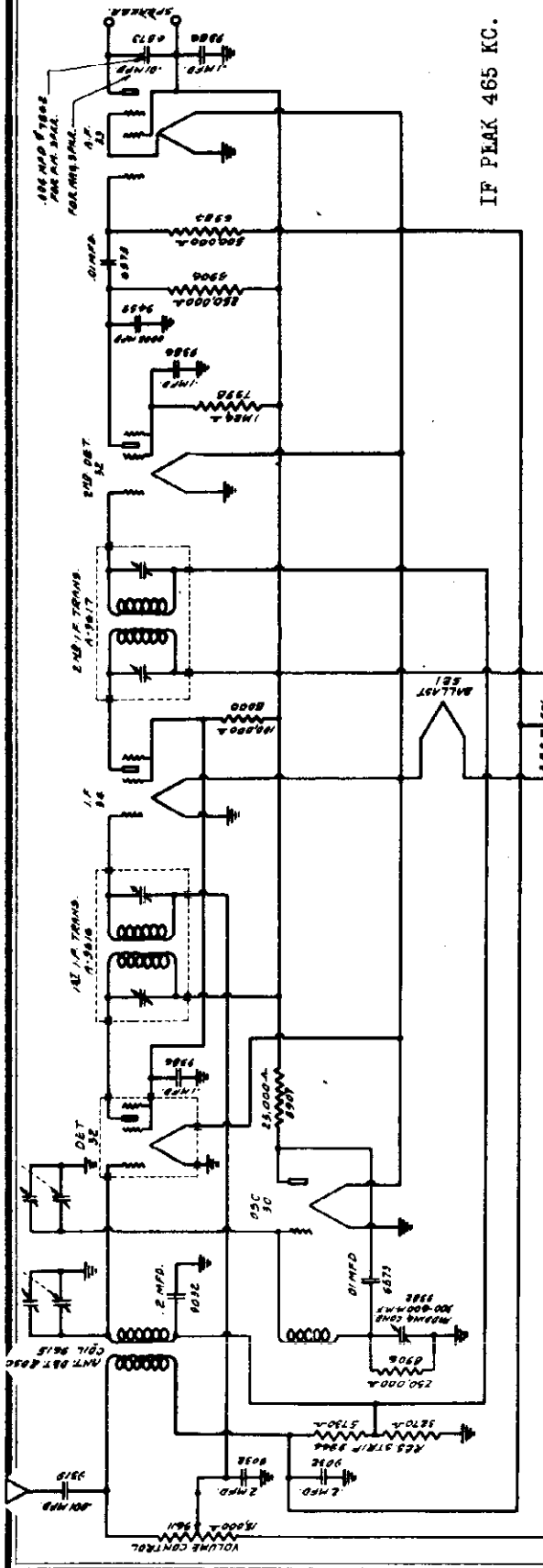


LAFAYETTE MODEL A-18
6 TUBE 5 BAND SUPERHET RECEIVER
LAFAYETTE RADIO MFG. CO.
100 SIXTH AVE., NEW YORK, N.Y.
1-30-35



LAFAYETTE RADIO MFG. CO.

IF PEAK 465 KC.



PARTS AND PRICE LIST

PART NUMBER	DESCRIPTION	LIST PRICE
9870	No. 5E1 Tube Socket	.11
9819	No. 50 Tube Socket	.11
9820	No. 32 Tube Socket	.11
9821	No. 34 Tube Socket	.11
9822	No. 33 Tube Socket	.11
9821	Tube Shield Base	.20
9222	Tube Shield	.19
9612	Two Gang Condenser	2.54
9615	Antenna, Detector & Oscillator Coil	1.38
9616	1st I. P. Transformer	1.90
9617	2nd I. P. Transformer	1.90
9392	Padding Condenser	.50
9614	Tuning Dial	.56
9611	Volume Control	.91
9623	3 P. S. T. Switch	1.40
9613	Battery Cable	1.02
9625	Wire Wound Resistor Strip	.86
8906	250,000 Ohm 1/5 Watt Resistor	.19
8907	25,000 Ohm 1/5 Watt Resistor	.19
8000	100,000 Ohm 1/5 Watt Resistor	.19
7998	1 Meg Ohm 1/5 Watt Resistor	.19
6984	500,000 Ohm 1/3 Watt Resistor	.22
9319	.001 Mfd. Moulded Condenser	.21
9459	.0005 Mfd. Moulded Condenser	.21
9386	.1 Mfd. 200 Volt Condenser	.18
6873	.01 Mfd. 200 Volt Condenser	.17
7882	.02 Mfd. 200 Volt Condenser	.23
7882	.004 Mfd. 400 Volt Condenser	.17
9718	Knob with arrow	.14

NOTE:
1. DOTTED LINES DENOTE SHIELDING.
2. PARTS UNDER OUR PATENT RELATIVE TO THIS SET.
3. NUMBERS SHOWN WITH PREFIX "M" ARE COMPLETE ASSEMBLIES.
4. I.P. = 465 K.C.

INTERMEDIATE ALIGNMENT: Only when an intermediate transformer has become defective due to an open or burned out winding should it be necessary to readjust the intermediate transformer. For aligning either the intermediate transformer or the variable condenser it is necessary that an oscillator be used with some type of output measuring device. To align the intermediate transformer:

1. Connect the high side of the oscillator output to the control grid of the No. 32 Modulator tube. The ground side of the oscillator should be connected to the chassis.
2. Set the oscillator at 465 kilocycles (this must be accurate) and adjust the output of the oscillator so that a convenient reading is obtained on the output meter.
3. Align the first intermediate transformer by turning one of the intermediate transformer trimmer screws up and down until maximum reading is obtained on the output meter. Then adjust the other trimmer screw in the same manner.
4. The second I.P. transformer should next be adjusted in the same manner. The intermediate transformer trimmer screws are accessible through the small hole in the top of the intermediate transformer shields.

To align the variable condenser:

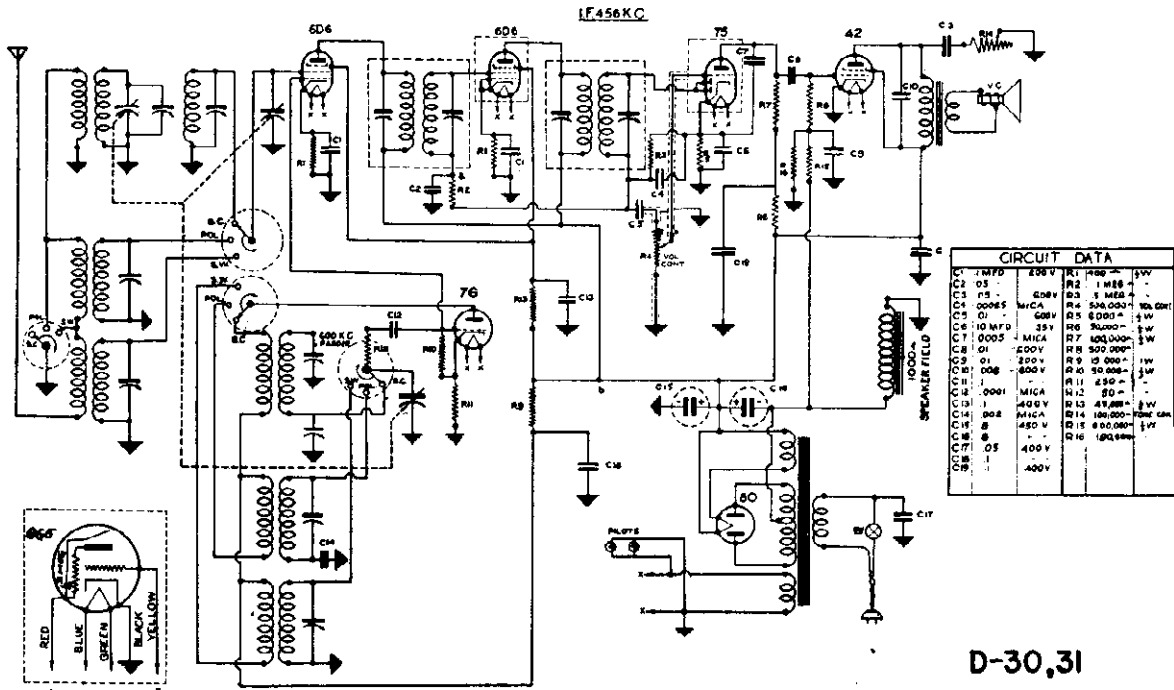
1. Connect the high output side of the oscillator to the set antenna lead and the ground side of the oscillator to the chassis.
2. Tune the receiver to 1400 kilocycles on the dial and set the oscillator to this frequency.
3. Adjust the variable condenser trimmer screws for maximum output reading.
4. Tune the set to approximately 600 kilocycles on the dial and adjust the oscillator frequency to 600 kilocycles. Adjust the padding condenser located on the rear of the chassis adjacent to the antenna and ground leads and accessible through the hole in the chassis for maximum output reading.

When making this adjustment be sure to rock the variable condenser slightly to the right and left to enter the position where the greatest output reading is obtained.

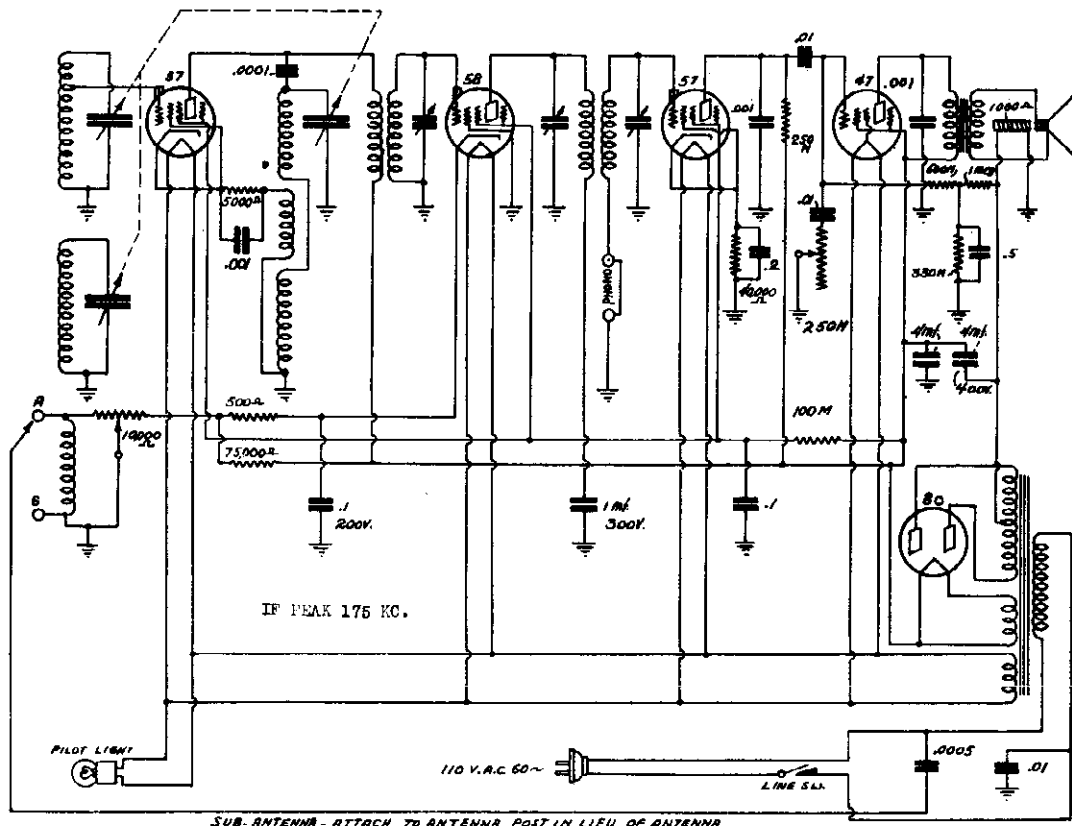
These prices are subject to change without notice.

MODELS D30, D31
 MODEL M31(1935)
 Schematics

LAFAYETTE RADIO MFG. CO.



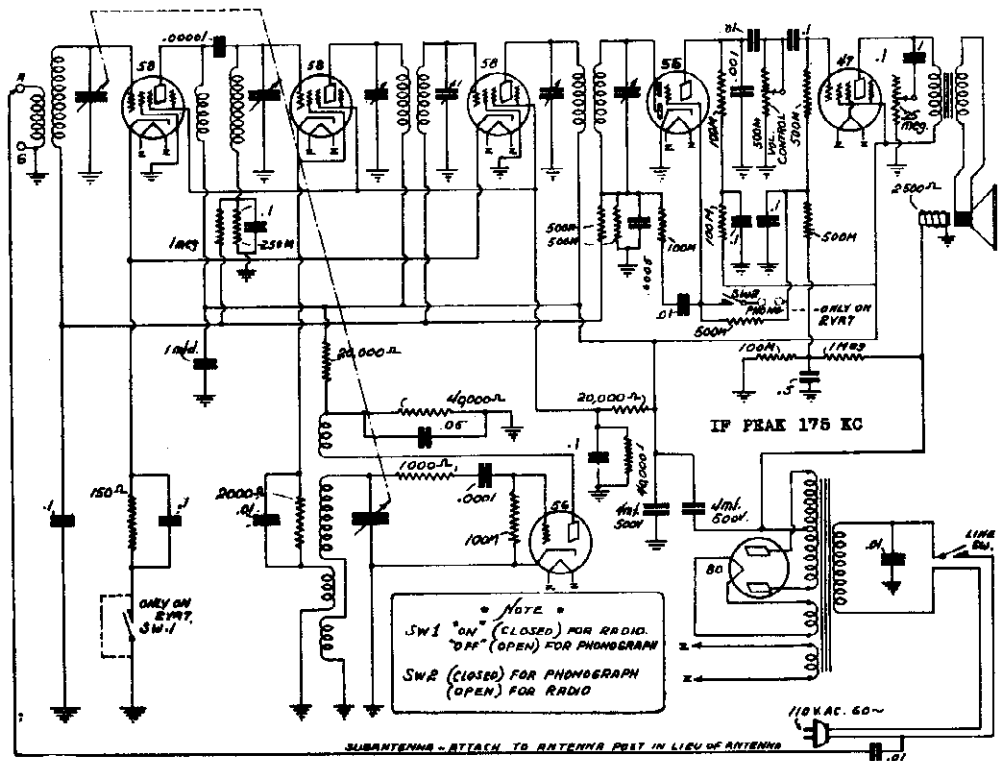
D-30,31



MODEL M-31
 Date _____
 Drawn by *Left*
 Checked by *Print*
 No. 510

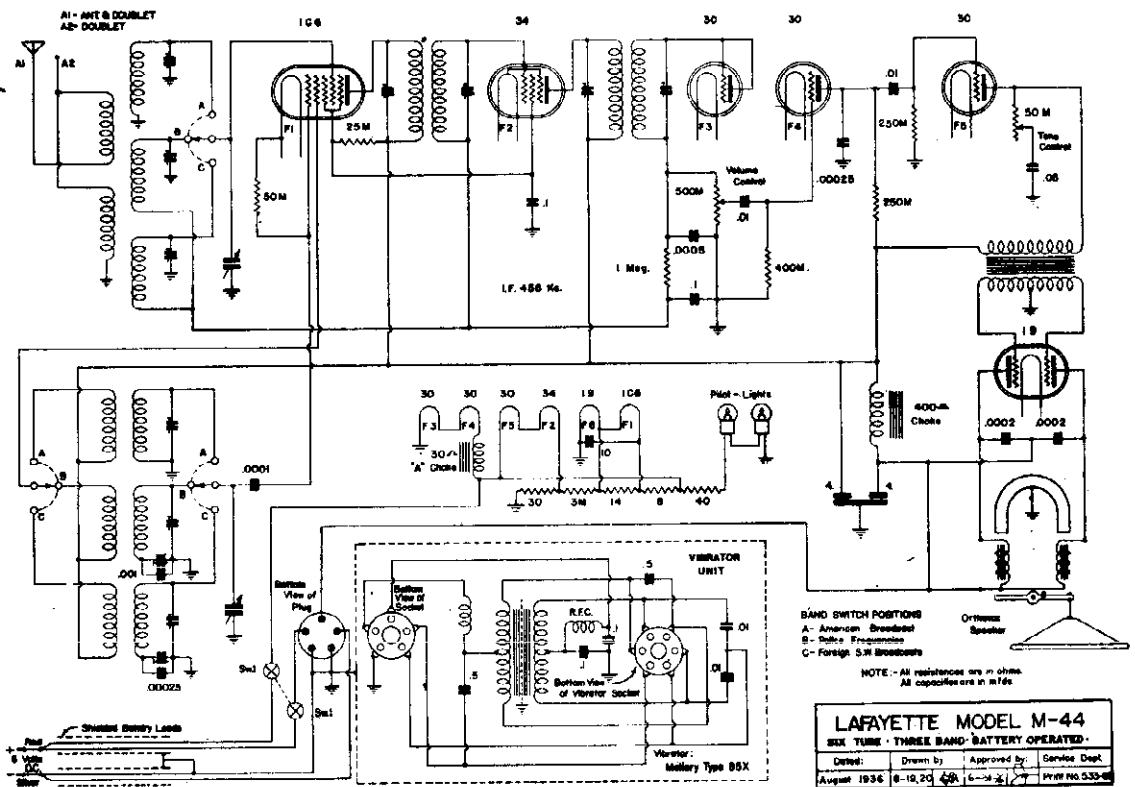
LAFAYETTE RADIO MFG. CO.

MODEL M37
MODEL M44
Schematic



Date *Sept 18 1935* Drawn by *Left* Print
Checked by *No. 511*

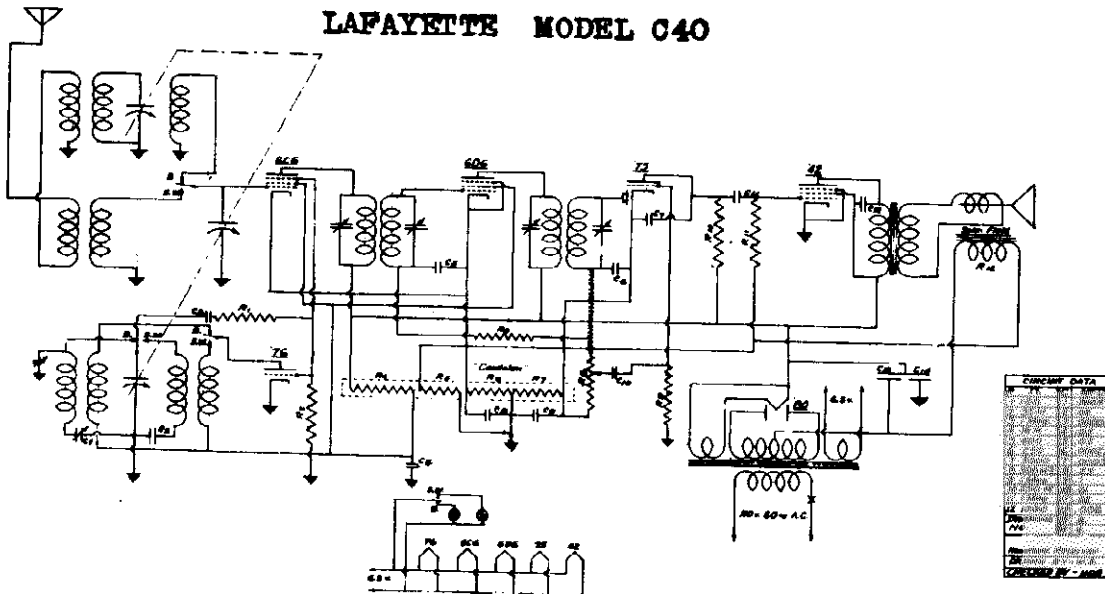
MODEL M-37



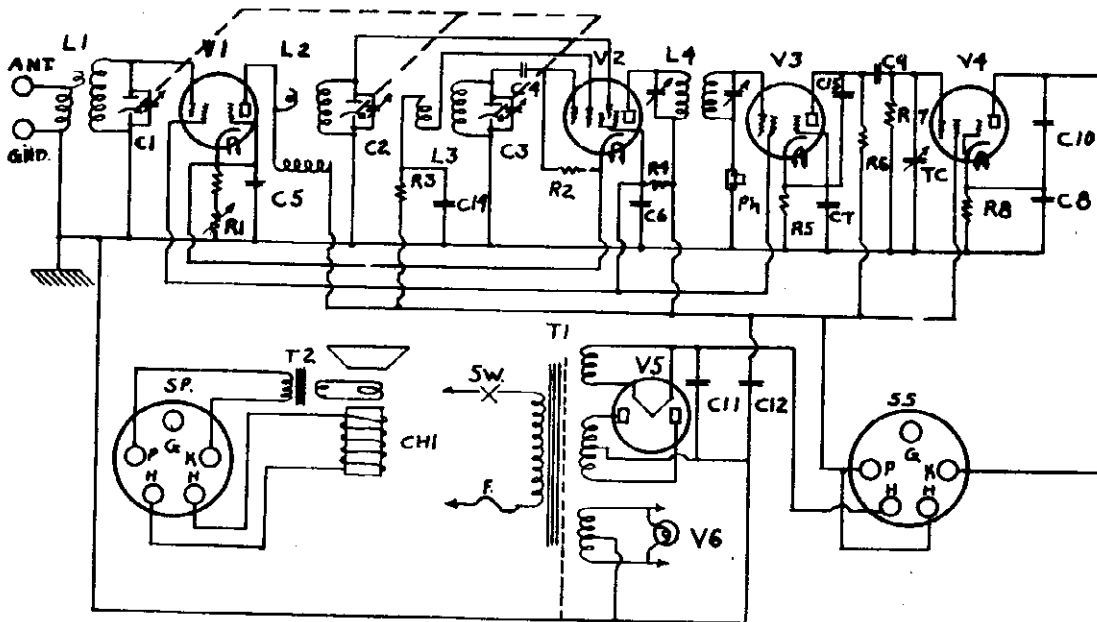
MODEL C40
MODEL SL45
Schematics
Alignment

LAFAYETTE RADIO MFG. CO.

LAFAYETTE MODEL C40



LAFAYETTE MODEL SL45



- V1—58 Tube
- V2—2A7 Tube
- V3—57 Tube
- V4—2A5 Tube
- V5—80 Tube
- V6—2.5 V. Pilot Light
- C1—365 Mmfd. Var. Cond.
- C3—175 K.C. oscillator section
- C4—0.0025 Mfd.
- C5—6-14—.05 Mfd.
- C7—8-11—10 Mfd.
- C9—.01 Mfd.

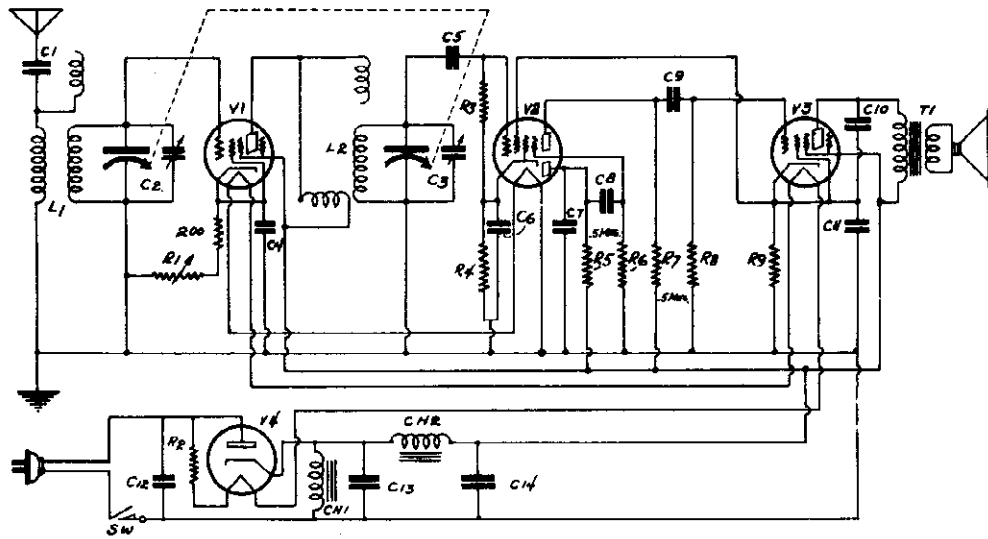
- C10—.006 Mfd.
- C12—8 Mfd.
- C15—.0005 Mfd.
- L1—Antennae Coil
- L2—R.F. Coil
- L3—Oscillator Coil
- L4—I.F. 175 K.C. Coil
- R1—4M Vol. con. 190-Ohm min. with switch
- R2—50M Resistor
- R3—10M Resistor
- R4—50M Resistor

- R5—10M Resistor
- R6—250M Resistor
- R7—250 M Resistor
- R8—410 Ohms Resistor
- PH.—Phono
- TC.—Tone Control
- T1—Power Trans.
- T2—Audio Trans.
- CHI—Speaker Field
- SW—Switch on Vol. Control
- SS—Speaker Socket
- SP—Speaker Plug

To align receiver—Short C9—apply 175 K.C. to grid of V2 and adjust L4 and adjust L4 with R1 fully on—remove short on C9—Tune in 1500 K.C. signal and adjust Trimmer on C9 to 11.5 on dial—adjust trimmers on C1 and C2.

LAFAYETTE RADIO MFG. CO.

MODEL S-L71
MODEL R71
Schematics

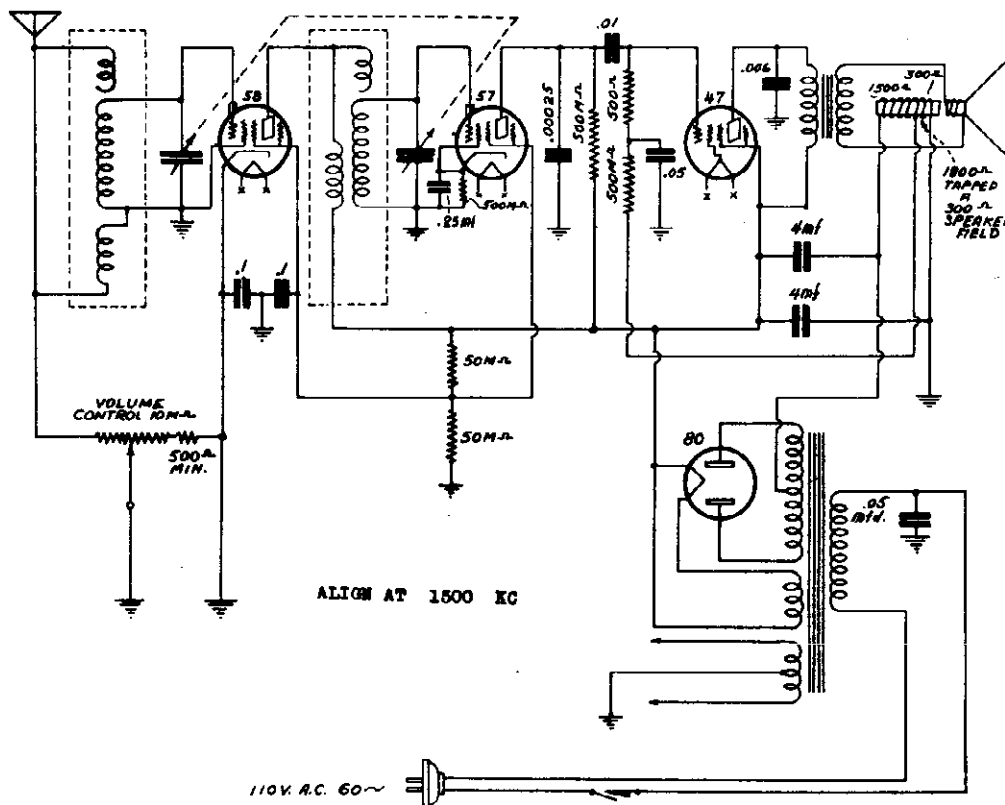


V1	78 TUBE	C6-11	10 mfd. COND'S	R6-8	1 Meg. RESISTOR
V2	6-F-7 TUBE	C7	.0005 mfd. COND. IN	R-9	700 ohm RESISTOR
V3	43 TUBE	C8-10	.01 mfd. COND'S ONE	L-1	ANTENNA COIL
V4	12-2-3 TUBE	C-13	12 mfd. COND. A BLOCK	L-2	R-F COIL
C-1	.005 mfd. COND.	C-14	8 mfd. COND. 2	CH1	3000 ohm SPEAKER FIELD
C2-3	365 mf. VAR. COND.	R-1	200 m ohm VOL. CONTROL	CHR	200 ohm CHOKE
C4-5	.05 mfd. COND.	R-2	250 ohms IN LINE COND.	T-1	SPEAKER TRANSFORMER
C5	.00005 mfd. COND.	R-3	2 Meg. RESISTOR	SW	SWITCH ON VOL. CONTROL
		R-4	5M ohm RESISTOR		

To Align the Receiver: Uncoil Antenna wire and adjust trimmers at any high frequency station preferably 1500 k.c.

TRUETEST MODEL S-L-71

Date	Sept 17 1935
Drawn by	W.R.
Printed	NOV 29 1935
Checked by	



Lafayette 4 TUBE TREASURE CHEST MODEL R-71

Date	Oct. 2, 1935
Drawn by	W.R.
Printed	
Checked by	

MODELS B97-98
 Socket, Trimmers
 Coils, Phono

LAFAYETTE RADIO MFG. CO.

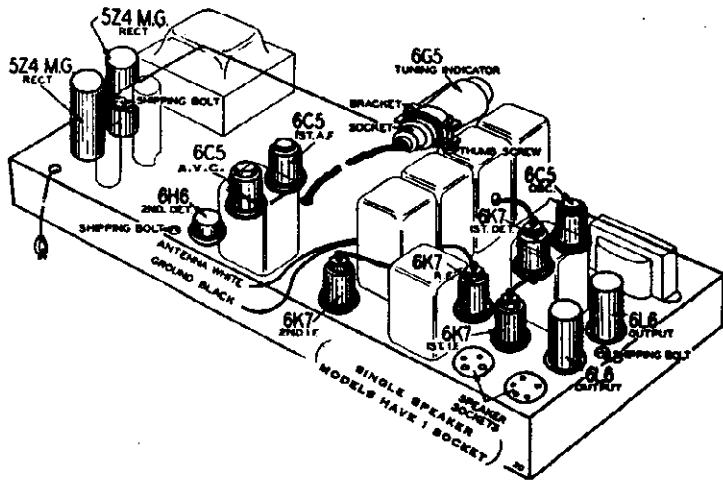


Fig. 5—Location of Tubes

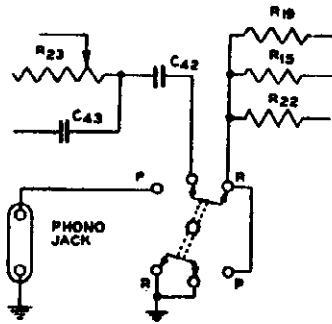


Fig. 7—Phonograph Connections

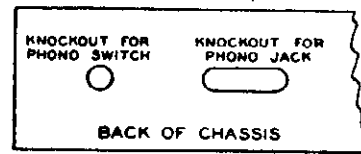


Fig. 8—Location of Phono Knockouts

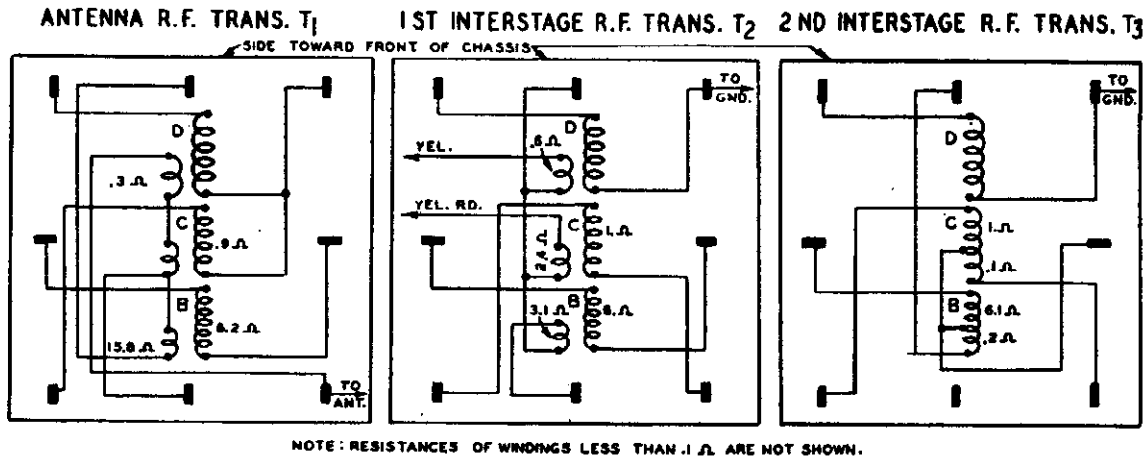


Fig. 6—R.F. and Oscillator Coil Base Terminal Arrangement and D.C. Resistance of Windings

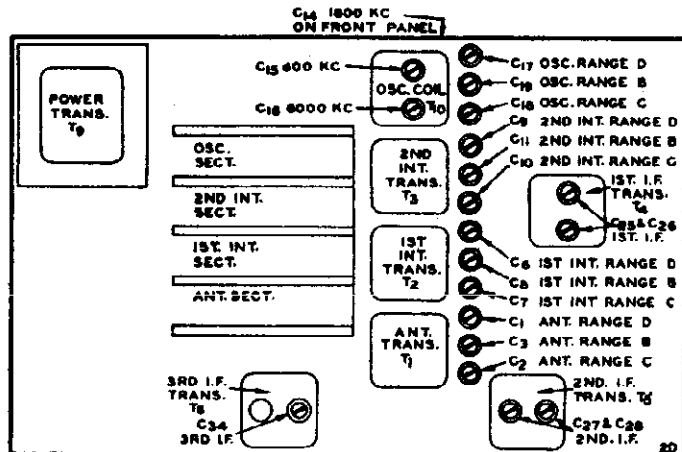
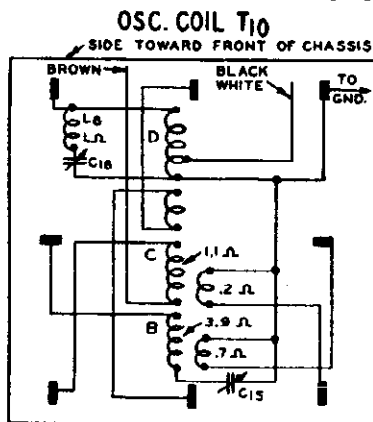
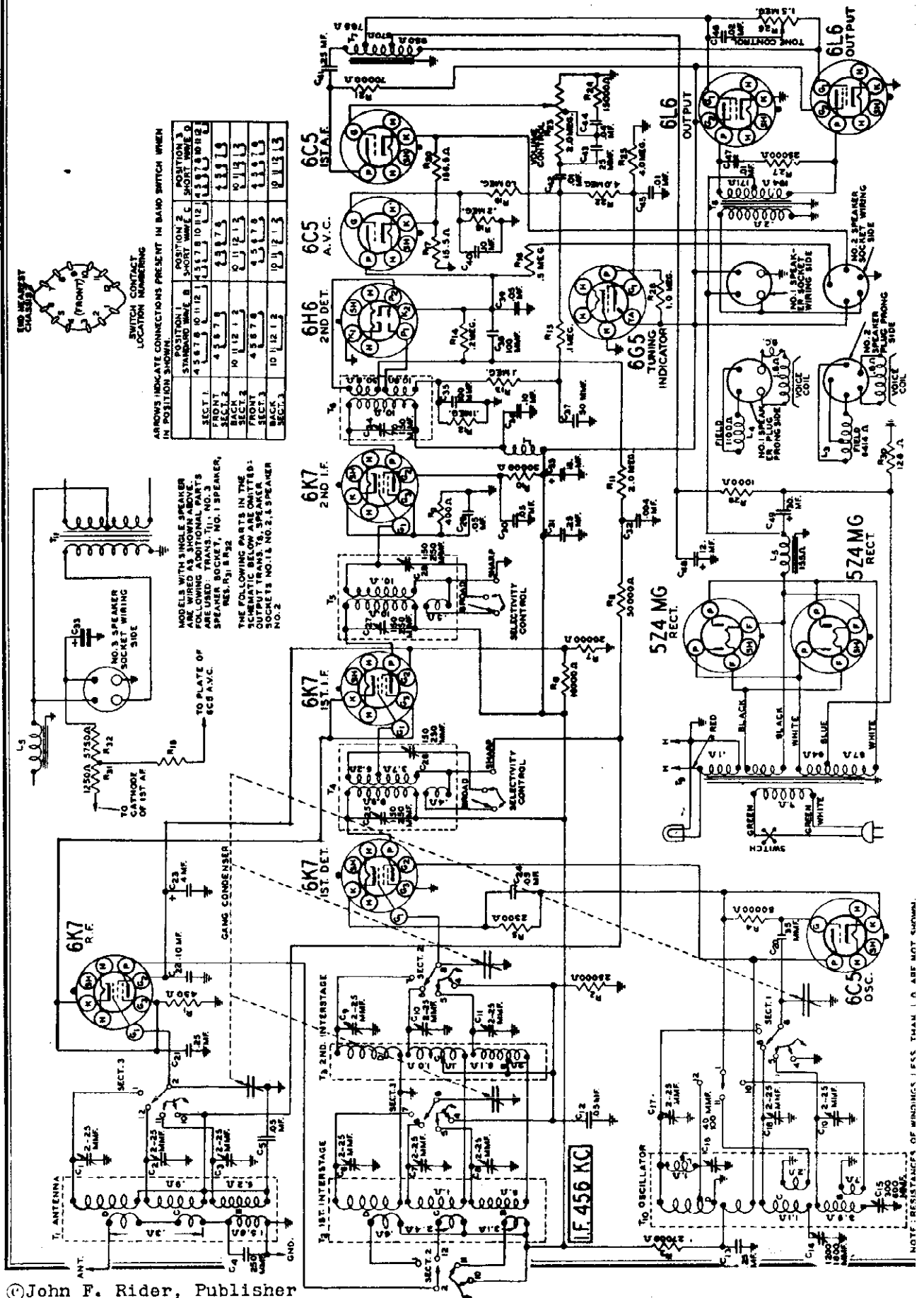


Fig. 3—Location of Trimmers

LAFAYETTE RADIO MFG. CO.

Schematic



MODELS B97-98
Alignment
Voltage
Notes

LAFAYETTE RADIO MFG. CO.

Phonograph Connections

Phonograph connections can be made as shown in Fig. 7. The parts required are shown in the parts list. Knockouts are provided in the back of the chassis for mounting the phono jack and phono switch—See Fig. 8.

The phono switch should be mounted with one set of terminals nearest the bottom of the chassis base.

The connections are made by opening the slide return circuit at the volume control. This is done by removing the wire connecting condenser C47 to the wiper R15, R19 and R22, at the terminal strip located near the back of the planetary drive. Cut this wire to correct length and solder it to the proper terminal on the phono switch—See Fig. 7, keeping the wire close to the back of the chassis base.

A wire is then connected from the lug on the above mentioned terminal strip to which C47 was connected, to the correct terminal on the phono switch—See Fig. 7. This wire should be brought directly to the back of the chassis at a point close to the phono jack pin tip nearest the channel provided for a chassis mounting bolt, and then routed over to the switch.

Completes the other connections as illustrated in Fig. 7.

It will be necessary to re-route the AC line cord away from the 6C5 1/2 audio grid lead by running it between the volume control and the filter choke and then straight back to the hose provided for it in the chassis base.

If a hum is heard when the phono pickup is touched, reverse the two pickup leads.

Twenty-five Cycle Models

The twenty-five cycle receiver differs from the sixty cycle receiver in the fact that a different antenna transformer is used. The correct power transformer is shown in the parts list.

The twenty-five cycle receiver can be operated satisfactorily from a sixty cycle power supply. However, the reverse is not true, the sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

A 115-230 volt, 40 to 60 cycle as well as other power transformers with special power ratings are also available for this model.

Do not change the setting of the oscillator Range D trimmer.

6000 KC Adjustment
Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Trimmer Replacement

If one trimmer of the gang trimmer strip should become defective, it is not necessary to replace the entire strip. A single trimmer P-17A16, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (side not grounded) of the defective trimmer in the strip. This connection is then made to the single trimmer. Connect it to the wiper of the trimmer not in contact with the adjusting screw. The other side of the single trimmer is then connected to a good ground, using a piece of heavy wire in order to prevent the trimmer adequately in replacing a trimmer. Be sure to keep both leads as short as possible and keep the ungrounded lead as far from ground as possible.

Planetary Drive Assembly

The planetary assembly is the unit that is integral with the tuning shaft.

If the nut on the back end of this assembly is too tight, the drive will be jerky and will turn hard in high speed. If this condition exists, back of this nut out, or two turns and note the effect.

If this nut is too loose, the drive will slip in slow speed. The remedy in this case, of course, is to tighten the nut.

Should the condenser drive cord slip when the planetary pulley is turning, inspect the tuning condenser, drive drum and gears to see if they are turning properly or if they are being obstructed in some way.

If the drive turns unevenly (rough in spots), this may mean that the planetary assembly is defective or damaged internally and a new unit will be required.

Range C Alignment

CAUTION—When aligning the short wave bands be sure NOT to adjust at the range frequency. This can be checked as follows: Let us say the signal generator is 6000 KC. The signal will then indicate 6000 KC on the dial of the radio. The image signal, which is weaker, will be heard at 1900 low 914 KC or 0383 KC. It may be necessary to increase the input signal to hear the image.

5000 KC Adjustment
Set the signal generator for 5000 KC.

Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range C position (first short wave band).

Adjust the oscillator Range C trimmer (C18) until maximum output is obtained. See Fig. 3 for location of this trimmer.

5000 KC Adjustment
Set the signal generator for 1000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st and 2nd intermediate Range C trimmer (C7 and C10) and antenna Range C trimmer (C5) to maximum.

Do not change the setting of the oscillator Range C trimmer.

1800 KC Adjustment
Set the signal generator for 1800 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 1800 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

18,300 KC Adjustment
Set the signal generator for 18,300 KC.

Keep the antenna lead of the receiver connected through the 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range D position (second short wave band).

Adjust the oscillator Range D trimmer (C17) until maximum output is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment
Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st and 2nd intermediate Range D trimmer (C8 and C9) and antenna Range D trimmer (C1) to maximum.

When adjusting the 2nd intermediate Range D trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

I. F. Adjustment

Set the signal generator for a signal of 416 KC. Connect the output of the signal generator through a 100 ohm resistor to the grid of the detector.

Connect the ground lead of the receiver to the ground point of the signal generator.

Turn the band switch to the Range B position (standard wave band).

Turn the selectivity control to the sharp position and keep it in this position for all adjustments.

Turn the volume control to the maximum position. Attenuate the signal from the signal generator to prevent the leveling of action of the AVC.

Then adjust the five I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis and the location is shown in Fig. 3.

Range B Alignment

After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

1730 KC Adjustment
Set the signal generator for 1730 KC.

Turn the rotor of the tuning condenser to the full open position.

Keep the band switch in the standard wave position.

Connect the antenna lead of the receiver through a 200 ohm resistor to the output of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the oscillator Range B trimmer (C19) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

1500 KC Adjustment
Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

In test using pointer, loosen the screw of the large pointer and set the pointer at the 1500 KC mark on the standard wave band scale. Realign the screw.

In sets using the moving beam of light, there is a drum by means of a screw. Loosen the screw and move the light assembly until it is at the 1500 KC mark on the dial. Realign the screw.

Adjust the 1st and 2nd intermediate Range B trimmer (C3 and C11), and antenna Range B trimmer (C2) to maximum.

Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment
Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

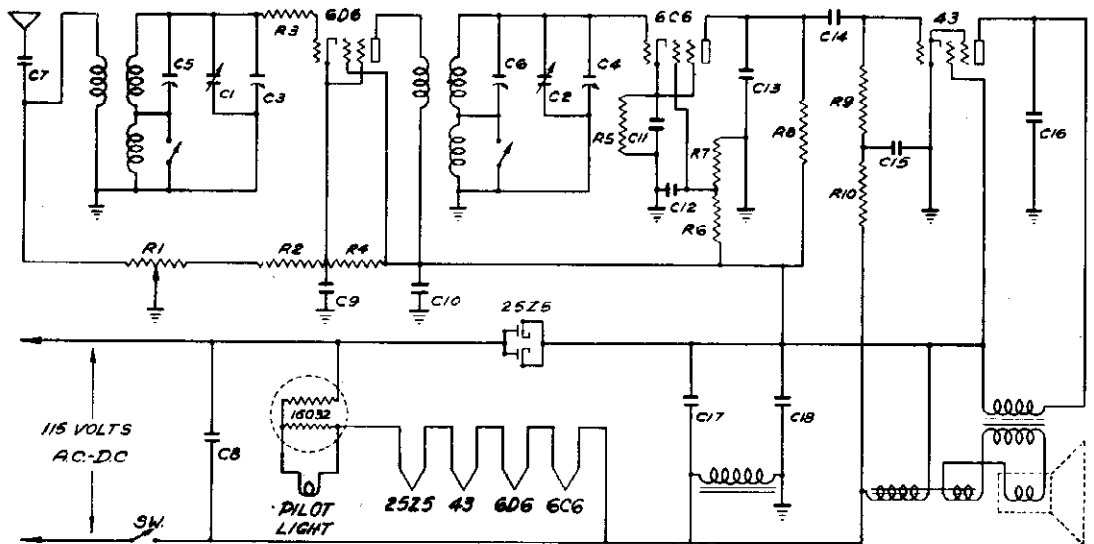
Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

LINE VOLTAGE 115 Voltage Control: Maximum	POSITION OF BAND SWITCH (Standard Wave)										Antenna Mounted to Ground	
	Power No. 1	Power No. 2	Power No. 3	Power No. 4	Power No. 5	Power No. 6	Power No. 7	Power No. 8	Power No. 9	Power No. 10		
7000												
487	0	0	0	0	0	0	0	0	0	0	0	0
487	1st Bk.	0	0	0	0	0	0	0	0	0	0	0
628	0m.	0	0	0	0	0	0	0	0	0	0	0
487	1st L.A.	0	0	0	0	0	0	0	0	0	0	0
487	2nd L.A.	0	0	0	0	0	0	0	0	0	0	0
487	2nd Bk.	0	0	0	0	0	0	0	0	0	0	0
628	A.V.C.	0	0	0	0	0	0	0	0	0	0	0
628	1st A.S.	0	0	0	0	0	0	0	0	0	0	0
487	Power	0	0	0	0	0	0	0	0	0	0	0
628	Indicator	0	0	0	0	0	0	0	0	0	0	0
488	Tuning Indicator	0	0	0	0	0	0	0	0	0	0	0

(1) AC voltage at load across heater terminals 2 and 4.
(2) AC voltage at load across heater terminals 2 and 4.
(3) AC voltage at load across terminals 4 and 2.
(4) AC voltage at load across terminals 4 and 2.

MAJESTIC RADIO & TELEV. CO.

MODEL 50
Schematic, Socket
Trimmers, Voltage
Alignment, Part



ALIGNMENT PROCEDURE—Correct alignment is of extreme importance. Your receiver is properly aligned at the factory and realignment should not be attempted by the service technician until all other causes of faulty operation are corrected.

In order to properly realign the receiver, the following equipment is necessary.

1. A signal generator which will provide an accurately calibrated signal at any frequency from 540 to 4000 kilocycles. The generator should have a modulated and adjustable signal output.
2. An output audio voltmeter to be connected across the moving coil of the speaker. This meter should be capable of providing a readable deflection for output levels of 1/2 volt, to avoid the effects of overload.
3. One screw driver; one .25 Mfd. 600 volt condenser; one 100 Mmf. mica condenser.

BROADCAST BAND 540 TO 1550 KILOCYCLES

1. Connect output meter across loud speaker voice coil.
2. Connect ground or low potential terminal of signal generator to receiver chassis through a .25 Mfd. 600 volt condenser.
3. Connect antenna or high potential terminal of signal generator through a 100 Mmf. mica condenser to antenna lead from the receiver.
4. Adjust signal generator to 1400 kilocycles and 5000 microvolts output.
5. Adjust receiver range indicator to broadcast or "B" band and pointer to 1400 kilocycles.
6. Adjust trimmers C3 and C4 until maximum output is obtained and reduce volume level with volume control to approximately 0.5 volt. Repeat until C3 and C4 cannot be adjusted to give greater output.
7. Turn volume control to clockwise or most sensitive position; reduce output from signal generator; retune receiver and check sensitivity.
8. Check sensitivity at 1000 kilocycles and 550 kilocycles.

POLICE BAND 1550 to 4000 KILOCYCLES

1. Adjust signal generator to 4000 kilocycles.
2. Adjust receiver range indicator to police or "P" band and pointer to 4000 kilocycles.
3. Turn receiver volume control to maximum or extreme clockwise position, and increase signal generator output until a signal is heard.
4. Adjust trimmers C5 and C6 until maximum output is obtained and reduce output from signal generator until receiver output is approximately 0.5 volt. Repeat until C5 and C6 cannot be adjusted to give greater output.
5. Check sensitivity at 2400 kilocycles and 1600 kilocycles.
6. Sensitivity at 1600 kilocycles may be adjusted by moving position of lead from wave switch to chassis.

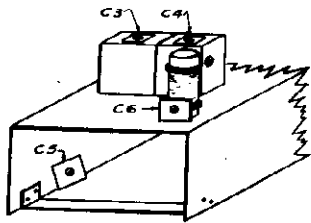


Fig. 2 Location of Trimmers

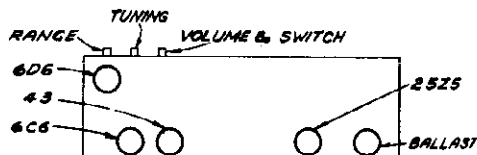


Fig. 1 Tuning Controls and Tube Position

Schematic Location	Part No.	Description
C1 C2	B-16986	Condenser Variable Gang
C3 C4		Condenser Trimmers, part of Variable Gang
C5 C6	A17003	Condenser Trimmer 3-25 Mmf. bakelite base
C7	15767	Condenser Tubular .001 Mfd. 400 volts
C8	15767	Condenser Tubular .1 Mfd. 400 volts
C9 C12	15752	Condenser Tubular .05 Mfd. 200 volts
C10	15757	Condenser Tubular .1 Mfd. 400 volts
C11	15751	Condenser Tubular .25 Mfd. 200 volts
C13	15929	Condenser Mica 250 Mmf. —20% type O
C14 C16	15754	Condenser Tubular .01 Mfd. 400 volt-
C15	15775	Condenser Tubular .5 Mfd. 200 volts
C17	B-16973	Condenser Wet Electrolytic 30 Mfd. 150 volts
C18	B-17042	Condenser Wet Electrolytic 25 Mfd. 150 volts
R1	B-16970	Control volume and line switch 50,000 ohms
R2	15569	Resistor Carbon 300 + -20% 1/4 watt
R3	15570	Resistor Carbon 2,000 + -20% 1/4 watt
R4	15515	Resistor Carbon 100,000 + -20% 1/4 watt
R5	15531	Resistor Carbon 10,000 + -20% 1/4 watt
R6	15568	Resistor Carbon 35,000 + -10% 1/4 watt
R7	15567	Resistor Carbon 15,000 + -10% 1/4 watt
R8	15512	Resistor Carbon 250,000 + -20% 1/4 watt
R9	15528	Resistor Carbon 400,000 + -20% 1/4 watt
R10	15515	Resistor Carbon 100,000 + -20% 1/4 watt
	15089	Bulb Pilot Light, Mazda No. 44
	16032	Ballast Tube
	B-16969	Ballast Tube Socket
	17057	Antenna Coil Assembly
	17058	Interstage Coil Assembly
	16934	Antenna Hank
	A-16971	Wave Switch
	C-16972	Filter Choke
	C-16985	Speaker
	B-16471	Line Cord
	A-17020	Spring, part of Dial Drive Assembly
	6001	String, Dial Drive
	A-16983	Socket, Pilot Light
	A-16997	Dial Glass
	A-17040	Dial Pointer
	A-17027	Wood Spacer, Dial Assembly
	A-17002	Purple Dial Backing
	A-2100	Fibre Washer, Dial Assembly
	1145	Dial Pointer Screw
	A-16988	Fish Paper Insulation, Electrolytic Condenser
	A-1954	Knob (volume, band switch and tune)
	A-17137	Washer, Felt (small)
		Escutecheon

VOLTAGE CHART						
Position	Tube	Ef	Ek	Eg Screen	Ep Suppressor	Ep Pentode
R. F. Amplifier	6D6	6.3	3.2	103	3.2	103
Detector	6C6	6.3	1.8	28	1.8	35
Power Output	43	25	Note "A"	103	Note "D"	Note "C"
Rectifier	25Z5	25	Note "A"			96
Ballast	16032	Note "B"				103

All above voltages to chassis with 115 volt 60 cycle line. Cathode, screen, suppressor and pentode voltages when operating from 115 volt d.c. line will be 10 percent lower.
 Note "A"—Output pentode bias should be measured across filter choke at 14 volts.
 Note "B"—Pins 3 to 7 should measure 50 volts a.c.
 Note "C"—Measured with 250,000 ohm voltmeter.
 Note "D"—Measured with 25,000 ohm voltmeter.

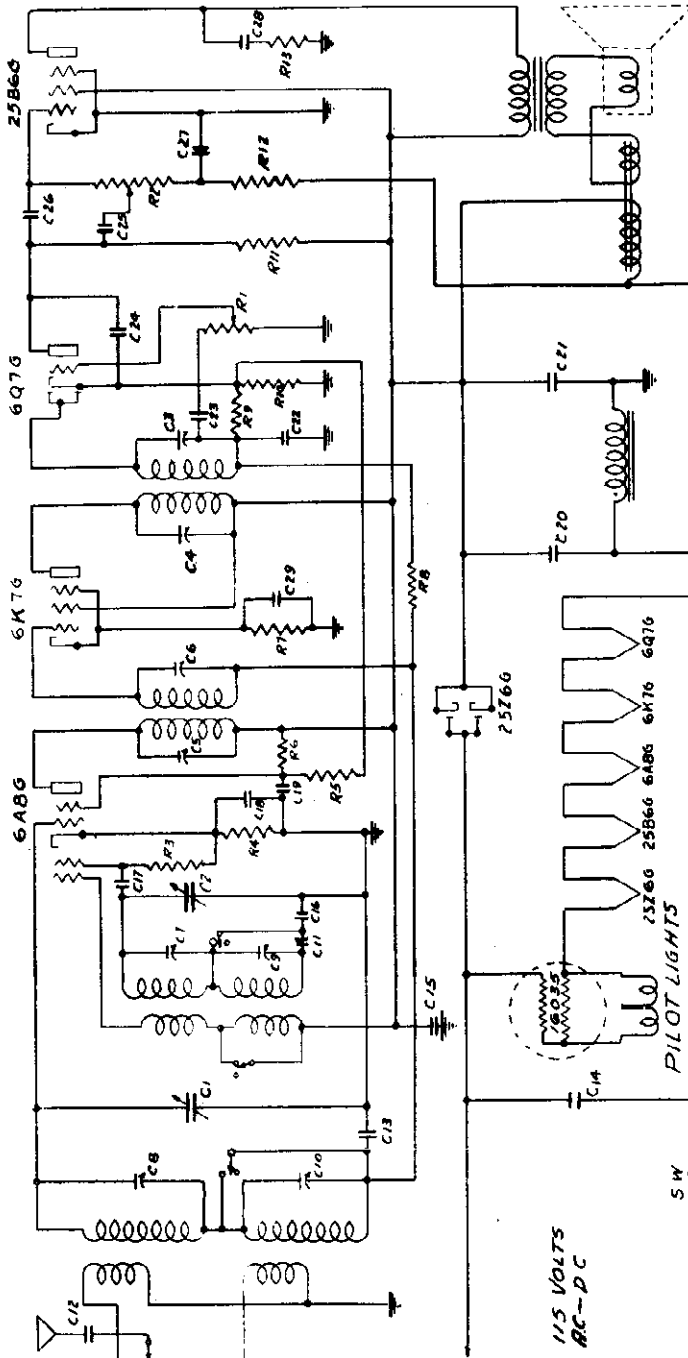
MODEL 60

Schematic, Voltage Parts

MAJESTIC RADIO & TELEV. CO.

VOLTAGE CHART					
TUBE	FUNCTION	Ef	Ep	E SCREEN	E BIAS
6A8G	Converter	6	106	53	2.3†
6K7G	I. F. Amplifier	6	106	106	4.6†
6Q7G	Detector and 1st audio amplifier	6	53*		1.1
25B6G	Power Output Tube	25	99	106	
25Z6G	Rectifier	25			
Ballast	Voltage Equalizer	45			

Line voltage—115 volts A.C.
 B supply voltage, B+ to chassis (ground)—106 volts.
 B supply voltage, B+ to B- (line)—121 volts.
 Voltage across filter choke (in negative lead) chassis ground to B—16.5 volts Note this is the bias voltage for the 25B6G output tube.
 * This reading taken with 1000 ohm voltmeter on 250 volt scale. True plate voltage is nearer 60 volts.
 † Deduct the bias voltage of the 6Q7G from these values for the net bias.
 Voltage across pilot lights approximately 4.8 volts each.
 These voltages will be about 10% lower for 115 volts D.C. power supply.



- 15520 Resistor Carbon 500,000 ohms
- 15537 Resistor Carbon 400 ohms
- 15504 Resistor Carbon 150,000 ohms
- 15512 Resistor Carbon 250,000 ohms
- 15577 Resistor Carbon 7,500 ohms
- 15088 Pilot Light Bulb Mazda No. 44
- A-17095 Pilot Light Socket bayonet base
- A-17020 Dial Drive Belt
- A-17138 Dial Drive Belt Spring
- B-17098 Dial Backing
- 17009 Dial Glass
- 17142 Complete Dial and Drive Assembly
- 17143 Antenna Transformer Assembly
- 17144 Oscillator Transformer Assembly
- B-17007-2 1st I. F. transformer Assembly
- 16994 2nd I. F. transformer Assembly
- A-17013 Antenna Hank
- C-17008-3 Wave Change Switch
- C-17001 Filter Choke
- B-16471 Speaker
- 16988 Fish Paper Insulation for Electrolytic Condenser
- A-16598 Knob (Vol. Control, Tuning, Tone Control and Band Switch)
- A-1984 Knob Washers (felt)
- 17382 Escutcheon with indicator lens
- 16036 Ballast Tube

- REPLACEMENTS PARTS LIST IF PEAK 456KC**
- Please Specify Receiver Serial No. When Ordering Parts.
- | Schematic Location | Part No. | Description |
|--------------------|-----------|---|
| C1 | C-17004 | Condenser Variable Gang |
| C2 | A-16472 | Condenser Variable Padder |
| C12 | 15759 | Condenser Tubular .005 Mfd. 600 volt |
| C25 | 15761 | Condenser Tubular .1 Mfd. 200 volt |
| C15 | 15757 | Condenser Tubular .1 Mfd. 400 volt |
| C14 | 15942 | Condenser Mica Padder 1710 Mmfd. 5% |
| C16 | 15929 | Condenser Mica 50 Mmfd. 20% |
| C17 | 15752 | Condenser Tubular .05 Mfd 200 volt |
| C18 | C29 | Condenser Electrolytic 40 Mfd. 150 volt 1 1/2" can |
| C20 | B-17041-3 | Condenser Electrolytic 40 Mfd. 150 volt 1 1/2" can |
| C21 | 157197 | Condenser Mica 250 Mmfd. (located inside 2nd I. F. can) |
| C22 | 15760 | Condenser Tubular .02 Mfd. 400 volt |
| C23 | C26 | Condenser Mica 250 Mmfd. 20% |
| C24 | 15928 | Condenser Mica 250 Mmfd. 200 volt |
| C27 | 15776 | Condenser Tubular .6 Mfd. 200 volt |
| C28 | 15764 | Condenser Tubular .03 Mfd. 400 volt |
| R1 | B-17010 | Volume control 1,000,000 ohms |
| R2 | B-17047 | Tone control 300,000 with on-off line switch |
| R3 | 15511 | Resistor Carbon 50,000 ohms 1/4 watt +-20% |
| R4 | 15571 | Resistor Carbon 500 ohms 1/4 watt +-10% |
| R5 | 15557 | Resistor Carbon 20,000 ohms 1/4 watt +-10% |
| R6 | 15575 | Resistor Carbon 12,500 ohms 1/4 watt +-10% |
| R7 | 15519 | Resistor Carbon 700 ohms 1/4 watt +-10% |
| R8 | 15517 | Resistor Carbon 1,000,000 ohms 1/4 watt +-20% |

MAJESTIC RADIO & TELEV. CO.

MODEL 60
MODEL 620
Socket
Trimmers
Alignment

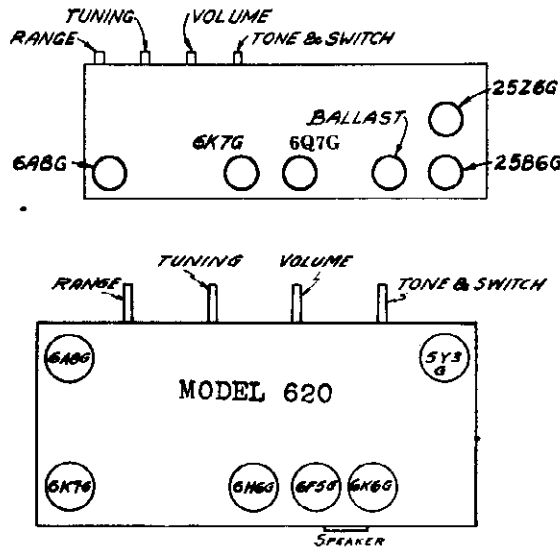
POWER LINE VOLTAGE

The model 620 is designed to operate on 110-115 volts, 50-60 cycles a.c. Serious damage may result if the set is connected to a power supply other than that shown above.

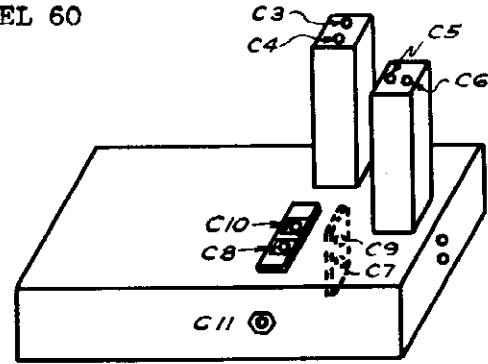
POWER LINE VOLTAGE—The model 60 is designed to operate on 105 to 125 volts, 50-60 cycles a.c. or d.c. Serious damage may result if the set is connected to a power supply other than that shown above. If there is any doubt in your mind, do not plug the set in until you first determine the voltage and cycles from your power supply company.

IF THE RECEIVER IS CONNECTED TO A D.C. SUPPLY FOR TWO MINUTES AND NO SIGNAL IS HEARD, REVERSE THE LINE PLUG.

DIAL LIGHTS—There are two No. 44 Mazda bayonet base dial lights in your receiver. It is not considered advisable to operate the receiver when either of the dial lights are defective as this may injure the ballast tube.



MODEL 60



MODEL 620

In order to properly realign the receiver, the following equipment is necessary.

1. A signal generator which will provide an accurately calibrated signal at any frequency from 400 to 7500 kilocycles. The generator should have a modulated and adjustable signal output.
2. An output audio voltmeter to be connected across the moving coil of the speaker. This meter should be of providing a readable deflection for output levels of 1/2 volt, to avoid the effects of overload.
3. One screw driver; one .25 Mfd. 600 volts condenser; one 200 Mmfd. mica condenser and one 400 ohm resistor.

I. F. SYSTEM

Apply 456 k.c. signal to the grid of 6A8G tube through a tubular condenser on the order of 1 Mfd. Make certain that the wave change switch is in the broadcast position fully counter-clockwise. Turn variable condenser until it is engaged completely.

Referring to figure two which is the trimming diagram: adjust the I. F. capacities in the following order for maximum signal; C6, C5, C3, and C4. Of course to begin with, a very strong signal may be necessary on the input to "find" the preliminary adjustments. As alignment is approached, it is advisable to reduce the generator signal to minimum satisfactory value to prevent the possibility of misalignment due to A.V.C. action. When the I. F. system has been adjusted, it will be found highly advisable to make all adjustments approach the resonance condition by starting at too high a capacity on the trimmer and working to a smaller value to give maximum output. In other words, having all trimmers down tight, unscrew them and bring the adjustment to a point of resonance. This should be done twice with C4. The general idea being to adjust C4 until the capacity has passed through resonance and has become too small. This is merely to indicate the maximum reading position. Return the capacity to an excess value again and gradually reduce it until it reaches its maximum tuning point.

SHORT WAVE BAND

In all cases the ground side of the generator should be connected to the ground on the chassis of the receiver through a .1 Mfd. or larger tubular paper condenser. Apply a 7.2 m.c. signal through a 400 ohm resistance dummy antenna to the terminal strip where the antenna hank connects. Turn the wave change switch in the clockwise direction. Turn the variable condenser until it is completely disengaged. Unscrew trimmer C7 to a minimum capacity. Slowly turn the screw so that trimmer capacity increases until the signal is heard. Adjust C8 until the response is maximum. It may be necessary here to "rock" the variable condenser slightly with the adjustment of C8. The short wave antenna circuit range is now set. Adjust variable condenser until the dial indicator points to 6 m.c. Turn trimmer C7 until signal comes in and reaches maximum. This means that the two circuits are absolutely aligned at this point. Inasmuch as a fixed padder is utilized and comes accurately matched, the two circuits should remain correctly aligned over entire band. It is considered advisable to check this at 4.25 m.c. and 2.4 m.c. These are the three tracking frequencies.

BROADCAST BAND

Shift wave change switch to broadcast position. Replace the 400 ohm dummy antenna with a 200 Mmfd. mica condenser. Apply signal to same input. (Caution—Applying the signal from the generator to the set through the antenna hank may cause serious misalignment.) Apply a 600 k.c. signal. Rotate variable condenser until dial scale pointer indicates 600 k.c. Adjust padder screw C11 until signal is approximately maximum. Disengage variable condenser. Apply 1750 k.c. signal. Turn trimmer C9 to max. sig. Adjust trimmer C10 for max sig. Turn variable condenser until dial indicator reads 1500 k.c. Adjust C9 until signal is maximum at this point. Shift variable condenser to 600 k.c. Apply this frequency on the generator. Note the direction in which this frequency has shifted on the dial scale. Accordingly this will determine whether C11 should be increased or decreased to effect a meeting of the oscillator circuit with the antenna circuit by the usual "rocking" process. Return again to 1500 k.c. on both generator and dial scale of the receiver; if necessary make a slight adjustment of C9 until signal is maximum at this point.

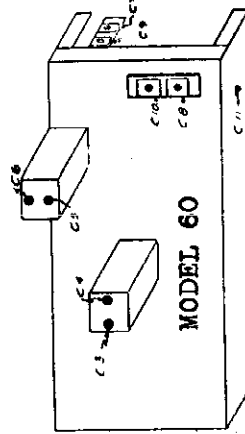


Fig. 2 Location of Trimmers

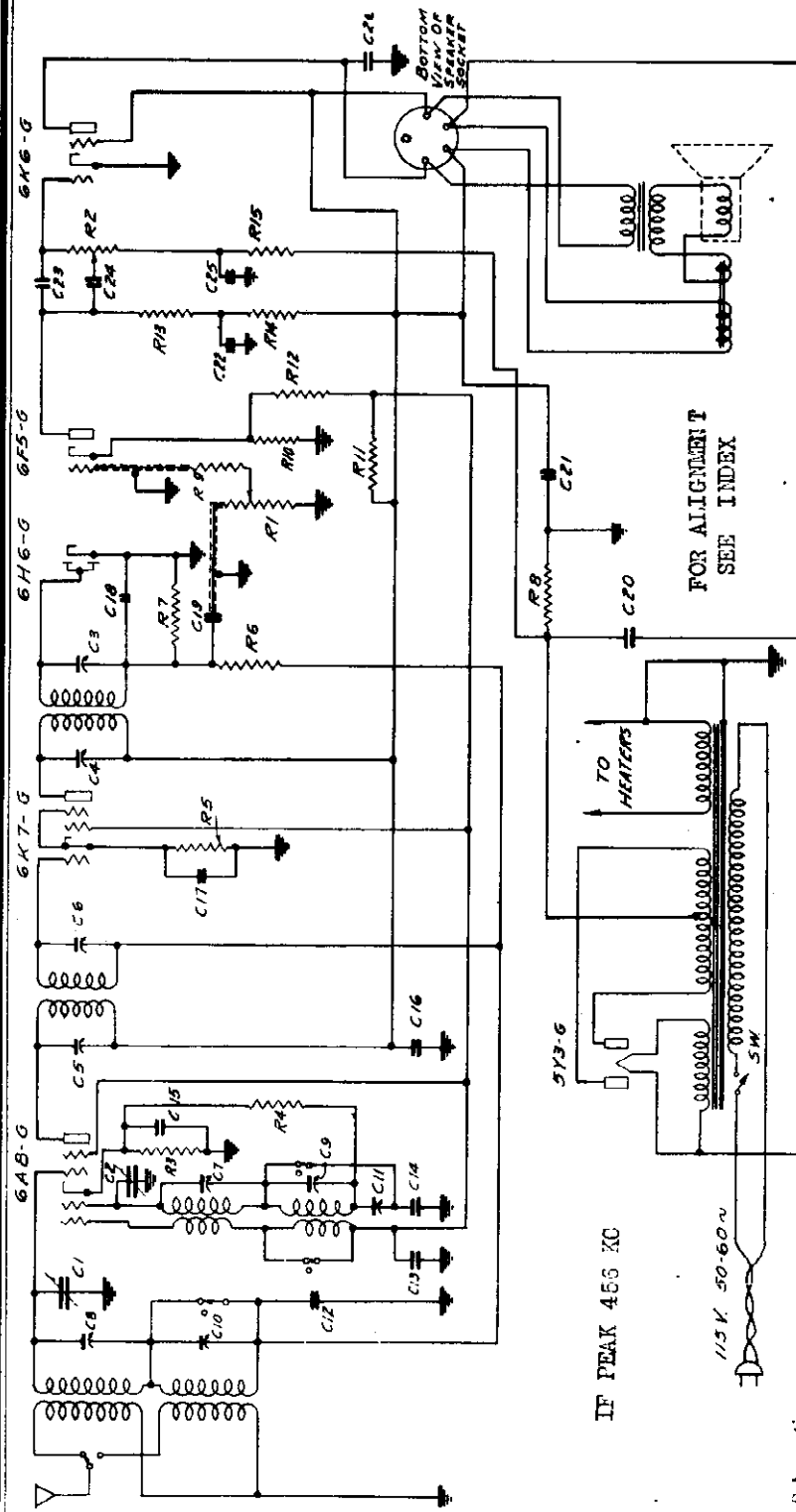
MODEL 620
Schematic, Voltage
Parts

MAJESTIC RADIO & TELEV. CO.

VOLTAGE CHART

TUBE	FUNCTION	Ef	Ep	E SCREEN	E BIAS	E OSC. PLATE
6A8G	Converter	6.3	210	115	4.7	115
6K7G	I. F. Amplifier	6.3	210	115	3.8	
6H6G	Detector—AVC	6.3				
6F5G	Audio Amplifier	6.3	125*		1.5	
6K6G	Power Output	6.3	200	210	14.5	
5Y3G	Rectifier	5.0				

Line voltage—115 volts—60 cycle AC.
All d. c. voltages measured to chassis.
* Measured with 250,000 ohm voltmeter.
Volts across speaker field—100 d. c.



Schematic Location	Part No.	Description
C1	15089	Bulb Pilot Light (Edgelight)
C2	C-17004	Condenser Variable Gang
C11	A-16472	Condenser Variable Padder
C8	A-17589	Condenser Trimmer (antenna coil)
C7	A-17590	Condenser Trimmer (oscillator coil)
C5	B-17560	Condenser 1st I. F. Trimmer (part of I. F. assembly)
C3	B-17561	Condenser 2nd I. F. Trimmer (part of I. F. assembly)
C15	15752	Condenser Tubular .05 Mfd. 400 V.
C13	15756	Condenser Tubular .05 Mfd. 400 V.
C16	15757	Condenser Tubular .1 Mfd. 400 V.
C12	15761	Condenser Tubular .1 Mfd. 200 V.
C24	15755	Condenser Tubular .005 Mfd. 600 V.
C19	15761	Condenser Tubular .02 Mfd. 400 V.
C26	15771	Condenser Tubular .004 Mfd. 600 V.
C14	15942	Condenser Mica 1710 Mmfd. 5 1/2 type W
C20	B-16469	Condenser Wet Electrolytic 16 Mfd. 350 volts
C21	B-16467-2	Condenser Wet Electrolytic 8 Mfd. 250 volts
R1	B-17010	Control Volume 1,000,000 ohms
R2	B-17047	Control Tone 300,000 ohms
R4	15511	Resistor Carbon 50,000 + -20% 1/2 watt
R9	15515	Resistor Carbon 100,000 + -20% 1/2 watt
R6	15517	Resistor Carbon 1 meg. + -20% 1/2 watt
R7	15523	Resistor Carbon 500,000 + -20% 1/2 watt
R15	15523	Resistor Carbon 200,000 + -20% 1/2 watt
R5	15571	Resistor Carbon 500 + -10% 1/2 watt
R8	15684	Resistor Carbon 250 + -10% 1 watt
R12	15586	Resistor Carbon 15,000 + -10% 1 watt
R11	15587	Resistor Carbon 5,000 + -10% 2 watt
R3	15688	Resistor Carbon 350 + -10% 1/2 watt
R10	15689	Resistor Carbon 220 + -10% 1/2 watt
	A-16829	Socket Speaker
	A-17562	Socket Pilot Light
	A-17095	Dial Drive Belt
	A-17606	Dial Backing
	B-17691	Dial Glass
	17597	Complete Dial and Drive Assembly
	17583	Antenna Coil Assembly
	17584	Oscillator Coil Assembly
	17567	1st I. F. Transformer Assembly
	B-17561	2nd I. F. Transformer Assembly
	A-17013	Wave Change Switch
	C-17580	Speaker 8"
	B-16471	Attachment Cord
	A-16598	Knob
	A-1954	Washer Felt
	17382	Escutcheon with Indicator Lens
	C-16575-6	Transformer Power 110 volts 50-60 cycle

MAJESTIC RADIO & TELEV. CO.

MODELS 65, 66, 65
 MODELS 75, 76, 75
 MODELS 85, 86, 85
 Trimmers, Voltage
 Alignment

VOLTAGE CHART							
POSITION	TUBE	E _f	E _k	E _g SCREEN	E _g SUPPRESSOR	E _p TRIODE	E _p PENTODE
Converter	6 A8-G	6.3	3.0	90.0		150.0	220.0
I. F. Amplifier	6 K7-G	6.3	3.0	90.0	Connected to gr'd.		220.0
Detector—AVC	6 Q7-G	6.3	2.0			195.0	
Power Output	6 K6-G	6.3	16.0	220.0	Connected to Cathode in Tube		208.0
Rectifier	5 Y3	5.0					

MODELS 65 - 66 - 650

VOLTAGE CHART							
POSITION	TUBE	E _f	E _k	E _g SCREEN	E _g SUPPRESSOR	E _p TRIODE	E _p PENTODE
Oscillator	6 C6C	6.3				160.0	
Converter	6 L7G	6.3	3.0	90.0			230.0
I. F. Amplifier	6 K7G	6.3	3.0	90.0			230.0
Detector—AVC	6 Q7G	6.3	2.0			110.0	
Power Output	6 F6G	6.3	14.5	230.0			215.0
Rectifier	5 Y3	5.0					

MODELS 75-76-750

VOLTAGE CHART							
POSITION	TUBE	E _f	E _k	E _g SCREEN	E _g SUPPRESSOR	E _p TRIODE	E _p PENTODE
Converter	6 A8-G	6.3	3.0	110.0			225.0
I. F. Amplifier	6 K7-G	6.3	3.0	110.0			230.0
Detector—AVC	6 Q7-G	6.3	2.0			95.0	
Phase Inverter	6 C5C	6.3	7.0			150.0	
Power Output	6 F6G	6.3	14.0	230.0			225
Rectifier	6 Y3	5.0	14.0	230.0			225

MODELS 85-86-850

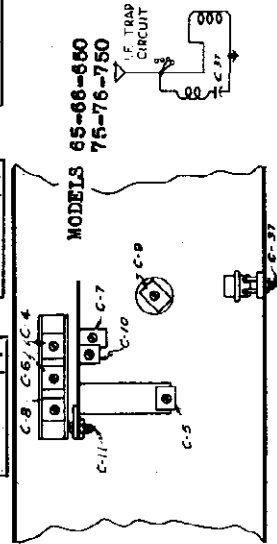


Fig. 2 Location of Trimmers

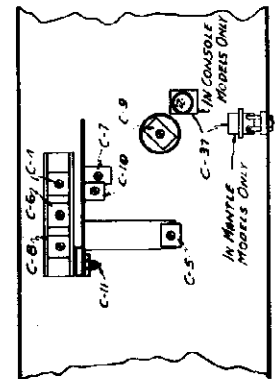


Fig. 2 Location of Trimmers

MODELS 65-66-650; 75-76-750; 85-86-850

ALIGNMENT PROCEDURE

Correct alignment is of extreme importance in all wave receivers. The receivers are properly aligned at the factory with precision equipment and realignment should not be attempted by the service technician until all other causes of faulty operation are corrected. In order to properly realign the receiver the following equipment is necessary:

1. A signal generator which will provide an accurately calibrated signal at any frequency from 456 kilocycles to 18 megacycles. The generator should have adjustable signal output.
2. An output audio voltmeter of the low voltage type to be connected across the moving coil of the speaker. This should be capable of providing a readable deflection for relatively low output levels to avoid the effects of overload.
3. An insulated or non-metallic screw driver for the adjustment of trimmers.

I F ALIGNMENT 456 KC

1. Connect the output meter (low scale) across the loud speaker voice coil. Turn the wave band switch to broadcast position. Turn the volume control to its maximum position.
2. Connect the test oscillator ground to chassis and the "hot" lead from the test oscillator to the grid of the converter tube through a series .1 Mfd condenser. Set test oscillator to 456 KC.

Models 85 and 86 have a two point selectivity or high fidelity control associated with the tone control. This adjustment should be set for highest selectivity during alignment. Highest selectivity is obtained when the switch at the end of the tone control action is in its left or counterclockwise position.

3. Model 850 has this same control as a separate adjustment (second knob from the left). This adjustment should also be in its left hand or counterclockwise position during alignment.
4. Adjust I. F. alignment screws of second I. F. transformer adjacent to power tube to maximum output, reducing output of test oscillator to keep the meter reading on scale as alignment proceeds.
5. Adjust alignment of first I. F. transformer (directly behind tuning condenser) to maximum output as described above.

6. Readjust these trimmers for accurate alignment. Always use the lowest possible output from the test oscillator to preclude the possibility of automatic volume control action confusing proper adjustment.

6. Connect "hot" lead of test oscillator to receiver antenna lead in series with 200 Mmfd. condenser, and tune receiver to 550 kilocycles.
7. Adjust C-37 for minimum receiver output.

NOTE: Since coils are used in series it is absolutely necessary to align the high frequency bands first, in the order indicated.

FOREIGN BAND 5.7 TO 18.5 MEGACYCLES

1. With test oscillator connected to the antenna

and ground terminals through a 400 ohm resistor set oscillator at 16 megacycles.

2. Set the dial scale to 16 megacycles and adjust the oscillator trimmer condenser (C 4) to a resonance using the counterclockwise or low capacity point.
3. Adjust input circuit trimmer (C 5) to maximum response, rocking the gang condenser back and forth a degree or two to obtain proper maximum.

POLICE OR MIDDLE BAND 1.75 TO 5.8 MEGACYCLES

1. With the test oscillator connected as above set the oscillator and dial to 5.5 megacycles.
2. Adjust oscillator trimmer condenser (C 6) for maximum response using the counterclockwise or low capacity point.
3. Adjust input circuit trimmer (C 7) to maximum response rocking the gang condenser as described above.

BROADCAST BAND 535 TO 1800 KC

1. With test oscillator connected to antenna and ground through a 200Mmfd. condenser set oscillator and receiver dial to 1600 kilocycles.
2. Adjust broadcast oscillator trimmer (C 8) to obtain maximum response.
3. Adjust antenna circuit trimmer (C 9) for maximum output.
4. Adjust presselector trimmer (C 10) for maximum output.

5. Set test oscillator and dial to 600 kilocycles and tune in the signal, then adjust broadcast band padding condenser (C 11) for maximum output. This paddler is mounted on the aluminum coil deck near the panel and is adjusted through a hole provided in the back of the chassis pan. Rock the condenser back and forth a degree or two in order to obtain proper maximum.

6. Repeat the 1600 KC adjustments described above for greater accuracy.

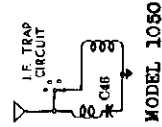
MODELS 65, 66, 650
 MODELS 75, 76, 750
 MODELS 85, 86, 850
 Socket Layouts

MAJESTIC RADIO & TELEV. CO.

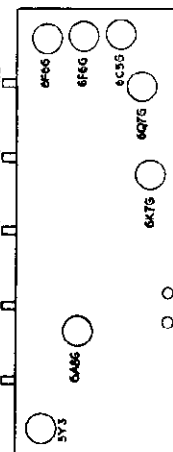
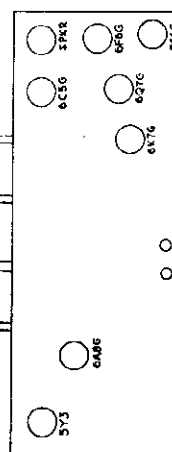
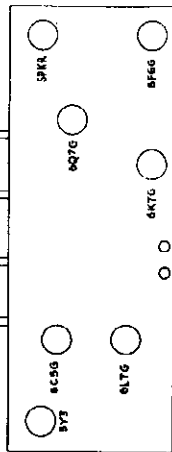
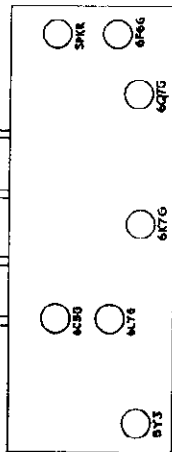
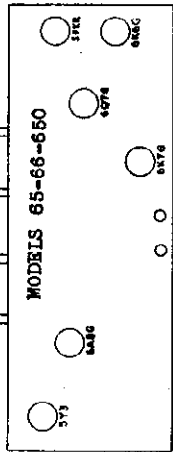
MODEL 1050
 Socket, Trimmers
 Voltage, Alignment

VOLTAGE CHART							
Position	Tube	Ef	Ek	Eg Screen	Eg Suppressor	Ip Triode	Ep Pentode
R. F. Amplifier	6 K7G	4.3	4	90.0	Connected to Cathode		235
Converter	6 L7G	6.3	4	90.0	Connected to Cathode		235
Oscillator	6 C6G	6.3				110	
I. F. Amplifier	6 K7G	6.3	4	90.0	Connected to Cathode		235
Detector A.V.C.	6 Q7G	6.3	1.1			105	212
Driver	6 P6G	6.3		connected to plate	Connected to Cathode in tube		
Power Output	6 P6G	6.3		235	Connected to Cathode in tube		335
Power Output	6 P6G	6.3		235	Connected to Cathode in tube		335
Rectifier	5 Z8	5.0	340				

MODEL 1050



MODEL 1050



MODEL 850

7. Repeat adjustments described under 3, 4, and 5 for greater accuracy.

POLICE OR SECOND BAND

1. Turn the wave switch to second or police band. Leave oscillator connected as above but with the output set to 5000 KC and the .00025 Mfd. condenser replaced by a 400 ohm resistor. Set dial scale to 5 MC on the second band. Adjust oscillator trimming condenser C8 for maximum output, observing as before that the proper point occurs at the minimum or counter-clockwise position of the screw as two points are found.
2. Adjust detector input trimming condenser, C13, to maximum, while rocking the tuning condenser slightly for maximum response.
3. Adjust antenna stage trimmer, C5, for maximum output.
4. Set test oscillator to 2000 KC and tune in the signal. Adjust oscillator padding condenser, C11, for maximum output, while rocking the tuning condenser as described above.
5. Repeat operations 1, 2 and 3 to assure precise alignment.

FOREIGN OR THIRD BAND

1. With the test oscillator connected the same as above and set to 16000 KC (16MC) set the dial to 16MC on the third band.
2. Adjust oscillator trimming condenser, C7, for maximum response. Use lower capacity or counter-clockwise response point.
3. Adjust detector input trimmer, C12, to maximum, rocking tuning adjustment.
4. Adjust antenna trimmer, C4, for maximum response.

ULTRA HIGH FREQUENCY OR INSIDE BAND

This band was adjusted at the factory and will not require further adjustment.

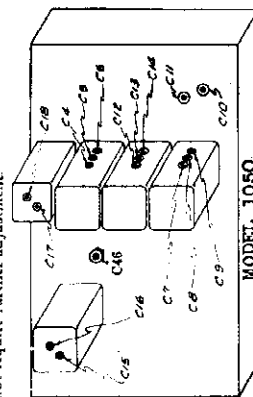
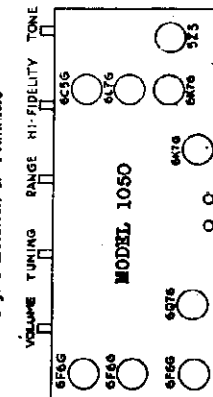


Fig. 2 Location of Trimmers



ALIGNMENT PROCEDURE

Correct alignment is of extreme importance in all wave receivers. The receivers are properly aligned at the factory with precision equipment and realignment should not be attempted by the service technician until all other causes of faulty operation are corrected. In order to properly realign the receiver the following equipment is necessary:

1. A signal generator which will provide an accurately calibrated signal at any frequency from 456 kilocycles to 18 megacycles. The generator should have adjustable signal output.
2. An output audio voltmeter of the low voltage type to be connected across the moving coil of the speaker. This should be capable of providing a readable deflection for relatively low output levels to avoid the effects of overload.
3. An insulated or non-metallic screw driver for the adjustment of trimmers.

I F ALIGNMENT 456 KC

1. Connect the output meter (low scale) across the loud speaker voice coil. Turn the wave band switch to broadcast position. Turn the volume control to its maximum position.
2. Connect the test oscillator ground to chassis and the "hot" lead from the test oscillator to the grid of the 6L7 converter tube through a series .1 Mfd condenser. Set test oscillator to 456 KC.
3. Turn selectivity control (second from the left) to its high selectivity position. This is the left hand or counter-clockwise position.
4. Adjust I. F. alignment screws C17 and C18 of the output transformer to maximum output, reducing output of test oscillator to keep meter reading on scale at alignment proceeds.
5. Adjust alignment screws, C15 and C16, of input transformer to maximum output as described above.
6. Readjust all four alignment screws to insure accurate alignment. Always use the lowest possible output from the test oscillator to preclude the possibility of automatic volume control action confusing proper adjustment.
7. Connect "hot" lead of test oscillator to receiver antenna lead in series with 250 Mmfid condenser and tune receiver to 550 kilocycles.
8. Adjust C-46 for minimum receiver output.

R. F. ALIGNMENT BROADCAST BAND

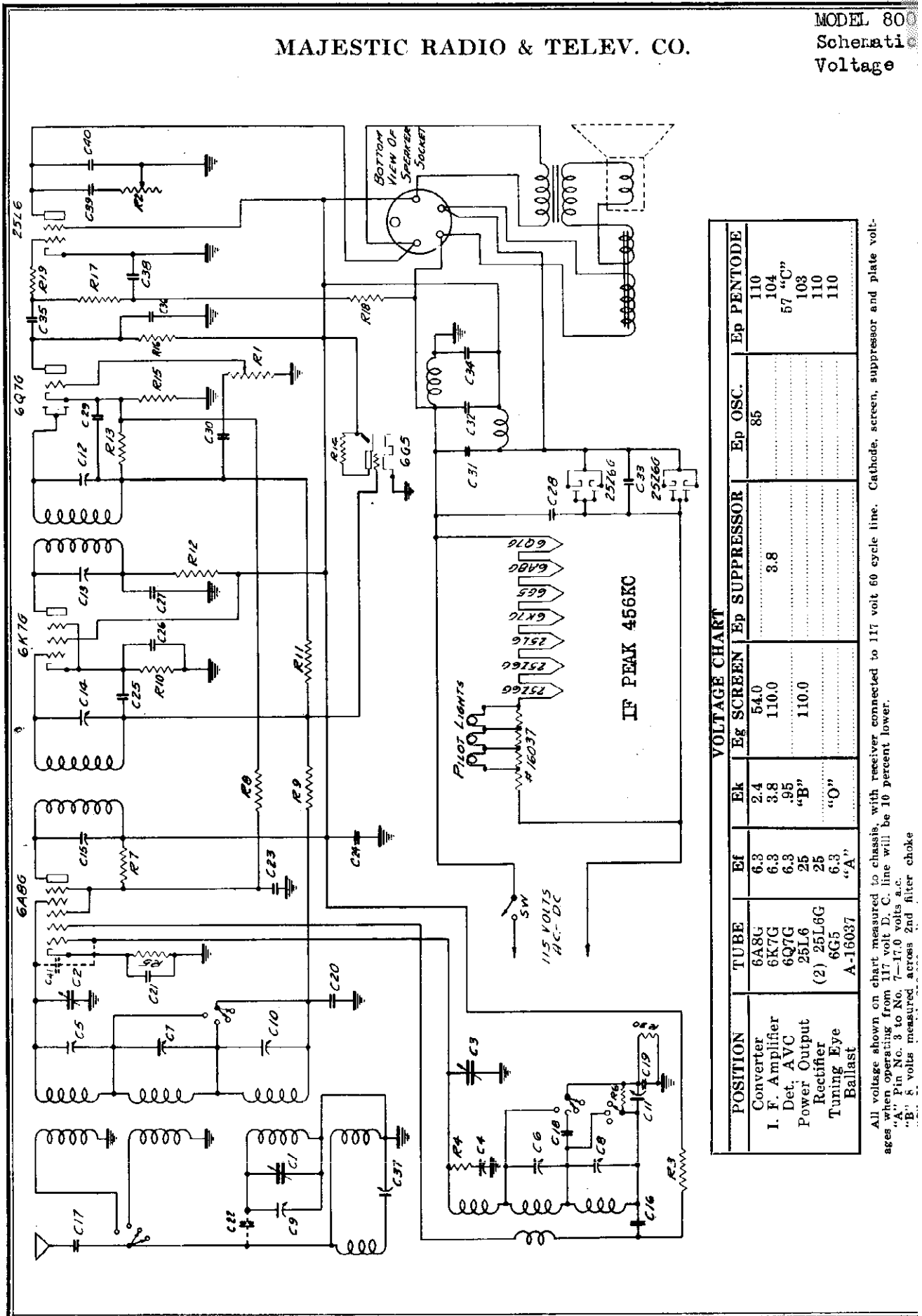
1. With test oscillator connected to the antenna post through .00025 Mfd., set signal generator to 1600 KC.
2. Set travelite indicator to end of scale (beyond 550 KC calibration) with gang condenser fully meshed at maximum capacitance.
3. Set dial to 1600 KC. Adjust broadcast oscillator trimming condenser, C9, for maximum output meter reading.
4. Adjust detector input trimmer, C14, to a maximum.
5. Adjust antenna stage trimmer, C6, to a maximum.
6. Set test oscillator to 600 KC and tune in the signal, then adjust broadcast oscillator paddler, C10, for maximum output. Rock the main tuning adjustment back and forth a degree or two in order to obtain proper maximum.

MAJESTIC RADIO & TELEV. CO.

MODEL 800

Schematic

Voltage



VOLTAGE CHART

POSITION	TUBE	Ef	Ek	Ep	Ep SUPPRESSOR	Ep OSC.	Ep PENTODE
Converter	6A8G	6.3	2.4	54.0		85	110
I. F. Amplifier	6K7G	6.3	3.8	110.0	3.8		104
Det. AVC	6Q7G	6.3	.95				57 "C"
Power Output	25L6	25	"B"	110.0			103
Rectifier	(2) 25L6G	25	"O"				110
Tuning Eye	6G5	6.3					110
Ballast	A-16037	"A"					

All voltage shown on chart measured to chassis, with receiver connected to 117 volt 60 cycle line. Cathode, screen, suppressor and plate voltages when operating from 117 volt D. C. line will be 10 percent lower.
 "A" Pin No. 3 to No. 7—17.0 volts a.c.
 "B" 8. volts measured across 2nd filter choke

MODEL 800

Socket, Trimmers Alignment, Parts

MAJESTIC RADIO & TELEV. CO.

- Set the dial scale to 16 megacycles and adjust the oscillator trimmer condenser (C4) to a resonance using the counter-clockwise or low capacity point.
- Adjust input circuit trimmer (C5) to maximum response, rocking the gang condenser back and forth a degree or two to obtain proper maximum.

POLICE OR MIDDLE BAND
1.75 TO 5.8 MC

- With the test oscillator connected as above set the oscillator and dial to 5.5 megacycles.
- Adjust oscillator trimmer condenser (C6) for maximum response using the counter-clockwise or low capacity point.
- Adjust input circuit trimmer (C7) to maximum response; rocking the gang condenser as described above.

BROADCAST BAND
535 TO 1800 KC

- With test oscillator connected to receiver antenna lead through a 200Mmfd. condenser, set oscillator and receiver dial to 1600 kilocycles.
- Adjust broadcast oscillator trimmer (C8) to obtain maximum response.
- Adjust antenna circuit trimmer (C9) for maximum output.
- Adjust presselector trimmer (C10) for maximum output.
- Set test oscillator and dial to 600 kilocycles and tune in the signal, then adjust broadcast band padding condenser (C11) for maximum output. This padding is mounted on the aluminum coil deck near the panel and is adjusted through a hole provided in the back of the chassis pan. Rock the condenser back and forth a degree or two in order to obtain proper maximum.
- Repeat the 1600 kilocycle adjustments described above for greater accuracy.

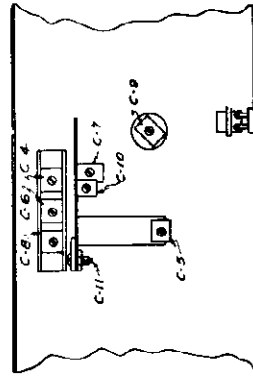


Fig. 2 Location of Trimmers

ALIGNMENT PROCEDURE

Correct alignment is of extreme importance in all wave receivers. The receivers are properly aligned at the factory with precision equipment, and realignment should not be attempted by the service technician until all other causes of faulty operation are corrected. In order to properly realign the receiver the following equipment is necessary:

- A signal generator which will provide an accurately calibrated signal at any frequency from 456 kilocycles to 18 megacycles. The generator should have adjustable signal output.
- An output audio voltmeter of the low voltage type to be connected across the moving coil of the speaker. This should be capable of providing a readable deflection for relatively low output levels to avoid the effects of overload.
- An insulated or non-metallic screw driver for the adjustment of trimmers.

I. F. ALIGNMENT 456 KC

- Connect the output meter (low scale) across the loud speaker voice coil. Turn the wave band switch to broadcast position. Turn the volume control to its maximum position.
- Connect the test oscillator ground to chassis in series with .25 Mfd 600 volt condenser, and the "hot" lead from the test oscillator to the grid of the 6A8G converter tube through a series .1 Mfd. condenser. Set test oscillator to 456 KC.
- Adjust I. F. alignment screws of second I. F. transformer (at rear corner of chassis) to maximum output, reducing output of test oscillator to keep the meter reading on scale as alignment proceeds.
- Adjust alignment of first I. F. transformer (rear front corner of chassis) to maximum output as described above.
- Readjust these trimmers for accurate alignment. Always use the lowest possible output from the test oscillator to preclude the possibility of automatic volume control action confusing proper adjustment.
- Connect "hot" lead of test oscillator to receiver antenna lead in series with 200 Mmfd. condenser.
- Adjust C37 for minimum output, increasing test oscillator output until a signal is heard when C37 is adjusted for minimum output.

NOTE: Since coils are used in series it is absolutely necessary to align the high frequency bands first in the order indicated.

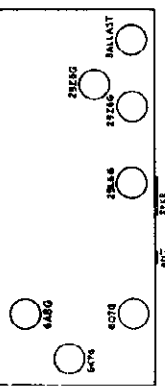
FOREIGN BAND 5.7 TO 18.5 MC

- With test oscillator connected to the receiver antenna lead through a 400 ohm resistor, set oscillator at 16 megacycles.

State serial number of receiver when ordering parts.

REPLACEMENT PARTS MODEL 800

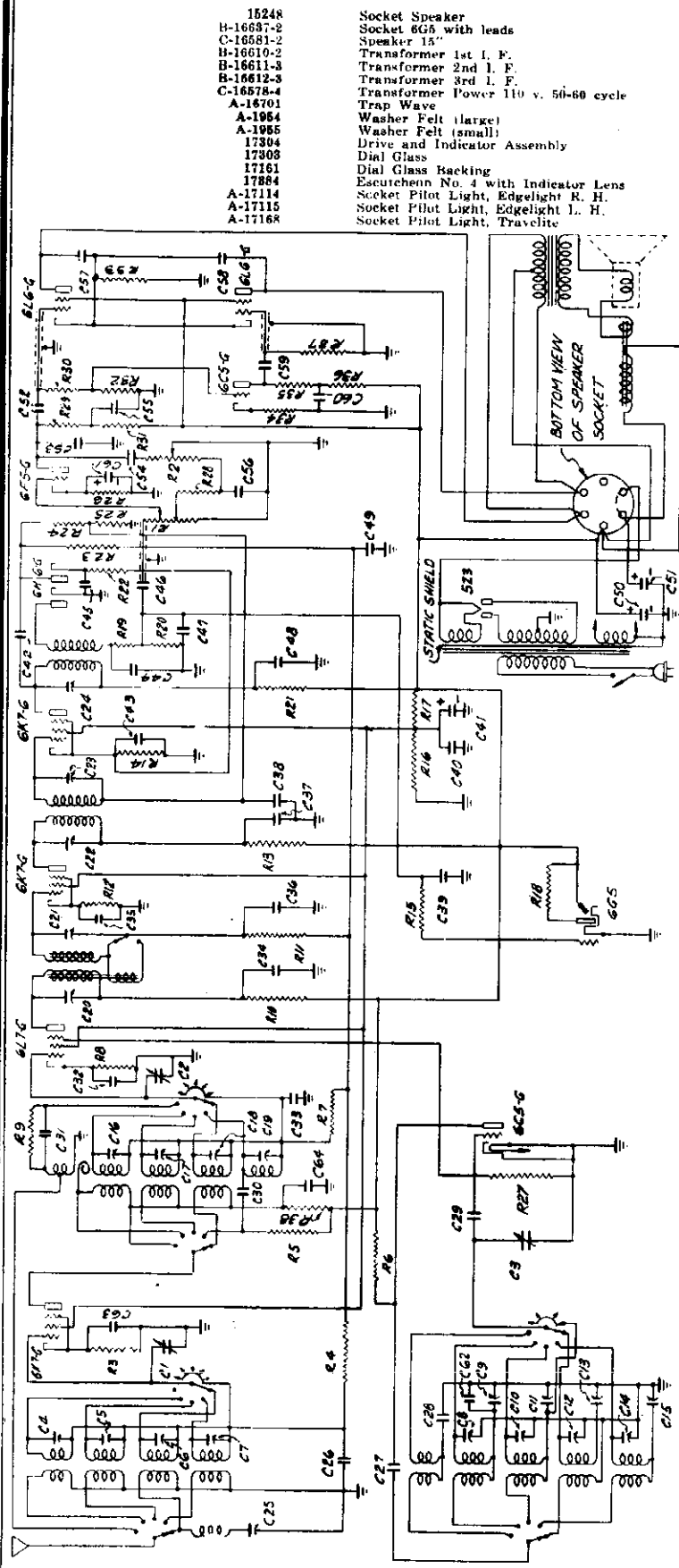
Part No.	Description
B-16885	Bulb Pilot Light (Edgelight)
B-16886	Bulb Pilot Light (Travelite)
B-16461-5	Condenser Variable Gang
A-18473	Condenser Trimmer 3-30 Mmfd. triple strip bakelite
A-18474	Condenser Trimmer 1 1/2-10 Mmfd. ceramic base
A-17486	Condenser Trimmer 3-30 Mmfd. bakelite base
A-18246-2	Condenser Variable Gang 340-500 Mmfd.
A-18472	Condenser Tubular .001 Mfd. 500 volts, Type W
A-18470	Condenser Mica 1750 Mmfd. +-5% Type W
A-18471	Condenser Mica 4800 Mmfd. +-5% Type W
A-18473	Condenser Tubular .05 Mfd. 200 volts
A-18472	Condenser Tubular .1 Mfd. 200 volts
A-18471	Condenser Tubular 1 Mfd. 400 volts
A-18470	Condenser Mica 250 Mfd. 200 volts, Type O
A-18471	Condenser Wet Electrolytic 40 Mfd. 150 volts
A-18472	Condenser Wet Electrolytic 40 Mfd. 150 volts
A-18473	Condenser Wet Electrolytic 25 Mfd. 150 volts
A-18474	Condenser Padder 20-85 Mmfd.
A-18475	Condenser Tubular .25 Mfd. 200 volts
A-18476	Condenser Tubular .05 Mfd. 400 volts
A-18477	Control Volume
A-18478	Control Tone and line switch (15,000 ohms)
A-18479	No. 38 D. C. Manganin wire 2 ohms
A-18480	Resistor Carbon 600 ohms +-10% 1/2 watt
A-18481	Resistor Carbon 25,000 ohms +-10% 1/2 watt
A-18482	Resistor Carbon 12,500 ohms +-10% 1/2 watt
A-18483	Resistor Carbon 20,000 ohms +-10% 1/2 watt
A-18484	Resistor Carbon 1,000 ohms +-20% 1/2 watt
A-18485	Resistor Carbon 1,000 ohms +-20% 1/2 watt
A-18486	Resistor Carbon 600,000 ohms +-20% 1/2 watt
A-18487	Resistor Carbon 400 ohms +-10% 1/2 watt
A-18488	Resistor Carbon 150,000 ohms +-20% 1/2 watt
A-18489	Resistor Carbon 500,000 ohms +-20% 1/2 watt
A-18490	Resistor Carbon 200,000 ohms +-20% 1/2 watt
A-18491	Coil and mounting assembly (oscillator, antenna and wave switch)
A-18492	Speaker cabinet assembly
A-18493	Waste tray
A-18494	Drive and Indicator assembly (complete)
A-18495	Dial Glass Backing
A-18496	Escutcheon with indicator lenses
A-18497	Knob (tone and volume)
A-18498	Socket Speaker leads
A-18499	Socket Pilot Light leads
A-18500	Socket pilot light edgelight R. H.
A-18501	Socket pilot light edgelight L. H.
A-18502	Socket pilot light travelite
A-18503	Speaker
A-18504	Transformer 1st I. F.
A-18505	Transformer 2nd I. F.
A-18506	Choke Filter
A-18507	Washer Flat (large)
A-18508	Washer Flat (small)
A-18509	Balance Wheel
A-18510	Ballast Tube
A-18511	Universal Joint
A-18512	Band Pulley
A-18513	Travel Light
A-18514	Dial Glass Chip
A-18515	Dial Drive
A-18516	Pilot Light Shield
A-18517	A-17585



POWER LINE VOLTAGE
The model 800 is designed to operate on 105 to 125 volts, 50-60 cycles a.c. or d.c. Serious damage may result if the set is connected to a power supply other than that shown above. If there is any doubt in your mind, do not plug in the set until you first determine the voltage and cycles from your power supply company.

MAJESTIC RADIO & TELEV. CO.

MODEL 1250
Schematic
Parts



- 1524R Socket Speaker
- H-16687-2 Socket 6G5 with leads
- C-16581-2 Transformer 1st I. F.
- B-16610-2 Transformer 2nd I. F.
- B-16611-3 Transformer 3rd I. F.
- B-16612-3 Transformer Power 110 v. 50-60 cycle
- C-16578-4 Trap Wave
- A-16701 Washer Felt (large)
- A-1955 Washer Felt (small)
- 17304 Drive and Indicator Assembly
- 17308 Dial Glass
- 17161 Dial Glass Backing
- 17884 Esecutenn No. 4 with Indicator Lens
- A-17114 Socket Pilot Light, Edgelight R. H.
- A-17115 Socket Pilot Light, Edgelight L. H.
- A-17168 Socket Pilot Light, Trivalent

- 15789 Condenser Tubular .01 Mfd. 200 volts
- 15772 Condenser Tubular .02 Mfd. 200 volts
- 15774 Condenser Tubular .002 Mfd. 400 volts
- B-16586-2 Control Tune
- B-16588-2 Control Tune
- A-16541-2 Coil Antenna in Shield
- 16380 Coil Oscillator in Shield
- A-16538 Knob (volume and tone)
- A-16539 Knob (volume and tone)
- A-16540 Knob (band switch)
- 15510 Resistor Carbon 20,000 \pm 20% $\frac{1}{4}$ watt
- 15511 Resistor Carbon 50,000 \pm 20% $\frac{1}{4}$ watt
- 15512 Resistor Carbon 250,000 \pm 20% $\frac{1}{4}$ watt
- 15540 Resistor Carbon 25,000 \pm 10% $\frac{1}{4}$ watt
- 15515 Resistor Carbon 100,000 \pm 20% $\frac{1}{4}$ watt
- 15520 Resistor Carbon 50,000 \pm 20% $\frac{1}{4}$ watt
- 15521 Resistor Carbon 10,000 \pm 20% $\frac{1}{4}$ watt
- 15588 Resistor Carbon 600 \pm 10% $\frac{1}{4}$ watt
- 15552 Resistor Carbon 30,000 \pm 20% $\frac{1}{4}$ watt
- 15514 Resistor Carbon 20,000 \pm 10% $\frac{1}{4}$ watt
- 15551 Resistor Carbon 25,000 \pm 20% $\frac{1}{4}$ watt
- 15554 Resistor Carbon 150,000 \pm 10% $\frac{1}{4}$ watt
- 15555 Resistor Carbon 4,000 \pm 10% $\frac{1}{4}$ watt
- 15516 Resistor Carbon 100,000 \pm 10% $\frac{1}{4}$ watt
- 15514 Resistor Carbon 20,000 \pm 10% $\frac{1}{4}$ watt
- 15566 Resistor Carbon 2,000 \pm 10% $\frac{1}{4}$ watt
- 15576 Resistor Carbon 5000-2 \pm 10% $\frac{1}{4}$ watt
- A-16785 Resistor Carbon 220 ohm $\frac{1}{4}$ watt

PART. NO.	DESCRIPTION	SCHEMATIC LOCATION
C39	Bulb Pilot Light (edgelight)	C39
C66	Bulb Pilot Light (edgelight)	C66
C27	Condenser Variable Gauze (transistor)	C27
R1	Condenser Trimmer 5-50 Mmfd. (triple strip)	R1
R2	Condenser Trimmer 5-50 Mmfd. (triple strip)	R2
R3	Condenser Padder 1000-3000 Mmfd.	R3
R4	Condenser Padder 1000-3000 Mmfd.	R4
R5	Condenser Padder 1000-3000 Mmfd.	R5
R6	Condenser Padder 1000-3000 Mmfd.	R6
R7	Condenser Trimmer (part of 3rd I. F. assembly)	R7
R8	Condenser Trimmer (part of 3rd I. F. assembly)	R8
R9	Condenser Trimmer (part of 3rd I. F. assembly)	R9
R10	Condenser Trimmer (part of 3rd I. F. assembly)	R10
R11	Condenser Trimmer (part of 3rd I. F. assembly)	R11
R12	Condenser Trimmer (part of 3rd I. F. assembly)	R12
R13	Condenser Trimmer (part of 3rd I. F. assembly)	R13
R14	Condenser Trimmer (part of 3rd I. F. assembly)	R14
R15	Condenser Trimmer (part of 3rd I. F. assembly)	R15
R16	Condenser Trimmer (part of 3rd I. F. assembly)	R16
R17	Condenser Trimmer (part of 3rd I. F. assembly)	R17
R18	Condenser Trimmer (part of 3rd I. F. assembly)	R18
R19	Condenser Trimmer (part of 3rd I. F. assembly)	R19
R20	Condenser Trimmer (part of 3rd I. F. assembly)	R20
R21	Condenser Trimmer (part of 3rd I. F. assembly)	R21
R22	Condenser Trimmer (part of 3rd I. F. assembly)	R22
R23	Condenser Trimmer (part of 3rd I. F. assembly)	R23
R24	Condenser Trimmer (part of 3rd I. F. assembly)	R24
R25	Condenser Trimmer (part of 3rd I. F. assembly)	R25
R26	Condenser Trimmer (part of 3rd I. F. assembly)	R26
R27	Condenser Trimmer (part of 3rd I. F. assembly)	R27
R28	Condenser Trimmer (part of 3rd I. F. assembly)	R28
R29	Condenser Trimmer (part of 3rd I. F. assembly)	R29
R30	Condenser Trimmer (part of 3rd I. F. assembly)	R30
R31	Condenser Trimmer (part of 3rd I. F. assembly)	R31
R32	Condenser Trimmer (part of 3rd I. F. assembly)	R32
R33	Condenser Trimmer (part of 3rd I. F. assembly)	R33

PART. NO.	DESCRIPTION	SCHEMATIC LOCATION
C1	Condenser Tubular .01 Mfd. 200 V.	C1
C2	Condenser Tubular .01 Mfd. 200 V.	C2
C3	Condenser Tubular .01 Mfd. 200 V.	C3
C4	Condenser Tubular .01 Mfd. 200 V.	C4
C5	Condenser Tubular .01 Mfd. 200 V.	C5
C6	Condenser Tubular .01 Mfd. 200 V.	C6
C7	Condenser Tubular .01 Mfd. 200 V.	C7
C8	Condenser Tubular .01 Mfd. 200 V.	C8
C9	Condenser Tubular .01 Mfd. 200 V.	C9
C10	Condenser Tubular .01 Mfd. 200 V.	C10
C11	Condenser Tubular .01 Mfd. 200 V.	C11
C12	Condenser Tubular .01 Mfd. 200 V.	C12
C13	Condenser Tubular .01 Mfd. 200 V.	C13
C14	Condenser Tubular .01 Mfd. 200 V.	C14
C15	Condenser Tubular .01 Mfd. 200 V.	C15
C16	Condenser Tubular .01 Mfd. 200 V.	C16
C17	Condenser Tubular .01 Mfd. 200 V.	C17
C18	Condenser Tubular .01 Mfd. 200 V.	C18
C19	Condenser Tubular .01 Mfd. 200 V.	C19
C20	Condenser Tubular .01 Mfd. 200 V.	C20
C21	Condenser Tubular .01 Mfd. 200 V.	C21
C22	Condenser Tubular .01 Mfd. 200 V.	C22
C23	Condenser Tubular .01 Mfd. 200 V.	C23
C24	Condenser Tubular .01 Mfd. 200 V.	C24
C25	Condenser Tubular .01 Mfd. 200 V.	C25
C26	Condenser Tubular .01 Mfd. 200 V.	C26
C27	Condenser Variable Gauze (transistor)	C27
C28	Condenser Tubular .01 Mfd. 200 V.	C28
C29	Condenser Tubular .01 Mfd. 200 V.	C29
C30	Condenser Tubular .01 Mfd. 200 V.	C30
C31	Condenser Tubular .01 Mfd. 200 V.	C31
C32	Condenser Tubular .01 Mfd. 200 V.	C32
C33	Condenser Tubular .01 Mfd. 200 V.	C33
C34	Condenser Tubular .01 Mfd. 200 V.	C34
C35	Condenser Tubular .01 Mfd. 200 V.	C35
C36	Condenser Tubular .01 Mfd. 200 V.	C36
C37	Condenser Tubular .01 Mfd. 200 V.	C37
C38	Condenser Tubular .01 Mfd. 200 V.	C38
C39	Bulb Pilot Light (edgelight)	C39

MODEL 1250

Socket, Trimmers
Voltage, Alignment

MAJESTIC RADIO & TELEV. CO.

I. F. ALIGNMENT 456 KC

1. Connect the output meter (low scale) across the loud speaker voice coil. Turn the wave band switch to extreme clockwise position (broadcast band). Turn the volume control to maximum position. Rotate the hi-fidelity switch to the counter-clockwise position and the volume control to the "treble" or clockwise position.
2. Connect the test oscillator ground to chassis and the "hot" lead from the oscillator to the grid of the 6L7 converter tube through a series .1 mfd. condenser. Set test oscillator to 456.0 KC.
3. Adjust I. F. alignment screw of 3rd I. F. assembly, at rear of chassis, to maximum output, reducing output of test oscillator to keep meter reading on scale as alignment proceeds.
4. Adjust I. F. alignment screws of 2nd I. F. transformer adjacent to 3rd I. F. transformer, for maximum output as described above.
5. Adjust alignment screws of 1st I. F. transformer, near front of chassis, for maximum output as described above.
6. Re-adjust alignment screws of all three transformers to make sure of accurate alignment. Always use lowest possible output of test oscillator to preclude the possibility of the automatic volume control action confusing correct alignment.

WAVE TRAP ADJUSTMENT

1. With test oscillator still set at 456.0 KC remove series condenser from grid of 6L7 converter tube and substitute a 200 mmfd. condenser in its place.
2. Connect test oscillator lead to antenna post of receiver.
3. Keep variable condenser at maximum capacity position with wave band switch in broadcast position.
4. Raise output of test oscillator until a half scale meter deflection is obtained.
5. Adjust trimmer No. C-25 (located on chassis) until the meter reading is at the minimum deflection (toward zero).

BROADCAST BAND—535-1720 KC

1. Set test oscillator to 1600 KC. Connect oscillator to receive through a 200 mmfd. condenser.
2. Rotate wave band switch to full clockwise direction.
3. Set dial scale to 1600 KC, and adjust trimmer C-19 to a resonance.
4. Adjust trimmer C-18 for maximum response.
5. Adjust trimmer C-6 for maximum response.
6. Set test oscillator to 600 KC.
7. Set dial scale to 600 KC and adjust padding condenser C-13 for maximum response "rocking" gang condenser while adjustment is made, to obtain proper resonance.
8. Repeat the adjustments at 1600 KC to obtain greater accuracy.

WEATHER BAND—140-410 KC

1. Set test oscillator to 400 KC. Use 200 mmfd. condenser in series with oscillator lead.
2. Rotate wave band switch one position in counter-clockwise direction.

3. Set dial scale to 400 KC and adjust trimmer C-14 to a resonance.
4. Adjust trimmer C-19 to a maximum response.
5. Adjust trimmer C-7 to a maximum response.
6. Set test oscillator to 160 KC.
7. Set dial scale to 160 KC and adjust padding condenser C-15 to maximum response, "rocking" gang condenser while adjustment is made, to obtain proper resonance.

POLICE BAND—1.7-5.8 Megacycles

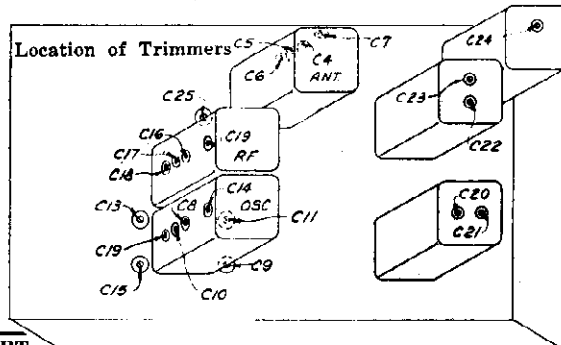
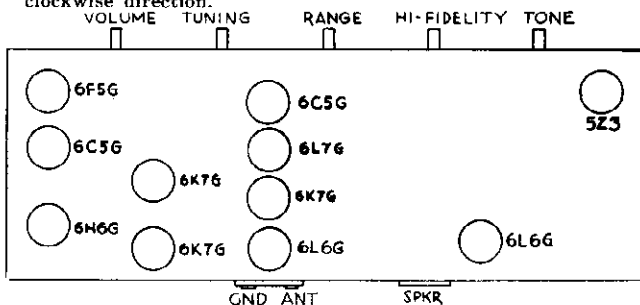
1. Set test oscillator to 5.5 megacycles, (400 ohm resistor in series with oscillator lead).
2. Rotate wave band switch counter-clockwise one position.
3. Set dial scale to 5.5 megacycles, and adjust C-10 to a resonance. The resonance obtained with the trimmer in the low capacity direction, being the correct one.
4. Adjust trimmer C-17 to a maximum response, "rocking" gang condenser while adjustment is made, to obtain proper resonance.
5. Adjust trimmer C-5 to a maximum response, "rocking" gang condenser while adjustment is made, to obtain proper resonance.
6. Set test oscillator to 2.0 megacycles.
7. Set dial scale to 2.0 megacycles, and adjust padding condenser C-11 for maximum response, "rocking" gang condenser while adjustment is made, to obtain proper resonance.
8. Repeat the adjustments at 5.5 megacycles to obtain greater accuracy.

FOREIGN BAND—5.6-18.0 Megacycles

1. With test oscillator connected to the antenna and ground terminals through a 400 ohm resistor, set oscillator at 16.0 megacycles.
2. Rotate the wave band switch to the 4th position in the counter-clockwise position. Set dial scale to 16.0 megacycles.
3. Adjust oscillator trimmer C-8 to a resonance. There will possibly be two resonant points noticed. The one obtained with the trimmer out in the minimum capacity direction, is the correct one.
4. Adjust trimmer C-16 to maximum response, "rocking" the gang condenser back and forth a degree or two to obtain proper resonance.
5. Adjust trimmer C-4 to maximum response, "rocking" gang condenser while trimming to obtain proper resonance.
6. Set test oscillator to 6.0 megacycles.
7. Set dial scale to 6.0 megacycles, and adjust padding condenser C-9 until a maximum response is obtained, "rocking" the gang condenser while adjustment is made to obtain proper resonance.
8. Return to 16.0 megacycles and check adjustment of C-8, C-16, and C-4 to make certain that the adjustment of C-9 has not disturbed their adjustments.

**ULTRA HIGH FREQUENCY BAND
16.5-42.0 Megacycles**

The alignment of this band is fixed at the factory and does not have any adjustments to be made in the field.



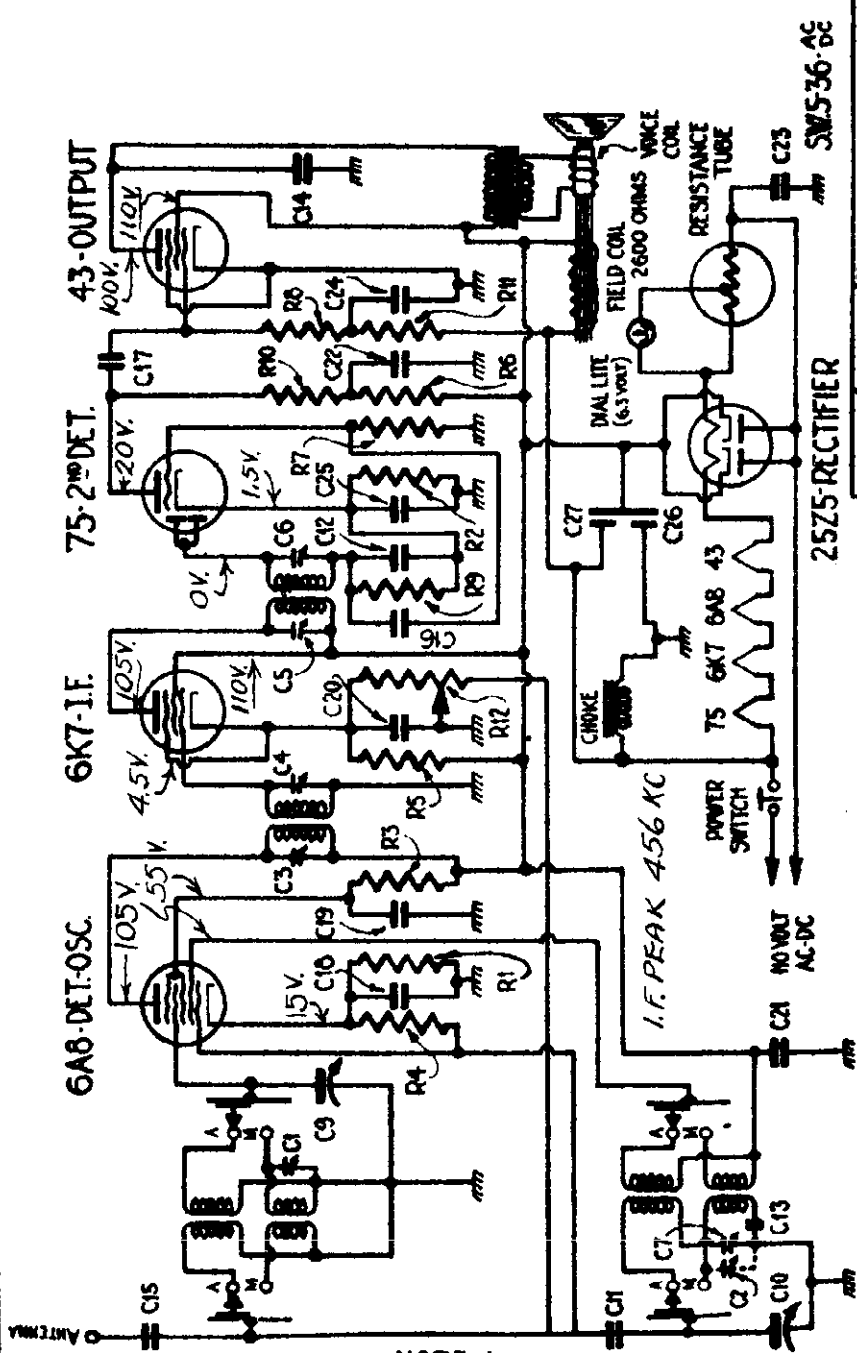
VOLTAGE CHART							
Position	Tube	Ef	Ek	Eg Screen	Eg Suppressor	Ep Triode	Ep Pentode
R. F. Amplifier	6 K7G	6.3	3.5	85.0	Tied to Cathode		278.0
1st I. F. Amplifier	6 K7G	6.3	5.0	85.0	Tied to Cathode		275.0
Converter	6 L7G	6.3	3.5				275.0
Oscillator	6 C5G	6.3				100.0	
2nd I. F. Amplifier	6 K7G	6.3	5.0	85.0	Tied to Cathode		275.0
Detector A.V.C.	6 H6G	6.3	2.5				
1st Audio	6 F5G	6.3	1.5			200.0	
Phase Inverter	6 C5G	6.3	3.5			75.0	
Audio Output	6 L6G	6.3	22.0	280.0			275.0
Audio Output	6 L6G	6.3	22.0	280.0			275.0
Rectifier	5 Z3	5.0					

MID-WEST RADIO CORP.

MODEL SW5-36 AC-DC
Schematic, Alignment
Voltage

- (2) Connect signal generator to antenna post on set through a standard dummy antenna. Remove short circuit from condenser. Set generator and dial to 1500 k.c. and peak variable condensers for maximum output on meter. For low frequency adjustment set dial at 600 k.c. and peak padding condenser on front of chassis. Short wave calibration is automatically taken care of by fixed calibrated trimmers and padders. No need for further adjustment.

CONDENSERS		RESISTORS	
C1 LW TRIMMER	C7 PADDER	R1 240 OHMS	R7 900,000 OHMS
C2 LF TRIMMER	C8 TUNING CONDENSER	R2 6,500 OHMS	R8 260,000 OHMS
C3 LF TRIMMER	C9 TUNING CONDENSER	R3 25,000 OHMS	R9 500,000 OHMS
C4	C10 100 MFD. MICA	R4 50,000 OHMS	R10
C5	C11 350 MFD.	R5	R11
C6	C12 .05 MFD.	R6 67,000 OHMS	R12 VOLUME CONTROL
C13 0.02 MFD. MICA	C19 .05 MFD. PAPER		
C14 .006 MFD.	C20		
C15 .02 MFD. PAPER	C21		
C16	C22 1 MFD. 200V.		
C17 100 MFD. MICA	C23 1 MFD. 400V.		
C18 .05 MFD.	C24 .25 MFD. PAPER		
	C25 5 MFD.		
	C26 2 MFD. TIC COND.		
	C27 20 MFD.		



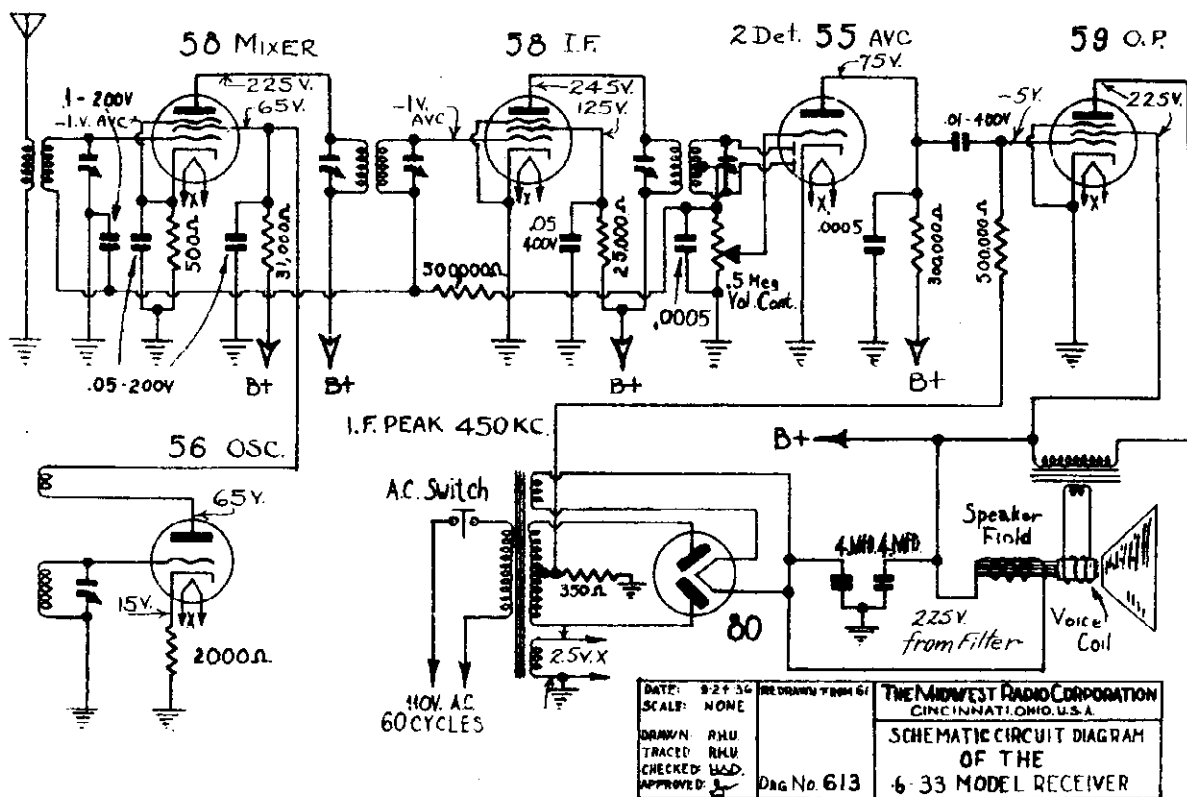
THE MIDWEST RADIO CORPORATION
CINCINNATI, OHIO, U.S.A.
SCHEMATIC CIRCUIT DIAGRAM
OF THE
SW5-36 AC-DC MODEL RECEIVER
Part No. 561
DATE: 7-3-36
SCALE: NONE
POWER SUPPLY
CHECKED BY:
APPROVED BY:

NOTE
On Long Wave Model use Trimmers C1 & C2. Also replace C13 with Padder C8. E & M Band coils are replaced with E Band coils.

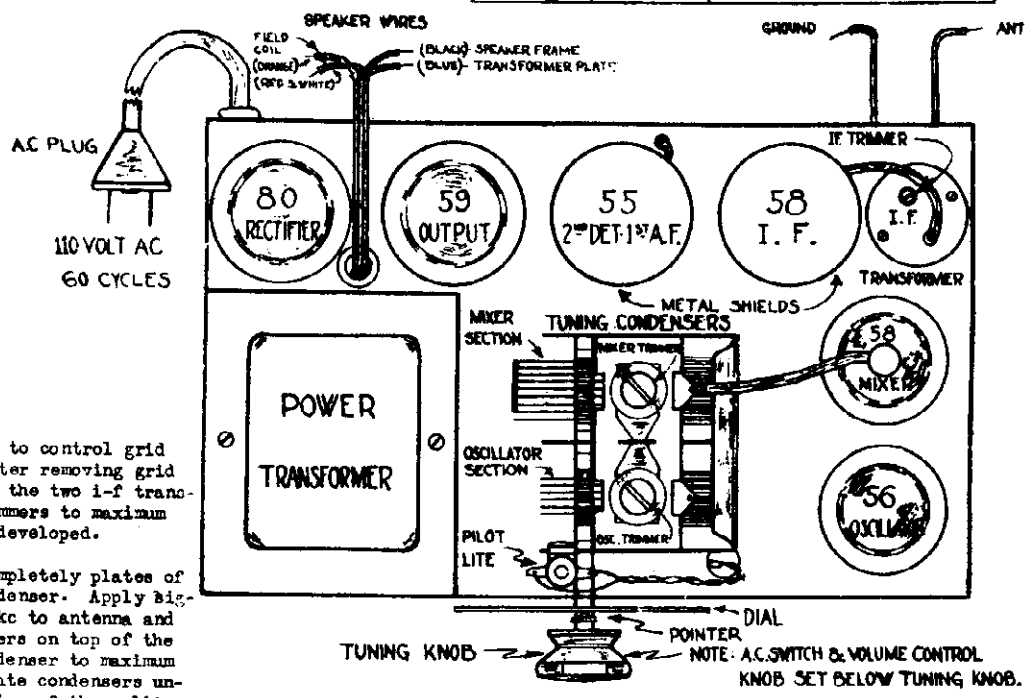
- (1) Set signal generator to 456 k.c. and connect output meter from plate of 43 tube to ground. Connect output of signal generator to grid of 6A8 tube. Ground stator of front section of variable condenser. Adjust both grids and plate trimmers of 1st and 2nd I.F. transformers for maximum gain on output meter.

MODEL 6-33
Schematic, Socket
Voltage, Alignment

MID-WEST RADIO CORP.



DATE: 9-27-34	RE-DRAWN FROM 61	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
SCALE: NONE		
DRAWN: R.H.U.		SCHEMATIC CIRCUIT DIAGRAM OF THE 6-33 MODEL RECEIVER
TRACED: R.H.U.		
CHECKED: H.G.D.		
APPROVED: [Signature]	Diag No. 613	



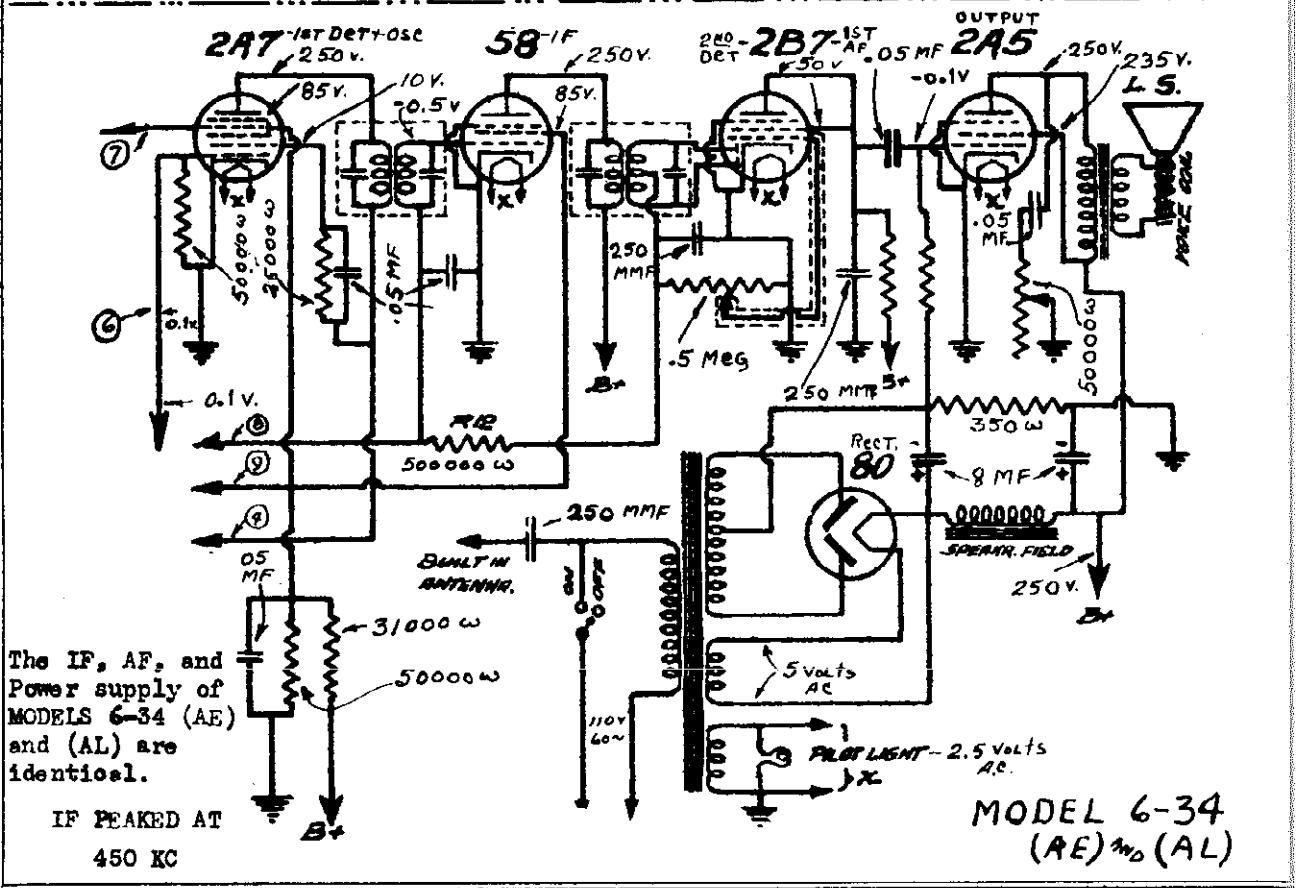
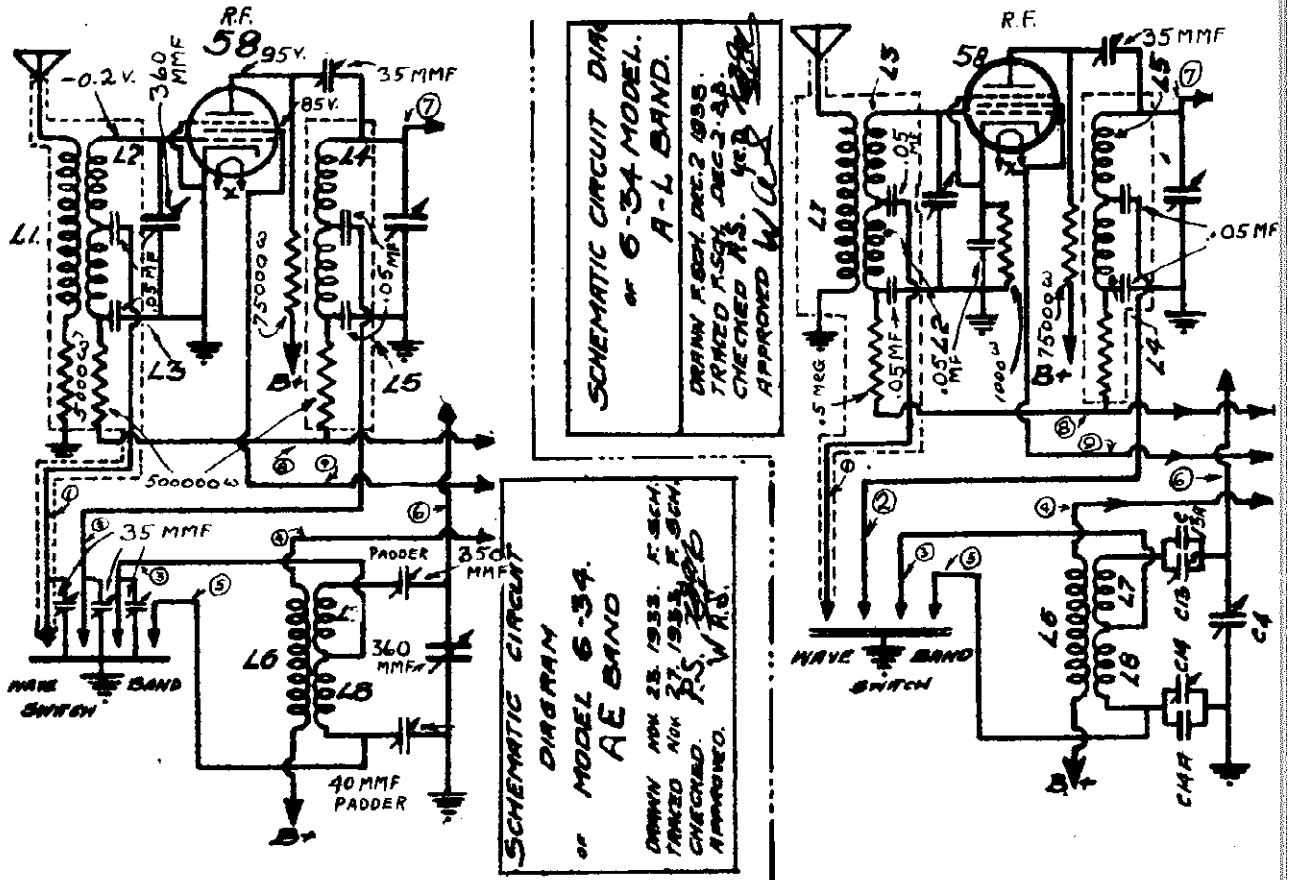
Apply 450 kc to control grid of Mixer, after removing grid cap. Adjust the two i-f transformers' trimmers to maximum AVC voltage developed.

Disengage completely plates of variable condenser. Apply signal of 1712 kc to antenna and adjust trimmers on top of the variable condenser to maximum output. Rotate condensers until one section of the split plates are engaged and bend plates for maximum output. Be sure to change oscillator frequency with each move to a new section.

DATE: 10-16-35	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO.
SCALE: FULL	
DRAWN: H.G.D.	CHASSIS LAYOUT SHOWING LOCATION OF TUBES & PARTS FOR 6-33 MODEL.
TRACED: H.G.D.	
CHECKED: H.G.D.	
APPROVED: [Signature]	Diag No. A120

MID-WEST RADIO CORP.

MODEL 6-34 (A-E)
 MODEL 6-34 (A-L)
 Schematics, Voltage



MODEL 6-34 (A-E)
 MODEL 6-34 (A-L)
 Socket, Trimmers
 Alignment

MID-WEST RADIO CORP.

INSTRUCTIONS FOR REBALANCING 6 TUBE 1934 MODEL DUAL
 WAVE RECEIVER. MODEL AE AND AL

Remove the control grid cap of the 2A7 tube (mixer) and apply a modulated signal of 450 K.C. to the control grid of the 2A7 tube. Trim the first and second I.F. Transformers for maximum AVC voltage developed. Be sure during the alignment procedure to keep the signal input down as low as possible or double peaking of stations will result. There are two adjustments on each of the I.F. transformers.

To align the R.F. and Osc. and Mixer circuits on the AL Model --

Turn the wave band switch to the A position (all switch contacts open), turn the variable condenser until the plates are entirely engaged. Apply a signal of 530 K.C. to the antenna connection of the receiver and adjust the A band padder until the oscillator signal is received at maximum. Apply signal of 1600 K.C. to the antenna connection of the receiver and turn the variable condenser until the plates are disengaged and trim the trimmers on the variable condenser until maximum signal is obtained. Adjust the Osc., Mixer and R.F., in order named.

To adjust the L band, apply a signal of 1600 K.C. to the antenna connection of the receiver and adjust the L band padder until maximum signal is obtained.

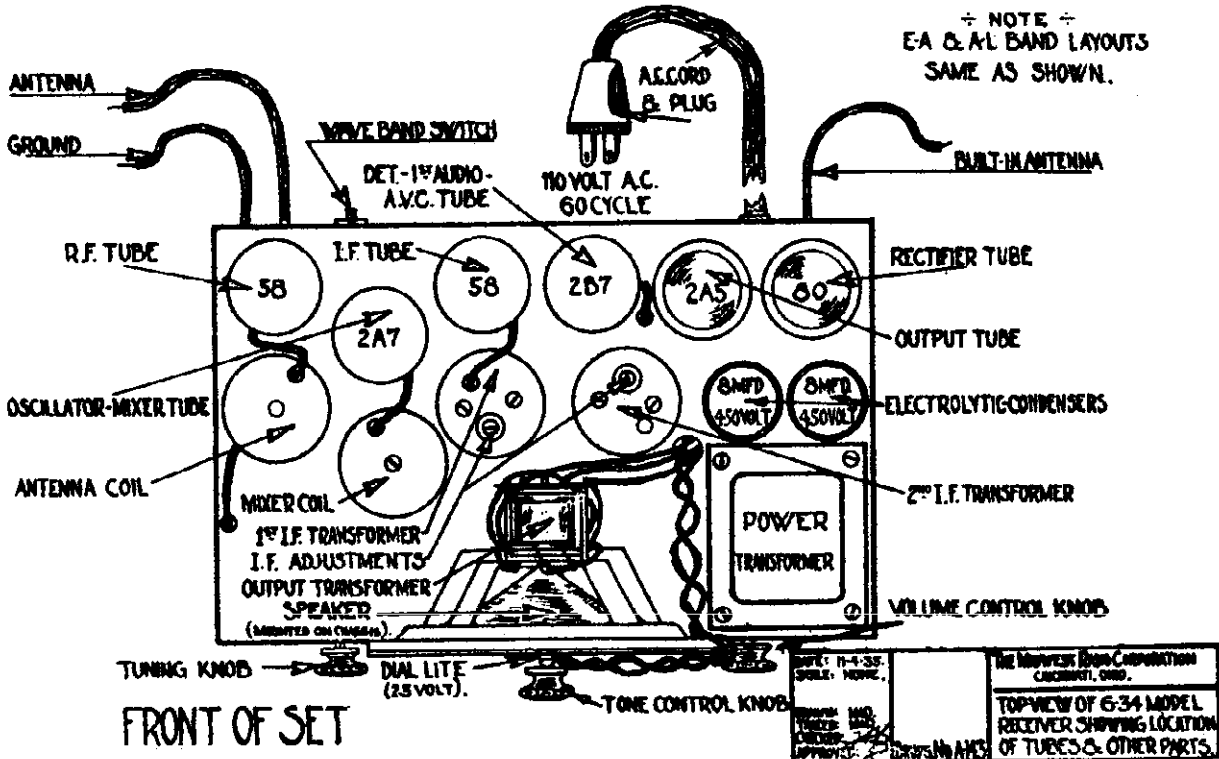
To align the R.F., Osc. and Mixer circuits of the AE model --

Turn the wave band switch to the A position (all contacts closed). Apply a signal of 530 K.C. to the antenna connection of the receiver and adjust the A band padder until maximum signal is received. Condensers being fully engaged or closed. Rotate condensers to the position where the plates are entirely disengaged. Apply a signal of 1600 K.C. to the antenna connection of the receiver and trim the adjustments on the variable condenser until maximum output is received.

Turn the wave change switch to the B position (all contacts open). Apply a signal of 150 K.C. to the antenna connection of the receiver, and adjust the E band padder until maximum signal is received. Rotate the variable condenser being closed for this operation.

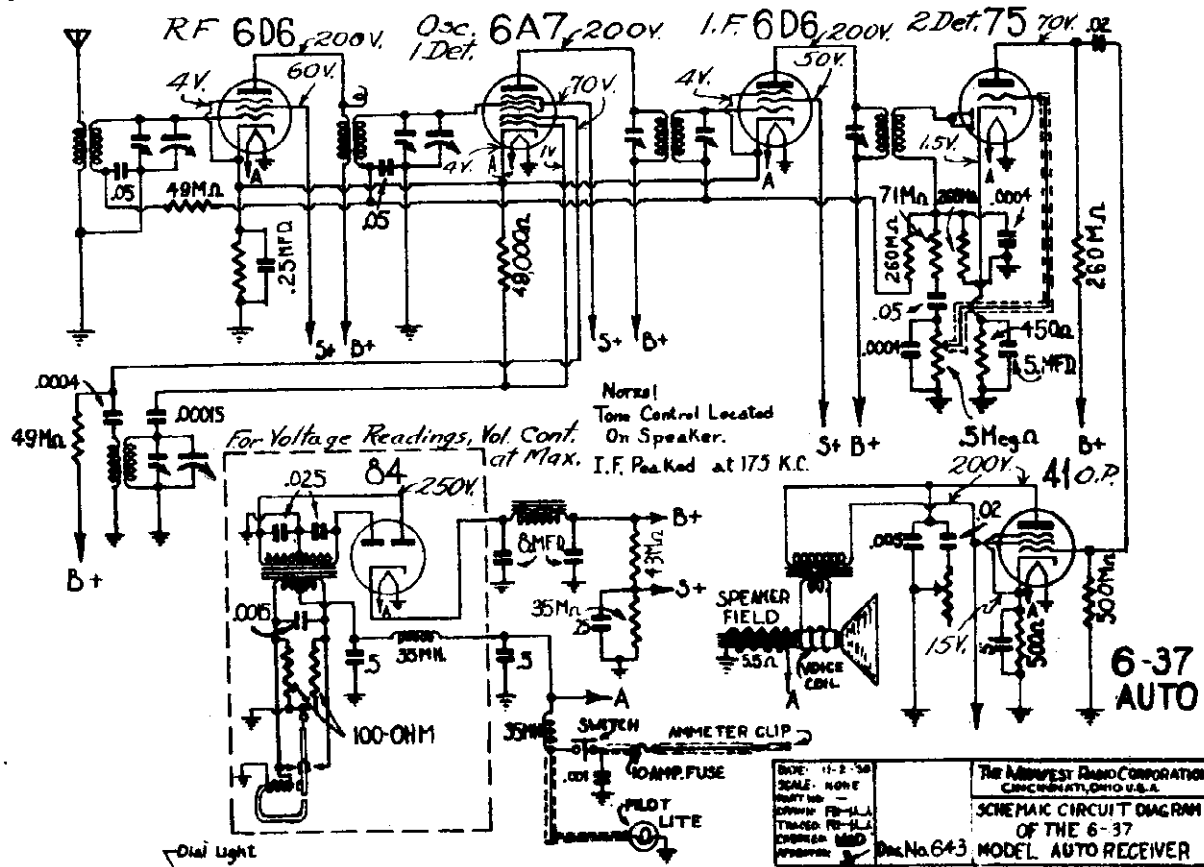
Turn the variable condensers to the position where the plates are entirely disengaged and apply a signal of 370 K.C. to the antenna connection of the receiver and adjust the trimmers on switch until maximum signal is received. This completes the procedure of rebalancing the receiver.

Be sure to always keep the signal input as low as possible when aligning a receiver.

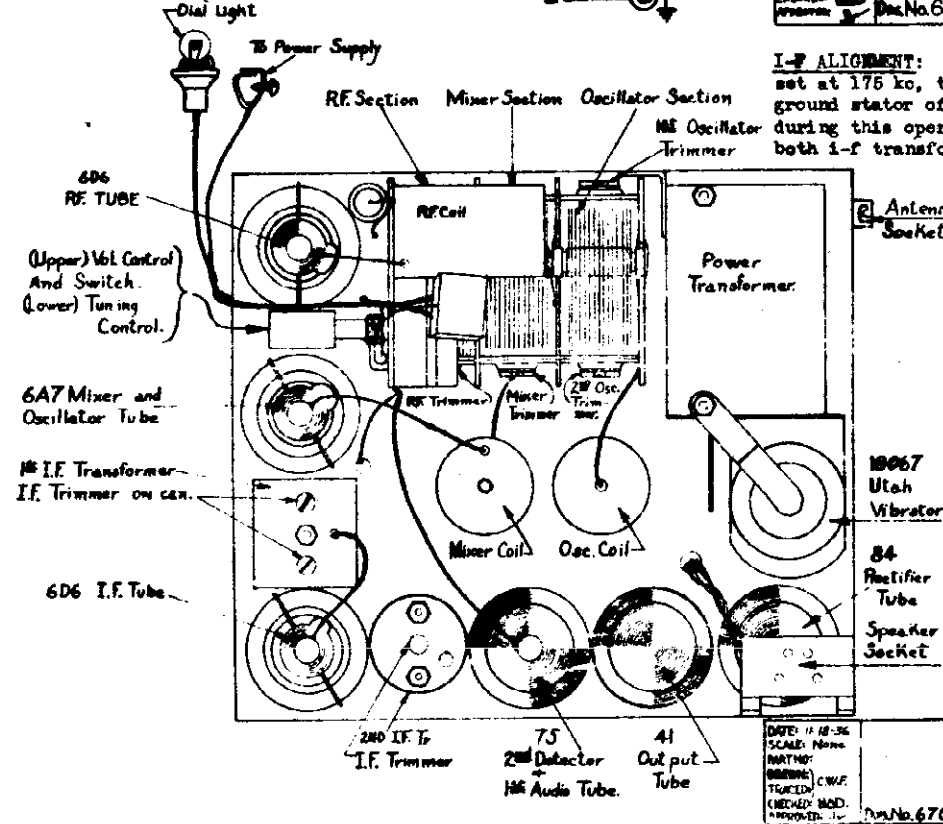


MODEL 6-37 Auto
Schematic, Voltage
Socket, Trimmers
Alignment

MID-WEST RADIO CORP.



DATE: 11-2-36
SCALE: NONE
PART NO:
DRAWN: RB-14
TRACED: RB-14
CHECKED: RB-14
APPROVED: RB-14
The Midwest Radio Corporation
CINCINNATI, OHIO U.S.A.
SCHEMATIC CIRCUIT DIAGRAM
OF THE 6-37
MODEL AUTO RECEIVER
Doc. No. 643

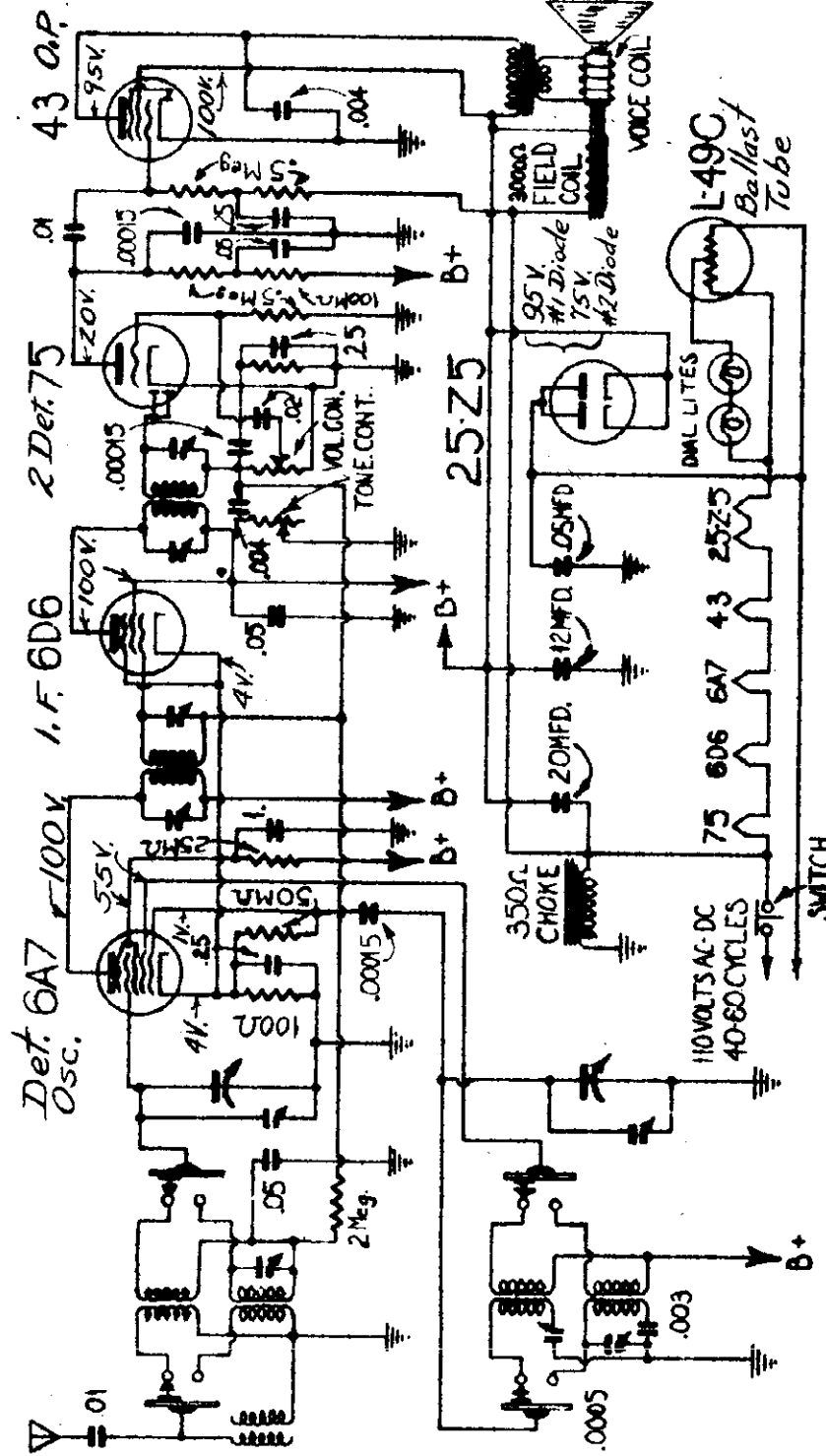


I-F ALIGNMENT: Connect signal generator set at 175 kc, to grid of 6A7 tube and ground stator of oscillator condenser during this operation. Peak trimmers of both i-f transformers for maximum.

R-F ALIGNMENT: Connect signal generator to antenna post of set through a standard dummy antenna. Remove ground from oscillator condenser. Set dial and signal generator to 1500 kc and align trimmers on variable condensers for maximum output. All other frequencies will be aligned automatically because of cut section oscillator condenser.

DATE: 11-18-36
SCALE: None
DRAWN: C.W.F.
TRACED: C.W.F.
CHECKED: M.D.
APPROVED: J.L.
The Midwest Radio Corporation
CINCINNATI, OHIO U.S.A.
TUBE & TRIMMER
LOCATION ON THE
Doc. No. 670 6-37 AUTO RECEIVER

MID-WEST RADIO CORP.



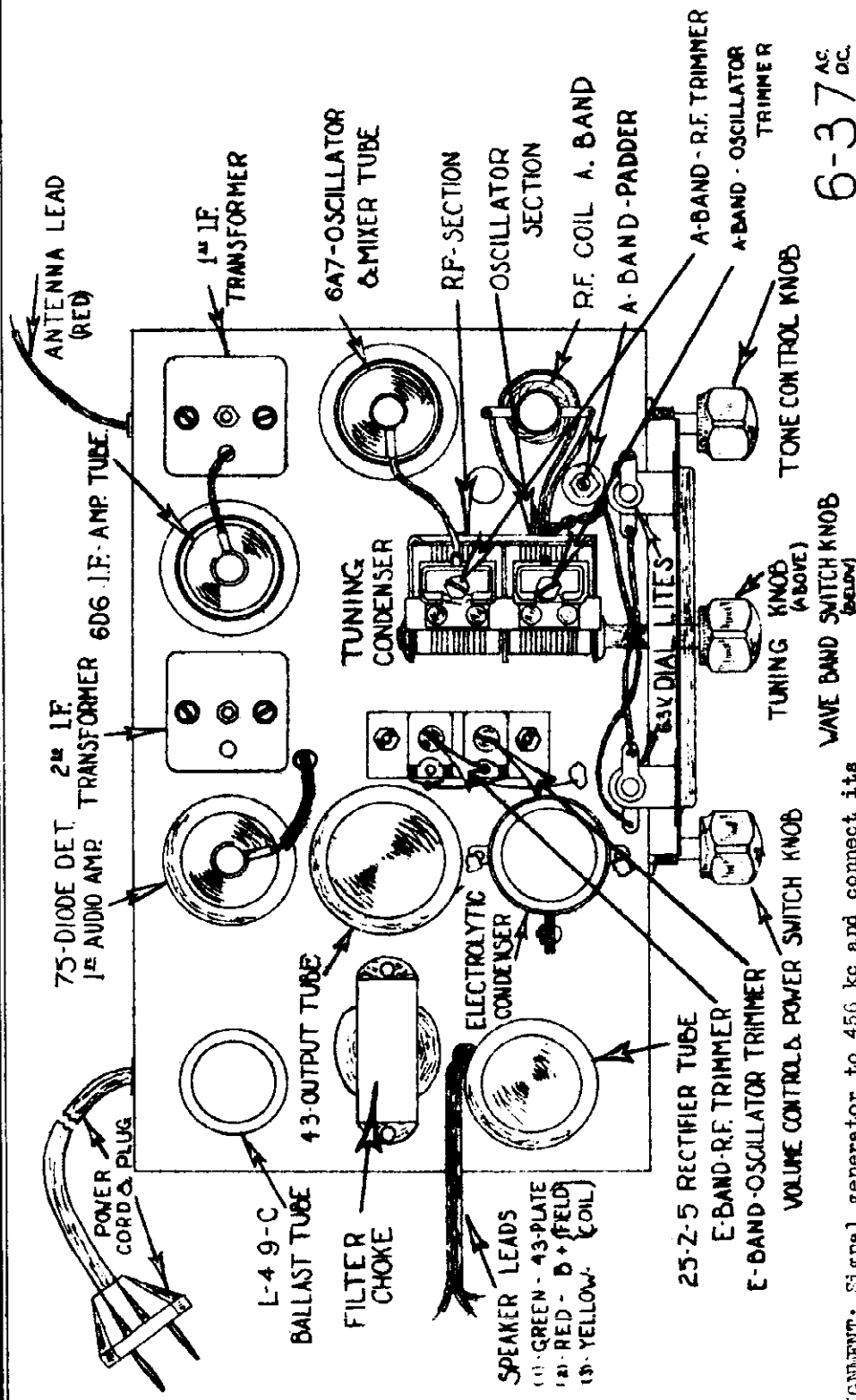
IF PEAK 456 KC

6-37 8E

DATE: 10-18-36	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO U.S.A.
SCALE: NONE	SCHEMATIC CIRCUIT DIAGRAM OF THE 6-37
DRAWN: RU-LU		AC-DC MODEL DFC11FD
TRACED: RU-LU	
CHECKED: MAD.	
APPROVED:	

MODEL 6-37 AC-DC
 Socket, Trimmers
 Alignment

MID-WEST RADIO CORP.



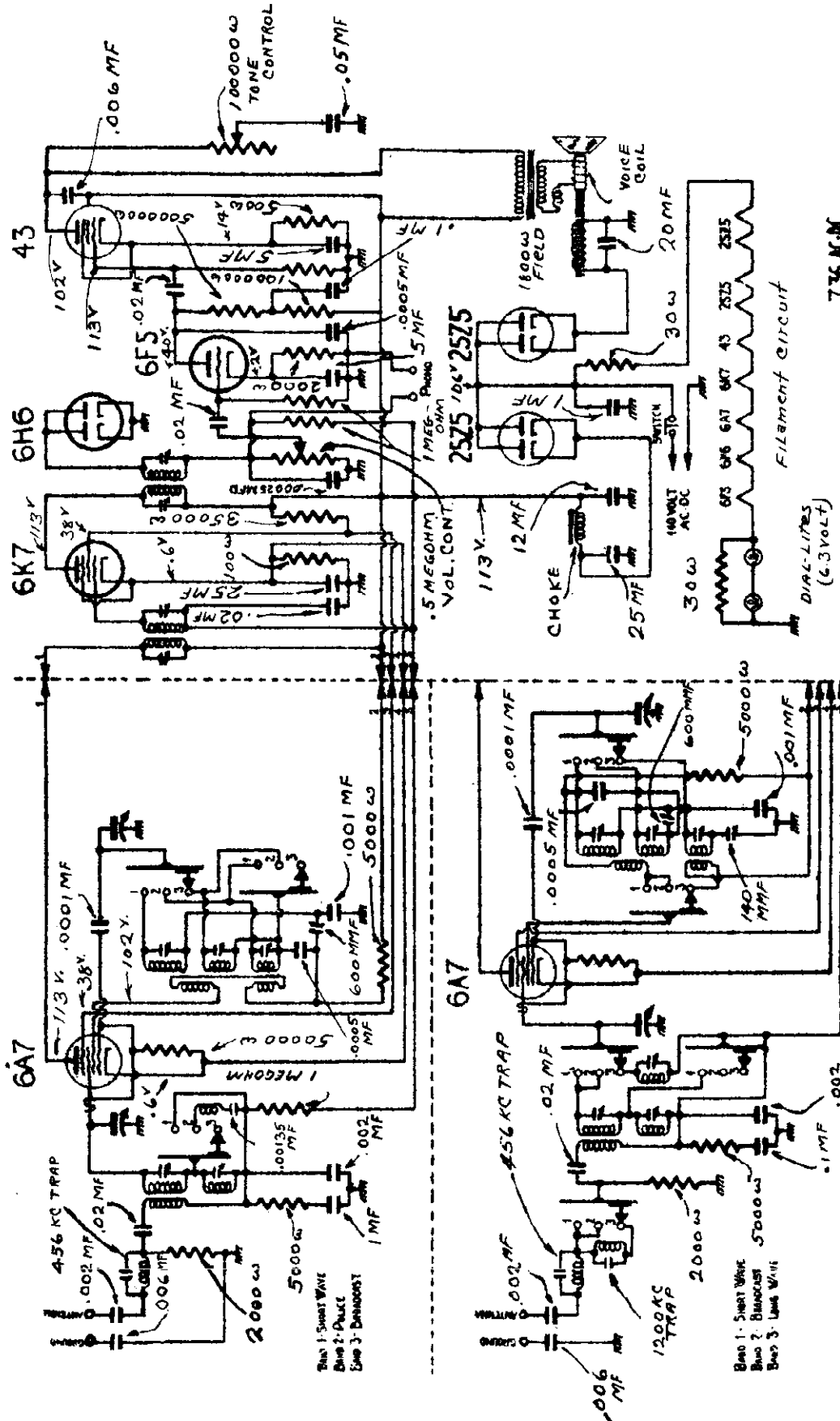
6-37 AC-DC

DATE: 11-18-38
 SCALE: NONE
 DRAWN: P-L-U
 TRACED: P-L-U
 CHECKED: HAD
 APPROVED: [Signature]
 The Midwest Radio Corporation
 CINCINNATI, OHIO, U.S.A.
 TOP VIEW OF MODEL 6-37 AC-DC
 SHOWING LOCATION OF TUBES,
 TRIMMERS, AND OTHER PARTS
 Part No. 658

I-F ALIGNMENT: Signal generator to 456 kc and connect its output to grid of 6A7 tube. Short-circuit front section of variable condenser. Adjust trimmers of both i-f transformers for maximum.

R-F ALIGNMENT: Broadcast Band-- Remove short circuit from condenser. Connect signal generator, set at 1500 kc, to antenna post of receiver through standard dummy antenna. Set dial to 1500 kc and peak variable condenser trimmers for maximum. Set signal generator and dial to 600 kc and adjust padder for maximum output. Re-adjust 1500-kc alignment.
Short-wave Alignment-- Set signal generator and dial to 15 mc and peak trimmers for maximum output. Low-frequency setting is automatically cared for by fixed calibrated padder.

MID-WEST RADIO CORP.



7-36 AC-DC

THE MIDWEST RADIO CORPORATION
CINCINNATI, OHIO, U.S.A.

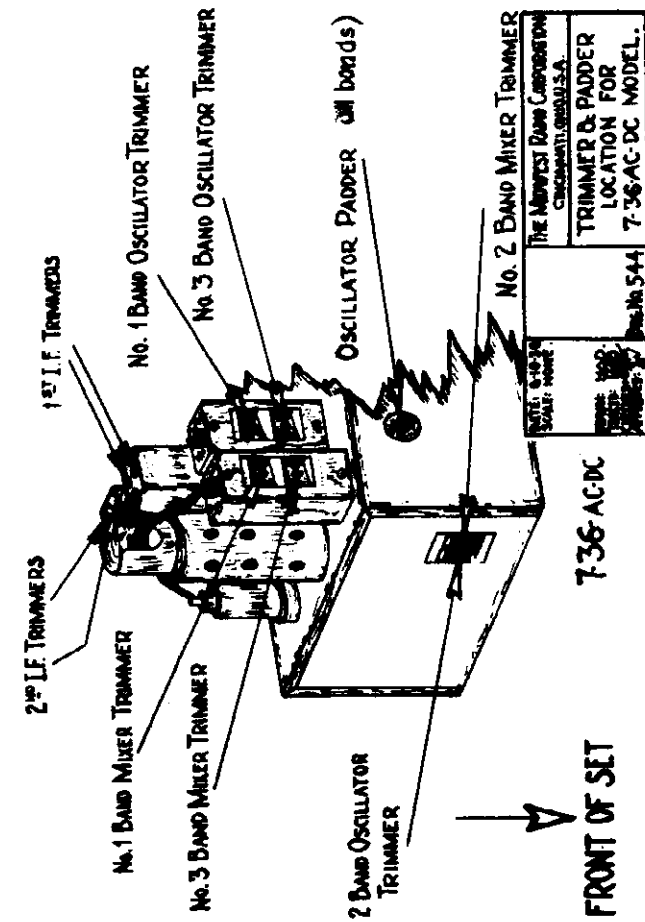
SCHMATIC CIRCUIT DIAGRAM
OF THE
7-36 AC-DC MODEL RECEIVER

All parts and connections indicated to the right of this dotted line are identical on both Models.

IF PEAK 456KC

MODEL 7-36 AC-DC
Socket, Trimmers
Alignment

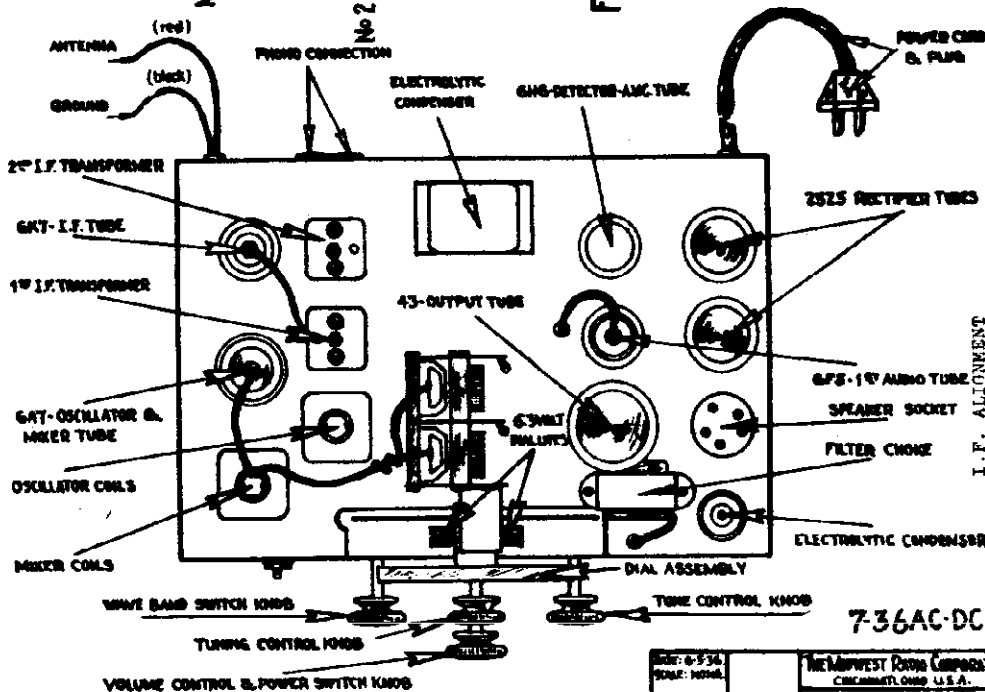
MIDWEST RADIO CORP.



R.F. ALIGNMENT

- (2) Band #1 Alignment :- The short circuit is removed from oscillator condenser and the signal generator is connected to the antenna post of the receiver through a standard dummy antenna. The receiver and signal generator are set at 16 m.c. The oscillator trimmer is adjusted so as to bring in the signal at this setting. The antenna trimmer is adjusted for maximum output.
- (3) Band #2 Alignment: - With the signal generator still connected to antenna post of receiver, set generator and receiver dial at 1400 k.c. Adjust oscillator trimmer so that signal comes in at this setting. The Antenna and R.F. trimmers are adjusted for maximum output. The signal generator is set at 600 k.c. and the padder is adjusted so that the signal comes in at this point on the dial. After making this adjustment the 1400 k.c. adjustment should then be rechecked.
- (4) Band #3 Alignment: - With the receiver and signal generator both set at 325 k.c., the oscillator trimmer is adjusted so that this signal agrees with the dial. Antenna trimmer is then adjusted for maximum output.

Note: To assure more accurate trimmer setting always use lowest possible post oscillator output consistent with readable output meter scale deflection.



I.F. ALIGNMENT

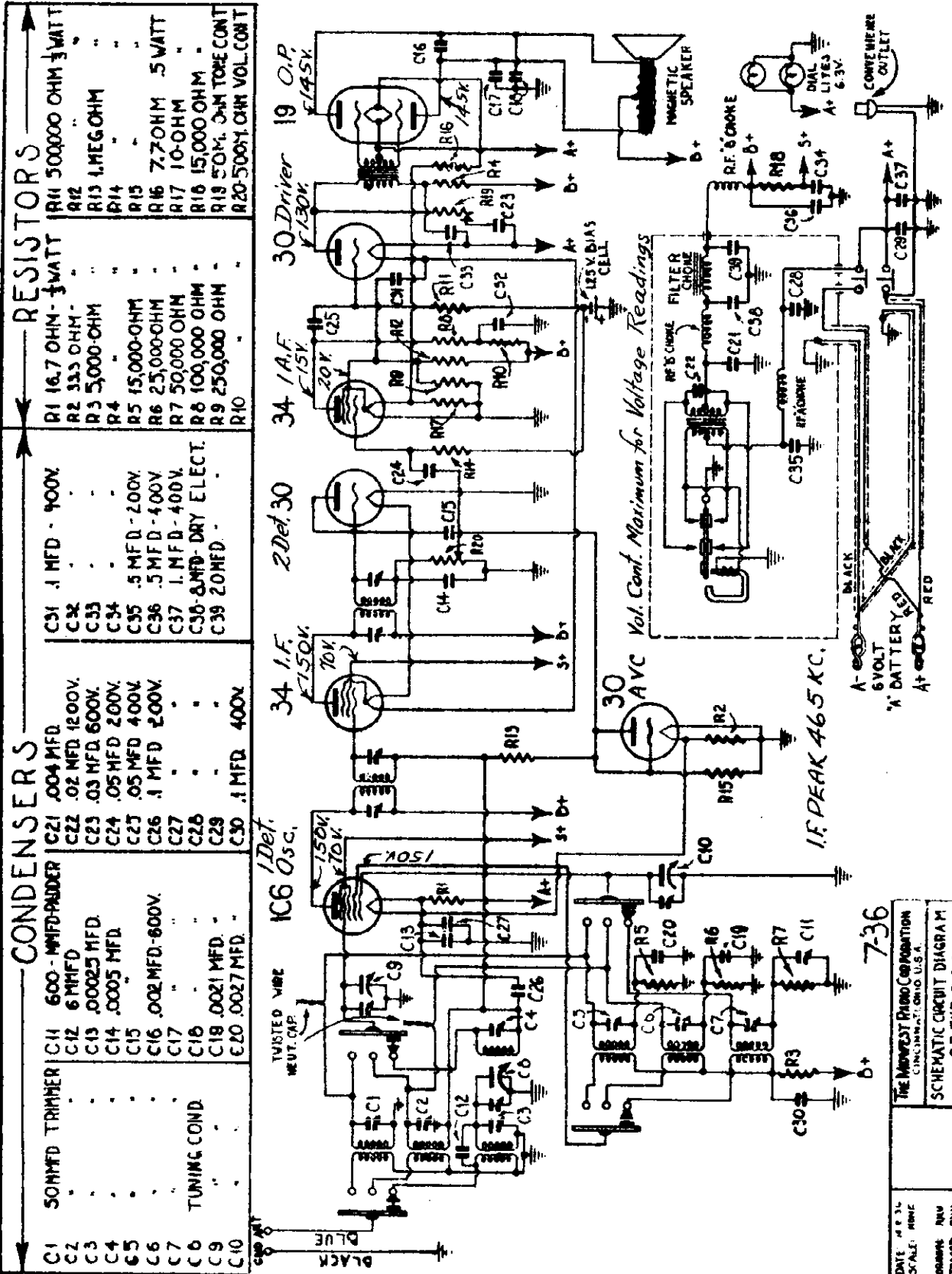
Set signal generator to 1450 k.c. Connect output meter from plate of 43 output tube to ground. Connect output of signal generator to grid cap of 6K7 tube. The front section of the tuning condenser if short circuited and the volume control is turned to maximum gain on output meter.

Note: To assure more accurate trimmer setting always use lowest possible test oscillator output consistent with readable output meter scale deflection.

METAL TUBES ARE INTERCHANGEABLE WITH GLASS COUNTERPART TUBES. EXAMPLE:- METAL TUBE 6K7 MAY BE REPLACED WITH GLASS COUNTERPART TUBE 6K7-G

MODEL: 7-36 SIZE: 8x10 PRINTED AND CHECKED: JMB APPROVED: JMB PART NO. 514	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO U.S.A. TOP VIEW OF THE 7-36 AC-DC MODEL RECEIVER SHOWING LOCATION OF TUBES & OTHER PARTS
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MID-WEST RADIO CORP.



RESISTORS

R1	16.7 OHM - 1/2 WATT
R2	333 OHM - "
R3	5,000 OHM - "
R4	"
R5	15,000 OHM - "
R6	25,000 OHM - "
R7	50,000 OHM - "
R8	100,000 OHM - "
R9	250,000 OHM - "
R10	"
R11	500,000 OHM - 1/2 WATT
R12	"
R13	1 MEG OHM - "
R14	"
R15	"
R16	7.7 OHM - 5 WATT
R17	10 OHM - "
R18	15,000 OHM - "
R19	50% OHM TOROIDAL
R20	500% OHM TOROIDAL

CONDENSERS

C1	50 MFD TRIMMER
C2	6 MFD
C3	.00025 MFD
C4	.0005 MFD
C5	.05 MFD 200V
C6	.05 MFD 400V
C7	.002 MFD - 600V
C8	"
C9	.0021 MFD - "
C10	.0027 MFD - "
C21	.004 MFD
C22	.02 MFD 120V
C23	.03 MFD 600V
C24	.05 MFD 200V
C25	.05 MFD 400V
C26	.1 MFD 200V
C27	"
C28	"
C29	"
C30	.1 MFD 400V
C31	.1 MFD - 900V
C32	"
C33	"
C34	"
C35	.5 MFD - 200V
C36	.5 MFD - 400V
C37	.1 MFD - 400V
C38	.8 MFD - DRY ELECT.
C39	.2 MFD - "

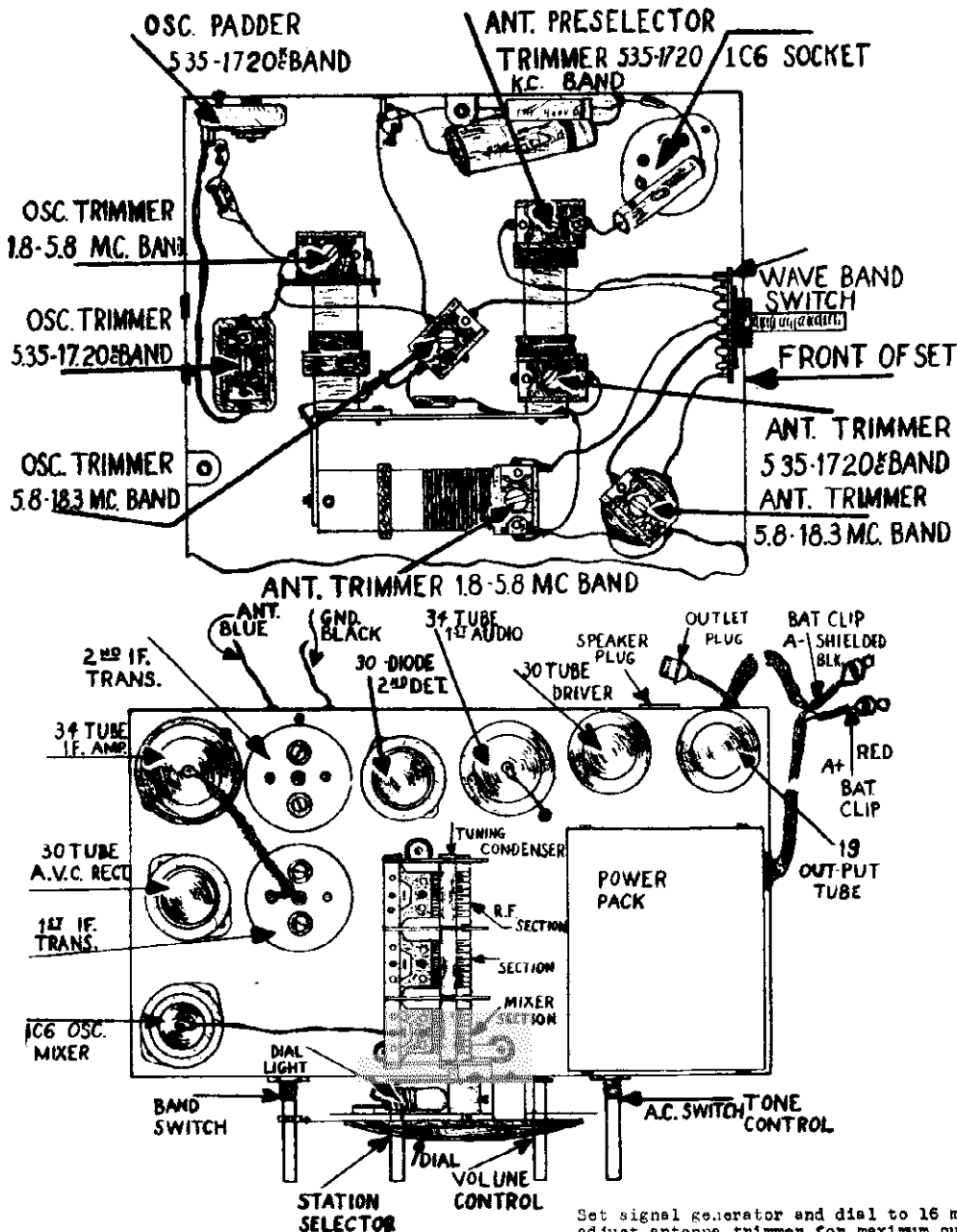
CONDENSERS

C1	50 MFD TRIMMER
C2	6 MFD
C3	.00025 MFD
C4	.0005 MFD
C5	.05 MFD 200V
C6	.05 MFD 400V
C7	.002 MFD - 600V
C8	"
C9	.0021 MFD - "
C10	.0027 MFD - "
C21	.004 MFD
C22	.02 MFD 120V
C23	.03 MFD 600V
C24	.05 MFD 200V
C25	.05 MFD 400V
C26	.1 MFD 200V
C27	"
C28	"
C29	"
C30	.1 MFD 400V
C31	.1 MFD - 900V
C32	"
C33	"
C34	"
C35	.5 MFD - 200V
C36	.5 MFD - 400V
C37	.1 MFD - 400V
C38	.8 MFD - DRY ELECT.
C39	.2 MFD - "

7-36
The Midwest Radio Corporation
CINCINNATI, OHIO, U.S.A.
SCHEMATIC CIRCUIT DIAGRAM
OF THE 7-36

MODEL 7-36 Batt.
Socket, Trimmers
Alignment

MID-WEST RADIO CORP.

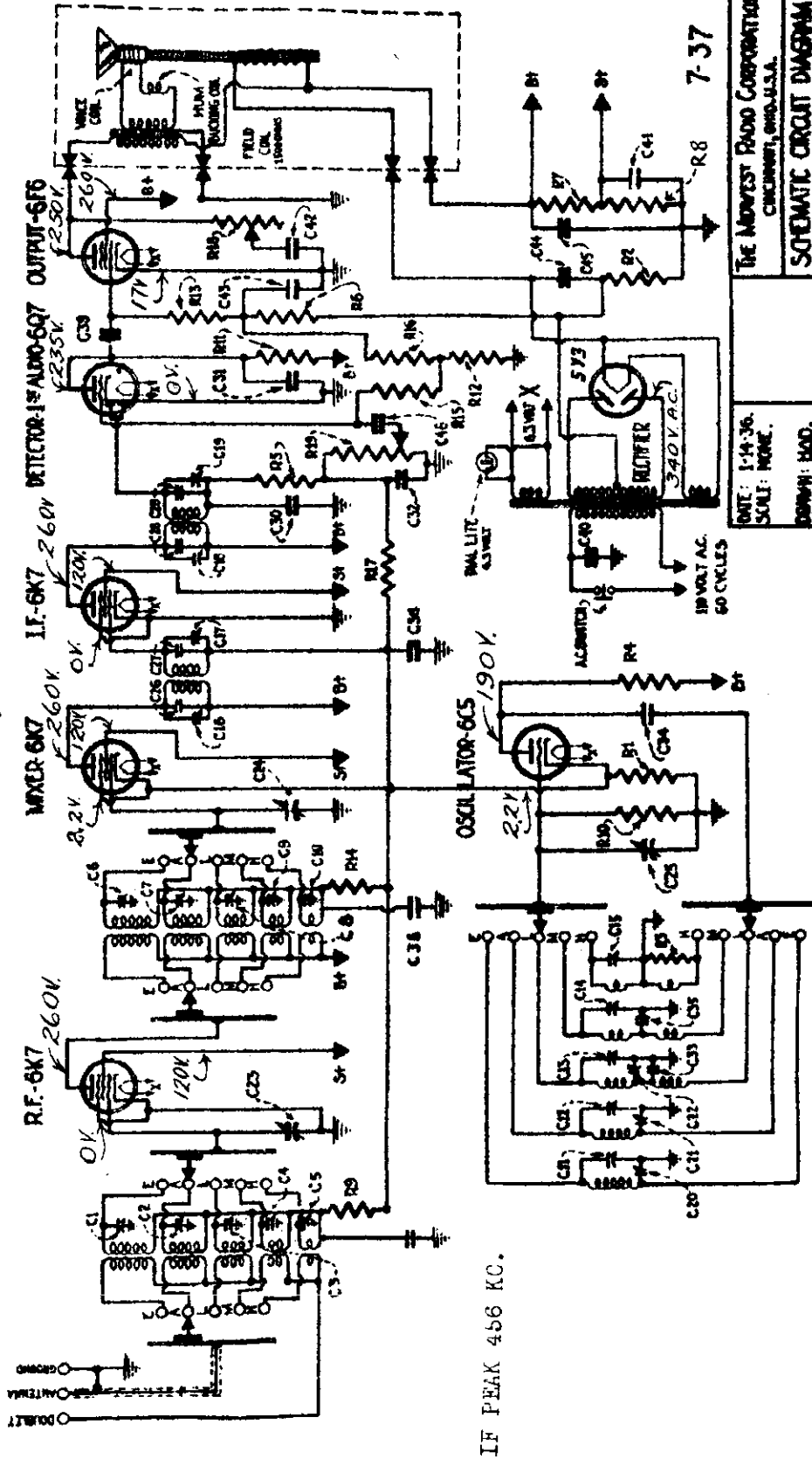


- (1) Connect output of signal generator to the control grid of the 106 tube through a .02 mfd. condenser. Leave the grid cap connected to the grid terminal of the tube and connect the ground side of the signal generator to the receiver ground. Set signal generator to 465 k.c. and connect output meter between plates of the 19 output tube. Adjust grid and plate trimmer screws of 1st and 2nd I. F. transformers for maximum gain.
 - (2) Connect output of signal generator to antenna post of receiver through a standard dummy antenna.
 - (a) Place band selector switch for operation on the 5.8 to 18.3 m.c. band. Tune the receiver dial and the signal generator to exactly 18.3 m.c. Adjust the 18.3 m.c. oscillator trimmer for maximum gain. Care must be taken that the fundamental peak and not the image peak is used for aligning the receiver at this frequency.
 - (b) Place band selector switch for operation on the 1.8 to 5.8 m.c. band. Set the signal generator and dial to a frequency of 5.8 m.c. Adjust 5.8 m.c. oscillator trimmer for maximum output. Adjust antenna trimmer for maximum output.
 - (c) Place band selector switch for operating on the 5.35 to 17.20 k.c. band. Set signal generator and dial to 17.20 k.c. and adjust oscillator trimmer for maximum output. Adjust 1400 k.c. R. F. and antenna trimmers for maximum output. Set signal generator and dial to 600 k.c. and adjust oscillator padder for maximum output.
- Set signal generator and dial to 16 m.c. and adjust antenna trimmer for maximum output.
- It will be necessary to recheck the 17.20 k.c. setting after this alignment.

MID-WEST RADIO CORP.

CONDENSERS		RESISTORS	
35MMFD. TRIMMER	C15	200 OHMS	R1
35MMFD. TRIMMER	C16	25 WATT	R2
I.F.	C17	500 000	R3
35MMFD. TRIMMER	C18	25 WATT	R4
35MMFD. TRIMMER	C19	25 WATT	R5
35MMFD. TRIMMER	C20	1	R6
35MMFD. TRIMMER	C21	1	R7
35MMFD. TRIMMER	C22	1	R8
35MMFD. TRIMMER	C23	1	R9
35MMFD. TRIMMER	C24	1	R10
35MMFD. TRIMMER	C25	1	R11
35MMFD. TRIMMER	C26	1	R12
35MMFD. TRIMMER	C27	1	R13
35MMFD. TRIMMER	C28	1	R14
35MMFD. TRIMMER	C29	1	R15
35MMFD. TRIMMER	C30	1	R16
35MMFD. TRIMMER	C31	1	R17
35MMFD. TRIMMER	C32	1	R18
35MMFD. TRIMMER	C33	1	R19
35MMFD. TRIMMER	C34	1	R20
35MMFD. TRIMMER	C35	1	R21
35MMFD. TRIMMER	C36	1	R22
35MMFD. TRIMMER	C37	1	R23
35MMFD. TRIMMER	C38	1	R24
35MMFD. TRIMMER	C39	1	R25
35MMFD. TRIMMER	C40	1	R26
35MMFD. TRIMMER	C41	1	R27
35MMFD. TRIMMER	C42	1	R28
35MMFD. TRIMMER	C43	1	R29
35MMFD. TRIMMER	C44	1	R30
35MMFD. TRIMMER	C45	1	R31
35MMFD. TRIMMER	C46	1	R32

FOR ALIGNMENT, SEE INDEX



THE MIDWEST RADIO CORPORATION
CINCINNATI, OHIO, U.S.A.

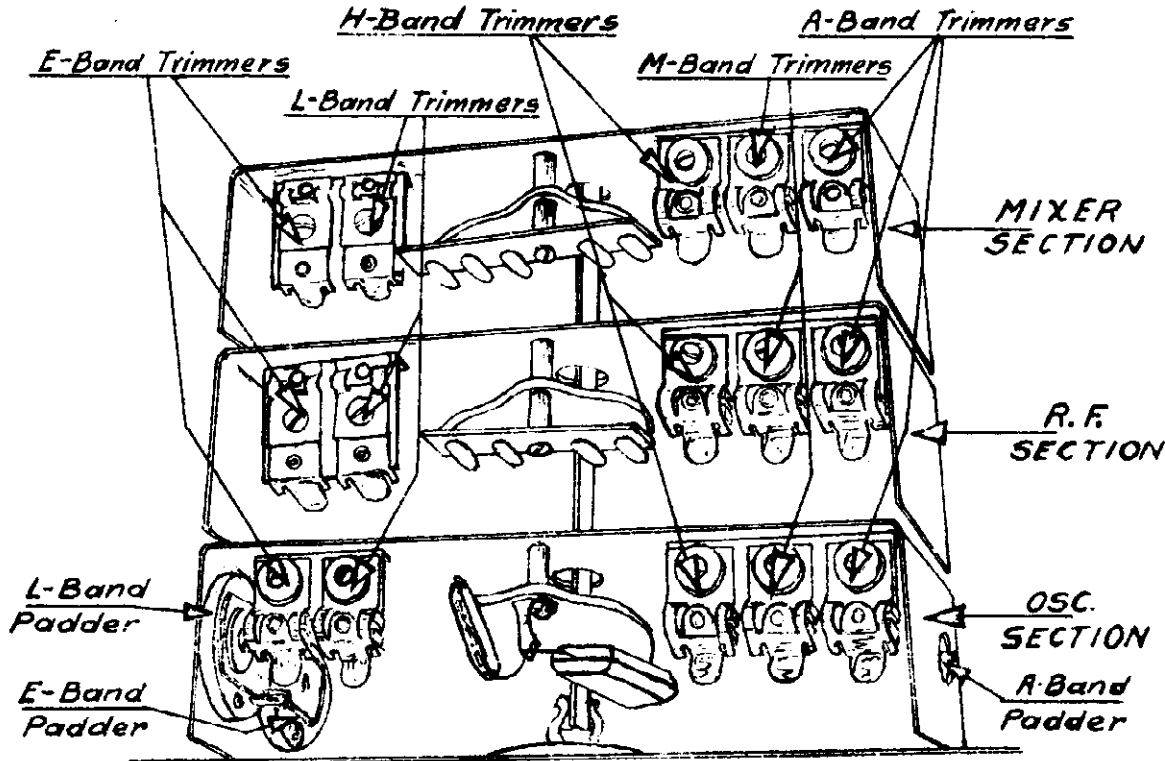
DATE: 1-14-36.
SCALE: NONE.

DESIGNED: HADD.
TRACED: HADD.
CHECKED: HADD.

7-37

MODEL 7-37 AC
Socket, Trimmers

MID-WEST RADIO CORP.

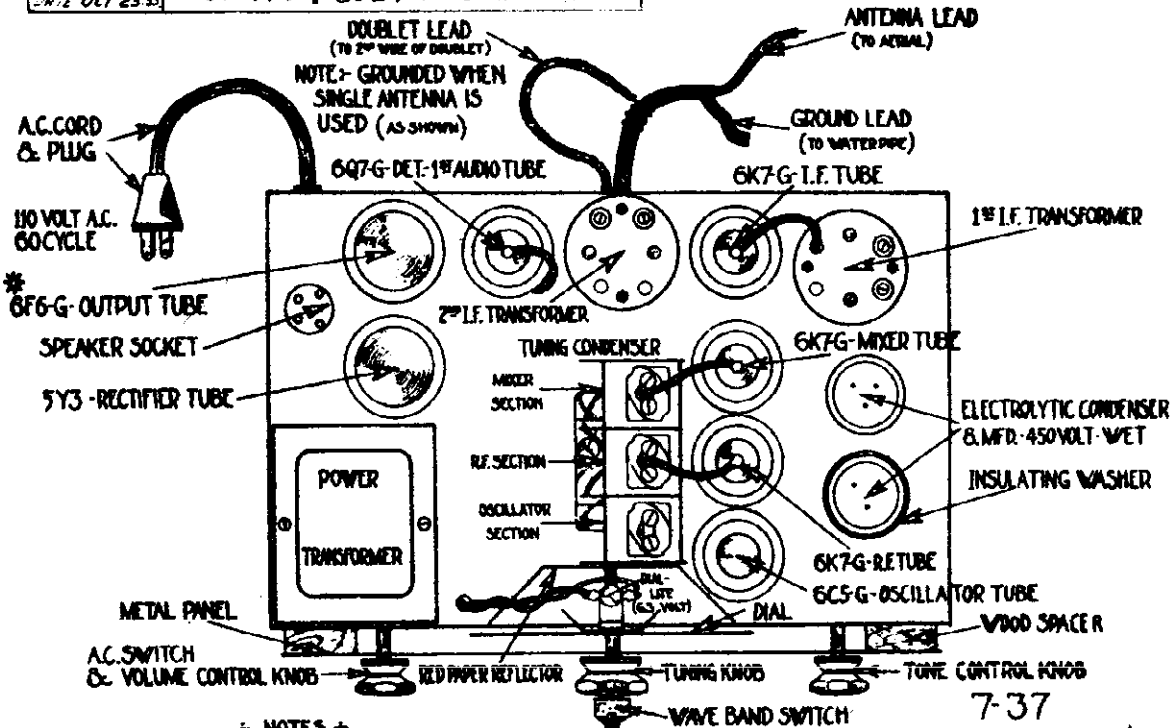


Drawn F.S.M.
Checked R.C.C.
Approved J.V.
DATE OCT 25 35

THE MIDWEST RADIO CORP.
CINCINNATI, OHIO.

PADDER AND TRIMMER LOCATIONS
OF THE 7-3637 MODEL SET.

FRONT OF SET
↓



+ NOTES +

This chassis is shown with glass-counterpart tube.
* Metal, metal-glass or glass-counterpart tubes may be used. For example the Output tube shown is a glass-counterpart tube numbered 6F6-G. A metal-glass tube would be numbered 6F6-MG and a Metal tube would be numbered 6F6.
Wood spacers and metal panel used in cascade models only.

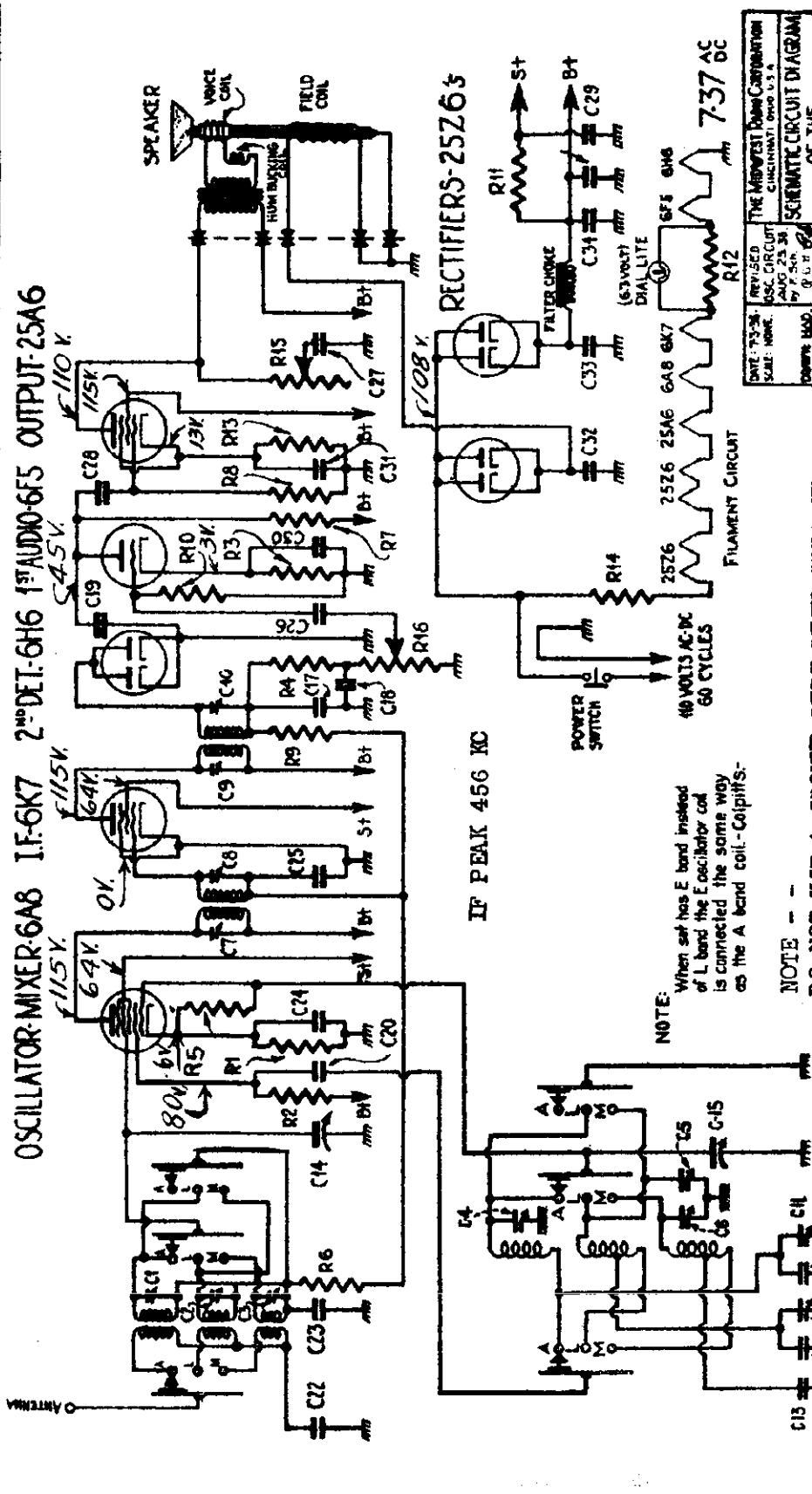
DATE: 1-16-36
SCALE: NONE.
DRAWN: M.A.D.
TRACED: M.A.D.
CHECKED: J.V.
APPROVED: J.V.

THE MIDWEST RADIO CORPORATION
CINCINNATI, OHIO, U.S.A.

TOP VIEW OF THE 7-37 MODEL
RECEIVER SHOWING LOCATION
OF TUBES & OTHER PARTS.

MIDWEST RADIO CORP.

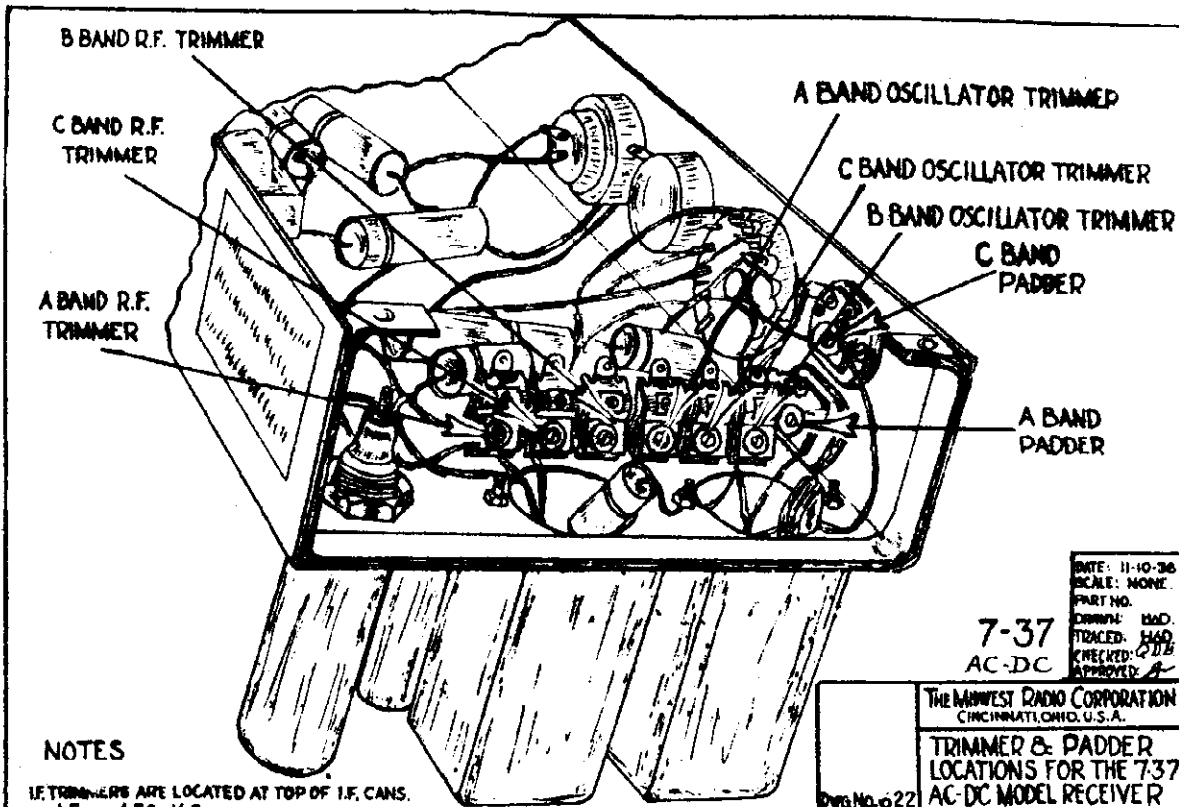
CONDENSERS		RESISTORS	
C1 35 MMFD. TRIMMERS	C25 0.5MFD. 200 VOLT	R1 100 OHMS .25 WATT	R17 500 OHMS 1 WATT
C2 35 MMFD. TRIMMERS	C26 450 MMFD. TUNING CONDENSER	R2 2000 OHMS	R18 28 OHMS 2 WATT
C3 35 MMFD. TRIMMERS	C27 4.00 VOLT 200 VOLT	R3 25,000 OHMS	R19 500,000 OHM TONE CONTROL
C4 35 MMFD. TRIMMERS	C28 25 MMFD. 200 VOLT	R4 200,000 OHMS	R20 500,000 OHM VOLUME
C5 35 MMFD. TRIMMERS	C29 25 MMFD. 200 VOLT	R5 500,000 OHMS	
C6 100 MMFD. MICA	C30 10. MFD. 25 VOLT-10K	R6 1 MEGOHM	
C7 250 MMFD. MICA	C31 12. MFD.	R7 2000 OHMS	
C8 250 MMFD. MICA	C32 20. MFD. 175 VOLT-10K	R8 25,000 OHMS	
C9 250 MMFD. MICA	C33 20. MFD. 175 VOLT-10K	R9 1 MEGOHM	
C10 250 MMFD. MICA	C34 20. MFD. 175 VOLT-10K	R10 3 MEGOHM	
C11 350 MMFD. PADDER		R11 5000 OHMS 1 WATT	
		R12 21 OHMS 1 WATT	



DATE: 7-23-34
 SCALE: NONE
 BY: F. S. C.
 CHECKED: G. H. H.
 THE MIDWEST RADIO CORPORATION
 CHICAGO, ILL. U.S.A.
 SCHEMATIC CIRCUIT DIAGRAM

MODEL 7-37 AC-DC
Socket, Trimmers

MID-WEST RADIO CORP.



DATE: 11-10-36
SCALE: NONE
PART NO.
DRAWN: HAD.
TRACED: HAD.
CHECKED: 2/28
APPROVED: A

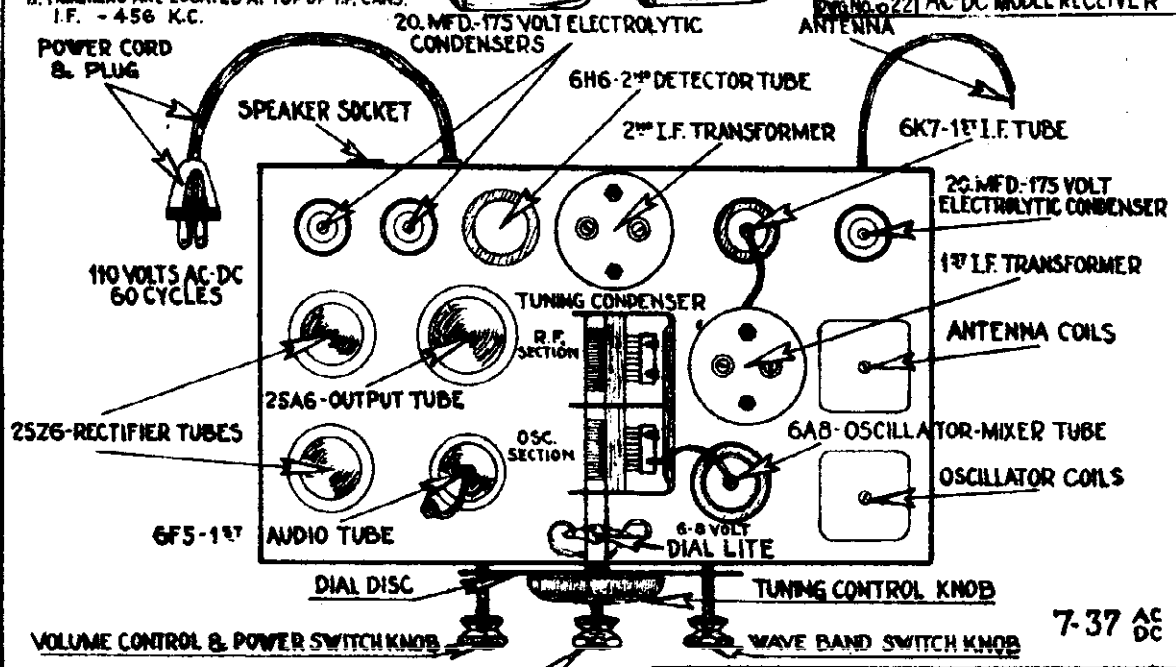
7-37
AC-DC

THE MIDWEST RADIO CORPORATION
CINCINNATI, OHIO, U.S.A.

TRIMMER & PADDER
LOCATIONS FOR THE 7-37
AC-DC MODEL RECEIVER

NOTES

IF TRIMMERS ARE LOCATED AT TOP OF I.F. CANS.
I.F. - 456 K.C.



÷ NOTE ÷
Do NOT use a ground wire with this set.

DATE: 7-20-36
SCALE: NONE.
DRAWN: HAD.
TRACED: HAD.
CHECKED: HAD.
APPROVED: A

DWG. No. 572

THE MIDWEST RADIO CORPORATION
CINCINNATI, OHIO, U.S.A.

TOP VIEW OF THE 7-37 AC-DC
MODEL RECEIVER SHOWING LOC
ATION OF TUBES & OTHER PARTS

MID-WEST RADIO CORP.

INSTRUCTIONS FOR ALIGNING THE MIDWEST 7-TUBE 1935-36 MODEL RECEIVERS

- (1) Set the signal generator to 456 k.c. and connect it from the mixer grid to ground.
- (2) Remove the oscillator tube from the receiver.
- (3) Connect the output meter from the plate of the output tube to positive B+.
- (4) Using a moderately weak signal approximately 40 microvolts, align the two I.F. transformers to maximum output.
- (5) Keep decreasing the oscillator input and realigning for maximum gain.

This completes the alignment of the I.F. amplifier.

Insert the oscillator tube. Connect the signal generator and mixer grid lead between antenna and ground.

- (1) Set the wave change switch to the "E" Band.
- (2) Set the signal generator to 325 k.c.
- (3) Adjust the "E" oscillator trimmer to maximum gain, then adjust the "E" Band R.F. and the "E" Band mixer trimmers for maximum gain.
- (4) Reset the signal generator to 135 k.c. and rotate the receiver dial to 135 k.c.
- (5) Adjust the "E" Band padder for maximum signal.
- (6) Repeat the adjustment of trimmers and padders until the adjustment of one does not effect the adjustment of the other.

This completes the alignment of the "E" Band.

- (1) Set the wave change switch to the "A" Band.
- (2) Set the signal generator to 1490 k.c.
- (3) Adjust the "A" oscillator trimmer to maximum gain, then adjust the "A" Band R.F. and the "A" Band mixer trimmers for maximum gain.
- (4) Reset the signal generator to 550 k.c. and rotate the receiver dial to 550 k.c.
- (5) Adjust the "A" Band padder for maximum signal.
- (6) Repeat the adjustment of trimmers and padders until the adjustment of one does not effect the adjustment of the other.

This completes the alignment of the "A" Band.

- (1) Set the wave change switch to the "L" Band.
- (2) Set the signal generator to 3.8 megacycles.
- (3) Adjust the "L" oscillator trimmer to maximum gain, then adjust the "L" Band R.F. and the "L" Band mixer trimmers for maximum gain.
- (4) Reset the signal generator to 1.6 megacycles and rotate the receiver dial to 1.6 megacycles.
- (5) Adjust the "L" Band padder for maximum signal.
- (6) Repeat the adjustment of trimmers and padders until the adjustment of one does not effect the adjustment of the other.

This completes the alignment of the "L" Band.

- (1) Set the wave change switch to the "M" Band.
- (2) Set the signal generator to 11.5 megacycles.
- (3) Adjust the "M" oscillator trimmer to maximum gain, then adjust the "M" Band R.F. and the "M" Band mixer trimmers for maximum gain.

This completes the alignment of the "M" Band.

- (1) Set the wave change switch to the "H" Band.
- (2) Set the signal generator to 26 megacycles.
- (3) Adjust the "H" Band oscillator trimmer to maximum gain, then adjust the "H" Band R.F. and the "H" band mixer trimmers for maximum gain.

This completes the alignment of the "H" Band.

INSTRUCTIONS FOR ALIGNING THE MIDWEST 7-37 AC-30 RECEIVER

- (1) Set the signal generator to 456 k.c. and connect it from the mixer grid to ground.
- (2) Be sure that set is not tuned to a station.
- (3) Connect the output meter from the plate of the output tube to positive B.
- (4) Using a moderately weak signal approximately 60 microvolts, align the two I.F. transformers to maximum gain.
- (5) Keep decreasing the oscillator input and realigning for maximum gain.

This completes the alignment of the I.F. amplifier.

Connect the signal generator between antenna and ground. Connect mixer grid lead to grid of mixer tube.

- (1) Set the wave change switch to the "A" band.
- (2) Set the signal generator to 1490 k.c.
- (3) Adjust the "A" oscillator trimmer to maximum gain, then adjust "A" band mixer trimmer for maximum gain.
- (4) Reset the signal generator to 550 k.c. and rotate the receiver dial to 550 k.c.
- (5) Adjust the "A" band padder for maximum signal.
- (6) Repeat the adjustment of trimmers and padders until the adjustment of one does not effect the adjustment of the other.

This completes the alignment of the "A" band.

- (1) Set the wave change switch to the "B" band.
- (2) Set the signal generator to 12 mc.
- (3) Adjust the "B" oscillator trimmer to maximum gain, then adjust the "B" band mixer for maximum gain.

This completes the alignment of the "B" band.

Short Wave Receiver

- (1) Set the wave change switch to the "C" band.
- (2) Set the signal generator to 4 m.c. Set dial at 75.
- (3) Adjust the "C" oscillator trimmer to maximum gain, then adjust the "C" band mixer trimmers for maximum gain.
- (4) Reset the signal generator to 2 m.c. and rotate the receiver dial to 16.
- (5) Adjust the "C" band padder for maximum signal.
- (6) Repeat the adjustment of trimmers and padders until the adjustment of one does not effect the adjustment of the other.

This completes the alignment of the "C" band s.w.

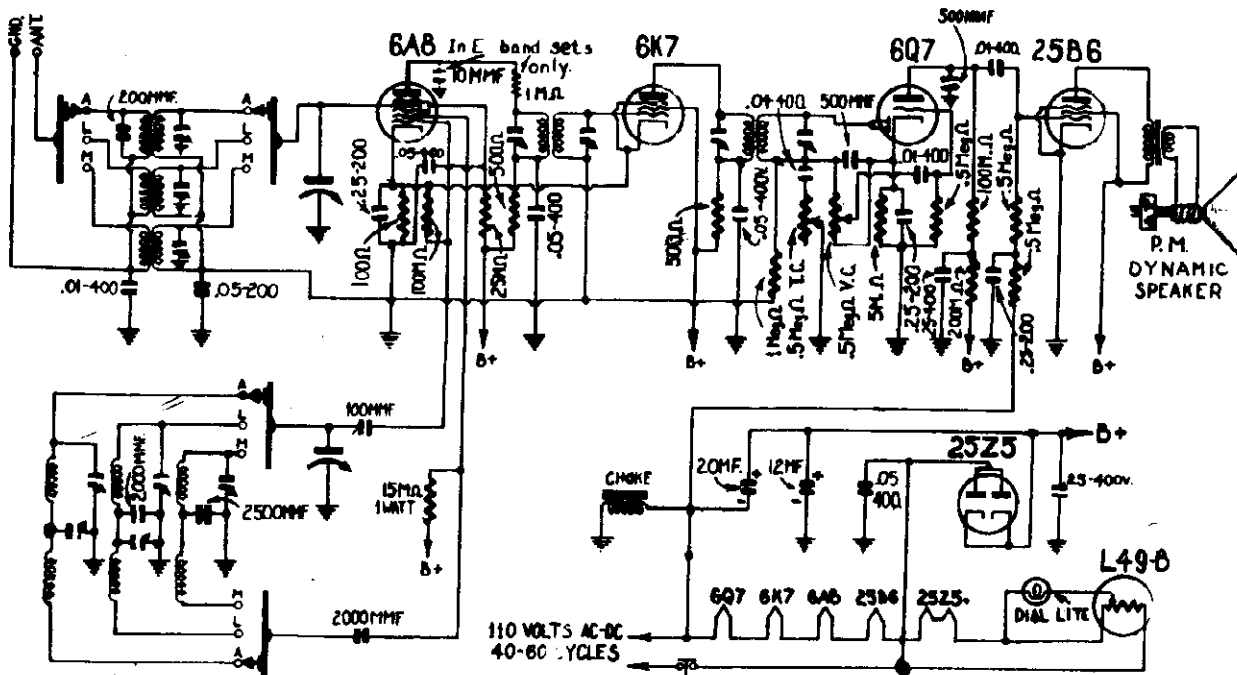
Long Wave Receiver

- (1) Set the wave change switch to the "C" band.
- (2) Set the signal generator to 325 k.c.
- (3) Adjust the "C" oscillator trimmer to maximum gain, then adjust the "C" band mixer trimmers for maximum gain.
- (4) Reset the signal generator to 150 k.c. and rotate the receiver dial to 150 k.c.
- (5) Adjust the "C" band padder for maximum signal.
- (6) Repeat the adjustment of trimmers and padders until the adjustment of one does not effect the adjustment of the other.

This completes the alignment of the "C" band l.w.

MODEL 6-38 AC-DC
(Export)
Schematic, Socket

MID-WEST RADIO CORP.



NOTE
ALL R.F. & OSC. TRIMMERS
ARE 45 MMFD MAX. CAP.
OSC. PADDER IS
500MMFD. MAX. CAP.

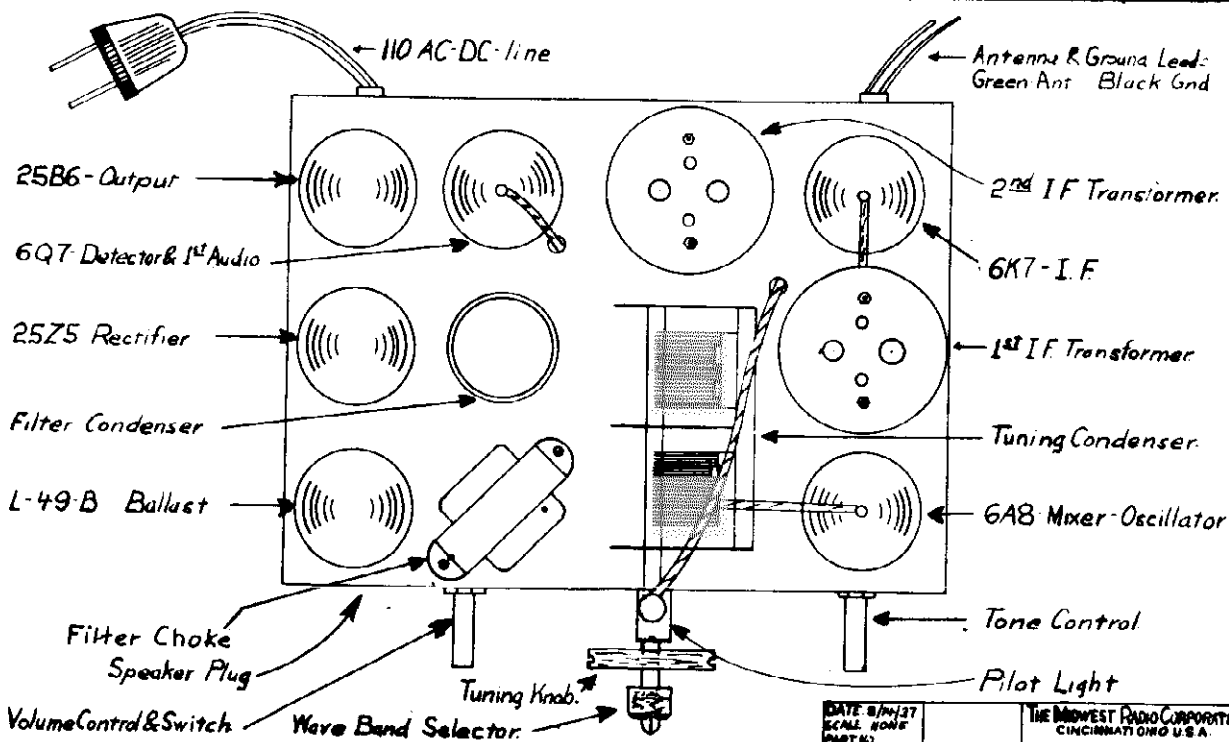
E BAND NOTE
In sets having long w.v.
band, E (long wave) band coil
replaces L Band coil. The
oscillator is connected colpits.

POWER SWITCH
(MOUNTED ON VOL. CONT)

EXPORT 6-38 AC DC

I.F. = 456 KC.

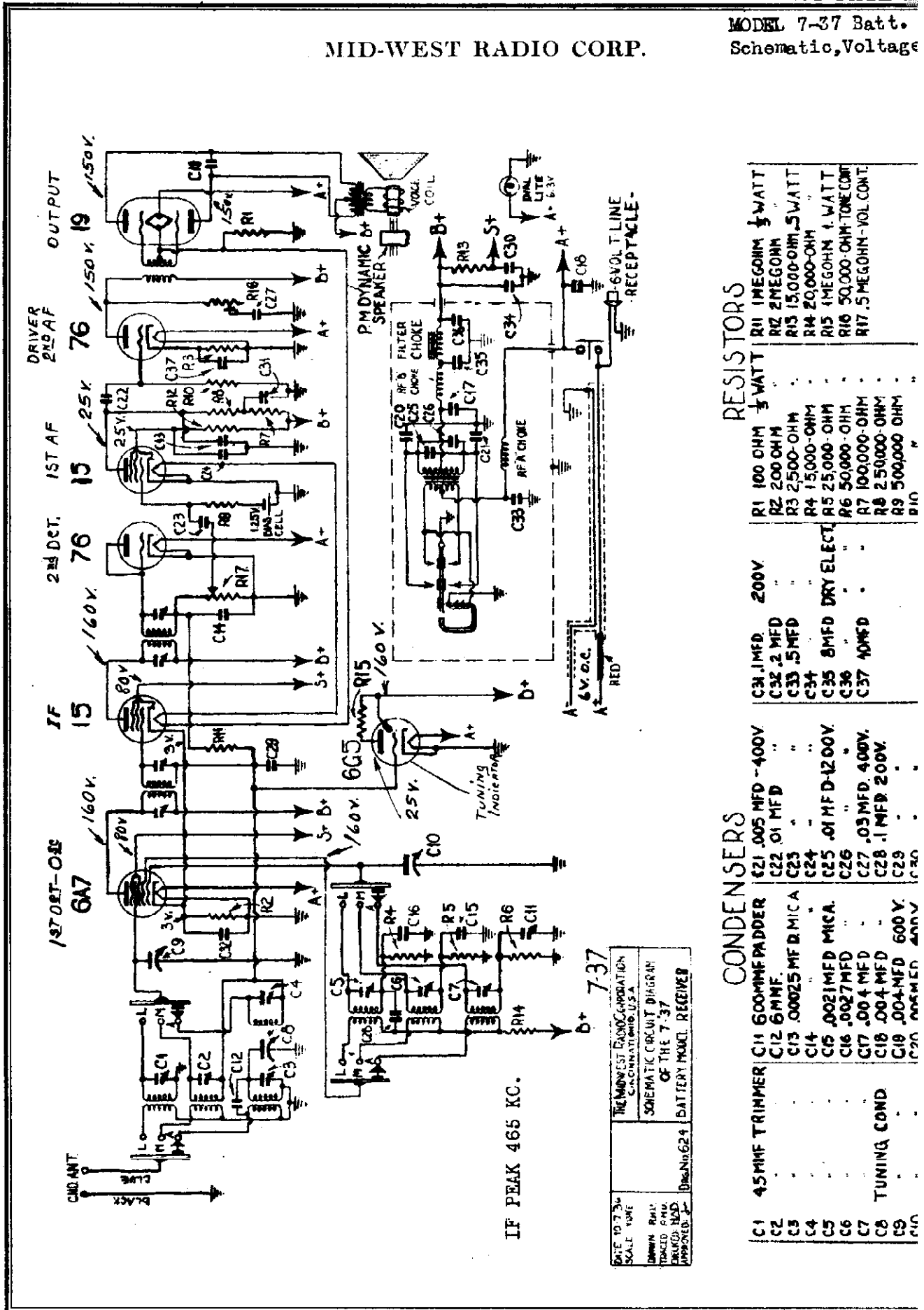
DATE: 8-20-37	THE MIDWEST RADIO CORPORATION CINCINNATI OHIO U.S.A.
SCALE: NONE	SCHEMATIC CIRCUIT DIAGRAM OF THE 6-38 AC DC
PART NO.	
DRAWN: G.W.	
TRACED: P.W.	
CHECKED: P.W.	Doc. No. 914
APPROVED:	



FOR TRIMMERS, SEE INDEX

DATE: 8/21/37	THE MIDWEST RADIO CORPORATION CINCINNATI OHIO U.S.A.
SCALE: NONE	Top View of 6-38 Export
PART NO.	
DRAWN: G.W.	
TRACED: P.W.	
CHECKED: P.W.	Doc. No. 971
APPROVED:	

MID-WEST RADIO CORP.



IF PEAK 465 KC.

7-37

THE MIDWEST RADIO CORPORATION
CINCINNATI, OHIO, U.S.A.
SCHEMATIC CIRCUIT DIAGRAM
OF THE 7-37
BATTERY MODEL RECEIVER
Des. No. G24

CONDENSERS

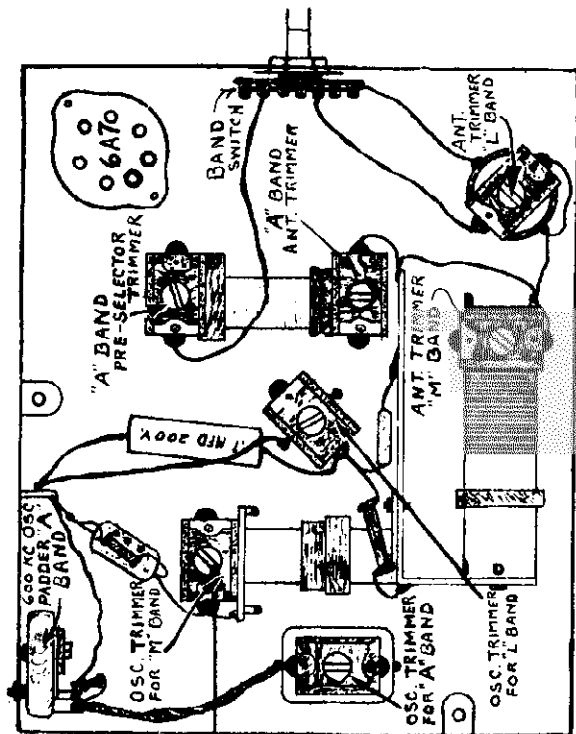
C1	45 MFD TRIMMER	C11	600 MFD	400V
C2		C12	6 MFD	
C3		C13	.00025 MFD	MICA
C4		C14		
C5		C15	.0021 MFD	MICA
C6		C16	.0027 MFD	
C7		C17	.004 MFD	
C8	TUNING COND.	C18	.004 MFD	
C9		C19	.004 MFD	600 V.
C10		C20	.005 MFD	400V
		C21	.005 MFD	400V
		C22	.01 MFD	
		C23		
		C24		
		C25	.01 MFD	1200V.
		C26		
		C27	.03 MFD	400V.
		C28	.1 MFD	200V.
		C29		
		C30		

RESISTORS

R1	100 OHM	R11	1 MEG OHM	1/2 WATT
R2	200 OHM	R12	2 MEG OHM	
R3	2500 OHM	R13	15,000 OHM	1/2 WATT
R4	15,000 OHM	R14	20,000 OHM	
R5	25,000 OHM	R15	1 MEG OHM	1 WATT
R6	50,000 OHM	R16	50,000 OHM	TONE CONT.
R7	100,000 OHM	R17	5 MEG OHM	VOL. CONT.
R8	250,000 OHM			
R9	500,000 OHM			
R10				
		R18	150 OHM	
		R19	25 OHM	
		R20	100 OHM	
		R21	100 OHM	
		R22	100 OHM	
		R23	100 OHM	
		R24	100 OHM	
		R25	100 OHM	
		R26	100 OHM	
		R27	100 OHM	
		R28	100 OHM	
		R29	100 OHM	
		R30	100 OHM	

MODEL 7-37 Batt.
Socket, Trimmers
Alignment

MID-WEST RADIO CORP.

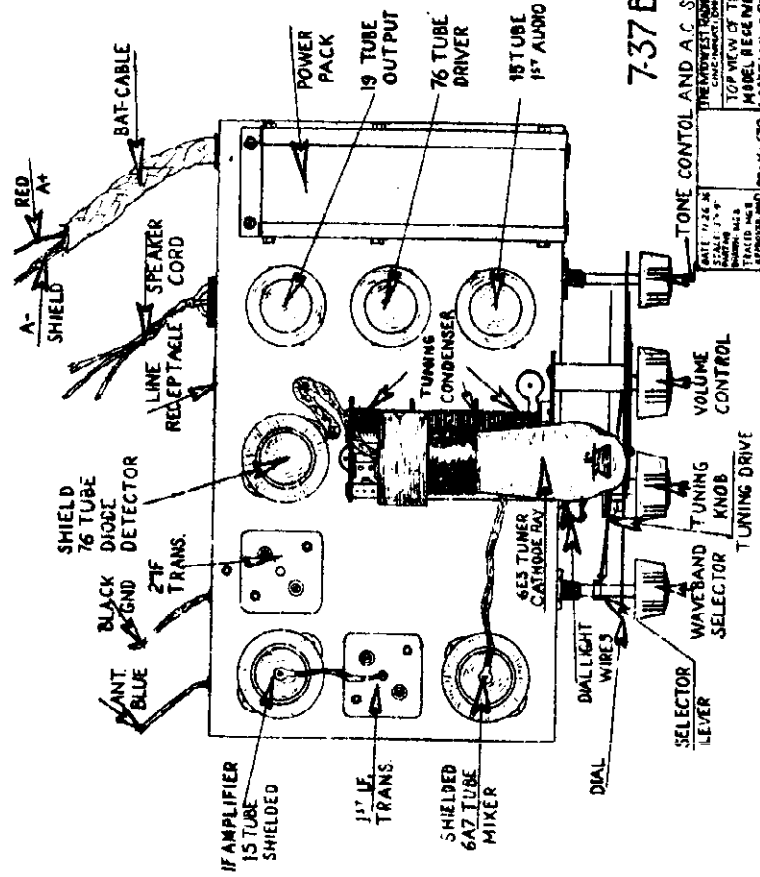


DATE: 11-27-38
SCALE: FULL
DRAWN BY: MEB
TRACED BY: MEB
APPROVED BY: MEB
P.C. 121

THE MIDWEST RADIO CORPORATION
CHICAGO, ILL., U.S.A.

TRIMMER AND PADDER
LOCATION ON MODEL
7-37 BATT.

Doc NO. 683

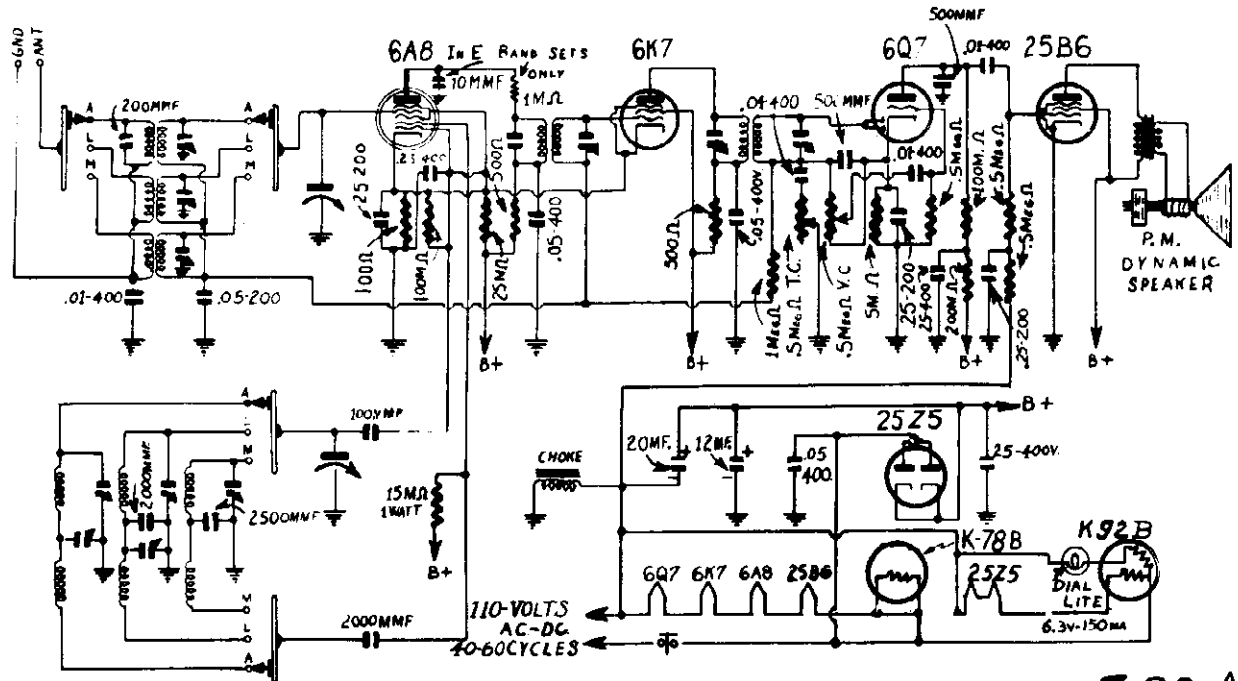


7-37 BATT.

- (3) Aligning 1.8 - 5.8 m.c. Band: - Disconnect dummy antenna from test oscillator and insert a 400 ohm resistor in series with the test oscillator output. Set test oscillator frequency to 5.8 m.c. Bring in 5.8 m.c. signal on dial to maximum output by adjusting 5.6, m.c. oscillator trimmers.
- (4) Aligning 5.8 - 18.3 m.c. Band: - Leaving 400 ohm resistor in series with test oscillator output, set oscillator frequency to 18 m.c., and adjust 18 m.c. oscillator trimmers for maximum output. It is important that the fundamental peak on 18 m.c. be reached.
- Start with trimmers at minimum capacity, the first peak on the trimmers will be the fundamental frequency if trimmer is screwed toward maximum capacity another peak will be observed. This is the image peak and is not used in aligning the receiver.
- Set test oscillator at 15 m.c. and adjust 15 m.c. antenna trimmers for maximum output.

- (1) I.F. Alignment: - Set test oscillator at 465 k.c. and connect output from oscillator to grid of 6A7 tube through an .02 mfd. series condenser. Important: Do not remove grid clip from tube. Peak each of the first and second I.F. transformer trimmer for maximum gain on output meter.
- (2) Aligning 720 - 535 k.c. Band: - Check tuning dial. Adjust by turning gang condenser until plates touch maximum capacity stop, at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. Connect test oscillator to antenna lead through a standard dummy antenna.
- Set test oscillator to 1720 k.c. and, using 1720 k.c. oscillator trimmer, adjust to maximum signal output at 1720 k.c. on the dial.
- Set test oscillator at 1400 k.c. and adjust 1400 k.c. preselector and antenna trimmers for maximum output.
- Set test oscillator at 600 k.c. and adjust 600 k.c. oscillator padder for maximum signal strength at 600 k.c. on the dial.

MID-WEST RADIO CORP.



NOTE:
ALL RF & OSC. TRIMMERS
ARE 45 MMFD MAX CAP.
OSC. PADDERS ARE
500MMFD. MAX CAP.

E BAND NOTE
IN SETS HAVING LONG WAVE
BAND, E (LONG WAVE) BAND COIL
REPLACES L BAND COIL THE
OSCILLATOR IS CONNECTED COLPITTS

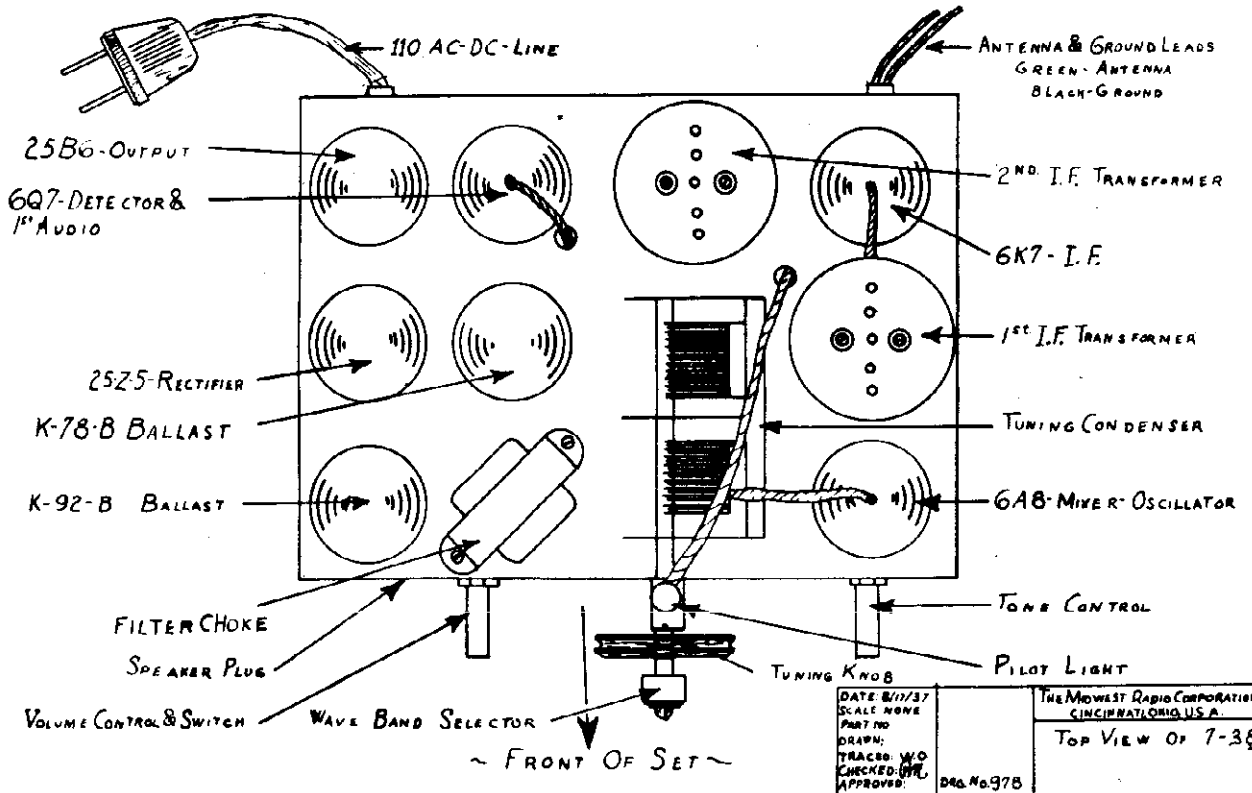
POWER
SWITCH
(MOUNTED ON VOL. CONT)

I.F.-456Kc.

7-38 AC
DC

DATE 8-10-37	SCALE NONE	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
PART NO.		
DRAWN:		
TRACED: W/O		
CHECKED: W/O		
No. 984		SCHEMATIC CIRCUIT DIAGRAM OF THE 7-38 AC DC

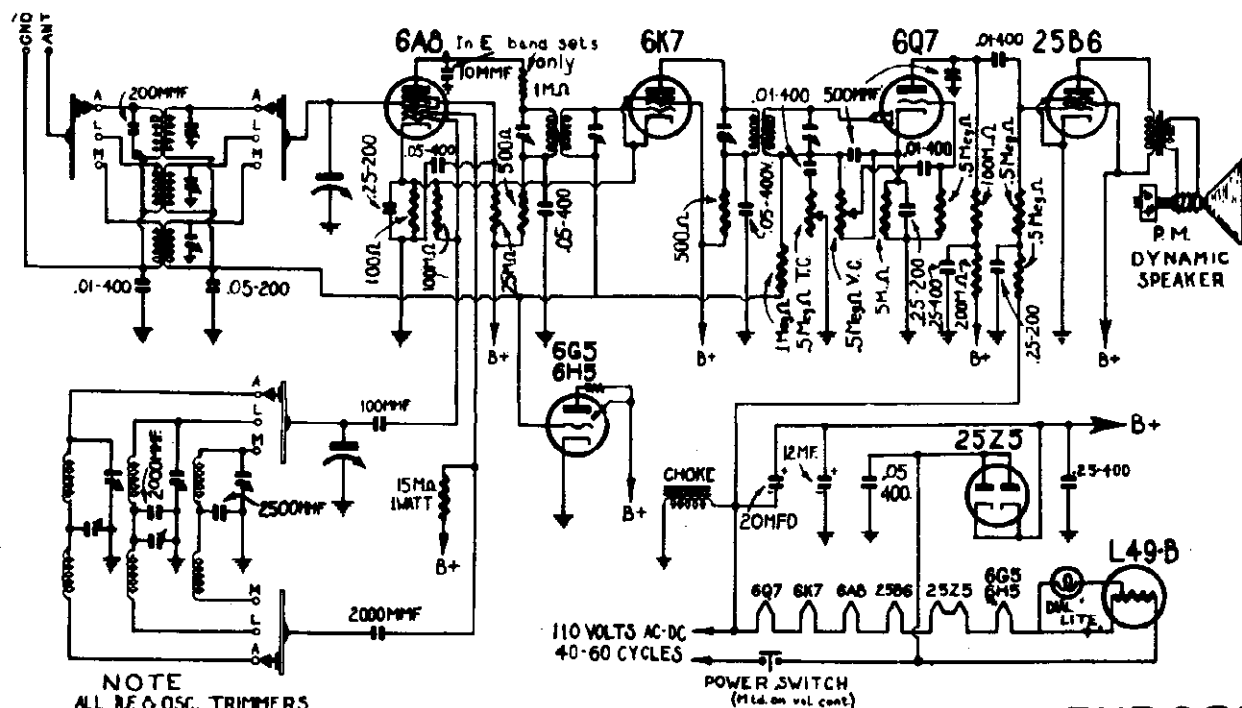
FOR TRIMMERS, SEE INDEX



DATE 8-11-37	SCALE NONE	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
PART NO.		
DRAWN:		
TRACED: W/O		
CHECKED: W/O		
No. 978		TOP VIEW OF 7-38

MODEL 7-38 AC-DC
(Export)
Schematic, Socket

MID-WEST RADIO CORP.



NOTE
ALL RF & OSC. TRIMMERS
ARE 45 MMFD MAX. CAP.
OSC. PADDERS ARE
500MMFD. MAX. CAP.

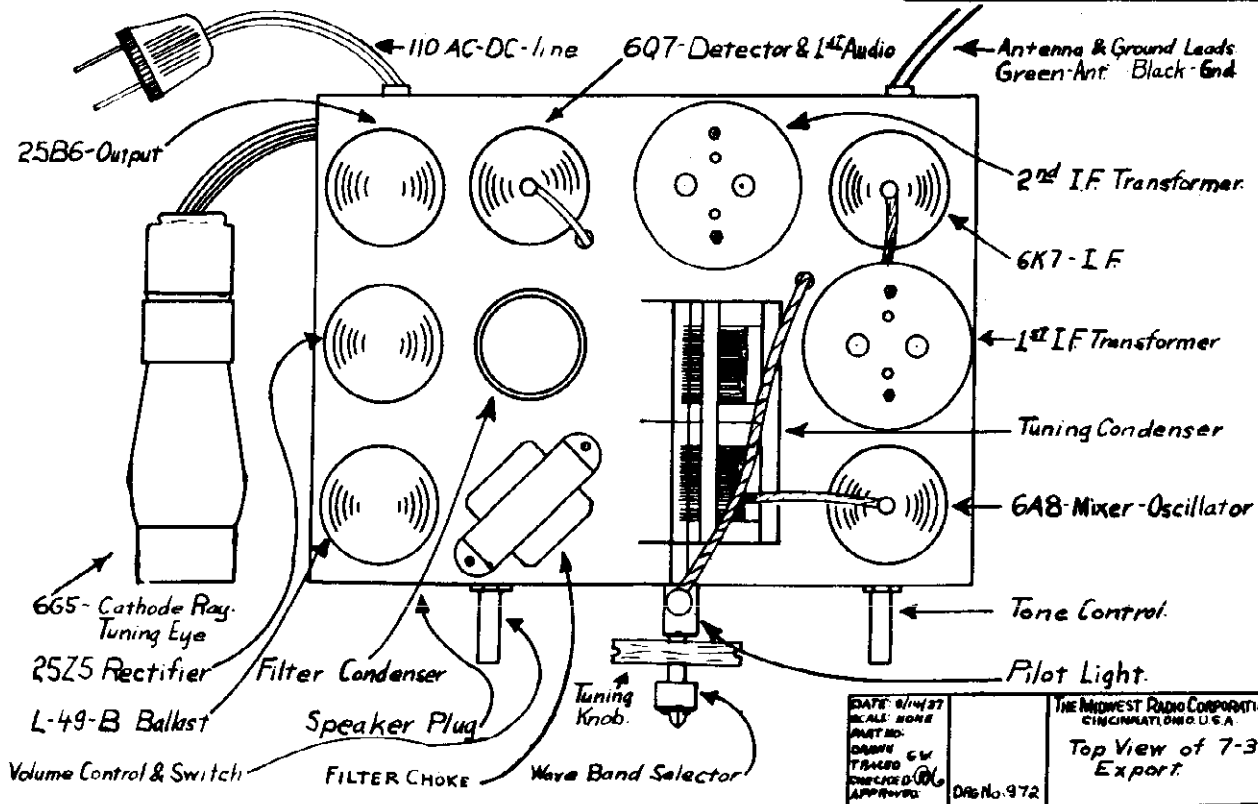
E-BAND NOTE
In sets having long wave band, E (long wave) band coil replaces L band coil. Colpitts oscillator is used - no tickler coil. No fixed padder is used. Variable padder is 140MMFD. Max. Cap. in place of 500 MMFD RF filter is added in plate circuit of 6A8

I.F. = 456 KC. EXPORT
7-38 AC DC

DATE: 6/18/37	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
SCALE: NONE	
DESIGNED BY: J. H. L.	
APPROVED BY: J. H. L.	

SCHEMATIC CIRCUIT DIAGRAM OF THE 7-38A AC

FOR TRIMMERS, SEE INDEX

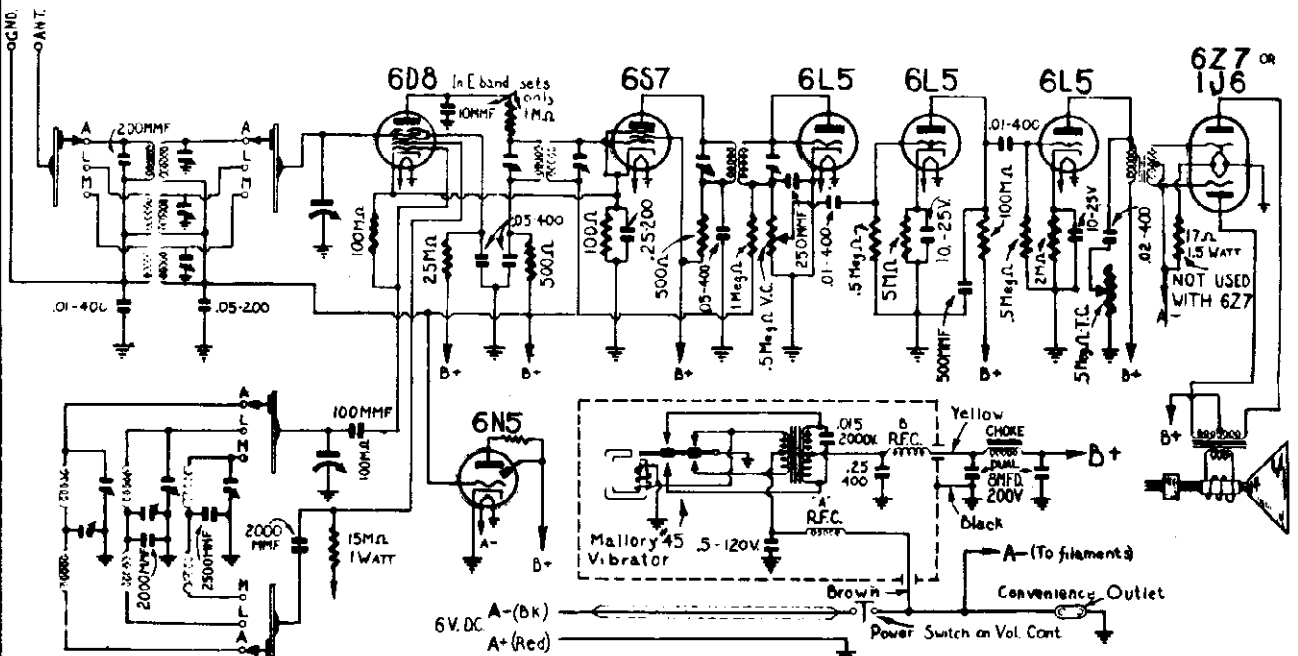


DATE: 6/18/37	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
SCALE: NONE	
DESIGNED BY: J. H. L.	
APPROVED BY: J. H. L.	

Top View of 7-38 Export

MID-WEST RADIO CORP.

MODEL 7-38 Batt
(Export)
Schematic, Socket



NOTE
All RF and Os. trimmers are 45MMFD. Max. Cap. Os. padders are 500MMFD. Max. Cap.

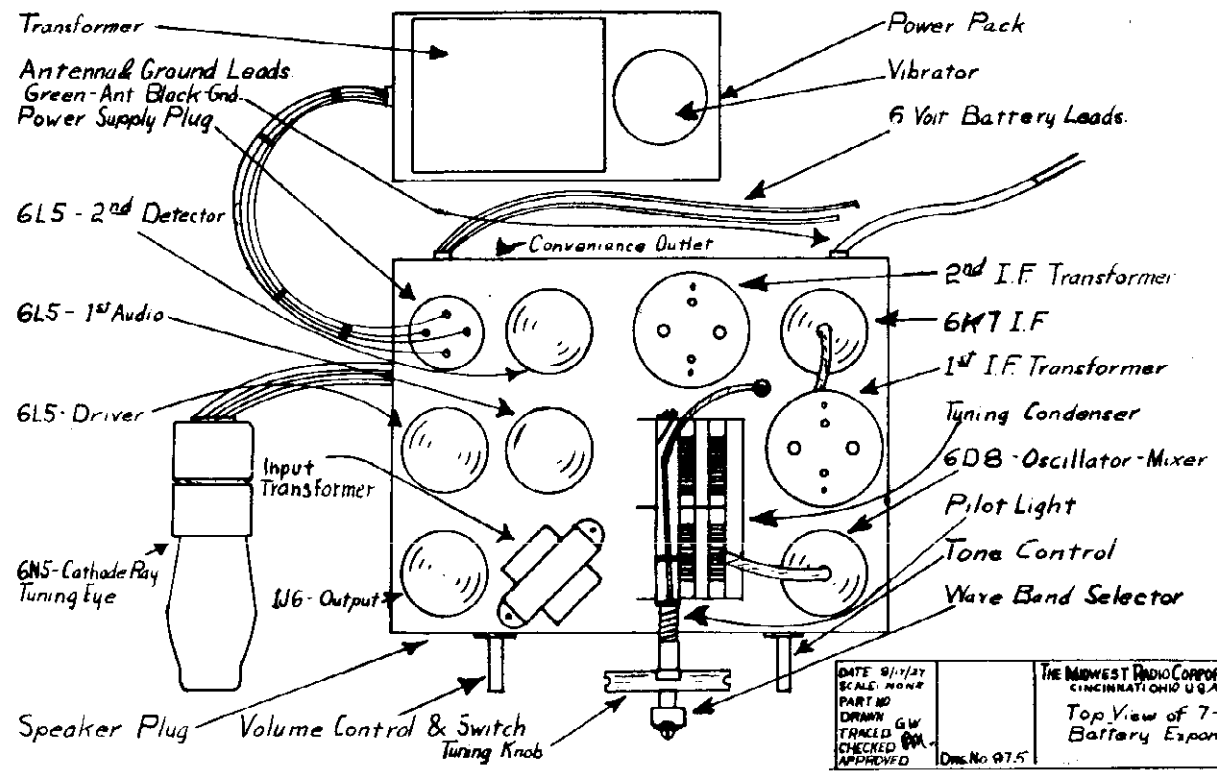
E-BAND NOTE
In sets having long wave band, E (long wave) band coil replaces L band coil. Colpitts oscillator is used—no tickler coil. No fixed paddler is used. Variable paddler is 140MMFD. Max. Cap. in place of 500MMFD. RF filter is added in plate circuit of 6D8.

IF=456KC

EXPORT 7-38 BATT

DATE: 6-16-37	SCALE: NONE	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A. SCHEMATIC CIRCUIT DIAGRAM OF THE 7-38A, BATT
PART NO.	DRW. BY: G.W.	
TRACED BY: G.W.	CHECKED BY: G.W.	
APPROVED BY: G.W.		
	Doc. No. 920	

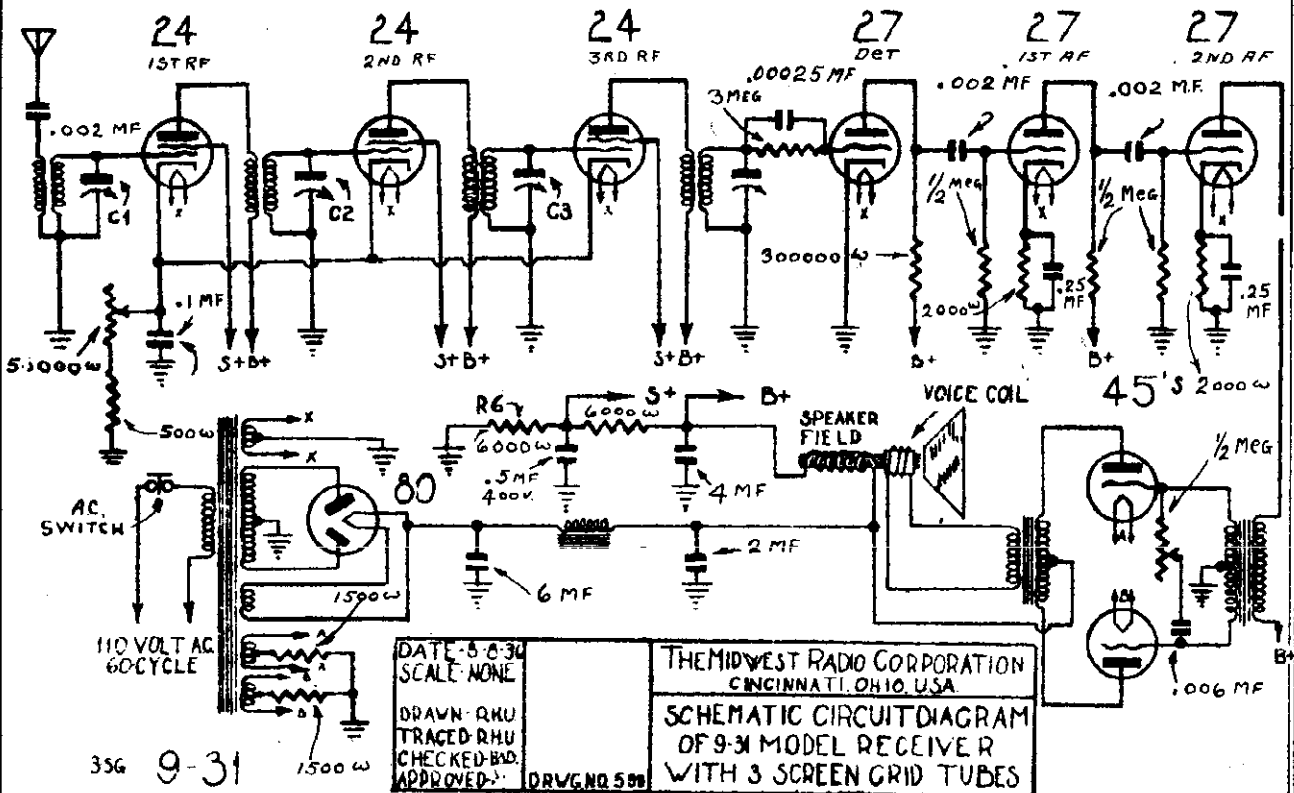
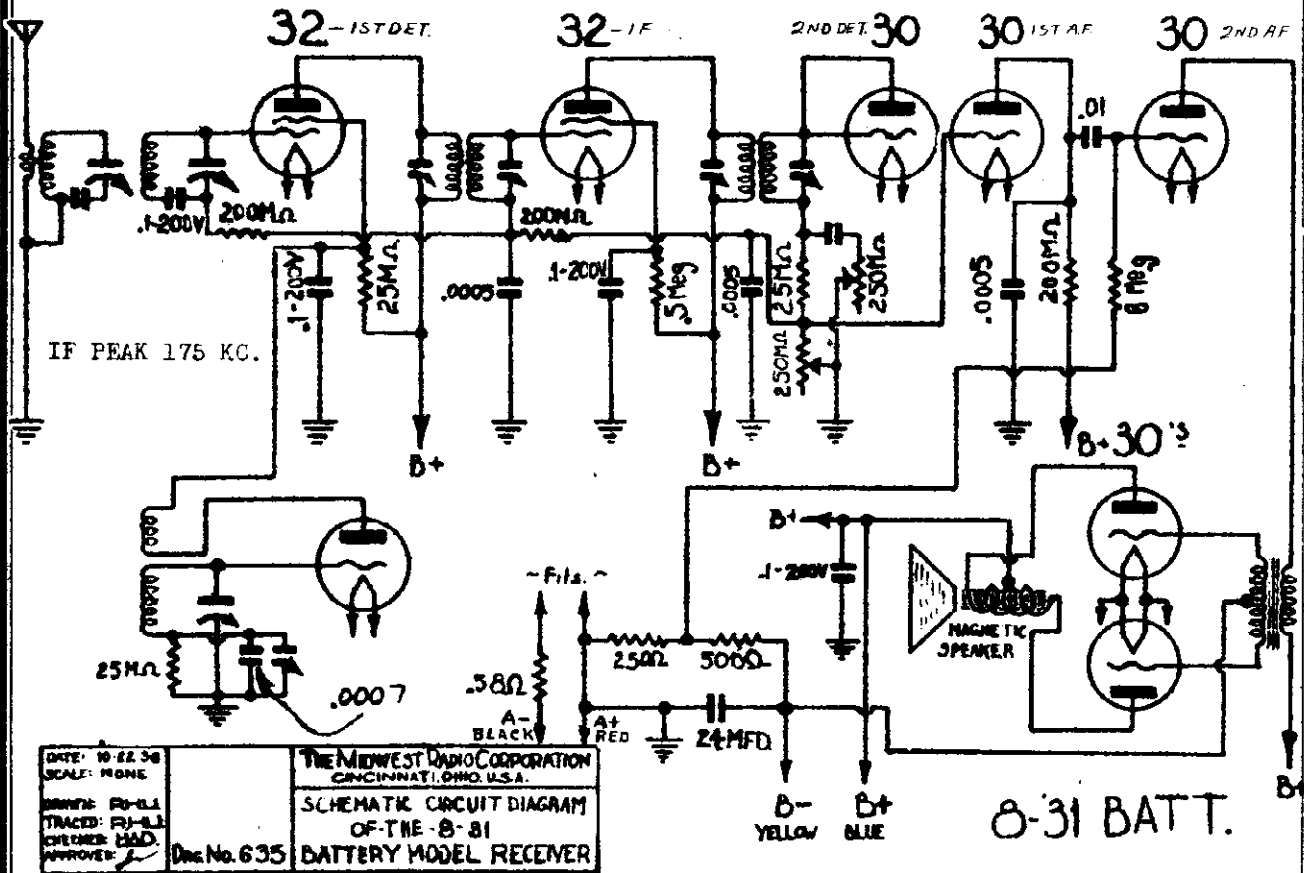
FOR TRIMMERS, SEE INDEX



DATE: 9/1/37	SCALE: NONE	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A. Top View of 7-38 Battery Export
PART NO.	DRW. BY: G.W.	
TRACED BY: G.W.	CHECKED BY: G.W.	
APPROVED BY: G.W.		
	Doc. No. 975	

MODEL 8-31 Batt.
 MODEL 9-31 (3SG)
 Schematics

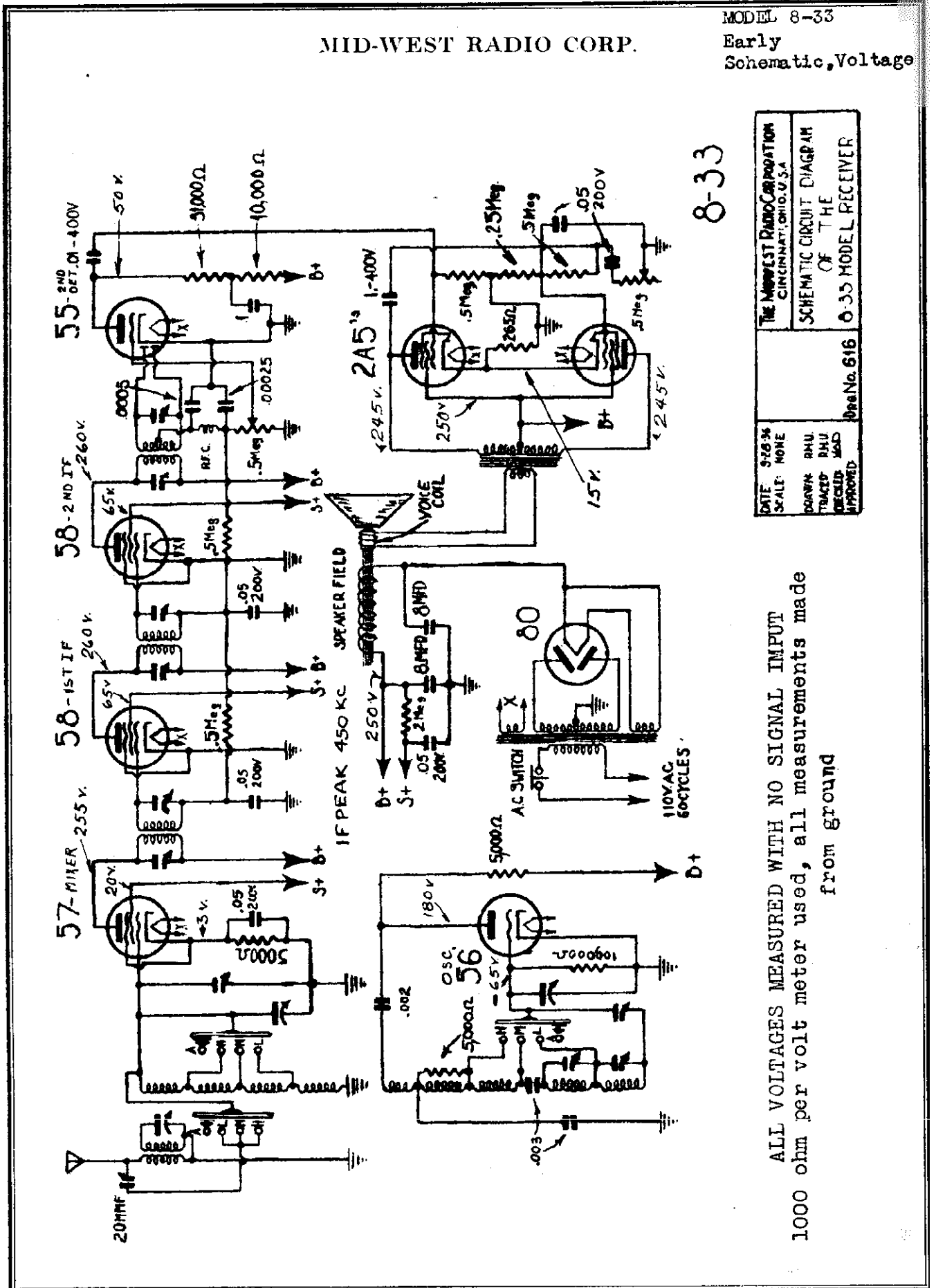
MID-WEST RADIO CORP.



MID-WEST RADIO CORP.

MODEL 8-33
Early
Schematic, Voltage

8-33



THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.	
SCHEMATIC CIRCUIT DIAGRAM OF THE 8-33 MODEL RECEIVER	
DATE: 5-26-36	Drawn No. 616
SCALE: NONE	
DESIGNED BY: RNU	
TRACED BY: RNU	
CHECKED BY: RNU	
APPROVED BY: RNU	

ALL VOLTAGES MEASURED WITH NO SIGNAL INPUT
1000 ohm per volt meter used, all measurements made
from ground

MODEL 8-33, Early
Socket, Trimmers
Alignment

MID-WEST RADIO CORP.

Using a standard signal generator and having approximate frequency from 400 k.c. to 20 m.c. and a standard output meter.

I. F. ALIGNMENT

- (1) Connect output of signal generator to control grid of 57 first detector tube. Connect output meter to plate of output tube to ground. Set signal generator to 450 k.c. and adjust the trimmers of the three I.F. transformers for the greatest output. The 1st I. F. transformer will be found to contain two adjustments; the 2nd, one adjustment; and the 3rd, two adjustments.

This completes the I. F. alignment.

Note: To assure more accurate trimmer setting always use lowest possible test oscillator output consistent with readable output meter scale deflection.

R. F. ALIGNMENT

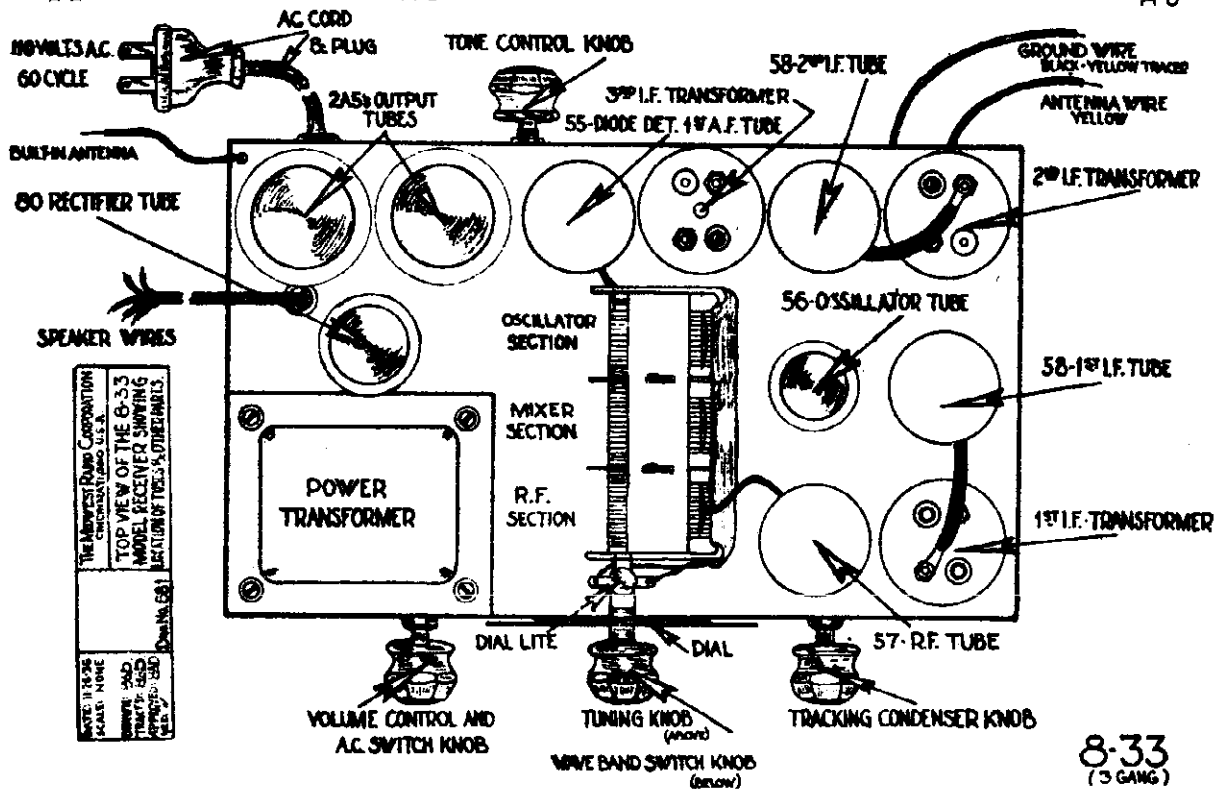
- (2) Connect signal generator to antenna post of the receiver through a standard dummy antenna with the band selector switch in the A position and the variable trimmer at minimum capacity and the dial at 100. Set signal generator at 540 k.c. and adjust the A padder for maximum gain. Set signal generator at 1400 k.c. and adjust R. F. and mixer trimmers for maximum gain. Receiver dial during this operation is set at about 15. Tighten the A trimmer as tight as it will go and turn it back one half turn for proper adjustment.

- (3) Turn band selector switch to L position. Set signal generator to 3800 k.c. and adjust trimmer D to the greatest output. This setting will be at about 15 on the dial.

This completes the R. F. alignment.

Note: We do not advise the customer to attempt adjustment on the M and H bands as this is done at the factory by experts. If set appears to be broad in tuning, we suggest that you inspect the spacing of the I. F. transformers. The correct spacing for I.F. transformers is 5/8".

Note: To assure more accurate trimmer setting always use lowest possible test oscillator output consistent with readable output meter scale deflection.



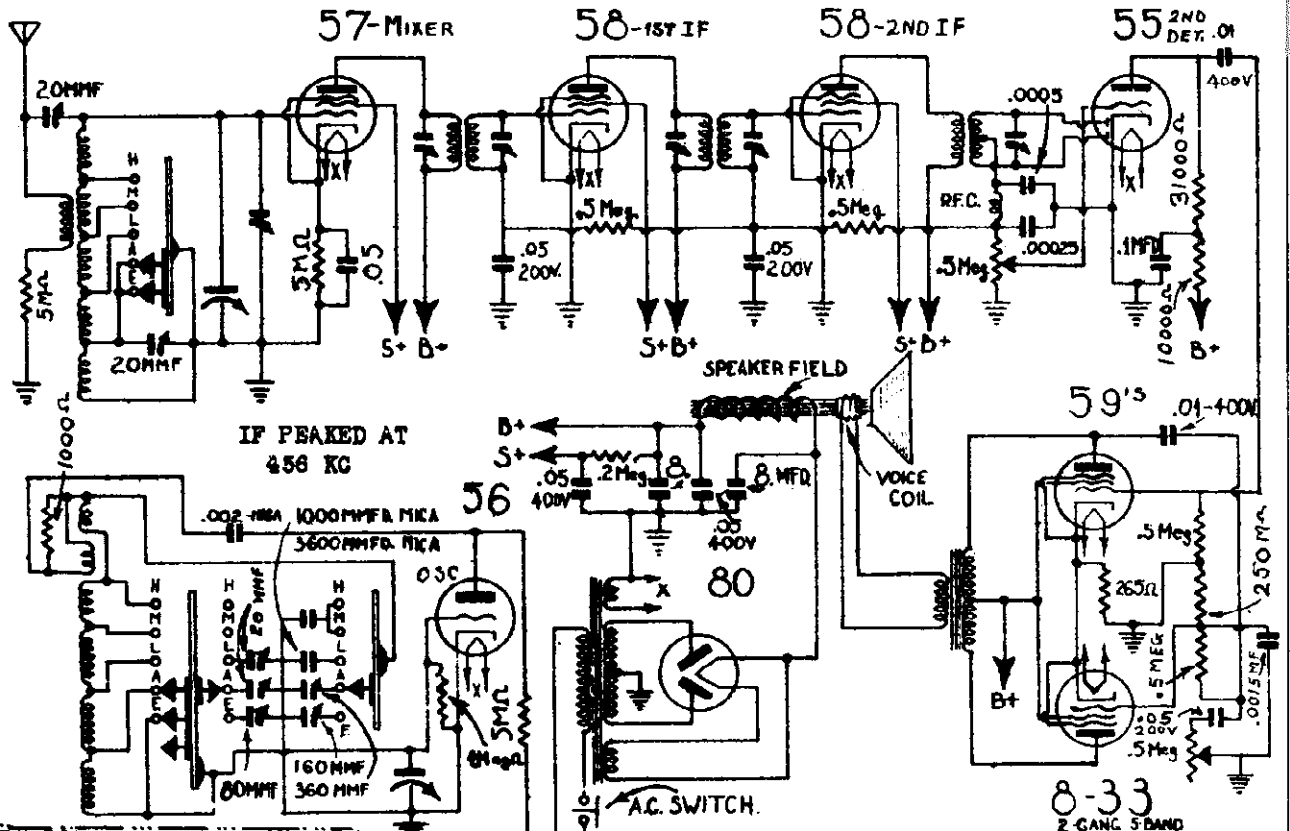
8-33
 (3 GANG)

MID-WEST RADIO CORP.

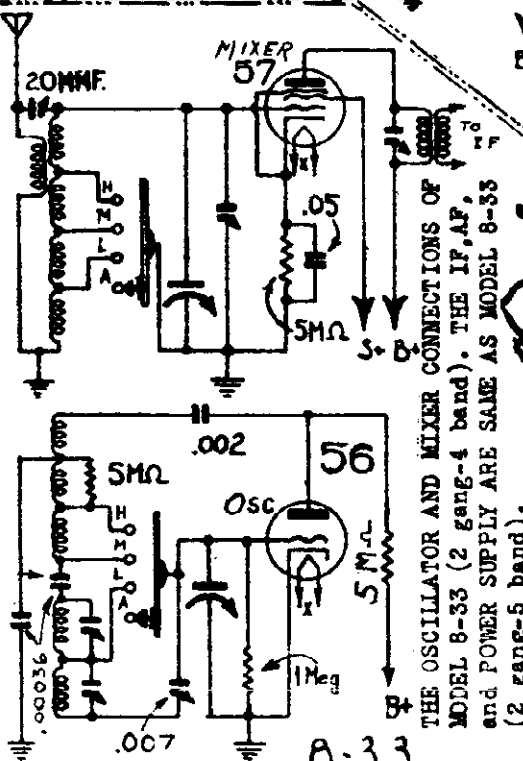
MODEL 8-33(2 Gang, 4 Band)

MODEL 8-33(2 Gang, 5 Band)

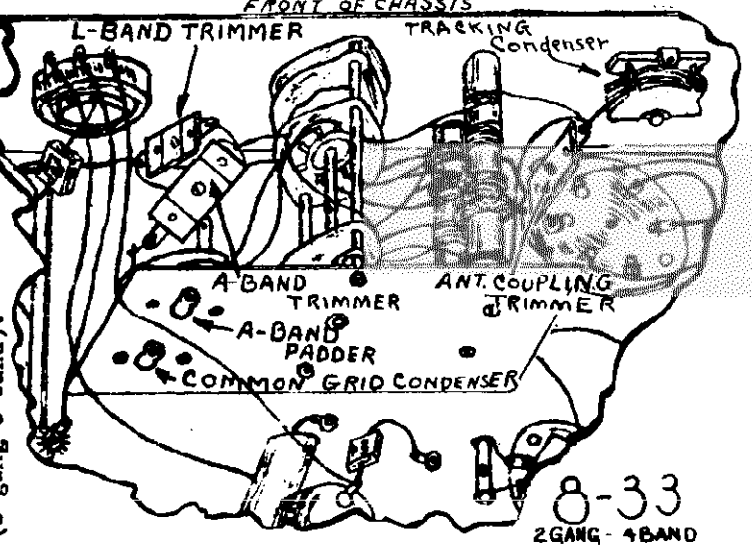
Schematics, Trimmers



DATE: 10-14-36	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO U.S.A.
SCALE: NONE	SCHEMATIC CIRCUIT DIAGRAM OF THE 8-33 MODEL RECEIVER
PART NO:	
DRWN: R-J-L	
TRACED: R-J-L	Doc No 631
CHECKED: MAG	
APPROVED:	



THE OSCILLATOR AND MIXER CONNECTIONS OF MODEL 8-33 (2 gang-4 band). THE IF, AF, and POWER SUPPLY ARE SAME AS MODEL 8-33 (2 gang-5 band).



DATE: 10-17-36	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO U.S.A.
SCALE: NONE	SCHEMATIC CIRCUIT DIAGRAM OF THE 8-33 MODEL RECEIVER
PART NO:	
DRWN: R-J-L	
TRACED: R-J-L	Doc No 632
CHECKED: MAG	
APPROVED:	

DATE: 11-4-38	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO U.S.A.
SCALE: NONE	TRIMMER AND PADDER LOCATION FOR MODEL 8-33 - RECEIVER
PART NO:	
DRWN: R-J-L	
TRACED: R-J-L	Doc No 647
CHECKED: MAG	
APPROVED:	

IF PEAK 456KC

MODEL 8-33 (2 Gang, 4 Band)

MODEL 8-33 (2 Gang, 5 Band) MIDWEST RADIO CORP.

Alignment

ALIGNMENT PROCEDURE

MODEL 8-33 (2 GANG-4 BAND), 8-33 (2 GANG-5 BAND)

- (1) Set the signal generator to 456 KC and connect it from the mixer grid to ground.
- (2) Remove the oscillator tube from the receiver.
- (3) Using a moderately weak signal approximately 40 micro-volts, align the three IF transformers to maximum output.
- (4) Keep decreasing the oscillator (signal generator) input and repeat the alignment for maximum output and gain.

Insert the oscillator tube into the receiver. Connect the signal generator and mixer grid lead between the antenna and ground.

"E" Band Alignment

- (1) Set the wave band change switch to the "E" band position.
- (2) Set the signal generator to 325 KC.
- (3) Adjust the "E" oscillator trimmer to maximum gain, then adjust the "E" band mixer trimmers for maximum gain.
- (4) Reset the signal generator to 135 KC and rotate the receiver dial to 135 KC setting.
- (5) Adjust the "E" band padder for maximum signal.

"A" Band Alignment

- (1) Set the receiver wave change switch to the "A" band position.
- (2) Set the signal generator to 1490 KC.
- (3) Adjust the "A" oscillator trimmer to maximum gain, then adjust the "A" band RF and the "A" band mixer trimmers for maximum gain.
- (4) Reset the signal generator to 550 KC, and rotate the receiver dial position to 550 KC.
- (5) Adjust the "A" band padder for maximum signal.
- (6) Repeat the adjustment of trimmers and padders until the adjustment of one does not effect the adjustment of the other.

"L" Band Alignment

- (1) Set the wave change switch to the "L" band position.
- (2) Set the signal generator to 3.8 MC.
- (3) Adjust the "L" band oscillator trimmer to maximum gain, then adjust the "L" band RF and Mixer trimmers for maximum gain.
- (4) Reset the signal generator to 1.5 MC, and rotate the receiver dial to the 1.6 MC position.
- (5) Adjust the "L" band padder for maximum signal.
- (6) Repeat the adjustment of trimmers and padders until the adjustment of one does not effect the adjustment of the other.

"M" Band Alignment

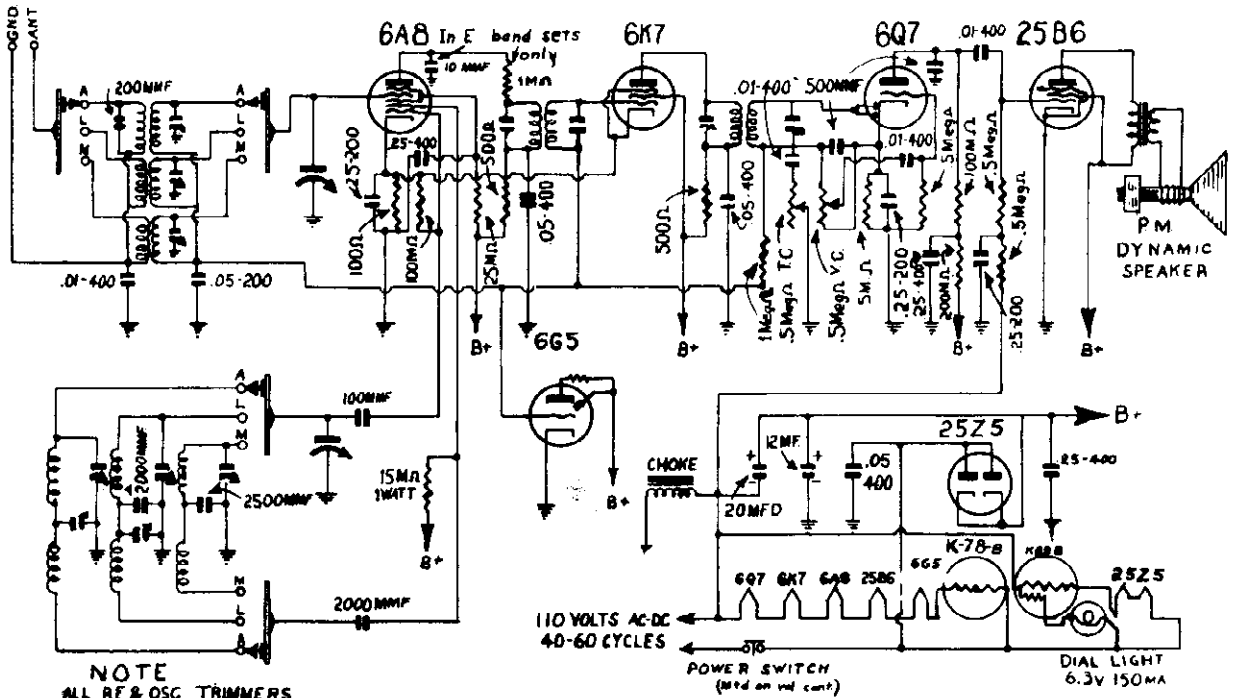
- (1) Set the wave change switch to the "M" band position.
- (2) Set the signal generator to 11.5 MC.
- (3) Adjust the "M" band oscillator trimmer to maximum gain, then adjust the "M" band RF and Mixer trimmers for maximum gain.

"H" Band Alignment

- (1) Set the wave change switch to the "H" band position.
- (2) Set the signal generator to 28 MC.
- (3) Adjust the "H" band oscillator trimmer to maximum gain, then adjust the "H" band RF and Mixer trimmers for maximum gain.

MID-WEST RADIO CORP.

MODEL 8-38 AC-DC
Schematic, Socket



NOTE
ALL RF & OSC TRIMMERS
ARE 45MMFD MAX CAP
OSC PADDERS ARE
500MMFD MAX CAP

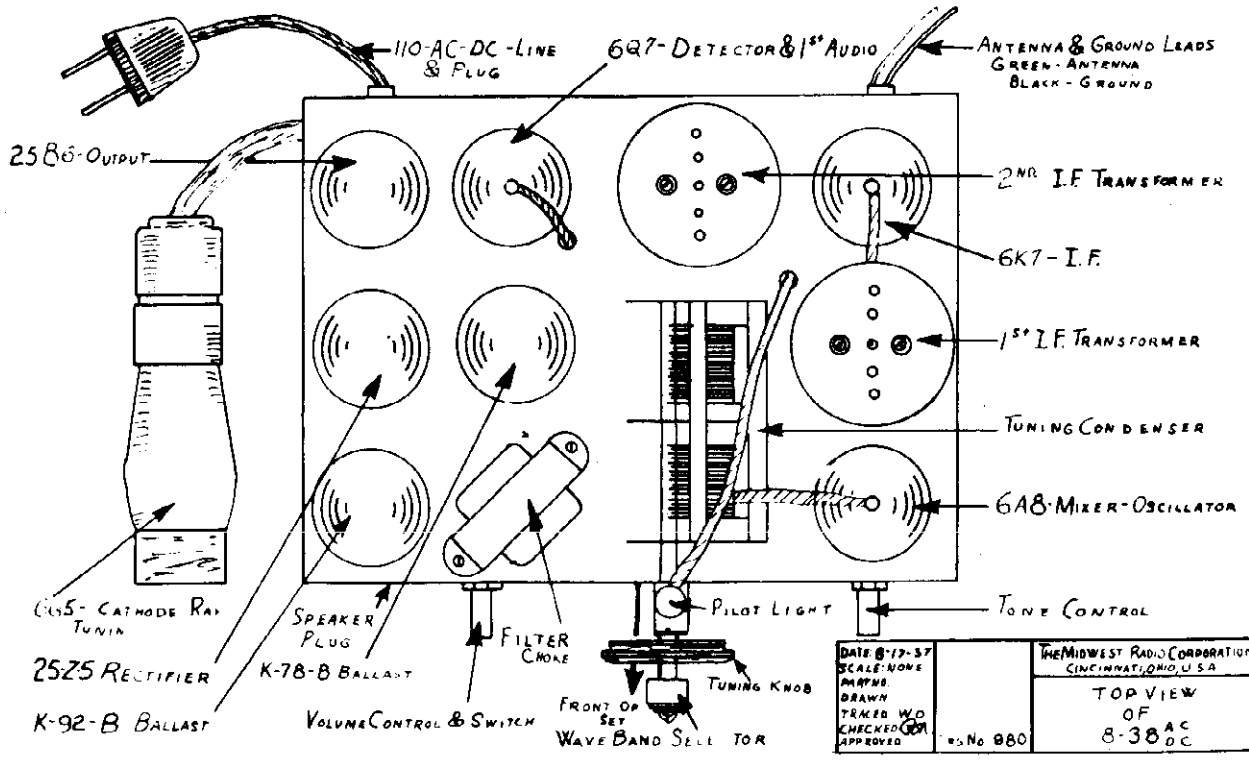
E-BAND NOTE
In sets having long wave band, E (long wave)
band coil replaces L band coil. Colpitts
oscillator is used - no tickler coil. No fixed
padder is used. Variable padder is 140MMFD
Max Cap in place of 500 MMFD. RF filter
is added in plate circuit of 6AB.

I.F. = 456Kc.

8-38 AC DC

FOR TRIMMERS, SEE INDEX

DATE 8-17-37	SCALE NONE	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A. SCHEMATIC CIRCUIT DIAGRAM OF THE 8-38 AC DC
PART NO -	DRAWN BY	
TRACED BY	CHECKED BY	
APPROVED	DESIGN NO 986	

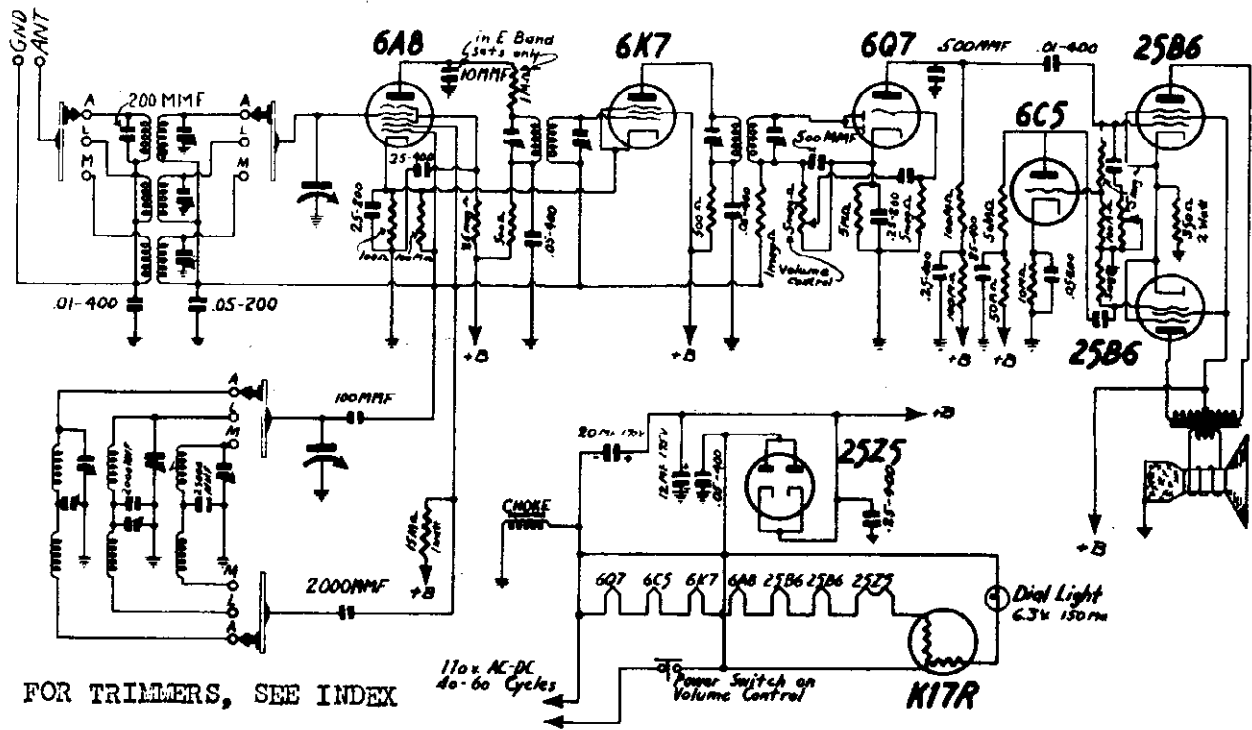


DATE 8-17-37	SCALE NONE	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A. TOP VIEW OF 8-38 AC DC
PART NO -	DRAWN BY	
TRACED BY	CHECKED BY	
APPROVED	DESIGN NO 986	

MODEL 8-38 AC-DC

Export
Schematic, Socket

MID-WEST RADIO CORP.



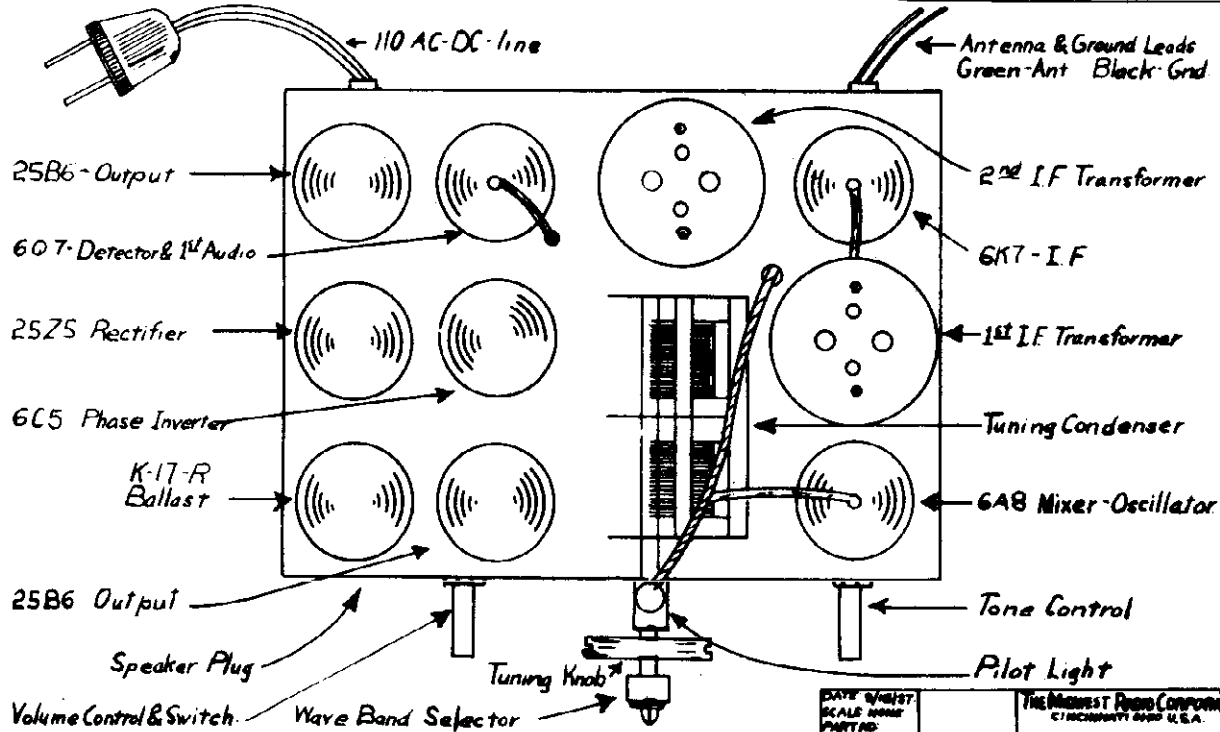
FOR TRIMMERS, SEE INDEX

NOTE
All RF. & Osc. trimmers are 45 MMFD Maximum Capacity.
Osc. padders are 500 MMFD Maximum Capacity.
E Band Padder 150 MMFD Maximum Capacity.

E BAND NOTE
• In sets having long wave band E (long wave) band coil replaces L band coil. The oscillator is connected colpitts.
LF = 456 KC

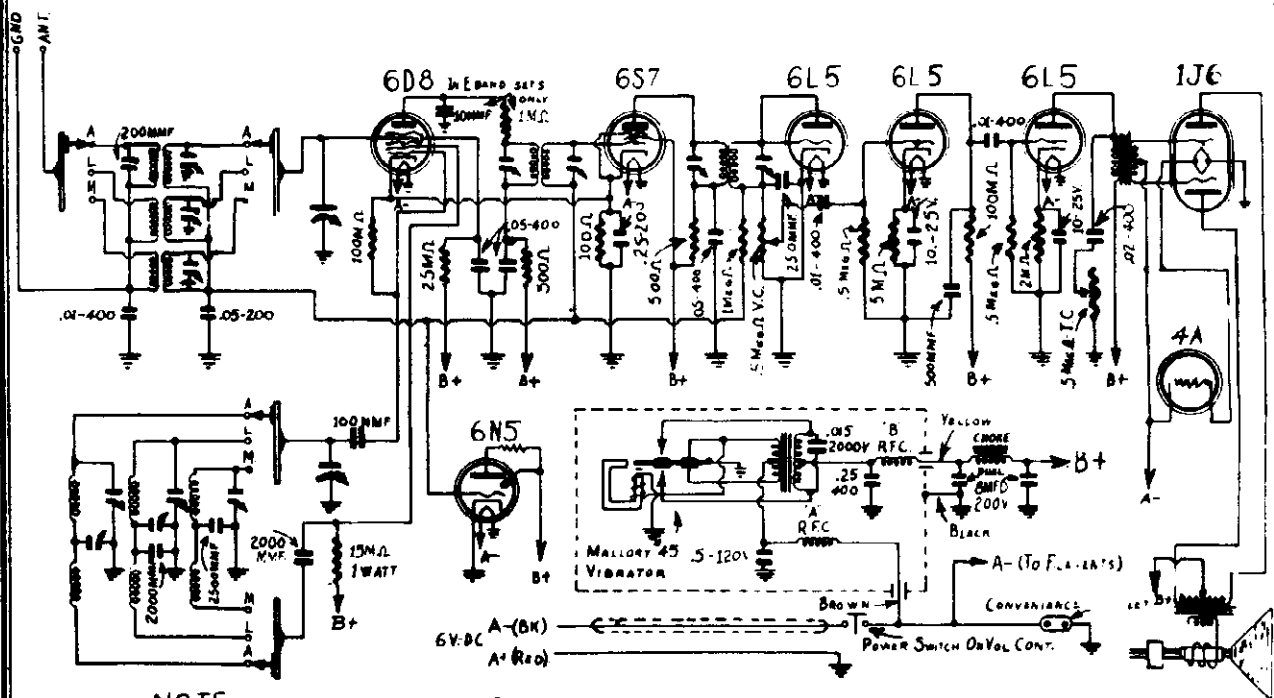
EXPORT 8-38 AC DC

DATE: 9-3-51 SCALE: 100%	MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
APPROVED: J.F.R. TRACED: J.C. ENGR'G: J.P. APPROVED: J.P.	SCHEMATIC CIRCUIT DIAGRAM OF THE EXPORT 8-38 AC-DC Dwg. No. 967



DATE: 9-3-51 SCALE: 100%	MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
APPROVED: J.F.R. TRACED: J.C. ENGR'G: J.P. APPROVED: J.P.	Top View of 8-38 Export Dwg. No. 973

MID-WEST RADIO CORP.



NOTE
ALL RF AND OSC TRIMMERS ARE ± 5 MMFD. MAX. CAP. OSC PADDERS ARE 500MMFD MAX. CAP.

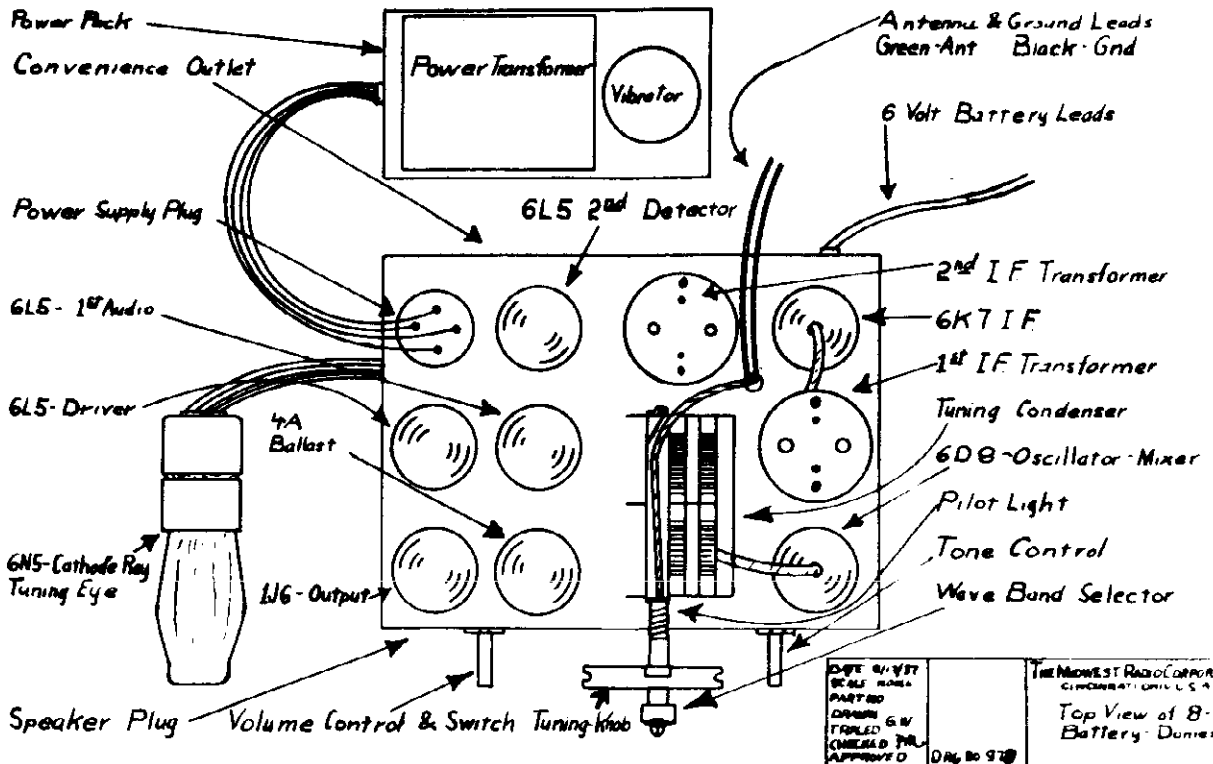
E-BAND NOTE
IN SETS HAVING LONG WAVE BAND, (E LONG WAVE) BAND COIL REPLACES L BAND COIL. COLPITZ OSCILLATOR IS USED—NO TRIMMER COIL. NO FIXED PADDERS IS USED. VARIABLE PADDERS IS 140MMFD. MAY CAP. IN PLACE OF 500MMFD. RF FILTER IS ADDED IN PLATE CIRCUIT OF 6D8.

8-38 BATT.

IF = 456KC.

DATE: 11/17/37 DRAWN: G.W. CHECKED: G.W. APPROVED: G.W.	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A. SCHEMATIC CIRCUIT OF THE 8-38 BATT.
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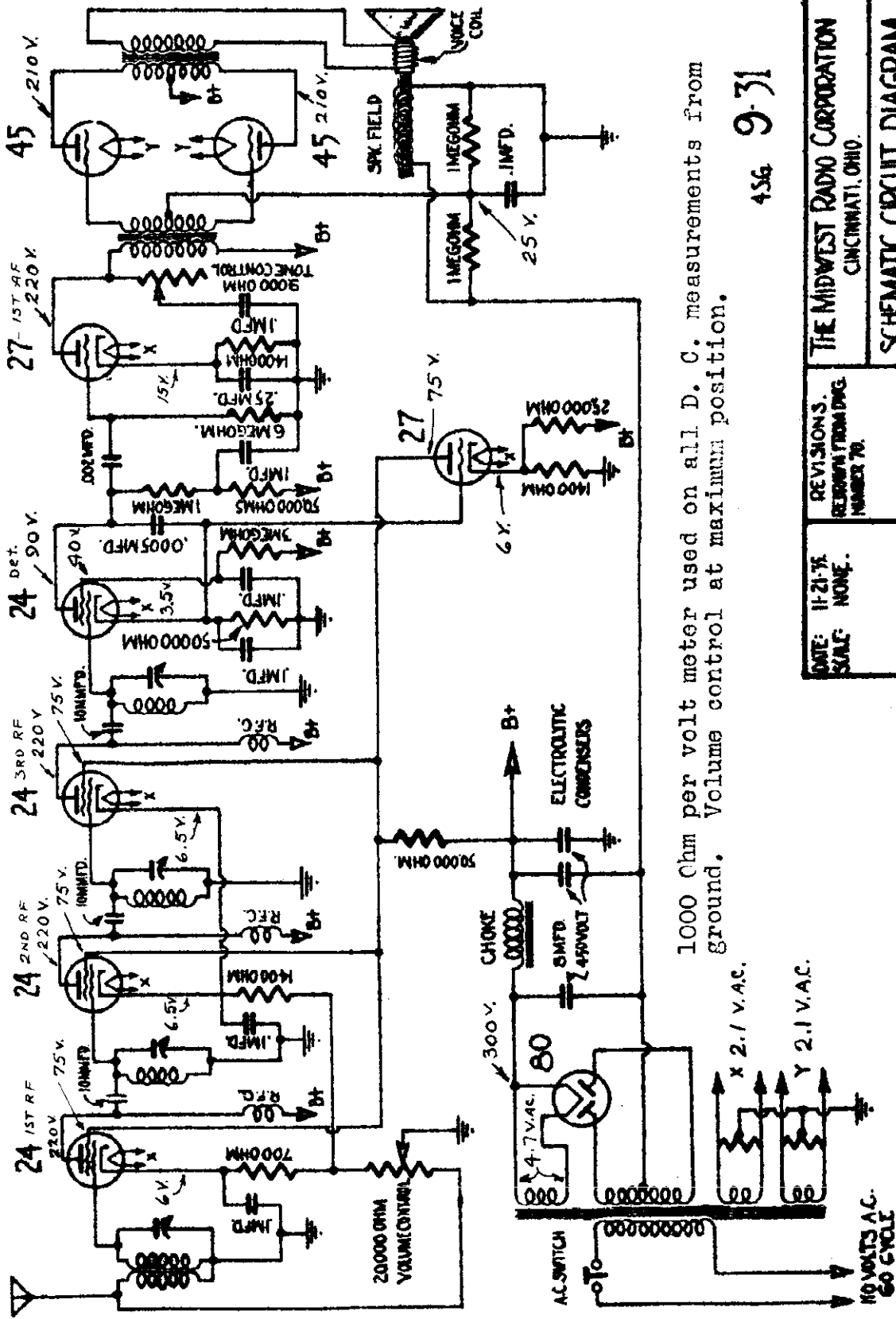
FOR TRIMMERS, SEE INDEX



DATE: 11/17/37 DRAWN: G.W. CHECKED: G.W. APPROVED: G.W.	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A. Top View of 8-38 Battery Domestic.
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MODEL 9-31 (48G)
Schematic, Voltage

MID-WEST RADIO CORP.



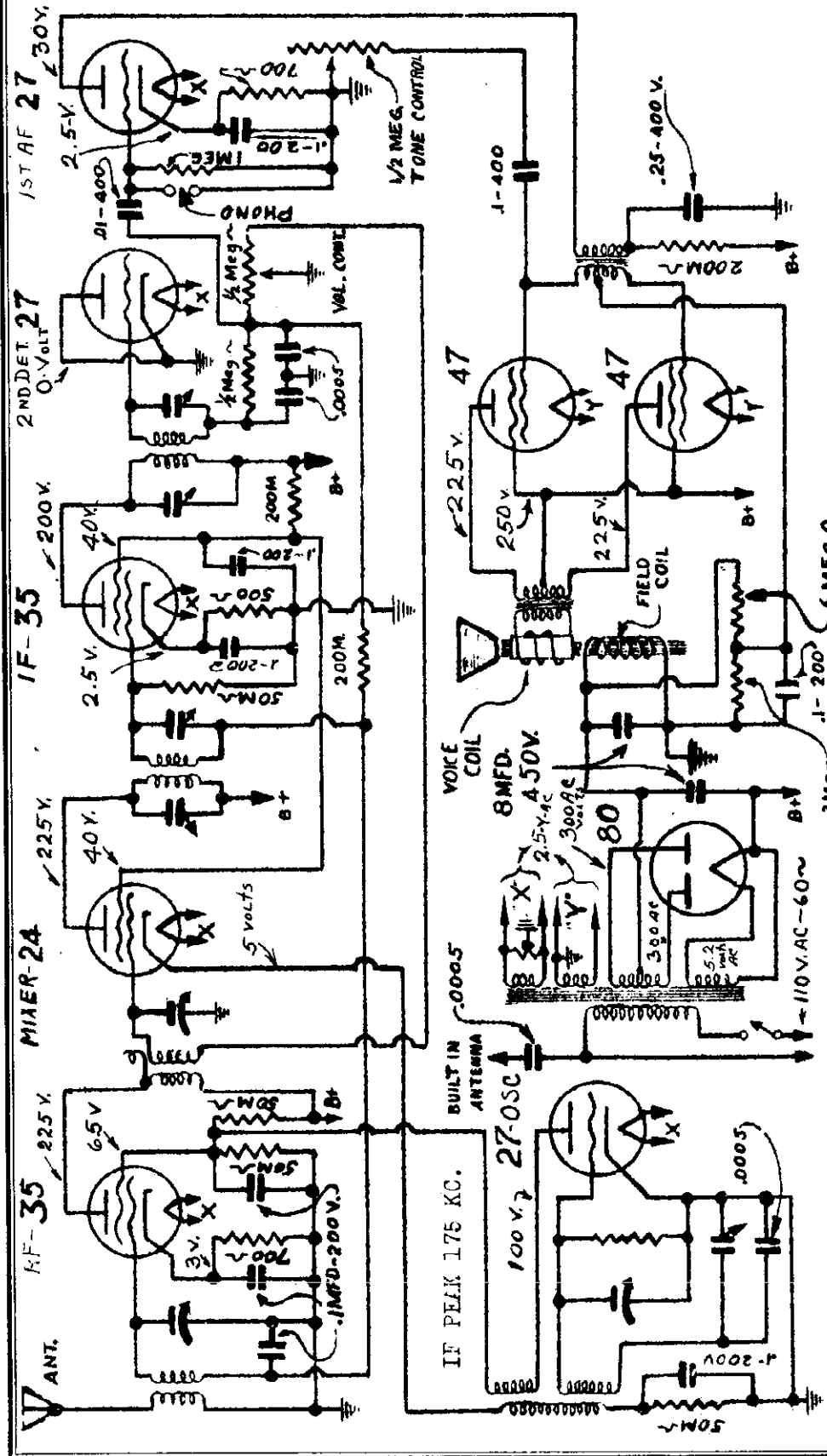
1000 Ohm per volt meter used on all D. C. measurements from ground. Volume control at maximum position.

456 9-31

DATE: 11-21-36	REVISIONS: REVISION FROM DIAG. NUMBER TO:	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO.
SCALE: NONE.	DRAWN: HAD.	SCHEMATIC CIRCUIT DIAGRAM OF 9-31 MODEL RECEIVER WITH 4 SCREEN GRID TUBES
	TRACED: HAD.	
	CHECKED: HAD.	DRAWING NO. A-158
	APPROVED: HAD.	

MID-WEST RADIO CORP.

MODEL 9-32
Schematic, Voltage
Alignment



ALIGNMENT PROCEDURE

- (1) Set the signal generator to 175 KC and connect it from the mixer grid to ground.
- (2) Remove the oscillator tube from the receiver, using weak signal (approx. 40 microvolts), align the IF transformers to maximum output.

IF transformers to maximum output.

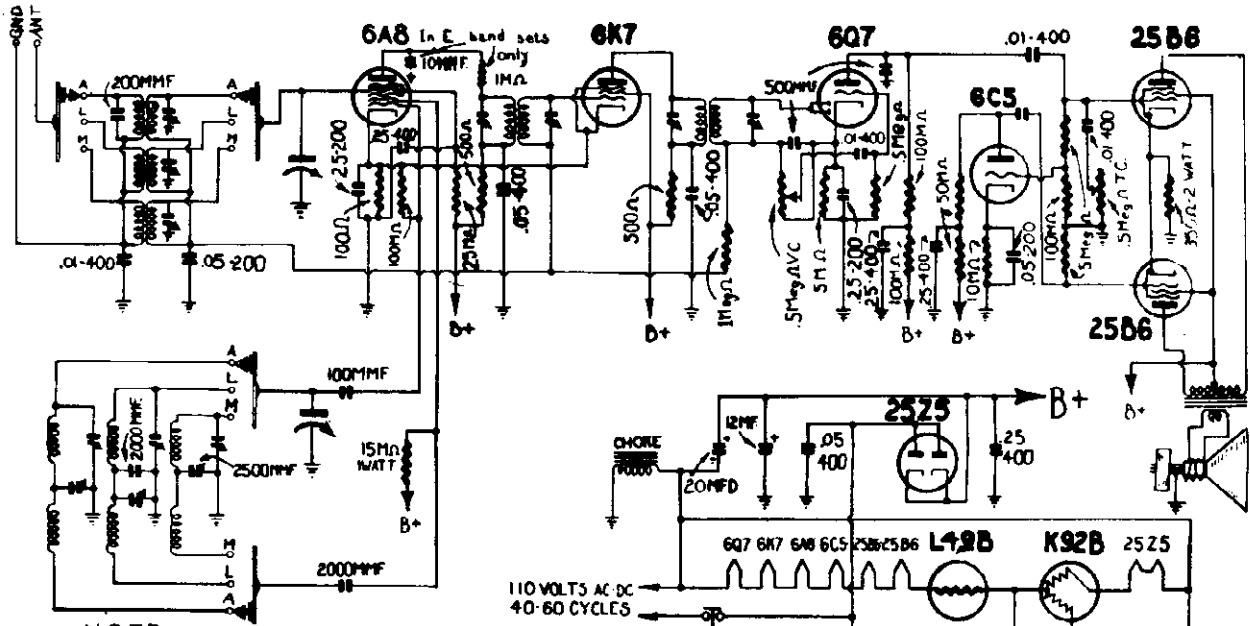
Insert the oscillator tube. Connect the signal generator to 1490 KC, located at between antenna and ground. Connect the mixer lead to the grid of the mixer tube.

- (1) Set signal generator and receiver to 1490 KC, located at 10 on the receiver dial. (variable condenser)
- (2) Oscillator section is adjusted by bending plates of the
- (3) Adjust mixer & RF trimmers for maximum gain.

DATE: 10-1-36	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
SCALE: NONE	SCHEMATIC CIRCUIT DIAGRAM OF THE 9-32 MODEL RECEIVER
PART NO: DRAWING: C.M.F.	
TRAINED: M.S.D.	Dwg. No. 619
CHECKED: M.S.D. APPROVED: M.S.D.	

MODEL 9-38 AC-DC
Schematic, Socket

MID-WEST RADIO CORP.



NOTE
ALL RF & OSC. TRIMMERS
ARE 45 MMFD. MAX. CAP.
OSC. PADDER IS
500MMFD. MAX. CAP.

~ E-BAND NOTE ~
In sets having long wave band, E (long wave) band coil replaces L band coil. Colpitts oscillator is used - no tickler coil. - No fixed padler is used - Variable padler is 140MMFD Max Cap in place of 500MMFD. - RF filter is added in plate circuit of 6A8.

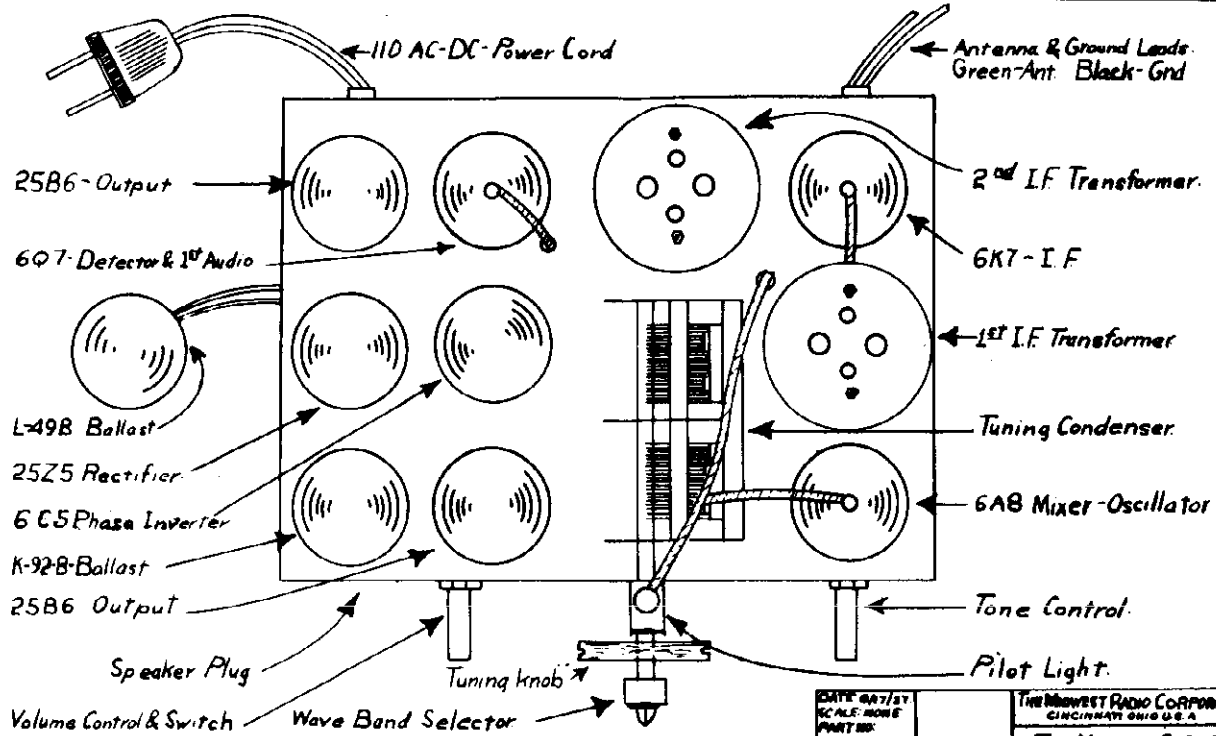
I.F.: 456Kc.

DIAL LIGHT
6-3V. 150-MA.

9-38 AC DC

FOR TRIMMERS, SEE INDEX

DATE: 6/27/57 SCALE: 100% PART NO: DRAWN: G.W. TRACED BY: G.W. CHECKED: G.W. APPROVED: _____	THE MIDWEST RADIO CORPORATION CINCINNATI OHIO U.S.A. SCHEMATIC CIRCUIT DIAGRAM OF THE 9-38 DC FIG. No 985
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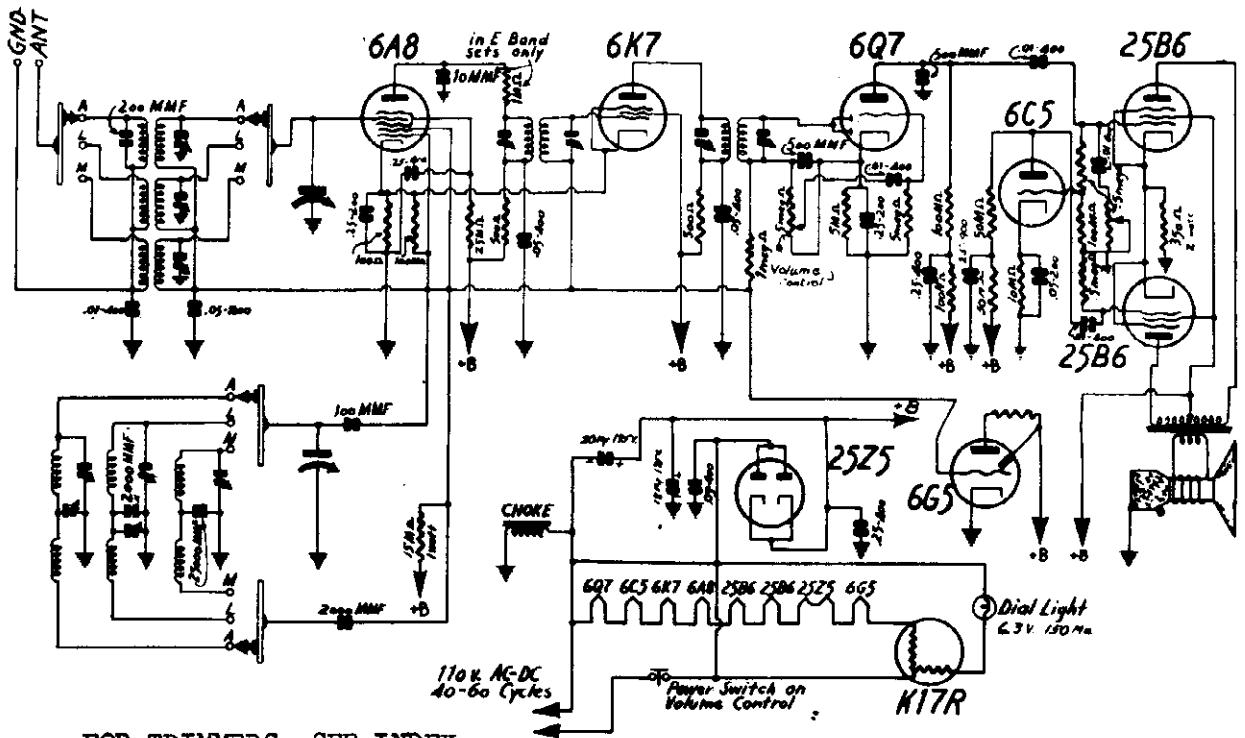


DATE: 6/27/57 SCALE: 100% PART NO: DRAWN: G.W. TRACED BY: G.W. CHECKED: G.W. APPROVED: _____	FIG. No 982
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THE MIDWEST RADIO CORPORATION CINCINNATI OHIO U.S.A. Top View of 9-38 AC-DC
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MID-WEST RADIO CORP.

MODEL 9-38 AC-DC
Export
Schematic, Socket



FOR TRIMMERS, SEE INDEX

NOTE

- All RF. & Osc. Trimmers are 45 MMFD Maximum Capacity.
- Osc. padders are 300 MMFD Maximum Capacity.
- E Band Padder 150 MMFD Maximum Capacity.

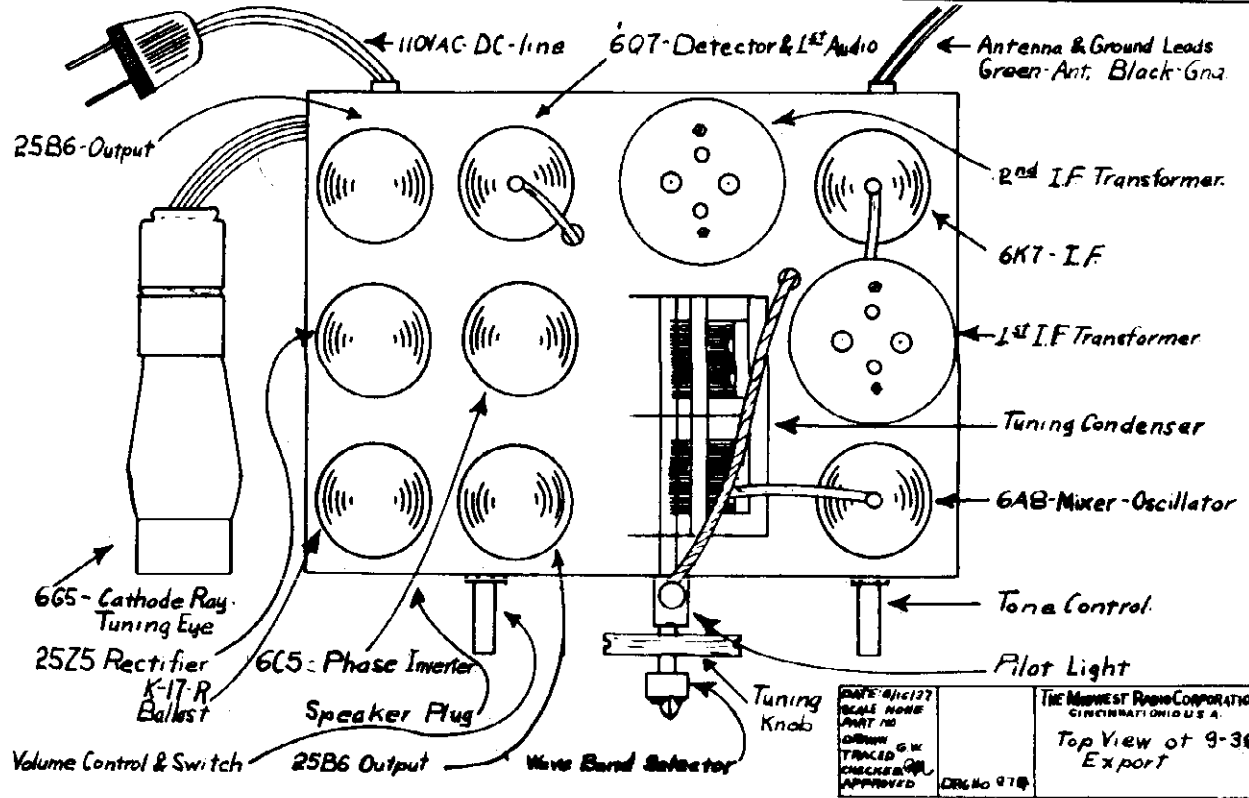
E BAND NOTE

- In sets having long wave band E (long wave) band coil replaces L band coil. The oscillator is connected colpitts.

I.F. = 456 KC

EXPORT 9-38 AC DC

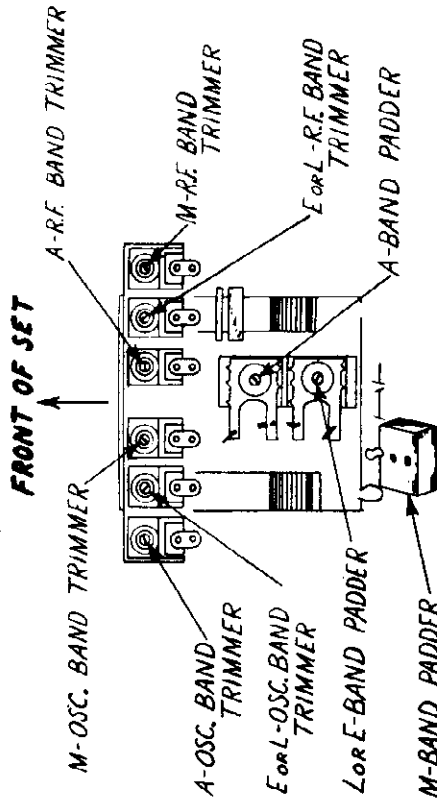
DATE: 9-20-37	SCALE: NONE	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A. SCHEMATIC CIRCUIT DIAGRAM OF THE EXPORT 9-38 AC DC Bk. No. 958
DRAWN: J.L.S.		
CHECKED: [initials]		
APPROVED: [initials]		



MODELS 6-38, 7-38, 8-38,
 9-38 Export AC-DC
 MODEL 7-38 Batt. Export
 MODELS 7-38, 8-38, 9-38
 10-38 AC-DC
 MODEL 8-38 Batt, 12-38 Batt.

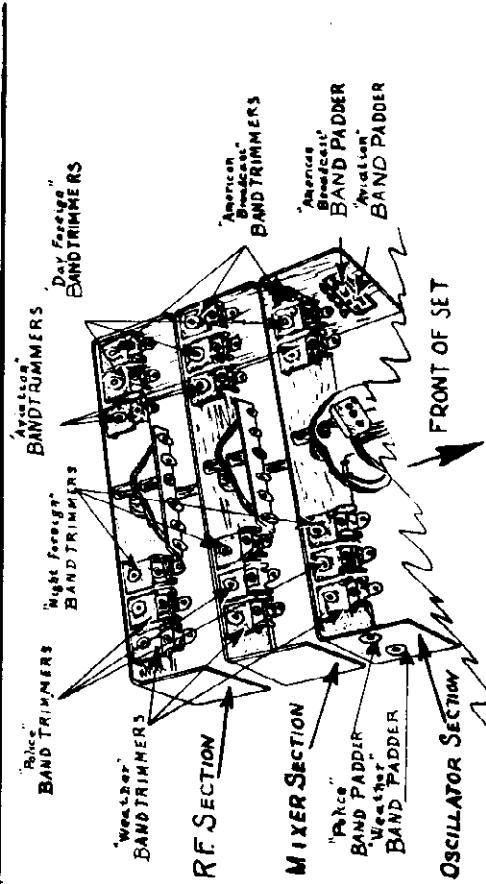
MID-WEST RADIO CORP.

MODELS 16-38, 18-38, 20-38
 Trimmers
 MODEL 16-38
 Socket Layout



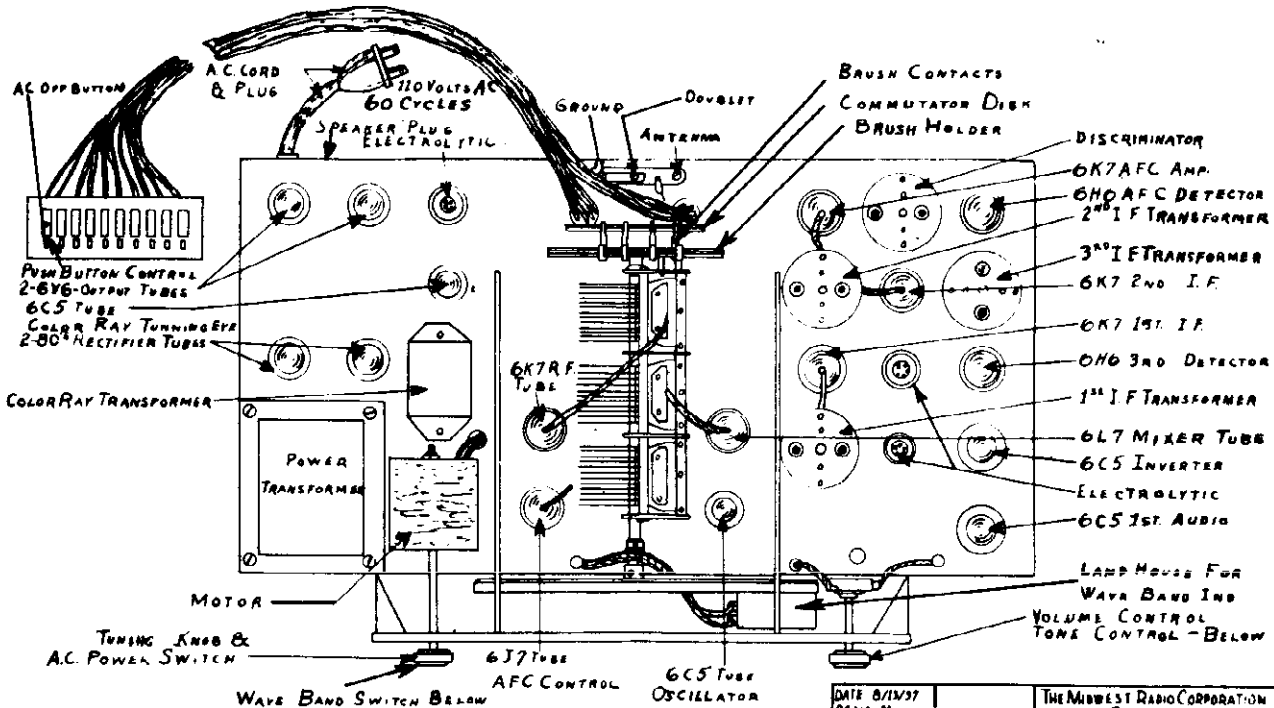
DATE: 8/21/37
 SCALE: NONE
 DRAWN: J.S.S.
 TRACED: M.W.O.
 CHECKED: M.W.O.
 APPROVED: [Signature]

THE MIDWEST RADIO CORPORATION
 CINCINNATI, OHIO, U.S.A.
 TRIMMER & PADDER LOCATION
 67, 69, 45, 7, 11, 38 EXPORT
 7, 8, 9, 10 Batt. 8, 11, 38
 DRG. No. 976



DATE: 8-22-37
 SCALE: NONE
 DRAWN: M.W.O.
 TRACED: M.W.O.
 CHECKED: M.W.O.
 APPROVED: [Signature]

THE MIDWEST RADIO CORPORATION
 CINCINNATI, OHIO, U.S.A.
 TRIMMER & PADDER LOCATION
 OF THE
 12-38 Batt., 16-18-20-38
 DRG. No. 962



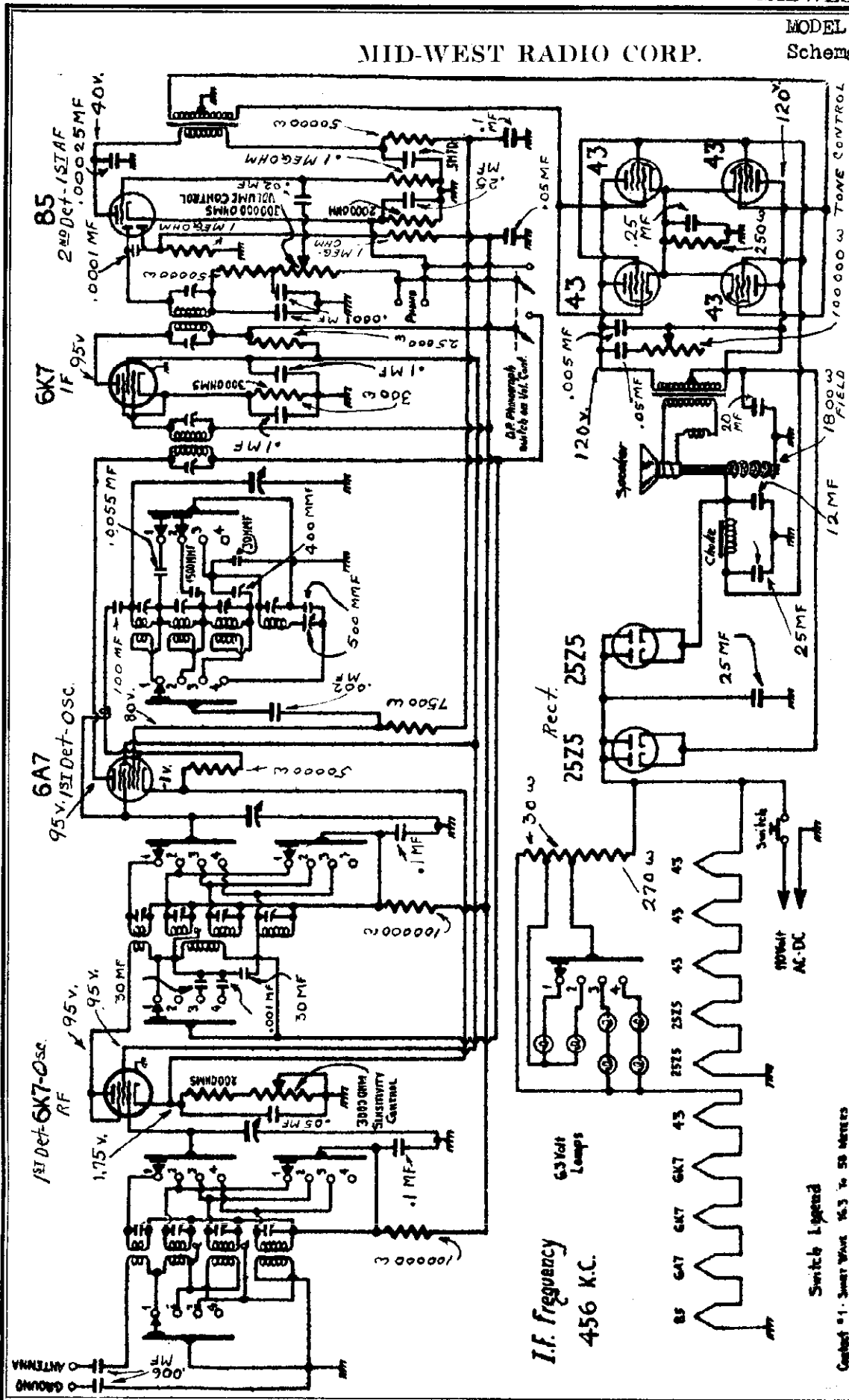
DATE: 8/21/37
 SCALE: NONE
 PART NO.
 DRAWN: M.W.O.
 TRACED: M.W.O.
 CHECKED: M.W.O.
 APPROVED: [Signature]

DRG. No. 968

THE MIDWEST RADIO CORPORATION
 CINCINNATI, OHIO, U.S.A.
 Top View
 OF
 16-38

MID-WEST RADIO CORP.

Schematic, Voltag



The Midwest Radio Corporation. CHICAGO, ILL. U.S.A.	
SCHEMATIC CIRCUIT DIAGRAM OF THE	
10-37 AC-DC MODEL RECEIVER	
Date: 3-4-36	Drawn: J.H.D.
Scale: None	Checked: J.H.D.
By: J.H.D.	Approved: J.H.D.

10-37 AC-DC

- Switch Legend
- * 1 - Sweep Wave 6.5 To 50 Meters
 - * 2 - Pulse Amplitude 50 To 180
 - * 3 - Demodulator 100 To 500
 - * 4 - Load Wave 0.50 To 20.00

MODEL 10-37 AC-DC

Socket, Trimmers Alignment

MID-WEST RADIO CORP.

I. F. ADJUSTMENT - The signal generator is set at 456 KC and is connected to the grid of the first detector (6A7). With the oscillator section of the tuning condenser short-circuited, and the receiver volume control at its maximum position, the I. F. trimmers are adjusted for maximum output. These trimmers may be found on the I. F. transformer shield cans to the right and rear of the gang condenser.

18 MEGACYCLE ADJUSTMENT - The high side of the signal generator is connected to the antenna lead of the receiver and the low side of the ground lead. The receiver and the signal are both tuned to a frequency of 18 MC with the selector switch in position for band No. 1. The oscillator trimmer condenser is adjusted so that the 18 MC signal is tuned in exactly at the 18 MC calibration point, with the volume control on full and the signal generator adjusted for minimum input. The antenna preselector and first detector trimmers are then adjusted in the order named for maximum output. These trimmers are located on the tops of the shield cans at the left side of the chassis; reading from front to back, these coils are as follows: 1. antenna preselector; 2. first detector; 3. oscillator. It will be noted that there are four trimmers on each of these coils. The adjustment screw for the trimmer in the front left hand corner of each is painted red. This denotes the trimmer for the No. 1 band.

5 MC ADJUSTMENT - With the band selector switch in position for operation on band No. 2 and the receiver and signal generator both set at 5 MC. The procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can, and is located to the right of the red painted trimmer. The antenna preselector and interstage coil trimmers are located in the same positions on the corresponding shield cans.

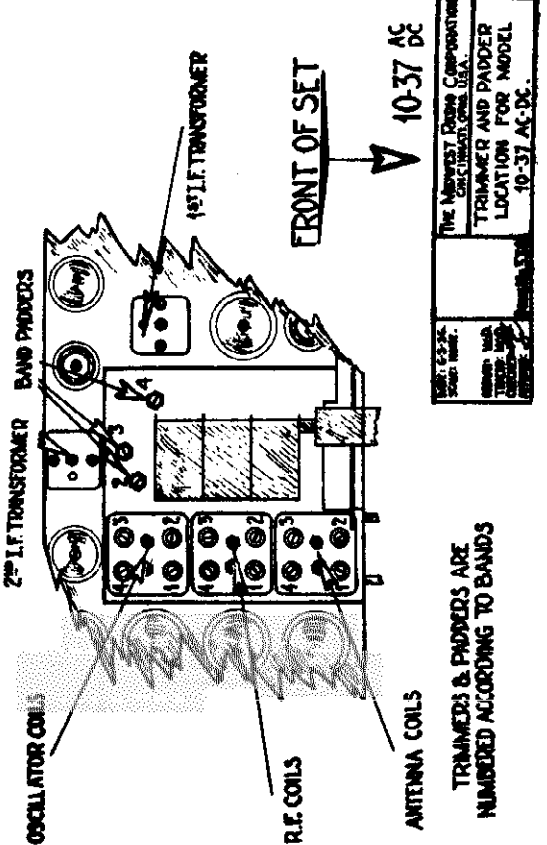
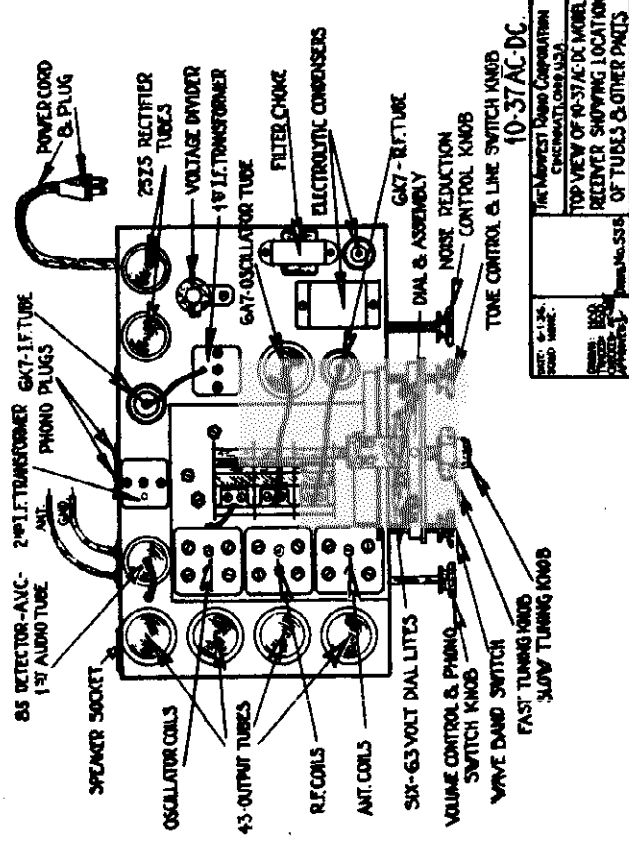
The signal generator is set at 1.7 MC and the signal tuned in on the dial. The padcer condenser for this band is adjusted for maximum gain while the gang tuning condenser is rocked slightly to the right and left. The 5 MC adjustment should then be rechecked. The 1.7 MC padcer is located on the subbase on which the gang tuning condenser is mounted and is the left hand one at the group of three found here.

1400 KC ADJUSTMENT - The band selector switch is set in position for operation on the No. 3 band. The receiver and signal generator are both set at 1400 KC and the procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can, and is located diagonally opposite the red painted trimmer. The other trimmers for this band are located in similar positions on the corresponding coil cans.

The signal generator is set at 600 KC and the signal tuned in on the dial. The padcer condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 1400 KC adjustment should then be rechecked. The 600 KC padcer is located on the sub-panel on which the gang tuning condenser is mounted and is the center of the three located at this point.

340 KC ADJUSTMENT - The band selector switch is set in position for operation on band No. 4. The receiver and generator are both tuned to 340 KC and the procedure outlined above is repeated. The oscillator trimmer is located on the rear coil can. It is the one directly behind the trimmer marked in red. The other trimmers for this band are located in similar positions on the corresponding shield cans.

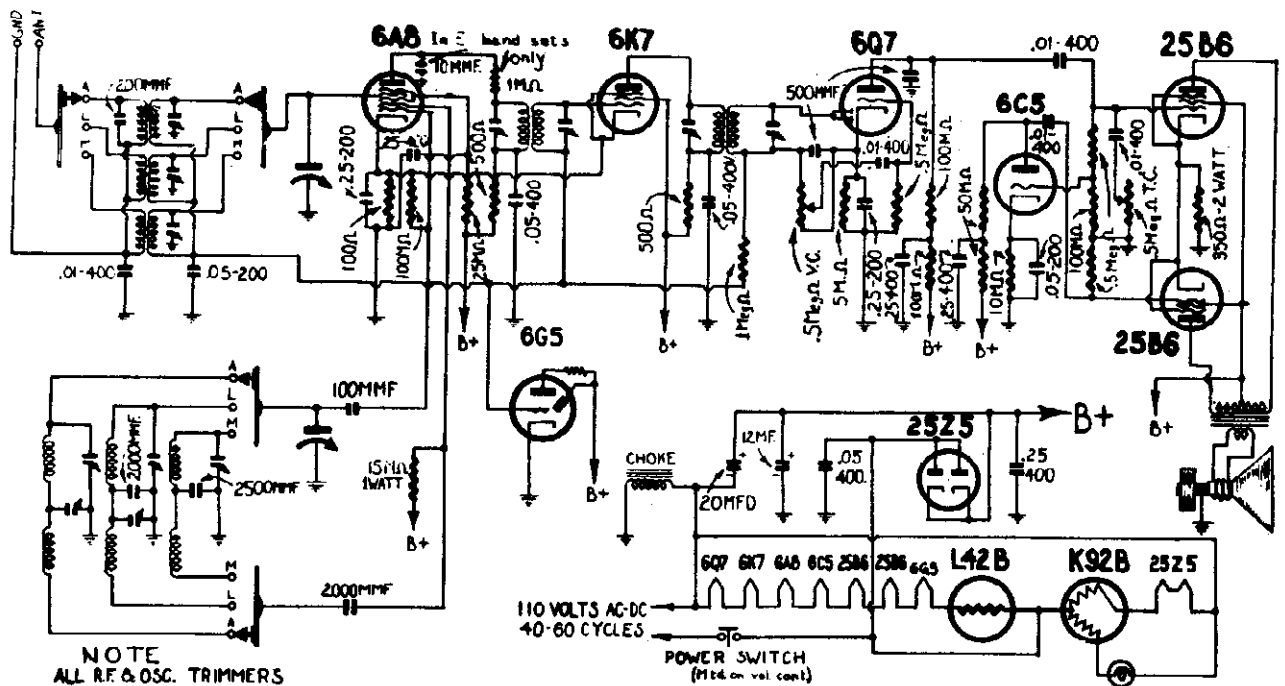
The signal generator is set at 150 KC and the signal is tuned in on the dial. The padcer condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 340 KC adjustment should then be rechecked. The 150 KC padcer is located on the sub-panel on which the tuning condenser is mounted and is the right hand one of this group.



TOP VIEW OF 10-37 AC-DC MODEL RECEIVER SHOWING LOCATION OF TUBES & OTHER PARTS

FRONT VIEW OF 10-37 AC-DC MODEL RECEIVER SHOWING LOCATION OF TUBES & OTHER PARTS

MID-WEST RADIO CORP.



NOTE
ALL RF & OSC. TRIMMERS
ARE 45 MMFD. MAX. CAP.
OSC PADDER IS
500MMFD. MAX. CAP.

E-BAND NOTE

In sets having long wave band, E (long wave) band coil replaces L band coil. Colpitts oscillator is used - no tickler coil. No fixed padder is used. Variable padder is 140MMFD. Max. Cap. in place of 500 MMFD. R.F. filter is added in plate circuit of 6A8.

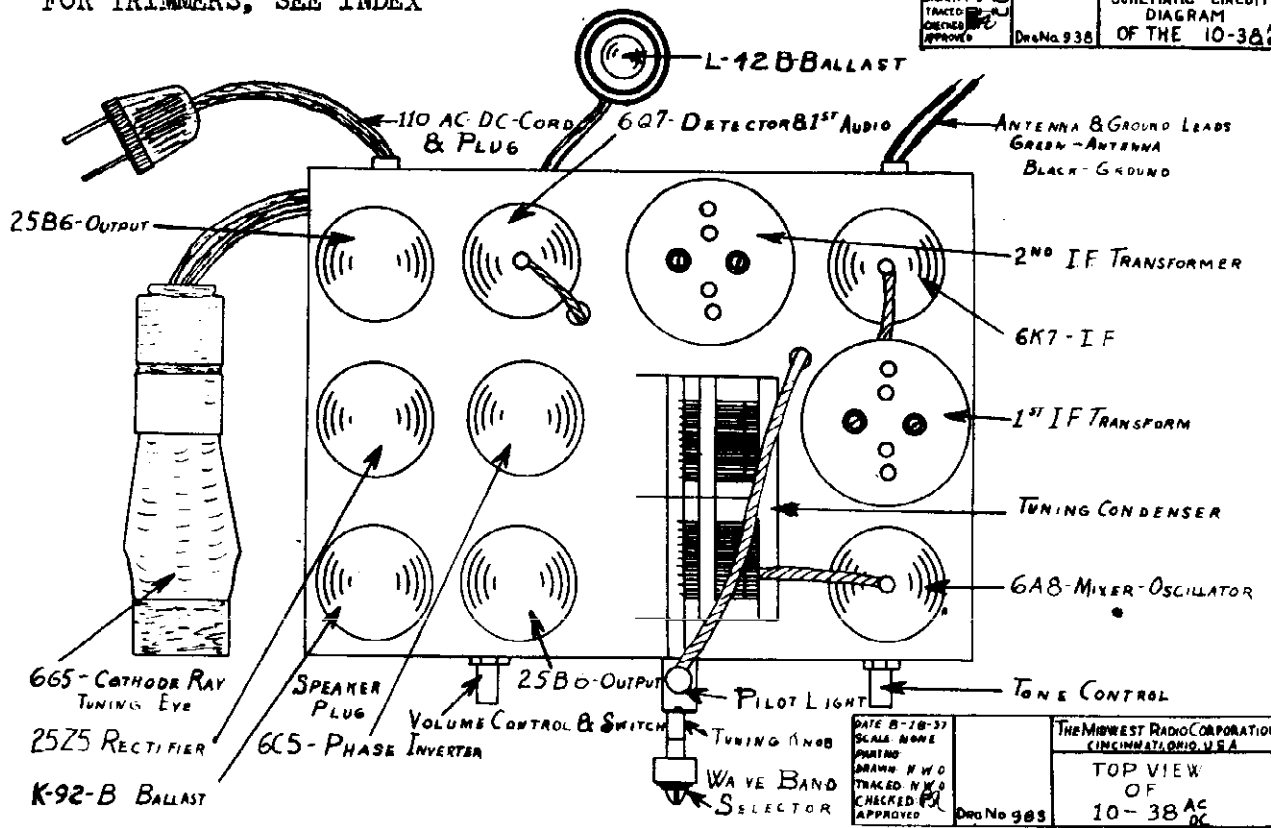
I.F. = 456 KC.

DIAL LITE
6-0V. 150 MA.

10-38 AC DC

FOR TRIMMERS, SEE INDEX

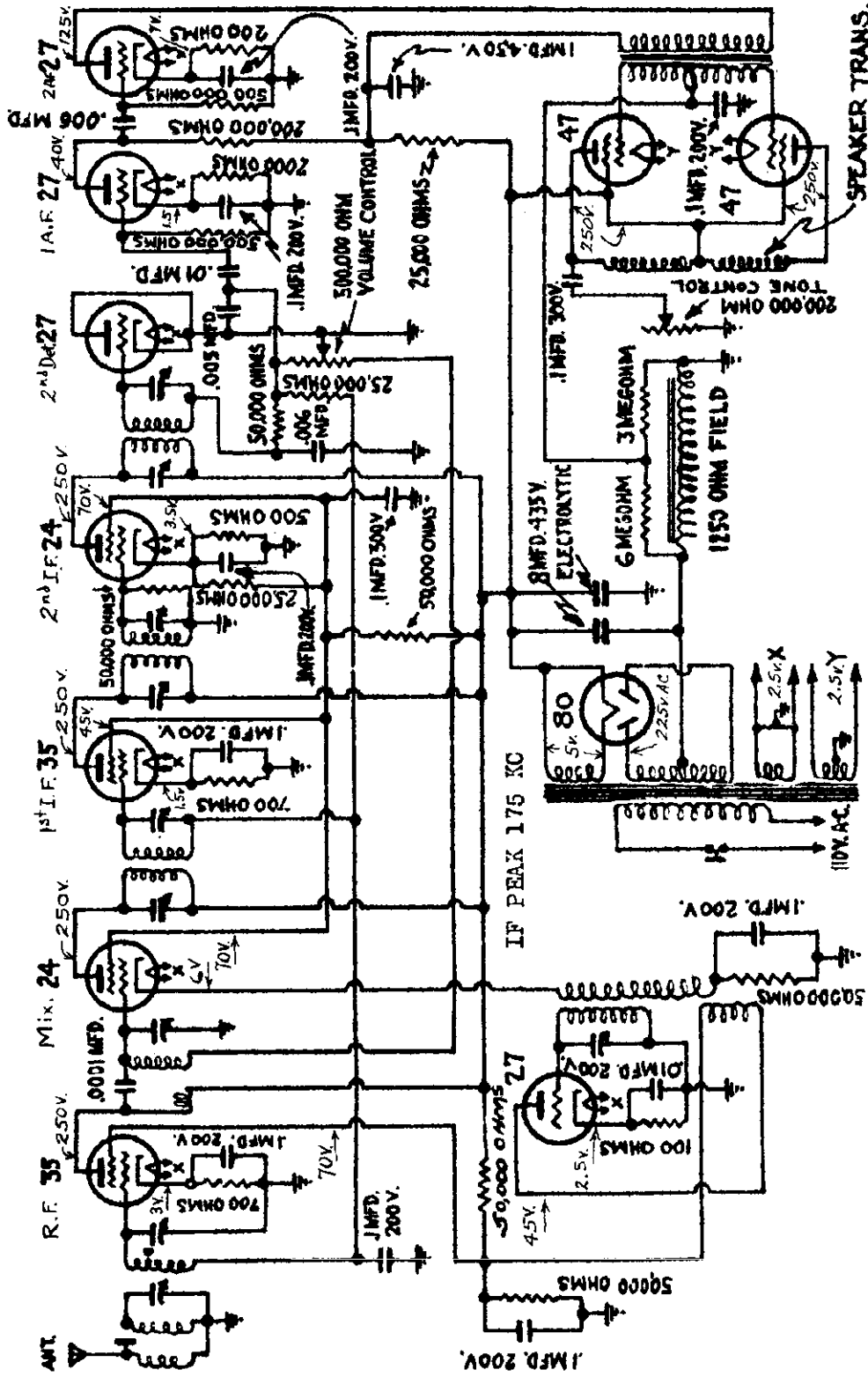
DATE: 6-22-37	SCALE: —	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
DRAWN: N.W.D.	TRACED: N.W.D.	
CHECKED: R.F.	APPROVED: —	
Dwg. No. 938		
SCHEMATIC CIRCUIT DIAGRAM OF THE 10-38 AC DC		



DATE: 6-22-37	SCALE: NONE	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
DRAWN: N.W.D.	TRACED: N.W.D.	
CHECKED: R.F.	APPROVED: —	
Dwg. No. 938		
TOP VIEW OF 10-38 AC DC		

MODEL 11-31
Schematic, Voltage
Alignment

MID-WEST RADIO CORP.



Remove oscillator tube. Align i-f transformers at 175 kc, with signal generator connected between mixer grid and ground. Then insert osc. tube. Set signal generator at 1490 kc and receiver dial at 10 (1490 kc) Adjust osc. section of variable tuning condenser by bending plates. Adjust mixer and r-f trimmers for maximum gain.

DATE: 9-19-35.
SCALE: NONE.

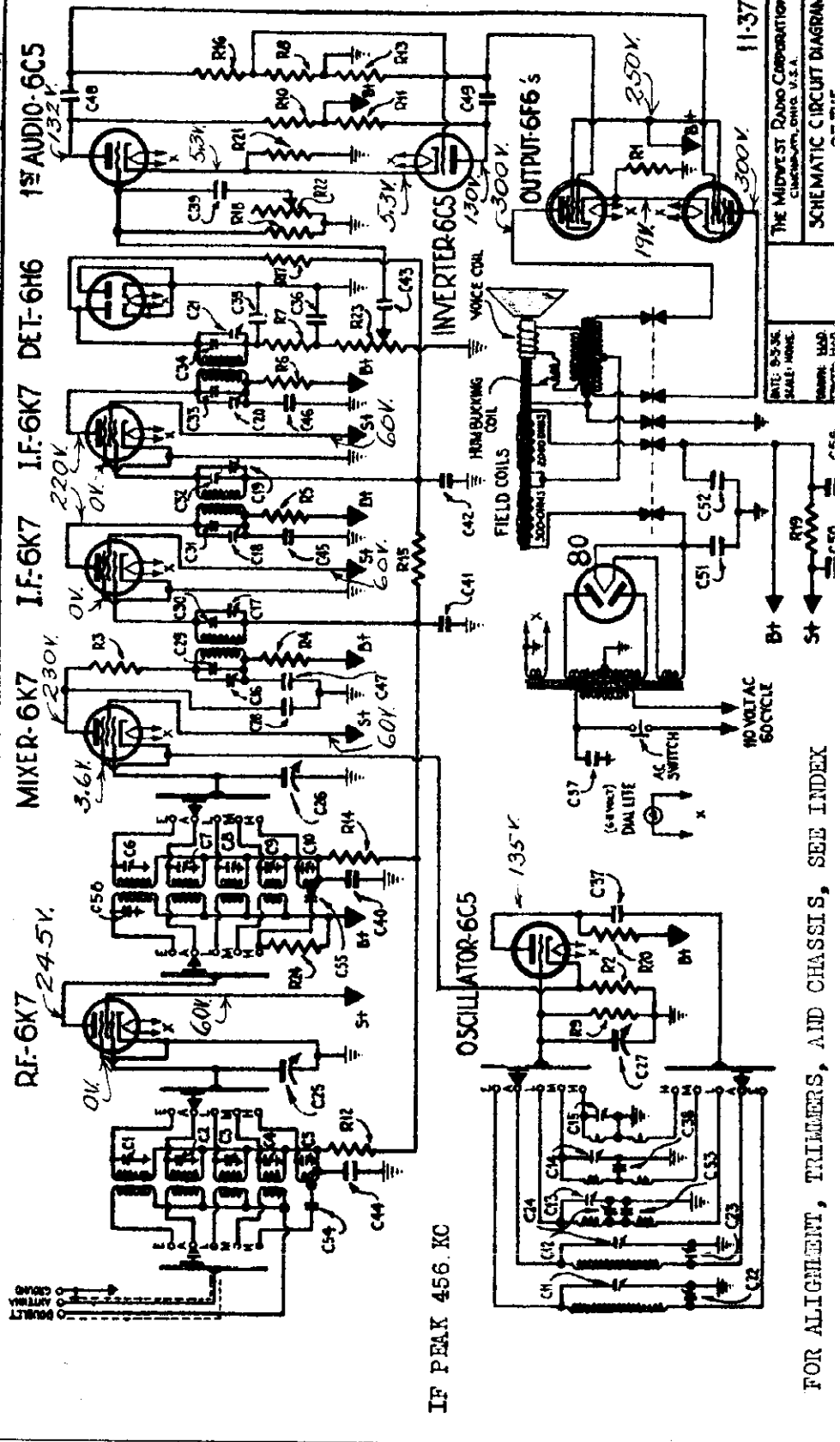
DRAWN: BMD
TRACKED: BMD
CHECKED: JES
APPROVED: JES

THE MIDWEST RADIO CORPORATION
CINCINNATI, OHIO.

SCHMATIC WIRING DIAGRAM
OF SUPERHETRODYNE 11-31
MODEL RECIEVER.

DRAWING No. A77

CONDENSERS		RESISTORS	
C1	35MMFD. TRIMMERS	R1	35000MS 2WATT FLEX.
C2	"	R2	300 OHMS .25WATT
C3	"	R3	50000MS 2.5WATT
C4	"	R4	"
C5	"	R5	"
C6	1.5 I.F.	R6	1 MEGOHM
C7	"	R7	3 MEGOHM
C8	"	R8	50000 OHMS .5WATT
C9	"	R9	15000 OHMS 2WATT
C10	"	R10	2500 OHMS
C11	"	R11	500000 OHMS 5WATT
C12	"	R12	500000 OHMS VOL. CONT.
C13	35 MMFD. TRIMMERS	R13	500000 OHMS .5WATT
C14	"	R14	"
C15	"	R15	"
C16	90 MMFD. MICA	R16	"
C17	75 MMFD.	R17	"
C18	"	R18	"
C19	"	R19	"
C20	"	R20	"
C21	"	R21	"
C22	70 MMFD. PADDER	R22	"
C23	350MMFD.	R23	"
C24	"	R24	"
C25	"	R25	"
C26	"	R26	"
C27	"	R27	"
C28	"	R28	"
C29	"	R29	"
C30	"	R30	"
C31	"	R31	"
C32	"	R32	"
C33	"	R33	"
C34	"	R34	"
C35	"	R35	"
C36	"	R36	"
C37	2000 MMFD. MICA	R37	"
C38	3000 MMFD.	R38	"
C39	.01 MFD. 200VOLT	R39	"
C40	.05 MFD.	R40	"
C41	"	R41	"
C42	"	R42	"
C43	"	R43	"
C44	"	R44	"
C45	"	R45	"
C46	"	R46	"
C47	"	R47	"
C48	"	R48	"
C49	.05MFD. 400VOLT	R49	"
C50	.25 MFD.	R50	"
C51	24MFD.500VOLT MET ELEC.	R51	"
C52	40MFD.350VOLT	R52	"
C53	750MMFD. MICA	R53	"
C54	100 MMFD.	R54	"
C55	"	R55	"
C56	.25 MFD. 400VOLT	R56	"
C57	.05 MFD	R57	"
C58	500MMFD MICA	R58	"



THE MIDWEST RADIO CORPORATION
CHICAGO, ILL. U.S.A.
SCHEMATIC CIRCUIT DIAGRAM

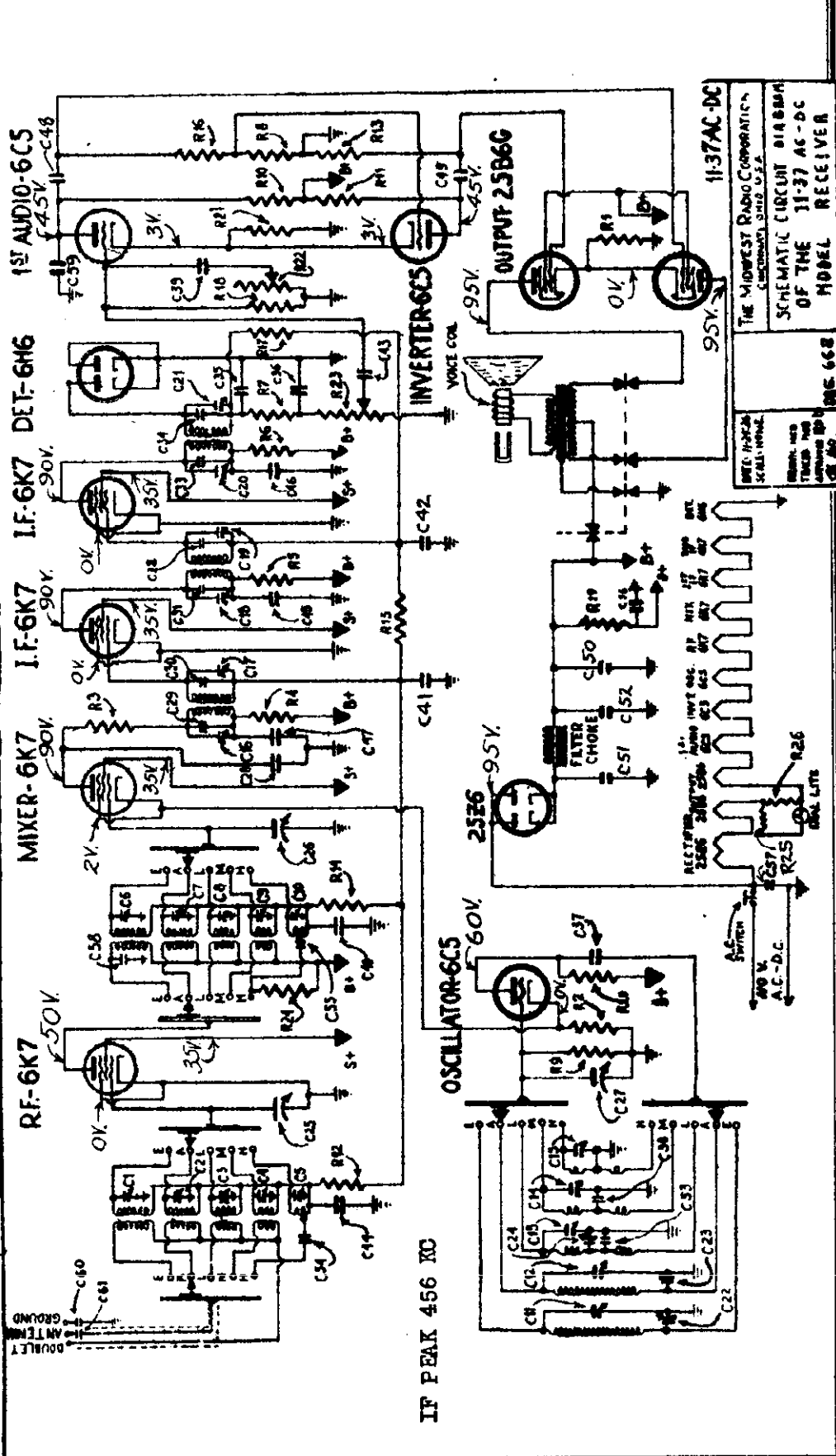
DATE: 8-25-36
SCALE: NONE
DRAWN: M.S.D.

FOR ALIGNMENT, TRIMMERS, AND CHASSIS, SEE INDEX

MODEL 11-37 AC-DC
Schematic, Voltage

MID-WEST RADIO CORP.

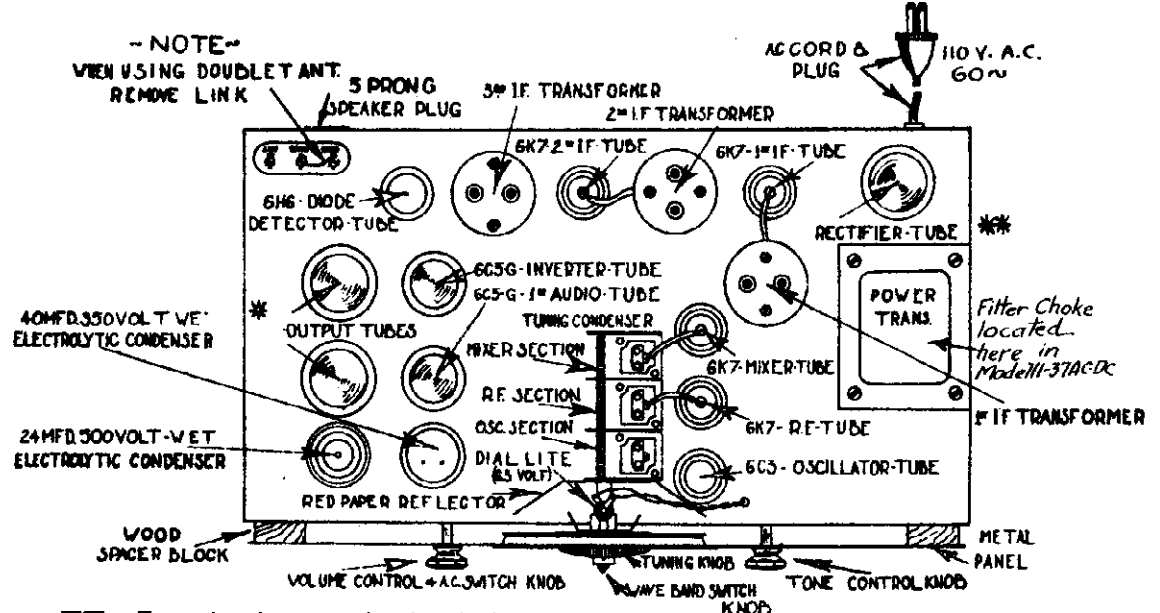
CONDENSERS		RESISTORS	
C1 35MMFD TRIMMERS	C25 .65MMFD TUNING COND.	R1 35000MS 2 WATT FLEX.	R13 500000-0HMS 2.5WATT
C2 35MMFD TRIMMERS	C26 "	R2 500-0HMS .25WATT	R14 500-0HMS .25WATT
C3 35MMFD TRIMMERS	C27 "	R3 5000-0HMS	R15 5000-0HMS
C4 35MMFD TRIMMERS	C28 10 MMFD. MICA	R4 50000C 0HM	R16 50000C 0HM
C5 35MMFD TRIMMERS	C29 75MMFD.	R5 3MEG-0HM	R17 3MEG-0HM
C6 35MMFD TRIMMERS	C30 "	R6 50000-0HMS 5WATT	R18 50000-0HMS 5WATT
C7 35MMFD TRIMMERS	C31 "	R7 25000-0HMS	R19 25000-0HMS
C8 35MMFD TRIMMERS	C32 "	R8 15000-0HMS 2.5WATT	R20 15000-0HMS 2.5WATT
C9 35MMFD TRIMMERS	C33 "	R9 2500-0HMS	R21 2500-0HMS
C10 35MMFD TRIMMERS	C34 "	R10 500000-0HMS TONE CONT.	R22 500000-0HMS TONE CONT.
C11 35MMFD TRIMMERS	C35 250MMFD. MICA	R11 50000-0HMS 1/2 WATT	R23 50000-0HMS 1/2 WATT
C12 35MMFD TRIMMERS	C36 250MMFD. MICA	R12 50000-0HMS 1/2 WATT	R24 50000-0HMS 1/2 WATT
	C37 2000 MMFD. MICA		
	C38 3000 MMFD.		
	C39 .02 MMFD. 200 VOLT		
	C40 .05 MMFD.		
	C41 "		
	C42 "		
	C43 "		
	C44 "		
	C45 "		
	C46 "		
	C47 "		
	C48 "		
	C49 .05MMFD. 400VOLT		
	C50 25MMFD.		
	C51 25MMFD. 350VOLT WET ELEC.		
	C52 40MMFD. 350VOLT "		
	C53 750MMFD. MICA		
	C54 10.0 MMFD.		
	C55 "		
	C56 25 MMFD. 400 VOLT		
	C57 .05 MMFD.		
	C58 500MMFD. MICA		
	C59 250 "		
	C60 .01 MMFD. 400VOLT		



THE MIDWEST RADIO CORPORATION
CINCINNATI, OHIO, U.S.A.
SCHEMATIC CIRCUIT AIRBORNE
OF THE 11-37 AC-DC
MODEL RECEIVER
MS 668

MID-WEST RADIO CORP.

MODEL 11-37
 Socket, Trimmer;
 MODEL 11-37 AC-
 Trimmers

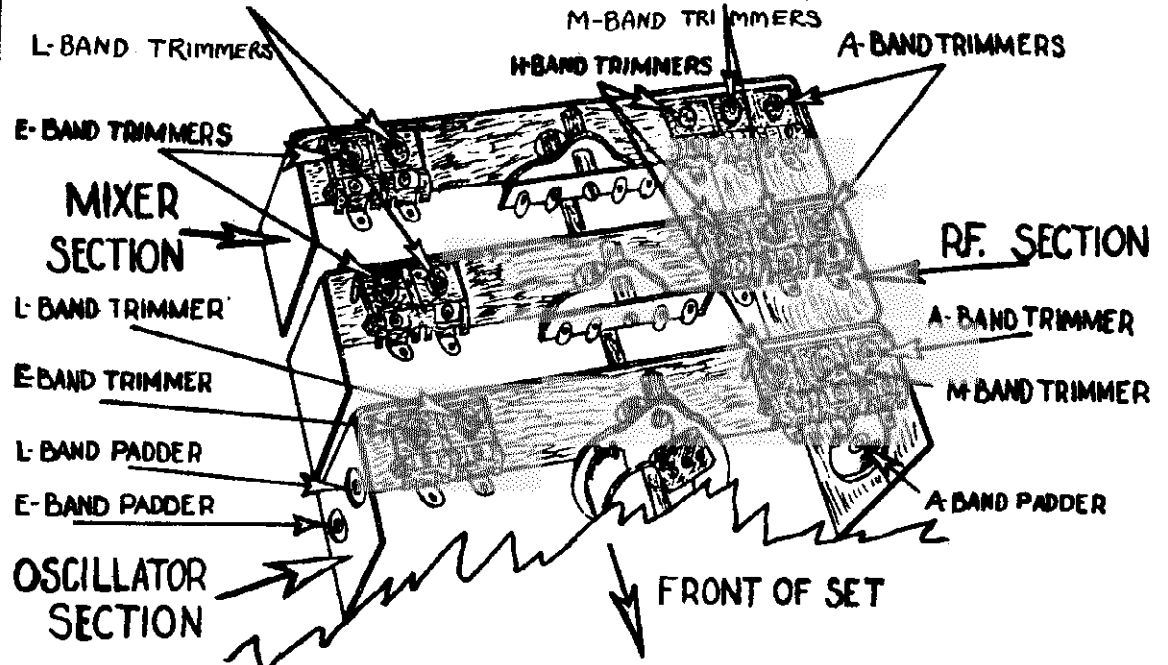


NOTE - These chassis are equipped with the best tube combination available

- * 6F6G output tubes in 11-37 AC and 25B6G tubes in 11-37 AC-DC.
 - ** 80 rectifier in 11-37 AC and 25Z6 in 11-37 AC-DC.
- Metal, metal-glass, or glass counterpart tubes may be used, but the rectifier tubes should be those specified.

11-37

DATE: 11-24-36 SCALE: NONE	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
DRAWN: F.H.U. TRACED: F.H.U. CHECKED: H.M.D. APPROVED: J.H.C.	TOP VIEW OF THE 11-37 MODEL RECEIVER SHOWING LOCATION OF TUBES & OTHER PARTS



DATE: 11-24-36 SCALE: NONE	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
DRAWN: F.H.U. TRACED: F.H.U. APPROVED: H.M.D.	TRIMMER & PADDER LOCATION OF THE 11-37 AC & 11-37 MODEL RECEIVER

DRG.No. 676

MODEL 11-37

MODEL 11-37 AC-DC

Alignment

MID-WEST RADIO CORP.

ALIGNMENT INSTRUCTIONS FOR MODEL 11-37 AC
AND MODEL 11-37 AC-DC

- (1) Set the signal generator to 456 k.c. and connect it from the mixer grid to ground.
- (2) Remove the oscillator tube from the receiver.
- (3) Connect the output meter from the plate of the output tube to positive B.
- (4) Using a moderately weak signal approximately 40 microvolts, align the three I.F. transformers to maximum output.
- (5) Keep decreasing the oscillator input and re-aligning for maximum gain.

This completes the alignment of the I.F. amplifier. Insert the oscillator tube. Connect the signal generator between antenna and ground. Connect mixer lead to grid of mixer tube.

- (1) Set the wave change switch to the "E" band.
- (2) Set the signal generator to 325 k.c., and also the dial.
- (3) Adjust the "E" oscillator trimmer to maximum gain, then adjust the "E" band R. F. and the "E" band mixer trimmers for maximum gain.
- (4) Reset the signal generator to 135 k.c. and rotate the receiver dial to 135 k.c.
- (5) Adjust the "E" band padder for maximum signal.
- (6) Repeat the adjustment of trimmers and paddors until the adjustment of one does not effect the adjustment of the other.

This completes the alignment of the "E" band.

- (1) Set the wave change switch to the "A" band.
- (2) Set the signal generator to 1490 k.c.

- (5) Adjust the "A" oscillator trimmer to maximum gain, then adjust the "A" band R.F. and the "A" band mixer trimmers for maximum gain.
 - (4) Reset the signal generator to 550 k.c. and rotate the receiver dial to 550 k.c.
 - (5) Adjust the "A" band padder for maximum signal.
 - (6) Repeat the adjustment of trimmers and paddors until the adjustment of one does not effect the adjustment of the other.
- This completes the alignment of the "A" band.
- (1) Set the wave change switch to the "L" band.
 - (2) Set the signal generator to 3.8 m.c.
 - (3) Adjust the "L" oscillator trimmer to maximum gain, then adjust the "L" band R.F. and the "L" band mixer trimmers for maximum gain.
 - (4) Reset the signal generator to 1.6 m.c. and rotate the receiver dial to 1.6 m.c.

- (5) Adjust the "L" band padder for maximum signal.
- (6) Repeat the adjustment of trimmers and paddors until the adjustment of one does not effect the adjustment of the other.

This completes the alignment of the "L" band.

- (1) Set the wave change switch to the "M" band.
- (2) Set the signal generator to 11.5 m.c.

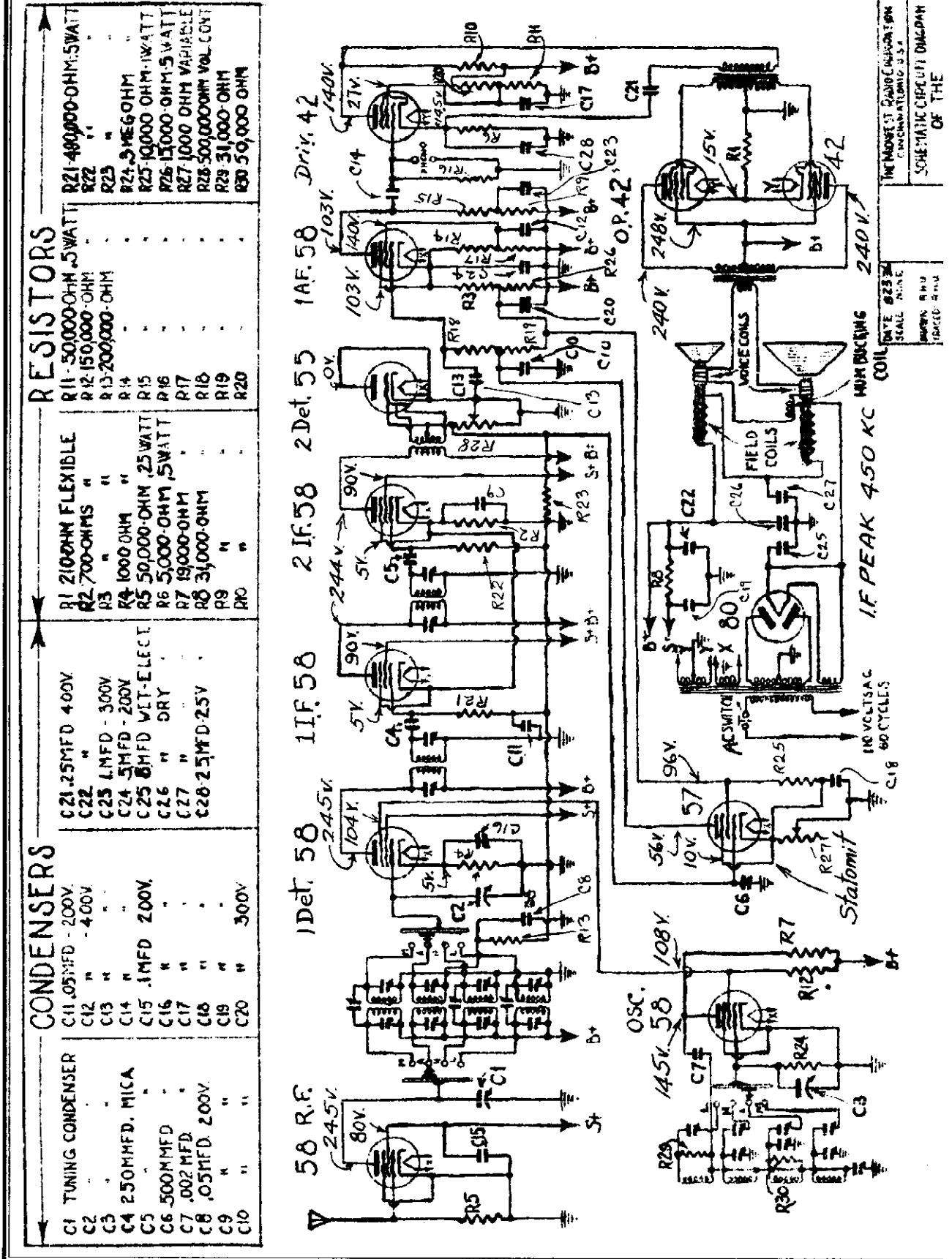
- (3) Adjust the "M" oscillator trimmer to maximum gain, then adjust the "M" band R.F. and the "M" band mixer trimmers for maximum gain.

This completes the alignment of the "M" band.

- (1) Set the wave change switch to the "H" band.
- (2) Set the signal generator to 28 m.c.

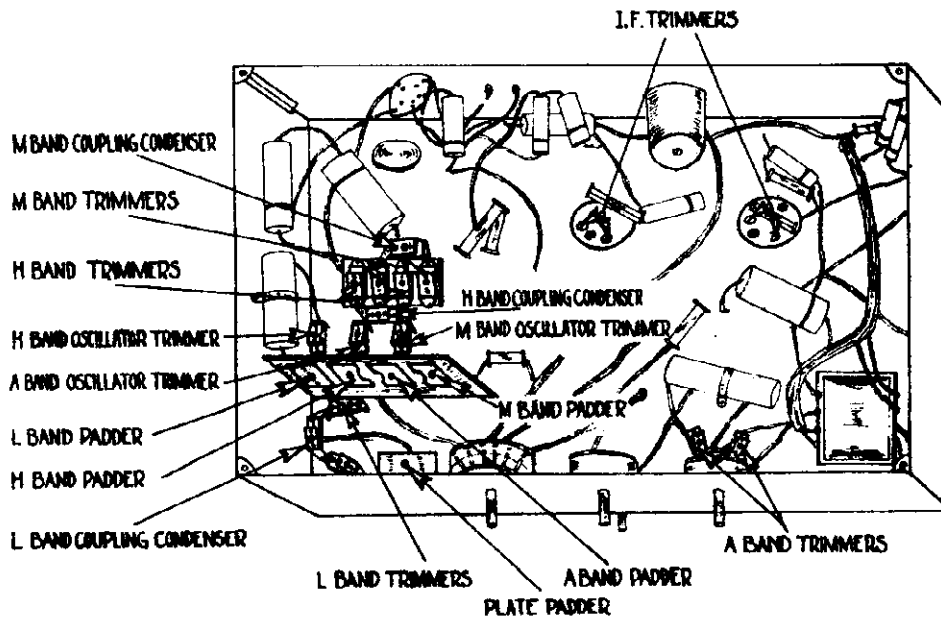
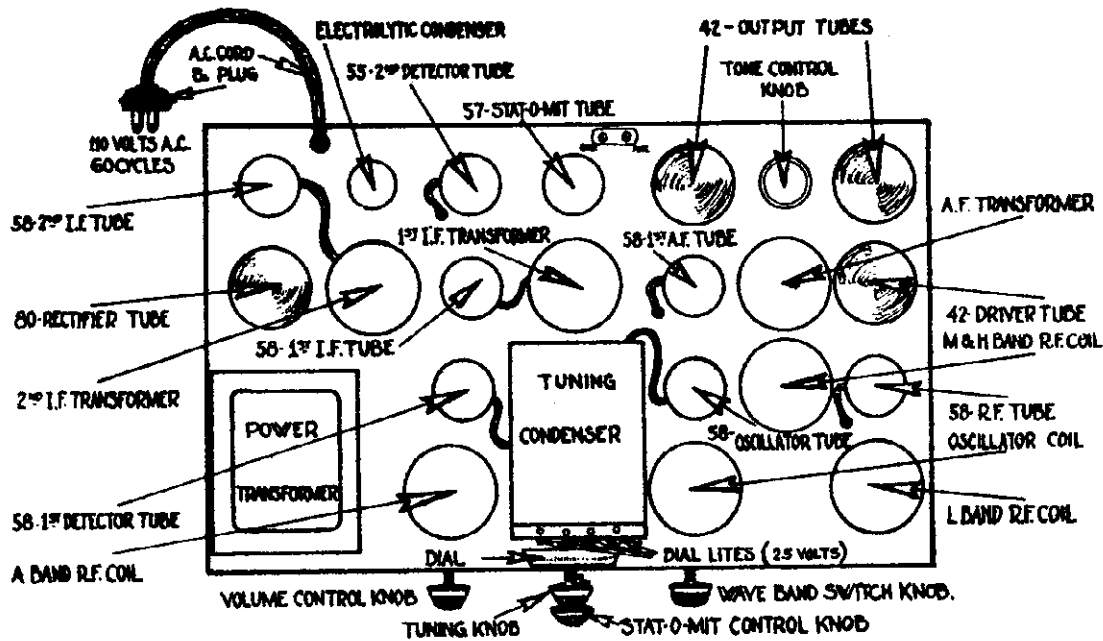
- (3) Adjust the "H" band oscillator trimmer to maximum gain, then adjust the "H" band R.F. and the "H" band mixer trimmers for maximum gain.

This completes the alignment of the "H" band.



MODEL 12-35
 Socket, Trimmers
 Alignment

MID-WEST RADIO CORP.



Before aligning the i-f amplifier, check the spacing of the i-f transformers, as they sometimes collapse resulting in broad tuning. The spacing should be 3/4 inch between faces of the coils. Wax coils in place. Set signal generator at 450 kc and adjust i-f trimmers. Measure the AVC voltage developed for peaking purposes.

A BAND-WHITE. Do not adjust the plate padder. This has been done at the factory and should not be changed. Set dial at 5 and signal generator at 1490 kc. Adjust A-Band r-f trimmers to maximum output and then padder at 560 kc with dial set at 98.

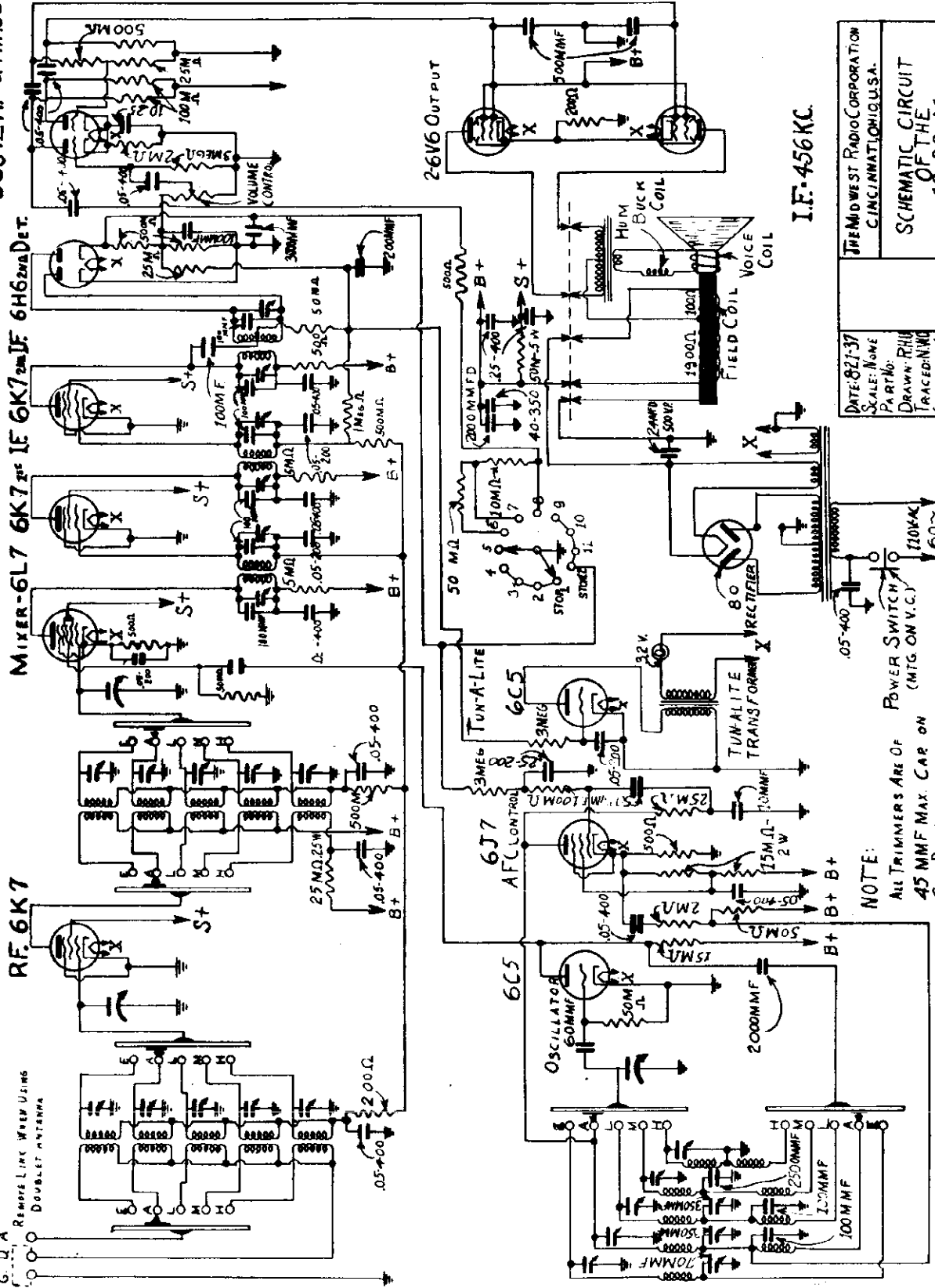
L BAND-RED. Set dial at 2. Adjust r-f trimmers at 4.1 mc. Set dial at 98 and adjust padder at 1712 kc. Adjust feed condenser until maximum sensitivity is reached over the whole band. Generally this condenser will be tight.

M BAND-GREEN. Set dial at 2. Adjust r-f trimmers at 9 mc. Adjust padder at 4.5 mc. Adjust feed condenser as was done in L Band.

H BAND-ALBER or BLUE. Set dial at 5. Adjust r-f trimmers at 20 mc. Adjust padder at 9 mc. with dial at 98. Adjust feed condenser as was done in L Band.

MID-WEST RADIO CORP.

6C8151AF & PHASE INV.



I.F. 456 KC.

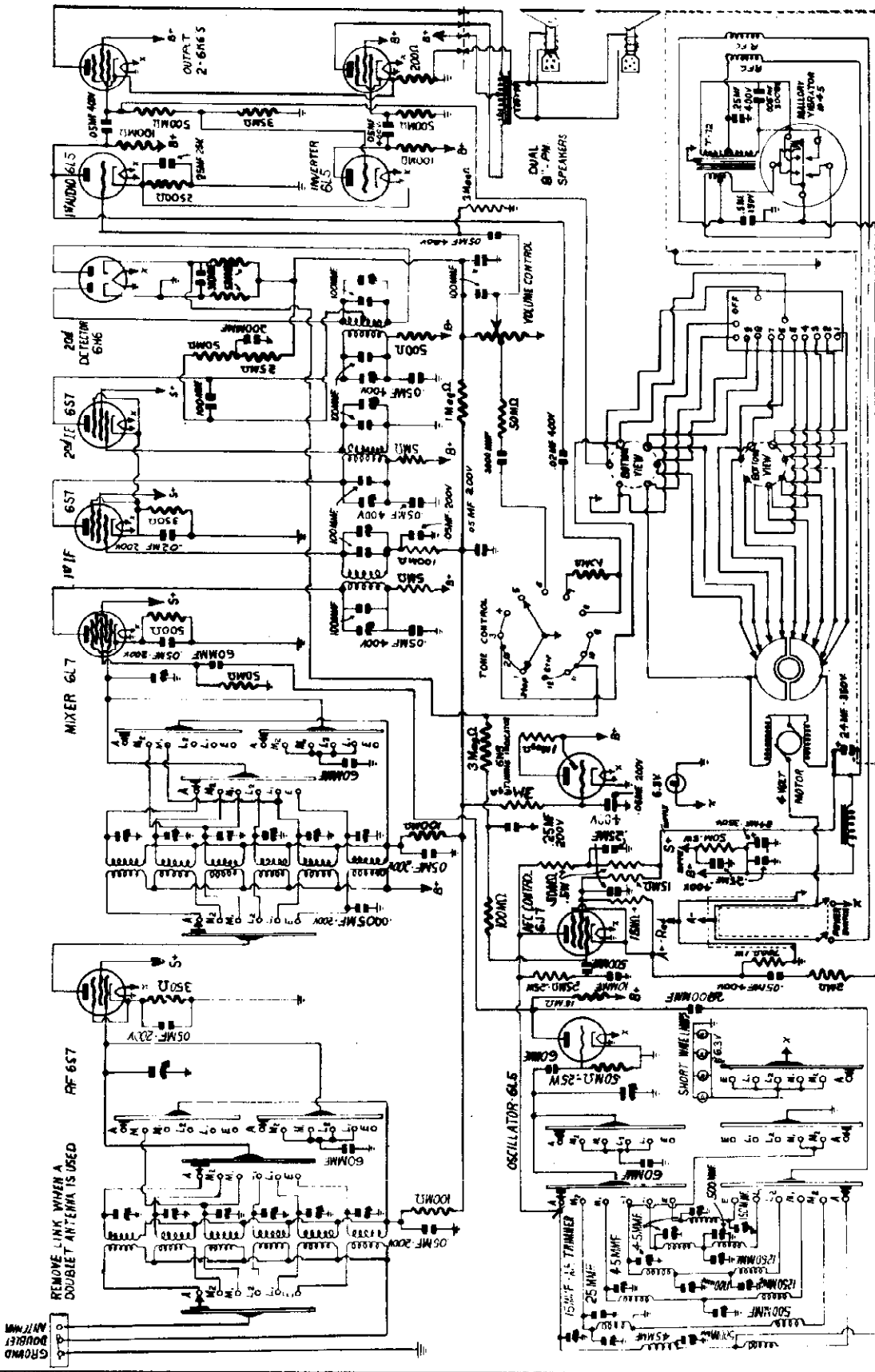
DATE: 8-21-37	MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
SCALE: NONE	SCHEMATIC CIRCUIT OF THE 12-38-AC
PART NO:	
DRAWN: R.H.H.	
TRACED: J.W.C.	
CHECKED: J.W.C.	APPROVED:
	DRG. No. 986

NOTE:

ALL TRIMMERS ARE OF
45 MMF MAX. CAR ON
COIL PLATES
IF TRIMMERS ARE 150MMF MAX. CAR.

MODEL 12-38 Batt.
Schematic

MID-WEST RADIO CORP.



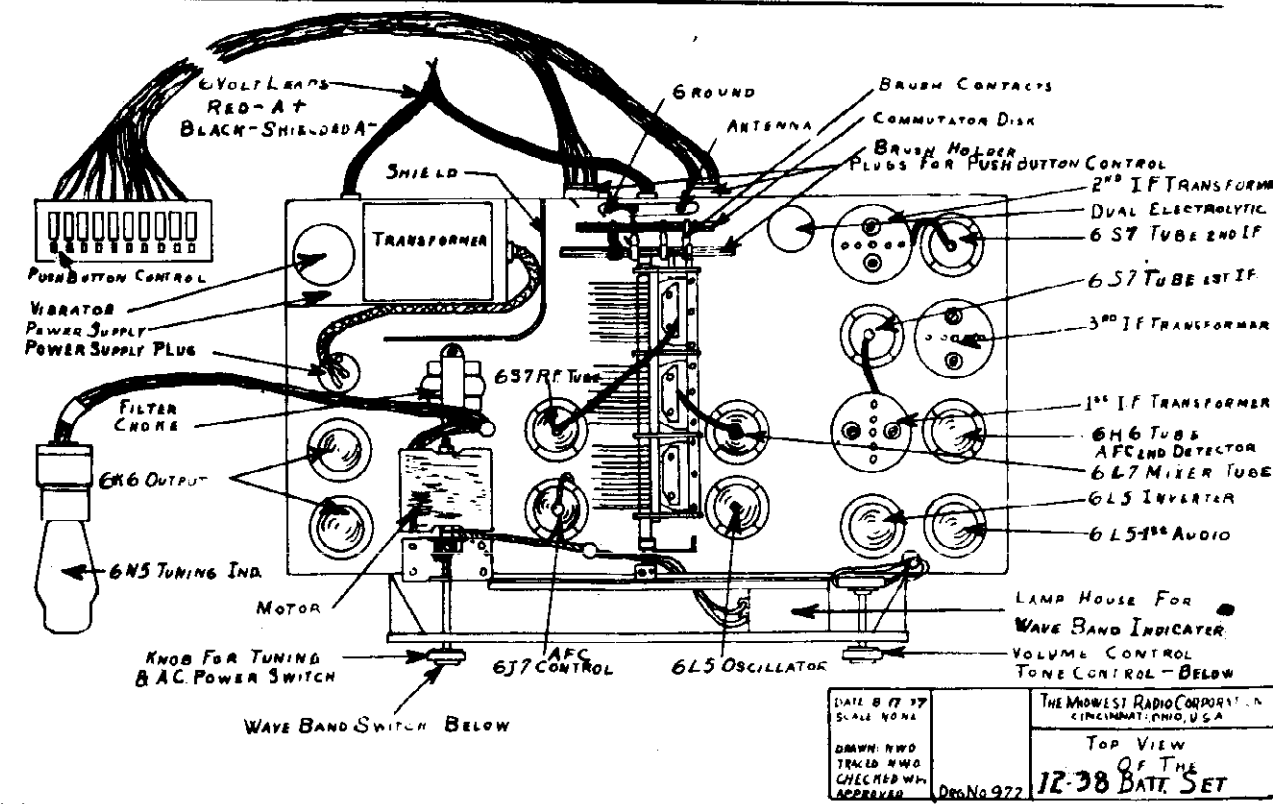
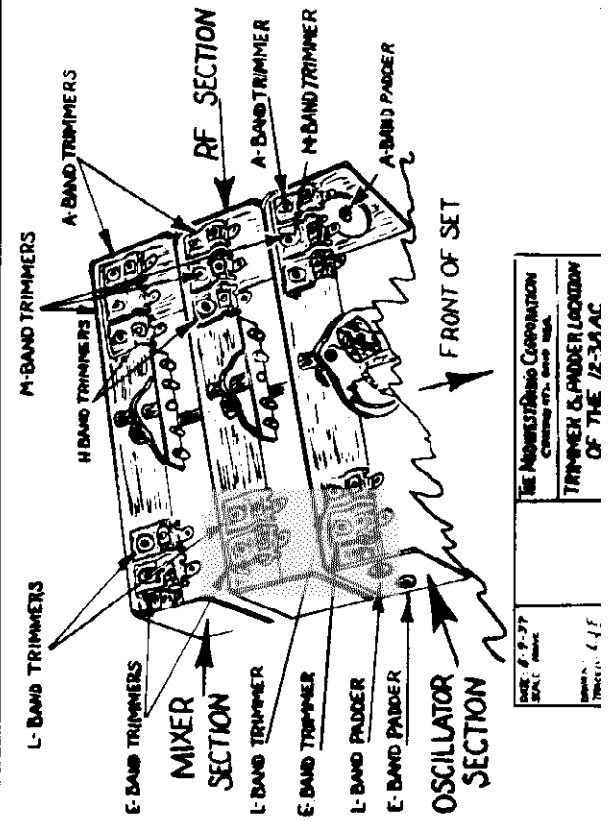
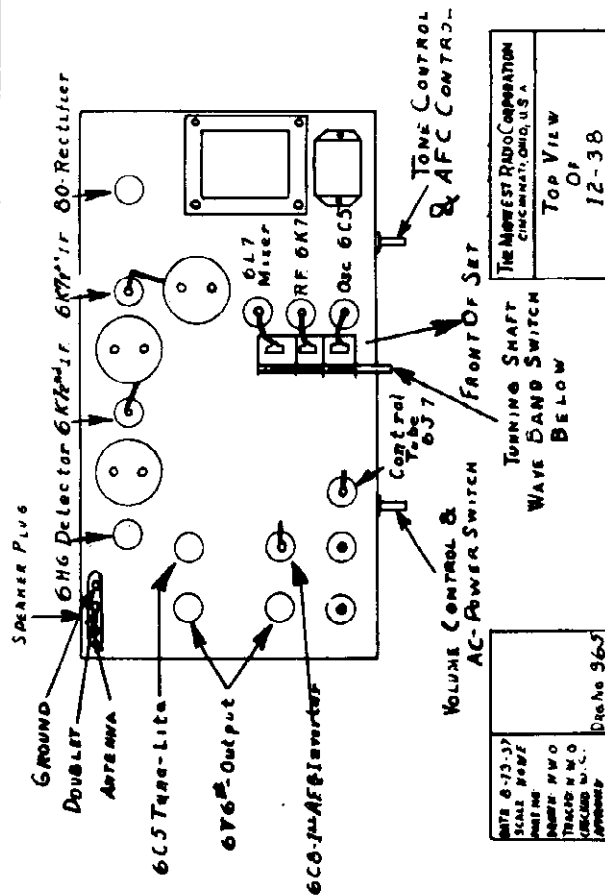
DATE 6/25/38
 DRAWN BY
 CHECKED BY
 APPROVED DRG. 6/29

THE MIDWEST RADIO CORPORATION
 SCHEMATIC CIRCUIT DIAGRAM
 OF THE 12-38
 BATTERY RECEIVER

12-38 BATTERY IF = 456KC.

MID-WEST RADIO CORP.

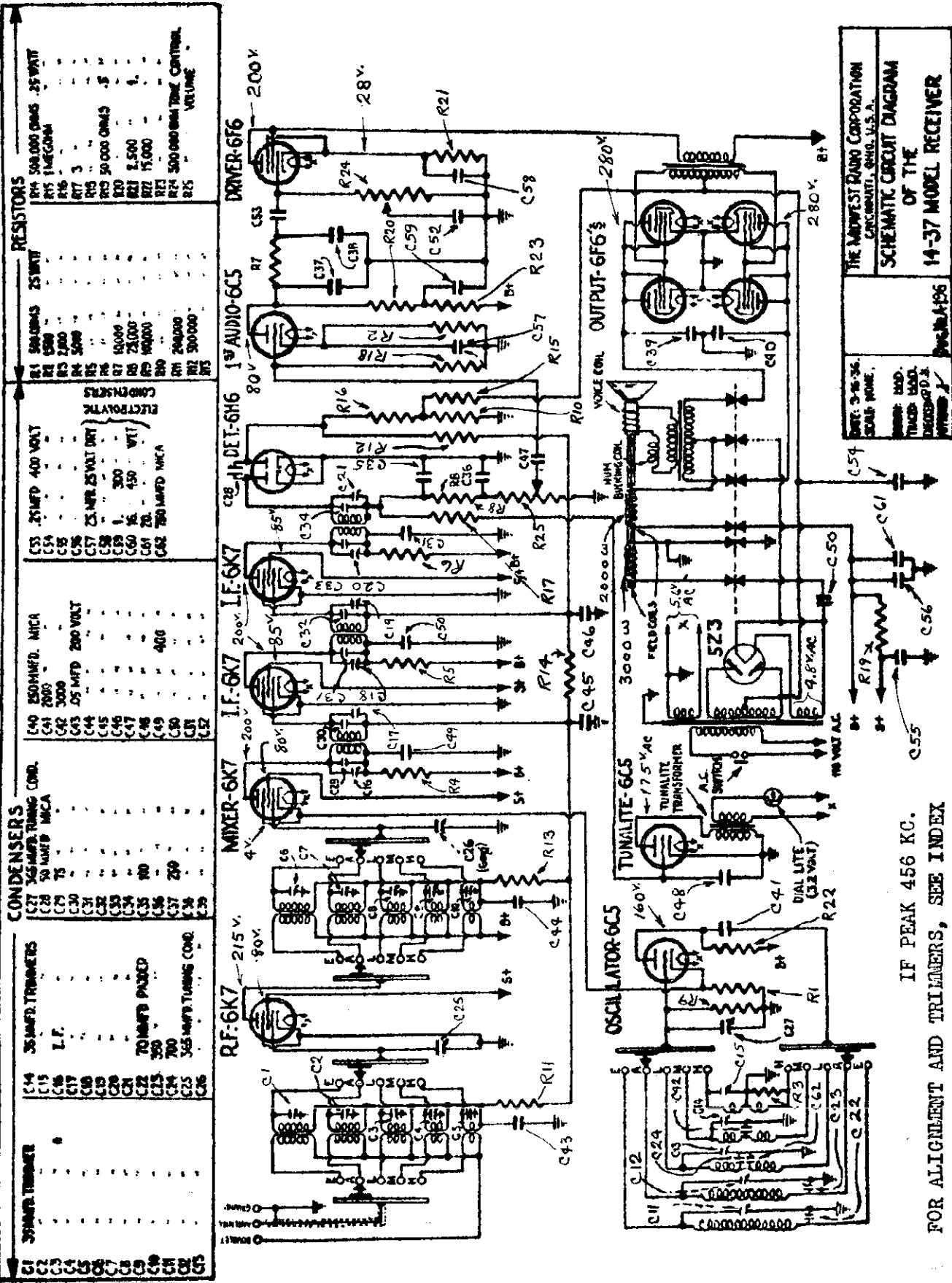
MODEL 12-38 AC
 Socket, Trimmers
 MODEL 12-38 Bat
 Socket



MODEL 14-37

Schematic, Voltage

MID-WEST RADIO CORP.

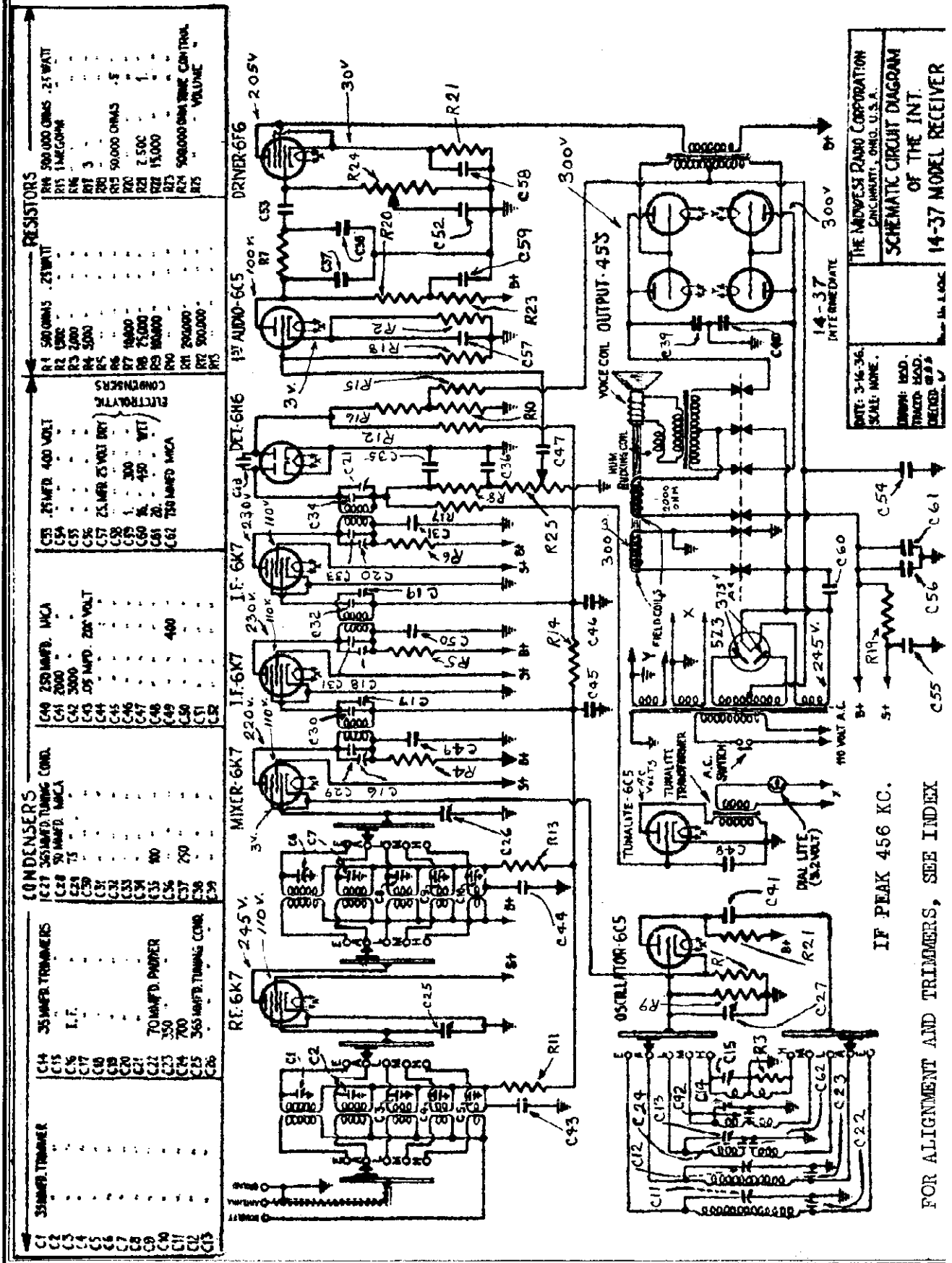


THE MIDWEST RADIO CORPORATION
 CINCINNATI, OHIO, U.S.A.
 SCHEMATIC CIRCUIT DIAGRAM
 OF THE
 14-37 MODEL RECEIVER
 DATE: 3-16-34.
 SCALE: 100%
 DRAWN: HOD.
 CHECKED: HOD.
 APPROVED: HOD.

STANDARD TRIMMER		35 MAFB TRIMMERS		CONDENSERS		ELECTROLYTIC CONDENSERS		RESISTORS	
C14	C15	C16	C17	C18	C19	C20	C21	R1	R2
C22	C23	C24	C25	C26	C27	C28	C29	R3	R4
C30	C31	C32	C33	C34	C35	C36	C37	R5	R6
C38	C39	C40	C41	C42	C43	C44	C45	R7	R8
C46	C47	C48	C49	C50	C51	C52	C53	R9	R10
C54	C55	C56	C57	C58	C59			R11	R12
C60	C61	C62						R13	R14
C63	C64	C65						R15	R16
C66	C67	C68						R17	R18
C69	C70	C71						R19	R20
C72	C73	C74						R21	R22
C75	C76	C77						R23	R24
C78	C79	C80						R25	

IF PEAK 456 KC.
 FOR ALIGNMENT AND TRIMMERS, SEE INDEX

MIDWEST RADIO CORP.



CONDENSERS		RESISTORS	
C1	35MMFD. TRIMMER	R1	500 OHMS .25WATT
C2	35MMFD. TRIMMER	R2	100 OHMS .25WATT
C3	35MMFD. TRIMMER	R3	100 OHMS .25WATT
C4	35MMFD. TRIMMER	R4	200 OHMS .25WATT
C5	35MMFD. TRIMMER	R5	200 OHMS .25WATT
C6	35MMFD. TRIMMER	R6	200 OHMS .25WATT
C7	35MMFD. TRIMMER	R7	200 OHMS .25WATT
C8	35MMFD. TRIMMER	R8	200 OHMS .25WATT
C9	35MMFD. TRIMMER	R9	200 OHMS .25WATT
C10	35MMFD. TRIMMER	R10	200 OHMS .25WATT
C11	35MMFD. TRIMMER	R11	200 OHMS .25WATT
C12	35MMFD. TRIMMER	R12	200 OHMS .25WATT
C13	35MMFD. TRIMMER	R13	200 OHMS .25WATT
C14	35MMFD. TRIMMER	R14	200 OHMS .25WATT
C15	35MMFD. TRIMMER	R15	200 OHMS .25WATT
C16	35MMFD. TRIMMER	R16	200 OHMS .25WATT
C17	35MMFD. TRIMMER	R17	200 OHMS .25WATT
C18	35MMFD. TRIMMER	R18	200 OHMS .25WATT
C19	35MMFD. TRIMMER	R19	200 OHMS .25WATT
C20	35MMFD. TRIMMER	R20	200 OHMS .25WATT
C21	35MMFD. TRIMMER	R21	200 OHMS .25WATT
C22	35MMFD. TRIMMER	R22	200 OHMS .25WATT
C23	35MMFD. TRIMMER	R23	200 OHMS .25WATT
C24	35MMFD. TRIMMER	R24	200 OHMS .25WATT
C25	35MMFD. TRIMMER	R25	200 OHMS .25WATT
C26	35MMFD. TRIMMER	R26	200 OHMS .25WATT
C27	35MMFD. TRIMMER	R27	200 OHMS .25WATT
C28	35MMFD. TRIMMER	R28	200 OHMS .25WATT
C29	35MMFD. TRIMMER	R29	200 OHMS .25WATT
C30	35MMFD. TRIMMER	R30	200 OHMS .25WATT
C31	35MMFD. TRIMMER	R31	200 OHMS .25WATT
C32	35MMFD. TRIMMER	R32	200 OHMS .25WATT
C33	35MMFD. TRIMMER	R33	200 OHMS .25WATT
C34	35MMFD. TRIMMER	R34	200 OHMS .25WATT
C35	35MMFD. TRIMMER	R35	200 OHMS .25WATT
C36	35MMFD. TRIMMER	R36	200 OHMS .25WATT
C37	35MMFD. TRIMMER	R37	200 OHMS .25WATT
C38	35MMFD. TRIMMER	R38	200 OHMS .25WATT
C39	35MMFD. TRIMMER	R39	200 OHMS .25WATT
C40	35MMFD. TRIMMER	R40	200 OHMS .25WATT
C41	35MMFD. TRIMMER	R41	200 OHMS .25WATT
C42	35MMFD. TRIMMER	R42	200 OHMS .25WATT
C43	35MMFD. TRIMMER	R43	200 OHMS .25WATT
C44	35MMFD. TRIMMER	R44	200 OHMS .25WATT
C45	35MMFD. TRIMMER	R45	200 OHMS .25WATT
C46	35MMFD. TRIMMER	R46	200 OHMS .25WATT
C47	35MMFD. TRIMMER	R47	200 OHMS .25WATT
C48	35MMFD. TRIMMER	R48	200 OHMS .25WATT
C49	35MMFD. TRIMMER	R49	200 OHMS .25WATT
C50	35MMFD. TRIMMER	R50	200 OHMS .25WATT
C51	35MMFD. TRIMMER	R51	200 OHMS .25WATT
C52	35MMFD. TRIMMER	R52	200 OHMS .25WATT
C53	35MMFD. TRIMMER	R53	200 OHMS .25WATT
C54	35MMFD. TRIMMER	R54	200 OHMS .25WATT
C55	35MMFD. TRIMMER	R55	200 OHMS .25WATT
C56	35MMFD. TRIMMER	R56	200 OHMS .25WATT
C57	35MMFD. TRIMMER	R57	200 OHMS .25WATT
C58	35MMFD. TRIMMER	R58	200 OHMS .25WATT
C59	35MMFD. TRIMMER	R59	200 OHMS .25WATT
C60	35MMFD. TRIMMER	R60	200 OHMS .25WATT
C61	35MMFD. TRIMMER	R61	200 OHMS .25WATT

DATE: 3-16-36.
SCALE: NONE.
DRAWN: B.S.D.
CHECKED: B.S.D.
DESIGNED: V.

THE MIDWEST RADIO CORPORATION
CINCINNATI, OHIO, U.S.A.

SCHMATIC CIRCUIT DIAGRAM
OF THE INT.
14-37 MODEL RECEIVER

IF PEAK 456 KC.
FOR ALIGNMENT AND TRIMMERS, SEE INDEX

MODEL 14-37A
Schematic, Voltage

MID-WEST RADIO CORP.

RESISTORS

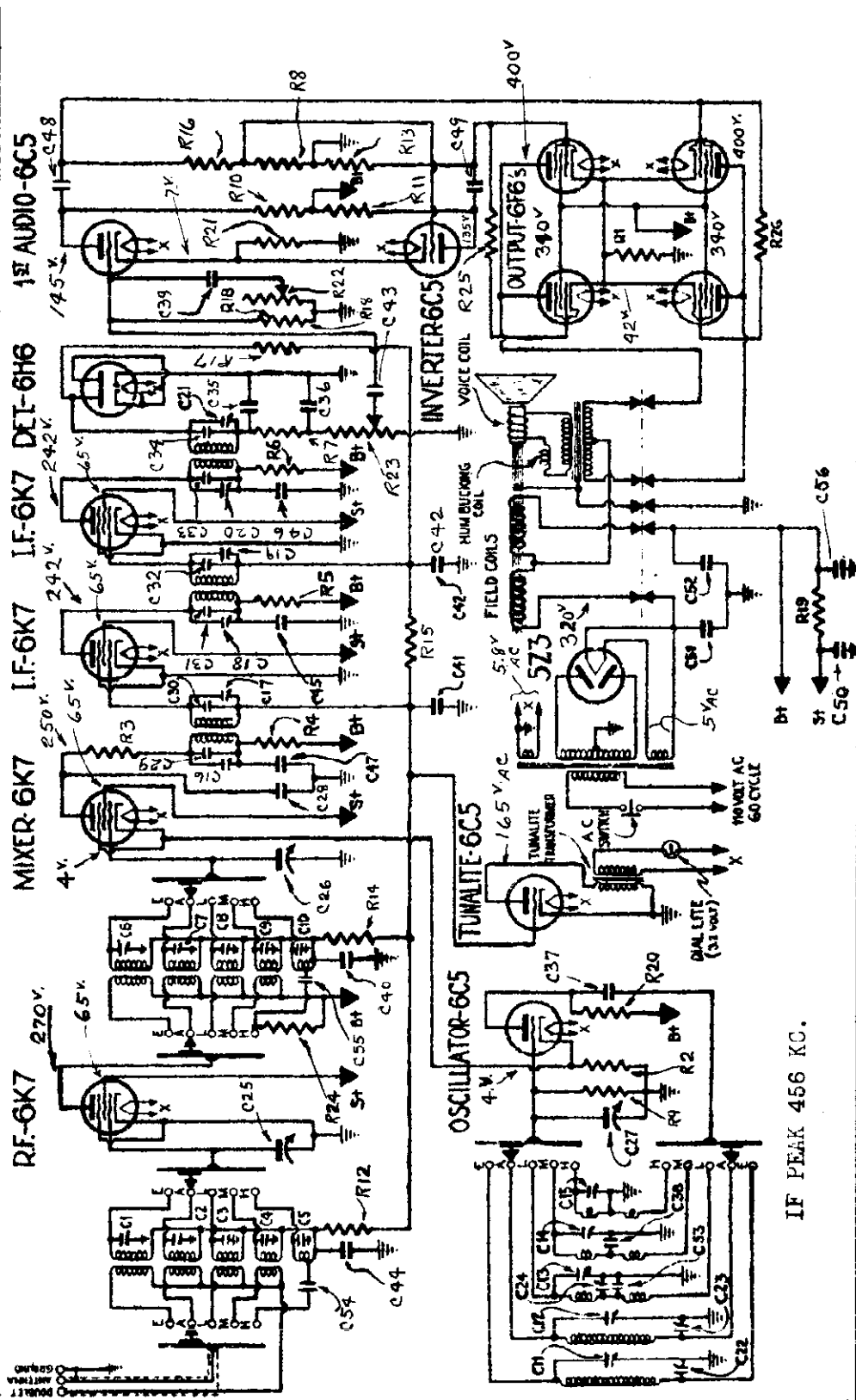
R1	35000Ω 2WATT FLEX.	R15	500000Ω 0.5WATT
R2	500Ω 0.5WATT	R16	500000Ω 0.5WATT
R3	50000Ω 0.5WATT	R17	1 MEGΩ 0.5WATT
R4	50000Ω 0.5WATT	R18	3 MEGΩ 0.5WATT
R5	25000Ω 0.5WATT	R19	50000Ω 0.5WATT
R6	25000Ω 0.5WATT	R20	15000Ω 0.5WATT
R7	49000Ω 0.5WATT	R21	2500Ω 0.5WATT
R8	100000Ω 0.5WATT	R22	500000Ω 0.5WATT
R9	100000Ω 0.5WATT	R23	500000Ω 0.5WATT
R10	500000Ω 0.5WATT	R24	250000Ω 0.5WATT
R11	500000Ω 0.5WATT		
R12	500000Ω 0.5WATT		

C49	0.5MFD. 400VOLT	C37	2000 MAFD. MICA
C50	.25MFD.	C38	3000 MAFD.
C51	24.MED.500VOLT WET ELIC	C39	0.1 MFD. 200 VOLT
C52	40MFD.350VOLT	C40	0.5MFD.
C53	750 MAFD. MICA	C41	
C54	100 MAFD.	C42	
C55		C43	
C56	25 MFD. 400 VOLT	C44	
		C45	
		C46	
R26	200 OHM 1 WATT	C47	
R25		C48	

CONDENSERS

C1	35 MAFD. TRIMMERS	C25	365 MAFD. TUNING COND.
C2		C26	
C3		C27	
C4		C28	10 MAFD. MICA
C5		C29	75 MAFD.
C6		C30	100 MAFD.
C7		C31	
C8		C32	
C9		C33	250 MAFD. MICA
C10		C34	250 MAFD. MICA
C11		C35	250 MAFD. MICA
C12		C36	250 MAFD. MICA
		C37	2000 MAFD. MICA
		C38	3000 MAFD.
		C39	0.1 MFD. 200 VOLT
		C40	0.5MFD.
		C41	
		C42	
		C43	
		C44	
		C45	
		C46	
		C47	
		C48	

C13	35 MAFD. TRIMMERS	C21	70 MAFD. PADDER
C14		C22	350 MAFD.
C15		C23	350 MAFD.
C16		C24	
C17			
C18			
C19			
C20			
C21			
C22			
C23			
C24			



IF PEAK 456 KC.

14 37A

DATE: 5-28-34	DESIGNED BY: [Signature]	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
SCALE: NONE	CHECKED BY: [Signature]	
DRINK: EAD	APPROVED: [Signature]	SCHEMATIC CIRCUIT DIAGRAM OF THE 14-37A MODEL RECEIVER
INSTR: BOB	Drawn No. 533	

MID-WEST RADIO CORP.

MODEL 14-37
 MODEL 14-37(Int.)
 MODEL 14-37A
 Trimmers, Alignment

ALIGNMENT PROCEDURE
 MODELS 14-37, 14-37A, AND 14-37 INTERMEDIATE

INTERMEDIATE FREQUENCY ALIGNMENT

- (1) Set the signal generator to 456 KC and connect it from the Mixer tube grid to ground.
- (2) Remove the Oscillator tube from the receiver.
- (3) Connect the output meter from the plate of the output tube to the positive "B".
- (4) Using a moderately weak signal of approximately 40 microvolts, align the three IF transformers to maximum output.
- (5) Keep decreasing the signal generator input and re-align for maximum gain.

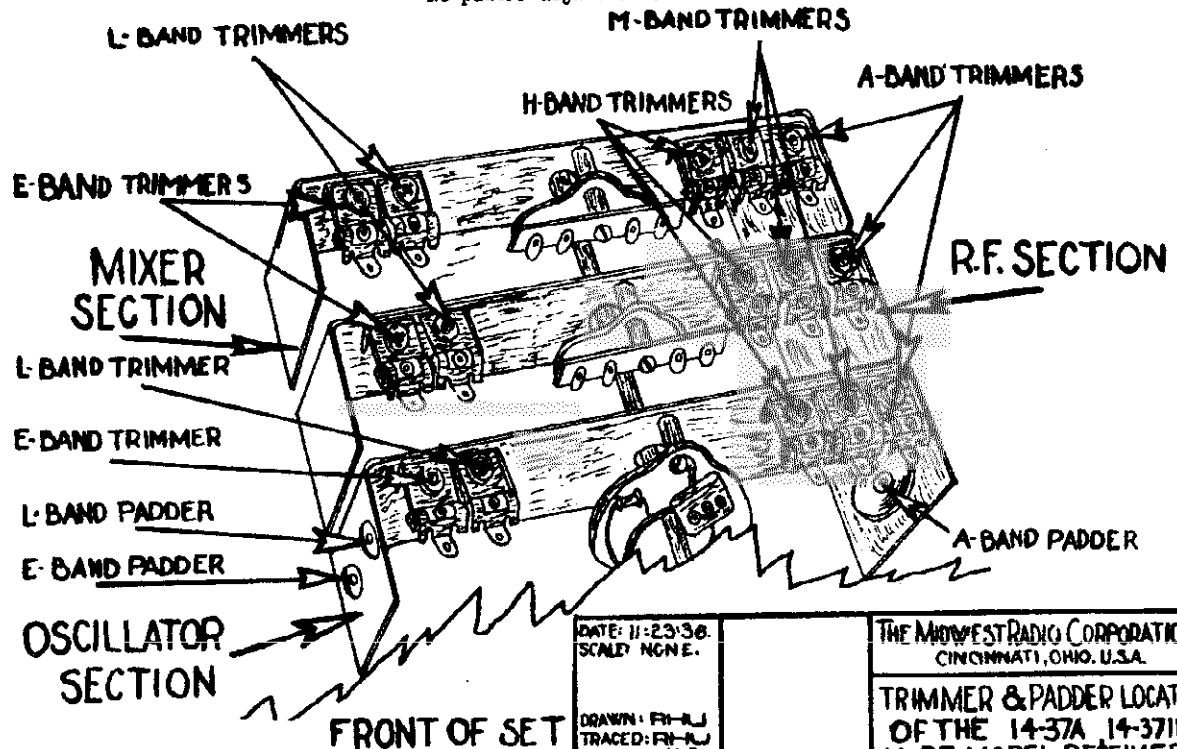
"E" Band ALIGNMENT

- (1) Set the receiver wave change switch to the "E" Band.
- (2) Set the signal generator to 325 KC.
- (3) Adjust the "E" Band Oscillator trimmer to maximum gain, then adjust the RF and Mixer trimmers of the same band to maximum gain.
- (4) Reset the signal generator to 135 KC and set the receiver dial to the same frequency.
- (5) Adjust the "E" band padder for maximum signal.
- (6) Repeat the adjustments of trimmers and padder until the adjustment of one does not affect the adjustment of the other.

"A", "L", "M", AND "H" BAND ALIGNMENT

The procedure of alignment of these bands are the same as given above for the "E" band. The frequencies for their adjustment are as follows :-

- "A" BAND- Adjust Oscillator, RF, and Mixers trimmers to 1490 KC
 Adjust Oscillator padder to 550 KC.
- "L" BAND- Adjust Oscillator, RF, and Mixer trimmers to 3.8 MC
 Adjust Oscillator padder to 1.6 MC.
- "M" BAND- Adjust Oscillator, RF, and Mixer trimmers to 11.5 MC
 No padder adjustment.
- "H" BAND- Adjust Oscillator, RF, and Mixer trimmers to 28 MC
 No padder adjustment.

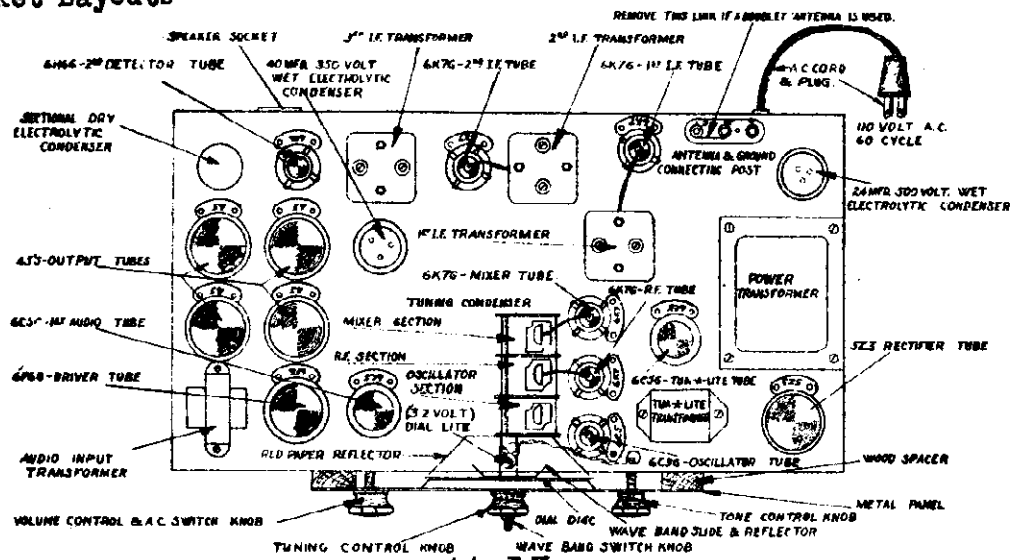


DATE: 11-23-36 SCALE: NONE.	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
DRAWN: FR-AL TRACED: FR-AL CHECKED: HND APPROVED: [Signature]	TRIMMER & PADDER LOCATION OF THE 14-37A 14-37INT., 14-37 MODEL RECEIVER

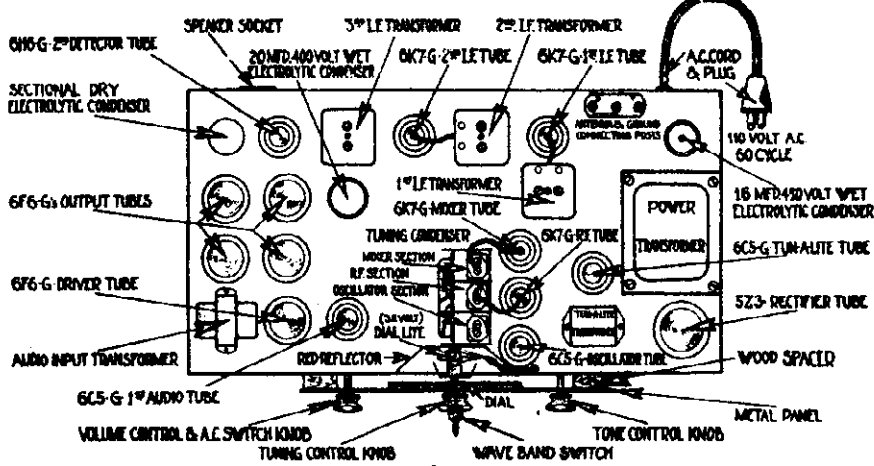
Dwg. No. 675

MODEL 14-37
 MODEL 14-37(Int.)
 MODEL 14-37A
 Socket Layouts

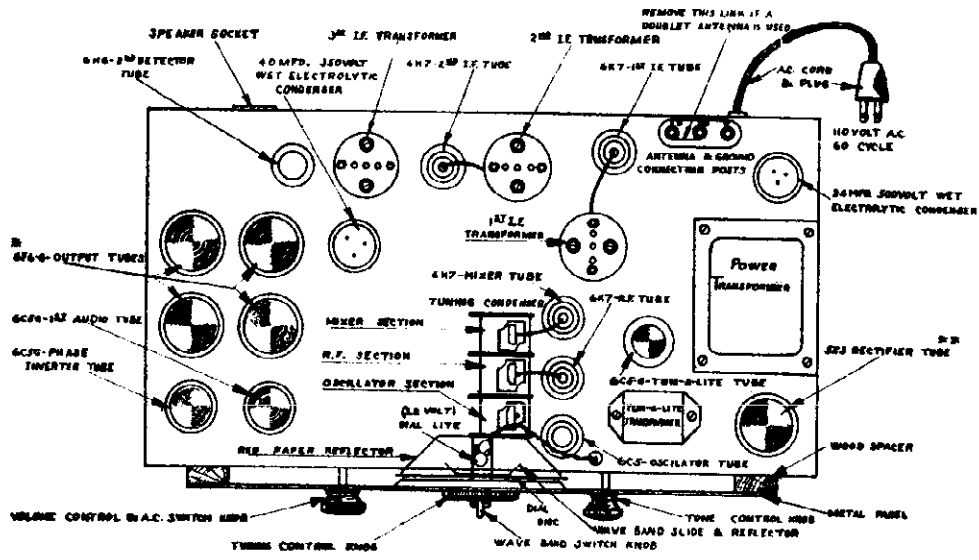
MID-WEST RADIO CORP.



14-37
 INTERMEDIATE



14-37



14-37A

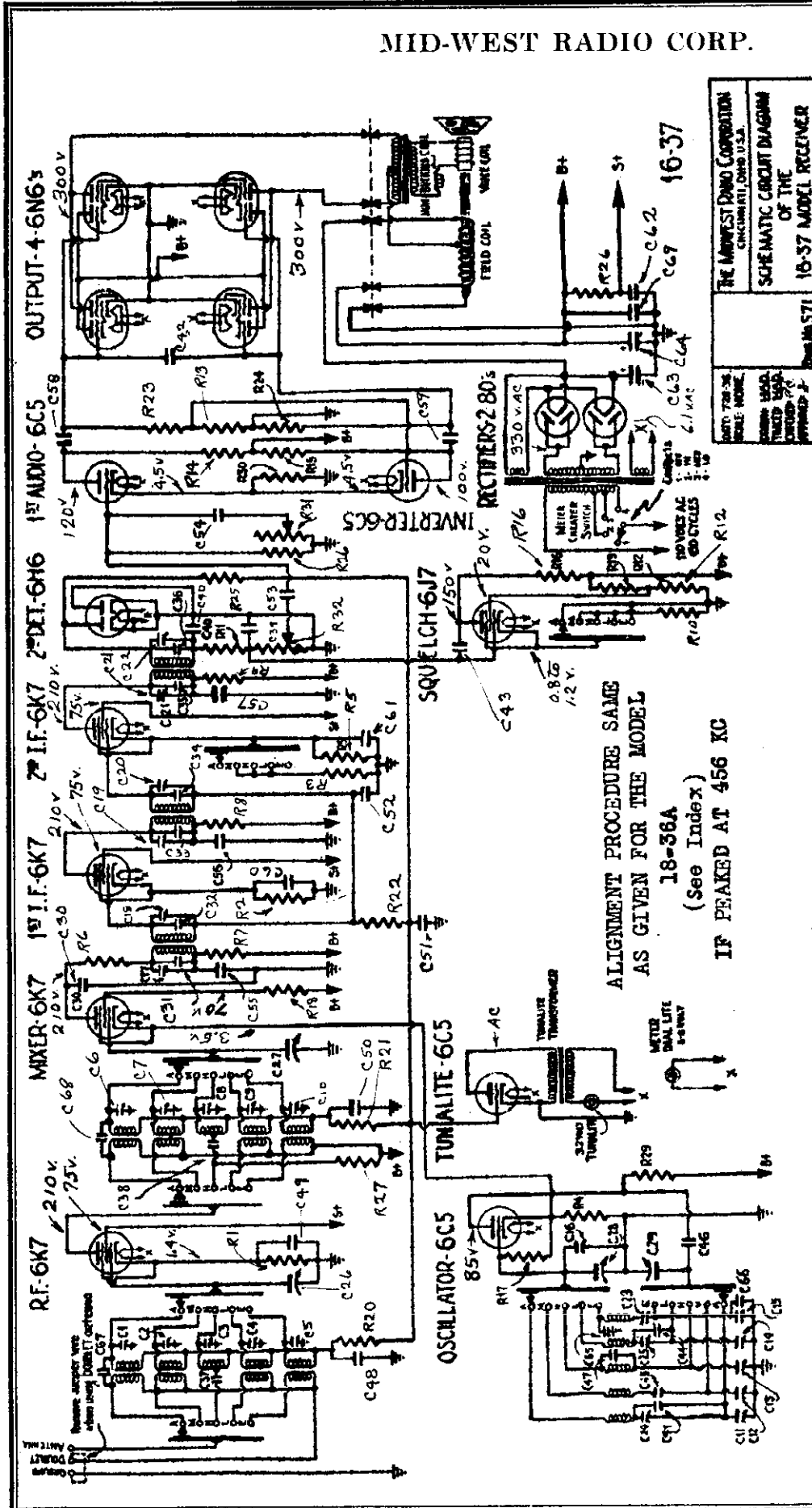
THE MIDWEST RADIO CORPORATION
 CHICAGO, ILL., U.S.A.
 TOP VIEW OF 14-37 INT.
 MODEL RECEIVER SHOWING
 LOCATION OF PARTS.
 No. 8-54-46

THE MIDWEST RADIO CORPORATION
 CHICAGO, ILL., U.S.A.
 TOP VIEW OF 14-37 MODEL
 RECEIVER SHOWING LOCATION
 OF TUBES & OTHER PARTS.
 No. 8-54-46

THE MIDWEST RADIO CORPORATION
 CHICAGO, ILL., U.S.A.
 TOP VIEW OF 14-37A
 SHOWING LOCATION OF
 TUBES & OTHER PARTS.
 No. 8-54-46

MID-WEST RADIO CORP.

MODEL 16-37 AC
Schematic, Voltage



THE MIDWEST RADIO CORPORATION
CINCINNATI, OHIO U.S.A.
SCHEMATIC CIRCUIT DIAGRAM
OF THE
16-37 MODEL RECEIVER
SHEET 571

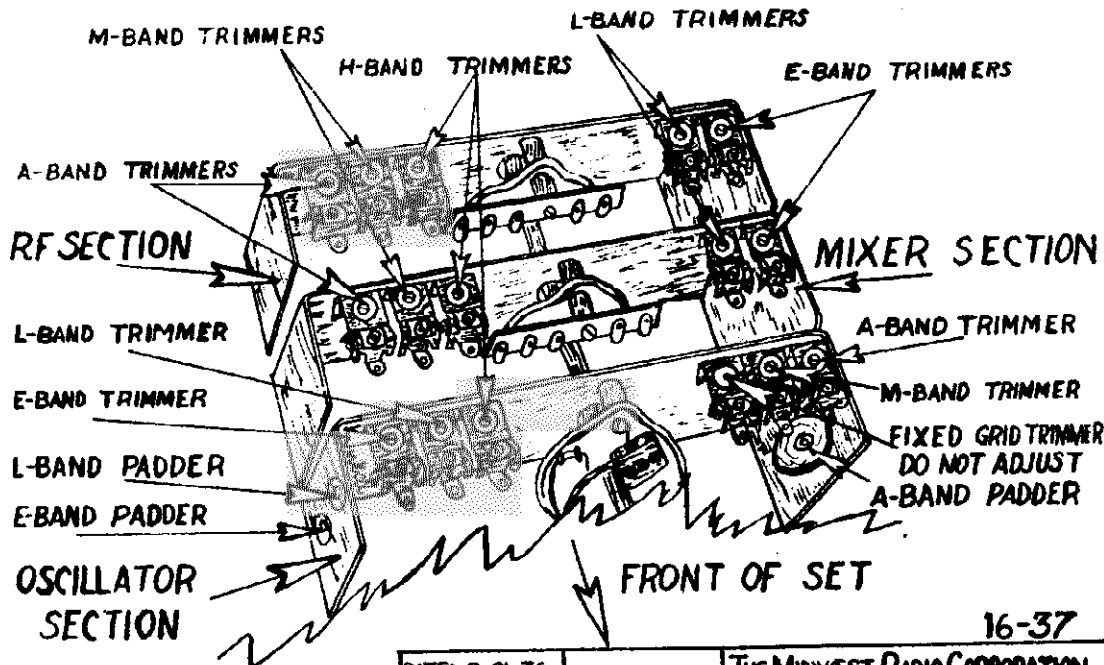
ALIGNMENT PROCEDURE SAME
AS GIVEN FOR THE MODEL
18-36A
(See Index)

IF PEAKED AT 456 KC

RESISTORS		CONDENSERS	
RES.	WATT	CAP.	TYPE
R1	500 OHMS	C1	500 MICRO
R2	500 OHMS	C2	500 MICRO
R3	500 OHMS	C3	500 MICRO
R4	500 OHMS	C4	500 MICRO
R5	500 OHMS	C5	500 MICRO
R6	500 OHMS	C6	500 MICRO
R7	500 OHMS	C7	500 MICRO
R8	500 OHMS	C8	500 MICRO
R9	500 OHMS	C9	500 MICRO
R10	500 OHMS	C10	500 MICRO
R11	500 OHMS	C11	500 MICRO
R12	500 OHMS	C12	500 MICRO
R13	500 OHMS	C13	500 MICRO
R14	500 OHMS	C14	500 MICRO
R15	500 OHMS	C15	500 MICRO
R16	500 OHMS	C16	500 MICRO
R17	500 OHMS	C17	500 MICRO
R18	500 OHMS	C18	500 MICRO
R19	500 OHMS	C19	500 MICRO
R20	500 OHMS	C20	500 MICRO
R21	500 OHMS	C21	500 MICRO
R22	500 OHMS	C22	500 MICRO
R23	500 OHMS	C23	500 MICRO
R24	500 OHMS	C24	500 MICRO
R25	500 OHMS	C25	500 MICRO
R26	500 OHMS	C26	500 MICRO
R27	500 OHMS	C27	500 MICRO
R28	500 OHMS	C28	500 MICRO
R29	500 OHMS	C29	500 MICRO
R30	500 OHMS	C30	500 MICRO
R31	500 OHMS	C31	500 MICRO
R32	500 OHMS	C32	500 MICRO
R33	500 OHMS	C33	500 MICRO
R34	500 OHMS	C34	500 MICRO
R35	500 OHMS	C35	500 MICRO
R36	500 OHMS	C36	500 MICRO
R37	500 OHMS	C37	500 MICRO
R38	500 OHMS	C38	500 MICRO
R39	500 OHMS	C39	500 MICRO
R40	500 OHMS	C40	500 MICRO
R41	500 OHMS	C41	500 MICRO
R42	500 OHMS	C42	500 MICRO
R43	500 OHMS	C43	500 MICRO
R44	500 OHMS	C44	500 MICRO
R45	500 OHMS	C45	500 MICRO
R46	500 OHMS	C46	500 MICRO
R47	500 OHMS	C47	500 MICRO
R48	500 OHMS	C48	500 MICRO
R49	500 OHMS	C49	500 MICRO
R50	500 OHMS	C50	500 MICRO
R51	500 OHMS	C51	500 MICRO
R52	500 OHMS	C52	500 MICRO
R53	500 OHMS	C53	500 MICRO
R54	500 OHMS	C54	500 MICRO
R55	500 OHMS	C55	500 MICRO
R56	500 OHMS	C56	500 MICRO
R57	500 OHMS	C57	500 MICRO
R58	500 OHMS	C58	500 MICRO
R59	500 OHMS	C59	500 MICRO
R60	500 OHMS	C60	500 MICRO
R61	500 OHMS	C61	500 MICRO
R62	500 OHMS	C62	500 MICRO
R63	500 OHMS	C63	500 MICRO
R64	500 OHMS	C64	500 MICRO
R65	500 OHMS	C65	500 MICRO
R66	500 OHMS	C66	500 MICRO
R67	500 OHMS	C67	500 MICRO
R68	500 OHMS	C68	500 MICRO
R69	500 OHMS	C69	500 MICRO
R70	500 OHMS	C70	500 MICRO
R71	500 OHMS	C71	500 MICRO
R72	500 OHMS	C72	500 MICRO
R73	500 OHMS	C73	500 MICRO
R74	500 OHMS	C74	500 MICRO
R75	500 OHMS	C75	500 MICRO
R76	500 OHMS	C76	500 MICRO
R77	500 OHMS	C77	500 MICRO
R78	500 OHMS	C78	500 MICRO
R79	500 OHMS	C79	500 MICRO
R80	500 OHMS	C80	500 MICRO
R81	500 OHMS	C81	500 MICRO
R82	500 OHMS	C82	500 MICRO
R83	500 OHMS	C83	500 MICRO
R84	500 OHMS	C84	500 MICRO
R85	500 OHMS	C85	500 MICRO
R86	500 OHMS	C86	500 MICRO
R87	500 OHMS	C87	500 MICRO
R88	500 OHMS	C88	500 MICRO
R89	500 OHMS	C89	500 MICRO
R90	500 OHMS	C90	500 MICRO

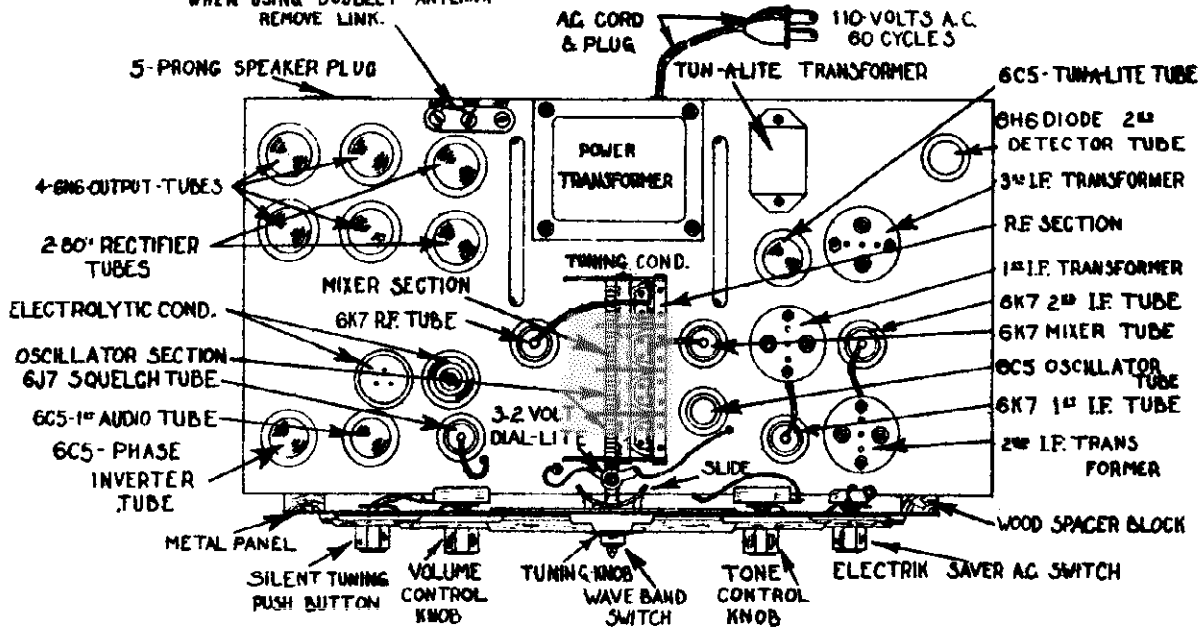
MODEL 16-37 AC
Socket, Trimmers

MID-WEST RADIO CORP.



DATE: 9-21-36 SCALE: NONE PART NO: DRAWN: C.W.F. TRACED: C.W.F. CHECKED: H.S.D. APPROVED:	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A. TRIMMER & PADDER LOCATION OF THE 16-37 MODEL RECEIVER
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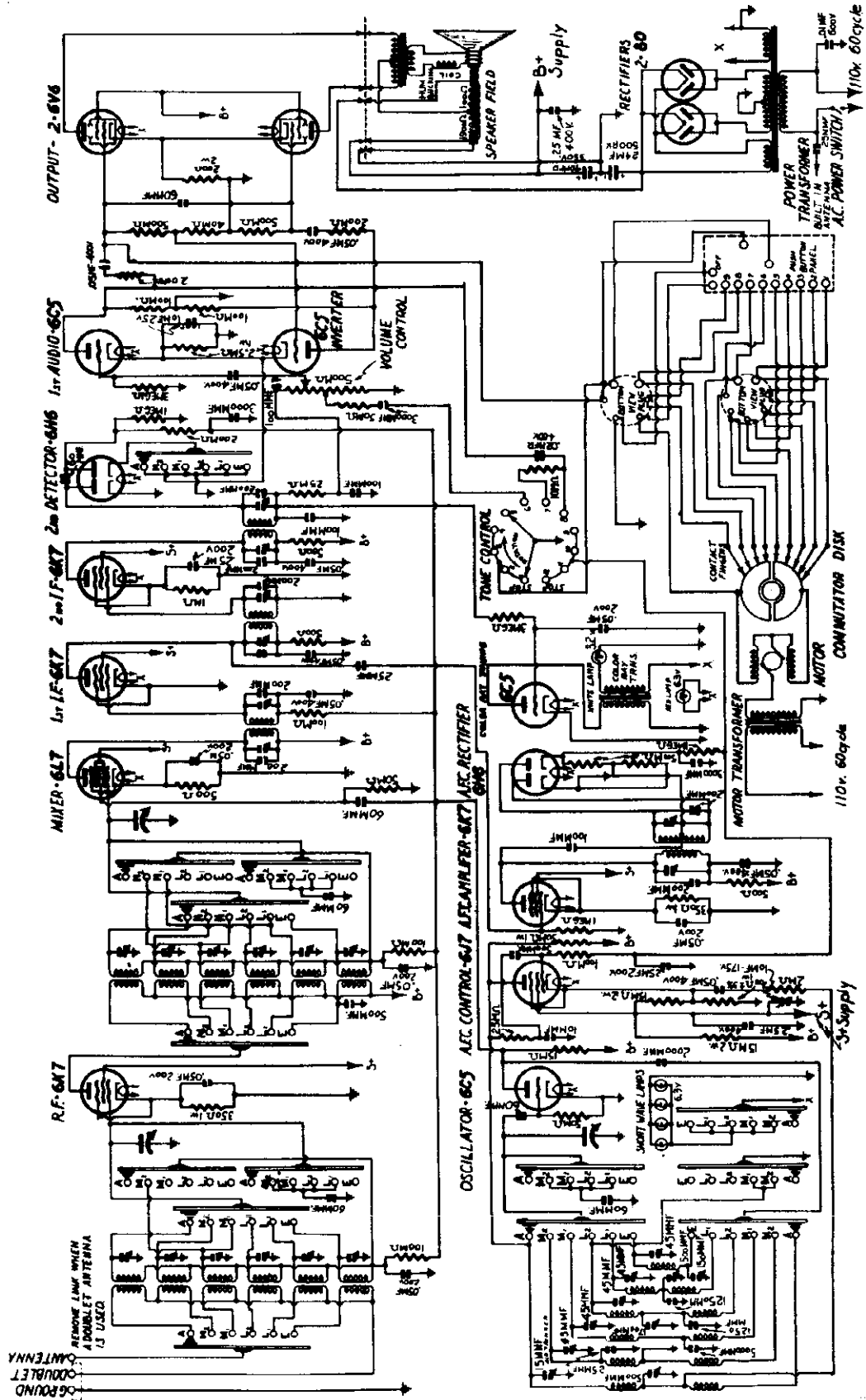
~NOTE~
WHEN USING DOUBLET ANTENNA
REMOVE LINK.



16-37

DATE: 11-20-36 SCALE: NONE DRAWN: R.H.H. TRACED: R.H.H. CHECKED: H.S.D. APPROVED:	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A. TOP VIEW OF MODEL 16-37 RECEIVER SHOWING LOCATION OF TUBES & OTHER PARTS
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MID-WEST RADIO CORP.



THE MIDWEST RADIO CORPORATION
CINCINNATI, OHIO, U.S.A.
MTE-0587
SCALE-NONE
DRAWN BY
TRACED BY
CHECKED BY
APPROVED
Dwg 995

IF=456 KC.

16-38

FOR CHASSIS AND TRIMMERS, SEE INDEX

MODEL 35-SW
Socket, Trimmers
Voltage, Alignment
Notes

MID-WEST RADIO CORP.

Using a standard signal generator and having an approximate frequency from 400 k.c. to 14 m.c. and a standard output meter.

I. F. ALIGNMENT

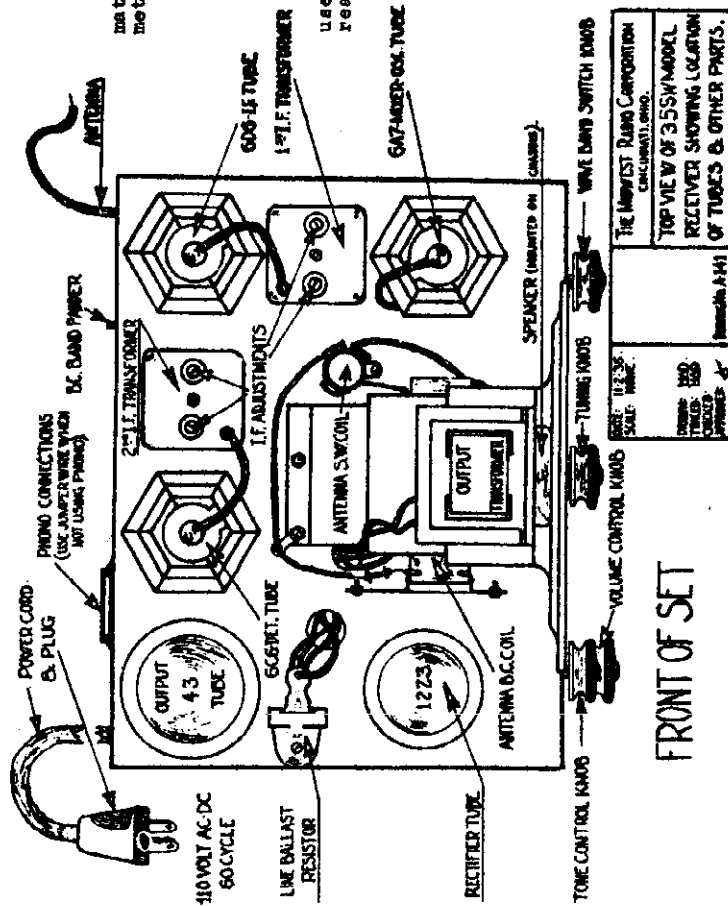
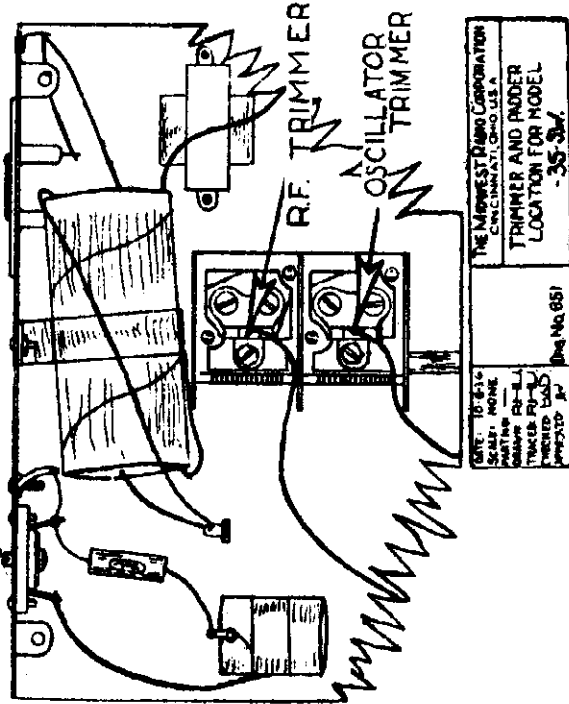
- (1) Set signal generator to 465 k.c. and connect output of signal generator to grid of 6A7 tube, shorting out front section of variable condenser. Connect output meter to plate of 43 tube and ground. Adjust both 1st and 2nd I.F. grid and plate trimmers for maximum output on meter.

NOTE: To assure more accurate trimmer setting always use lowest possible test oscillator output consistent with readable output meter scale deflection.

R. F. ALIGNMENT

- (2) Setting dial and signal generator at 1450 k.c., connect signal generator to antenna post of receiver through a standard dummy antenna. Adjust R. F. trimmers on variable condenser so that maximum output is obtained at this frequency. Set signal generator and dial at 860 k.c. and adjust "A" band paddler in rear of set for maximum output. Short wave adjustments are automatically taken care of by carefully calibrated coils and fixed condensers. No adjustment is needed for the particular band.

EC BAND PADDLER



FRONT OF SET

NOTE: The schematic of the MODEL 35 SW is the same as the MODEL 35-6-SW, with the exception that the 6A7 screen grid by-pass condenser has a value of 0.1 MFD capacity instead of 0.02 MFD. The Model 35-6-SW schematic should show one side of the line grounded to the same point on chassis that the series filaments are grounded.
The Intermediate Frequency for the Short-Wave Model is 465 KC. For the Long-Wave Model the "IF" is peaked at 175 KC. For the latter additional paddlers are shown on the top view.

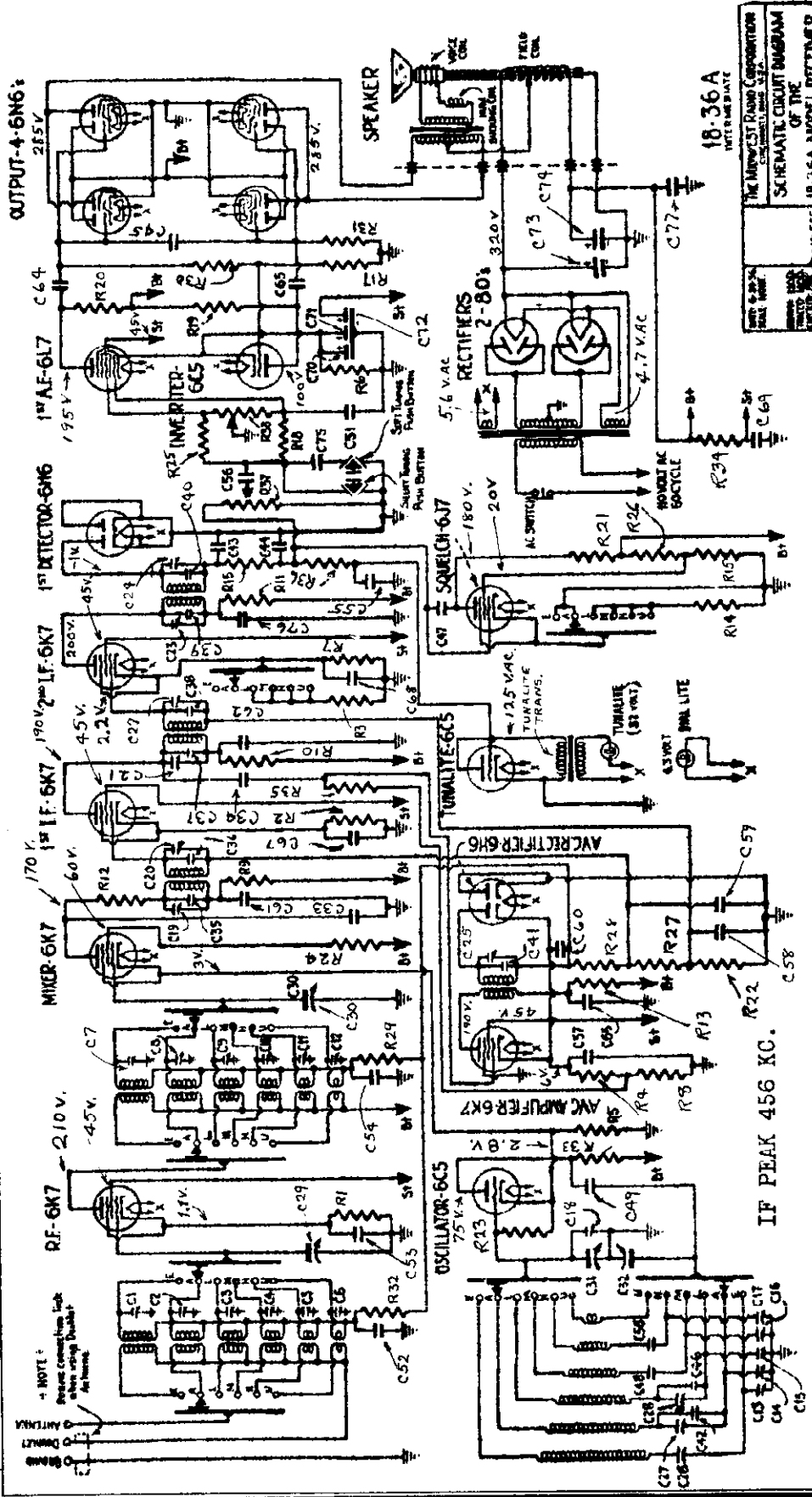
SEE INDEX FOR SCHEMATIC

TYPE	POSITION	VOLTAGE DATA		SUPPLY DATA		FIL. DATA	
		PLATE VOLTS	SCREEN VOLTS	VOLTS	VOLTS	VOLTS	VOLTS
6A7	OSC	100	60	9	9	6.2	
	Mixer	100	60	9	9	6.2	
5D8	1st IF	100	60	9	9	6.2	
43	2nd IF	25	25	4	4	6.2	
	OUTPUT	95	100	15	15	2B	
12Z3	RECT.	120				1E	

All voltages measured with no signal input.
Voltages depending on the voltage of the line supplying sets.

MID-WEST RADIO CORP.

Model 18-36A
(Intermediate)
Schematic,
Voltage.



18-36A
INTERMEDIATE
THE MIDWEST RADIO CORPORATION
DESIGNED AND BUILT IN U.S.A.
SCHEMATIC CIRCUIT DIAGRAM
OF THE
MODEL 18-36A RECEIVER

CONDENSERS

C70	25 MFD 25 VOLT
C71	6 MFD 50 VOLT
C72	20 MFD 250 VOLT WET
C73	48 MFD 350 VOLT
C74	48 MFD 350 VOLT
C75	.05 MFD 200 VOLT
C76	480 VOLT
C77	.25 MFD 400 VOLT

C56	.05 MFD 200 VOLT
C57	200 VOLT
C58	400 VOLT
C59	400 VOLT
C60	400 VOLT
C61	400 VOLT
C62	400 VOLT
C63	400 VOLT
C64	400 VOLT
C65	400 VOLT
C66	400 VOLT
C67	400 VOLT
C68	400 VOLT
C69	400 VOLT

C36	75 MFD MICA
C37	75 MFD MICA
C38	75 MFD MICA
C39	75 MFD MICA
C40	75 MFD MICA
C41	100 MFD
C42	250 MFD
C43	250 MFD
C44	250 MFD
C45	250 MFD
C46	250 MFD
C47	250 MFD
C48	250 MFD
C49	250 MFD
C50	250 MFD
C51	250 MFD
C52	250 MFD
C53	250 MFD
C54	250 MFD

C18	LF TRIMMERS
C19	LF TRIMMERS
C20	LF TRIMMERS
C21	LF TRIMMERS
C22	LF TRIMMERS
C23	LF TRIMMERS
C24	LF TRIMMERS
C25	LF TRIMMERS
C26	LF TRIMMERS
C27	LF TRIMMERS
C28	LF TRIMMERS
C29	LF TRIMMERS
C30	LF TRIMMERS
C31	LF TRIMMERS
C32	LF TRIMMERS
C33	LF TRIMMERS
C34	LF TRIMMERS
C35	LF TRIMMERS
C36	LF TRIMMERS

C1	350 OHMS WIRE WOUND
C2	350 OHMS WIRE WOUND
C3	350 OHMS WIRE WOUND
C4	350 OHMS WIRE WOUND
C5	350 OHMS WIRE WOUND
C6	350 OHMS WIRE WOUND
C7	350 OHMS WIRE WOUND
C8	350 OHMS WIRE WOUND
C9	350 OHMS WIRE WOUND
C10	350 OHMS WIRE WOUND
C11	350 OHMS WIRE WOUND
C12	350 OHMS WIRE WOUND
C13	350 OHMS WIRE WOUND
C14	350 OHMS WIRE WOUND
C15	350 OHMS WIRE WOUND
C16	350 OHMS WIRE WOUND
C17	350 OHMS WIRE WOUND
C18	350 OHMS WIRE WOUND
C19	350 OHMS WIRE WOUND
C20	350 OHMS WIRE WOUND
C21	350 OHMS WIRE WOUND
C22	350 OHMS WIRE WOUND
C23	350 OHMS WIRE WOUND
C24	350 OHMS WIRE WOUND
C25	350 OHMS WIRE WOUND
C26	350 OHMS WIRE WOUND
C27	350 OHMS WIRE WOUND
C28	350 OHMS WIRE WOUND
C29	350 OHMS WIRE WOUND
C30	350 OHMS WIRE WOUND
C31	350 OHMS WIRE WOUND
C32	350 OHMS WIRE WOUND
C33	350 OHMS WIRE WOUND
C34	350 OHMS WIRE WOUND
C35	350 OHMS WIRE WOUND
C36	350 OHMS WIRE WOUND
C37	350 OHMS WIRE WOUND
C38	350 OHMS WIRE WOUND
C39	350 OHMS WIRE WOUND
C40	350 OHMS WIRE WOUND
C41	350 OHMS WIRE WOUND
C42	350 OHMS WIRE WOUND
C43	350 OHMS WIRE WOUND
C44	350 OHMS WIRE WOUND
C45	350 OHMS WIRE WOUND
C46	350 OHMS WIRE WOUND
C47	350 OHMS WIRE WOUND
C48	350 OHMS WIRE WOUND
C49	350 OHMS WIRE WOUND
C50	350 OHMS WIRE WOUND
C51	350 OHMS WIRE WOUND
C52	350 OHMS WIRE WOUND
C53	350 OHMS WIRE WOUND
C54	350 OHMS WIRE WOUND
C55	350 OHMS WIRE WOUND
C56	350 OHMS WIRE WOUND
C57	350 OHMS WIRE WOUND
C58	350 OHMS WIRE WOUND
C59	350 OHMS WIRE WOUND
C60	350 OHMS WIRE WOUND
C61	350 OHMS WIRE WOUND
C62	350 OHMS WIRE WOUND
C63	350 OHMS WIRE WOUND
C64	350 OHMS WIRE WOUND
C65	350 OHMS WIRE WOUND
C66	350 OHMS WIRE WOUND
C67	350 OHMS WIRE WOUND
C68	350 OHMS WIRE WOUND
C69	350 OHMS WIRE WOUND
C70	350 OHMS WIRE WOUND
C71	350 OHMS WIRE WOUND
C72	350 OHMS WIRE WOUND
C73	350 OHMS WIRE WOUND
C74	350 OHMS WIRE WOUND
C75	350 OHMS WIRE WOUND
C76	350 OHMS WIRE WOUND
C77	350 OHMS WIRE WOUND

R1	500 OHMS
R2	500 OHMS
R3	500 OHMS
R4	500 OHMS
R5	500 OHMS
R6	500 OHMS
R7	500 OHMS
R8	500 OHMS
R9	500 OHMS
R10	500 OHMS
R11	500 OHMS
R12	500 OHMS
R13	500 OHMS
R14	500 OHMS
R15	500 OHMS
R16	500 OHMS
R17	500 OHMS
R18	500 OHMS
R19	500 OHMS
R20	500 OHMS
R21	500 OHMS
R22	500 OHMS
R23	500 OHMS
R24	500 OHMS
R25	500 OHMS
R26	500 OHMS
R27	500 OHMS
R28	500 OHMS
R29	500 OHMS
R30	500 OHMS
R31	500 OHMS
R32	500 OHMS
R33	500 OHMS
R34	500 OHMS
R35	500 OHMS
R36	500 OHMS
R37	500 OHMS
R38	500 OHMS
R39	500 OHMS
R40	500 OHMS
R41	500 OHMS
R42	500 OHMS
R43	500 OHMS
R44	500 OHMS
R45	500 OHMS
R46	500 OHMS
R47	500 OHMS
R48	500 OHMS
R49	500 OHMS
R50	500 OHMS
R51	500 OHMS
R52	500 OHMS
R53	500 OHMS
R54	500 OHMS
R55	500 OHMS
R56	500 OHMS
R57	500 OHMS
R58	500 OHMS
R59	500 OHMS
R60	500 OHMS
R61	500 OHMS
R62	500 OHMS
R63	500 OHMS
R64	500 OHMS
R65	500 OHMS
R66	500 OHMS
R67	500 OHMS
R68	500 OHMS
R69	500 OHMS
R70	500 OHMS
R71	500 OHMS
R72	500 OHMS
R73	500 OHMS
R74	500 OHMS
R75	500 OHMS
R76	500 OHMS
R77	500 OHMS
R78	500 OHMS
R79	500 OHMS
R80	500 OHMS
R81	500 OHMS
R82	500 OHMS
R83	500 OHMS
R84	500 OHMS
R85	500 OHMS
R86	500 OHMS
R87	500 OHMS
R88	500 OHMS
R89	500 OHMS
R90	500 OHMS
R91	500 OHMS
R92	500 OHMS
R93	500 OHMS
R94	500 OHMS
R95	500 OHMS
R96	500 OHMS
R97	500 OHMS
R98	500 OHMS
R99	500 OHMS
R100	500 OHMS

MODEL 18-36A(Int.)

Socket, Trimmers Alignment

MID-WEST RADIO CORP.

ALIGNMENT PROCEDURE

A good signal generator with accurate frequency calibration and an output meter are required. An INTERMEDIATE FREQUENCY of 456 KC is used.

- (1) Set the signal generator to 456 KC and connect it from the mixer grid to ground.
- (2) Remove the Oscillator tube from the receiver.
- (3) Connect the output meter from the plate of the output tube to positive B₁ and from the plates of one pair of tubes to the plates of the other pair of output tubes.
- (4) Using a weak signal of approximately 40 microvolts, align the I.F. transformer to maximum output.
- (5) Gradually decrease the signal and realign the I.F. amplifier.
- (6) Increase the input from the signal generator to approximately 100 microvolts. Align the A.V.C. transformer for minimum output.
- (7) Repeat using weaker signal strengths for the I.F. and stronger signal strengths for the A.V.C. adjustments until absolute peak is assured.

Insert the oscillator tube. Connect the signal generator between antenna and ground. Connect mixer lead to grid of the mixer tube.

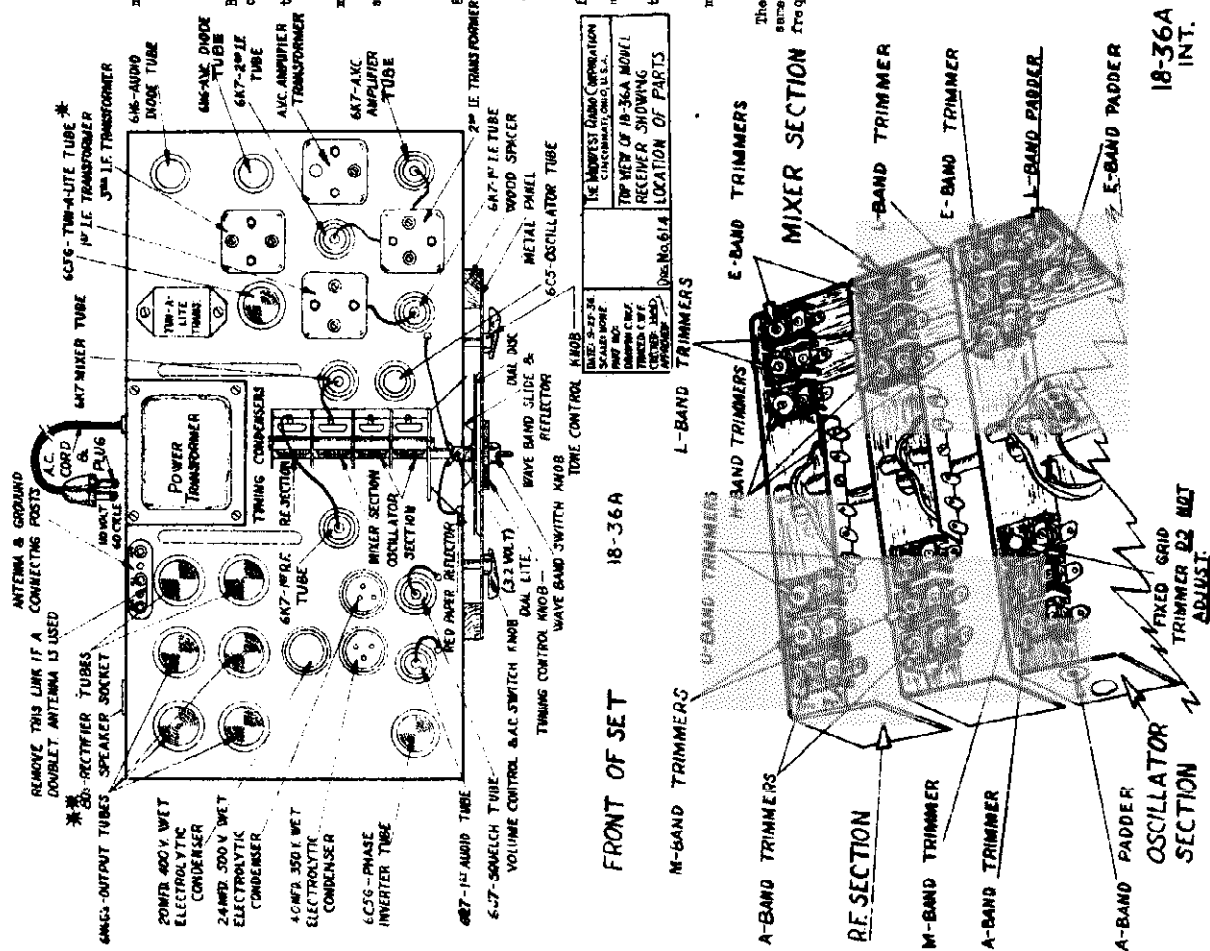
"E" BAND ADJUSTMENT

- (1) Set the receiver wave change switch to the "E" Band.
- (2) Set the generator to 328 KC, and set the receiver dial to same frequency setting.
- (3) Adjust the "E" Oscillator trimmer to maximum gain, then adjust the "E" Band RF and "MIXER" trimmers for maximum gain.
- (4) Reset the signal generator to 165 KC and change the receiver dial to 135 KC frequency setting.
- (5) Adjust the "E" Band padder for maximum signal.
- (6) Repeat the adjustment of the trimmers and padders until the adjustment of one does not affect the adjustment of the other.

The procedure for adjustments of the "A", "L", "M", "H", and "U" Bands are the same as given above for the "E" Band. The bands are adjusted to the following frequencies:

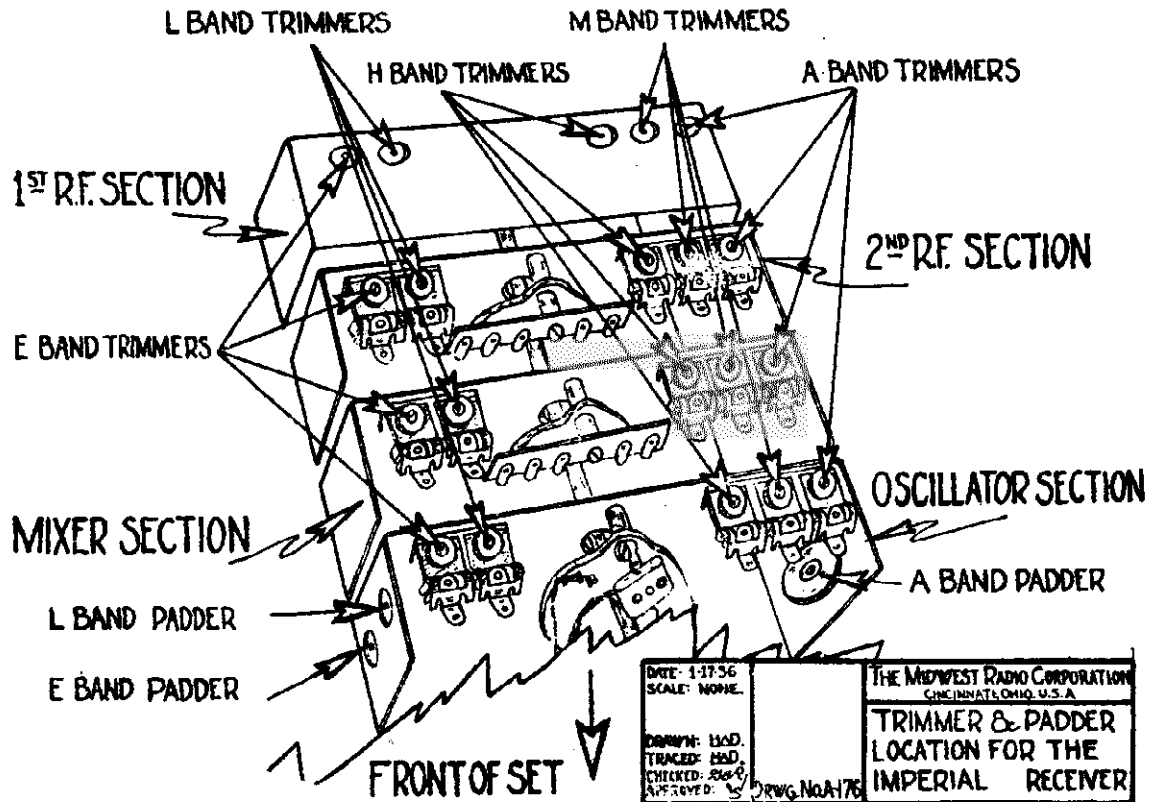
- "A" Band - Adjust Oscillator, then RF and Mixer trimmers to 1490 KC
Adjust Oscillator padder at 550 KC
- "L" Band - Adjust Oscillator, then RF and Mixer trimmers to 3.8 MC
Adjust Oscillator padder at 1.6 MC
- "M" Band - Adjust Oscillator, then RF and Mixer trimmers to 11.5 MC
No padder adjustment.
- "H" Band - Adjust Oscillator, then RF and Mixer trimmers to 28 MC
No padder adjustment.
- "U" Band - Tune receiver until signal is heard, then adjust the Mixer trimmer for maximum gain. No other adjustments are required on this band.

DATE: 9-22-36	THE MIDWEST RADIO CORPORATION CINCINNATI, O., U.S.A.
SCALE: NONE	TRIMMER & PADDER
PART NO:	LOCATION OF THE 18-36A
MANUFACTURER: C.W.F.	MODEL RECEIVER
TRACED: C.W.F.	
REG'D: H.A.D.	
APPROVED: [Signature]	PRE No. 615



18-36A INT.

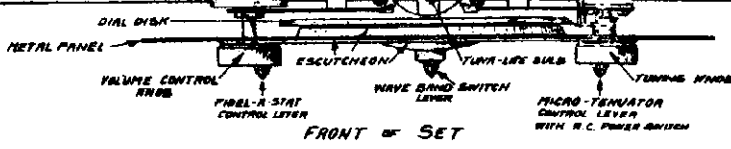
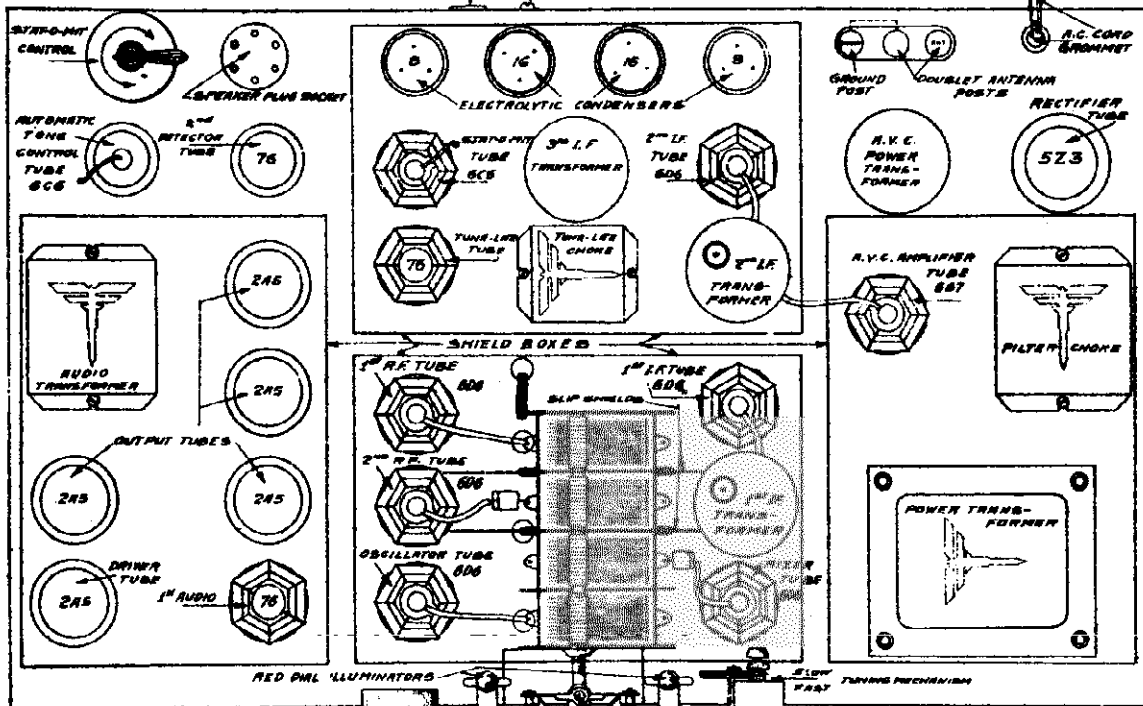
MID-WEST RADIO CORP. MODEL Imperial 18(1935) Socket, Trimmers



DATE: 1-17-36
 SCALE: NONE
 DRAWN: H.D.
 TRACED: H.D.
 CHECKED: H.D.
 APPROVED: W.G.
 TRWG: NGA:75

THE MIDWEST RADIO CORPORATION
 CINCINNATI, OHIO, U.S.A.
**TRIMMER & PADDER
 LOCATION FOR THE
 IMPERIAL RECEIVER**

PHONE JUMPER GROUND FOR PHONE



ALL PHL BULBS 3-1/2 VOLT SIZE

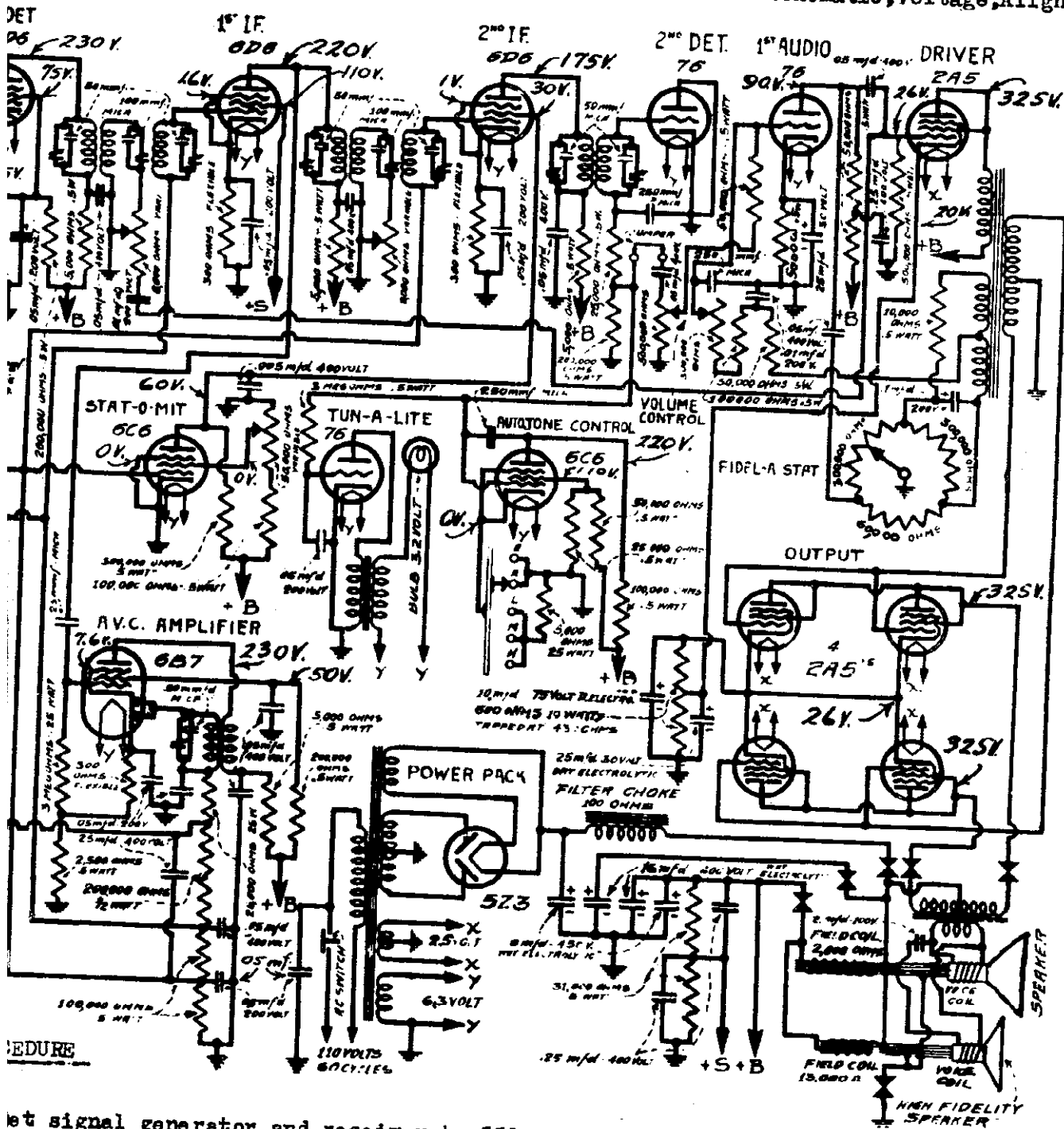
THE MIDWEST RADIO CORPORATION
 CINCINNATI, OHIO

FOR VIEW OF THE IMPERIAL 18 TUBE
 RECEIVER SHOWING LOCATION OF THE
 VARIOUS PARTS

TRWG: NGA: 75
 APPROVED W.G.
 DRAWING N-183

RADIO CORP.

MODEL Imperial 18(1935)
Schematic, Voltage, Alignment



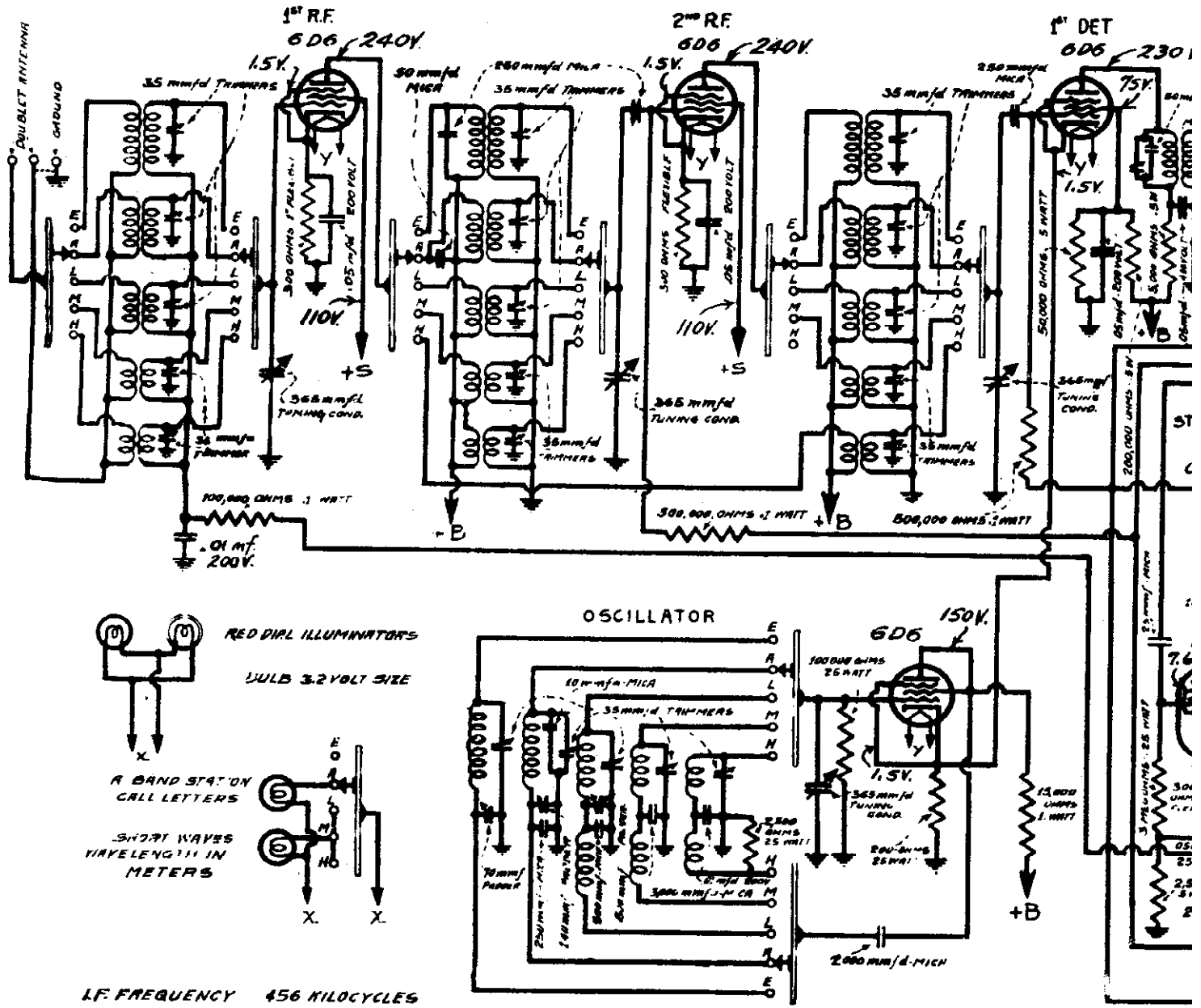
PROCEDURE

Let signal generator and receiver to 550 KC. Adjust "A" Band padder to maximum gain.

BAND ADJUSTMENT - Set switch to "L" Band. Set signal generator and receiver to 1.6 MC. Trim "L" Band Oscillator, RF, and Mixer trimmers to maximum gain. Reset signal generator and receiver to 1.6 MC, and adjust "L" Band padder to maximum signal.

BAND ADJUSTMENT - Set switch to "M" Band. Set signal generator and receiver to 5 MC. Adjust Oscillator, RF, and Mixer trimmers for maximum gain. No padder adjustment is provided for on the "M" Band.

BAND ADJUSTMENT - Set the wave change switch of the receiver to the "H" Band. Set the signal generator and receiver to 28 MC. Adjust the "H" Band trimmers of the Oscillator, RF, and Mixer circuits until a maximum signal is obtained. Padder adjustment is provided for on the "H" Band.



LF. FREQUENCY 456 KILOCYCLES

DRAWN: MARCH 12 1935 BY FRIE SCH. CHECKED BY [Signature] APPROVED BY [Signature]

DRAWING NO 182

ALIGNMENT PROCEDURE

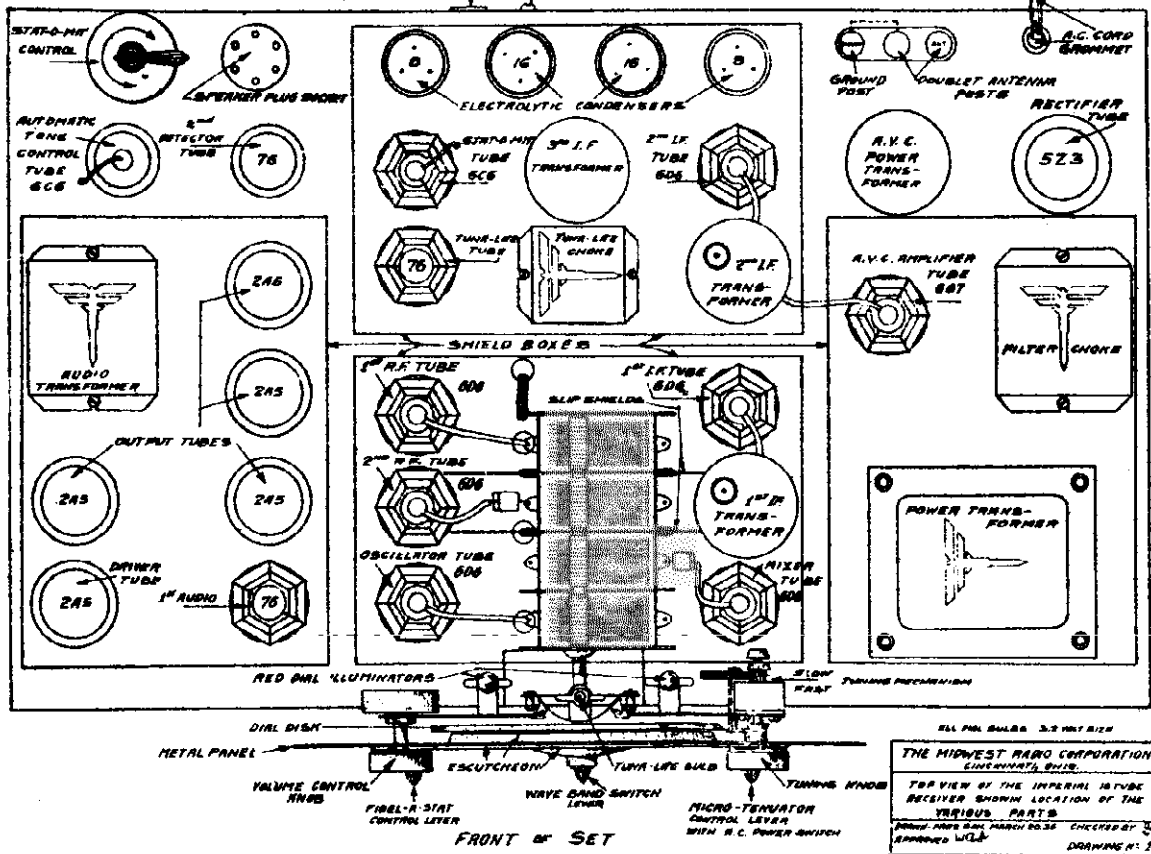
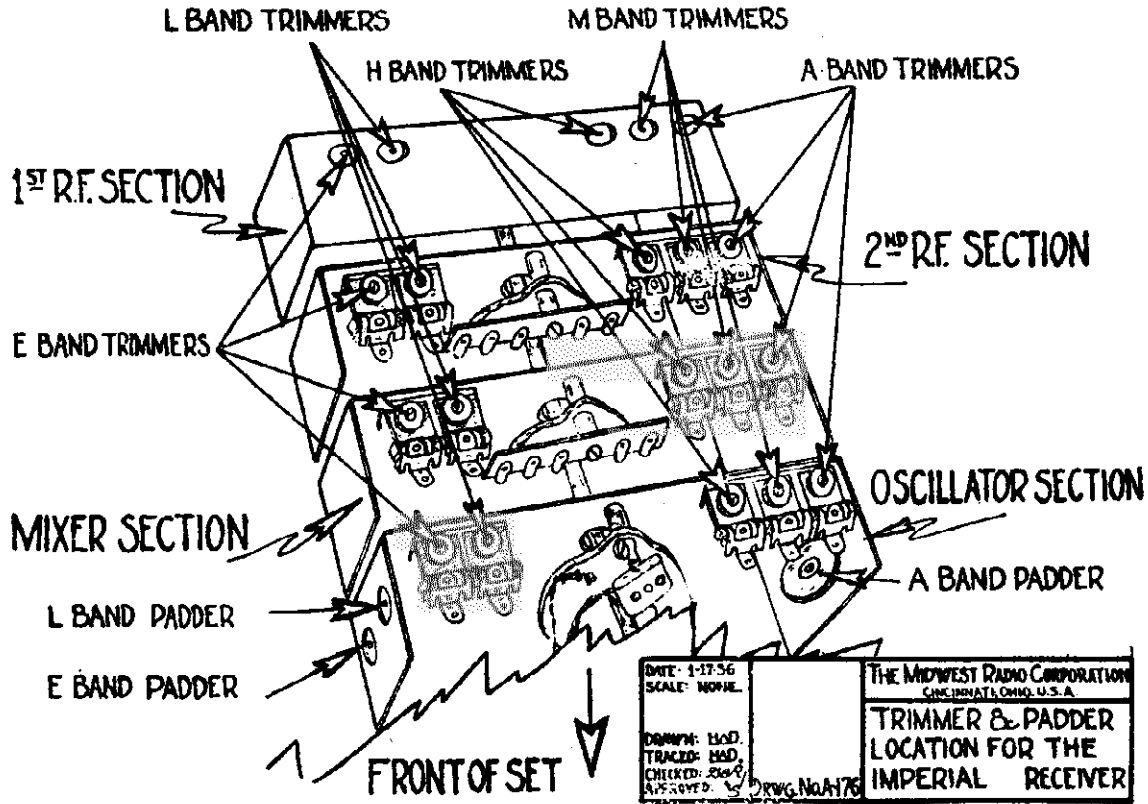
Set the signal generator to 456 KC. Remove oscillator tube from receiver, set the Microtenuator to maximum, with approximately 40 microvolts into the grid of the mixer, peak the 3rd, 2nd, and 1st IF Transformers to maximum audio output. Do not measure AVC as indication of output. Increase input to Mixer grid to 100 microvolts, tune AVC transformer to maximum dip, set microtenuator at minimum setting. Do not shield coils to maximum dip. Recheck adjustments to the above procedure. Replace oscillator tube in receiver.

"E" BAND ADJUSTMENT - Connect signal generator to ANT. and Gnd. posts. Set wave change switch to "E" Band. Set signal generator to 325 KC. Trim "E" Band Osc. trimmers for maximum signal. Trim the "E" Band RF and Mixer trimmers for maximum signal, set signal generator and receiver dial to 135 KC. Trim "E" Band padder for maximum gain.

"A" BAND ADJUSTMENT - Set switch to "A" Band. Set signal generator and dial of receiver to 1490 KC. Trim "A" Band Oscillator, RF, and Mixer trimmers to maximum gain.

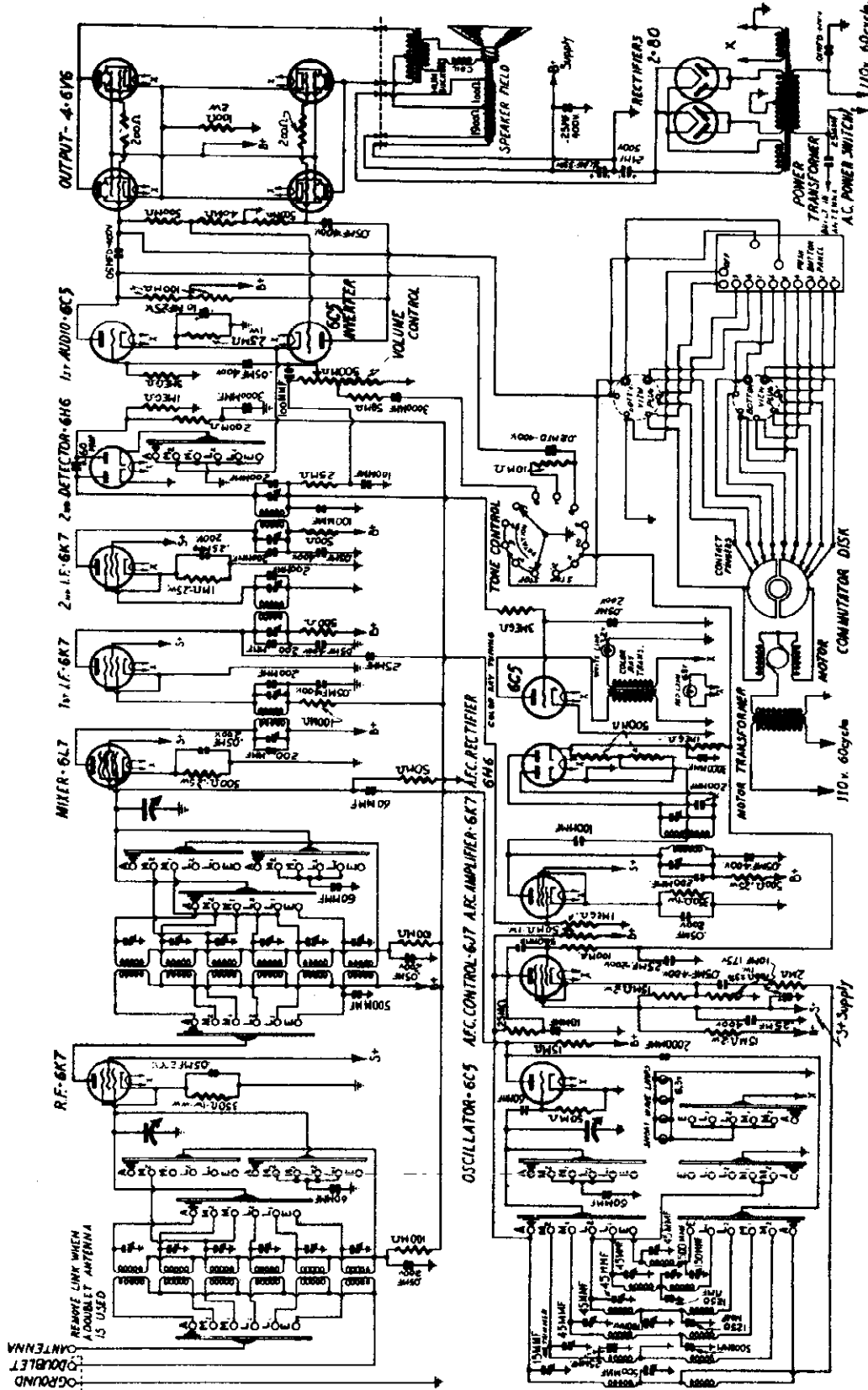
Reset signal generator to 3.8 MC. T
 "L" BAND
 3.8 MC. T
 "M" BAND
 11.5 MC.
 "H" BAND
 Set the signal generator to 11.5 MC.
 Oscillator trimmers to maximum gain.
 No padder

MID-WEST RADIO CORP. MODEL Imperial 18(1935)
Socket, Trimmers



MODEL 18-38AC
Schematic

MID-WEST RADIO CORP.



DATE: 6-11-37
 SCALE: NONE
 DRAWN: JES
 CHECKED: JES
 APPROVED: Dmg 990

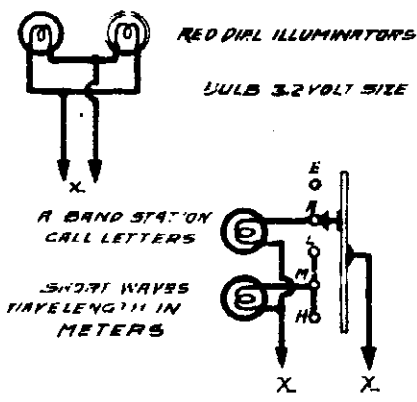
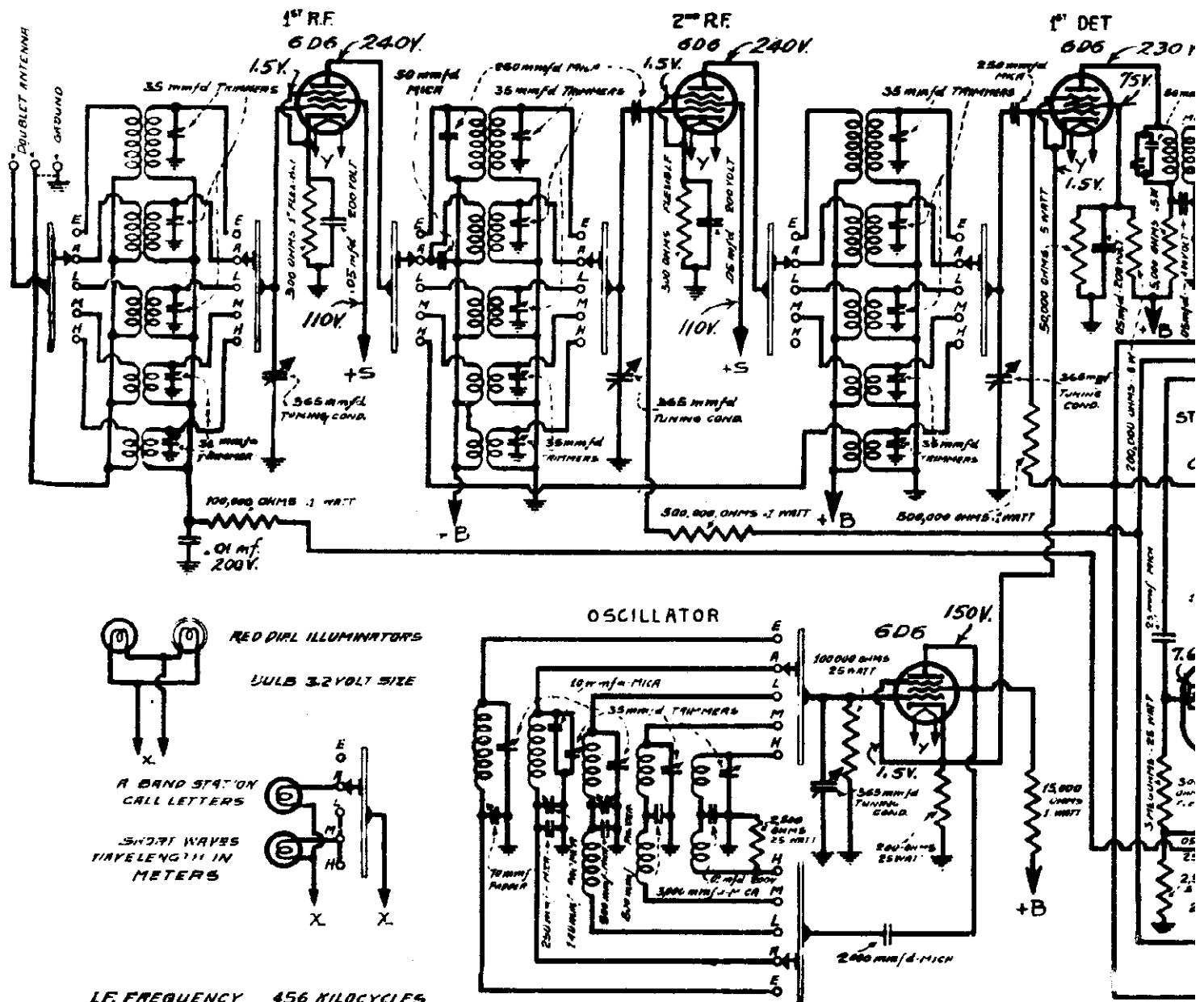
THE MIDWEST RADIO CORPORATION
 CINCINNATI, OHIO, U.S.A.

SCHMATIC CIRCUIT DIAGRAM
 18-38 MOTORIZED RECEIVER

IF-456 KC.

18-38

FOR CHASSIS AND TRIMMERS, SEE INDEX



LF. FREQUENCY 456 KILOCYCLES

DRAWN: MARCH 12 1935 BY FRAZ SCH. CHECKED BY [Signature] APPROVED BY [Signature]

DRAWING NO 182

ALIGNMENT PROCEDURE

Set the signal generator to 456 KC. Remove oscillator tube from receiver, set the Microtenuator to maximum, with approximately 40 microvolts into the grid of the mixer, peak the 3rd, 2nd, and 1st IF Transformers to maximum audio output. Do not measure AVC as indication of output. Increase input to Mixer grid to 100 microvolts, tune AVC transformer to maximum dip, set microtenuator at minimum setting. Do not shield coils to maximum dip. Recheck adjustments to the above procedure. Replace oscillator tube in receiver.

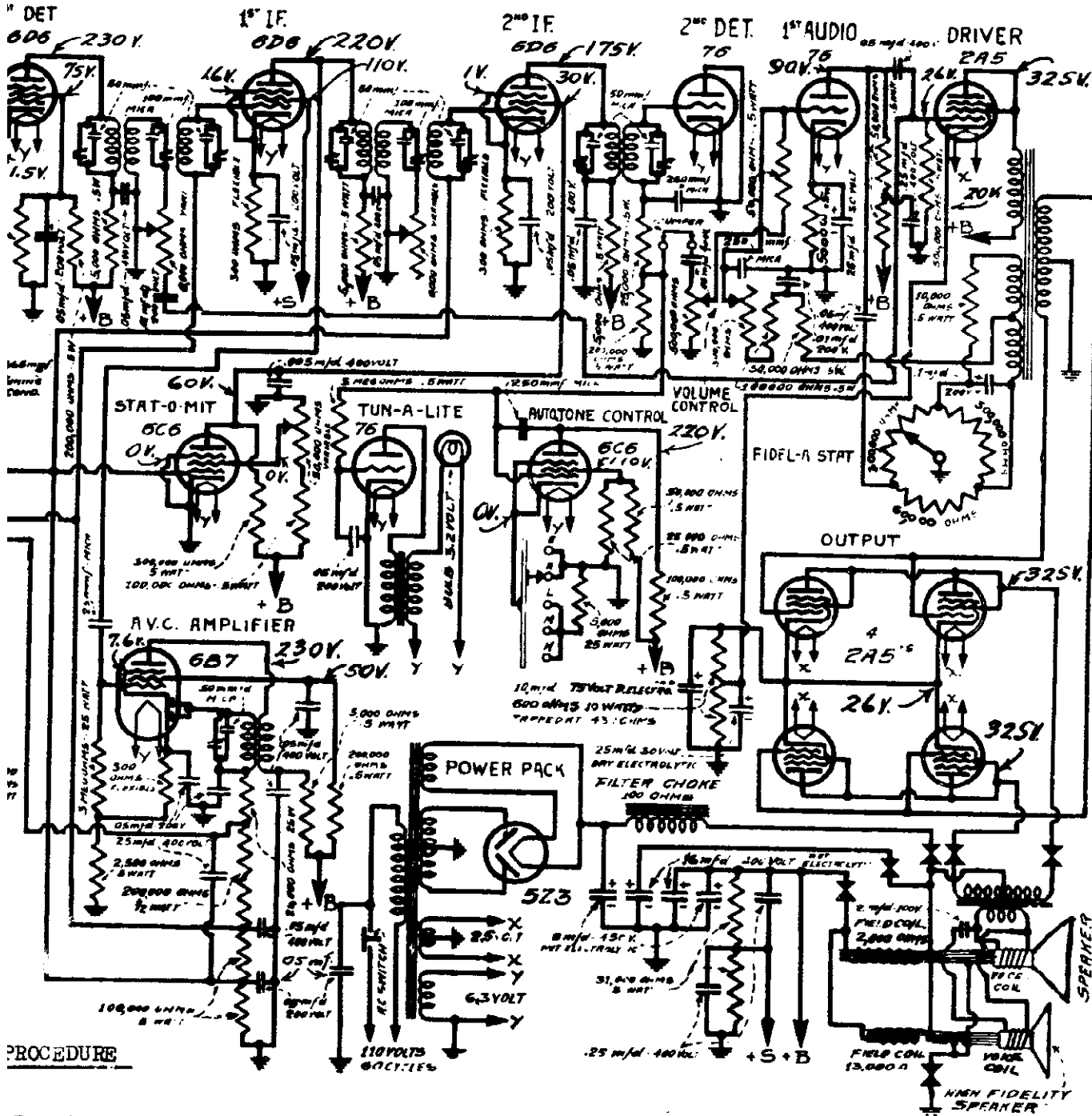
"E" BAND ADJUSTMENT - Connect signal generator to ANT. and Gnd. posts. Set wave change switch to "E" Band. Set signal generator to 325 KC. Trim "E" Band Osc. trimmers for maximum signal. Trim the "E" Band RF and Mixer trimmers for maximum signal, set signal generator and receiver dial to 135 KC. Trim "E" Band padder for maximum gain.

"A" BAND ADJUSTMENT - Set switch to "A" Band. Set signal generator and dial of receiver to 1490 KC. Trim "A" Band Oscillator, RF, and Mixer trimmers to maximum gain.

Reset signal generator to 3.8 MC. Trim "M" Band padder to 11.5 MC. Set the signal generator to "H" BAND. Set the signal generator to "H" BAND. No padder.

RADIO CORP.

MODEL Imperial 18(1935)
Schematic, Voltage, Alignment



PROCEDURE

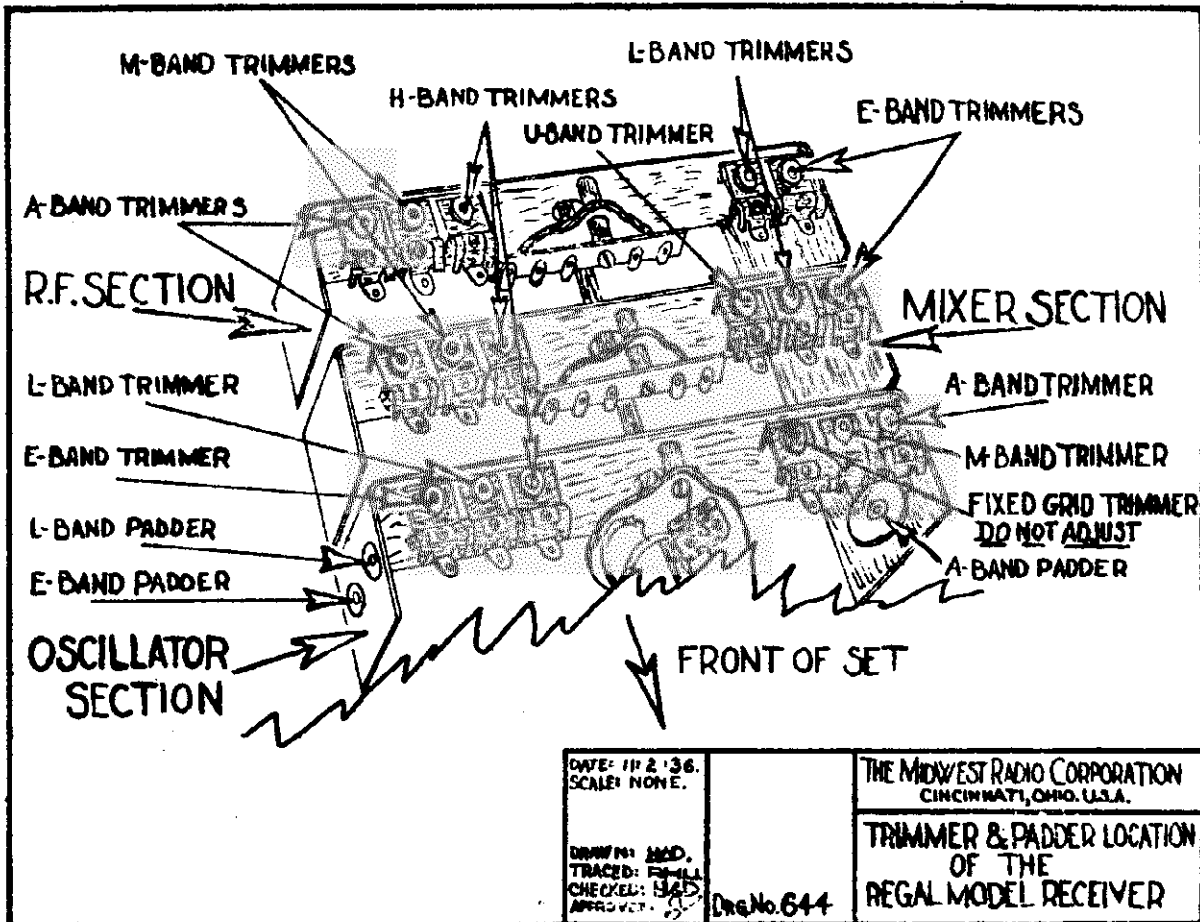
Reset signal generator and receiver to 550 KC. Adjust "A" Band padder to maximum gain.

"L" BAND ADJUSTMENT - Set switch to "L" Band. Set signal generator and receiver to 3.8 MC. Trim "L" Band Oscillator, RF, and Mixer trimmers to maximum gain. Reset signal generator and receiver to 1.6 MC, and adjust "L" Band padder to maximum signal.

"M" BAND ADJUSTMENT - Set switch to "M" Band. Set signal generator and receiver to 11.5 MC. Adjust Oscillator, RF, and Mixer trimmers for maximum gain. No padder is provided on the "M" Band.

"H" BAND ADJUSTMENT - Set the wave change switch of the receiver to the "H" Band. Set the signal generator and receiver to 28 MC. Adjust the "H" Band trimmers of the Oscillator, RF, and Mixer circuits until a maximum signal is obtained. No padder adjustment is provided for on the "H" Band.

MID-WEST RADIO CORP.

MODEL Regal(1936)
Alignment, Trimmers

I-F ALIGNMENT: Remove oscillator tube from its socket. Set signal generator to 456 kc and connect it from mixer grid to ground. Using a signal of about 40 microvolts, adjust i-f trimmers to maximum. Decrease signal and re-align i-f amplifier. Increase signal to about 100 microvolts and align AVC transformer for minimum output. Repeat using weaker signal for i-f amplifier and stronger signal for AVC adjustments until an absolute peak is assured. Replace oscillator tube.

R-F ALIGNMENT: Signal generator connected to antenna post and ground.

E-Band: Set band switch to E band and signal generator and dial of set to 325 kc. Adjust "E" oscillator trimmer for maximum; then "E" r-f and mixer trimmers for maximum. Set signal generator and dial to 135 kc and adjust "E" padder for maximum. Repeat adjustments until one does not affect the adjustment of the others.

A-Band: Set band switch to A band and signal generator and dial to 1490 kc. Adjust oscillator, r-f, and mixer trimmers of "A" band for maximum. Set signal generator and dial to 550 kc and adjust "A" padder for maximum. Repeat adjustments as before.

L-Band: Set band switch to L band and signal generator and dial to 3.8 mc. Adjust oscillator, r-f, and mixer trimmers of "L" band for maximum. Set signal generator and dial to 1.6 mc and adjust "L" padder for maximum. Repeat adjustments as before.

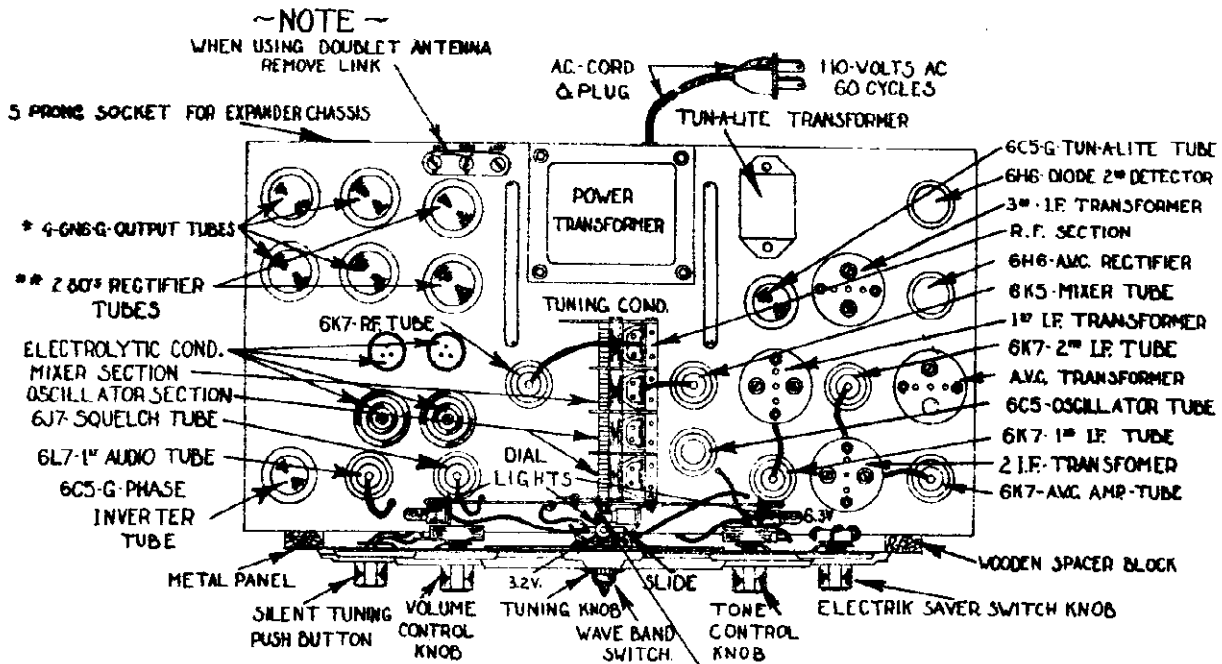
M-Band: Set band switch to M band, and signal generator and dial to 11.5 mc. Adjust oscillator, r-f, and mixer trimmers for maximum.

H-Band: Set band switch to H band and signal generator and dial to 28 mc. Adjust oscillator, r-f, and mixer trimmers for maximum.

U-Band: Set band switch to U band and signal generator to 60 mc. Tune set until signal is received. Adjust "u" mixer trimmer for maximum.

MODEL Regal(1936)
Socket, Chassis

MID-WEST RADIO CORP.

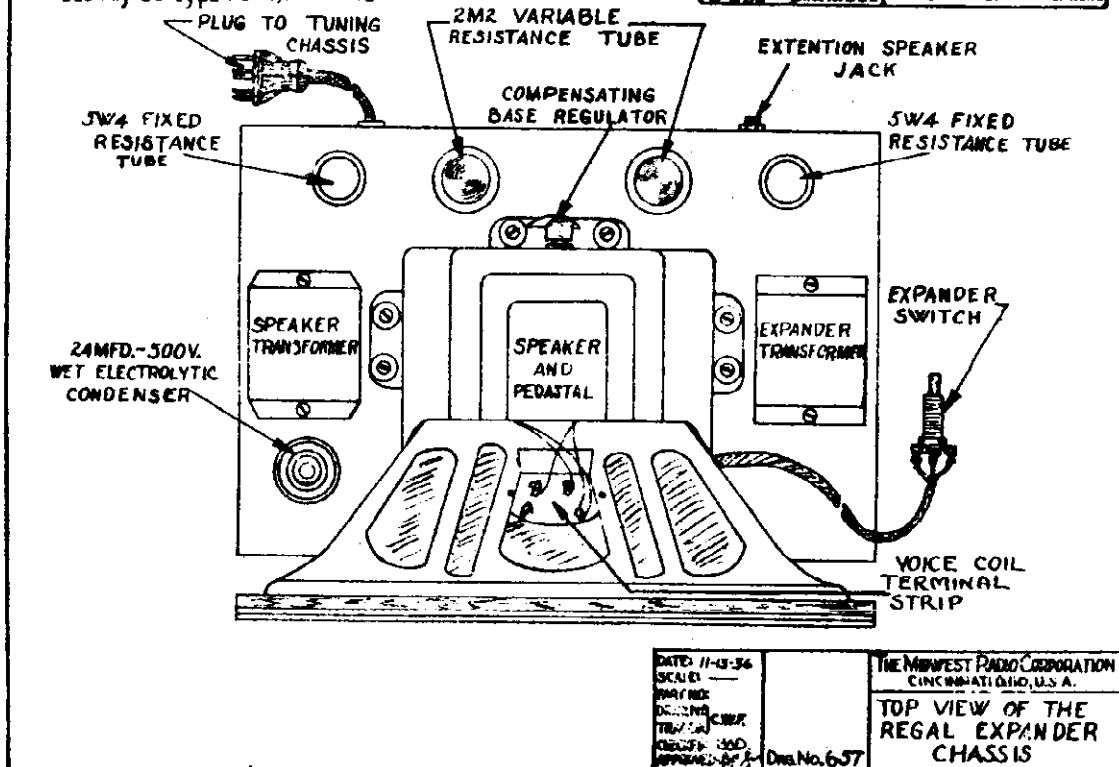


~NOTE~
This chassis is shown equipped with the best tube combination available.
* Metal, metal-glass, or glass counter part tubes may be used. For example the output tubes shown are glass counter-part tubes numbered -6N6-G; metal glass tubes would be numbered 6N6-MG and metal tubes would be numbered -6N6.
** Use only 80 type Rectifier tubes.

6.3VOLT-RED DIAL-LITE

37-REGAL

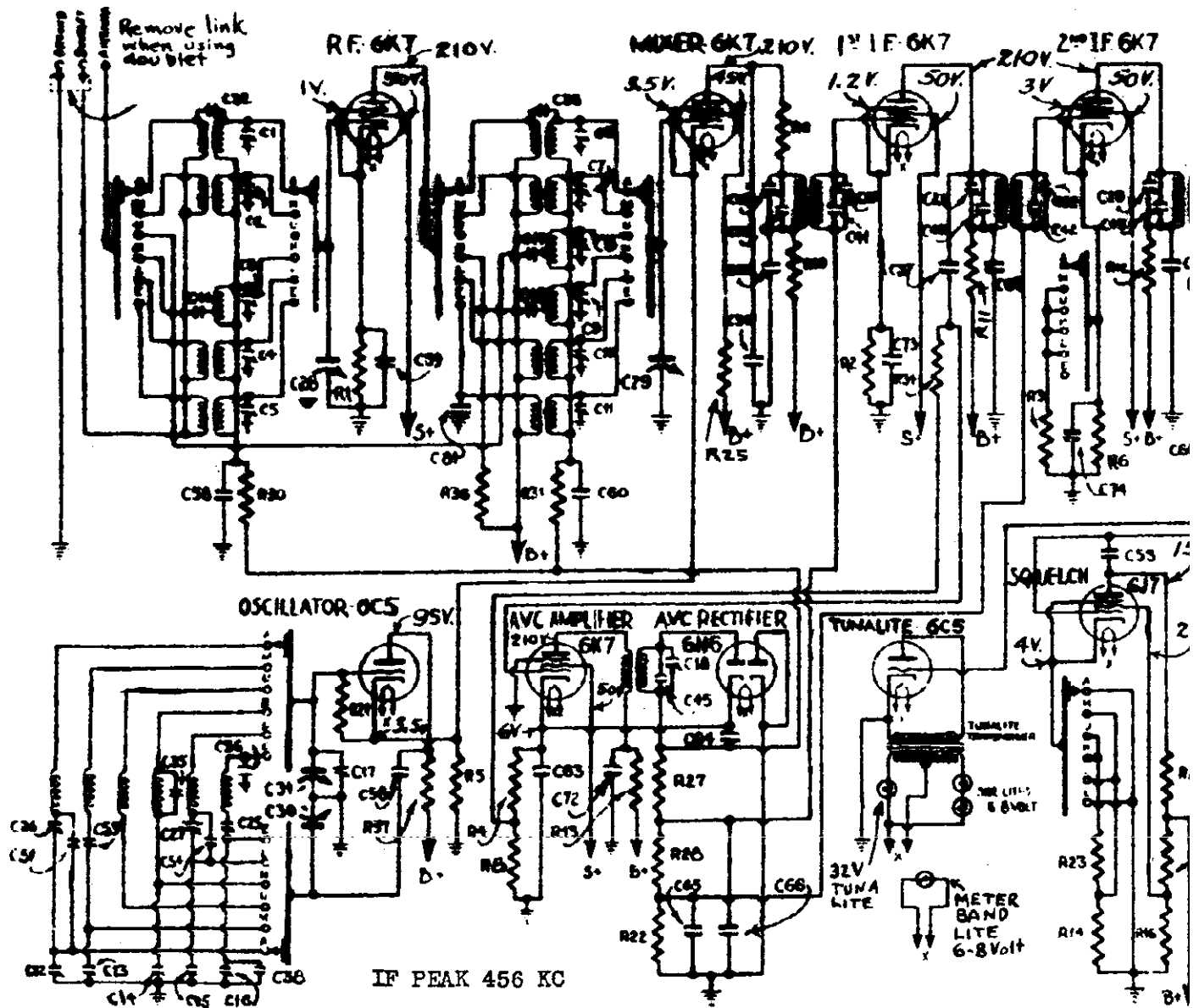
DATE: 11-26-36	THE MIDWEST RADIO CORPORATION
SCALE: NONE	CINCINNATI, OHIO, U.S.A.
DRAWN: CH-11	TOP VIEW OF THE REGAL
TRACED: CH-11	MODEL RECEIVER SHOWING
APPROVED: HAD	LOCATION OF TUBES & OTHER PARTS
2/6/37	Des. No. 880



DATE: 11-13-36	THE MIDWEST RADIO CORPORATION
SCALE: NONE	CINCINNATI, OHIO, U.S.A.
DRAWN: CH-11	TOP VIEW OF THE
TRACED: CH-11	REGAL EXPANDER
APPROVED: HAD	CHASSIS
2/6/37	Des. No. 657

CONDENSERS

C1 3500MFD TRIMMER	C19 1F TUNING	C37 250MFD. MICA	C55 2000MMFD MICA	C73 .25MFD
C2	C20	C38	C56	C74
C3	C21	C39 20MMFD	C57 .02 MFD 200VOLT	C75 25MFD
C4	C22	C40	C58 .05 MFD	C76
C5	C23	C41 100MMFD	C59	C77 80MMFD
C6	C24	C42	C60	C78 25 MFD
C7	C25 70MMFD PAPER	C43	C61	C79 40MMFD
C8	C26	C44	C62	C80 60MMFD
C9	C27 3500MFD	C45	C63	C81 300MFD
C10	C28 300MMFD TUNING COND	C46	C64	C82 100 MFD
C11	C29	C47	C65	C83 . MFD
C12	C30	C48	C66	C84 25MFD
C13	C31 5MMFD MICA	C49	C67	C85
C14	C32	C50	C68 .05MFD 100VOLT	C86 2 MFD
C15	C33 10MMFD	C51 200MMFD	C69	C87
C16	C34	C52 250MMFD	C70	C88 24MFD
C17	C35	C53 350MMFD	C71	
C18	C36		C72	



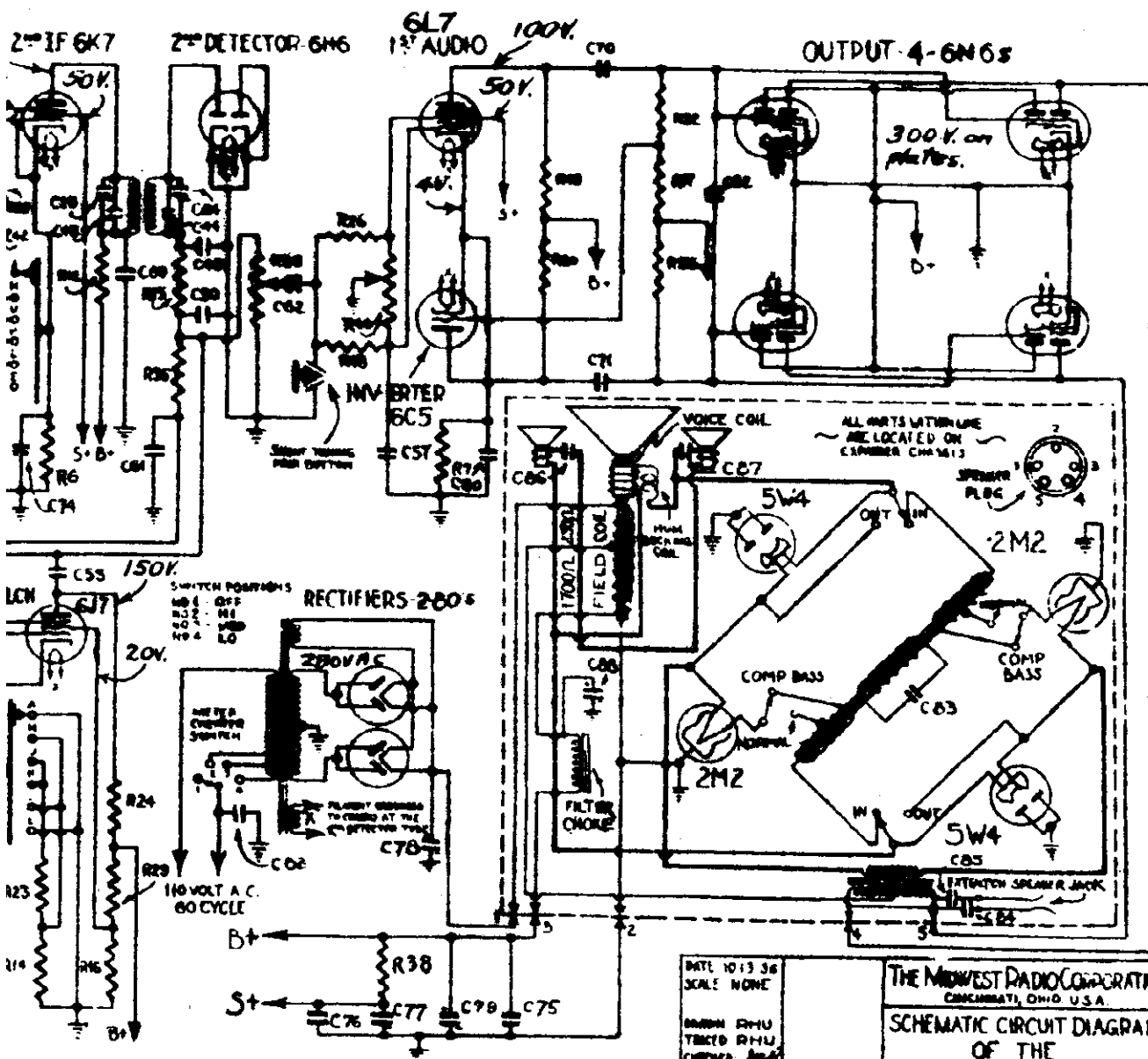
RESISTORS

- C75 .25MFD 200VOLT
- C76 .25MFD 400VOLT
- C77 .25MFD 175V WET ELECTROLYTIC
- C78 25 MFD 500V
- C79 40MFD 350V
- C80 60MFD 10 V.
- C81 300MFD MICA
- C82 20 MFD 400 VOLT
- C83 1MFD 400 VOLT
- C84 25MFD 600 VOLT
- C85
- C86 2 MFD. 200 VOLT
- C87
- C88 24MFD 350V WET ELECT.

- R1 350 OHMS WIRE WOUND
- R2
- R3
- R4
- R5 500 OHM .25 WATT
- R6 1,000 OHM
- R7
- R8 4800 OHM
- R9 5000 OHM
- R10
- R11
- R12
- R13
- R14
- R15 25,000 OHM
- R16
- R17 40,000 OHM
- R18 100,000 OHM

- R19 100,000 OHM .25 WATT
- R20
- R21
- R22 45,000 OHMS "
- R23 100,000 "
- R24
- R25 200,000 OHM
- R26
- R27
- R28
- R29
- R30 500,000 OHM
- R31
- R32
- R33
- R34 1 MEG OHM
- R35 3 MEG OHM
- R36 25,000 OHM .5 WATT

- R37 50,000 OHMS .5 WATT
- R38 " " " "
- R39 500,000 " VOL. CONT.
- R40 " " " TONE "



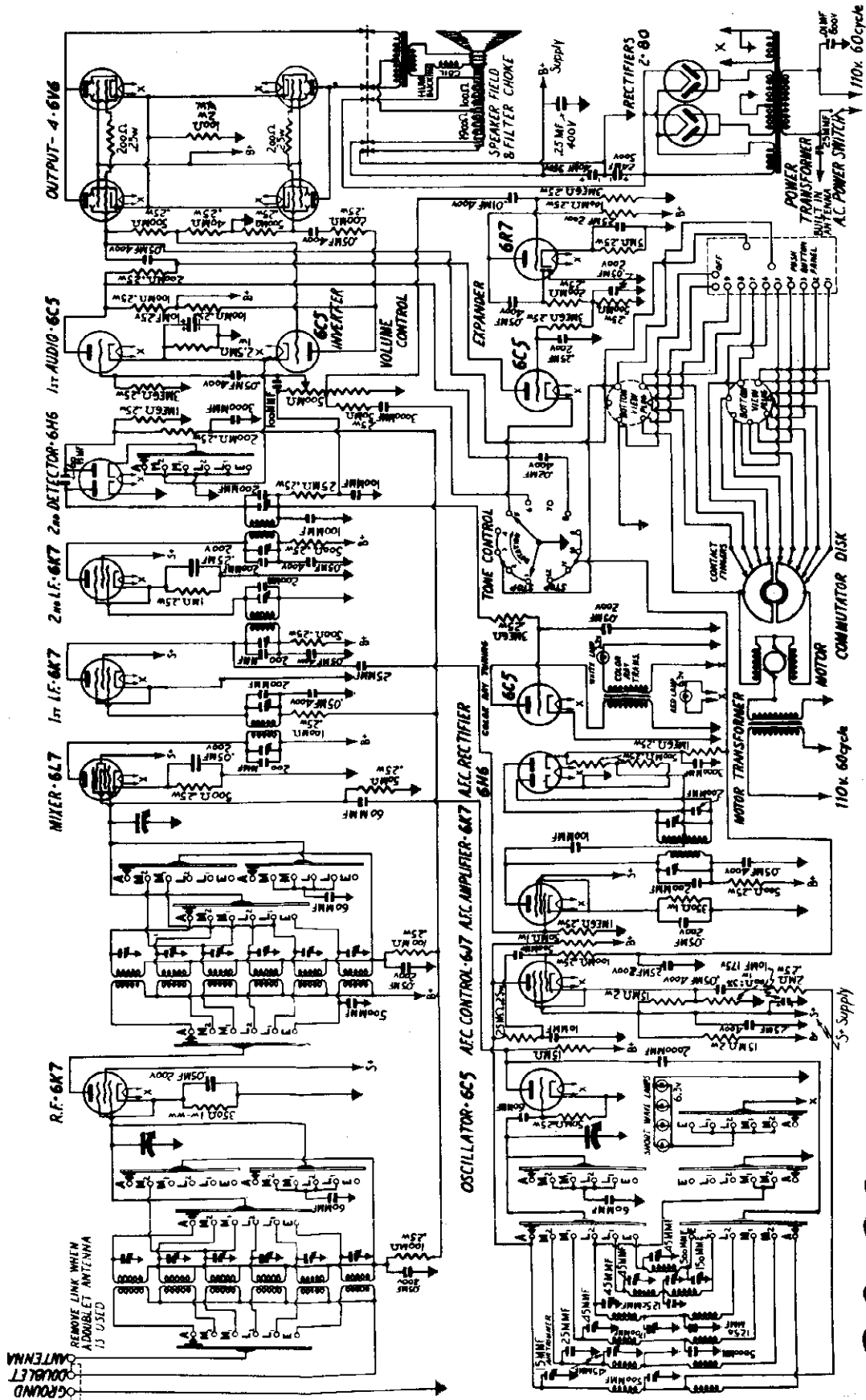
DATE 10/13/36
 SCALE NONE
 DRAWN BY H. J. TRACY
 CHECKED BY J. W. HENNING
 APPROVED BY J. W. HENNING

THE MIDWEST RADIO CORPORATION
 CINCINNATI, OHIO, U.S.A.
**SCHEMATIC CIRCUIT DIAGRAM
 OF THE
 REGAL MODEL RECEIVER**

Fig No 629

MID-WEST RADIO CORP.

MODEL 20-38 AC Schematic



THE MIDWEST RADIO CORPORATION
CINCINNATI, OHIO, U.S.A.

DATE: 8-7-37
SCALE: NONE
DRAWN: JGS
TRACED: JGS
CHECKED: JGS
APPROVED: JGS

DMG 98/20-38 MOTORIZED RECEIVER

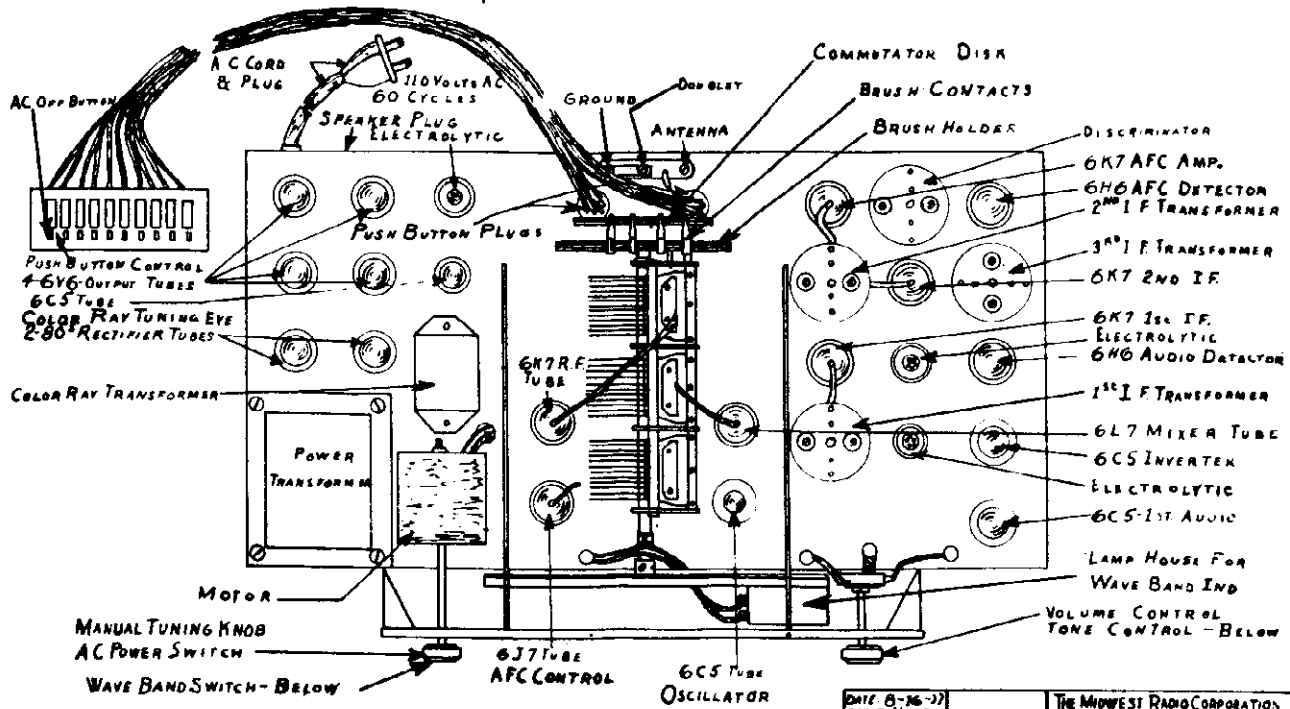
IF-456 kc.

FOR CHASSIS AND TRIMMERS, SEE INDEX

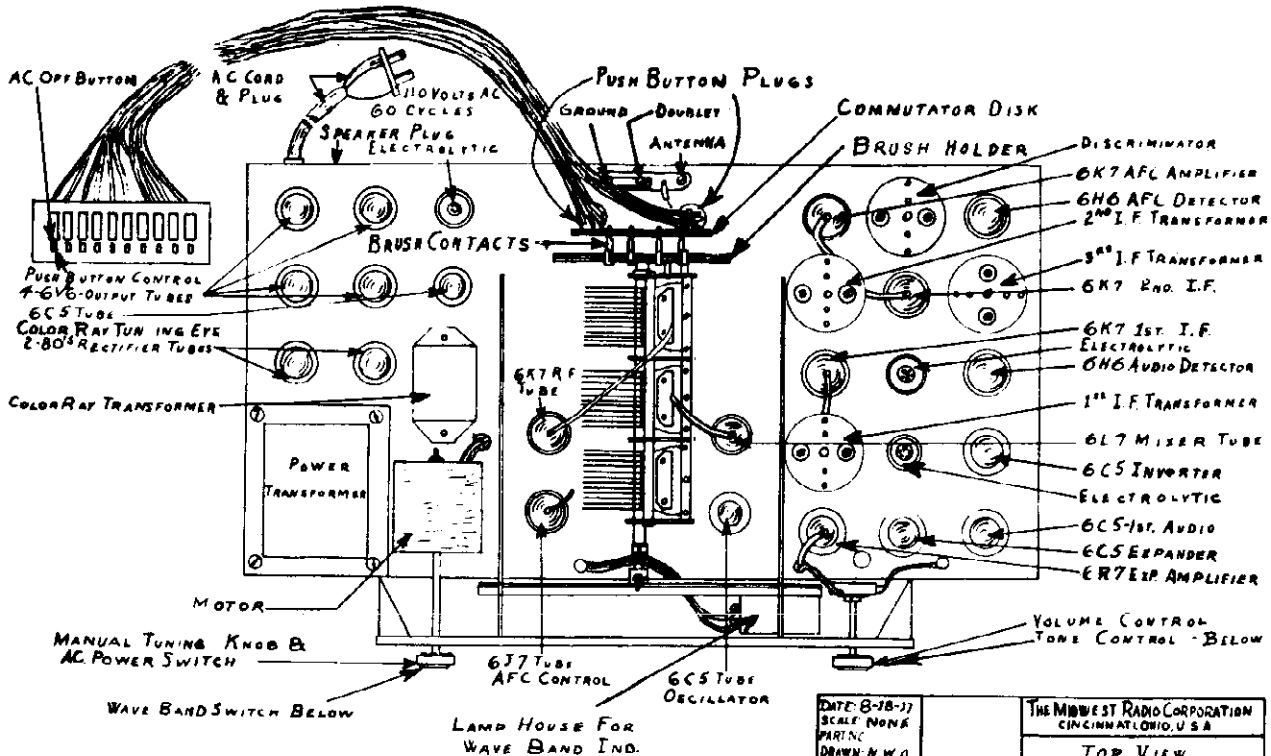
20-38

MODEL 18-38 AC
 MODEL 20-38 AC
 Socket Layouts

MID-WEST RADIO CORP.



DATE: 8-26-33	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
SCALE: NONE	TOP VIEW
PART NO. DRAWN: N.W.D.	OF
TRACED: N.W.D.	18-38
CHECKED: [Signature]	
APPROVED: [Signature]	



DATE: 8-28-33	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
SCALE: NONE	TOP VIEW
PART NO. DRAWN: N.W.D.	OF
TRACED: N.W.D.	20-38
CHECKED: [Signature]	
APPROVED: [Signature]	

MONTGOMERY-WARD & CO.



Image too Large — Blurred



Image in Focus



Image too Small — Blurred

Fig. 1—Effect of Lens Focus

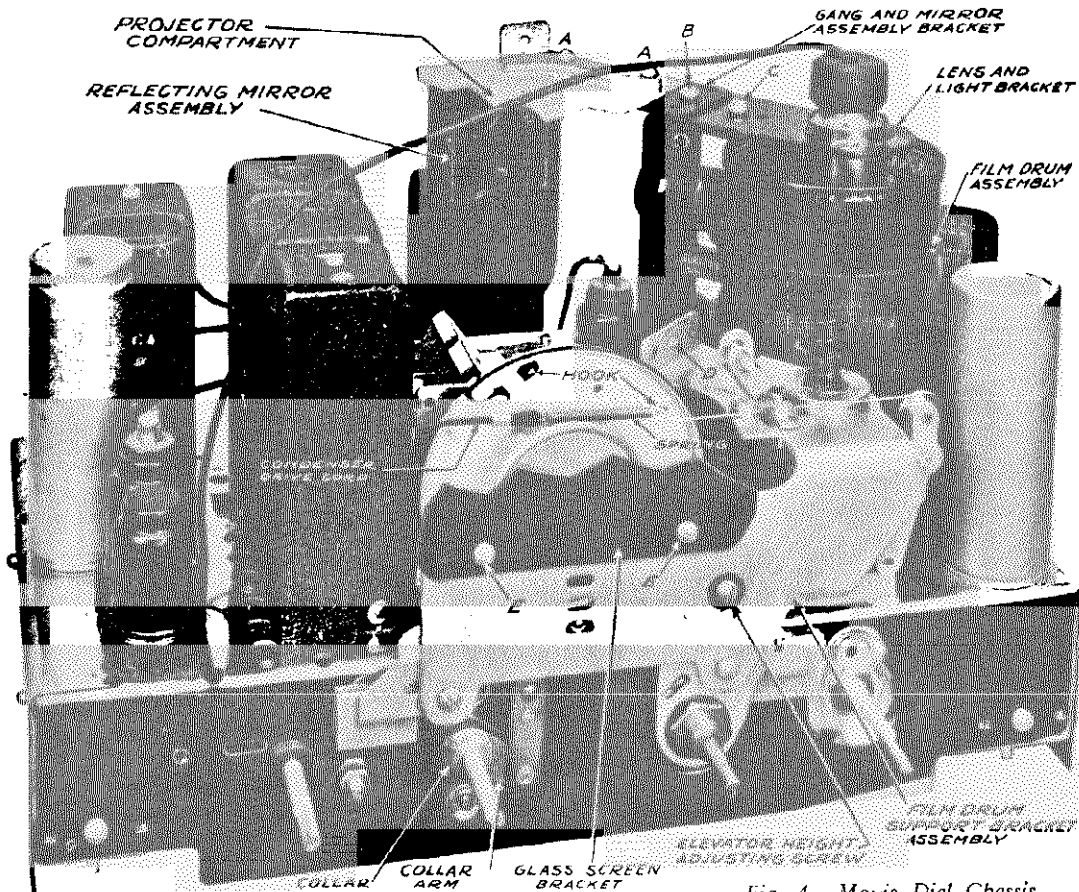
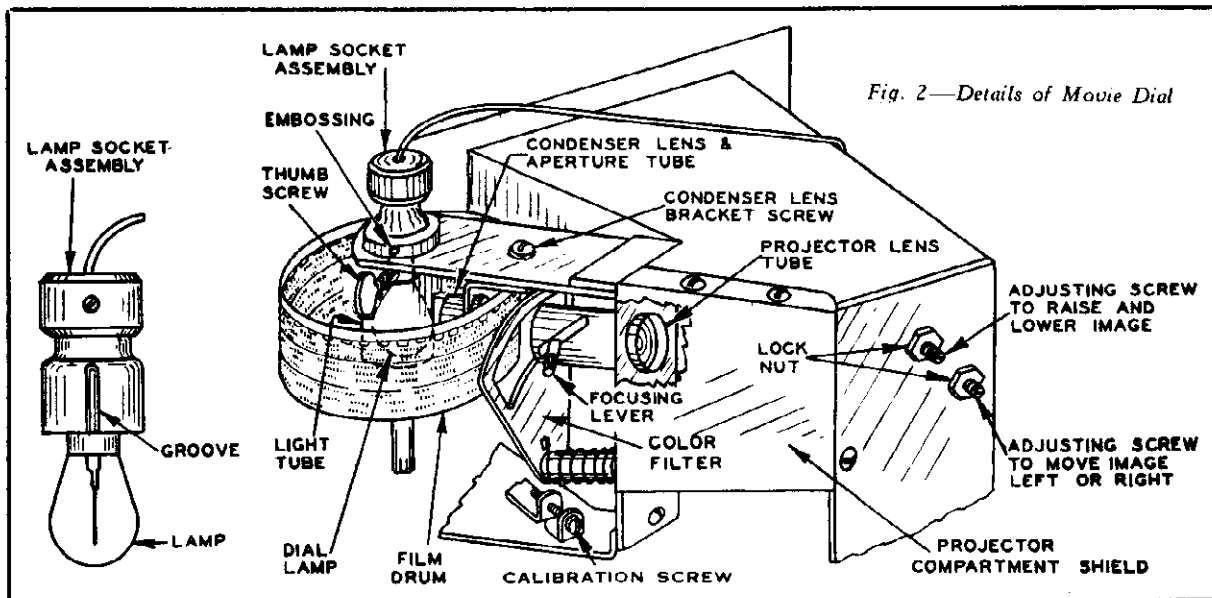


Fig. 4—Movie Dial Chassis

MODEL Movie Dial Drive

Lamp and Takeup Assemblies MONTGOMERY-WARD & CO.

Drive Cord Diagram

Caution

In all work on the chassis and movie dial, extreme care must be taken not to scratch the film or damage the color filter. The film is easily scratched and should not be touched by the hand or any other object.

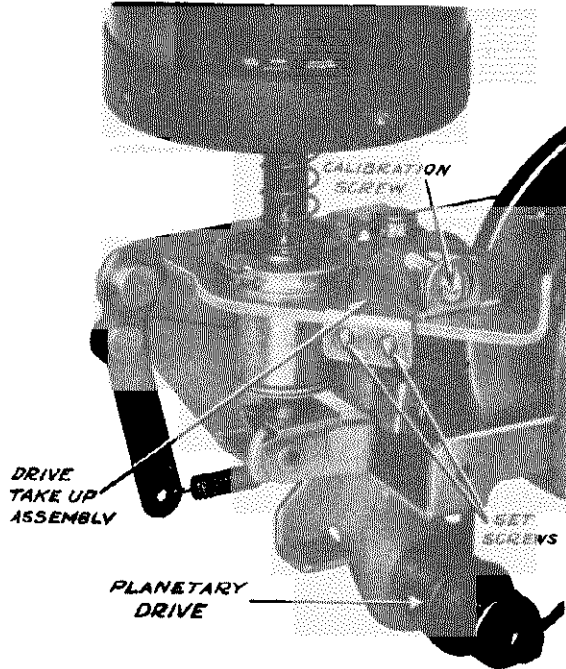


Fig. 3—Drive Takeup Assembly

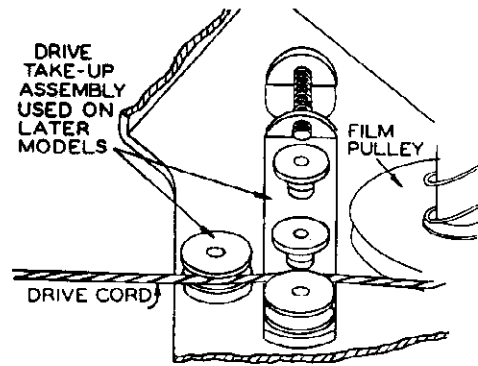


Fig. 7—Replacement of Film Drum Drive Cord

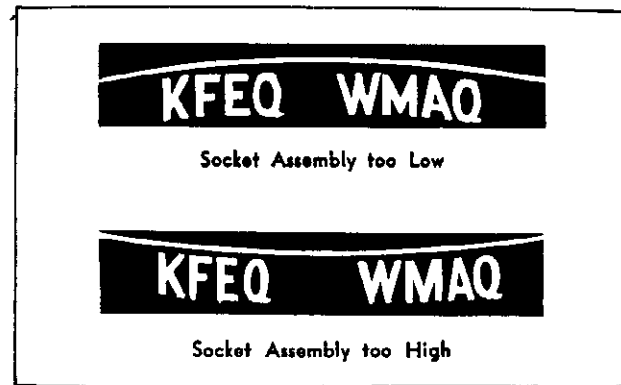


Fig. 5—Effect of Lamp Socket Assembly Height

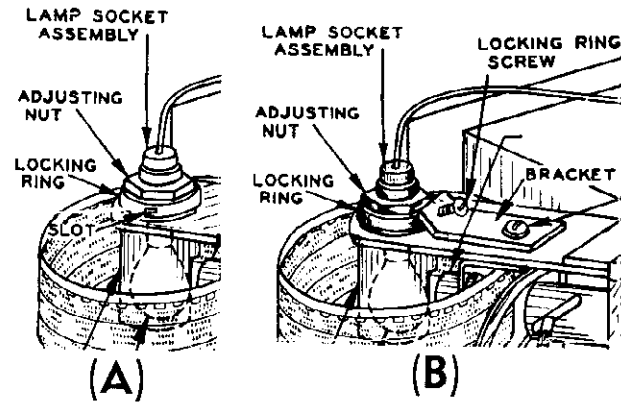
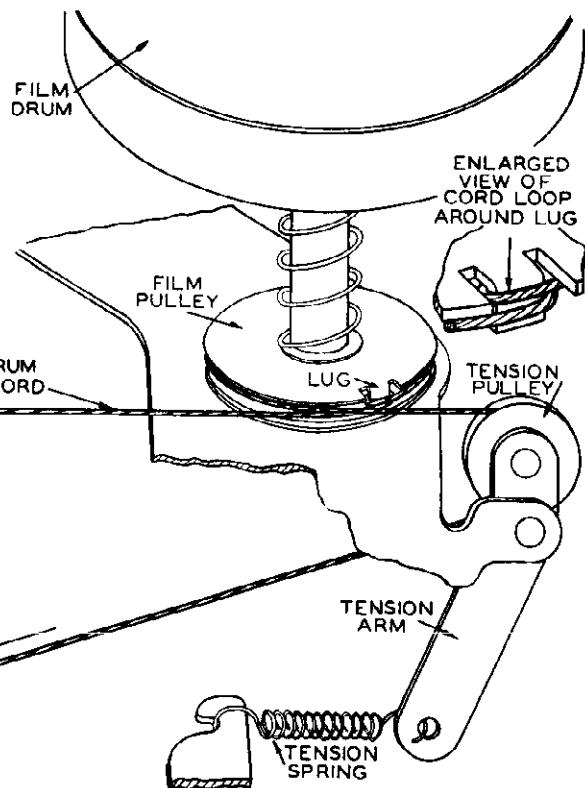


Fig. 6—Early Dial Lamp Assemblies



Adjustments and Service Data MOVIE DIAL AND DRIVE August, 1936

Bringing Lens Adjustment to a Focus

Important—Turn the band switch to the standard wave position.

Move the focusing lever (see Fig. 2) up or down until the image on the screen is clearest. In Fig. 1 is shown the effect of correct and incorrect focusing. Care should be taken not to touch the color filter.

Adjusting Reflecting Mirror

On the back wall of the projector compartment are two screws as shown in Fig. 2, the purpose of which is to adjust the position of the reflecting mirror vertically and horizontally.

If the raising and lowering adjustment screw (see Fig. 2) is not adjusted properly, the image will be too high or too low on the screen and the kilocycle or megacycle lines will not be horizontal. Also, part of the image may be cut off. If this condition exists loosen the nut which holds this screw in place. Back this nut off about one turn and then carefully turn this screw until the image is centered on the screen and the lines are horizontal. Use a fine blade screwdriver for this adjustment. Retighten the nut.

If the image cannot be centered from top to bottom, it may be necessary to adjust the elevator height in accordance with the article on this subject in this manual.

If the image on the screen is too far to the right, there will be a space at the left of the screen without light. If the image is too far to the left the same condition is true on the right side of the screen. In either case, loosen the nut which holds the left and right adjusting screw in place—see Fig. 2. Back this nut off about one turn and then carefully turn this screw with a fine blade screwdriver until the image is centered. Retighten the nut.

Drive Takeup Assembly

Later models are equipped with a drive takeup assembly illustrated in Fig. 7, by means of which the dial drum can be rotated a slight amount for calibration purposes. The earlier models do not have this adjustment. However, a special unit illustrated in Fig. 3 can be put on.

This unit is assembled to the film drum bracket and drive cord as shown in Fig. 3. Unscrew the two set screws and open the slot to the maximum position by turning the adjusting screw in a counter-clockwise direction. Place the unit in position on the bracket.

Push it as far to the left as possible (from back of chassis) and tighten the two set screws. These will extend beneath the film drum bracket. Then place the drive cord between the two pulleys as shown.

Tighten the calibration screw to secure the required cord tension. When this is done the radio might be out of calibration. If this condition occurs, the film drum may be shifted to the proper position by loosening the two screws inside the drum at the bottom. After these two screws are tightened, a fine calibration adjustment may then be obtained by turning the calibration screw.

Dial Calibration

The radio is properly calibrated if, when a station is correctly tuned in, the vertical red line on the screen crosses the call letters of that station. If the red line is found to be on one side of the call letters of a large number of stations on the standard wave band (the same side in each case), the dial is out of calibration.

To re-calibrate, tune in the signal of one of the larger nearby stations. Choose a station which is near the 1300 KC end of the dial and tune carefully to resonance. Turn the calibration screw (see

Fig. 2, 3 or 7) until the vertical red line on the screen is at the center of the call letters of that station.

If the film drum cannot be turned a sufficient amount by means of the calibration screw, loosen the 2 screws at the bottom of the drum which hold it in place. Adjust the position of the drum and tighten the screws. The early models do not have the cord take-up calibration screw mentioned above.

These models must be calibrated by loosening the drum screws.

The dial will then be properly calibrated and this adjustment should not be changed unless re-calibration again becomes necessary. It should be remembered that after calibration a few of the stations will be tuned in when the vertical red line is near the end of the call letters and city of a station. That is because of slight variations in the film.

Adjusting Elevator to Raise or Lower Image

Adjust the lamp assembly height until the lines on the screen are straight—see article on this adjustment in this manual.

Turn the upper reflecting mirror adjusting screw—see Fig. 2, until the lines on the screen are horizontal.

Turn the band switch to the second short wave position (green).

Loosen the elevator adjusting screw—see Fig. 4.

Raise and lower the elevator until the megacycle line (at bottom) is between the letters "S" and "T" of the word "West" on the glass at either side of the glass screen.

Tighten the elevator adjusting screw.

Removing Play between Band Switch and Elevator

If the elevator arm stops and the band switch stops do not coincide, there will be a certain amount of play between the band switch and the elevator. When this condition occurs, the position of the image on the screen will not be fixed, but can be moved up or down by turning the band switch knob.

To remedy this condition, first turn the band switch to the second short wave position (green).

Loosen the set screw and square head screw on the band switch shaft collar, see Fig. 4. Turn the band switch shaft clockwise as far as it will go. Push the collar arm clockwise as far as it will go without pulling the elevator arm ball bearing out of the bottom slot.

Then tighten the square head screw and set screw in the elevator arm collar.

Planetary Drive Assembly

The planetary assembly is the unit that is integral with the tuning shaft. It is illustrated in Fig. 3.

If the nut of this assembly is too tight, the drive will be jerky and will turn hard in high speed. If this condition exists, back off this nut one or two turns and note the effect.

If this nut is too loose, the drive will slip in low speed. The remedy in this case, of course, is to tighten the nut.

Should the condenser drive cord slip when the planetary pulley is turning, inspect the tuning condenser, drive drum and film drum to see if they are turning properly or if they are being obstructed in some way.

If the drive turns unevenly (rough in spots), this may mean that the planetary assembly is defective or damaged internally and a new unit will be required.

Changes in Early Models

Film Drum Base—In the early models a metal film drum base was used. This was replaced in later models with a molded base. The latter type is used in filling orders and is interchangeable with the early type. A clamping plate is now included with the molded base Film Drum Assembly.

Lamp Socket Assembly—Two changes were made in the lamp socket assemblies in the early models. The type used with each receiver is illustrated in the instruction book packed with that model. For further information regarding this assembly see the article "Replacing and Positioning the Dial Lamp" in this manual.

Cleaning Light Reflecting and Transmitting Parts**Cleaning the Lenses**

It is very seldom necessary to clean the lenses. Occasionally, however, dust or dirt on the lens may cause the image on the screen to be spotted or foggy. If this is the case, the lenses may be removed as explained below and may then be cleaned by wiping carefully with a clean chamois or soft cloth.

Removing Condenser Lens—This lens is inside the film drum as shown in Fig. 2. Turn the band switch to the standard wave position. Take out screw (C) holding the condenser lens bracket in place—see Fig. 4. Turn this bracket in a clockwise direction (from top) and lift it out carefully to avoid scratching the film.

This lens can be cleaned without removal or may be forced out of the tube with a wood block. When the lens is replaced, line up the end of the lens barrel with the edge of the tube.

In replacing the condenser lens bracket, shift this bracket until the end of the condenser lens tube is about 1/8 inch from the dial lamp.

Removing Projector Lens—This lens is inside the projector lens tube as shown in Fig. 2. Turn the band switch to the standard wave position. Take out the three screws which hold the projector compartment shield in place. Then remove the projector compartment shield by tilting the top slightly to the back and toward the right (from back of shield). Move the focusing lever to the highest position. Unscrew and remove this lever.

Push the color filter in a counter-clockwise direction (from front) as far as it will go. Insert a fine blade screwdriver into the projector lens tube (from the front). The blade of the screwdriver should engage the end of the barrel of this lens and push against it until it has been pushed a slight distance

toward the projector compartment. CAUTION—Do not let the screwdriver touch the glass. Then insert the screwdriver through the slot in the side of this tube, again engaging the barrel of the lens. Push against the barrel until the lens can be removed by hand from the projector compartment.

Cleaning the Reflecting Mirror, Film, Color Filter and Glass Screen

As in the case of the lenses, it is very seldom necessary to clean the reflecting mirror, film, color filter or glass screen. If, however, the image on the screen is spotted or foggy, it may be necessary to clean these items as explained below.

Reflecting Mirror—The reflecting mirror is located within the projector compartment. Remove the projector compartment shield as described above under "Removing Projector Lens". The glass may then be cleaned without removal of this assembly. Wipe the glass carefully with a clean chamois or soft cloth.

Film—The film may be dusted with a camel hair brush or fine cloth. CAUTION—Extreme care must be taken not to scratch the film.

Color Filter—To clean the color filter, turn the band switch to the second short wave position (green). Clean the filter using a fine cloth or chamois. CAUTION—Extreme care must be taken not to damage the filter.

Glass Screen—If the screen should become dirty, the front may be cleaned by wiping with a clean, dry cloth. If the back of the screen becomes dirty, it should be cleaned with alcohol. Care should be taken not to get any alcohol on the paint on the letters at the sides of the screen, or on the r, line at the front of the screen.

MODEL Movie Dial Drive Replacing Parts

MONTGOMERY-WARD & CO.

Replacing Parts

Replacing and Positioning the Dial Lamp

Caution—If a new lamp is required, use only the correct lamp, as shown in the parts list and on the label on each radio.

These are special lamps and can be purchased only through Wards stores and mail order houses. The life of the lamp is somewhat less than that of a radio tube.

First, turn the radio off.

Loosen the thumb screw and lift the lamp socket assembly out of the light tube—see Fig. 2. This can be lifted vertically by grasping the insulated top of the assembly through which the wire runs.

Remove the old lamp from the socket and put in the new one.

Replace the lamp socket assembly in the light tube with the light tube embossing in the groove of the lamp socket assembly—see Fig. 2. Do not tighten the thumb screw yet.

Turn the radio on.

Then grasp the top of the lamp socket assembly and move it up or down until the image on the screen is clearest and the lines are horizontal. The effect of having the lamp assembly too high or low is shown in Fig. 5. Tighten the thumb screw.

Early Types—There were two earlier types of lamp socket assemblies.

In the assembly shown in Fig. 6(A) the procedure differs from the above as follows:

To remove the socket assembly from the light tube, grasp the locking ring and turn it in a counter-clockwise direction until the pins are at the vertical portion of the slots. Then lift it out.

When replacing the lamp socket assembly in the light tube, line up the slots in the locking ring over the pins at the top of the light tube. Push the locking ring down and turn it clockwise until the pins move as far as possible into the horizontal portion of the slot—see Fig. 6(A).

To make the image on the screen clear and the lines horizontal, turn the adjusting nut. This moves the lamp assembly up or down depending on the direction of rotation.

In the assembly shown in Fig. 6(B), the procedure differs from that used in the (A) type as follows:

To remove the lamp socket assembly, unscrew the locking ring screw until it is free of the locking ring. Then pry the locking ring upward with a screw driver and lift the assembly out of the light tube.

When replacing the assembly in the light tube, line up one of the holes in the locking ring with the screw in the bracket. Push the locking ring down on the light tube and tighten the locking ring screw until it enters the hole in the locking ring.

Turn the adjusting nut as explained for the type (A) assembly. If the adjusting nut turns hard,

grasp the black insulated top of the assembly and lift upward slightly until the nut turns freely.

Important—Latest type used for parts orders. In filling orders for this assembly the latest type, illus- trated in the parts list, is shipped. This is inter- changeable with all early types.

The early types of lamp socket and light tube did not have the groove and embossing illustrated in Fig. 2. When one of the latest type of socket as- sembly is used in these models, it will be necessary to turn the assembly until the filament is at right angles to the lens.

Replacing the Film Drum Assembly

Remove the lamp socket assembly from the light tube by lifting it out in accordance with instructions in "Replacing and Positioning the Dial Lamp".

Remove the projector compartment shield by tak- ing out the three screws which hold it in place— See Fig. 2.

Take out the two screws (B and D) which hold the lens and light bracket in place—See Fig. 4. Now remove the lens and light bracket taking care not to scratch the inside of the film.

Remove the film drum assembly by unscrewing the two small screws located inside the drum at the bottom.

Mount the new film drum assembly on the film drum supports leaving the paper around the film for protection, and insert the clamping plate within the film drum. The film drum and clamping plate should then be so placed that the small screws are in the center of the two slots.

Replace the lens and light bracket taking care not to scratch the inside of the film.

Replace the projector compartment shield and dial lamp assembly.

Now remove the paper from the film, turn the radio on and calibrate the dial in accordance with the instructions in the article "Dial Calibration".

The film and mounting drum are sold as one as- sembly and cannot be ordered separately.

Replacing the Glass Screen

Loosen the screws holding the glass screen clamps on each side of the screen. Loosen these only enough to enable the glass screen to be removed by lifting it out from the top.

Mount the new screen from the top being very careful not to touch the back of the screen, as touch- ing the screen will leave fingerprints on the rough- ened or ground portion.

Push the glass screen down until it rests on the shelves provided for it.

Tighten the four screws holding the screen clamps just enough so that the glass is held firmly in place.

Replacing Film Drum Drive Cord

Remove the projector compartment and glass screen assembly together. To do this, take out the 2 screws (A) see Fig. 4, at the back of the top of the projector compartment, the 2 screws (E) at the bot- tom of the glass screen bracket, and the 2 brass col- lars from the volume control and tone control shafts.

Disconnect the tension spring from the arm at the right side of drive mechanism—see Fig. 7.

Remove the old cord by unsoldering it from the small lug on the film pulley. Clean the excess solder off of this lug. With a narrow blade screwdriver carefully bend this lug out toward the vertical posi- tion, a slight amount.

Turn the tuning shaft until the condenser plates are completely in mesh.

Turn the film drum so that the lug on the film pulley is in the position shown in Fig. 7. This is important.

Insert the new drive cord in the left slot in the drive drum (from front) and wind the cord in a clockwise direction one half turn around the drive drum.

Continue the cord horizontally to the lug on the film pulley. Loop the cord around this lug in the manner shown in Fig. 7.

Wind the cord on the film pulley one turn counter-clockwise, being sure that the end coming from the pulley passes over the cord from the drive drum.

Bring the cord over the brass tension pulley and back again to the left. Insert the end in the right slot in the drive drum.

Replace tension spring and reassemble projector compartment, glass screen and collars to the chassis.

Set the signal generator to 600 KC and carefully tune in the signal. Adjust the position of the film drum in accordance with the article "Dial Calibra- tion" in this manual until the 600 KC mark on the dial is at the red line on the screen. Do not touch the film with the fingers.

When the above adjustments have been made, carefully bend the lug on the film pulley down over the cord and solder, being sure that the upper cord leaving the pulley receives no solder.

Replacing Condenser Drive Cord

Remove the projector compartment and glass screen assembly together. To do this, take out the 2 screws (A) see Fig. 4, at the back of the top of the projector compartment, the 2 screws (E) at the bottom of the glass screen bracket and the 2 brass collars from the volume control and tone control shafts.

Turn the drive drum until it is in the position shown in Fig. 4.

Place the loop at the end of the drive cord (with- out the spring) over the small hook nearest the cut out part of the drive drum.

Now turn the chassis on its back. Bring the cord down over the right side (from front) of the drive drum and over the planetary drive pulley, keeping the cord in the groove provided for it. Bring the drive cord up over the left side (from front) of the drive drum to the cut out part of the drum. While holding the cord in place, return the chassis to normal position.

Then bring the cord in toward the inside of the drum, attaching the tension spring to the small hook provided for it.

Reassemble the projector compartment, glass screen and collars to the chassis.

Replacing the Color Filter Semaphore

Push the focusing lever up as far as it will go.

Cut a strip of paper the width of the film drum assembly and place this around the film holding it on with a string wound around the drum. This will protect the film from being scratched on the outside.

Remove the projector compartment shield by tak- ing out the three screws which hold it in place—See Fig. 2.

Remove the lens and light bracket by taking out screws (B and D) which hold it in place—See Fig. 4. Care must be taken not to scratch the inside of the film when removing this bracket.

Remove the horseshoe washer from the stud hold- ing the color filter semaphore in place. Then take off the color filter semaphore.

Take the spring off of the old assembly. Put this spring on the new assembly, the straight end of the spring being placed under the small clip provided for it on the color filter semaphore.

Now replace the color filter semaphore on the stud on which it mounts. Put on the horseshoe washer, pinching the open ends together. The free end of the spring should catch the edge of the lens and light bracket.

Next turn the color filter one complete turn in a counter-clockwise direction (from front) to provide tension on the spring.

Holding the semaphore in this position, replace the entire assembly with the semaphore stop placed under the film drum. (drum in second short wave or highest position). Care must be taken not to scratch the inside of the film when replacing the lens and light bracket assembly.

Now replace the projector compartment shield and remove the paper from around the film.

Turn the radio on and bring the letters on the screen into proper focus by means of the focusing lever—See Fig. 2. The effects of incorrect focusing are shown in Fig. 1.

MONTGOMERY WARD & CO. MODELS 62-226, 62-228
62-259, 62-308
62-313, 62-408
62-418

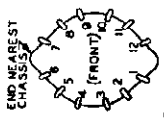
Schematic

ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

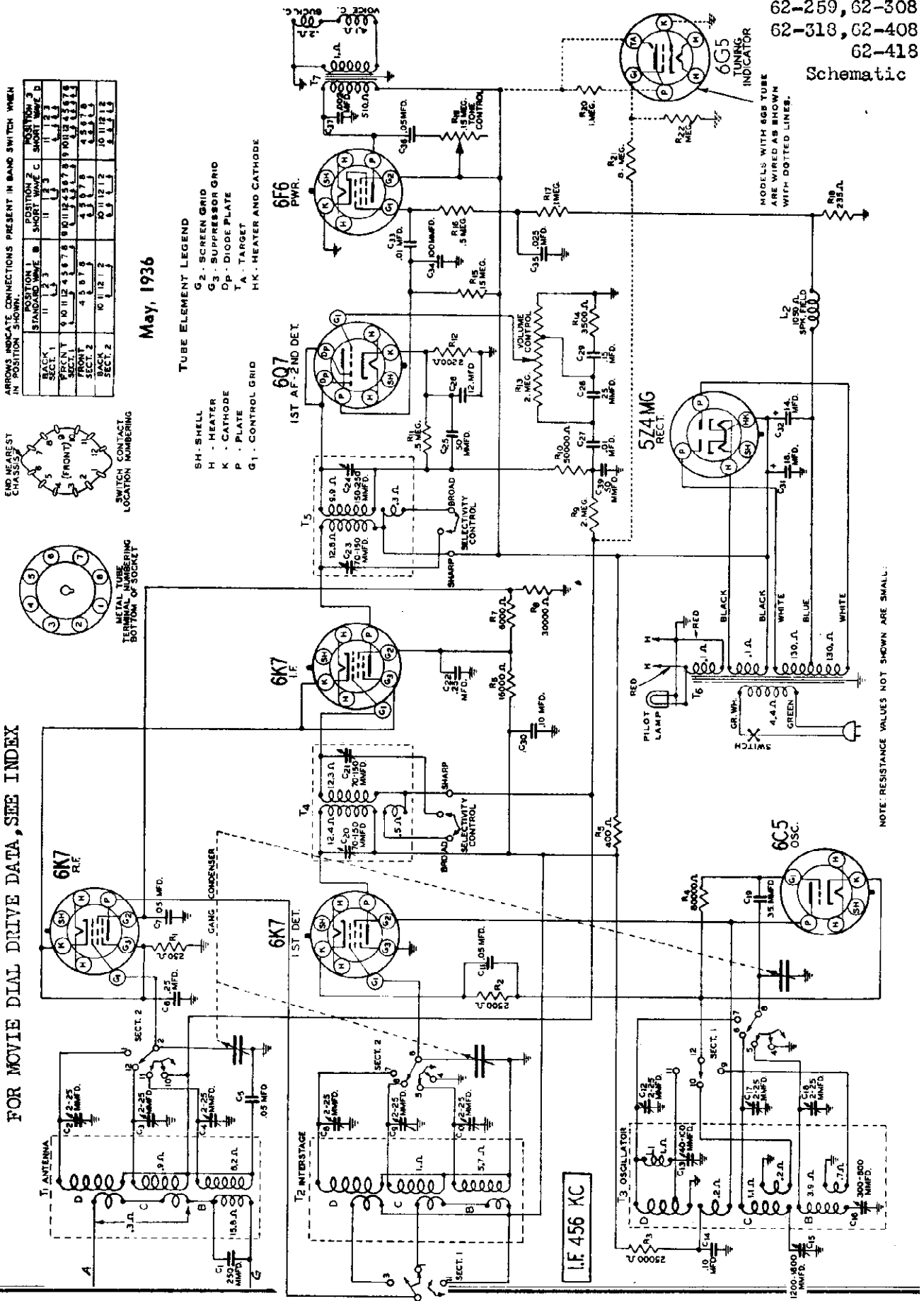
POSITION	1	2	3	4
BACK SECT. 1	1	2	3	4
FRONT SECT. 1	5	6	7	8
BACK SECT. 2	9	10	11	12
FRONT SECT. 2	13	14	15	16

May, 1936

- TUBE ELEMENT LEGEND**
- G2 - SCREEN GRID
 - G3 - SUPPRESSOR GRID
 - DP - DIODE PLATE
 - T - TARGET
 - HK - HEATER AND CATHODE
 - SH - SHELL
 - H - HEATER
 - K - CATHODE
 - P - PLATE
 - G1 - CONTROL GRID



FOR MOVIE DIAL DRIVE DATA, SEE INDEX



NOTE: RESISTANCE VALUES NOT SHOWN ARE SMALL.

MODEL S 62-226, 62-228, 62-259
62-308, 62-318, 62-408
62-418

MONTGOMERY-WARD & CO.

Trimmers, Voltage, Socket, Coils
Sensitivity, Phono Data

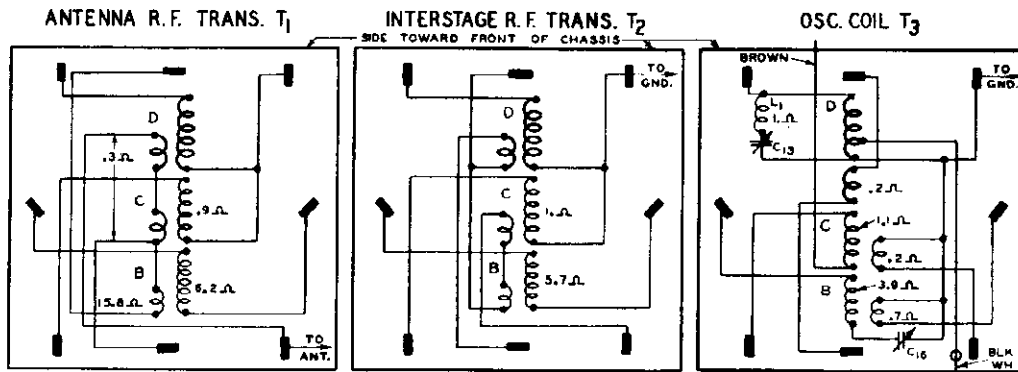


Fig. 4—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

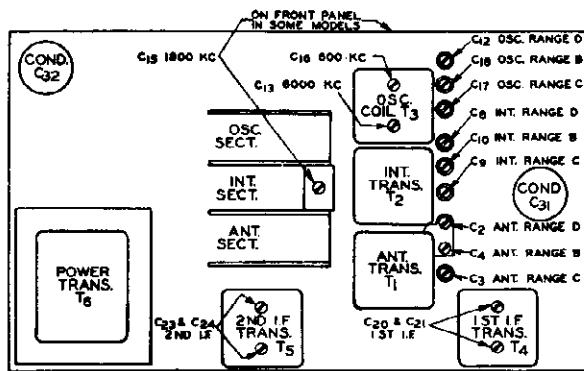


Fig. 3—Location of Trimmers

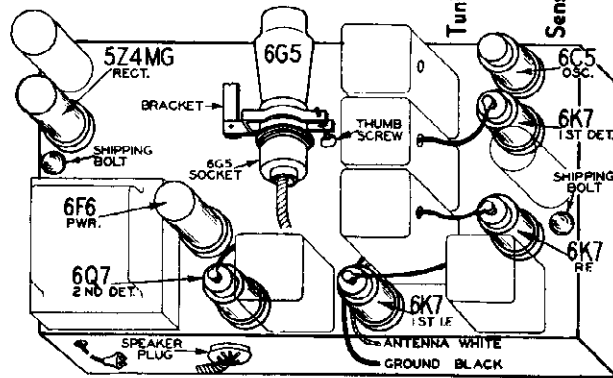


Fig. 6—Location of Tubes

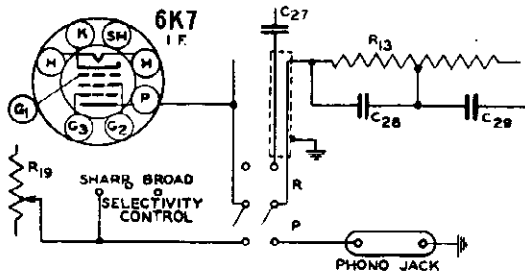


Fig. 7—Phonograph Connections

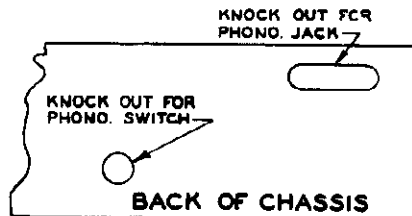


Fig. 8—Location of Phono Knockouts

Tuning Frequency Range	528 to 1730 KC.	Absolute
B Range	1710 to 5800 KC.	0.5 to 2 Microvolts
C Range	5750 to 18300 KC.	0.5 to 2 Microvolts
D Range		1.0 to 4 Microvolts

Sensitivity	Absolute
B Range	0.5 to 2 Microvolts
C Range	0.5 to 2 Microvolts
D Range	1.0 to 4 Microvolts

Speaker
8" and 10" Dynamic

Power Consumption ... 85 Watts (At 115 volts 60 cycles)
Power Output ... 3 Watts Undistorted
Selectivity ... 28 KC Broad at 1000 times Signal (Sharp)
Intermediate Frequency ... 456 KC.

Line Voltage: 115
Volume Control: Maximum

Antenna Shorted to Ground
Position of Band Switch: Standard Wave

TUBE	FUNCTION	VOLTAGE BETWEEN SOCKET PRONGS AND GROUND (Unless otherwise indicated)							
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
6K7	RF.	0	6.1(1)	260	100	4.0	...	6.1(1)	4.0
6K7	1st Det.	0	6.1(1)	260	118	0	...	6.1(1)	9.0
6C5	Osc.	0	6.1(1)	120	...	0	...	6.1(1)	0
6K7	I.F.	0	6.1(1)	260	138	4.0	...	6.1(1)	4.0
6Q7	1st A.F.—2nd Det.	0	6.1(1)	105	0	0	...	6.1(1)	1.4
6F6	Power Amp.	0	6.1(1)	238	260	18	...	6.1(1)	0
5Z4MG	Rect.	0	4.9(2)	...	680(3)	...	680(3)	...	4.9(2)
6E5	Tuning Indicator	Plate to Ground 30(4)		Target to Ground 270		Cathode to Ground 0		Across Heater 6.1 A.C.	

(1) A.C. voltage as read across heater terminals 2 and 7.
(2) A.C. voltage as read across heater terminals 2 and 8.

(3) A.C. voltage as read across terminals 4 and 6.
(4) As read with 500,000 ohm meter.

Alignment, Notes

Phonograph Connections

Phonograph connections can be made as shown in Fig. 7. The parts required are shown in the parts list. Knowltons are provided in the back panel of the chassis for mounting the phono jack and phono switch. See Fig. 7.

The phono switch must be mounted with one set of terminals nearest the bottom of the chassis base. The connections are made by opening the diode return circuit at the volume control. Unsolder the .01 mfd. condenser C27 from the volume control.

Strip about 2 3/4 inches of the shielding from each end of the cable furnished with the phono attachment parts. Connect one lead of the cable to the terminal on the volume control from which condenser C27 was removed. The other end of this lead is connected to the phono switch as shown in Fig. 7. The second cable lead is connected to the open end of condenser C27. Then connect the other end of this lead to the phono switch as shown in Fig. 7. Both of the shielded cable leads connected to the phono switch are con-

nected to the switch terminals nearest the chassis base. Before connecting the cable leads to the phono switch, it will be necessary to slip a piece of varnished tubing over the portion of the cable that passes near the 6K7 1st I.F. tube socket.

Now ground the shielding by soldering it to the lugs on the chassis base. One of these lugs is located just below the planetary drive; the other is near the rear mounting foot of the gang condenser.

Complete the other connections as illustrated in Fig. 7. The lead between the tone control and the .05 mfd. tubular condenser C36 mounted on the back of the chassis base, should be covered with a piece of varnished tubing.

The tin plate shield is soldered to the tone control mounting bracket in such a way that when it is bent down toward the bottom and back of the chassis it will shield the lower leads of the phono switch and the lead between the tone control and tubular condenser C36.

After making the phono connections, the I.F. stages should be realigned.

Alignment and Calibration

Adjust the oscillator Range B trimmer (C18) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

1500 KC Adjustment

Set the signal generator for 1500 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained. Loosen the pointer set screw and set the large pointer at the 1500 KC mark on the standard wave band scale. Retighten the set screw.

Adjust the interstage Range B trimmer (C4) and antenna Range B trimmer (C1) to maximum. Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment

Set the signal generator for 600 KC. Turn the tuning condenser rotor until maximum output is obtained. Turn the rotor slowly back and forth, at the same time adjusting the 600 KC trimmer, until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range C Alignment

CAUTION—When aligning the short wave bands be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC. It may be necessary to increase the input signal to hear the image.

5800 KC Adjustment

Set the signal generator for 5800 KC. Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

Adjust the oscillator Range B trimmer (C18) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

1500 KC Adjustment

Set the signal generator for 1500 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained. Loosen the pointer set screw and set the large pointer at the 1500 KC mark on the standard wave band scale. Retighten the set screw.

Adjust the interstage Range B trimmer (C4) and antenna Range B trimmer (C1) to maximum. Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment

Set the signal generator for 600 KC. Turn the tuning condenser rotor until maximum output is obtained. Turn the rotor slowly back and forth, at the same time adjusting the 600 KC trimmer, until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range C Alignment

CAUTION—When aligning the short wave bands be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC. It may be necessary to increase the input signal to hear the image.

5800 KC Adjustment

Set the signal generator for 5800 KC. Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

The planetary assembly is the unit that is integral with the tuning shaft. It is at the bottom of the belt. If the nut of this assembly is too tight, the drive will be jerky and will turn hard in high speed. If this condition exists, back off this nut one or two turns and note the effect. If the nut is too loose, the drive will slip in slow speed. The remedy in this case is, of course, to tighten up the nut.

Should the drive belt slip when the planetary pulley is turning, first inspect the drive drum assembly. This is the assembly which is mounted on the tuning condenser shaft. If this assembly and the tuning condenser rotor turn satisfactorily, the belt is probably too loose and a new one will be required. In the sets with the flat belt type of drive, there is an idler pulley which can be positioned, and by means of which the belt tension can be increased. In this type, therefore, the belt tension should be increased before attempting to put on a new one.

The replacement parts list shows the parts used in each type of drive and the parts common to both types.

Switch Contact Location Numbering

A standard arrangement for switch contact location numbering has been adopted. This numbering is illustrated in Fig. 2. In contact locations not used, the number applying to that particular location is not employed.

Twenty-five Cycle Receivers

The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer is used. The correct power transformer is shown in the parts list.

The twenty-five cycle receiver can be operated satisfactorily from a sixty cycle power supply. However, the reverse is not true, the sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

A 115-230 volt, 40 to 60 cycle as well as other power transformers with special power ratings are also available for this model.

Trimmer Replacement

If one trimmer of the gang trimmer strip should become defective, it is not necessary to replace the entire strip. A single trimmer P-17A36, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (side not grounded) of the defective trimmer in the strip. This connection is then made to the single trimmer. Connect it to the side of the trimmer not in contact with the adjusting screw. The other side of the single trimmer is then connected to a good ground, using a piece of heavy wire in order to support the trimmer adequately. In replacing a trimmer, be sure to keep both leads as short as possible and keep the ungrounded lead as far from ground as possible.

Voltage Chart

The voltage readings are taken with a voltmeter having a resistance of 1,000 ohms per volt. The standard metal tube socket terminal numbering system (bottom of socket) is shown in Fig. 3. On the schematic circuit diagram, Fig. 2 is a list giving the complete names of the tube elements and the corresponding symbols as used on the sockets on the schematic.

Turn the rotor of the tuning condenser to the full open position.

Turn the band selector to the Range C position (1st short wave band).

Adjust the oscillator Range C trimmer (C17) until maximum output is obtained. See Fig. 3 for location of this trimmer.

5000 KC Adjustment

Set the signal generator for 5000 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range C trimmer (C9) and antenna Range C trimmer (C3) to maximum.

1800 KC Adjustment

Set the signal generator for 1800 KC. Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth, at the same time adjusting the 1800 KC trimmer, until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range D Alignment

18,300 KC Adjustment

Set the signal generator for 18,300 KC.

Keep the antenna lead of the receiver connected through the 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band selector to the Range D position (2nd short wave band).

Adjust the oscillator Range D trimmer (C12) until maximum output is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range D trimmer (C8) and antenna Range D trimmer (C2) to maximum.

When adjusting the interstage Range D trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

Do not change the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Drive Assembly

This model uses a two-speed planetary drive.

All of the early sets are equipped with a flat belt and may be identified by the 1/4 inch wide belt. The later sets use the same type of drive, but have a black cord belt. This is a bronze cable with a black fabric covering. It is about 1/8 inch in diameter.

The belt type also has an idler pulley which the cord type does not have.

MODEL 62-236
Voltage, Coils
Panel Mtg. Kits

MONTGOMERY-WARD & CO.

Instrument Panel Mounting Kits

Car	Year & Model	Panel Kit No.	Car	Year & Model	Panel Kit No.	Car	Year & Model	Panel Kit No.		
Buick	1936	21A16	Ford	1936 Standard & DeLuxe	21A10	Plymouth	1936 DeLuxe	21A12		
Cadillac	1936	21A39		1935 DeLuxe	21A32		1936-35 Standard	21A37		
Chevrolet	1936-35 Standard & Master	21A11					1934 Standard	21A38	1935 DeLuxe	21A33
	1936 Six	21A19					1934	21A35	1934	21A49
Chrysler	1936 Eight	21A30	Hudson	1936	21A17	Pontiac	1936-35 Standard-DeLuxe 6 & 8	21A15		
	1936 Airflow	21A31		1935	21A48		1936 Dictator	21A20		
	1935-34 Except Imperial	21A47		1934	21A35			1936 President	21A24	
DeSoto	1936 Airflow & Airstream Custom	21A22	Lafayette	1936-35	21A50	Terraplane	1936	21A18		
		21A26	LaSalle	1936	21A40		1935	21A48		
	1935 DeLuxe	21A46	Lincoln	Zephyr 1936	21A10		1934	21A35		
	1934	21A47	Nash	1936-35	21A36		Steering column and under panel kit		21A23	
Dodge	1936 DeLuxe	21A13	Oldsmobile	1936	21A14	The mounting kit includes escutcheon plate, dial crystal, knobs, special mounting brackets and small items such as screws. The other items are shipped with the radio.				
	1935	21A45		1935	21A34					
Packard	1936	21A49	Packard	1936 120-B	21A21					
	1934	21A49		1935 120	21A41					

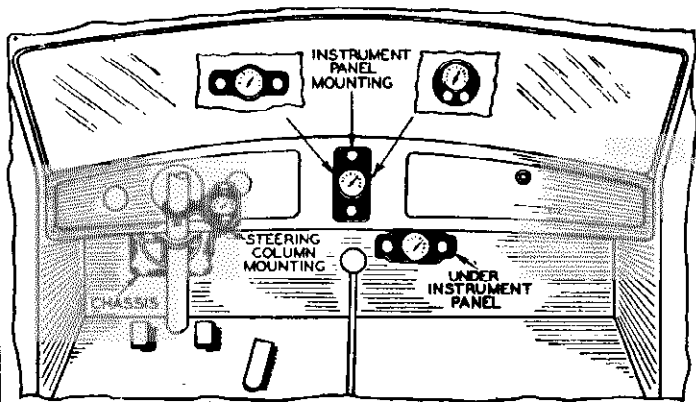


Fig. 6—Various Control Head Mountings

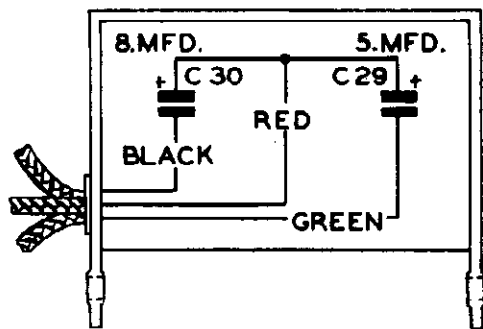


Fig. 5—Condenser Block—Internal Wiring

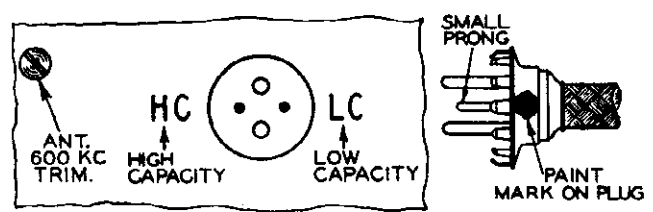


Fig. 3—Antenna Plug Insertion

Antenna Disconnected Battery 6 Volts Under Load

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground
6D6	R.F.	6	233	103	4.0
6C6	1st Det. & Osc.	6	233	103	
6D6	I.F.	6	233	103	4.0
75	2nd Det.	6	130		
41	Power	6	215	233	16.0(1)
84	Rectifier	6	560(2)		

(1) Grid bias read across filter choke L6
(2) Plate to Plate A.C. voltage

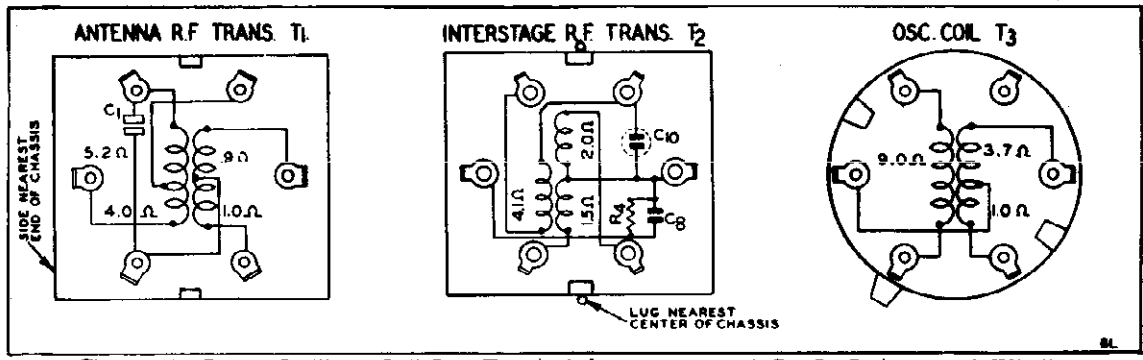
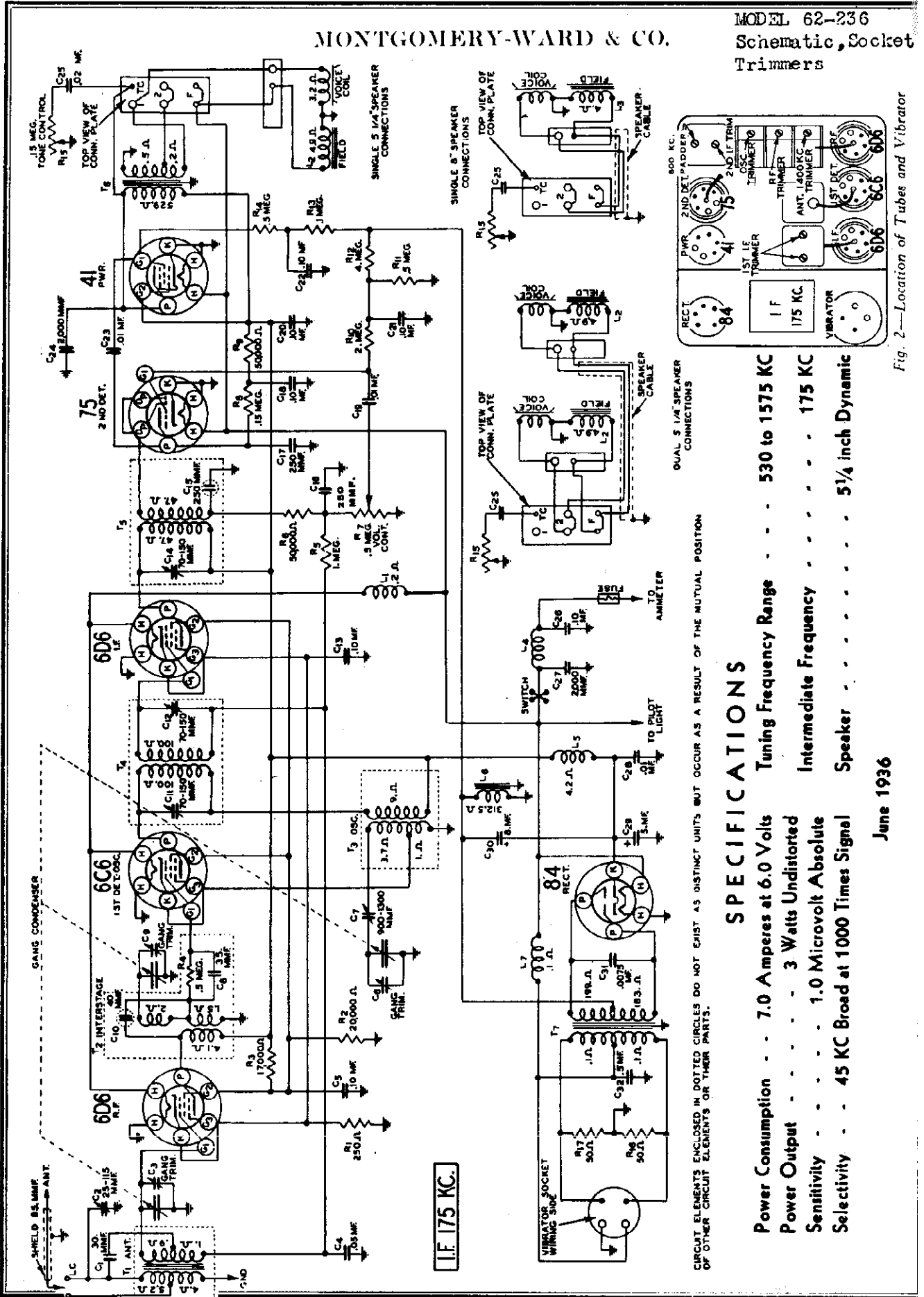


Fig. 4—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

MONTGOMERY-WARD & CO.

MODEL 62-236
Schematic, Socket
Trimmers



SPECIFICATIONS

Power Consumption	7.0 Amperes at 6.0 Volts	Tuning Frequency Range	530 to 1575 KC
Power Output	3 Watts Undistorted	Intermediate Frequency	175 KC
Sensitivity	1.0 Microvolt Absolute	Speaker	5 1/4 inch Dynamic
Selectivity	45 KC Broad at 1000 Times Signal		

CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS.

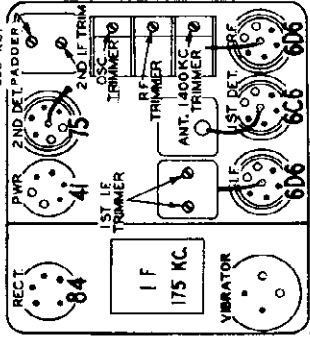


Fig. 2—Location of Tubes and Vibrator

MODEL 62-236

Alignment, Notes

MONTGOMERY-WARD & CO.

General Service Data

Roof Speaker

The Ford and General Motors 1936 automobiles have provision for mounting a speaker in the car roof (Ford 5 1/4 inch speaker, General Motors 5 1/4 or 8 inch speaker). This model is so designed that roof speaker installations in those cars can readily be made.

There are three general types of speaker installation. In the first type of installation the single 5 1/4 inch speaker attached to the chassis cover is used.

Control Head Mounting

This auto radio is supplied with a new type of control head known as the No. 4 Universal. This head in conjunction with suitable escutcheon plates and mounting brackets can be mounted in the instrument panel of practically all widely sold 1936 automobiles. In the case of 1935 and earlier cars, it can be mounted in the instrument panel, under the panel or on the steering column.

The escutcheon plate, dial crystal, special mounting brackets and knobs for the various cars are put up in kit form.

The control head, volume control fitting, flexible shafts, pilot lamp assembly, dial scale and pointer are packed with each radio.

In Fig. 6 are shown the various locations at which the control head is mounted. The head is intended for installation primarily in the instrument panel of the car. Most 1936 and many 1935 cars have a name plate or ash receiver on the instrument panel, the removal of which permits installation of the radio control head. Complete installation data is contained in the instruction booklet packed with each radio.

Alignment and Calibration

Adjust the R.F. interstage and antenna 1400 KC trimmers for maximum output.

Do not change the setting of the oscillator trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Connect the output of the signal generator through a .05 mf. condenser to the control grid of the 6D6 R.F. tube.

Turn the tuning condenser rotor until maximum output is obtained. Then turn the tuning condenser rotor back and forth, at the same time adjusting the 600 KC padder (see Fig. 2) until the peak of greatest intensity is obtained.

Re-connect the output of the signal generator to the shielded antenna lead through a 150 mmf. condenser (1500 mmf. if antenna is high capacity).

Adjust the 600 KC antenna trimmer to maximum. This trimmer is reached from the outside of the case—see Fig. 3.

Adjusting Antenna 600 KC Trimmer

After the receiver is installed and the car antenna is connected, it will be necessary to adjust the antenna trimmer. Tune in a weak signal at approximately 600 KC with the volume control about three-fourths on. Turn the adjusting screw of the antenna 600 KC trimmer up or down until maximum output is obtained. See Fig. 3 for location of this trimmer.

Calibrating the Receiver

To calibrate the receiver, tune in a station of known frequency. At the back of the control head is the calibration screw. Remove the pilot lamp assembly. Insert a fine blade screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received. The knob must be held during this adjustment.

If the control head is inaccessible it may be calibrated by setting the pointer from the front. Remove the rotor by inserting a knife blade under the lower edge. Loosen the pointer screw, set the pointer and retighten.

Misalignment of condensers generally manifests itself as broad tuning and lack of volume at portions or all of the standard wave band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide accurately calibrated signals over the standard wave band and at the intermediate frequency, and an output meter are required for indicating the effect of adjustments.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 175 KC. Connect the output of the signal generator through a .05 mf. condenser to the rotor of the R. F. interstage section of the tuning condenser. (See Fig. 2 for location of this section.)

Connect the ground lead of the signal generator to the chassis ground.

Set the volume control at the maximum position. Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

Then adjust the three I.F. trimmers until maximum output is obtained. The location of these trimmers is shown in Fig. 2.

1575 KC Adjustment

Set the signal generator for 1575 KC.

Turn the rotor of the tuning condenser to the full open position.

If a low capacity antenna is used, connect the shielded antenna lead from the chassis through a 150 mmf. condenser to the antenna post of the signal generator. (If high capacity, use 1500 mmf.)

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained—see Fig. 2 for location of this trimmer.

1400 KC Adjustment

Set the signal generator for 1400 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

In the second type of installation, a single 5 1/4 inch or 8 inch roof speaker is used. The third type of installation is the dual speaker mounting using two 5 1/4 inch speakers, one in the car roof and the other on the chassis cover. (The 8 inch and 5 1/4 inch speakers cannot be used together).

The electrical connections of the different speaker installations are shown in the schematic—Fig. 1. Complete information regarding the method of making the installations and the kits of parts required are in the installation manual packed with each radio.

Installation and Noise Suppression

The necessary information for installing this receiver and for suppression of ignition and generator noise is contained in the Installation Manual which is packed with each receiver.

Be sure that the cover is well grounded to the chassis case—clean off paint or particles of dirt which may prevent a good ground.

Voltagages at Sockets

In the voltage chart are given the voltagages at the sockets with all tubes in and the set in operating condition. The antenna should be disconnected.

The voltagages can be read with the chassis in the case, by means of an analyzer plug.

If the chassis unit is taken out of the case, all of the socket terminals can easily be reached under the circuit

Circuit

fer. AVC voltage is applied to the control grid circuits of the 6D6 R.F. and I.F. tubes. The manual volume control varies the audio voltage applied to the grid of the 75 tube.

In the output stage a 41 tube is employed. A dynamic reproducer is used. Provision is made for a single roof speaker and dual speaker (chassis and roof) connections. The electrical connections for the different speaker installations are shown in the schematic. For the single 8 inch or dual 5 1/4 inch speakers, the tapped connection of the output transformer secondary is used.

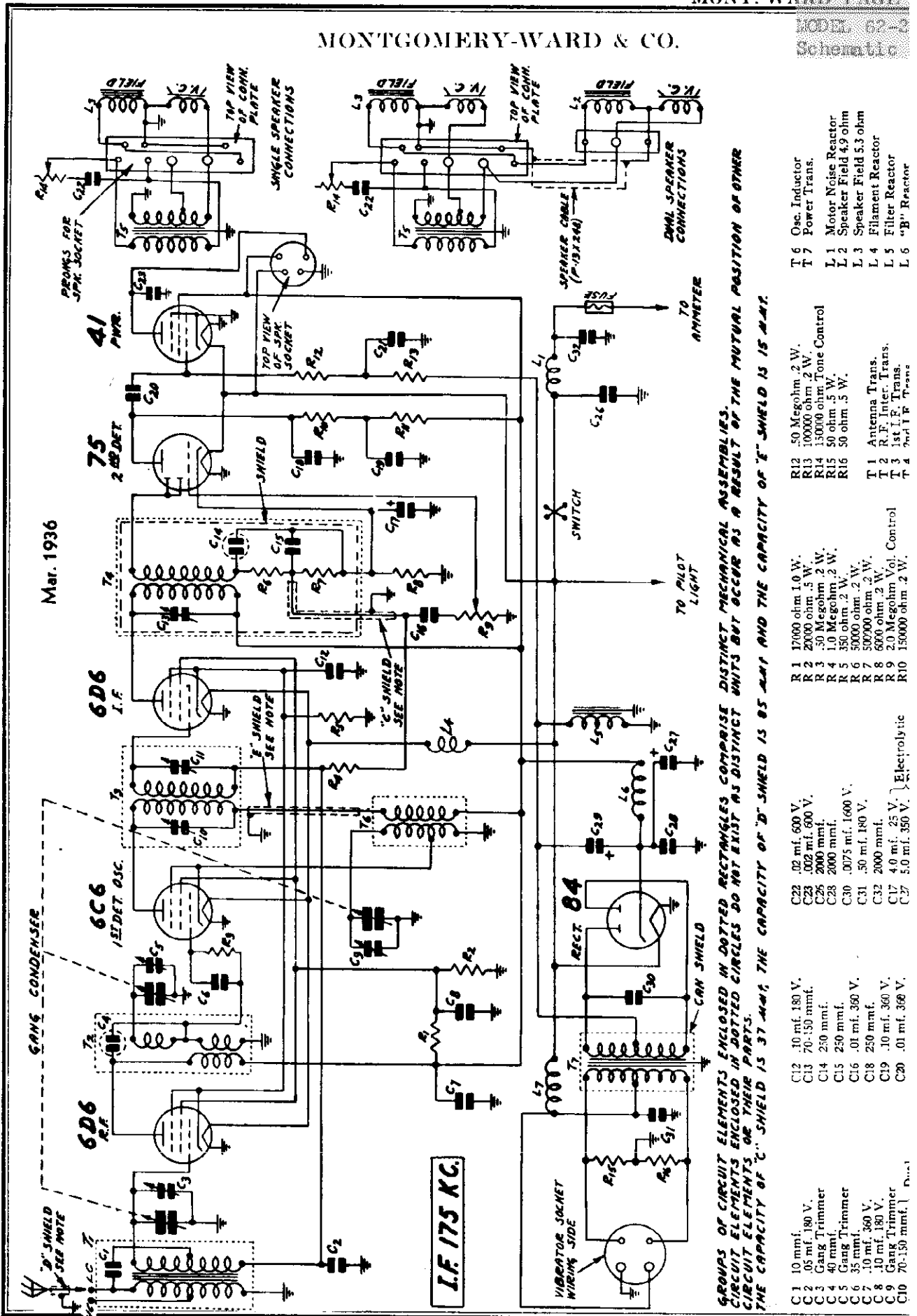
The vibrator in the power unit interrupts the current through the primary of the power transformer. The use of a vibrating interrupter in the primary circuit and a high ratio transformer results in the application of high voltage AC to the rectifier tube plates. The 84 full wave rectifier tube, filter choke and filter condensers convert this high voltage AC into high voltage DC for the plate and screen circuits.

This model is a 6 tube automobile radio covering the standard wave band. It has a tuning range as shown in the specifications above. The signal is fed through an antenna transformer with tuned secondary into a 6D6 tube which functions as an R.F. amplifier. A tapped connection is provided in the primary of the antenna transformer for installations in cars in which a high capacity antenna is used.

The output of the R.F. tube is fed through another R. F. transformer with tuned secondary into a 6C6 tube which functions as the first detector and oscillator. The oscillating circuit is tuned by the oscillator section of the gang condenser and is always resonant at a frequency 175 KC above the frequency to which the R.F. circuits are tuned.

One stage of I.F. amplification is employed using a 6D6 tube. The primary and secondary of the first I.F. transformer and the primary of the second I.F. transformer are tuned by small trimmer condensers. A 75 dual diode-triode tube functions as a diode 2nd detector, AVC tube and a one stage audio amplifier.

MONTGOMERY-WARD & CO.



Mar. 1936

I.F. 175 KC.

GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES. CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS. THE CAPACITY OF "C" SHIELD IS 37 MMF., THE CAPACITY OF "D" SHIELD IS 85 MMF. AND THE CAPACITY OF "E" SHIELD IS 15 MMF.

- | | | | | | | | |
|------|----------------------------|------|-------------------|------|------------------|-----|-----------------------|
| C 1 | 10 mmf. | C 22 | .02 mf. 600 V. | R 1 | 17000 ohm 1.0 W. | T 6 | Osc. Inductor |
| C 2 | .05 mf. 180 V. | C 23 | .002 mf. 600 V. | R 2 | 29000 ohm .5 W. | T 7 | Power Trans. |
| C 3 | Gang Trimmer | C 25 | 2000 mmf. | R 3 | .50 Megohm .2 W. | L 1 | Motor Noise Reactor |
| C 4 | 40 mmf. | C 26 | .0075 mf. 1600 V. | R 4 | 1.0 Megohm .2 W. | L 2 | Speaker Field 4.9 ohm |
| C 5 | Gang Trimmer | C 27 | 50000 ohm .2 W. | R 5 | 350 ohm .5 W. | L 3 | Speaker Field 5.3 ohm |
| C 6 | 35 mmf. | C 28 | 2000 mmf. | R 6 | 50000 ohm .2 W. | L 4 | Filament Reactor |
| C 7 | .10 mf. 360 V. | C 29 | .01 mf. 180 V. | R 7 | 50000 ohm .2 W. | L 5 | Filament Reactor |
| C 8 | .10 mf. 180 V. | C 30 | .0075 mf. 1600 V. | R 8 | 6000 ohm .2 W. | L 6 | "B" Reactor |
| C 9 | Gang Trimmer | C 31 | .50 mf. 180 V. | R 9 | 6000 ohm .2 W. | | |
| C 10 | 70-150 mmf. \| Electrolytic | C 32 | 2000 mmf. | R 10 | 150000 ohm .2 W. | | |
| | | C 33 | 4.0 mf. 25 V. | | | | |
| | | C 34 | 5.0 mf. 350 V. | | | | |
| | | | | | | | |

MODEL 62-242
Resistance, Coils
Voltage, Socket, Trimmers

MONTGOMERY-WARD & CO.

Power Consumption - - 7.0 Amperes at 6.0 Volts
Power Output - - - - 3 Watts Undistorted
Sensitivity - - - - - 1.0 Microvolt Absolute
Selectivity - - 45 KC Broad at 1000 Times Signal

Tuning Frequency Range - - - 530 to 1650 KC
Intermediate Frequency - - - - 175 KC
Speaker - - - - - 6 inch Dynamic

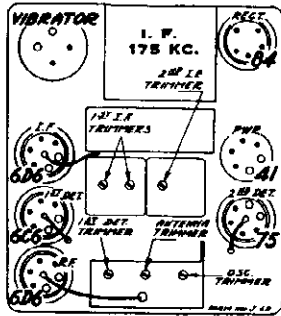


Fig. 2—Location of Tubes and Trimmers

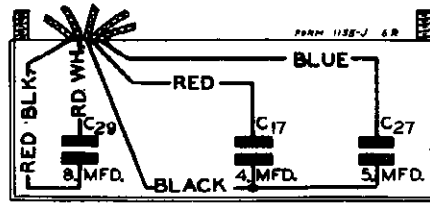


Fig. 4—Condenser Block—Internal Wiring

6 Tube Automobile Radio

VOLTAGES AT SOCKETS Antenna Disconnected Battery 6 Volts Under Load

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground	M. A.
6D6	R. F. Amp.	5.6	245	105	5.2	7.5
6C6	1st Det. Osc.	5.6	245	105	0	2.9
6D6	I. F. Amp.	5.6	245	105	5.2	7.5
75	2nd Det.	5.8	120(1)	1.4	1.4	0.14
41	Power	5.8	235	245	15.0(2)	30.0
84	Rectifier	5.8				52.0

(1) With 250,000 Ohm Meter
(2) Read Across Filter Choke

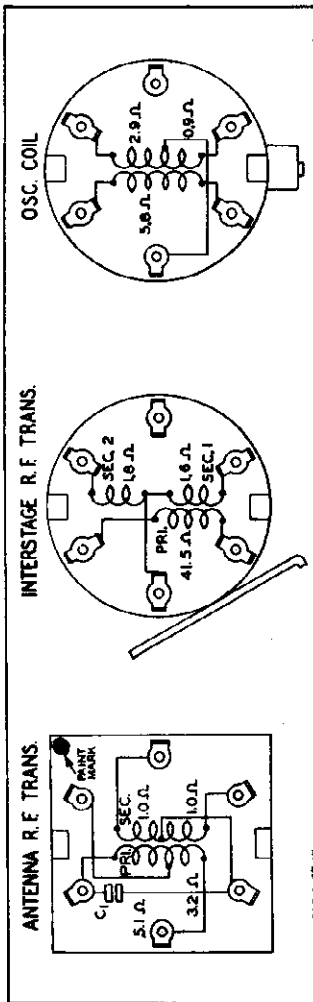


Fig. 3—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Code	Winding	D. C. Resistance in Ohms
T1	Antenna Transformer	
	Primary Winding	416.6
	Long Portion	Small
	Short Portion	5.3
	Secondary	Small
T2	Interstage Transformer	
	Primary Winding	2.9
	Long Portion	0.9
	Short Portion	5.8
	Plate Coil	
	Speaker Field	
	Speaker Voice Coil	
	Oscillator Coils	
	Grid Coil	
	Power Transformer	
	Primary Winding	Small
	Center Tap to Inside	Small
	Center Tap to Outside	200.0
	Secondary Winding	200.0
	Center Tap to Inside	
	Center Tap to Outside	
	Motor Noise Reactor	
	Filament Reactor	2.2
	L5 Filter Choke	300.0
	R. F. "B" Plate Reactor	4.0
	Vibrator Filter Reactor	Small
T3	1st I. F. Transformer	
	Primary Winding	88.0
	Secondary Winding	8.0
T4	2nd I. F. Transformer	
	Primary Winding	45.0
	Secondary Winding	48.2

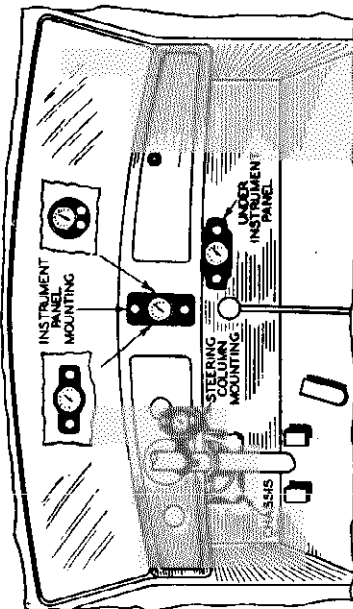


Fig. 5—Various Control Head Mountings

MONTGOMERY-WARD & CO.

Instrument Panel Mounting Kits						
Car	Year & Model	Panel Kit No.	Car	Year & Model	Panel Kit No.	
Buick	1936	21A16	Ford	1936 Standard & DeLuxe	21A10	
	1936	21A39		1935 DeLuxe Standard	21A32	
Cadillac	1936-35 Standard & Master	21A11			1934	21A38
	1936 Six	21A19			1936	21A17
Chevrolet	1936 Eight	21A30	1935	21A48		
	1936 Airflow	21A31	1934	21A35		
	1935-34 Except Imperial	21A47	Lafayette	1936-35	21A36	
	Airflow & Airstream Custom	21A22		LaSalle	1936	21A40
Chrysler	Airstream DeLuxe	21A26	Lincoln	Zephyr 1936	21A10	
	1935 DeLuxe	21A46	Nash	1936-35	21A36	
	1934	21A47	Oldsmobile	1936	21A14	
1936 DeLuxe	21A13	1935		21A34		
DeSoto	1935 DeLuxe	21A46	Packard	1936 120-B	21A21	
	1934	21A47		1935 120	21A41	
	1936 DeLuxe	21A45				
Dodge	1935	21A45				
	1934	21A49				

The mounting kit includes escutcheon plate, dial crystal, knobs, special mounting brackets and small items such as screws. The other items are shipped with the radio.

General Service Data

Installation and Noise Suppression

The necessary information for installing this receiver and for suppression of ignition and generator noise is contained in the Installation Manual which is packed with each receiver. Two additional items regarding reduction of noise can be mentioned as follows:

Be sure that the cover is well grounded to the chassis case—clean off paint or particles of dirt which may prevent a good ground.

In extreme cases of motor noise it is advisable to open the distributor rotor arm that is, increase the length of the arm by using a small machine's hammer. This will lessen the gap between the rotor arm and the stationary contacts, reducing the spark. Be sure, after peening the arm, that it does not strike the stationary contacts.

Voltagas at Sockets

In the voltage chart are given the voltages at the sockets with all fuses in and the set in operating condition. The antenna should be disconnected.

The voltages can be read with the chassis in the case, by means of an analyzer plug.

If the chassis unit is taken out of the case, all of the socket terminals can easily be reached under the chassis with test probe.

Control Head Mounting

This auto radio is supplied with a new type of control head known as the No. 4 Universal. This head in conjunction with suitable escutcheon plates and mounting brackets can be mounted in the instrument panel of practically all widely sold 1936 automobiles. In the case of 1935 and earlier cars, it can be mounted in the instrument panel under the panel or on the steering column.

The escutcheon plate, dial crystal, special mounting brackets and knobs for the various cars are put up in kit form.

The control head, volume control fitting, flexible shafts, pilot lamp assembly, dial scale and pointer are packed with each radio.

In Fig. 5 are shown the various locations at which the control head is mounted. The head is intended for installation primarily in the instrument panel of the car. Most 1936 and many 1935 cars have a name plate or ash receiver on the instrument panel, the removal of which permits installation of the radio control head. Complete installation data is contained in the instruction booklet packed with each radio.

Circuit

A 75 dual diode-tube functions as a diode 2nd detector, AVC tube and a one stage audio amplifier. AVC voltage is applied to the control grid circuit of the 6D6 R.F. and I.F. tubes. The manual volume control varies the audio voltage applied to the grid of the 75 tube.

In the output stage a 41 tube is employed. A dynamic reproducer is used.

The vibrator in the power unit interrupts the current through the primary of the power transformer. The use of a vibrating interrupter in the primary circuit and a high ratio transformer results in the application of high voltage AC to the rectifier tube plates. The 84 full wave rectifier tube, filter choke and filter condensers convert this high voltage AC into high voltage DC for the plate and screen circuits.

Alignment and Calibration

mmf. condenser to the antenna post of the signal generator. (If high capacity, use 1700 mmf.)

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained—see Fig. 2 for location of this trimmer.

1400 KC Adjustment

Set the signal generator for 1400 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st detector and antenna trimmer for maximum output. Do not change the setting of the oscillator trimmer.

Adjusting Antenna Trimmer

After the receiver is installed and the car antenna is connected it will be necessary to adjust the antenna trimmer. Tune in a weak signal between 1200 and 1400 KC with the volume control about three-fourths on. Remove the cover of the chassis case. The antenna trimmer is on the center tuning condenser section—see Fig. 2. Turn the adjusting screw of this condenser up or down until maximum output is obtained. CAUTION—Do not turn any of the other trimmer adjusting screws for this adjustment.

Calibrating the Receiver

To calibrate the receiver, tune in a station of known frequency. At the back of the control head is the calibration screw. Remove the pilot lamp assembly. Insert a fine blade screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received. The knob must be held during this adjustment.

If the control head is inaccessible it may be calibrated by setting the pointer from the front. Remove the crystal by inserting a knife blade under the lower edge. Loosen the pointer screw, set the pointer and retighten.

This model is a 6 tube automobile receiver covering the standard wave band. It has a tuning range as shown in the specifications above. The signal is fed through an antenna transformer with tuned secondary into a 6D6 tube which functions as an R.F. amplifier. The output of this tube is fed through another R.F. transformer with tuned secondary into a 6C6 tube which functions as the first detector and oscillator. The oscillating circuit is tuned by the oscillator section of the gang condenser and is always resonant at a frequency 175 KC above the frequency to which the R.F. circuits are tuned.

One stage of I.F. amplification is employed using a 6D6 tube. The primary and secondary of the first I.F. transformer and the primary of the second I.F. transformer are tuned by small trimmer condensers.

Misalignment or mistuning of condensers generally manifests itself as broad tuning and lack of volume at portions or all of the standard wave band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide accurately calibrated signals over the standard wave band and at the intermediate frequency, and an output meter are required for indicating the effect of adjustments.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

1. F. Adjustment

Set the signal generator for a signal of 175 KC. Connect the antenna lead of the signal generator thru a .05 mf. condenser to the stator of the 1st detector section of the tuning condenser. (See Fig. 2 for location of this section.) This can be done by pushing a wire or conductor between the stator plates or by extending an insulated wire thru the hole in the shield over the stator and pushing the wire thru the hole in the lug which extends up from the insulated stator assembly.

Connect the ground lead of the signal generator to the chassis ground. Short out the oscillator section of the tuning condenser.

Set the volume control at the maximum position. Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

Then adjust the three I.F. trimmers until maximum output is obtained. The location of these trimmers is shown in Fig. 2.

1650 KC Adjustment

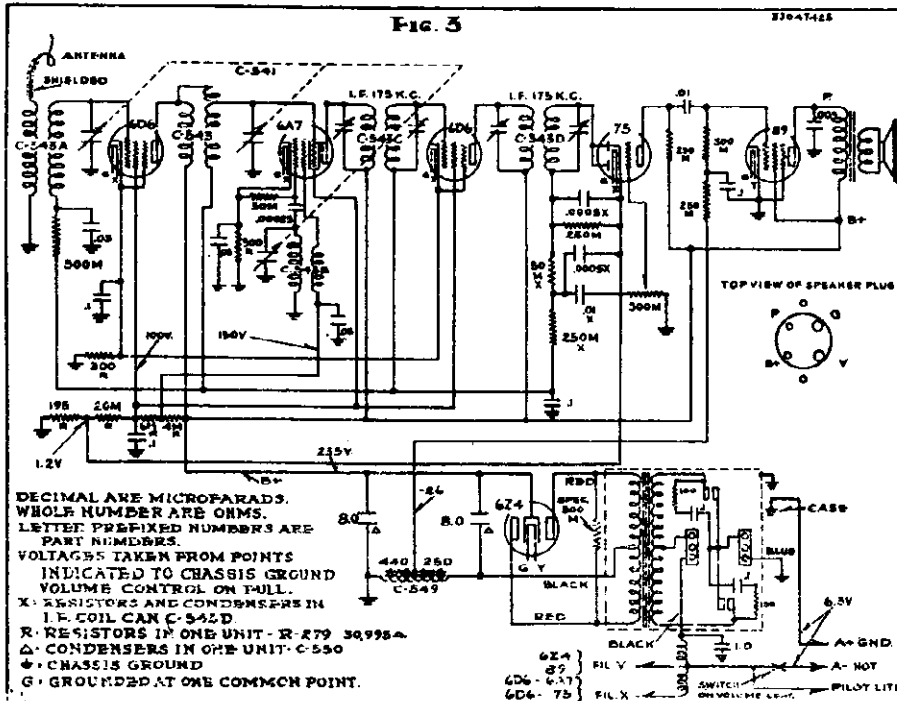
Set the signal generator for 1650 KC.

Turn the rotor of the tuning condenser to the full open position.

If a low capacity antenna is used connect the shielded antenna lead from the chassis through a 150

MODEL 62-130
Schematic, Voltage
Socket, Trimmers
Parts

MONTGOMERY-WARD & CO.

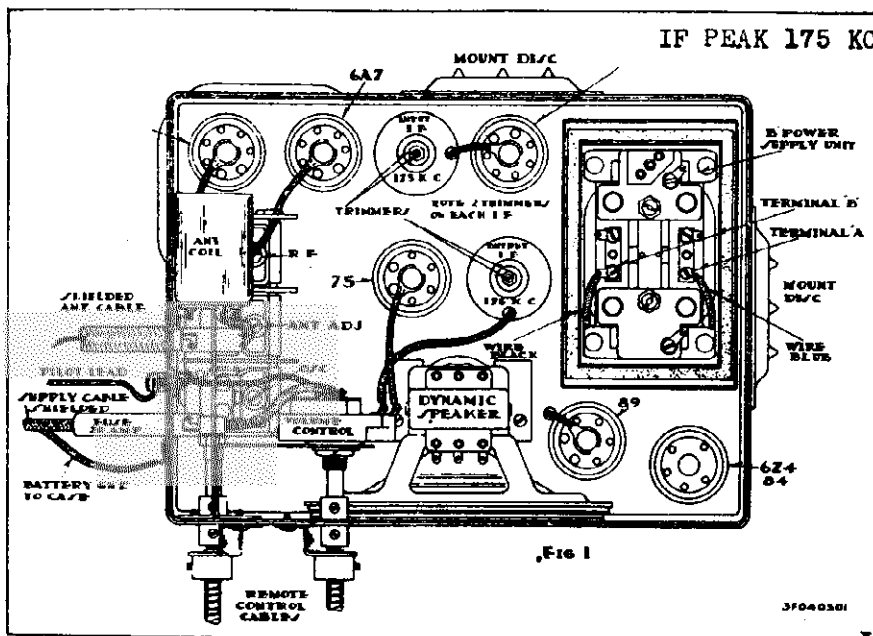


**SCHEMATIC CIRCUIT
DIAGRAM**

See instructions for serial notes etc.

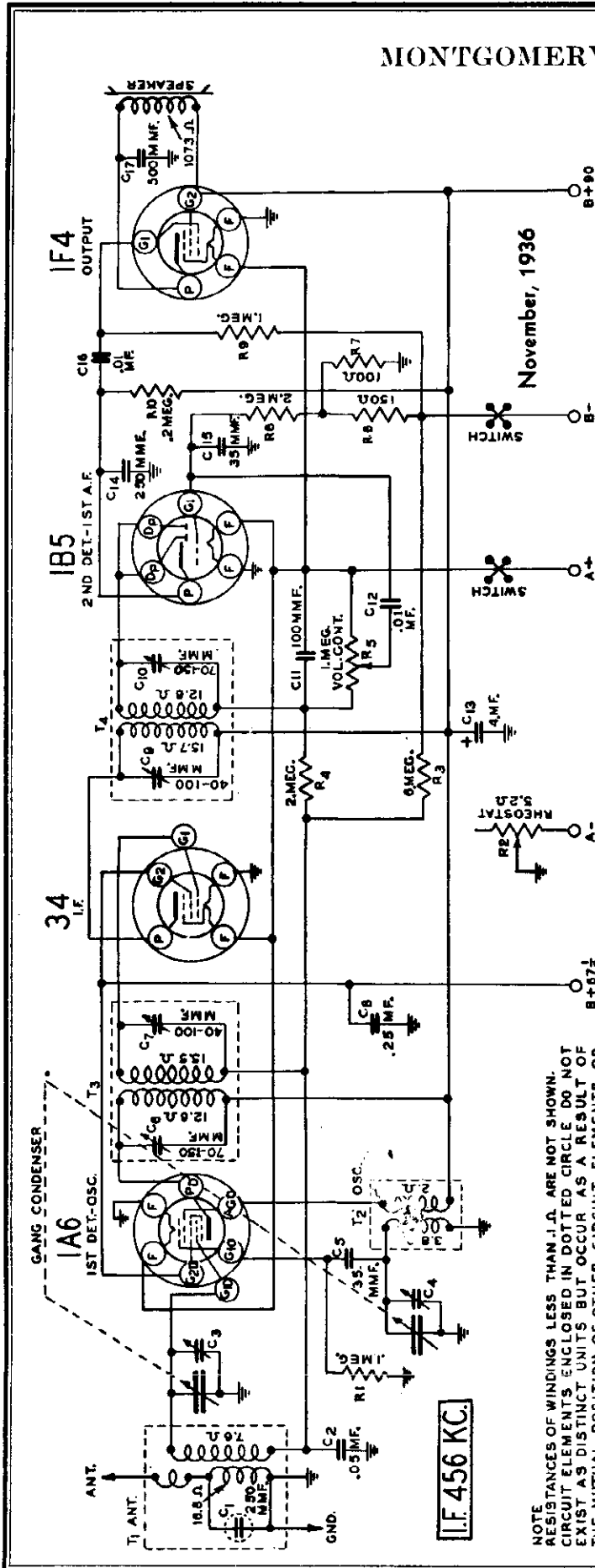
PARTS LIST

Part No.	Description	List Price Each
A 660	Battery Cable—Plug Type	1.75
B 104	Cable Shaft Brackets	.35
B 660	Antenna Cable—Plug Type	.80
C 106	Shaft Couplings	.35
C 117	"A" Choke—Small	.25
C 118	"A" Choke—Large	.35
C 144	Dual .1-200 Volt Con- denser	.35
C 152	.00025 Mica Condenser	.20
C 155	.0005 Mica Condenser	.20
C 522	.01-400 Volt Condensers	.25
C 531A	Dual .05 Condenser	.30
C 535	Dual .1-200 Volt Con- denser	.35
C 541B	3 Gang Condenser	3.75
C 543	R.F. Coil	.20
C 543A	Antenna Coil	.80
C 543B	Oscillator Coil	.70
C 543C	Input I.F. Transformer	1.25
C 543D	Output I.F. Transformer with Parts	2.50
C 547	.1-200 Volt Condenser	.30
C 549	690 Ohm Choke	1.40
C 550	8-8 Mfd. Electrolytic Condenser	2.25
C 551	1 Mfd.—120 Volt Con- denser	.35
C 553	.05-200 Volt Condenser	.25
C 554	.5 Mfd. Generator Con- denser	.50
R 232A	Special 500M Ohm Resistor Identified with 2 Yellow Dots	.35
R 279	30,995 Ohm Resistor	.60
R 281	100 Ohm Resistor	.20
S 338	18" Volume Control Shaft	1.25
S 339	18" Selector Control Shaft	1.25
S 338S	Special 24" Volume Con- trol Shaft	1.50
S 339S	Special 24" Selector Con- trol Shaft	1.50
V 660	Complete "B" Unit—OAK	6.00
V 603	Volume Control	1.50
660	Remote Control Head Com- plete Less Shafts	5.00
	20 Ampere Fuses	.10
	Mounting Bolts	.10
	All carbon resistors	.20
	All sockets	.20
	Dynamic speakers	5.00



MONTGOMERY-WARD & CO.

MODEL 62-254
Schematic, Voltages
Socket, Trimmers



- TUBE ELEMENT LEGEND**
- F - FILAMENT
 - P - PLATE
 - Pd - PLATE DETECTOR
 - Dp - DIODE PLATE
 - G₁ - CONTROL GRID
 - G₁₀ - CONTROL GRID OSCILLATOR
 - G₁₀ - CONTROL GRID DETECTOR
 - G₂ - SCREEN GRID
 - G₂₀ - SCREEN GRID DETECTOR
 - AG₀ - ANODE GRID OSCILLATOR

VOLTAGES AT SOCKETS
Antenna Shorted to Ground
"A" Battery - 2 Volts

Type of Tube	Function	Across Filament	Plates to Ground	Screen to Ground	Grid to Ground
1A6	1st Det.-Osc.	2.0	87 (1)	64.5	
34	I.F.	2.0	87	64.5	
1B5	2nd Det.-1st Audio	2.0	42 (2)		1.2 (3)
1F4	Power	2.0	82	87	3.0 (4)

- (1) Anode Grid (AG₀) to ground
- (2) As read on 250 volt scale (1000 ohm per volt meter)
- (3) As read across R7
- (4) As read across R5 and R7

Fig. 2—Schematic Circuit Diagram

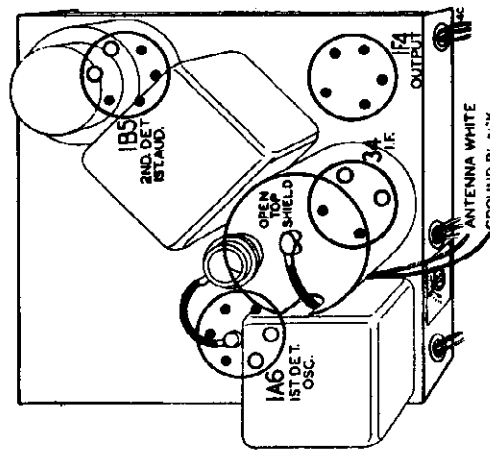


Fig. 6—Tube Arrangement

NOTE
RESISTANCES OF WINDINGS LESS THAN 1.0 Ω ARE NOT SHOWN.
CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLE DO NOT
EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF
THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR
THEIR PARTS.

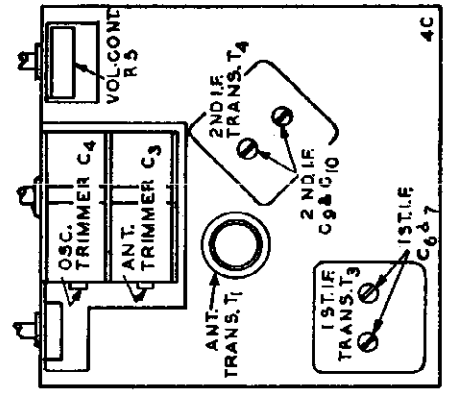
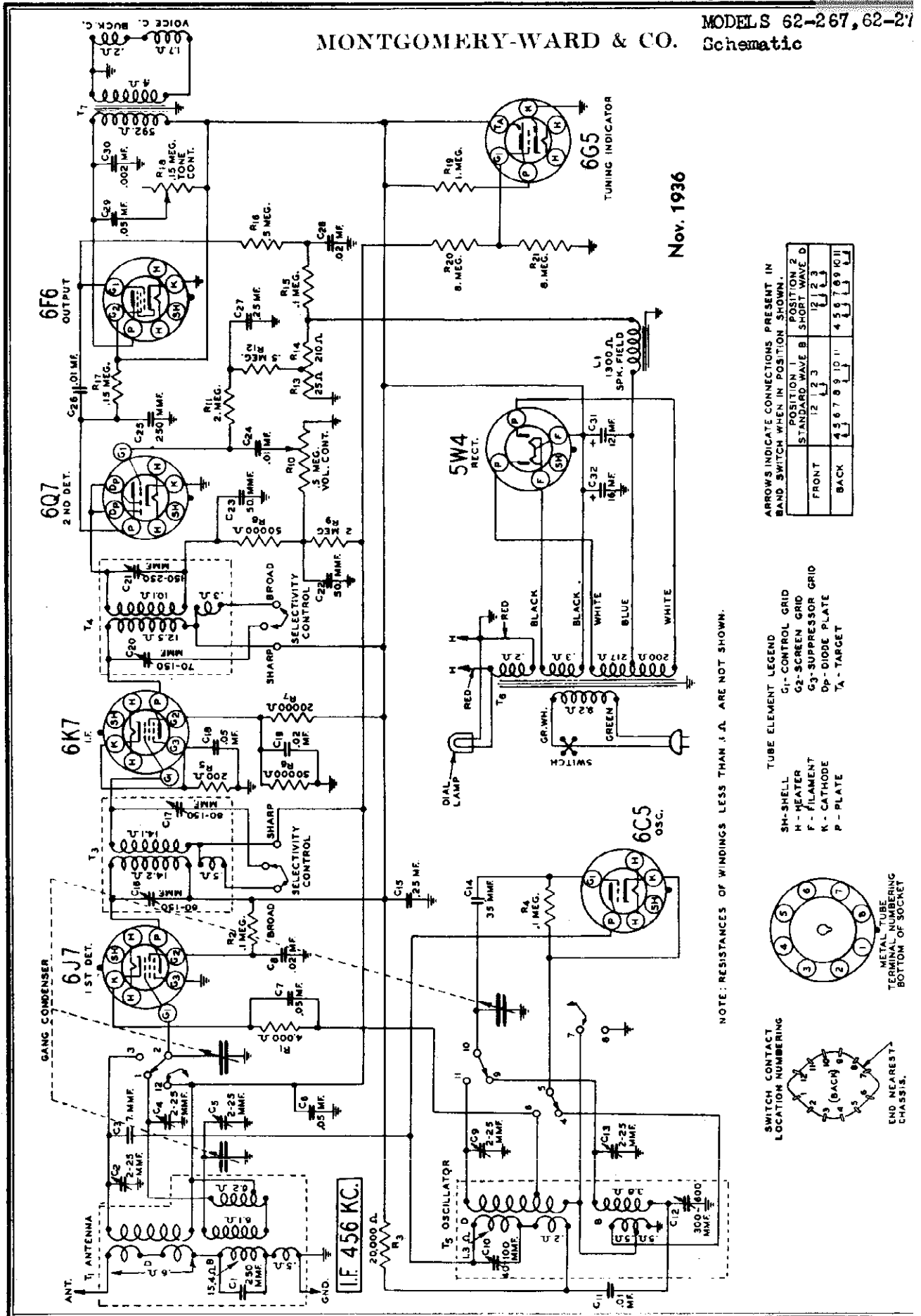


Fig. 5—Location of Trimmers

MONTGOMERY-WARD & CO. Schematic

MODEL S 62-267, 62-27

Nov. 1936

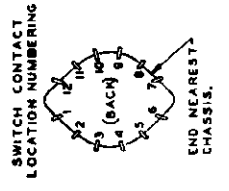
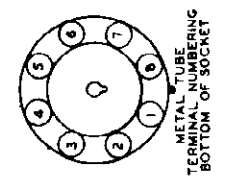


ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

	POSITION 1	POSITION 2
STANDARD WAVE	B	D
FRONT	1 2 3	1 2 3
BACK	4 5 6 7 8 9 10 11	4 5 6 7 8 9 10 11

TUBE ELEMENT LEGEND

SH-SHELL	G1-CONTROL GRID
H-HEATER	G2-SCREEN GRID
F-FILAMENT	G3-SUPPRESSOR GRID
K-CATHODE	Dp-DIODE PLATE
P-PLATE	Ta-TARGET



MODELS 62-267, 62-277

Trimmers, Socket
Voltage, Coils

MONTGOMERY-WARD & CO.

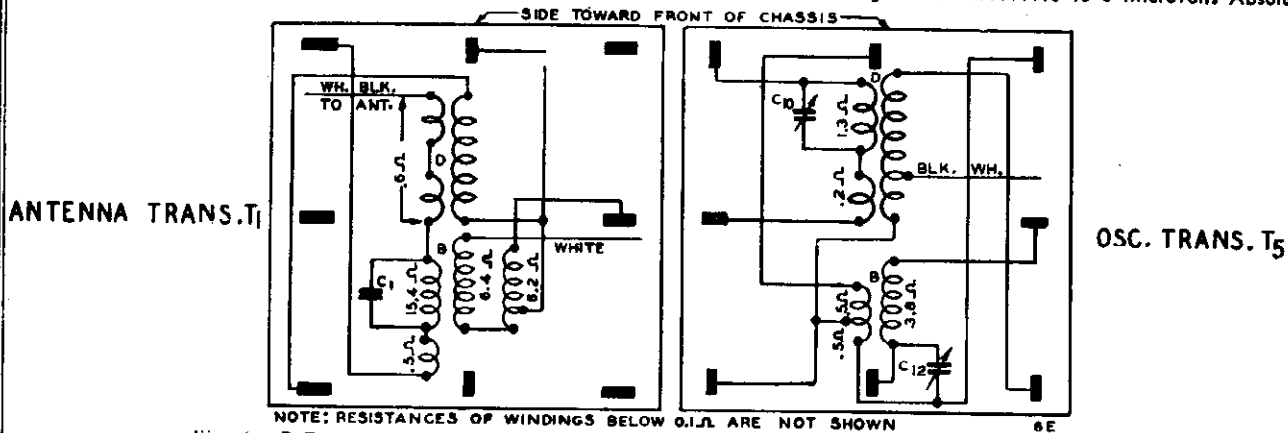
Power Consumption - 60 Watts (At 115 volts 60 cycles)
Power Output - - - - - 2.5 Watts Undistorted
Selectivity - 30 KC Broad at 1000 times Signal (Sharp)
Intermediate Frequency - - - - - 456 KC
Speaker - - - - - 8" Dynamic

Tuning Frequency Range

B Range..... 528 to 1730 KC
D Range..... 5750 to 18300 KC

Sensitivity

B Range..... 4 to 5 Microvolts Absolute
D Range..... 5 to 6 Microvolts Absolute



NOTE: RESISTANCES OF WINDINGS BELOW 0.1 Ω ARE NOT SHOWN
Fig. 6 - R.F. and Oscillator Coil Base Terminal Arrangement and D.C. Resistance of Windings.

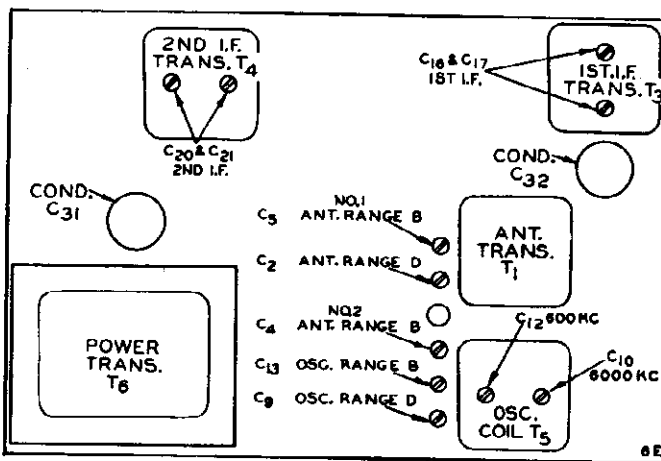


Fig. 3 - Location of Trimmers

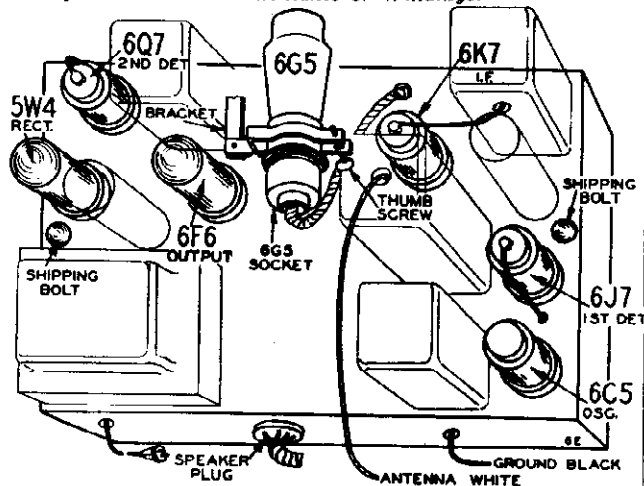


Fig. 5 - Location of Tubes

Line Voltage: 115

Volume Control: Maximum

VOLTAGES AT SOCKETS

Antenna Shorted to Ground
Position of Band Switch: Standard Wave

TUBE	FUNCTION	VOLTAGE BETWEEN SOCKET PRONGS AND GROUND (Unless otherwise indicated)							
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
6J7	1st Det.	0	6.1(1)	220	130	0		6.1(1)	9
6C5	Osc.	0	6.1(1)	140		0		6.1(1)	0
6K7	I.F.	0	6.1(1)	220	125	2.1		6.1(1)	2.1
6Q7	1st A.F.-2nd Det.	0	6.1(1)	110	0	0		6.1(1)	0(2)
6F6	Power	0	6.1(1)	200	220	12(3)		6.1(1)	0
5W4	Rectifier	0	4.9(4)		615(5)		615(5)		4.9(4)
6G5	Tuning Indicator	Plate to Ground 20		Target to Ground 220		Cathode to Ground 0		Across Heater 6.1	

(1) A. C. voltage as read across heater terminals 2 and 7.
(2) Bias (1.3 volts) as read across resistor R13.
(3) Bias voltage as read across resistor R13 and R14.

(4) A.C. voltage as read across filament terminals 2 and 8.
(5) A.C. voltage as read across terminals 4 and 6.

MONTGOMERY-WARD & CO.

Alignment
Circuit Data

Circuit

This model is a two band radio with a tuning range in each band as shown in the specifications above. Two band coverage is accomplished by means of two sets of R.F. and oscillator coils and a single section double throw switch.

Referring to the schematic circuit diagram, Fig. 2, T1 and T2 are the antenna transformer and oscillator coil assemblies. The standard wave and short wave coils are indicated by the letters B and D respectively.

The band switch completes connections to the coils in use. When it is in the Range B position, a double tuned antenna R.F. stage is used while for the D Range, a single tuned secondary is used. A type 6J7 tube functions as the 1st detector.

A separate type 6C5 tube is employed in the oscillator circuit. The oscillating circuit is always resonant at 456 KC above the frequency to which the R.F. amplifier is tuned.

The oscillator potential is fed into the cathode circuit of the 6J7 1st detector tube. As a result of the heating of the two frequencies, the intermediate or beat frequency of 456 KC is present in the plate circuit of this tube.

One stage of I.F. amplification is employed using a 6K7 tube. The primaries and secondaries of the first and second I.F. transformers are tuned by small trimmer condensers.

Referring to the 1st and 2nd I.F. transformers, T3 and T4, in Fig. 2, it will be noted that there is a coupling winding shown below the primary of T3 and below the secondary of T4.

When the selectivity control is in the sharp position, the coupling windings are open circuited and the loose coupling which exists between the primary and secondary of these transformers results in high selectivity.

When the selectivity control is in the broad position, the coupling winding which is wound under the primary in the case of T3 is connected in series with the secondary. In the case of T4, the coupling winding which is wound under the secondary is in series with the primary. This provides overcoupling which results in a greatly widened resonance curve. Passage of a wide range of audio frequencies is thus obtained.

A type 6Q7 duo-diode triode tube functions as the 2nd detector and a one stage amplifier. AVC voltage is applied through isolating resistors to the control grid circuits of the 1st detector and I.F. tubes. The audio voltage developed across volume control resistor R10 is applied through the movable arm to the control grid of the 6Q7 tube.

Resistance coupling is used between the first audio stage and the output stage which employs a type 6F6 output pentode tube. A type 1W4 full wave rectifier is used in the power unit.

The 6C5 tuning indicator tube is wired as shown in the schematic. The action of this tube is described in other service manuals as well as in current literature and will not be repeated here.

slowly back and forth until the peak of greatest intensity is obtained.

Do not change the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC trimmer (C10) until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Trimmer Replacement

If one trimmer of the gang trimmer strip should become defective, it is not necessary to replace the entire strip. A single trimmer 17A36, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (side not grounded) of the defective trimmer in the strip. This connection is then made to the single trimmer. Connect it to the side of the trimmer not in contact with the adjusting screw.

The other side of the single trimmer is then connected to a good ground, using a piece of heavy wire in order to support the trimmer adequately. In replacing a trimmer, be sure to keep both leads as short as possible and keep the ungrounded lead as far from ground as possible.

Twenty-five Cycle Radios

The twenty-five cycle model differs from the sixty cycle model only in the fact that a different power transformer is used. The correct power transformer is shown in the parts list.

The twenty-five cycle receiver can be operated satisfactorily from a sixty cycle power supply. However, the reverse is not true, the sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

A 115-230 volt, 40 to 60 cycle as well as other power transformers with special power ratings are also available for this model.

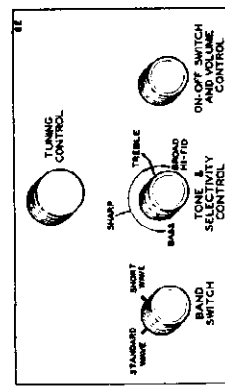


Fig. 1—Arrangement of Controls

Alignment and Calibration

Correct alignment is extremely important in connection with standard and short wave radios. The receivers are all properly aligned at the factory with precision instruments and re-alignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator which will provide an accurately calibrated signal at 456, 1730, 1500, 600, 18,300, 15,000 and 6000 KC and an output indicating meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 456 KC.

Connect the output of the signal generator through a .1 mf. condenser to the grid of the 1st detector.

Connect the ground lead of the radio to the ground post of the signal generator.

Turn the band switch to the Range B position (standard wave band).

Turn the selectivity control to the sharp position and keep it in this position for all adjustments.

Turn the volume control to the maximum position. Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

Then adjust the four I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 3.

Range B Alignment

After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

1730 KC Adjustment

Set the signal generator for 1730 KC.

Turn the rotor of the tuning condenser to the full open position.

Keep the band switch in the standard wave position.

Connect the antenna lead of the radio through a 200 mmf. condenser to the output of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the oscillator Range B trimmer (C13) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

1500 KC Adjustment

Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Loosen the two screws inside of the film drum at the bottom which hold the drum in place. Set the drum at the 1500 KC mark and retighten the screws. Adjust the antenna Range B trimmers (C4) and (C5) to maximum.

Do not change the setting of the oscillator Range B trimmer.

Turn the band switch to the Range D position (short wave band).

Adjust the oscillator Range D trimmer (C9) until maximum output is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the antenna Range D trimmer (C3) to maximum.

When adjusting this trimmer, it will be necessary at the same time to turn the tuning condenser rotor.

600 KC Adjustment

Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer (C17) until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range D Alignment

CAUTION—When aligning the short wave band can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC. It may be necessary to increase the input signal to hear the image.

18,300 KC Adjustment

Set the signal generator for 18,300 KC.

Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

MODELS 62-267, 62-277
 Movie Dial Data

MONTGOMERY-WARD & CO.



Fig. 7—Effect of Lens Focus

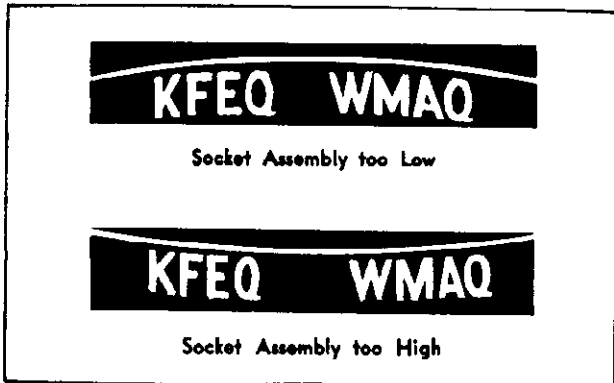


Fig. 8—Effect of Lamp Socket Assembly Height

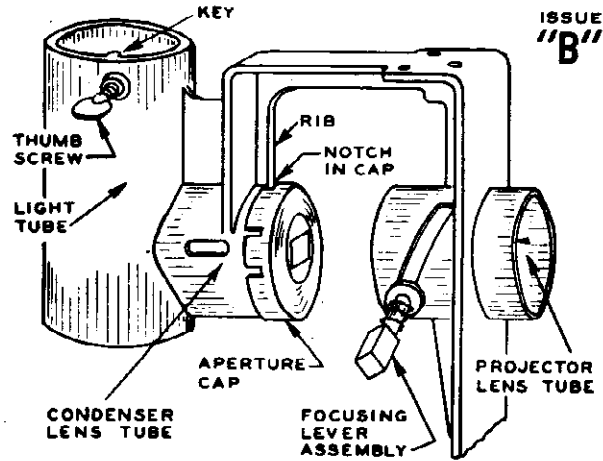


Fig. 10—Issue "B" Lens and Light Bracket

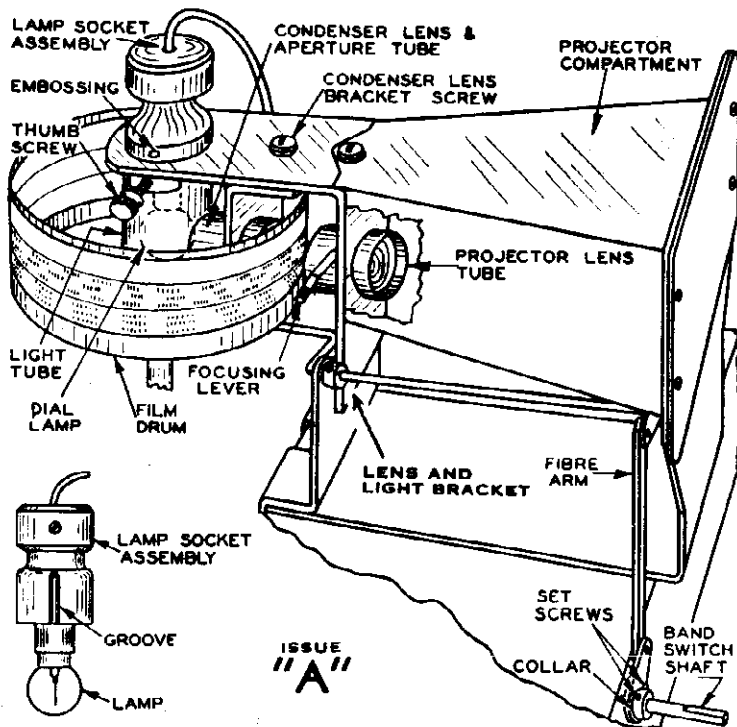


Fig. 9—Details of Movie Dial

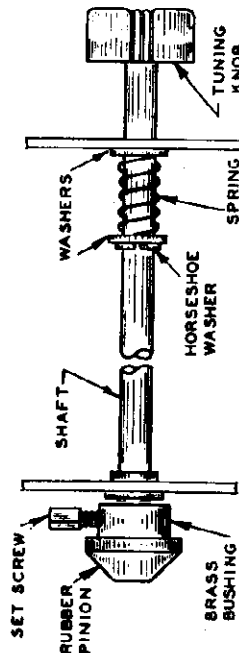


Fig. 11—Drive Shaft Assembly

FOR ADDITIONAL DATA ON MOVIE DIAL, SEE INDEX

MONTGOMERY-WARD & CO. Movie Dial Adjustment and Replacement Data

Movie Dial Adjustments and Replacements

Issue Letter of Radio

The issue letter is the large letter appearing on the under side of the chassis which identifies the chassis as to major part changes. There are two distinct types of chassis known as Issue A and Issue B. The adjustments, as described in the following paragraphs, cover both issues unless otherwise specified.

A chassis bearing the issue letter "A" may be further identified by the die stamped Light and Projector Lens Bracket and the separate die stamped Condenser Lens and Aperture Bracket. See Fig. 9.

The chassis bearing the issue letter "B" may be further identified by a die cast combination Lens, Light and Aperture Bracket. See Fig. 10.

Bringing Lens Adjustment to a Focus

Important—Turn the band switch to the standard wave position.

Move the focusing lever (see Fig. 9) up or down until the image on the screen is clearest. In Fig. 7 is shown the effect of correct and incorrect focusing.

Replacing and Positioning the Dial Lamp

Caution—If a new lamp is required, use only a G. E. lamp, Ward's catalogue No. 61P8204. Get this from your nearest Ward store or Ward Mail Order House.

First, turn the radio off.

Loosen the thumb screw and lift the lamp socket assembly out of the light tube—see Fig. 9. This can be lifted vertically by grasping the insulated top of the assembly through which the wire runs.

Remove the old lamp from the socket and put in the new one.

Replace the lamp socket assembly in the light tube with the light tube embossing in the groove of the lamp socket assembly—see Fig. 9. Do not tighten the thumb screw yet.

Turn the radio on.

Then grasp the top of the lamp socket assembly and move it up or down until the image on the screen is clearest and the lines are horizontal. The effect of having the lamp assembly too high or low is shown in Fig. 8. Tighten the thumb screw.

Dial Calibration

The radio is properly calibrated if, when a station is correctly tuned in, the vertical red line on the screen crosses the call letters of that station. If the

compartment up and away from the chassis. Remove the screw from the bottom of the lens and light bracket and take out this bracket, being careful not to scratch the film.

Issue A—Remove the condenser lens bracket from the lens and light bracket—see Fig. 9. The lens can then be cleaned without removal, or it may be forced out of the tube with a wood block. After the lens has been cleaned, reinsert it in the lens tube until the end of the lens barrel is about $\frac{1}{8}$ inch inside the tube.

Issue B—Remove the aperture cap—see Fig. 10. Insert a fine blade screw driver into the slot and then push the condenser lens away from the light tube until it is possible to remove the lens. Clean the lens carefully. Replace the lens so that the lens barrel projects about $\frac{1}{32}$ inch beyond the lens tube. Replace the aperture cap so that the square notch of the aperture cap fits over the square rib as illustrated.

Removing Projector Lens—Remove the projector compartment and lens and light bracket as explained in the first paragraph of the article "Removing Condenser Lens."

The projector lens may then be removed by first unscrewing the focusing lever assembly (Issue A radios have focusing lever only). Then push the lens barrel out of the projector lens tube. Clean the lens carefully. Replace the lens barrel so that the threaded hole will coincide with the slot opening of the bracket. Replace the focusing lever assembly.

Reassembling—Replace the lens and light bracket taking care not to scratch the inside of the film.

Replace the projector compartment, glass screen and dial lamp assembly.

When replacing the glass screen, the glass is put on with the frosted side toward the inside of the assembly.

Refocus the projector lens.

Cleaning the Film and Glass Screen

As in the case of the lenses, it is very seldom necessary to clean the film or glass screen. If, however, the image on the screen is spotted or foggy, it may be necessary to clean these items as explained below.

Film—The film may be dusted with a camel hair brush or fine cloth. **CAUTION**—Extreme care must be taken not to scratch the film.

Glass Screen—If the screen should become dirty, the front may be cleaned by wiping with a clean, dry cloth. If the back of the screen becomes dirty, it should be cleaned with alcohol. Care should be taken not to get any alcohol on the red line at the front of the screen.

Replacing the Film Drum Assembly

Remove the lamp socket assembly from the light tube by lifting it out in accordance with instructions in "Replacing and Positioning the Dial Lamp."

Remove the glass screen, projector compartment and lens and light bracket as described in the article "Removing Condenser Lens."

Remove the film drum assembly by unscrewing the two small screws located inside the drum at the bottom.

Mount the new film drum assembly on the film drum supports leaving the paper around the film for protection, and insert the clamping plate within the film drum. The film drum and clamping plate should then be so placed that the small screws are in the center of the two slots.

Replace the lens and light bracket taking care not to scratch the inside of the film.

Replace the projector compartment, glass screen and dial lamp assembly.

Now remove the paper from the film, turn the radio on and calibrate the dial in accordance with the instructions in the article "Dial Calibration."

The film and mounting drum are sold as one assembly and cannot be ordered separately.

Replacing Rubber Friction Drive Pinion

Loosen the set screw on the brass bushing which holds the rubber pinion—see Fig. 11. Push out the small horseshoe washer on the tuning shaft in back and below the glass screen. Push the tuning shaft from the front until the brass bushing may be removed. Place the new rubber pinion over the brass bushing and replace the bushing on the tuning shaft. Tighten the set screw on the brass bushing after the bushing has been returned to its original position. Replace the horseshoe washer.

Replacing Friction Drive Drum

If it is ever necessary to replace the friction drive drum, be sure that the stop on the drum fits into the stop on the condenser before the gang rotor is either completely meshed or completely open (maximum or minimum position).

MODELS 62-310, 62-410

Battery Data

MONTGOMERY-WARD & CO.

Caution the customers not to turn the pointer up higher than necessary as it will burn out the tubes and run down the battery. Also tell them to turn the pointer back to the starting position when a new 3 volt "A" battery is installed.

2 Volt Storage Battery—When this type of battery is used, turn the voltage regulator pointer to the position on the scale marked "2 Volt storage battery", and leave it there at all times.

"A" Battery (Models without Voltage Regulator)
These models are designed for use with a 2 volt storage battery. Any other battery of higher voltage, if connected directly, will damage the tubes.

Air Cell "A" Battery—If this type of battery is used, a series resistor will be required to reduce the voltage to the proper level of 2 volts for the tube filaments.

Testing Batteries

If the receiver does not operate satisfactorily test the batteries under load. A high resistance meter is required for the "B" and "C" voltages. If any of the batteries are considerably below their rated voltage, new ones should be used. When the "B" batteries are replaced the "C" battery should also be replaced. The reason for this is that the "C" drain is such that the "C" battery is run down in about the same time as the "B" batteries.

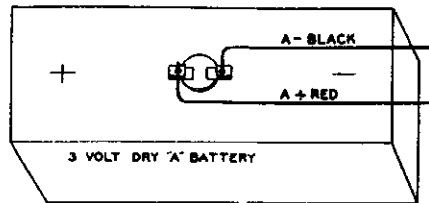


Fig. 4—3 V. Dry "A" Battery Connections

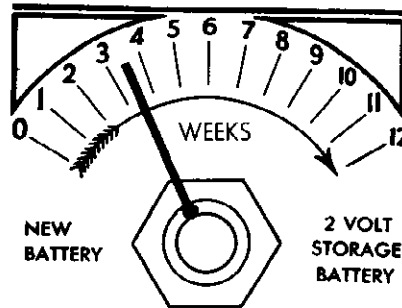


Fig. 5—"A" Battery Voltage Regulator

Batteries Required

The batteries and voltages required are shown in Figs. 2 and 3. The "A" drain is .6 amperes at 2 volts while the "B" drain is discussed below.

"B" Battery Life

The majority of potential complaints on short "B" battery life can be prevented if proper instructions are given to the customer at the time the receiver is installed.

Class "B" amplification is used in the output stage and the "B" battery consumption will, therefore, depend upon the output volume. The "B" consumption will also depend, to some extent, upon the strength of the incoming signal as the latter affects the AVC voltage. When no signal is being received the "B" drain is 21 milliamperes. When the volume control is at maximum and with high output volume, the "B" drain can become 47 milliamperes. A milliammeter in the "B" line will quickly determine if the "B" drain is excessive or normal.

As the dial lamp is not turned on except when tuning in a station, it is easy to forget to turn the radio off. When this happens, the radio may be on as long as 24 hours or more. A continuous drain of this kind for a long period will shorten the life of the "B" batteries considerably. **Caution the customer regarding this.**

"C" Battery

Any special "C" battery may be used from which a 10½ volt connection can be obtained. It is connected as shown in Fig. 3.

"A" Battery (Models with Voltage Regulator)

Models equipped with the voltage regulator on the back panel of the chassis may use any type of "A" battery delivering from 2 to 3 volts.

3 Volt Dry "A" Battery—When this type of battery is used, turn the voltage regulator pointer (See Fig. 5) to the left as far as possible. The purpose of this regulator is to reduce the voltage of the 3 volt battery to the 2 volts required by the tubes. Keep this pointer turned to the left as far as possible. Advance it one-half mark when reception gets weak. This should be about once a week if the radio is used from two to three hours per day. If it is used from four to five hours a day, it will generally be necessary to turn the pointer up one mark a week.

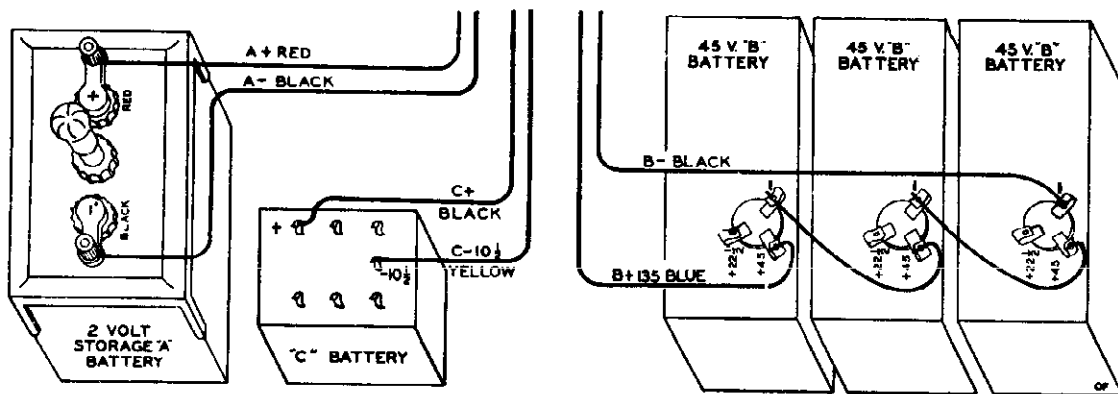
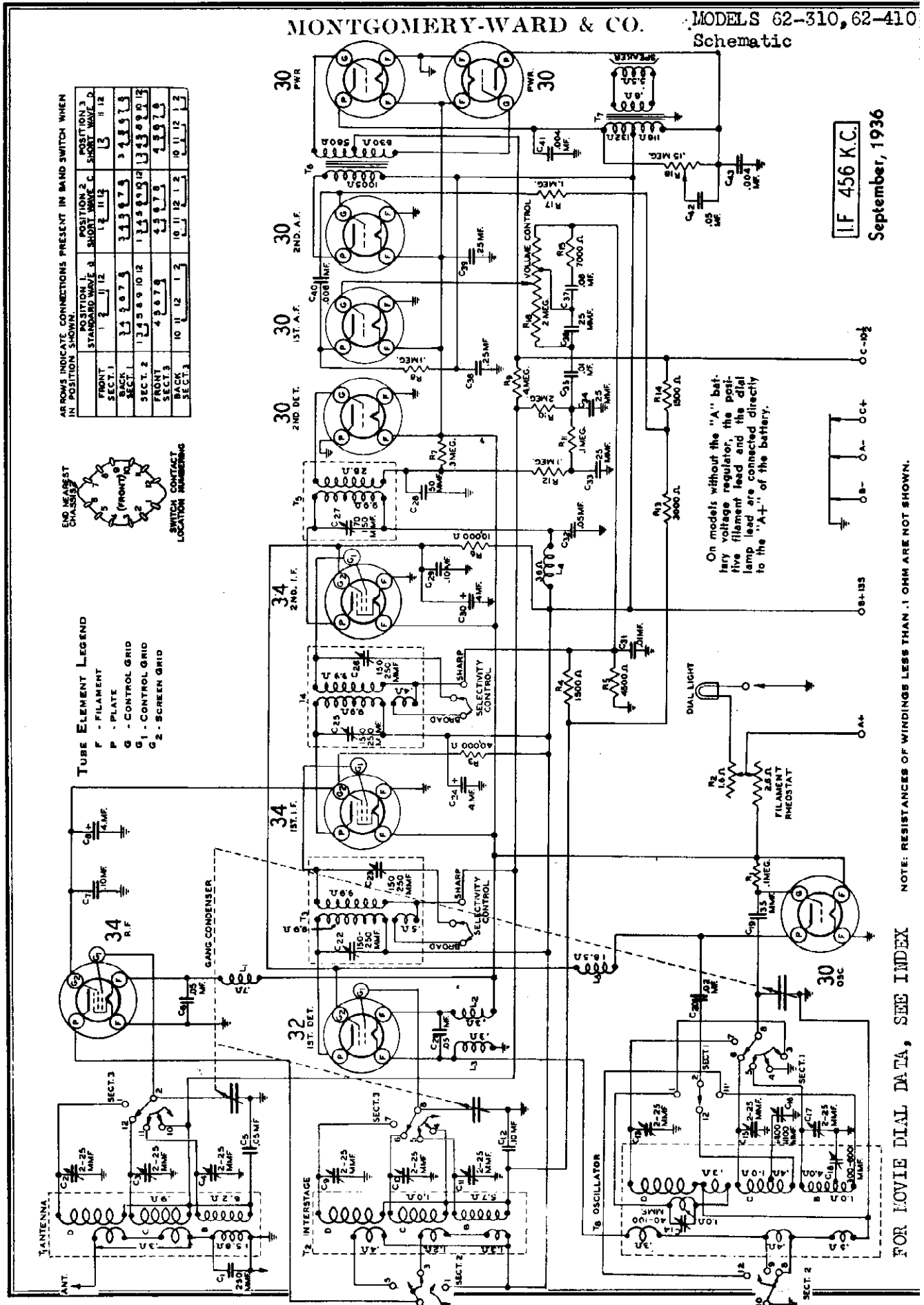


Fig. 3—"A", "B" and "C" Battery Connections

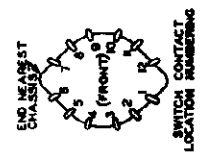
MONTGOMERY-WARD & CO.

MODELS 62-310, 62-410
Schematic



ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

POSITION	POSITION 2	POSITION 3
STANDARD	SHORT C.	SUBST. REAR
FRONT SECT. 1	1 2 11 12	1 3 11 12
BACK SECT. 1	1 2 7 8	1 3 7 8
FRONT SECT. 2	1 2 8 9 10 12	1 3 8 9 10 12
BACK SECT. 2	4 5 7 8	4 5 7 8
FRONT SECT. 3	10 11 12 1 2	10 11 12 1 2
BACK SECT. 3	10 11 12 1 2	10 11 12 1 2



TUBE ELEMENT LEGEND
 F - FILAMENT
 P - PLATE
 G - CONTROL GRID
 C1 - CONTROL GRID
 C2 - SCREEN GRID

I.F. 456 K.C.

September, 1936

NOTE: RESISTANCES OF WINDINGS LESS THAN .1 OHM ARE NOT SHOWN.

FOR MOVIE DIAL DATA, SEE INDEX

MODELS 62-310, 62-410
 Socket, Trimmers, Coils
 Voltage, Sensitivity

MONTGOMERY-WARD & CO.

SPECIFICATIONS

Input Voltages and Currents

- "A" Battery 2 Volts—6 Amperes
- "B" Batteries 135 Volts—21 to 47 Ma.
- "C" Battery 10½ Volts

Power Output 1.4 Watts Undistorted

Selectivity - 21 KC Broad at 1000 times Signal (Sharp)

Intermediate Frequency 456 KC

Speaker 8" P. M. Dynamic

Tuning Frequency Range

- B Range 528 to 1730 KC.
- C Range 1710 to 5800 KC.
- D Range 5750 to 18300 KC.

Sensitivity

- B Range 1 to 3 Microvolts Absolute
- C Range 1 to 4 Microvolts Absolute
- D Range 1 to 7 Microvolts Absolute

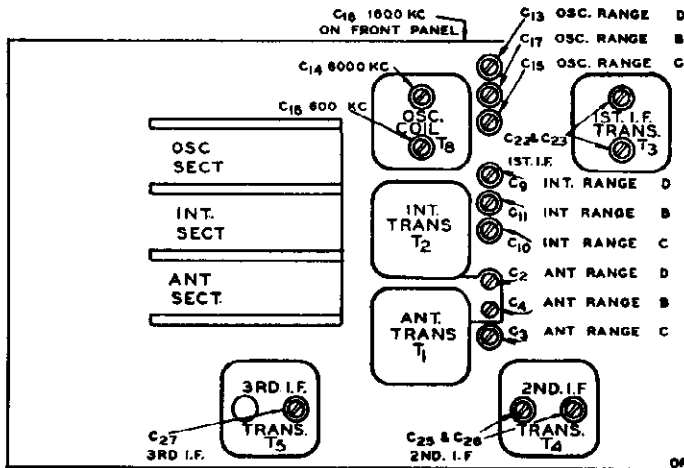


Fig. 6—Location of Trimmers

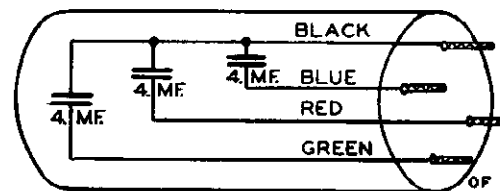


Fig. 9—Electrolytic Condenser Internal Connections

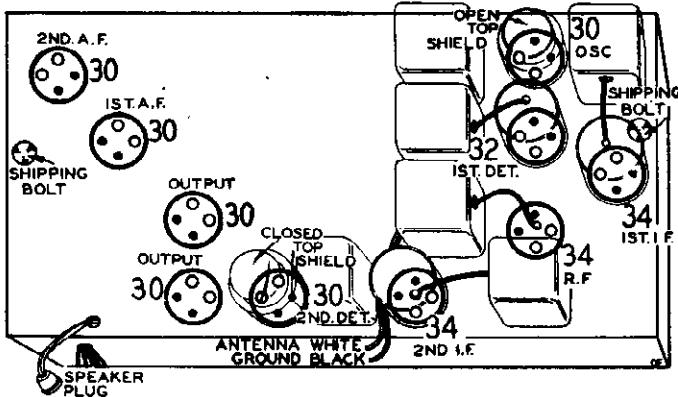


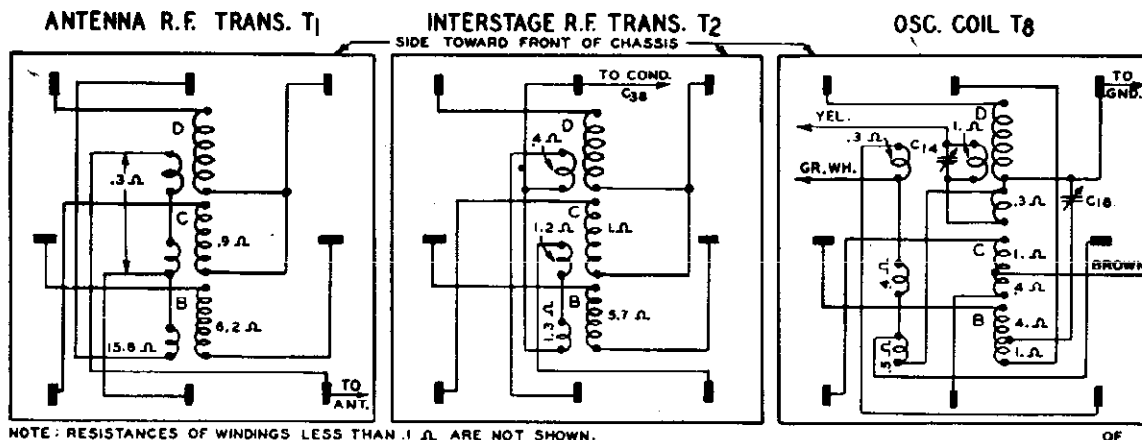
Fig. 7—Location of Tubes

VOLTAGES AT SOCKETS

Volume Control at Maximum Antenna Shorted to Ground
 Band Switch in Standard Wave Position

Type of Tube	Function	Across Filament	Plate to Ground	Screen to Ground	Control Grid to Ground
34	R. F.	2.0	135	65	
32	1st Det.	2.0	135	90	6
30	Osc.	2.0	90		
34	1st I. F.	2.0	135	65	
34	2nd I. F.	2.0	135	90	4.5
30	2nd Det.	2.0			
30	1st A. F.	2.0	75		4.5(1)
30	2nd A. F.	2.0	132		9 (2)
30	Power	2.0	135		10.5

(1) Volume control at minimum setting.
 (2) As read from connection between R13 and R14, and ground.



NOTE: RESISTANCES OF WINDINGS LESS THAN .1 Ω ARE NOT SHOWN.

Fig. 8—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

Voltagcs

Check the voltages at the sockets to see if correct values are being delivered to the tubes. The antenna and ground leads should be disconnected and the antenna and ground leads from the set connected together. The volume control should be turned to the right or maximum position.

All of the voltage readings as shown in the chart are read with a 1,000 ohm-per-volt meter. As high a range as possible should be used. In general, the higher the resistance of the meter, the more accurate the reading will be.

The voltage chart gives the voltages with all tubes in, the speaker connected and the set in operating condition. These voltages are typical of the sets but will vary slightly with variations in individual receivers, tubes, test equipment used and battery voltages.

Switch Contact Location Numbering

A standard arrangement for switch contact location numbering has been adopted. This numbering is illustrated in Fig. 2. In contact locations not used, the number applying to that particular location is not employed.

Trimmer Replacement

If one trimmer of the gang trimmer strip should become defective, it is not necessary to replace the entire strip. A single trimmer P17A36, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (side not grounded) of the defective trimmer in the strip. This connection is then made to the single trimmer. Connect it to the side of the trimmer not in contact with the adjusting screw. The other side of the single trimmer is then connected to a good ground, using a piece of heavy wire in order to support the trimmer adequately. In replacing a trimmer, be sure to keep both leads as short as possible and keep the ungrounded lead as far from ground as possible.

Planetary Drive Assembly

The planetary assembly is the unit that is integral with the tuning shaft.

If the nut on the back end of this assembly is too tight, the drive will be jerky and will turn hard in high speed. If this condition exists, back off this nut one or two turns and note the effect.

If this nut is too loose, the drive will slip in slow speed. The remedy in this case, of course, is to tighten the nut.

Should the condenser drive cord slip when the planetary pulley is turning, inspect the tuning condenser, drive drum and film drum to see if they are turning properly or if they are being obstructed in some way.

If the drive turns unevenly (rough, in spots), this may mean that the planetary assembly is defective or damaged internally and a new unit will be required.

Dial and Drive Assembly

Complete information regarding the movie dial and drive assembly will be found in the Movie Dial Manual No. 108.

1800 KC Adjustment

Set the signal generator for 1800 KC. Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth, at the same time adjusting the 1800 KC trimmer, until the peak of greatest intensity is obtained. See Fig. 6 for location of this trimmer.

Range D Alignment

18,300 KC Adjustment

Set the signal generator for 18,300 KC.

Keep the antenna lead of the receiver connected through the 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range D position (second short wave band).

Adjust the oscillator Range D trimmer (C13) until maximum output is obtained. See Fig. 6 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range D trimmer (C9) and antenna Range D trimmer (C7) to maximum.

When adjusting the interstage and antenna Range D trimmers, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

Do not change the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth, at the same time adjusting the 6000 KC trimmer, until the peak of greatest intensity is obtained. See Fig. 6 for location of this trimmer.

General Service Data

Tubes

The tubes used in this receiver are of the 2 volt series. All of them are of the filament or directly heated types. All of them have a 2 volt filament and should not be connected to a power supply not intended for this type of tube. Maximum filament voltage range is 1.8 to 2.0 volts. Operation of the tubes at under or over this value will be injurious to the tubes and may affect operation of the receiver.

Alignment and Calibration

Alignment Procedure

Correct alignment is extremely important in connection with all wave radios. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other reasonable causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide an accurately calibrated signal at 475, 1730, 1500, 5800, 5000, 1800, 18,300, 15,000 and 6000 KC and an output indicating meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 456 KC.

Connect the output of the signal generator through a .1 mf. condenser to the grid of the 1st detector.

Connect the ground lead of the receiver to the ground post of the signal generator.

Turn the band switch to the Range B position (standard wave band).

Turn the selectivity control to the sharp position and keep it in this position for all adjustments.

Turn the volume control to the maximum position.

Attenuate the signal from the signal generator to prevent the leveling off action of the AVC.

Then adjust the five I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis and the location is shown in Fig. 6.

Range B Adjustment

After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

1730 KC Adjustment

Set the signal generator for 1730 KC.

Turn the rotor of the tuning condenser to the full open position.

Keep the band switch in the standard wave position.

Connect the antenna lead of the receiver through a 200 mf. condenser to the output of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the oscillator Range B trimmer (C17) until maximum output is obtained. The location of this trimmer is shown in Fig. 6.

1500 KC Adjustment

Set the signal generator for 1500 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Turn the calibration screw (under color filter) until the 1500 KC mark on the dial scale is at the vertical red line on the screen. If the film drum cannot be turned a sufficient amount by means of the calibration screw, loosen the 2 screws inside the drum which hold it in place. Adjust the position of the drum and tighten the screws. The early models do not have the calibration screw mentioned above. These models must be adjusted by loosening the drum screws.

Adjust the interstage Range B trimmer (C11) and antenna Range B trimmer (C4) to maximum.

Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth, at the same time adjusting the 600 KC trimmer, until the peak of greatest intensity is obtained. See Fig. 6 for location of this trimmer.

Range C Alignment

CAUTION—When aligning the short wave bands be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC. It may be necessary to increase the input signal to hear the image.

5800 KC Adjustment

Set the signal generator for 5800 KC.

Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range C position (first short wave band).

Adjust the oscillator Range C trimmer (C15) until maximum output is obtained. See Fig. 6 for location of this trimmer.

5000 KC Adjustment

Set the signal generator for 5000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range C trimmer (C10) and antenna Range C trimmer (C3) to maximum. Do not change the setting of the oscillator Range C trimmer.

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MODELS 62-313, 62-314
Voltage, Socket, Coils
Trimmers, Phono data

Power Consumption - 170 Watts (At 115 volts 60 cycles)
Power Output 20 Watts Undistorted
Selectivity - 19 KC Broad at 1000 times Signal (Sharp)

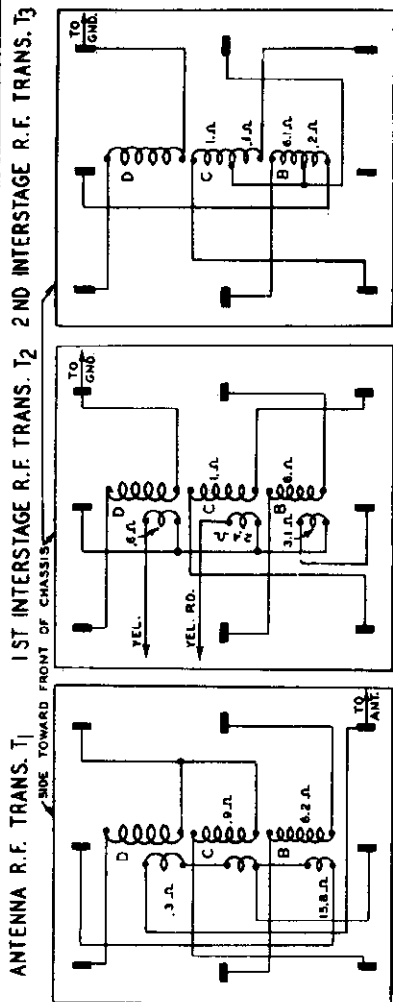
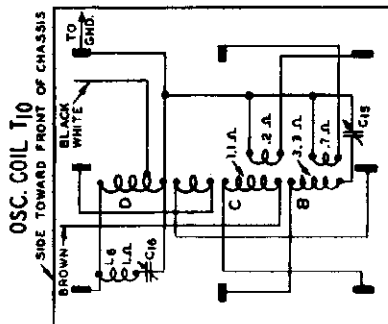


Fig. 6—R.F. and Oscillator Coil Base Terminal Arrangement and D.C. Resistance of Windings

NOTE: RESISTANCES OF WINDINGS LESS THAN 1.0 ARE NOT SHOWN.



OSC. COIL T10

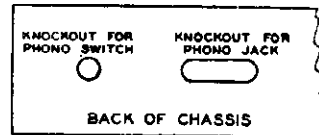
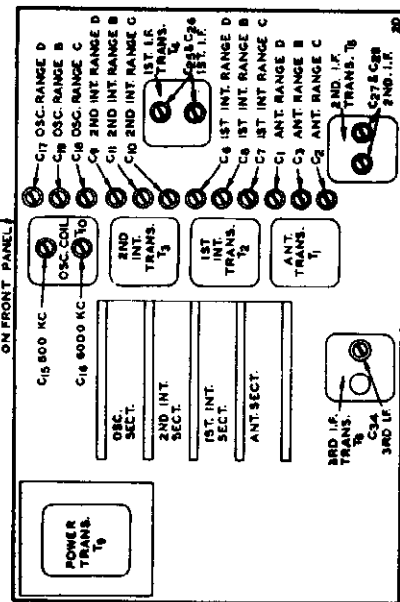


Fig. 8—Location of Phono Knockouts

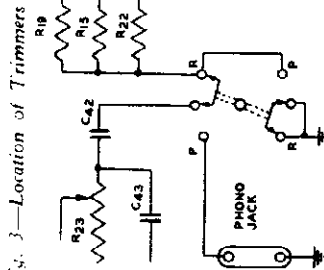


Fig. 3—Location of Trimmers

Fig. 7—Phonograph Connections

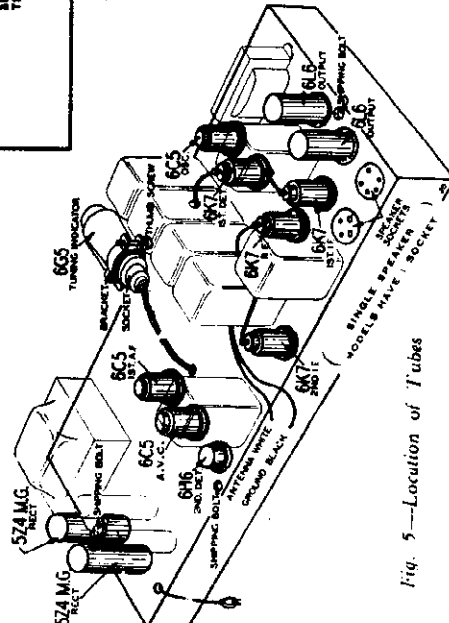


Fig. 5—Location of Tubes

Line Voltage: 115
Volume Control: Maximum

Antenna Shorted to Ground
Position of Band Switch: Standard Wave

VOLTAGE BETWEEN SOCKET PRONGS AND GROUND (Unless otherwise indicated)

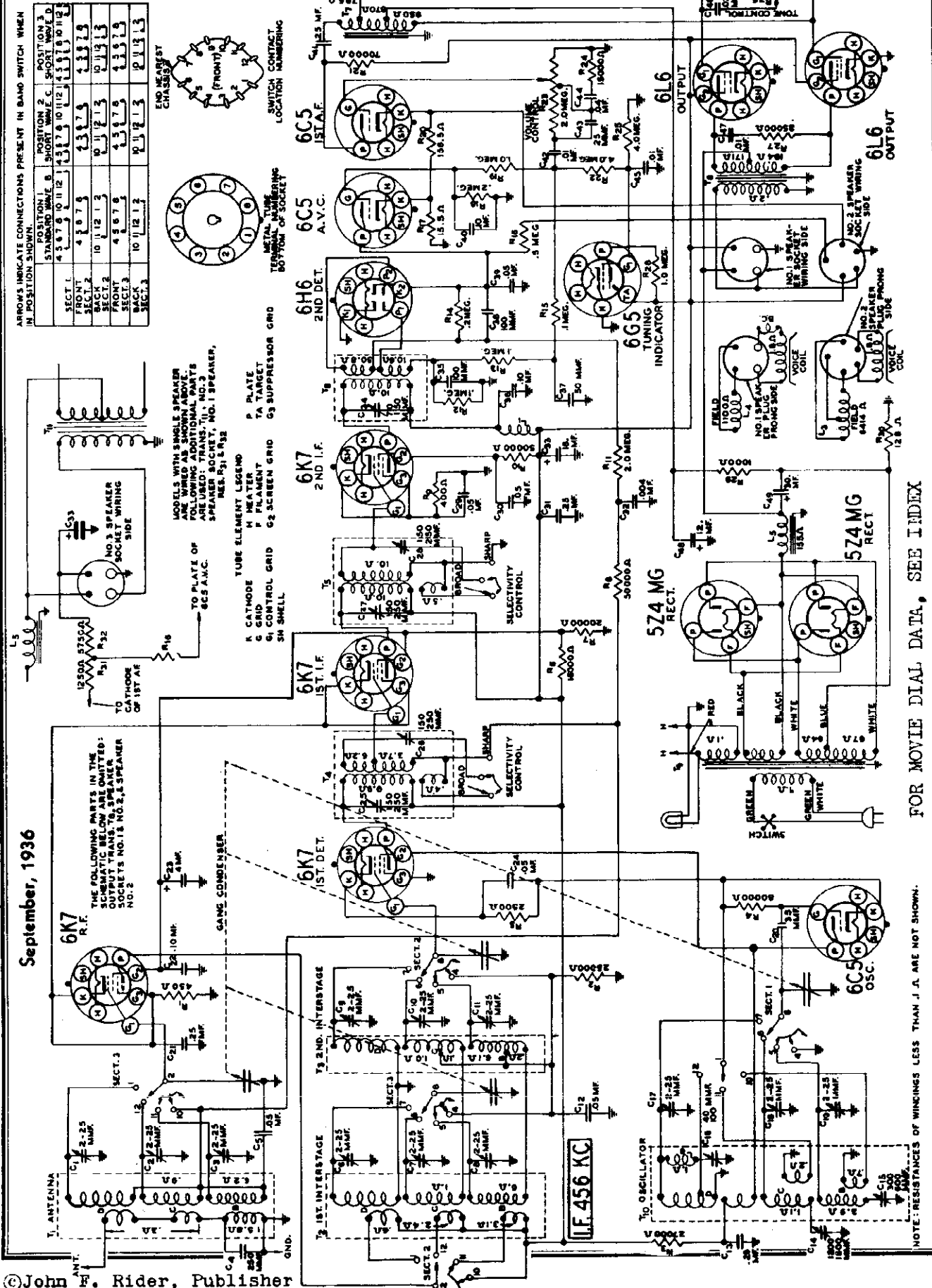
TUBE	FUNCTION	VOLTAGE BETWEEN SOCKET PRONGS AND GROUND (Unless otherwise indicated)							
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
6K7	R.F.	0	6.2(1)	250	110	7.5(2)		6.2(1)	7.5(2)
6K7	1st Det.	0	6.2(1)	250	110			6.2(1)	9.0
6C5	Osc.	0	6.2(1)	110				6.2(1)	
6K7	1st I.F.	0	6.2(1)	250	110	7.5		6.2(1)	7.5(2)
6K7	2nd I.F.	0	6.2(1)	250	115	5(2)		6.2(1)	5.0
6H6	2nd Det.	0	6.2(1)					6.2(1)	
6C5	A.V.C.	0	6.2(1)	5(3)				6.2(1)	0.5
6C5	1st A.F.	0	6.2(1)	130				6.2(1)	6.0
6L6	Power	0	6.2(1)	350	250	20(4)		6.2(1)	
5Z4MG	Rectifier	0	5.0(5)		1024(6)		1024(6)		5.0(5)

6G5 Tuning Indicator Plate to Ground 25(3) Target to Ground 250 Cathode to Ground 0 Across Heater 6.2 A.C.

(1) A.C. voltage as read across heater terminals 2 and 7.
(2) Subject to variation.
(3) As read with 500,000 ohm meter.
(4) As read across R-30.
(5) A.C. voltage as read across heater terminals 2 and 8.
(6) A.C. voltage as read across terminals 4 and 6.

MONTGOMERY-WARD & CO.

Schematic



Alignment and Calibration

Correct alignment is extremely important in connection with all wave radios. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide an accurately calibrated signal at 416, 1730, 1950, 5000, 5000, 1800, 18,300, 19,000 and 6000 KC and an output indicating meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 416 KC. Connect the output of the signal generator through a .1 mf. condenser to the grid of the 1st detector. Connect the ground lead of the receiver to the ground post of the signal generator.

Turn the band switch to the Range B position (standard wave band).

Turn the selectivity control to the sharp position and keep it in this position for all adjustments.

Turn the volume control to the maximum position. Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

Then adjust the five I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis and the location is shown in Fig. 3.

Range B Alignment

After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

1730 KC Adjustment

Set the signal generator for 1730 KC. Turn the rotor of the tuning condenser to the full open position.

Keep the band switch in the standard wave position.

Connect the antenna lead of the receiver through a 200 mf. condenser to the output of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the oscillator Range B trimmer (C19) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

1500 KC Adjustment

Set the signal generator for 1500 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Turn the calibration screw (under color filter) until the 1500 KC mark on the dial scale is at the vertical red line on the screen. If the film drum cannot be turned a sufficient amount by means of the calibration screw, loosen the 2 screws inside the drum which hold it in place. Adjust the position of the drum and tighten the screws. The early models do not have the calibration screw mentioned above. These models must be adjusted by loosening the drum screws.

Adjust the 1st and 2nd interstage Range B trimmer (C8 and C11) and antenna Range B trimmer (C1) to maximum.

Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range C Alignment

CAUTION—When aligning the short wave bands be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 4000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC. It may be necessary to increase the input signal to hear the image.

5800 KC Adjustment

Set the signal generator for 5800 KC.

Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range C position (first short wave band).

Adjust the oscillator Range C trimmer (C18) until maximum output is obtained. See Fig. 3 for location of this trimmer.

5000 KC Adjustment

Set the signal generator for 5000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st and 2nd interstage Range C trimmers (C7 and C10) and antenna Range C trimmer (C2) to maximum.

Do not change the setting of the oscillator Range C trimmer.

1800 KC Adjustment

Set the signal generator for 1800 KC. Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 1800 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range D Alignment

Set the signal generator for 18,300 KC.

Keep the antenna lead of the receiver connected through the 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range D position (second short wave band).

Adjust the oscillator Range D trimmer (C17) until maximum output is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st and 2nd interstage Range D trimmers (C6 and C9) and antenna Range D trimmer (C1) to maximum.

When adjusting the 2nd interstage Range D trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

Do not change the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Trimmer Replacement

If one trimmer of the gang trimmer strip should become defective, it is not necessary to replace the entire strip. A single trimmer P-17A36, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (side not grounded) of the defective trimmer in the strip. This connection is then made to the single trimmer. Connect it to the side of the trimmer not in contact with the adjusting screw. The other side of the single trimmer is then connected to a good ground, using a piece of heavy wire in order to support the trimmer adequately. In replacing a trimmer, be sure to keep both leads as short as possible and keep the ungrounded lead as far from ground as possible.

Planetary Drive Assembly

The planetary assembly is the unit that is integral with the tuning shaft.

If the nut on the back end of this assembly is too tight, the drive will be jerky and will turn hard in high speed. If this condition exists, back off this nut one or two turns and note the effect.

If this nut is too loose, the drive will slip in slow speed. The remedy in this case, of course, is to tighten the nut.

Should the condenser drive cord slip, when the planetary pulley is turning, inspect the tuning condenser, drive drum and film drum to see if they are turning properly or if they are being obstructed in some way.

If the drive turns unevenly (rough, in spots), this may mean that the planetary assembly is defective or damaged internally and a new unit will be required.

Twenty-five Cycle Models

The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer is used. The correct power transformer is shown in the parts list.

The twenty-five cycle receiver can be operated satisfactorily from a sixty cycle power supply. However, the reverse is not true, the sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

A 115-230 volt, 40 to 60 cycle as well as other power transformers with special power ratings are also available for this model.

Phonograph Connections

Phonograph connections can be made as shown in Fig. 7. The parts required are shown in the parts list.

Knockouts are provided in the back of the chassis for mounting the phono jack and phono switch.—See Fig. 8.

The phono switch should be mounted with one set of terminals nearest the bottom of the chassis base.

The connections are made by opening the diode return circuit at the volume control. This is done by removing the wire connecting condenser C42 to resistor R15, R19 and R22, at the terminal strip located near the back of the planetary drive. Cut this wire to correct length and solder it to the proper terminal on the phono switch.—See Fig. 7, keeping the wire close to the back of the chassis base.

A wire is then connected from the lug on the above mentioned terminal strip to which, C42 was connected, to the correct terminal on the phono switch.—See Fig. 7. This wire should be brought directly to the back of the chassis at a point close to the phono jack pin tip nearest the channel provided for a chassis mounting bolt, and then routed over to the switch. Complete the other connections as illustrated in Fig. 7.

It will be necessary to re-route the AC line cord away from the 6CS 1st audio grid lead by running it between the volume control and the filter choke and then straight back to the hole provided for it in the chassis base.

If a hum is heard when the phono pickup is touched, reverse the two pickup leads.

Adding 6N5 Tuning Eye Tube to 6 Volt "B" Batteryless Movie Dial Radios SERVICE MANUAL SUPPLEMENT

Models 62-273 and 62-283 differ from the earlier models 62-327, etc., only in the inclusion of a 6N5 cathode ray tuning eye tube. This service manual gives the tuning eye circuit and parts list and describes the changes necessary to convert the earlier models to the later by adding the tuning eye.

Installation of Tuning Eye in Early Models

Remove the chassis from the cabinet. Drill the necessary hole in the panel from the front of the cabinet to avoid splitting the veneer—See Fig. 1 for location of the hole. As shown in this illustration, the location of the hole depends upon whether the cabinet is a console or a table model. The location of the tuning eye bracket is shown in dotted lines in Fig. 1. This is attached to the back of the panel by means of two small wood screws.

The circuit connections are made in the following manner: Bring the cable from the 6N5 tube socket through the hole in the chassis base adjacent to the oscillator coil—See Fig. 3 in service manual No. 105 for location of the oscillator coil.

Remove the 3 megohm resistor R14 as shown in

Figs. 2 and 3. Solder the terminal strip to the chassis base at the point shown in Fig. 3. Connect resistors R19, R20 and R21 and the wires of the cable as shown schematically and pictorially in Figs. 2 and 3.

The brown lead of the cable, shown soldered to the chassis base, is the shorter of the two brown leads of the cable.

Do not remove any parts, except resistor R14, or any wires from the circuit. The connections to some terminals in Fig. 3 are not shown in order to simplify the illustration.

New Parts Used

(Not Shown in Manual No. 105 Parts List)

Bin No.	Part No.	Description	Selling Price
	21A81	6N5 KIT ASSEMBLY COMPLETE (LESS TUBE).....	\$.84
		Includes the following parts:	
	13X291	6N5 Tube Socket and Cable Assembly.....	.26
	4A17	Terminal Strip .....	.04
	25A71	Tube Clamp Assembly—includes screws.....	.20
	9X16	Cardboard Spacer .....	.04
	4X136	Escutcheon for Tuning Eye—includes Screws.....	.10
10971	A94254	Resistor R19 250,000 Ohm 0.2 Watt .....	.06
11115	A94205	Resistor R20 2 Megohm 0.2 Watt .....	.06
11188	A94105	Resistor R21 1 Megohm 0.2 Watt .....	.06

Type 6N5 Tuning Eye Tube is not included in the above Assembly

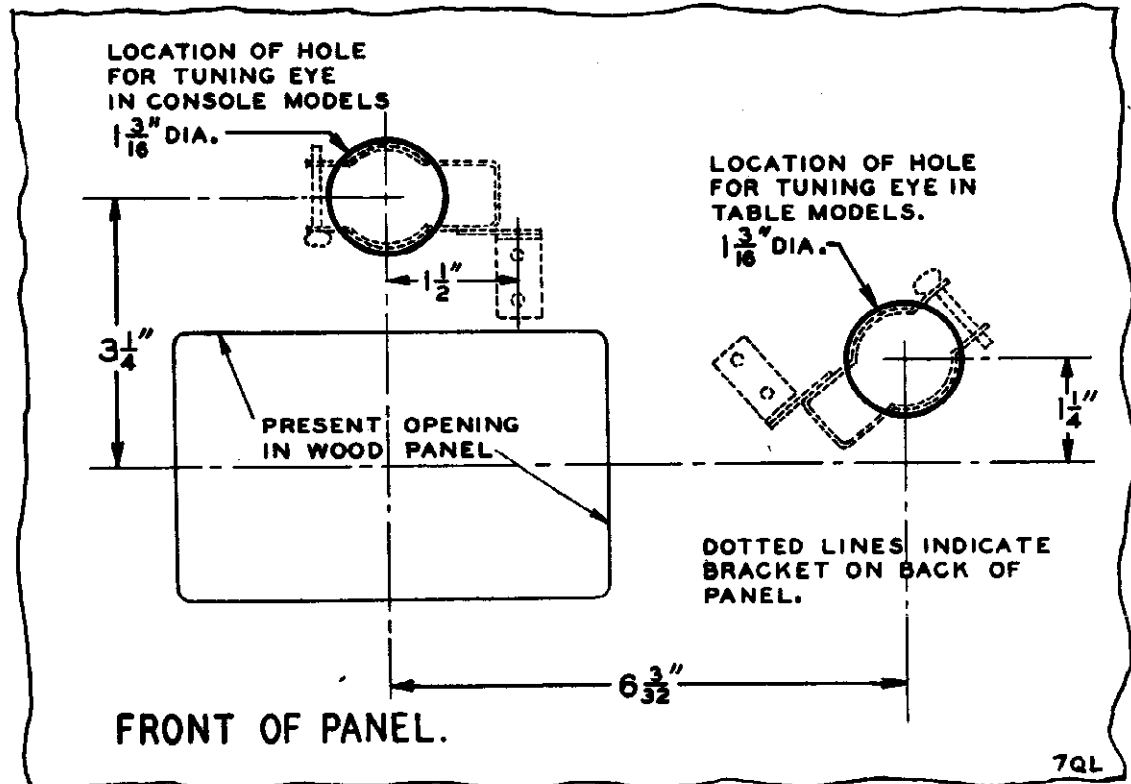
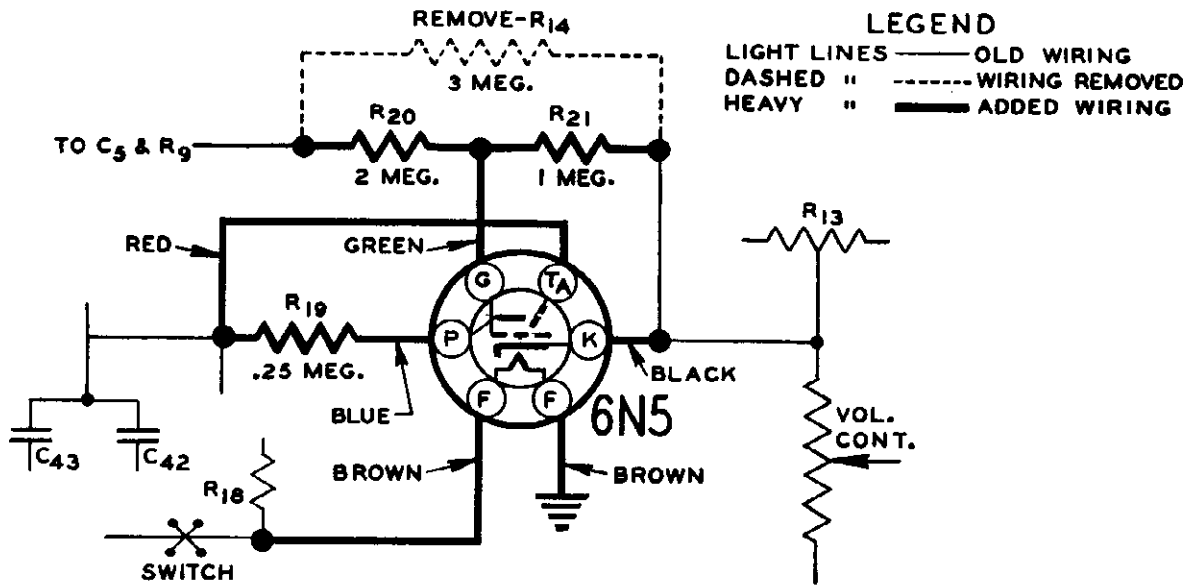


Fig. 1—Location of Holes for Panel Drilling

MODELS 62-273, 62-283
 Schematic, Chassis Wiring MONTGOMERY-WARD & CO.



Dec. 1936

Fig. 2—Supplementary Schematic Circuit Diagram

FOR COMPLETE DATA, SEE MODEL 62-327

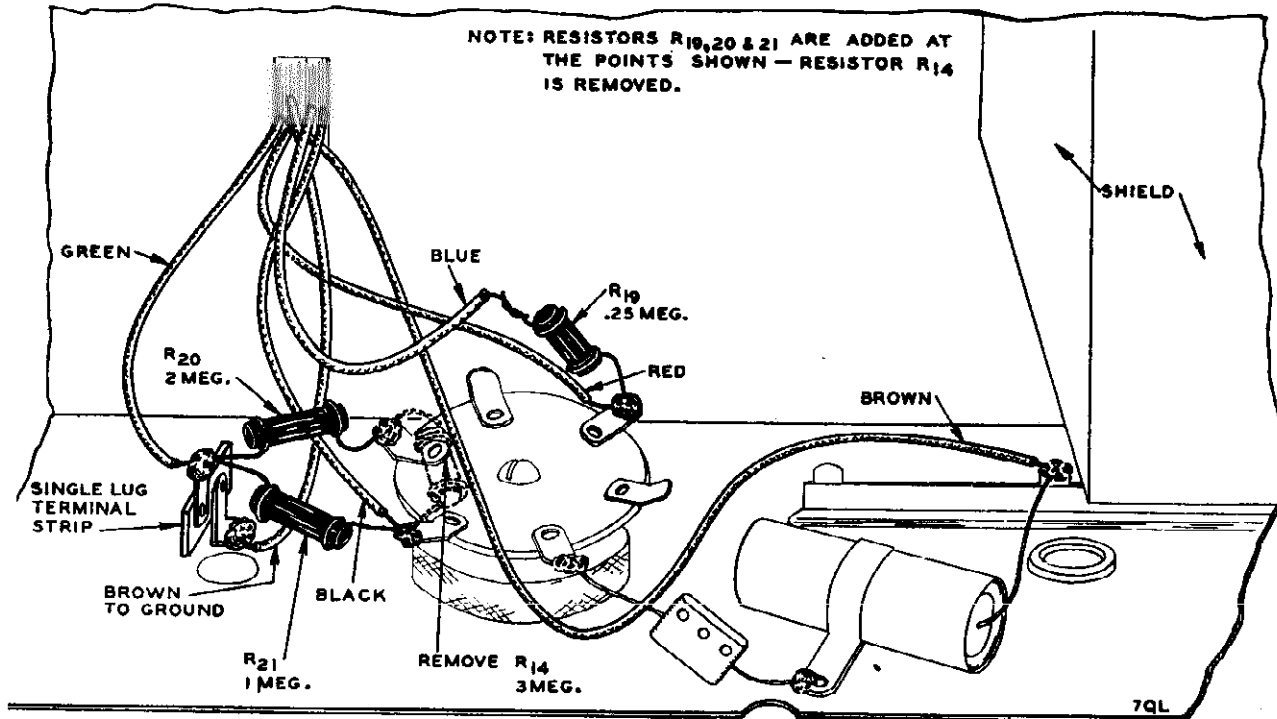
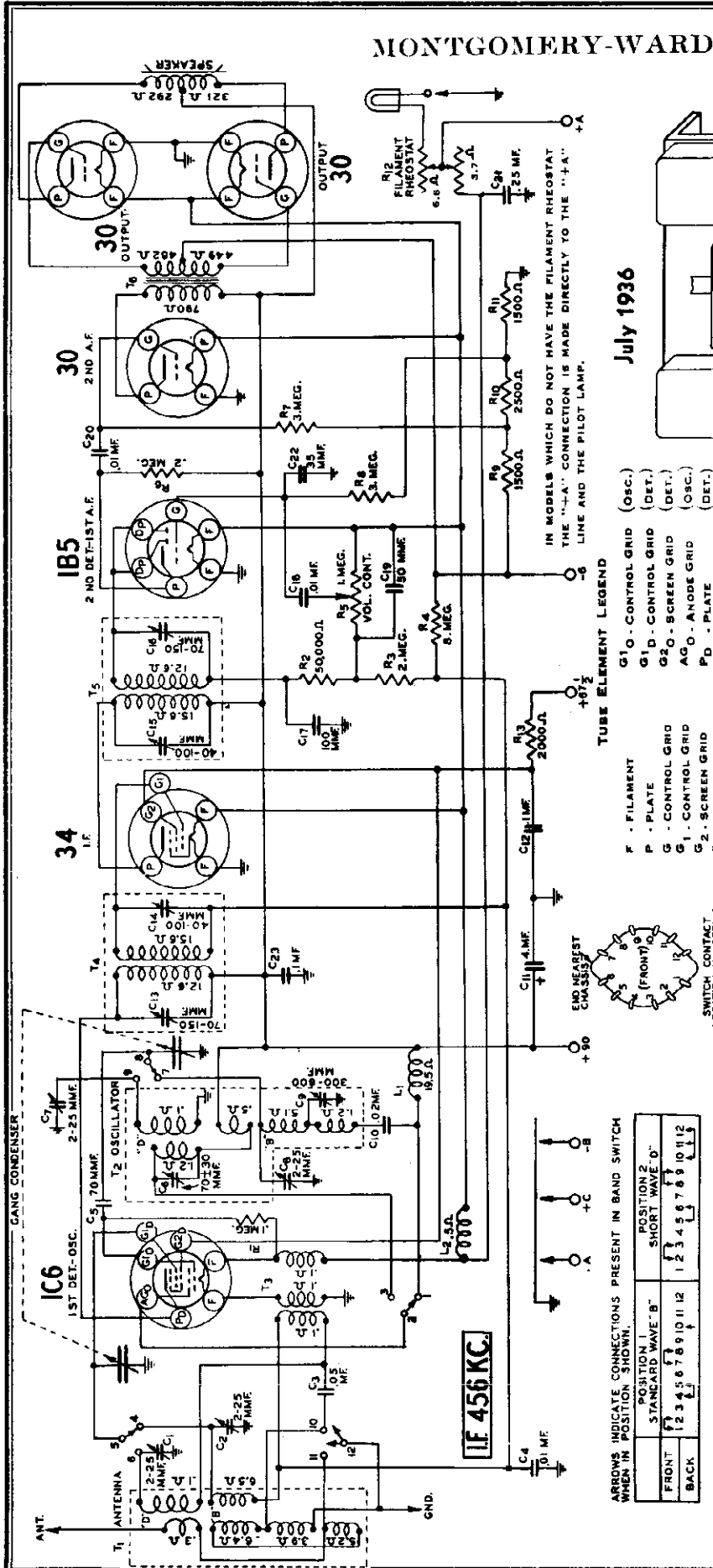


Fig. 3—Location of Parts Added to Chassis and Their Connections

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MODELS 62-326, 62-336
62-426, 62-436

Schematic, Voltage
Socket, Trimmers

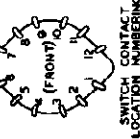


July 1936

IN MODELS WHICH DO NOT HAVE THE FILAMENT RHEOSTAT THE "A" CONNECTION IS MADE DIRECTLY TO THE "A" LINE AND THE PILOT LAMP.

TUBE ELEMENT LEGEND

- G10 - CONTROL GRID (OSC.)
- G1D - CONTROL GRID (DET.)
- G2O - SCREEN GRID (DET.)
- AG1O - ANODE GRID (OSC.)
- G2 - SCREEN GRID (DET.)
- PD - PLATE
- F - FILAMENT
- P - PLATE
- G - CONTROL GRID
- G1 - CONTROL GRID
- G2 - SCREEN GRID
- D - DIODE PLATE



VOLTAGES AT SOCKETS

Type of Tube	Volume Control at Maximum		Antenna Shorted to Ground		Grid to Ground
	Across Filament	Plate to Ground	Screen to Ground	Antenna Shorted to Ground	
1C6	2.0	90	60	6(2)	
34	2.0	90	60	6(2)	
IB5	2.0	30(3)		1.5(4)	
30	2.0	90		4.0(5)	
30	2.0	90		6	

- (1) Anode Grid to ground.
- (2) As read at "C" Battery.
- (3) As read with 500,000 ohm meter.
- (4) As read from negative end of R11 to ground.
- (5) As read from negative end of R10 to ground.

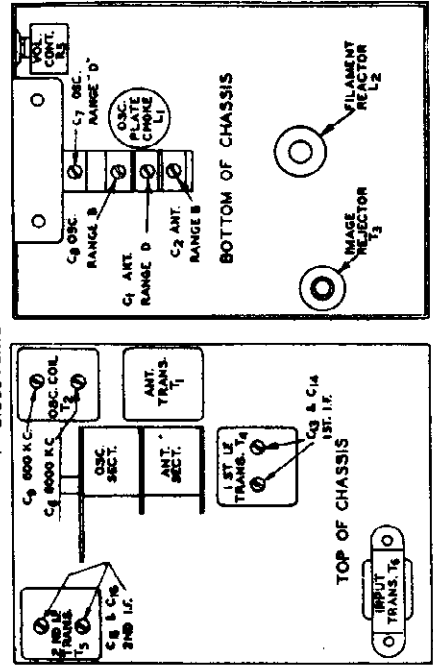


Fig. 7—Location of Trimmers

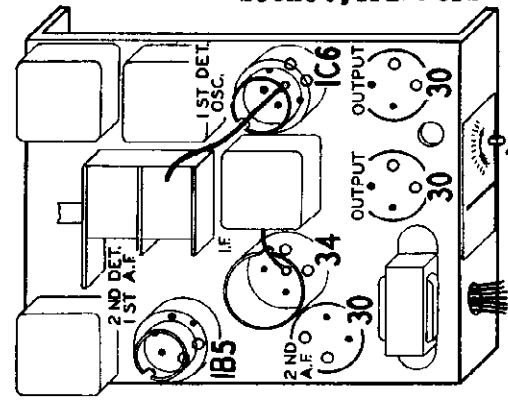


Fig. 9—Tube Arrangement

MODELS 62-326, 62-336
62-426, 62-436
Coils, Batt. Connections

MONTGOMERY-WARD & CO.

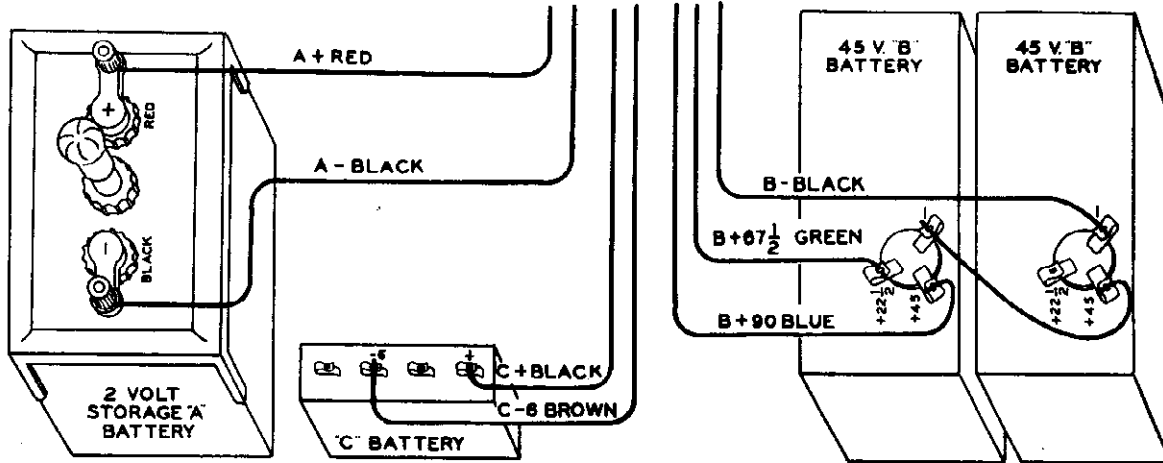


Fig. 3—"A", "B", and "C" Battery Connections

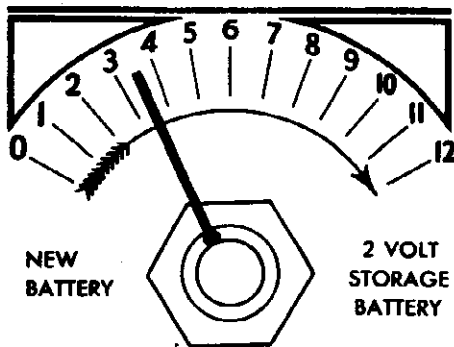


Fig. 6—"A" Battery Voltage Regulator

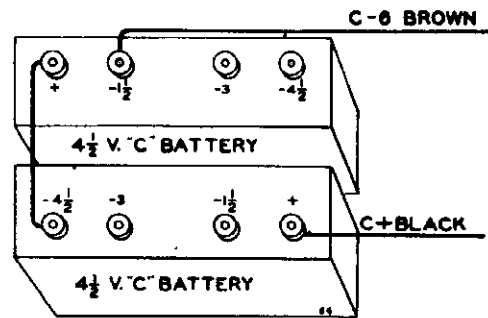


Fig. 4—Optional "C" Battery Connections

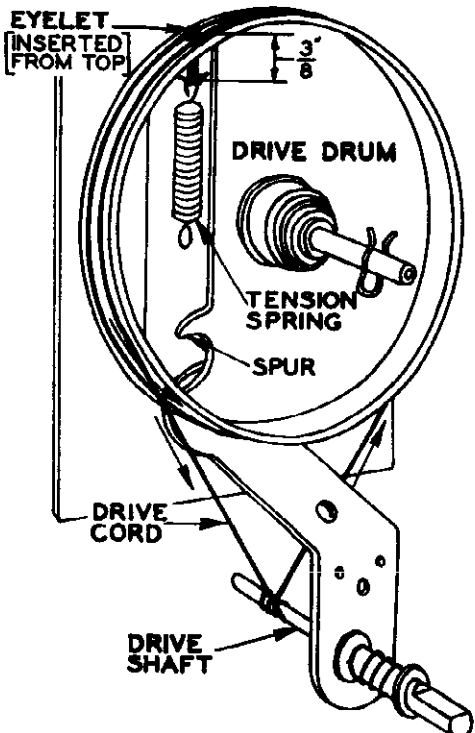


Fig. 10—Replacing Drive Cord

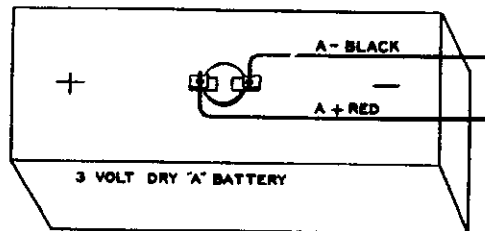


Fig. 5—3 V. Dry "A" Battery Connection

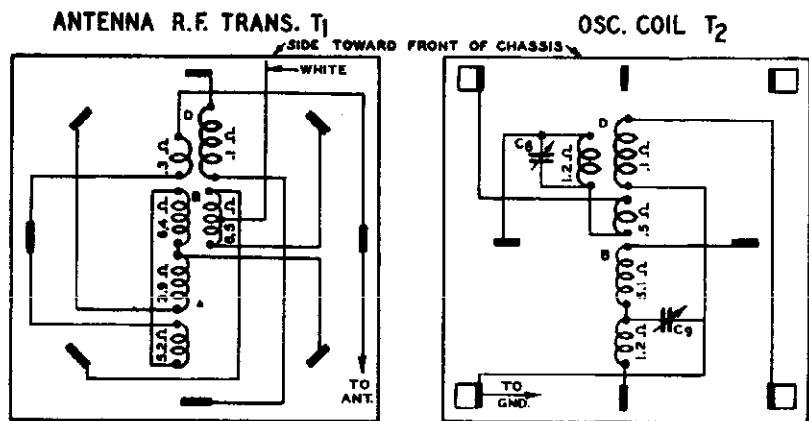


Fig. 8—R.F. and Oscillator Coil Base Terminal Arrangement and D.C. Resistance of Windings

MONTGOMERY-WARD & CO

Alignment, Notes

Input Voltages and Currents

"A" Battery	2 Volts—42 Amperes
"B" Batteries	90 & 67½ Volts—11.5 to 25.5 Ma.
"C" Battery	6 Volts

Power Output . . . 400 Milliwatts Undistorted

Selectivity . . . 30 KC Broad at 1000 Times Signal

Intermediate Frequency . . . 456 KC

Speaker . . . 6 inch Magnetic—Mantel Models
8 inch Magnetic—Console Models

Tuning Frequency Range

B Range	528 to 1730 KC
D Range	5650 to 16,000 KC

Sensitivity

B Range Average	25 to 35 Microvolts Absolute
D Range Average	25 to 60 Microvolts Absolute

Alignment and Calibration

Alignment Procedure

Correct alignment is extremely important in connection with all wave receivers. The receivers are all properly aligned at the factory with precision instruments and re-alignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide an accurately calibrated signal at 456, 1730, 1700, 600, 16,000, 15,000 and 6000 KC and an output indicating meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 456 KC. Connect the output of the signal generator through a .1 mf. condenser to the grid of the 1st detector. Connect the ground lead of the radio to the ground post of the signal generator.

Turn the band switch to the Range B position (standard wave band).

Turn the volume control to the maximum position. Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.

Then adjust the four I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 7.

Range B Alignment

After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

1730 KC Adjustment

Set the signal generator for 1730 KC. Turn the rotor of the tuning condenser to the full open position.

Keep the band switch in the standard wave position.

Connect the antenna lead of the radio through a 200 mmf. condenser to the output of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the oscillator Range B trimmer (C8) until

maximum output is obtained. The location of this trimmer is shown in Fig. 7.

1500 KC Adjustment

Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Loosen the pointer screw and set the pointer at the 1500 KC mark on the standard wave band scale. Retighten the screw.

Adjust the antenna Range B trimmer (C2) to maximum.

Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer (C9) until the peak of greatest intensity is obtained. See Fig. 7 for location of this trimmer.

Range D Alignment

CAUTION—When aligning the short wave band be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC. It may be necessary to increase the input signal to hear the image.

Tubes

The tubes used in this receiver are of the 2 volt series. All of them are of the filament or directly heated types. All of them have a 2 volt filament and should not be connected to a power supply not intended for this type of tube. Maximum filament voltage range is 1.8 to 2.0 volts. Operation of the tubes at under or over this value will be injurious to the tubes and may affect operation of the receiver.

Voltages

Check the voltages at the sockets to see if correct values are being delivered to the tubes. The antenna and ground should be disconnected and the antenna

16,000 KC Adjustment

Set the signal generator for 16,000 KC. Connect the antenna lead of the radio through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range D position (short wave band).

Adjust the oscillator Range D trimmer (C7) until maximum output is obtained. See Fig. 7 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the antenna Range D trimmer (C1) to maximum. When adjusting this trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

Do not change the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC (C6) trimmer until the peak of greatest intensity is obtained. See Fig. 7 for location of this trimmer.

General Service Data

and ground leads from the set connected together. The volume control should be turned to the right or maximum position.

All of the voltage readings as shown in the chart are read with a 1,000 ohm-per-volt meter. As high a range as possible should be used. In general, the higher the resistance of the meter, the more accurate the reading will be.

The voltage chart gives the voltages with all tubes in, the speaker connected and the set in operating condition. These voltages are typical of the sets but will vary slightly with variations in individual receivers, tubes, test equipment used and battery voltages.

MODELS 62-326, 62-336
62-426, 62-436

MONTGOMERY-WARD & CO.

Battery Data
Drive Cord Replacements

BATTERIES REQUIRED

The batteries and voltages required are shown in Figs. 2 and 3. The "A" drain is .42 amperes at 2 volts while the "B" drain is discussed below.

"B" BATTERY LIFE

The majority of potential complaints on short "B" battery life can be prevented if proper instructions are given to the customer at the time the receiver is installed.

Class "B" amplification is used in the output stage and the "B" battery consumption will, therefore, depend upon the output volume. The "B" consumption will also depend, to some extent, upon the strength of the incoming signal as the latter affects the AVC voltage. When no signal is being received the "B" drain is 11.5 milliamperes. When the volume control is at maximum and with high output volume, the "B" drain can become 25.5 milliamperes. A milliammeter in the "B" line will quickly determine if the "B" drain is excessive or normal.

As the pilot lamp is not turned on except when tuning in a station, it is easy to forget to turn the radio off. When this happens, the radio may be on as long as 24 hours or more. A continuous drain of this kind for a long period will shorten the life of the "B" batteries considerably. Caution the customer regarding this.

"C" BATTERY

Any special "C" battery may be used from which a 6 volt connection can be obtained. It is connected as shown in Fig. 3.

If standard 4 1/2 Volt "C" batteries are used, connect them as shown in Fig. 4.

"A" BATTERY (MODELS WITH VOLTAGE REGULATOR)

Models equipped with the voltage regulator on the back panel of the chassis may use any type of "A" battery delivering from 2 to 5 volts.

3 Volt Dry "A" Battery - When this type of battery is used, turn the voltage regulator pointer (See Fig. 6) to the left as far as possible. The purpose of this regulator is to reduce the voltage of the 3 volt battery to the 2 volts required by the tubes. Keep this pointer turned to the left as far as possible.

Advance it one-half mark when reception gets weak. This should be about once a week if the radio is used from two to three hours per day. If it is used from four to five hours a day, it will generally be necessary to turn the pointer up one mark a week.

Caution the customers not to turn the pointer up higher than necessary as it will burn out the tubes and run down the battery. Also tell them to turn the pointer back to the starting position when a new 3 volt "A" battery is installed.

2 Volt Storage Battery - When this type of battery is used, turn the voltage regulator pointer to the position on the scale marked "2 Volt storage battery", and leave it there at all times

"A" BATTERY

(MODELS WITHOUT VOLTAGE REGULATOR)

These models are designed for use with a 2 volt storage battery. Any other battery of higher voltage, if connected directly, will damage the tubes.

Air Cell "A" Battery - If this type of battery is used, a series resistor will be required to reduce the voltage to the proper level of 2 volts for the tube filaments.

TESTING BATTERIES

If the receiver does not operate satisfactorily test the batteries under load. A high resistance meter is required for the "B" and "C" voltages. If any of the batteries are considerably below their rated voltage, new ones should be used. When the "B" batteries are replaced the "C" batteries should also be replaced. The

reason for this is that the "C" drain is such that the "C" batteries are run down in about the same time as the "B" batteries.

REPLACING DRIVE CORD

Take off the station pointer by removing the screw at the center of the dial.

Remove the pilot lamp assembly by pulling the socket clip upward off the dial assembly.

Remove the dial assembly by removing the two screws which secure this assembly to the chassis. One screw is located on the drive assembly bracket; the other is on a bracket attached to the top of the gang condenser. The on-off indicator cord tension spring is removed from the small bracket at the upper left hand corner of the dial (from front).

Then lay the complete dial assembly face down in front of the chassis. Remove the on-off indicator disc from the pointer shaft. It is not necessary to remove the volume control collar which holds the indicator cord of this control in position.

Turn the drive drum until the opening in this drum is approximately vertical and with the hole at the top as shown in Fig. 10.

Remove the tension spring and the old drive cord.

See that the eyelet is in the hole in the drive drum as shown in Fig. 10. Insert one end of the new drive cord from the outside through this eyelet in the drive drum.

Tie the end of the cord which has been inserted through the eyelet to one end of the tension spring.

Wrap the cord in a counter clockwise direction (facing front of chassis) around the drive drum approximately one and one-quarter turns progressing toward the front.

Then tilt the chassis up on its back panel and bring the cord mentioned in the previous paragraph down to the drive shaft. Wrap this cord directly below the drive drum three and one-half turns around the drive shaft, as shown in Fig. 10, progressing toward the back of chassis.

Then bring this cord up to the drive drum and wrap it around the drum in back of cord already on the drum until it is up to the eyelet as shown in Fig. 10.

Now insert the free end of the cord through the hole in the eyelet and tie it to the end of the spring. The end of the spring when hanging free and with all slack removed from the drive cord should be 3/8" or less from the flange of the drum, as shown in Fig. 10. Cut off the surplus length of cord after it is tied to the spring.

Then secure the other end of the tension spring over the spur on the drive drum.

Turn the drive shaft back and forth several times.

Replace the dial assembly, pointer and pilot lamp assembly.

MONTGOMERY-WARD & CO.

RESISTORS

CARBON

Table with columns: Part No., Code, Resistance, Watts, Selling Price. Lists various carbon resistors like P-A15104, P-A15203, etc.

VARIABLE

Table with columns: Part No., Code, Resistance, Selling Price. Lists variable resistors like P-34X218, P-43X55.

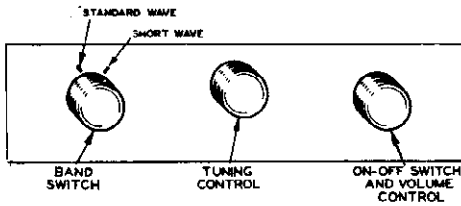


Fig. 1 - Arrangement of Controls

Resistance coupling is used between the 1st audio tube and the 2nd audio stage which employs a 30 stage which uses two type 30 tubes in a stage of class "B" amplification. A magnetic reproducer is used.

"C" voltages are obtained from the 6 volt "C" battery connection and from a potentiometer consisting of resistors R9, R10 and R11 connected between the 6 volt "C" connection and ground.

Models with the filament rheostat are connected as shown in Fig. 2. This rheostat permits the use of a 3 volt "A" battery. As shown in Fig. 2, there are two separate variable resistors one of which controls the filament voltage and the other the pilot lamp rheostat. In models which do not have the filament rheostat the "A" connection is made directly to the "A" line and the pilot lamp.

DIAL AND DRIVE ASSEMBLY

Table with columns: Part No., Description, Selling Price. Lists parts for the dial and drive assembly like P-34A12, P-34A13, etc.

ing out the image frequencies on the standard wave band.

The oscillator potential on the oscillator control grid of this tube modulates the electron stream from the cathode in such a manner as to impress on it the oscillator frequency which is always 456 KC above the frequency to which the R.F. amplifier is tuned. The electron stream is also modulated at the signal frequency by the detector control grid. As a result of the beating of the two frequencies, the intermediate or beat frequency of 456 KC is present in the plate circuit of this tube.

One stage of I.F. amplification is employed using a 34 tube. The primaries and secondaries of the first and second I.F. transformers are tuned by small trimmer condensers.

A type 1B5 duo-diode triode tube functions as the second detector and a one stage audio amplifier. The two diode plates are connected together. AVC voltage is applied through isolating resistors to the control grid circuits of the 1st detector and I.F. tubes. The audio voltage developed across volume control resistor R5 is applied through the movable arm to the control grid of the 1B5 tube.

Circuit

This radio is designed to operate from a battery power supply the values of which are shown in Figs. 2 and 3. The tubes used are of the 2 volt type. The radio is designed to operate at a very low current drain from the batteries.

Two bands are covered with a tuning range in each band as shown in the specifications above. Two band coverage is accomplished by means of two sets of antenna and oscillator coils and a single section double throw switch.

Referring to the schematic circuit diagram, Fig. 2, T1 and T2 are the antenna transformer and oscillator coil assemblies and T3 is the image rejector coil assembly. The standard wave and short wave coils are indicated by the letters B and D respectively.

The band switch completes connections to the antenna transformer secondary and oscillator grid coil in use. It also disconnects the antenna transformer secondary and oscillator grid coil not in use.

The antenna transformer with tuned secondary feeds into a type 1C6 pentagrid converter tube which functions as the oscillator and 1st detector. The image rejector pickup coil which is connected to the antenna "B" range transformer, is effective in buck-

Replacement Parts List

MISCELLANEOUS

Table with columns: Part No., Description, Selling Price. Lists miscellaneous parts like sockets, speakers, knobs, and general components.

TRANSFORMERS AND COILS

Table with columns: Part No., Code, Description, Selling Price. Lists transformer and coil parts like P-34A23, P-34A24, etc.

DIAL AND DRIVE ASSEMBLY

DIAL ASSEMBLY

Table with columns: Part No., Description, Selling Price. Lists dial assembly parts like P-15A44, P-15A45, etc.

Return defective parts to division superintendent only. There is a large letter on the chassis which identifies the set as major part changes. When ordering parts please be sure to mention the model number and this large letter.

Prices subject to change without notice

P-14A54 2 Gang Condenser for Drive Drum and Dial Assembly.....\$12.20

MISCELLANEOUS

CONDENSERS

TUBULAR

Table with columns: Part No., Code, Capacitance, Voltage, Selling Price. Lists tubular condenser parts like P-40A10, P-40A11, etc.

ELECTROLYTIC

MOLDED

Table with columns: Part No., Code, Capacitance, Voltage, Selling Price. Lists electrolytic condenser parts like P-47A12, P-47A13, etc.

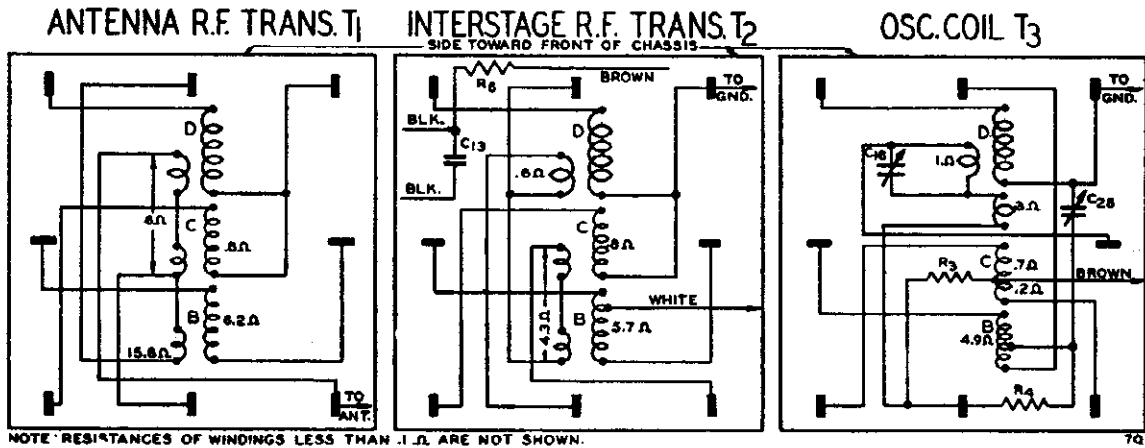
TRIMMER

Table with columns: Part No., Code, Description, Selling Price. Lists trimmer parts like P-17A57, P-17A58, etc.

MODELS 62-327, 62-337
62-427, 62-437

MONTGOMERY-WARD & CO.

Socket, Trimmers, Coils
Voltage, Batt. Connections



NOTE: RESISTANCES OF WINDINGS LESS THAN 1 Ω ARE NOT SHOWN.

Fig. 7—R.F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

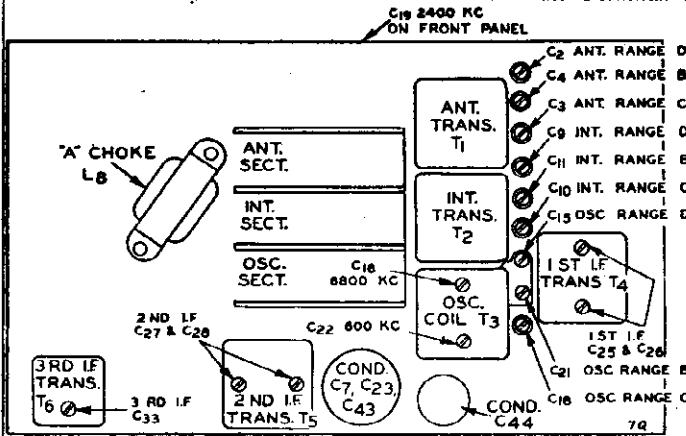


Fig. 3—Location of Trimmers

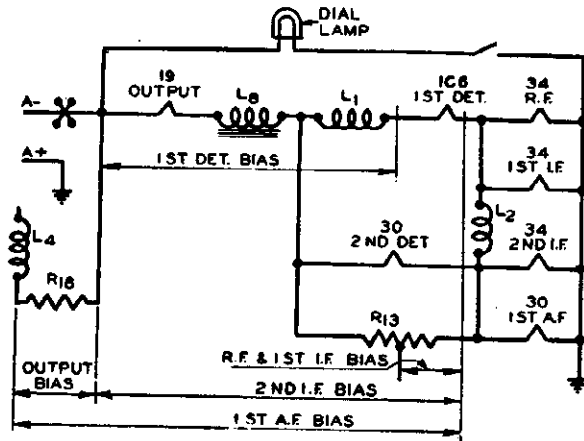


Fig. 5—Abridged wiring diagram showing filament wiring system and points at which no-signal bias voltages are obtained.

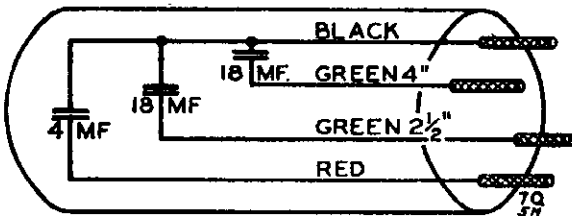


Fig. 8—Electrolytic Condenser Internal Connections

FOR MOVIE DIAL DATA, SEE INDEX

VOLTAGES AT SOCKETS					
Volume Control at Maximum			Antenna Shorted to Ground		
Battery - 6 Volts			Band Switch in Standard Wave Position		
Type of Tube	Function	Across Filament	Plate to Ground	Screen to Ground	Bias Voltage See Notes
34	R.F.	2.0	145	55	1.0(1)
IC6	1st Det.-Osc.	2.0	145	60	2 (3)
34	1st I.F.	2.0	145	55	1.0(1)
34	2nd I.F.	2.0	140	90	4.0(3)
30	2nd Det.	2.0			
30	1st A.F.	2.0	140		9 (4)
19	Power	2.0	140		5 (5)

- (1) As read from negative filament leg to tap of resistor R13.
- (2) Anode grid to ground.
- (3) As read from negative filament leg to A—.
- (4) Total voltage drop from negative filament leg to low potential end of resistor R18.
- (5) As read across resistor R18.

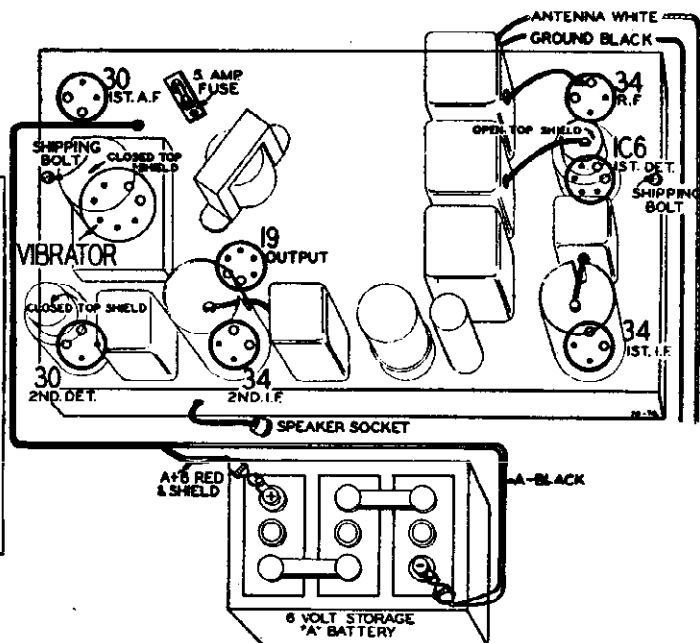


Fig. 4—Tube Arrangement and Battery Connections

MONTGOMERY-WARD & CO.

MODELS 62-327, 62-337
62-427, 62-437

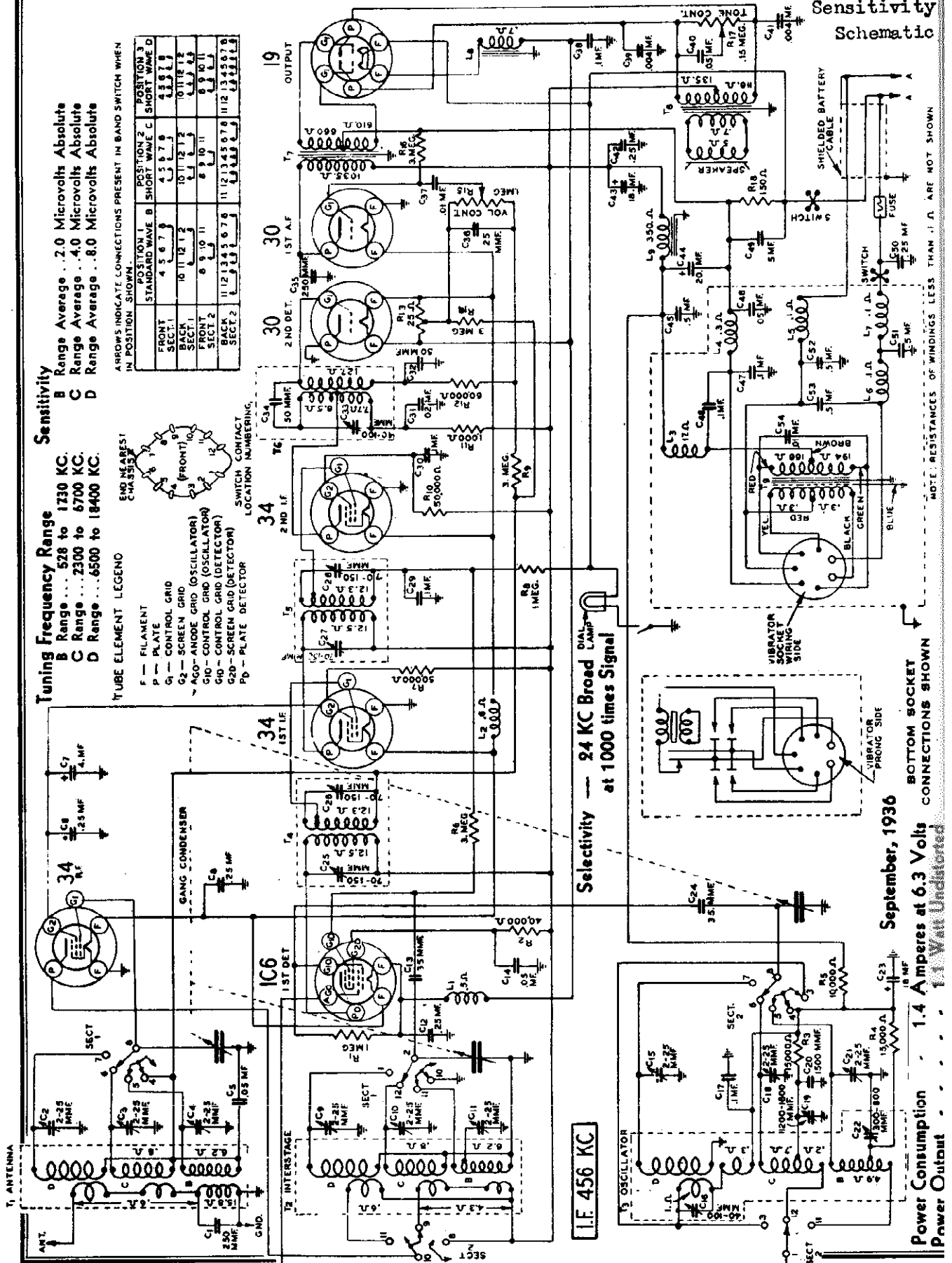
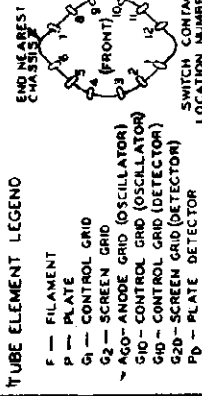
Sensitivity
Schematic

Tuning Frequency Range
 B Range ... 528 to 1730 KC.
 C Range ... 2300 to 6700 KC.
 D Range ... 6500 to 18400 KC.

Sensitivity
 B Range Average ... 2.0 Microvolts Absolute
 C Range Average ... 4.0 Microvolts Absolute
 D Range Average ... 8.0 Microvolts Absolute

ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

	POSITION 1 STANDARD WAVE	POSITION 2 SHORT WAVE C	POSITION 3 SHORT WAVE D
FRONT SECT. 1	4 5 6 7 8	4 5 6 7 8	4 5 6 7 8
FRONT SECT. 2	10 11 12 13	10 11 12 13	10 11 12 13
FRONT SECT. 3	9 10 11	9 10 11	9 10 11
BACK SECT. 1	11 12 13 14 15 16 17	11 12 13 14 15 16 17	11 12 13 14 15 16 17
BACK SECT. 2	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10



September, 1936

Power Consumption 1.4 Amperes at 6.3 Volts
Power Output 1.1 Watt Unfiltered

Bottom Socket Connections Shown

Note: Resistances of windings less than 1 Ω are not shown.

MODELS 62-327, 62-337
62-427, 62-437
Alignment, Data, Parts

MONTGOMERY-WARD & CO.

Table with multiple columns: Part No., Description, and Page. Includes sections for MISCELLANEOUS, RESISTORS, WIRE WOUND, VALUABLE, DIAL AND DRIVE ASSEMBLY, and DIAL AND DRIVE ASSEMBLY - Continued.

Servicing Power Unit
The power unit is that portion of the chassis assembly contained within the large rectangular shield and the circuit for which is shown within the shield lines at the lower right side of the schematic diagram, Fig. 2.

Resonance Check
The power transformer, choke coil circuits and condenser shorts may be checked by utilizing the vibrator socket terminals and various points on the "A" or "B" lines, without removal of the shield can. For example, when checking the continuity or resistance of the upper half of the transformer secondary, contact may be made with the test leads at the primary vibrator socket terminals. The positive terminal of the 20 mfd. electrolytic condenser, C24.

Removing Transformer and Vibrator Socket Assembly
Take off the unit shield can by removing the four screws in the right side of the chassis from the bolts at the top of the chassis. Unloosen the ground connections from the two lugs on the inside of the chassis base (right side from front). Uncover the black and white coded wire from the terminal strip by moving the front of the chassis. This terminal strip is mounted on the front of the chassis. Remove the bracket holding the terminal strip in the transformer cover.

Replacement of Buffer Condenser C24
This condenser is located in the top of the transformer and vibrator assembly just underneath the vibrator socket. To replace, remove the assembly as explained in the preceding article. In addition, the two screws holding the vibrator socket to the transformer cover assembly should be taken out. The condenser is then easily replaced with the tuning shaft.

Replacement of Tuning Condenser C25
This condenser is located in the top of the transformer and vibrator assembly just underneath the vibrator socket. To replace, remove the assembly as explained in the preceding article. In addition, the two screws holding the vibrator socket to the transformer cover assembly should be taken out. The condenser is then easily replaced with the tuning shaft.

Replacement of Power Transformer
Proceed with replacement of the power transformer as with any other necessary service or replacement and then reassemble.

Replacement of Tuning Condenser C25
This condenser is located in the top of the transformer and vibrator assembly just underneath the vibrator socket. To replace, remove the assembly as explained in the preceding article. In addition, the two screws holding the vibrator socket to the transformer cover assembly should be taken out. The condenser is then easily replaced with the tuning shaft.

Replacement of Power Transformer
Proceed with replacement of the power transformer as with any other necessary service or replacement and then reassemble.

1730 KC Adjustment
Set the signal generator for 1730 KC. Turn the rotor of the tuning condenser to the full open position. Keep the band switch in the standard wave position. Connect the antenna lead of the receiver through a 200 mfd. condenser to the output of the signal generator. For this and all subsequent adjustments keep the volume control at the maximum position and antenna AVC action.

18,400 KC Adjustment
Set the signal generator for 18,400 KC. Keep the antenna lead of the receiver connected through the 400 ohm resistor to the output of the signal generator. Turn the rotor of the tuning condenser to the full open position. Turn the band switch to the Range D position (400 ohm wave band). Adjust the oscillator Range D trimmer (C11) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

15,000 KC Adjustment
Set the signal generator for 15,000 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained. Adjust the oscillator Range D trimmer (C11) and antenna Range D trimmer (C2) to maximum. D trimmers, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained. Do not change the setting of the oscillator Range D trimmer.

6800 KC Adjustment
Set the signal generator for 6800 KC. Turn the tuning condenser rotor until maximum output is obtained. Turn the oscillator Range D trimmer (C11) until maximum output is obtained. See Fig. 3 for location of this trimmer.

600 KC Adjustment
Set the signal generator for 600 KC. Turn the tuning condenser rotor until maximum output is obtained. Turn the oscillator Range B trimmer (C11) and antenna Range B trimmer (C2) to maximum. Adjust the oscillator Range B trimmer (C11) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

6000 KC Adjustment
Set the signal generator for 6000 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained. Adjust the oscillator Range C trimmer (C10) and antenna Range C trimmer (C3) to maximum. Do not change the setting of the oscillator Range C trimmer.

2400 KC Adjustment
Set the signal generator for 2400 KC. Turn the tuning condenser rotor until maximum output is obtained. Turn the oscillator Range C trimmer (C10) and antenna Range C trimmer (C3) to maximum. Do not change the setting of the oscillator Range C trimmer.

Range B Alignment
After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

Range C Alignment
Connect the ground lead of the receiver to the ground post of the signal generator. Turn the band switch to the Range B position (standard wave band). Turn the volume control to the maximum position. Attract the signal from the signal generator to prevent the leveling-off action of the AVC. Then adjust the five I.F. trimmer screws until maximum output is obtained. The adjusting screws for these trimmers are located from the top of the chassis and the location is shown in Fig. 4.

Range D Alignment
Set the signal generator for 18,400 KC. Keep the antenna lead of the receiver connected through the 400 ohm resistor to the output of the signal generator. Turn the rotor of the tuning condenser to the full open position. Turn the band switch to the Range D position (400 ohm wave band). Adjust the oscillator Range D trimmer (C11) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

15,000 KC Adjustment
Set the signal generator for 15,000 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained. Adjust the oscillator Range D trimmer (C11) and antenna Range D trimmer (C2) to maximum. D trimmers, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained. Do not change the setting of the oscillator Range D trimmer.

6800 KC Adjustment
Set the signal generator for 6800 KC. Turn the tuning condenser rotor until maximum output is obtained. Turn the oscillator Range D trimmer (C11) until maximum output is obtained. See Fig. 3 for location of this trimmer.

600 KC Adjustment
Set the signal generator for 600 KC. Turn the tuning condenser rotor until maximum output is obtained. Turn the oscillator Range B trimmer (C11) and antenna Range B trimmer (C2) to maximum. Adjust the oscillator Range B trimmer (C11) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

6000 KC Adjustment
Set the signal generator for 6000 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained. Adjust the oscillator Range C trimmer (C10) and antenna Range C trimmer (C3) to maximum. Do not change the setting of the oscillator Range C trimmer.

2400 KC Adjustment
Set the signal generator for 2400 KC. Turn the tuning condenser rotor until maximum output is obtained. Turn the oscillator Range C trimmer (C10) and antenna Range C trimmer (C3) to maximum. Do not change the setting of the oscillator Range C trimmer.

Range B Alignment
After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

Trimmer Replacement
If one trimmer of the given trimmer set should become defective, it is possible to replace the trimmer with a new one. A single trimmer P17A26, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (do not ground) of the defective trimmer in the strip. This connection is then made to the single trimmer. Connect it to the side of the power transformer.

Condenser Replacement
If one condenser of the given condenser set should become defective, it is possible to replace the condenser with a new one. A single condenser P17A26, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (do not ground) of the defective condenser in the strip. This connection is then made to the single condenser. Connect it to the side of the power transformer.

Transformer and Coils
If one transformer or coil of the given transformer and coil set should become defective, it is possible to replace the transformer or coil with a new one. A single transformer and coil P17A26, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (do not ground) of the defective transformer or coil in the strip. This connection is then made to the single transformer or coil. Connect it to the side of the power transformer.

Power Transformer
If one power transformer of the given power transformer set should become defective, it is possible to replace the power transformer with a new one. A single power transformer P17A26, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (do not ground) of the defective power transformer in the strip. This connection is then made to the single power transformer. Connect it to the side of the power transformer.

Vibrator
If one vibrator of the given vibrator set should become defective, it is possible to replace the vibrator with a new one. A single vibrator P17A26, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (do not ground) of the defective vibrator in the strip. This connection is then made to the single vibrator. Connect it to the side of the power transformer.

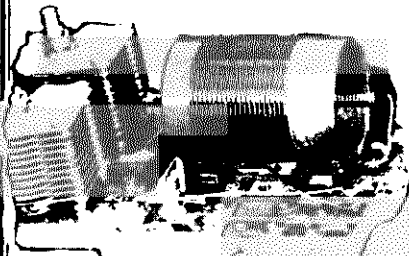
Power Transformer
If one power transformer of the given power transformer set should become defective, it is possible to replace the power transformer with a new one. A single power transformer P17A26, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (do not ground) of the defective power transformer in the strip. This connection is then made to the single power transformer. Connect it to the side of the power transformer.

Vibrator
If one vibrator of the given vibrator set should become defective, it is possible to replace the vibrator with a new one. A single vibrator P17A26, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (do not ground) of the defective vibrator in the strip. This connection is then made to the single vibrator. Connect it to the side of the power transformer.

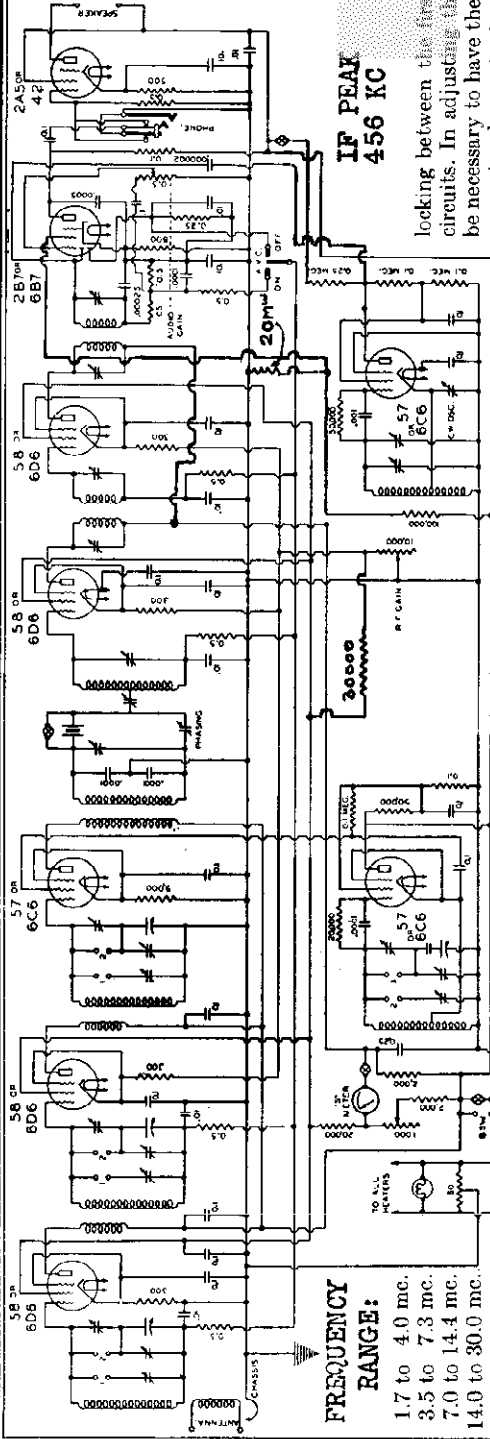
Power Transformer
If one power transformer of the given power transformer set should become defective, it is possible to replace the power transformer with a new one. A single power transformer P17A26, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (do not ground) of the defective power transformer in the strip. This connection is then made to the single power transformer. Connect it to the side of the power transformer.

NATIONAL COMPANY, INC.

MODEL HRO
Schematic, Socket
Trimmers, Alignment



R.F. COIL UNIT RE-MOVED FROM ITS SHIELD



locking between the first detector and oscillator circuits. In adjusting the No. 2 trimmer, it will be necessary to have the antenna connected with some signal or noise input.

Band-Spread Adjustment

The four screws must be shifted to the right-hand terminal blocks, as outlined under "Coil Ranges" in the preceding section. The tuning dial is set at 450 and a test oscillator adjusted to the exact high-frequency edge of the proper amateur band. Trimmer No. 7 (of the layout diagram) is adjusted until the signal is picked up. Trimmers Nos. 1, 3 and 5 are then adjusted for maximum sensitivity. The dial is then rotated to the low-frequency end of the band; that is, to 50, and the left-hand calibration curve should be checked. If found incorrect, it will be necessary to adjust the band-spread series padding condenser, mounted inside the oscillator coil and adjustable from the rear by means of a socket wrench. If the low-frequency end of the band is tuned in at any dial reading above 50, the capacity of this series padding condenser must be decreased.

Tracking of the two R. F. and first detector circuits may then be checked by tuning to the low-frequency end of the band and checking the adjustment of the Nos. 1, 8 and 5 trimmers. If more capacity is needed for best sensitivity (as indicated by improved signal strength when the trimmer is rotated clockwise), the series padding condenser of the coil being adjusted must have more capacity. If any of the Nos. 1, 3 or 5 trimmers require less capacity, a corresponding decrease must be made in the capacity of the series padding condenser. After the series padding condenser has been adjusted for trial, the dial is returned to 450 and the procedure repeated.

The coil panel screws must be in the left-hand terminal blocks to give the full coverage range.

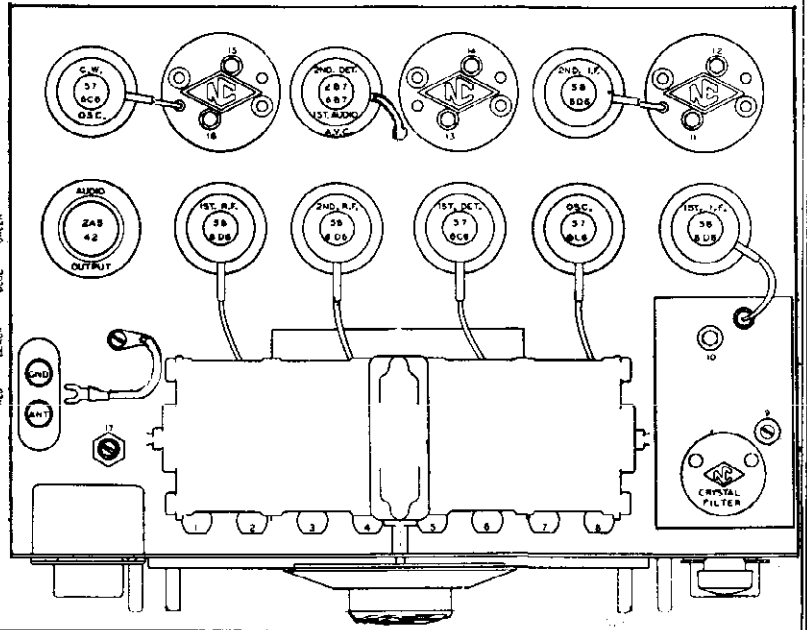
The tuning dial is turned to approximately 490 and a frequency meter, or accurate test oscillator, is set to the frequency indicated by the general coverage calibration chart.

The oscillator coil trimmer, shown on the layout diagram of the receiver as No. 8, is then adjusted so that the dial reading checks the calibration curve. Trimmers Nos. 2, 4 and 6 are then adjusted for maximum sensitivity.

The ganging is checked by pressing the outside rotor plate of the oscillator condenser sideways toward the stator.

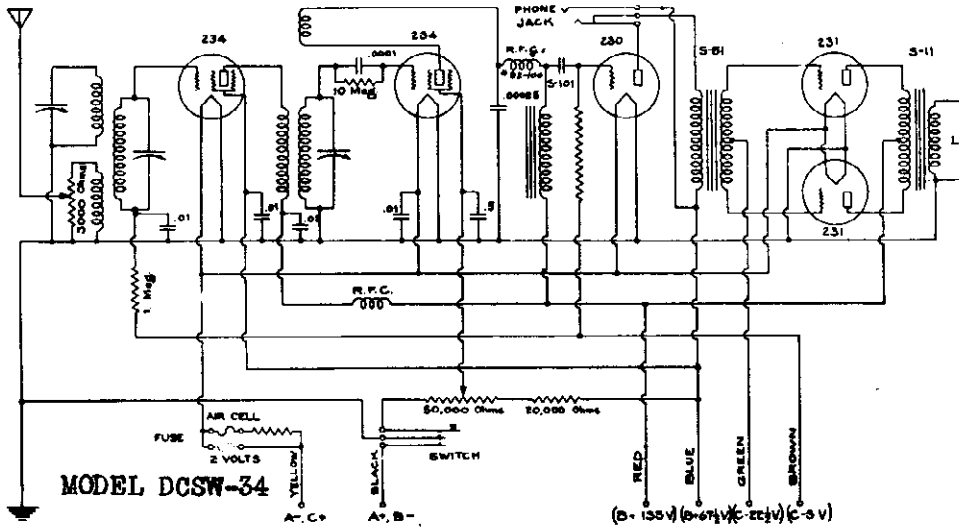
If sensitivity increases, the oscillator coil inductive trimmer must be adjusted to decrease inductance. In the case of the 14 to 30 megacycle coils, inductive trimming is accomplished by moving a loop of wire around the end of the oscillator coil. Bending this loop from right to left across the end of the coil form will increase inductance. After any change in the oscillator coil inductance has been made, it will be necessary to tune back to the high-frequency end of the range in order to readjust the No. 8 trimmer condenser.

In the case of the 14 to 30 megacycle coils, special care must be exercised to see that the oscillator is operating on the high-frequency side of the signal. Two points will be found when adjusting the No. 8 trimmer and of these, the correct one is on the counter-clockwise side. Furthermore, in adjusting the No. 6 trimmer of this coil assembly, there will be some interaction or inter-



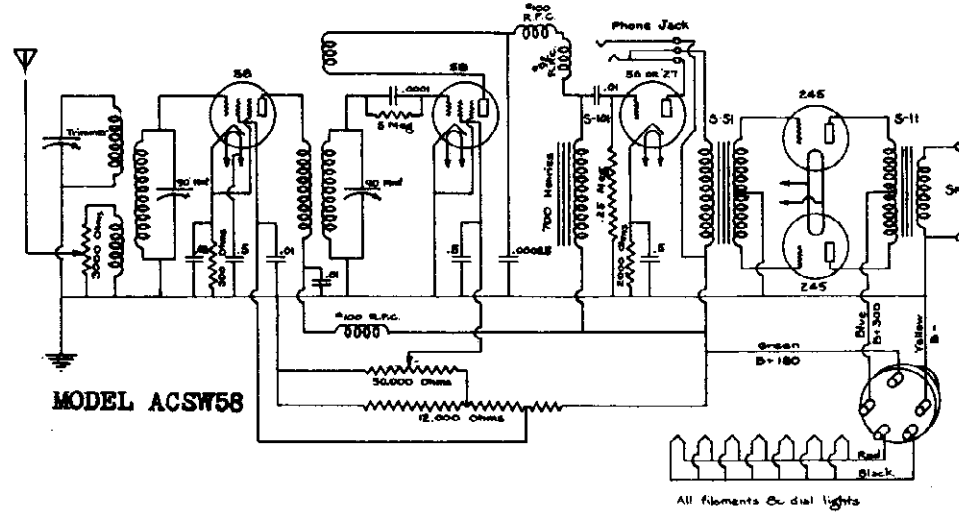
MODEL DCSW-34
 MODEL ACSW-58
 MODELS FBX, FBXA
 Schematics, Notes

NATIONAL COMPANY, INC.

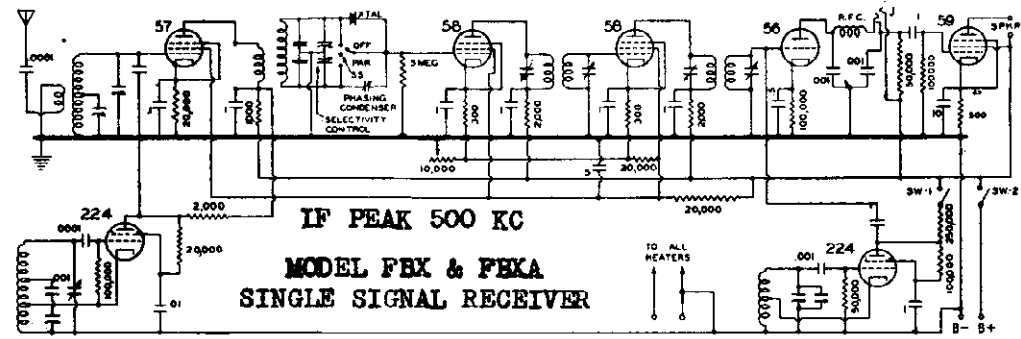


FREQUENCY RANGE AND COILS

bers only, beginning with the number 60 and increasing with wavelength. The d-c coils may be identified by number — from 10 to 21 increasing with wavelength — and by the color strip molded into the top ring. The wavelength of the coils increases with the number of turns of wire.
 Coils can be had extending the wavelengths of the receivers as high as 2000 meters (see catalog page 19), and the coils forms are available for the home winding of special inductors.



Five sets of coils are furnished with each SW-58 and SW-34, two coils to a set, and covering wavelengths from 13.5 to 200 meters. One coil of each set is plugged into the r-f circuit (left hand coil socket) and one coil into the detector coil socket. The two coils of each set are identical, and the wave bands they cover are indicated on the chart on the cover of the receiver and in the catalog coil list.
 The coils for the a-c receiver are designated by num-



See Special Section and Model NC100 (see index) for Alignment of this receiver.

FREQUENCY RANGES

- (Approximate, see calibration chart on inside of receiver cover)
- Coil A - 11500 to 19500 KC
 - Coil B - 6900 to 11750 KC
 - Coil C - 4100 to 7400 KC
 - Coil D - 2350 to 4350 KC
 - Coil E - 1500 to 2550 KC

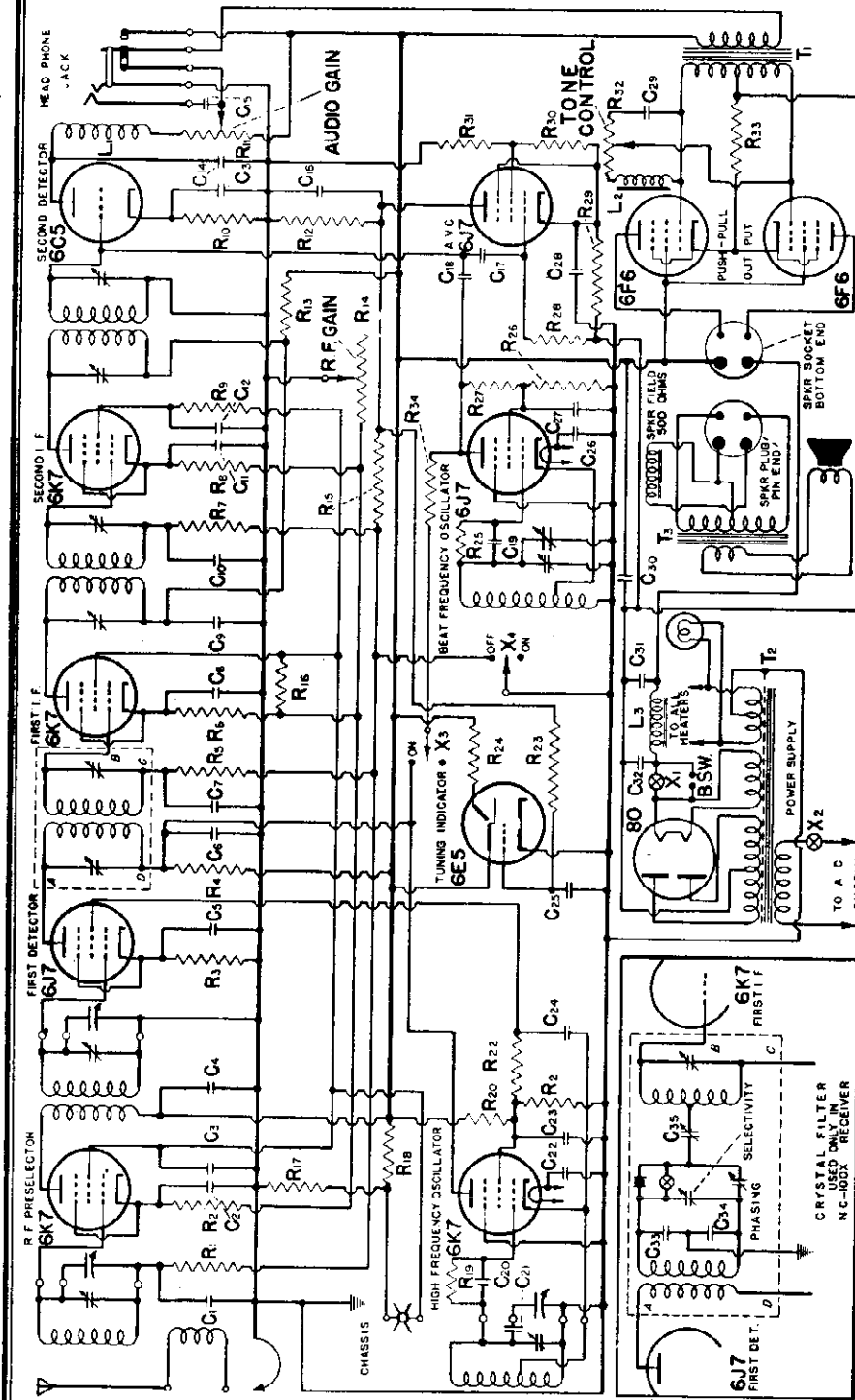
NATIONAL COMPANY, INC.

MODEL NC-100
Schematic, Parts

TYPE NC-100 RECEIVER

- | | | | |
|---|----------|--------------------------------------|----------|
| C24 H.F. Oscillator Coupling .01 mfd. | 400 volt | C34 Crystal Filter Bridge .0001 mfd. | Mica |
| C25 Tuning Indicator Grid Filter .01 mfd. | 400 volt | C35 Crvstal Filter Coupling 35 mmf. | Variable |
| C26 C.W. Oscillator Heater Bypass .1 mfd. | 200 volt | X1 B + (stand-by) Switch | |
| C27 C.W. Oscillator Screen Bypass .1 mfd. | 200 volt | X2 AC On-Off Switch | |
| C28 AVC Cathode Bypass .1 mfd. | 200 volt | X3 C.W. Oscillator Switch | |
| C29 Tone Control .01 mfd. | 400 volt | X4 AVC On-Off Switch | |
| C30 B-Supply Filter 8 mfd. | 450 volt | L1 2nd Det. I.F. Choke 7. mh. | |
| C31 B-Supply Filter 8 mfd. | 450 volt | L2 Tone Filter Choke 18. Henry | |
| C32 B-Supply Filter 8 mfd. | 450 volt | L3 B-Supply Filter Choke 20. Henry | |
| C33 Crystal Filter Bridge .0001 mfd. | Mica | | |

- T1 Push-Pull Input Audio Transformer 4:1 Ratio
 T2 Power Transformer
 T3 Output Transformer Mounted on Speaker



- | | | |
|---|--|---|
| R1 R.F. Grid filter .5 megohm | R21 H.F. Oscillator Voltage Divider 100,000 ohms | C4 R.F. and H.F. Osc. Plate Bypass 1 mfd. |
| R2 R.F. Cathode Bias 350 ohms | R22 1st Det. Screen Filter 100,000 ohms | C5 1st Det. Cathode Bypass .1 mfd. |
| R3 1st Det. Cathode Bias 5000 ohms | R23 Tuning Indicator Grid Filter .5 megohm | C6 1st Det. Plate Filter .1 mfd. |
| R4 H.F. Circuit B + Filter 2000 ohms | R24 Tuning Indicator Target .1 megohm | C7 1st I.F. Grid Filter .01 mfd. |
| R5 1st I.F. Grid Filter .5 megohm | R25 C.W. Oscillator Grid Leak 50,000 ohms | C8 1st I.F. Cathode Bypass .1 mfd. |
| R6 1st I.F. Cathode Bias 350 ohms | R26 C.W. Oscillator Voltage Divider 100,000 ohms | C9 1st and 2nd I.F. Plate Filter .1 mfd. |
| R7 2nd I.F. Grid Filter .5 megohm | R27 C.W. Oscillator Voltage Divider 100,000 ohms | C10 2nd I.F. Grid Filter .1 mfd. |
| R8 2nd I.F. Cathode Bias 500 ohms | R28 AVC Voltage Divider 100,000 ohms | C11 2nd I.F. Cathode Bypass .1 mfd. |
| R9 2nd I.F. Screen Filter 2000 ohms | R29 AVC Voltage Divider 1000 ohms | C12 2nd Det. Cathode Bypass 10. mfd. |
| R10 2nd Det. Cathode Bias 20,000 ohms | R30 AVC Voltage Divider 1000 ohms | C13 2nd Det. Cathode Bypass .001 mfd. |
| R11 Audio Volume Control 50,000 ohm potentiometer | R31 Tone Control 800,000 ohm potentiometer | C14 Phone Coupling .001 mfd. |
| R12 AVC Plate 2000 ohms | R32 Output Cathode Bias 250 ohms | C15 AVC Plate Bypass .1 mfd. |
| R13 I.F. B + Filter 2000 ohms | R33 C.W. Oscillator Plate Filter .25 megohm | C16 AVC Grid Coupling .0001 mfd. |
| R14 R.F. Gain Control 10,000 ohm variable | C1 R.F. Oscillator Grid .01 mfd. | C17 C.W. Oscillator Coupling .001 mfd. |
| R15 Common Grid Filter .5 megohm | C2 R.F. Cathode Bypass .1 mfd. | C18 H.F. Oscillator Grid .0001 mfd. |
| R16 Gain Control Bleeder 20,000 ohms | C3 R.F. and 1st I.F. Screen Bypass 1 mfd. | C19 H.F. Oscillator Series Padding — Different for each range |
| R17 Voltage Divider 20,000 ohms | C10 H.F. Oscillator Heater Bypass .01 mfd. | C20 H.F. Oscillator Screen Bypass .1 mfd. |
| R18 H.F. Oscillator Grid Leak 20,000 ohms | | |
| R19 H.F. Oscillator Voltage Divider 50,000 ohms | | |

MODEL NC-100
Chassis, Trimmers
Alignment, Socket

NATIONAL COMPANY, INC.

Preliminary Adjustments — The I.F.

All the I.F. transformers are now adjusted for maximum signal. This adjustment need not be made with any great degree of precision, since the crystal will not oscillate at exactly the same frequency to which it will be resonant in the receiver. The Phasing control should be set at "0".

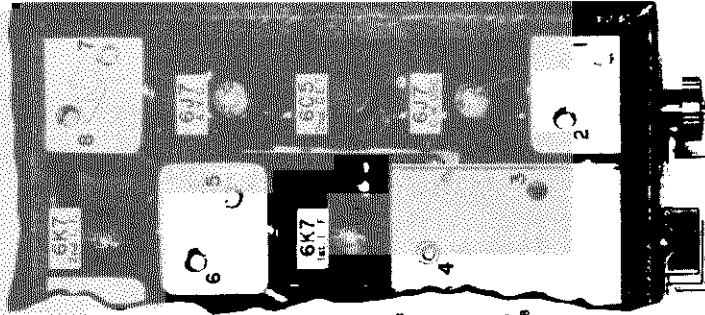
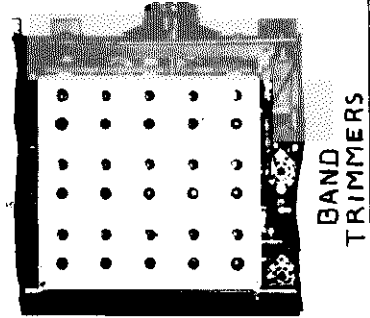
The I.F. adjustments are indicated on the layout diagram, page 4, Nos. 4 to 8 (inclusive).

The crystal filter output coupling condenser, adjustment No. 3, serves as a fixed I.F. gain

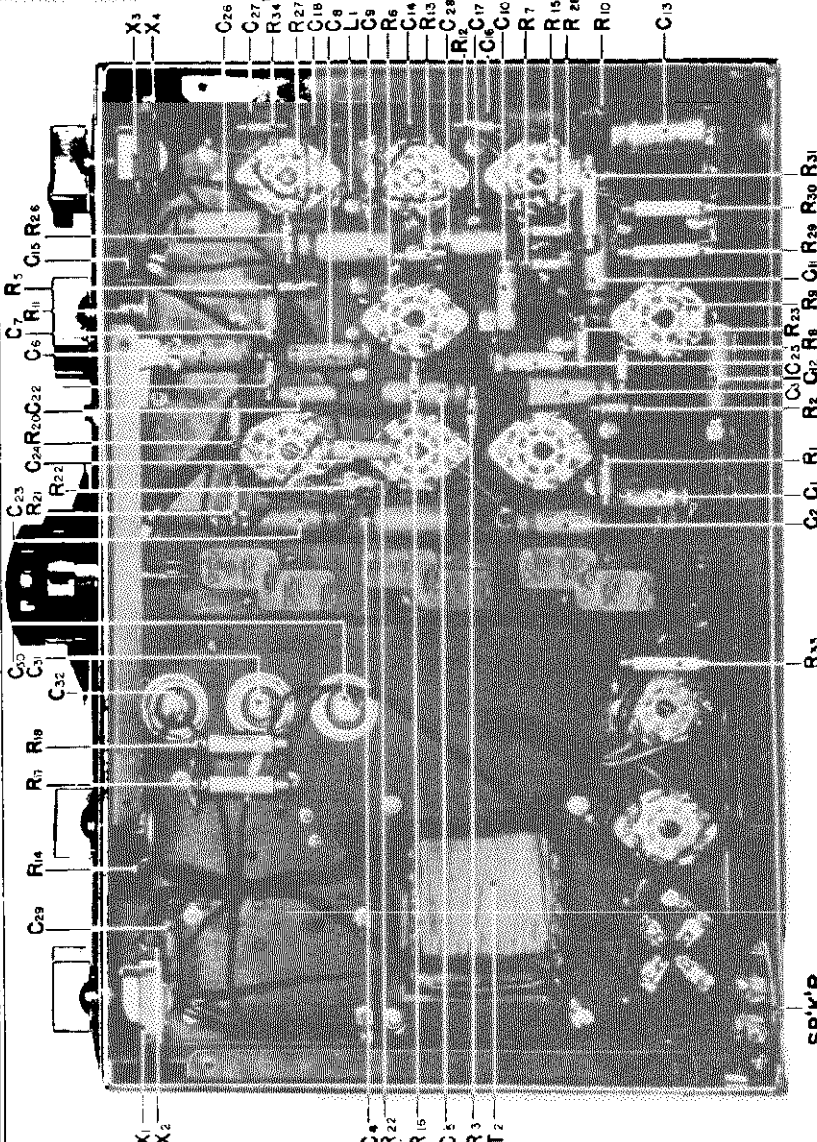
control and, in general, should not be touched.

The crystal may now be removed from the oscillator and installed in the receiver. Throw the switch to connect the crystal for single signal reception. Set the selectivity control for maximum selectivity; that is, with the pointer rotated all the way to the right. Now, tune in a steady signal from a local oscillator or monitor. Tuning very slowly across the carrier, there should be one point at which the signal will peak very sharply. The audio pitch of this peak will be nearly the same as the pitch of the beat used when the crystal oscillator was being picked up.

The final adjustment of the I.F. transformers may now be made. Set the control for maximum



selectivity, carefully tune in a steady signal until it is exactly on the crystal peak, and adjust each of the I.F. transformer tuning condensers for maximum signal strength. (In almost all cases where the I.F. amplifier has once been aligned to the crystal, this check is all that would be required, and it is not necessary to put the crystal in an external oscillator.) Even if the I.F. amplifier is considerably out of alignment, the crystal frequency may be found by employing a strong local signal from a monitor or frequency meter, slowly tuning across it while listening for a peak in the audio beat note. If the peak is found at a very high audio pitch it will be necessary to change the tuning of the beat oscillator so that the audio peak will be well inside the limits of audibility. It is probable that if the peak signal is found at all, the I.F. amplifier will not be far out of tune and the readjustments required will be small.



R.F. and H.F. Oscillator Alignment

Complete alignment of any one coil range is made as follows: Set the tuning dial near the high frequency end of the range between 470 and 490, check the dial reading against the calibration curve by means of an accurate test oscillator or a signal of known frequency; readjustment should be made if the dial reading is in error by more than five or six divisions. In checking the error, disregard the numbers between 495 and 500.

Correction for calibration is made by adjustment of the high frequency oscillator trimmer (nearest the front of the receiver).

With calibration correct at the high frequency end of the range, the dial should be rotated toward the lower numbers. The background noise may vary slightly over the range but should not get appreciably weaker except in the case of the .54 to 1.3 mc. coils. Ganging is checked by pressing one of the outside rotor plates of the oscillator condenser sideways toward the stator, but not enough to make the plates touch. The same check may be applied to the first detector and R.F. tuning condensers. Any bending of the rotor plates should make the background noise definitely weaker. A similar check can, of course, be made by bending the rotor plates out, away from the stator, care being taken not to bend the plates so far that they will not return to their original position.

On the two highest frequency ranges, it may be possible to make the initial oscillator adjustment incorrectly. There are two settings of the oscillator trimmer condenser which will tune in the desired signal at the proper point on the dial; of these, the higher frequency setting (least trimmer capacity) is correct. In checking the ganging of the 13.5 to 30. mc. range, the R.F. condenser has little effect upon the background noise at the low frequency end of the scale and at this one point it is better to use a test signal. Should any error in tracking be found on one range, it is probable that the same error will be present on all ranges and correction may be made by permanently bending the rotor plates of the tuning condenser section in question.

NOBLITT SPARKS INDUSTRIES

MODEL 19 Auto Schematic, Voltage Resistance, Parts

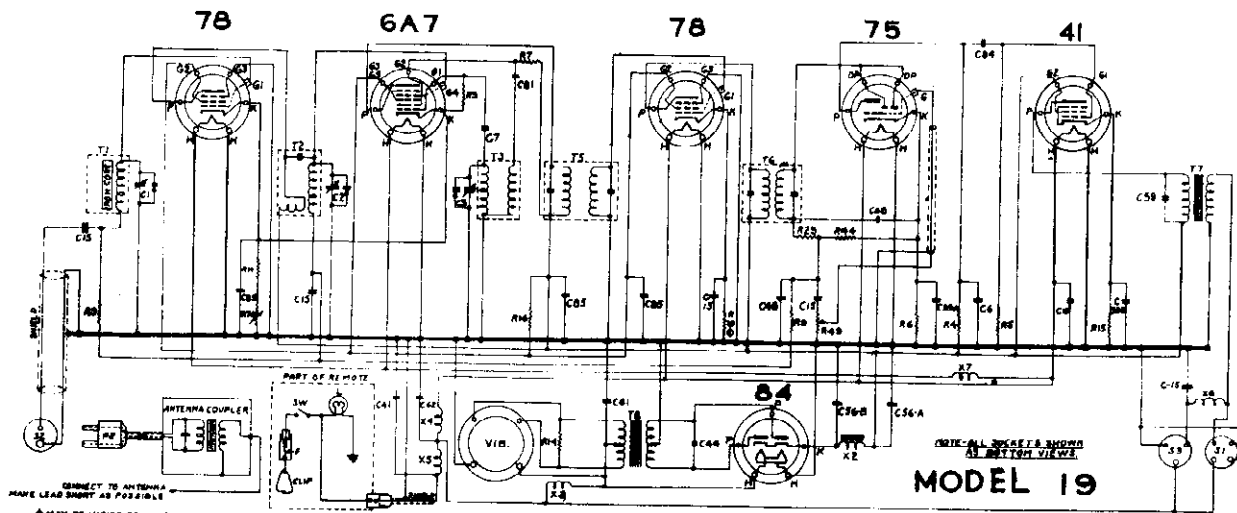


Table listing parts for the Model 19, categorized into Resistors, Capacitors, Coils & Transformers, and Miscellaneous Units. It includes columns for quantity, description, and part number.

MODEL 19 SOCKET VOLTAGES

Volts given here are actually for an input battery voltage of 5.8 amp., even though the normal heater voltage is shown as 6.3 amp.

Table of socket voltages for various tubes (78, 6A7, 75, 41, 84) across different electrodes: Heater, Cathode, Suppressor Grid, Screen Grid, Plate, Oscillator Grid, Anode Grid, and Diode Plates.

* Measured at 1500 K. C.
† Measured with Vacuum Tube Voltmeter.

POINT TO POINT RESISTANCES—MODEL 19

78—R. F. Amplifier

Resistance values for the 78 R.F. Amplifier: Heater (0), Cathode adj. max (1,000 Ω), Suppressor (0), Screen to +B (50,000 Ω), Plate to +B (100 Ω), Control Grid (1,255,000 Ω).

78—I. F. Amplifier

Resistance values for the 78 I.F. Amplifier: Heater (0), Cathode (See Diag.) (1,000 Ω), Suppressor (0), Screen to +B (50,000 Ω), Plate to +B (74 Ω), Control Grid (74 Ω).

41—Power Output

Resistance values for the 41 Power Output stage: Heater (0), Cathode (500 Ω), Control Grid (500,000 Ω), Screen to +B (0), Plate to +B (625 Ω).

6A7—1st Det. Oscillator

Resistance values for the 6A7 1st Det. Oscillator: Heater (0), Cathode adj. max (1,000 Ω), Osc. Grid (100,600 Ω), Anode Grid to +B (20,000 Ω), Screen Grid to +B (50,000 Ω), Plate to +B (74 Ω), Control Grid (1,155,000 Ω).

75—AVC Det; 1st Audio

Resistance values for the 75 AVC Det; 1st Audio stage: Heater (0), Cathode (5,000 Ω), Diode (205,000 Ω), Plate to +B (200,000 Ω), Control Grid, V. C. on (500,000 Ω), Control Grid, V. C. off (Max. 25 Ω).

84—Rectifier

Resistance values for the 84 Rectifier: Heater (0), Cathode to +B (140 Ω), Plate (250 Ω), Plate to Plate (520 Ω).

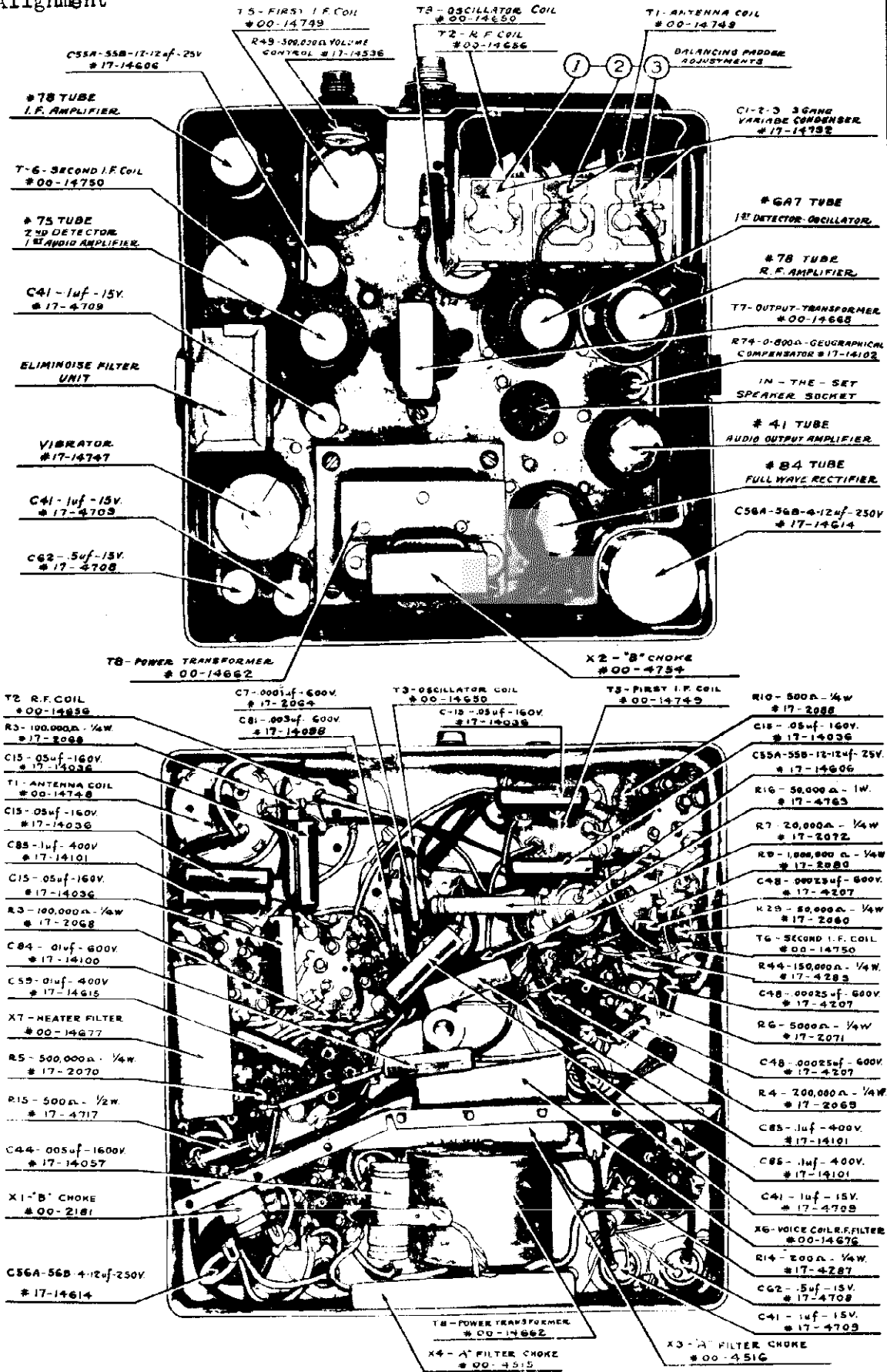
COIL AND TRANSFORMER RESISTANCES

Table of coil and transformer resistances: Phant. Filter Pri. (8.5 Ω), R. F. Coil Pri. (100.0 Ω), Osc. Coil Pri. (3.0 Ω), Osc. Coil Sec. (1.0 Ω), 1st I. F. Trans. Pri. (75.0 Ω), 2nd I. F. Trans. Pri. (75.0 Ω), Output Trans. Pri. (625.0 Ω), Output Trans. Sec. (.40 Ω), "B" Filter Choke (140.0 Ω), Power Trans. Pri. (.075-.075 Ω), Power Trans. Sec. (175.0-200.0 Ω).

MODEL 19 Auto
Socket, Chassis
Trimmers, Alignment

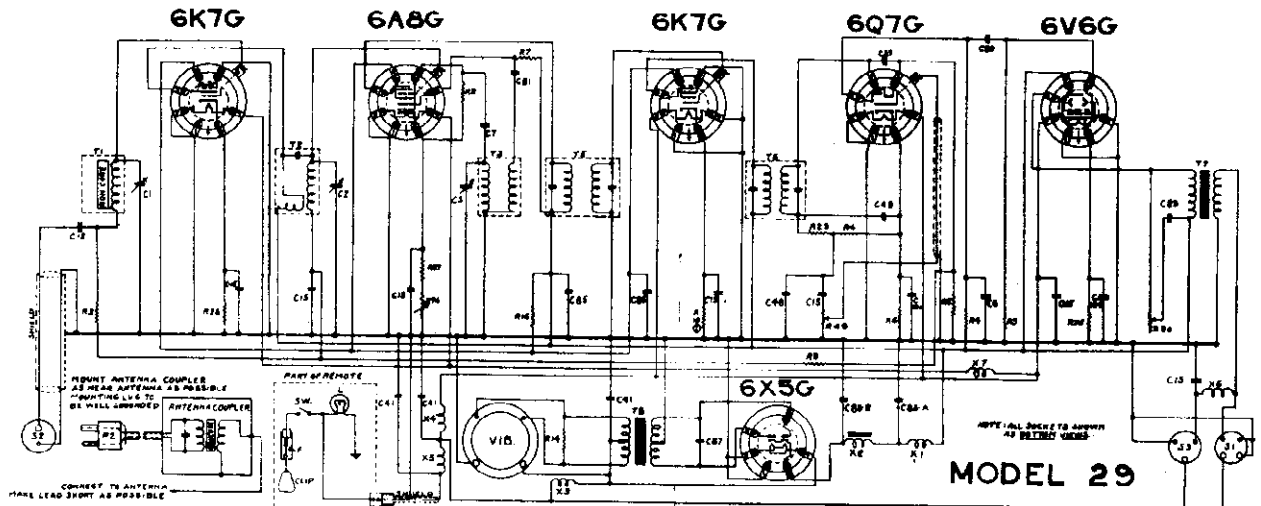
NOBLITT SPARKS INDUSTRIES

ALIGNMENT-Permaset prebalanced IF transformers require no adjustment. Gen. connected to Ant. post of Phantom-Filter. Gang out of mesh. Gen. grounded to chassis. Generator set to 1575 KC, adjust Padder No. 1 for maximum output. Reset Generator to 1400 KC, rotate gang until signal is resonated. Reduce Generator output, then adjust padders NO. 2 and NO. 3 for maximum output. After installation in a car tune in a weak station between 1150 and 1400 KC, readjust padder No. 3 for maximum output.



NOBLITT SPARKS INDUSTRIES

MODEL 29
Schematic, Voltage
Resistance, Parts



RESISTORS				CONDENSERS				CHOSES & TRANSFORMERS				MISCELLANEOUS UNITS	
RESISTOR	VALUE	PART NO.	PRICE	CAPACITANCE	VOLTAGE	PART NO.	PRICE	TYPE	PRICE	DESCRIPTION	PART NO.	PRICE	
R1	500K	17-2500	0.10	500	50	17-1000	0.10	TRANSFORMER	17-1000	POWER TRANS.	17-1000	0.10	
R2	100K	17-1000	0.05	100	50	17-1000	0.05	CHOSE	17-1000	AVC CHOSE	17-1000	0.05	
R3	50K	17-5000	0.05	50	50	17-5000	0.05	TRANSFORMER	17-5000	ANTENNA COUPLER	17-5000	0.05	
R4	10K	17-10000	0.05	10	50	17-10000	0.05	TRANSFORMER	17-10000	AVC TRANS.	17-10000	0.05	
R5	5K	17-50000	0.05	5	50	17-50000	0.05	TRANSFORMER	17-50000	AVC TRANS.	17-50000	0.05	
R6	1K	17-100000	0.05	1	50	17-100000	0.05	TRANSFORMER	17-100000	AVC TRANS.	17-100000	0.05	
R7	500	17-25000	0.05	500	50	17-25000	0.05	TRANSFORMER	17-25000	AVC TRANS.	17-25000	0.05	
R8	100	17-100000	0.05	100	50	17-100000	0.05	TRANSFORMER	17-100000	AVC TRANS.	17-100000	0.05	
R9	50	17-500000	0.05	50	50	17-500000	0.05	TRANSFORMER	17-500000	AVC TRANS.	17-500000	0.05	
R10	10	17-1000000	0.05	10	50	17-1000000	0.05	TRANSFORMER	17-1000000	AVC TRANS.	17-1000000	0.05	
R11	5	17-5000000	0.05	5	50	17-5000000	0.05	TRANSFORMER	17-5000000	AVC TRANS.	17-5000000	0.05	
R12	1	17-10000000	0.05	1	50	17-10000000	0.05	TRANSFORMER	17-10000000	AVC TRANS.	17-10000000	0.05	
R13	500K	17-2500	0.10	500	50	17-1000	0.10	TRANSFORMER	17-1000	POWER TRANS.	17-1000	0.10	
R14	100K	17-1000	0.05	100	50	17-1000	0.05	CHOSE	17-1000	AVC CHOSE	17-1000	0.05	
R15	50K	17-5000	0.05	50	50	17-5000	0.05	TRANSFORMER	17-5000	ANTENNA COUPLER	17-5000	0.05	
R16	10K	17-10000	0.05	10	50	17-10000	0.05	TRANSFORMER	17-10000	AVC TRANS.	17-10000	0.05	
R17	5K	17-50000	0.05	5	50	17-50000	0.05	TRANSFORMER	17-50000	AVC TRANS.	17-50000	0.05	
R18	1K	17-100000	0.05	1	50	17-100000	0.05	TRANSFORMER	17-100000	AVC TRANS.	17-100000	0.05	
R19	500	17-25000	0.05	500	50	17-25000	0.05	TRANSFORMER	17-25000	AVC TRANS.	17-25000	0.05	
R20	100	17-100000	0.05	100	50	17-100000	0.05	TRANSFORMER	17-100000	AVC TRANS.	17-100000	0.05	

Voltagcs given here are actually for an input battery voltage of 5.8 amp., even though the normal heater voltage is shown as 6.3 amp.

Tube	Heater	Cathode	Suppressor Grid	Screen Grid	Plate	*Oscillator Grid	Anode Grid	†Diode Plates
6K76	6.3	2.7	0	74	243	....	....	....
6A8C	6.3	2-6.4	....	74	243	5-12	176	....
6K7C	6.3	3.1	0	74	242	....	....	....
6Q7G	6.3	1.8	....	....	146	....	....	2.0
6V6G	6.3	10.5	....	250	224	....	....	....
6X5G	6.3	255	....	....	275	....	....	....

* Measured at 1500 K. C.
† Measured with Vacuum Tube Voltmeter.

POINT TO POINT RESISTANCES—MODEL 29

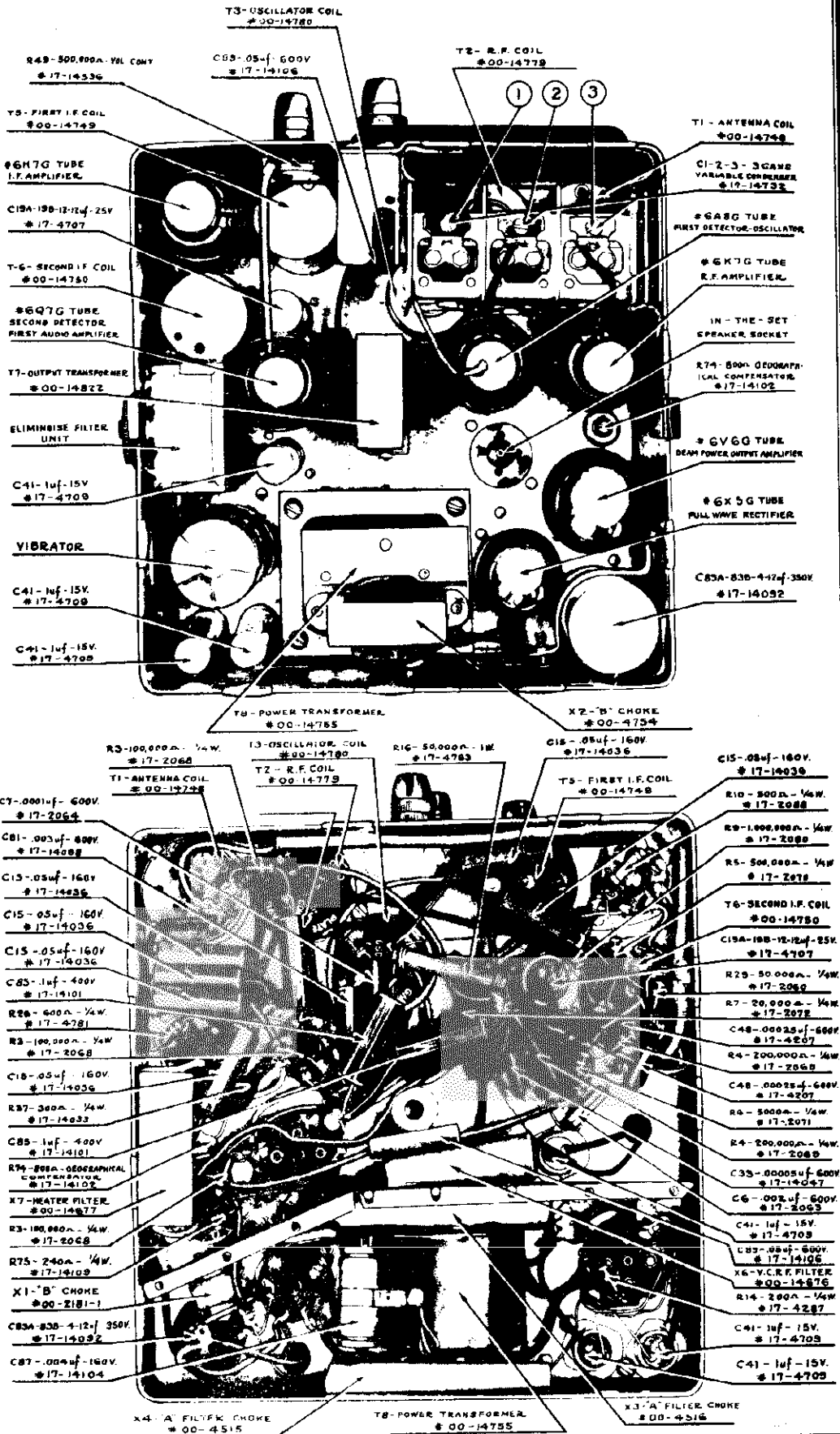
6K7G—R. F. Amplifier	6K7G—I. F. Amplifier	6V6G—Beam Power Output
Heater 0	Heater 0	Heater 0
Heater ∞	Heater ∞	Heater ∞
Cathode 600 Ω	Cathode 500 Ω	Cathode 240 Ω
Suppressor 0	Suppressor 0	Control Grid 100,000 Ω
Screen to +B 50,000 Ω	Screen to +B 50,000 Ω	Screen to +B 0
Plate to +B 100 Ω	Plate to +B 74 Ω	Plate to +B 395 Ω
Control Grid 1,600,000 Ω	Control Grid 74 Ω	
6A8C—1st Det. Oscillator	6Q7G—AVC 2nd Det., 1st Audio	6X5G—Rectifier
Heater 0	Heater 0	Heater 0
Heater ∞	Heater ∞	Heater ∞
Cathode, adj. max. 1,000 Ω	Cathode 5,000 Ω	Cathode to +B 140 Ω
Osc. Grid 100,600 Ω	Diode 205,000 Ω	Plate 185 Ω
Anode Grid to +B 20,000 Ω	Diode 205,000 Ω	Plate 163 Ω
Screen to +B 50,000 Ω	Plate to +B 200,000 Ω	Plate to Plate 348 Ω
Plate to +B 74 Ω	Control Grid, V. C. on 500,000 Ω	
Control Grid 1,500,000 Ω	Control Grid, V. C. off Max. 25 Ω	
COIL AND TRANSFORMER RESISTANCES		
Phant. Filter Pri. 8.5 Ω	Osc. Coil Sec. 1.8 Ω	Output Trans. Pri. 395.0 Ω
Phant. Filter Sec. 1.0 Ω	1st I. F. Trans. Pri. 75.0 Ω	Output Trans. Sec. 1 Ω
Antenna Coil 2,325 Ω	1st I. F. Trans. Sec. 75.0 Ω	Power Trans. Pri. 0.075-0.075 Ω
R. F. Coil Pri. 100.0 Ω	2nd I. F. Trans. Pri. 75.0 Ω	Power Trans. Sec. 175.0-200.0 Ω
R. F. Coil Sec. 3,475 Ω	2nd I. F. Trans. Sec. 75.0 Ω	"B" Filter Choke 140.0 Ω
Osc. Coil Pri. 3.0 Ω		"B" R. F. Choke 1.35 Ω

MODEL 29

Socket, Trimmers
Chassis, Alignment

NOBLITT SPARKS INDUSTRIES

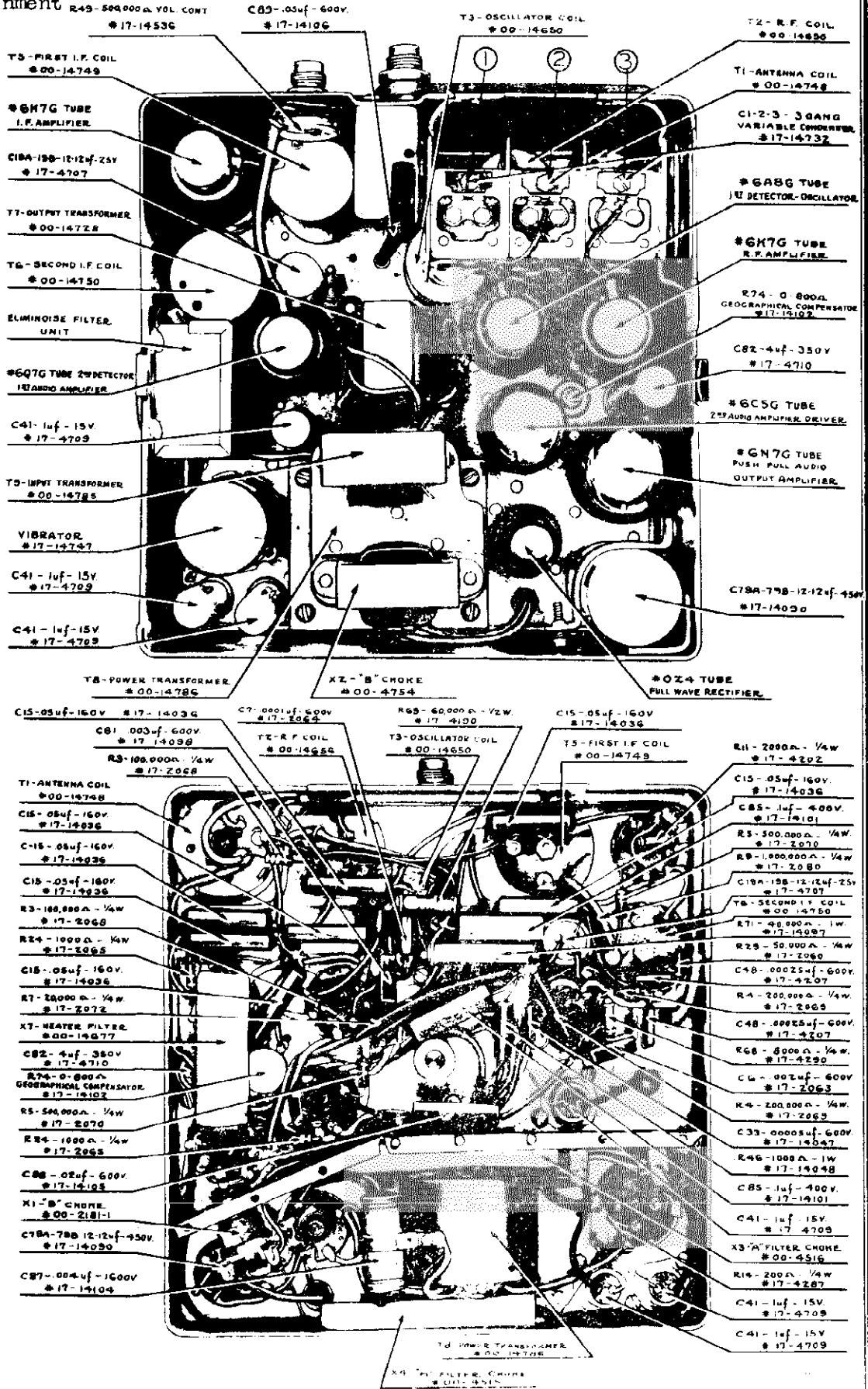
ALIGNMENT- Permaset prebalanced IF transformers require no adjustment. Gen. connected to ANT. post of Phantom-Filter. Gang out of mesh, Generator grounded to chassis, and set to 1575 KC, adjust padder NO. 1 for maximum output. Reset generator to 1400 KC, rotate gang until signal is resonated. Reduce the generator output, then adjust padders NO. 2 and NO. 3 for maximum output. After installation in a car tune in a weak station between 1150 and 1400 KC, readjust padder NO. 3 for maximum output.



MODEL 39

Socket, Trimmers
Chassis, Alignment

NOBLITT SPARKS INDUSTRIES

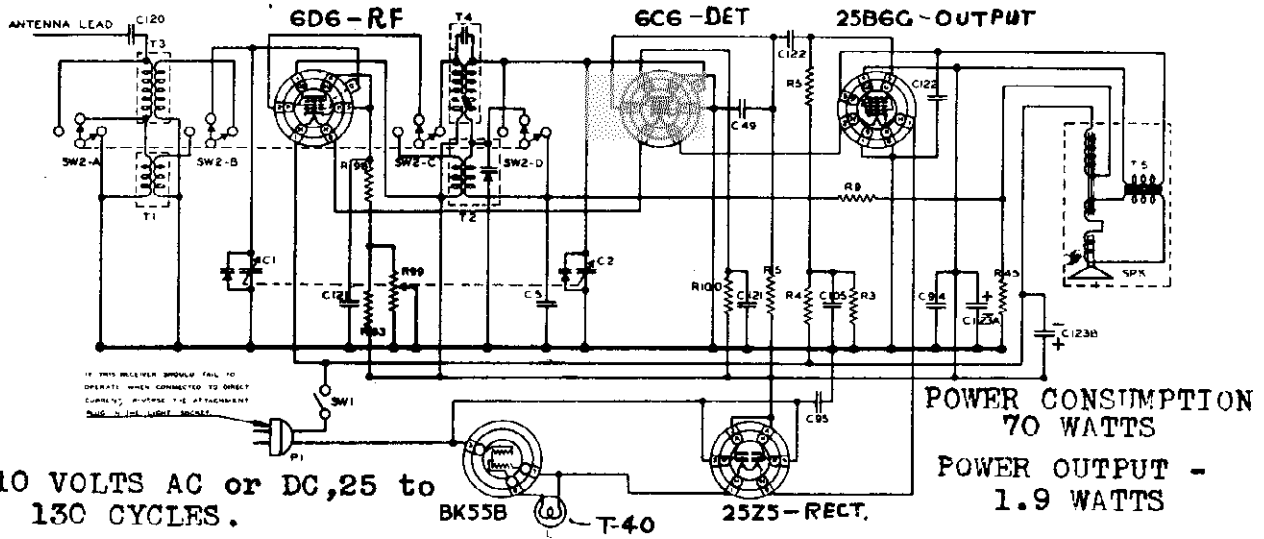


ALIGNMENT- Permaset prebalanced IF transformers require no adjustment. Gen. connected to Ant. post of Phantom-Filter. Gang out of mesh, Generator grounded to chassis, and set to 1575 KC, adjust the Padder No.1 for maximum output. Reset generator to 1400 KC, rotate gang until signal is resonated. Reduce the generator output, then adjust the padders No.2 and No.3 for maximum output. After the installation in a car readjust padder No.3 on a signal between 1150 and 1400 KC for maximum output.

NOBLITT SPARKS INDUSTRIES

MODEL 508 AC-DC
Schematic, Voltage
Resistance, Parts

ARVIN HOME RADIO MODEL 508



110 VOLTS AC or DC, 25 to 130 CYCLES.

POWER CONSUMPTION
70 WATTS

POWER OUTPUT -
1.9 WATTS

RESISTORS				CAPACITORS				TRANSFORMERS				MISCELLANEOUS			
QTY	VAL	TYPE	NO.	QTY	VAL	TYPE	NO.	QTY	TYPE	NO.	QTY	TYPE	NO.		
1	100K	1/2W	1	1	1000	50V	1	1	110V	1	1	1	1		
1	100K	1/2W	2	1	1000	50V	2	1	110V	1	1	1	1		
1	100K	1/2W	3	1	1000	50V	3	1	110V	1	1	1	1		
1	100K	1/2W	4	1	1000	50V	4	1	110V	1	1	1	1		
1	100K	1/2W	5	1	1000	50V	5	1	110V	1	1	1	1		
1	100K	1/2W	6	1	1000	50V	6	1	110V	1	1	1	1		
1	100K	1/2W	7	1	1000	50V	7	1	110V	1	1	1	1		
1	100K	1/2W	8	1	1000	50V	8	1	110V	1	1	1	1		
1	100K	1/2W	9	1	1000	50V	9	1	110V	1	1	1	1		
1	100K	1/2W	10	1	1000	50V	10	1	110V	1	1	1	1		

FREQUENCY RANGE-
BAND "A"-540 to 1600 KC
BAND "B"-1600 to 4250 KC

SENSITIVITY -
BAND A - 250 Microvolts minimum
50 milliwatts output.
BAND B - 400 Microvolts minimum
at 2400 KILOCYCLES.

MODEL 508 SOCKET VOLTAGES
(OUTPUT VOLTAGE 110 AC)

	Heater	Plate	Screen	Suppressor	Cathode	Grid Bias
6D6	6.3	94	94	....	2	....
6C6	6.3	30	20	0	0	....
25B6	25.0	87	94	....	0	15
25Z5	25.0	44	....	....	94	....
BK55B	51.4	....	....	....	....	....
DIAL LITE	6.0	....	....	....	....	....

POINT TO POINT RESISTANCES

All readings taken to ground unless otherwise specified. Tubes in sockets and speaker connected. All shield terminals grounded. Volume control to full-on position.

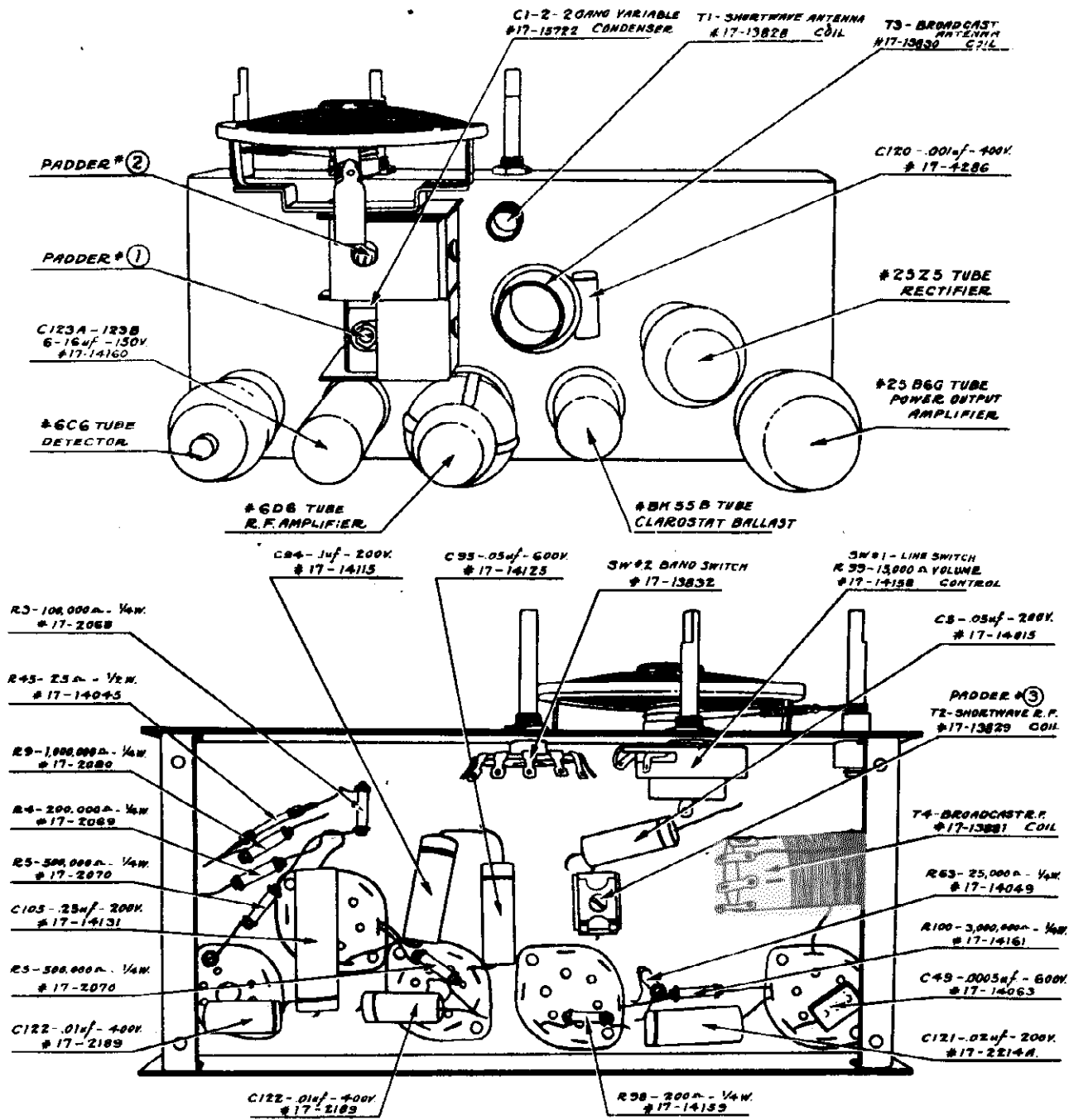
6D6	Heater to Ground.....	780 Ω	6C6	Heater to 110 V. Cord.....	.025 Ω	Cathode.....	0
	Heater to 110 V. Cord.....	6 Ω		Heater to 110 V. Cord.....	5 Ω	Control Grid.....	600,000 Ω
	*Cathode.....	200 Ω		Cathode.....	0	Screen Grid to B+.....	0
	*Suppressor.....	200 Ω		Suppressor.....	0	Plate to B+.....	110 Ω
	Screen to B+.....	0		Screen to B+.....	3,000,000 Ω	25Z5	
	Plate to B+.....	60 Ω		Plate to B+.....	500,000 Ω	Heater to 110 V. Cord.....	18.2 Ω
	* Volume control off.....	15,200 Ω		25B6G		Heater to 110 V. Cord.....	18.2 Ω
	† Broadcast Band only.....	40,000 Ω		Heater to 110 V. Cord.....	4.2 Ω	* Cathode.....	25,000 Ω
	‡ Volume control off.....	40,000 Ω		Heater to 110 V. Cord.....	18.2 Ω	Plate.....	185 Ω
				BK55B—Cold		Plate.....	185 Ω
				Resistance Terminal 3 to 8.....	145 Ω		
				Resistance Terminal 7 to 8.....	10 Ω		

COIL, TRANSFORMER AND SPEAKER RESISTANCES

T1 Broadcast Ant. Pri.....	60.0 Ω	T2 Broadcast R. F. Pri.....	60.0 Ω	T5 Output Trans. Pri.....	110 Ω
T1 Broadcast Ant. Sec.....	3.6 Ω	T2 Broadcast R. F. Sec.....	3.7 Ω	T5 Output Trans. Sec.....	.6 Ω
T3 Short Wave Ant. Pri.....	.3 Ω	T4 Short Wave R. F. Pri.....	5 Ω	Speaker Field.....	740 Ω
T3 Short Wave Ant. Sec.....	.2 Ω	T4 Short Wave R. F. Sec.....	1.0 Ω	Speaker Voice Coil.....	1.7 Ω

MODEL 508 AC-DC
Socket, Trimmers
Alignment

NOBLITT SPARKS INDUSTRIES



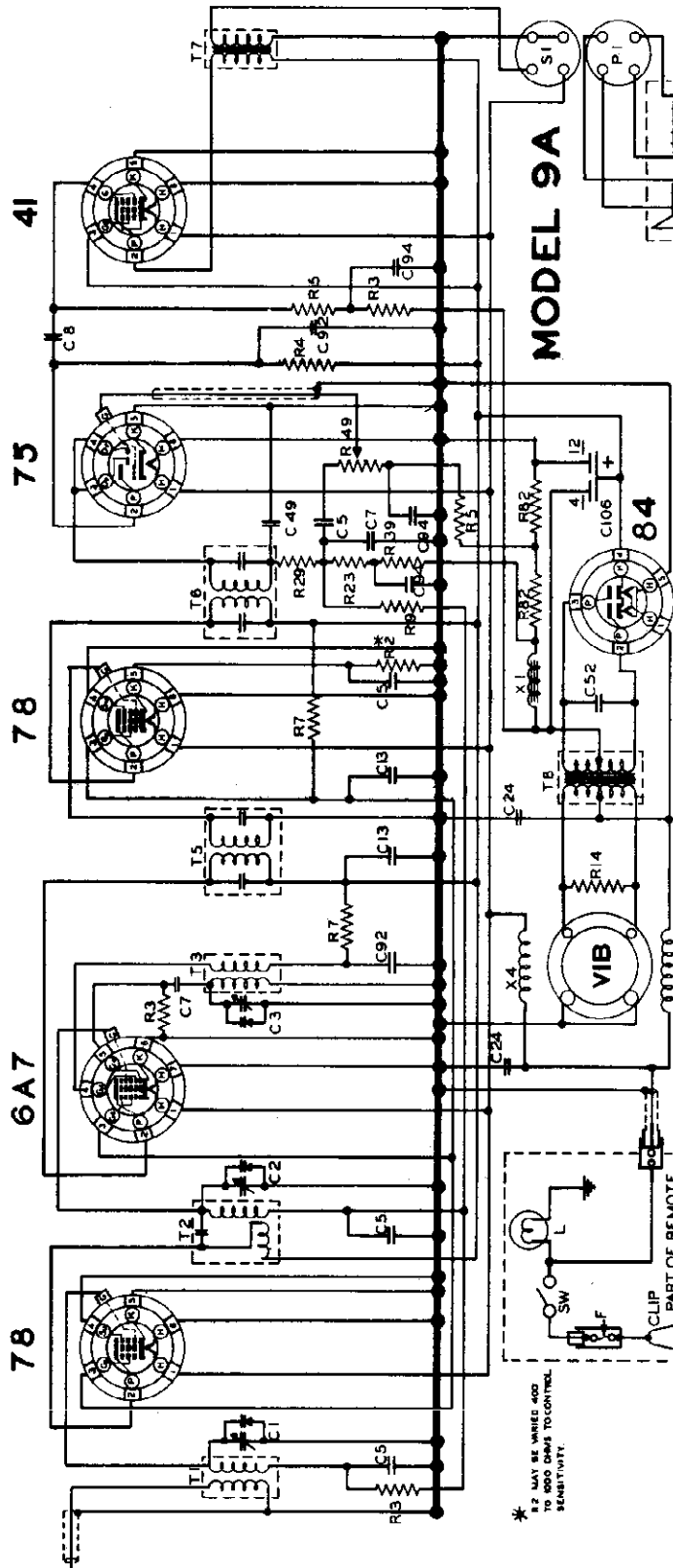
BALANCING INSTRUCTIONS

1. Rotate tuning condenser to extreme left and check to see that pointer lines up with horizontal lines across dial face.
2. Connect Generator to antenna terminal thru 200 MMF condenser. Set dial and signal generator to 1400 KC. Set wave band switch to Broadcast position. Adjust padders 1 and 2 for maximum output.
3. Set dial and Generator to approximately 2400 KC. Set wave band switch to short wave position. Adjust padder No. 3 for maximum output.

NOBLITT SPARKS INDUSTRIES

ARVIN PAGE 9

MODEL 9A Auto
Schematic, Parts



* R2 MAY BE WIARED 400 TO 600 OHMS TO CONTROL SENSITIVITY.

MODEL 9A

CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION

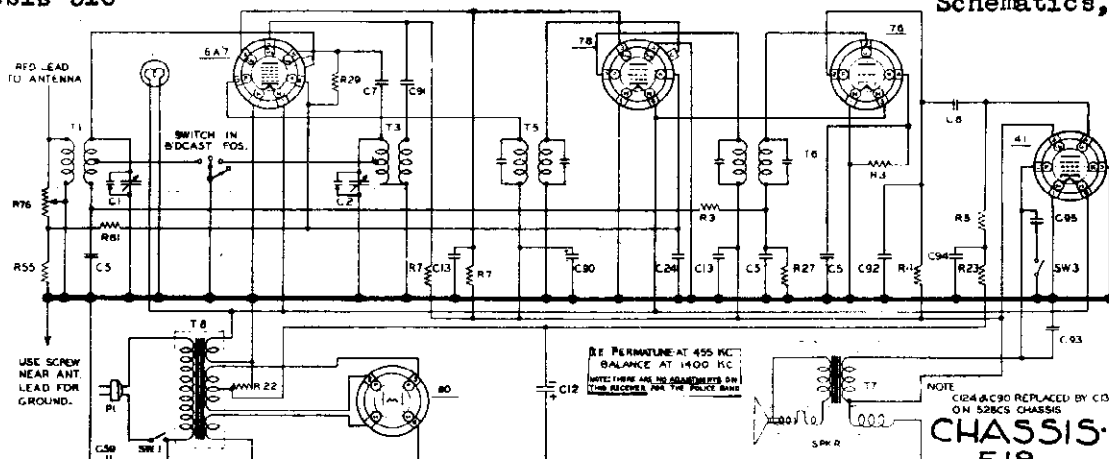
RESISTORS		CONDENSERS		CHOKES & TRANSFORMERS		MISCELLANEOUS UNITS	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
R1	100K	C1	0.001	T1	POWER TRANS.	S1	SWITCH
R2	100K	C2	0.001	T2	IF TRANS.	P1	PLUG
R3	100K	C3	0.001	T3	IF TRANS.		
R4	100K	C4	0.001	T4	IF TRANS.		
R5	100K	C5	0.001	T5	IF TRANS.		
R6	100K	C6	0.001	T6	IF TRANS.		
R7	100K	C7	0.001	T7	IF TRANS.		
R8	100K	C8	0.001	T8	IF TRANS.		
R9	100K	C9	0.001	T9	IF TRANS.		
R10	100K	C10	0.001	T10	IF TRANS.		
R11	100K	C11	0.001	T11	IF TRANS.		
R12	100K	C12	0.001	T12	IF TRANS.		
R13	100K	C13	0.001	T13	IF TRANS.		
R14	100K	C14	0.001	T14	IF TRANS.		
R15	100K	C15	0.001	T15	IF TRANS.		
R16	100K	C16	0.001	T16	IF TRANS.		
R17	100K	C17	0.001	T17	IF TRANS.		
R18	100K	C18	0.001	T18	IF TRANS.		
R19	100K	C19	0.001	T19	IF TRANS.		
R20	100K	C20	0.001	T20	IF TRANS.		
R21	100K	C21	0.001	T21	IF TRANS.		
R22	100K	C22	0.001	T22	IF TRANS.		
R23	100K	C23	0.001	T23	IF TRANS.		
R24	100K	C24	0.001	T24	IF TRANS.		
R25	100K	C25	0.001	T25	IF TRANS.		
R26	100K	C26	0.001	T26	IF TRANS.		
R27	100K	C27	0.001	T27	IF TRANS.		
R28	100K	C28	0.001	T28	IF TRANS.		
R29	100K	C29	0.001	T29	IF TRANS.		
R30	100K	C30	0.001	T30	IF TRANS.		
R31	100K	C31	0.001	T31	IF TRANS.		
R32	100K	C32	0.001	T32	IF TRANS.		
R33	100K	C33	0.001	T33	IF TRANS.		
R34	100K	C34	0.001	T34	IF TRANS.		
R35	100K	C35	0.001	T35	IF TRANS.		
R36	100K	C36	0.001	T36	IF TRANS.		
R37	100K	C37	0.001	T37	IF TRANS.		
R38	100K	C38	0.001	T38	IF TRANS.		
R39	100K	C39	0.001	T39	IF TRANS.		
R40	100K	C40	0.001	T40	IF TRANS.		
R41	100K	C41	0.001	T41	IF TRANS.		
R42	100K	C42	0.001	T42	IF TRANS.		
R43	100K	C43	0.001	T43	IF TRANS.		
R44	100K	C44	0.001	T44	IF TRANS.		
R45	100K	C45	0.001	T45	IF TRANS.		
R46	100K	C46	0.001	T46	IF TRANS.		
R47	100K	C47	0.001	T47	IF TRANS.		
R48	100K	C48	0.001	T48	IF TRANS.		
R49	100K	C49	0.001	T49	IF TRANS.		
R50	100K	C50	0.001	T50	IF TRANS.		
R51	100K	C51	0.001	T51	IF TRANS.		
R52	100K	C52	0.001	T52	IF TRANS.		
R53	100K	C53	0.001	T53	IF TRANS.		
R54	100K	C54	0.001	T54	IF TRANS.		
R55	100K	C55	0.001	T55	IF TRANS.		
R56	100K	C56	0.001	T56	IF TRANS.		
R57	100K	C57	0.001	T57	IF TRANS.		
R58	100K	C58	0.001	T58	IF TRANS.		
R59	100K	C59	0.001	T59	IF TRANS.		
R60	100K	C60	0.001	T60	IF TRANS.		
R61	100K	C61	0.001	T61	IF TRANS.		
R62	100K	C62	0.001	T62	IF TRANS.		
R63	100K	C63	0.001	T63	IF TRANS.		
R64	100K	C64	0.001	T64	IF TRANS.		
R65	100K	C65	0.001	T65	IF TRANS.		
R66	100K	C66	0.001	T66	IF TRANS.		
R67	100K	C67	0.001	T67	IF TRANS.		
R68	100K	C68	0.001	T68	IF TRANS.		
R69	100K	C69	0.001	T69	IF TRANS.		
R70	100K	C70	0.001	T70	IF TRANS.		
R71	100K	C71	0.001	T71	IF TRANS.		
R72	100K	C72	0.001	T72	IF TRANS.		
R73	100K	C73	0.001	T73	IF TRANS.		
R74	100K	C74	0.001	T74	IF TRANS.		
R75	100K	C75	0.001	T75	IF TRANS.		
R76	100K	C76	0.001	T76	IF TRANS.		
R77	100K	C77	0.001	T77	IF TRANS.		
R78	100K	C78	0.001	T78	IF TRANS.		
R79	100K	C79	0.001	T79	IF TRANS.		
R80	100K	C80	0.001	T80	IF TRANS.		
R81	100K	C81	0.001	T81	IF TRANS.		
R82	100K	C82	0.001	T82	IF TRANS.		
R83	100K	C83	0.001	T83	IF TRANS.		
R84	100K	C84	0.001	T84	IF TRANS.		
R85	100K	C85	0.001	T85	IF TRANS.		
R86	100K	C86	0.001	T86	IF TRANS.		
R87	100K	C87	0.001	T87	IF TRANS.		
R88	100K	C88	0.001	T88	IF TRANS.		
R89	100K	C89	0.001	T89	IF TRANS.		
R90	100K	C90	0.001	T90	IF TRANS.		
R91	100K	C91	0.001	T91	IF TRANS.		
R92	100K	C92	0.001	T92	IF TRANS.		
R93	100K	C93	0.001	T93	IF TRANS.		
R94	100K	C94	0.001	T94	IF TRANS.		
R95	100K	C95	0.001	T95	IF TRANS.		
R96	100K	C96	0.001	T96	IF TRANS.		
R97	100K	C97	0.001	T97	IF TRANS.		
R98	100K	C98	0.001	T98	IF TRANS.		
R99	100K	C99	0.001	T99	IF TRANS.		
R100	100K	C100	0.001	T100	IF TRANS.		

I.F. PEAK 170 K.C.
BALANCE AT 1400 K.C.
CHECK AT 1000 & 600 K.C.

MODELS 518, 518A, 518DW
528CS, 568, 568A
568DW
Chassis 518

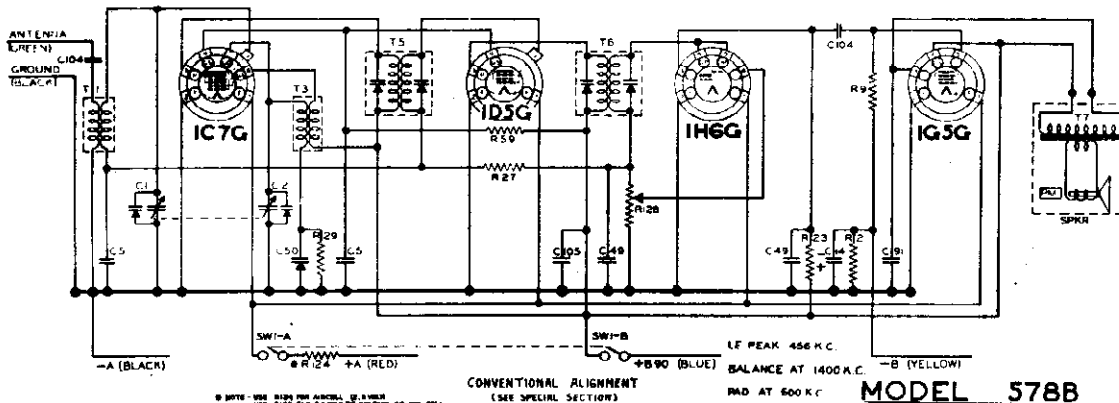
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MODEL 578B 628CS
MODELS 618, 618A, 628
638, 638CS
Schematics, Parts



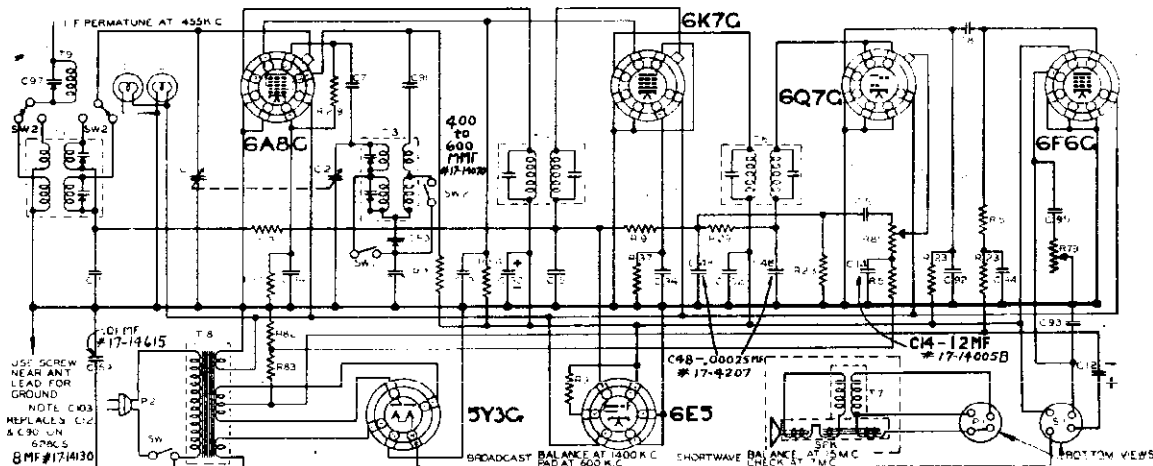
SEPT 1 1937

RESISTORS			CAPACITORS			TRANSFORMERS			MISCELLANEOUS UNITS		
QTY	TYPE	VALUE	QTY	TYPE	VALUE	QTY	TYPE	PART NO.	QTY	TYPE	DESCRIPTION
1	500K	500K	1	500K	500K	1	500K	500K	1	500K	500K
1	100K	100K	1	100K	100K	1	100K	100K	1	100K	100K
1	50K	50K	1	50K	50K	1	50K	50K	1	50K	50K
1	10K	10K	1	10K	10K	1	10K	10K	1	10K	10K
1	5K	5K	1	5K	5K	1	5K	5K	1	5K	5K
1	1K	1K	1	1K	1K	1	1K	1K	1	1K	1K
1	500	500	1	500	500	1	500	500	1	500	500
1	100	100	1	100	100	1	100	100	1	100	100
1	50	50	1	50	50	1	50	50	1	50	50
1	10	10	1	10	10	1	10	10	1	10	10
1	5	5	1	5	5	1	5	5	1	5	5
1	1	1	1	1	1	1	1	1	1	1	1
1	0.5	0.5	1	0.5	0.5	1	0.5	0.5	1	0.5	0.5
1	0.1	0.1	1	0.1	0.1	1	0.1	0.1	1	0.1	0.1
1	0.05	0.05	1	0.05	0.05	1	0.05	0.05	1	0.05	0.05
1	0.01	0.01	1	0.01	0.01	1	0.01	0.01	1	0.01	0.01
1	0.005	0.005	1	0.005	0.005	1	0.005	0.005	1	0.005	0.005
1	0.001	0.001	1	0.001	0.001	1	0.001	0.001	1	0.001	0.001



CONVENTIONAL ALIGNMENT (SEE SPECIAL SECTIONS)

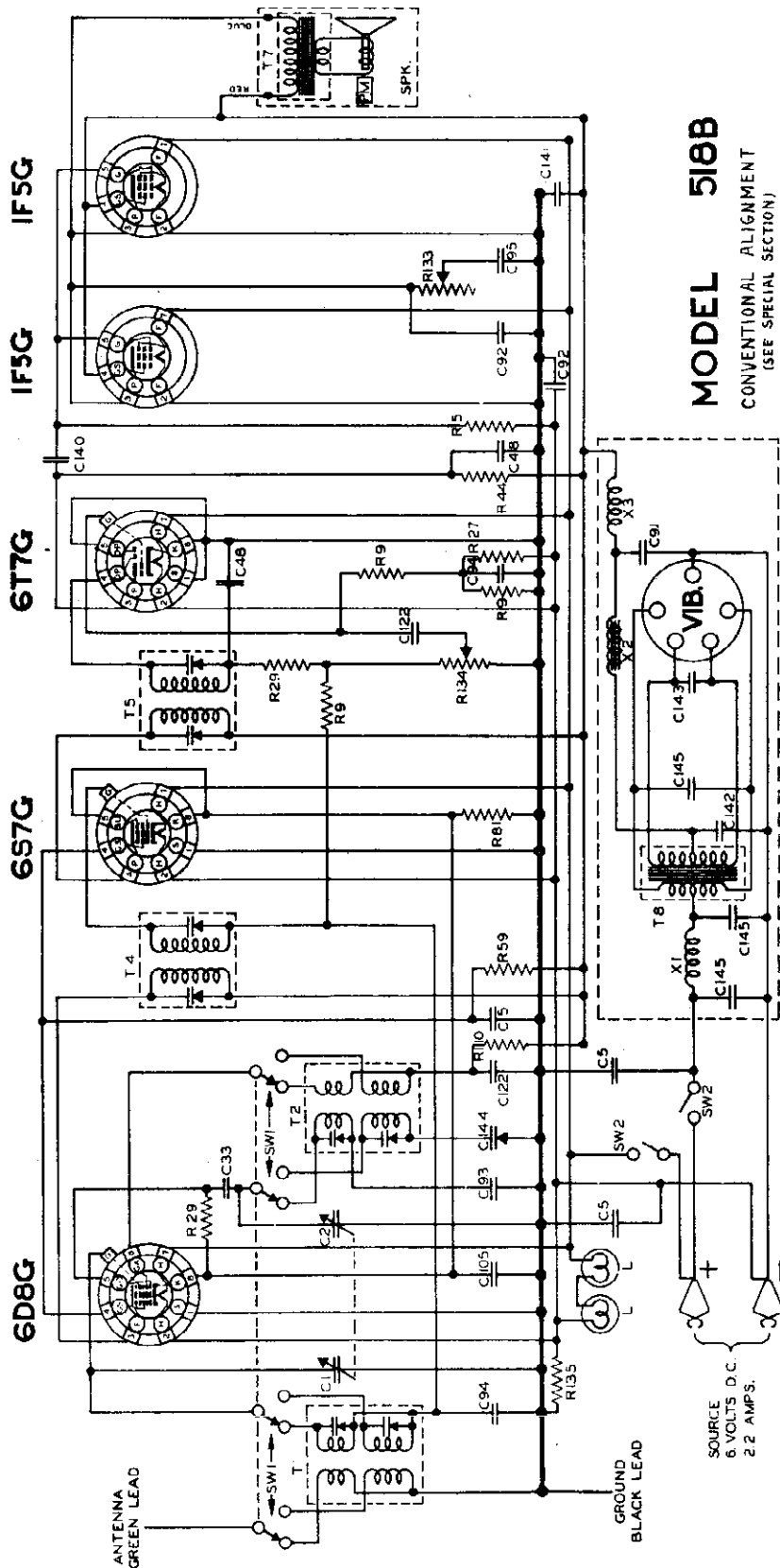
RESISTORS			CONDENSERS			TRANSFORMERS			MISCELLANEOUS UNITS		
QTY	TYPE	VALUE	QTY	TYPE	VALUE	QTY	TYPE	PART NO.	QTY	TYPE	DESCRIPTION
1	500K	500K	1	500K	500K	1	500K	500K	1	500K	500K
1	100K	100K	1	100K	100K	1	100K	100K	1	100K	100K
1	50K	50K	1	50K	50K	1	50K	50K	1	50K	50K
1	10K	10K	1	10K	10K	1	10K	10K	1	10K	10K
1	5K	5K	1	5K	5K	1	5K	5K	1	5K	5K
1	1K	1K	1	1K	1K	1	1K	1K	1	1K	1K
1	500	500	1	500	500	1	500	500	1	500	500
1	100	100	1	100	100	1	100	100	1	100	100
1	50	50	1	50	50	1	50	50	1	50	50
1	10	10	1	10	10	1	10	10	1	10	10
1	5	5	1	5	5	1	5	5	1	5	5
1	1	1	1	1	1	1	1	1	1	1	1
1	0.5	0.5	1	0.5	0.5	1	0.5	0.5	1	0.5	0.5
1	0.1	0.1	1	0.1	0.1	1	0.1	0.1	1	0.1	0.1
1	0.05	0.05	1	0.05	0.05	1	0.05	0.05	1	0.05	0.05
1	0.01	0.01	1	0.01	0.01	1	0.01	0.01	1	0.01	0.01
1	0.005	0.005	1	0.005	0.005	1	0.005	0.005	1	0.005	0.005
1	0.001	0.001	1	0.001	0.001	1	0.001	0.001	1	0.001	0.001



RESISTORS			CONDENSERS			TRANSFORMERS			MISCELLANEOUS UNITS		
QTY	TYPE	VALUE	QTY	TYPE	VALUE	QTY	TYPE	PART NO.	QTY	TYPE	DESCRIPTION
1	500K	500K	1	500K	500K	1	500K	500K	1	500K	500K
1	100K	100K	1	100K	100K	1	100K	100K	1	100K	100K
1	50K	50K	1	50K	50K	1	50K	50K	1	50K	50K
1	10K	10K	1	10K	10K	1	10K	10K	1	10K	10K
1	5K	5K	1	5K	5K	1	5K	5K	1	5K	5K
1	1K	1K	1	1K	1K	1	1K	1K	1	1K	1K
1	500	500	1	500	500	1	500	500	1	500	500
1	100	100	1	100	100	1	100	100	1	100	100
1	50	50	1	50	50	1	50	50	1	50	50
1	10	10	1	10	10	1	10	10	1	10	10
1	5	5	1	5	5	1	5	5	1	5	5
1	1	1	1	1	1	1	1	1	1	1	1
1	0.5	0.5	1	0.5	0.5	1	0.5	0.5	1	0.5	0.5
1	0.1	0.1	1	0.1	0.1	1	0.1	0.1	1	0.1	0.1
1	0.05	0.05	1	0.05	0.05	1	0.05	0.05	1	0.05	0.05
1	0.01	0.01	1	0.01	0.01	1	0.01	0.01	1	0.01	0.01
1	0.005	0.005	1	0.005	0.005	1	0.005	0.005	1	0.005	0.005
1	0.001	0.001	1	0.001	0.001	1	0.001	0.001	1	0.001	0.001

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MODEL 518B
Schematic
Parts



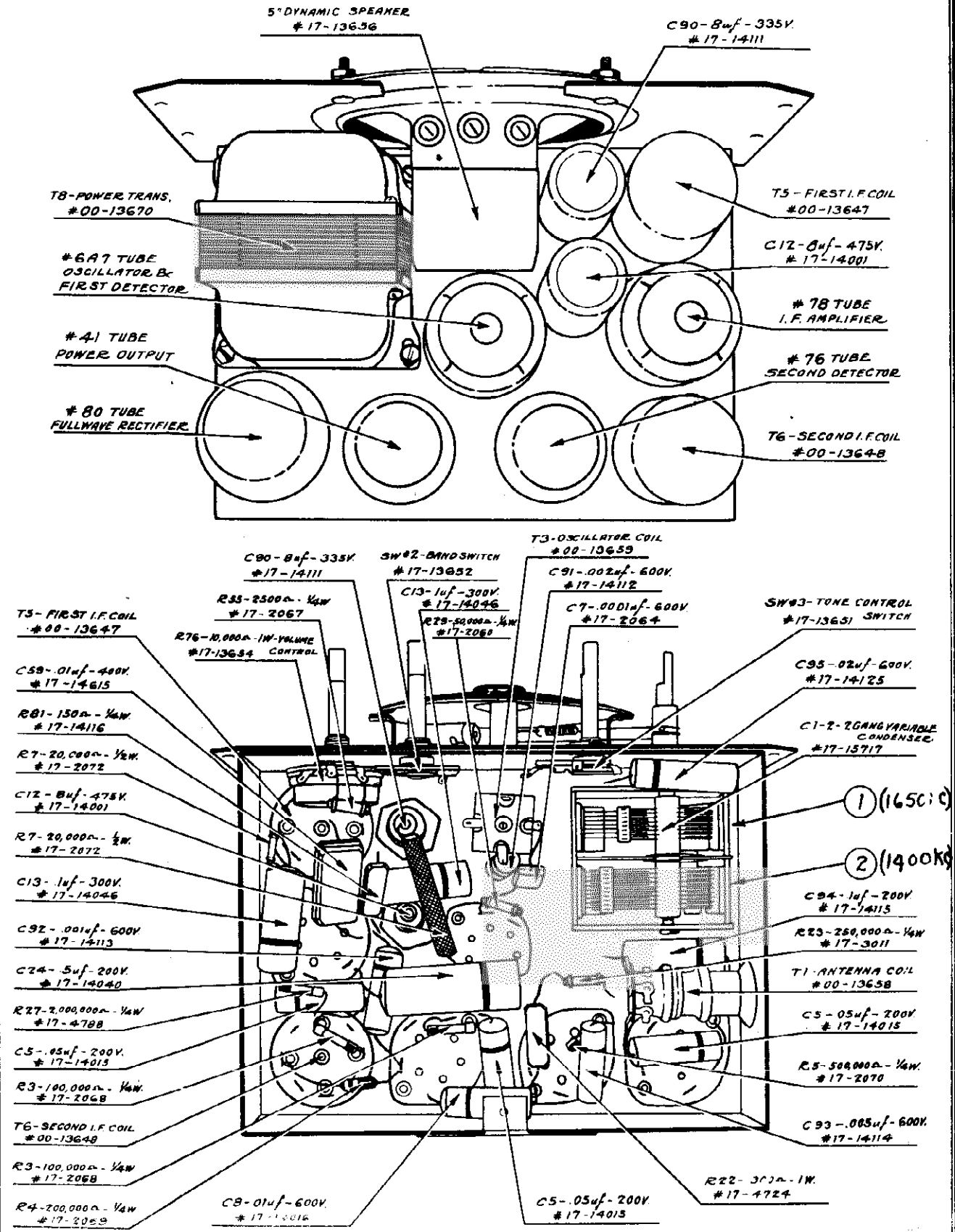
MODEL 518B
CONVENTIONAL ALIGNMENT
(SEE SPECIAL SECTION)

RESISTORS		CONDENSERS		TRANSFORMERS & CHOKES		MISCELLANEOUS	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
R1	100K	C1	100	T1	TRANSFORMER	SW1	PERMANENT MAGNET SPEAKER
R2	100K	C2	100	T2	ANTENNA COIL	SW2	PAID SWITCH
R3	100K	C3	100	T3	OSCILLATOR COIL	SW3	"W" SUPPLY SWITCH - SEE R184
R4	100K	C4	100	T4	PIFT 1.5 COIL	L	LAMP - MAZDA 302
R5	100K	C5	100	T5	SECOND I.F. COIL	VIB.	VIBRATOR
R6	100K	C6	100	T6	OUTPUT TRANS		
R7	100K	C7	100	T7	POWER TRANS		
R8	100K	C8	100	T8	CHOKES		
R9	100K	C9	100	T9	R.F. CHOKES		
R10	100K	C10	100	T10	FILTER CHOKES		
R11	100K	C11	100	T11	R.F. COIL		
R12	100K	C12	100	T12			
R13	100K	C13	100	T13			
R14	100K	C14	100	T14			
R15	100K	C15	100	T15			
R16	100K	C16	100	T16			
R17	100K	C17	100	T17			
R18	100K	C18	100	T18			
R19	100K	C19	100	T19			
R20	100K	C20	100	T20			
R21	100K	C21	100	T21			
R22	100K	C22	100	T22			
R23	100K	C23	100	T23			
R24	100K	C24	100	T24			
R25	100K	C25	100	T25			
R26	100K	C26	100	T26			
R27	100K	C27	100	T27			
R28	100K	C28	100	T28			
R29	100K	C29	100	T29			
R30	100K	C30	100	T30			
R31	100K	C31	100	T31			
R32	100K	C32	100	T32			
R33	100K	C33	100	T33			
R34	100K	C34	100	T34			
R35	100K	C35	100	T35			
R36	100K	C36	100	T36			
R37	100K	C37	100	T37			
R38	100K	C38	100	T38			
R39	100K	C39	100	T39			
R40	100K	C40	100	T40			
R41	100K	C41	100	T41			
R42	100K	C42	100	T42			
R43	100K	C43	100	T43			
R44	100K	C44	100	T44			
R45	100K	C45	100	T45			
R46	100K	C46	100	T46			
R47	100K	C47	100	T47			
R48	100K	C48	100	T48			
R49	100K	C49	100	T49			
R50	100K	C50	100	T50			
R51	100K	C51	100	T51			
R52	100K	C52	100	T52			
R53	100K	C53	100	T53			
R54	100K	C54	100	T54			
R55	100K	C55	100	T55			
R56	100K	C56	100	T56			
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R58	100K	C58	100	T58			
R59	100K	C59	100	T59			
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R61	100K	C61	100	T61			
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R63	100K	C63	100	T63			
R64	100K	C64	100	T64			
R65	100K	C65	100	T65			
R66	100K	C66	100	T66			
R67	100K	C67	100	T67			
R68	100K	C68	100	T68			
R69	100K	C69	100	T69			
R70	100K	C70	100	T70			
R71	100K	C71	100	T71			
R72	100K	C72	100	T72			
R73	100K	C73	100	T73			
R74	100K	C74	100	T74			
R75	100K	C75	100	T75			
R76	100K	C76	100	T76			
R77	100K	C77	100	T77			
R78	100K	C78	100	T78			
R79	100K	C79	100	T79			
R80	100K	C80	100	T80			
R81	100K	C81	100	T81			
R82	100K	C82	100	T82			
R83	100K	C83	100	T83			
R84	100K	C84	100	T84			
R85	100K	C85	100	T85			
R86	100K	C86	100	T86			
R87	100K	C87	100	T87			
R88	100K	C88	100	T88			
R89	100K	C89	100	T89			
R90	100K	C90	100	T90			
R91	100K	C91	100	T91			
R92	100K	C92	100	T92			
R93	100K	C93	100	T93			
R94	100K	C94	100	T94			
R95	100K	C95	100	T95			
R96	100K	C96	100	T96			
R97	100K	C97	100	T97			
R98	100K	C98	100	T98			
R99	100K	C99	100	T99			
R100	100K	C100	100	T100			

MODELS 518, 518A, 518DW
528CS, 568, 568A
568DW

NOBLITT SPARKS INDUSTRIES

Socket, Trimmers, Chassis



NOBLITT SPARKS INDUSTRIES

MODELS 518, 518A, 518DW
528CS, 568, 568A
568DW

Voltage, Resistance
Alignment, Sensitivity

POWER OUTPUT: 3.5 watts

SPEAKER: 5" Dynamic; 3 ohm voice coil

VOLTAGE & FREQUENCY: 110 V. 60 cycles

WATTS POWER CONSUMPTION: 65 watts

SENSITIVITY: 1400 KC 100 microvolts minimum for 50 milliwatts

2400 KC 100 microvolts minimum for 50 milliwatts

6A7—1st Detector—Oscillator

78—I. F. Amplifier

76—2nd Detector—AVC Bias Rectifier

41—Audio Output Amplifier

80—Full Wave Rectifier

FREQUENCY RANGE:

540-1650 Kilocycles

1650-4000 Kilocycles

MODEL 518-518A-568-568A SOCKET VOLTAGES

Tube	Heater	Plate	Screen	Suppressor	Cathode	Osc. Grid	Osc. Plate
6A7	6.3	225	100	.....	2.8	6-15	150
78	6.3	225	100	0	2.8	.....	.....
76	6.3	190	.....	.....	8.4	.....	.....
41	6.3	200	225	.....	15	.....	.....
80	5.0	385	.....	.....	325	.....	.....

POINT TO POINT RESISTANCES

All Readings tubes to ground unless otherwise specified. Tubes removed and speaker connected.

6A7	Heater	0	41	Heater	25 Ω
Heater	25 Ω	Cathode	2,650 Ω	Heater	25 Ω
Heater	0	Suppressor	0	Heater	0
Anode Grid to B+	20,000 Ω	Screen Grid to B+	20,000 Ω	Cathode	0
Plate to B+	11 Ω	Control Grid	11 Ω	Control Grid	750,000 Ω
Screen to B+	20,000 Ω	Plate to B+	11 Ω	Screen to B+	0
Cathode	{ V.C. on—150 Ω			Plate to B+	700 Ω
	{ V.C. off—12,500 Ω				
*Control Grid	2,100,000 Ω	76	Heater	25 Ω	80
Oscillator Grid	50,150 Ω	Heater	0	Filament to B+	1,600 Ω
*Band Switch in Broadcast Position		Cathode	100,000 Ω	Filament to B+	1,600 Ω
78		Control Grid	2,000,000 Ω	Plate	740 Ω
Heater	25 Ω	Plate to B+	200,000 Ω	Plate	700 Ω

COIL TRANSFORMER AND SPEAKER RESISTANCES

Speaker Field	1,600 Ω	T3 Oscillator Primary	2.5 Ω	T7 Output Trans. Secondary	1 Ω
Speaker Voice Coil	1 Ω	T5 1st I. F. Primary	11 Ω	T8 Power Trans. Primary	20 Ω
T1 Ant. Primary	25 Ω	T6 2nd I. F. Primary	11 Ω	T8 Power Trans. Sec. (High Voltage)	740-700 Ω
T1 Ant. Secondary	3 Ω	T6 2nd I. F. Secondary	11 Ω	T8 Power Trans. Sec. (5 volt)	.9 Ω
T3 Oscillator Primary	2.5 Ω	T7 Output Trans. Primary	700 Ω	T8 Power Trans. Sec. (6 volt)	.25 Ω

BALANCING INSTRUCTIONS

Models 518, 518A, 568, and 568A uses the Permatune Intermediate frequency transformers. All intermediate frequency adjustments are therefore eliminated.

If a check of sensitivity of the I.F. circuits is desired simply connect the output of a signal generator through 200 MMF dummy antenna to the grid cap of the 6A7 tube. Rotate the volume control to full position. The sensitivity at 455 KC should be 200 microvolts minimum for 50 milliwatts at three ohms load across the output of the voice coil winding of the speaker transformer.

1. Connect the Generator to the red antenna wire on the rear of radio chassis Ground the outside shield of the generator output cable to the radio chassis.

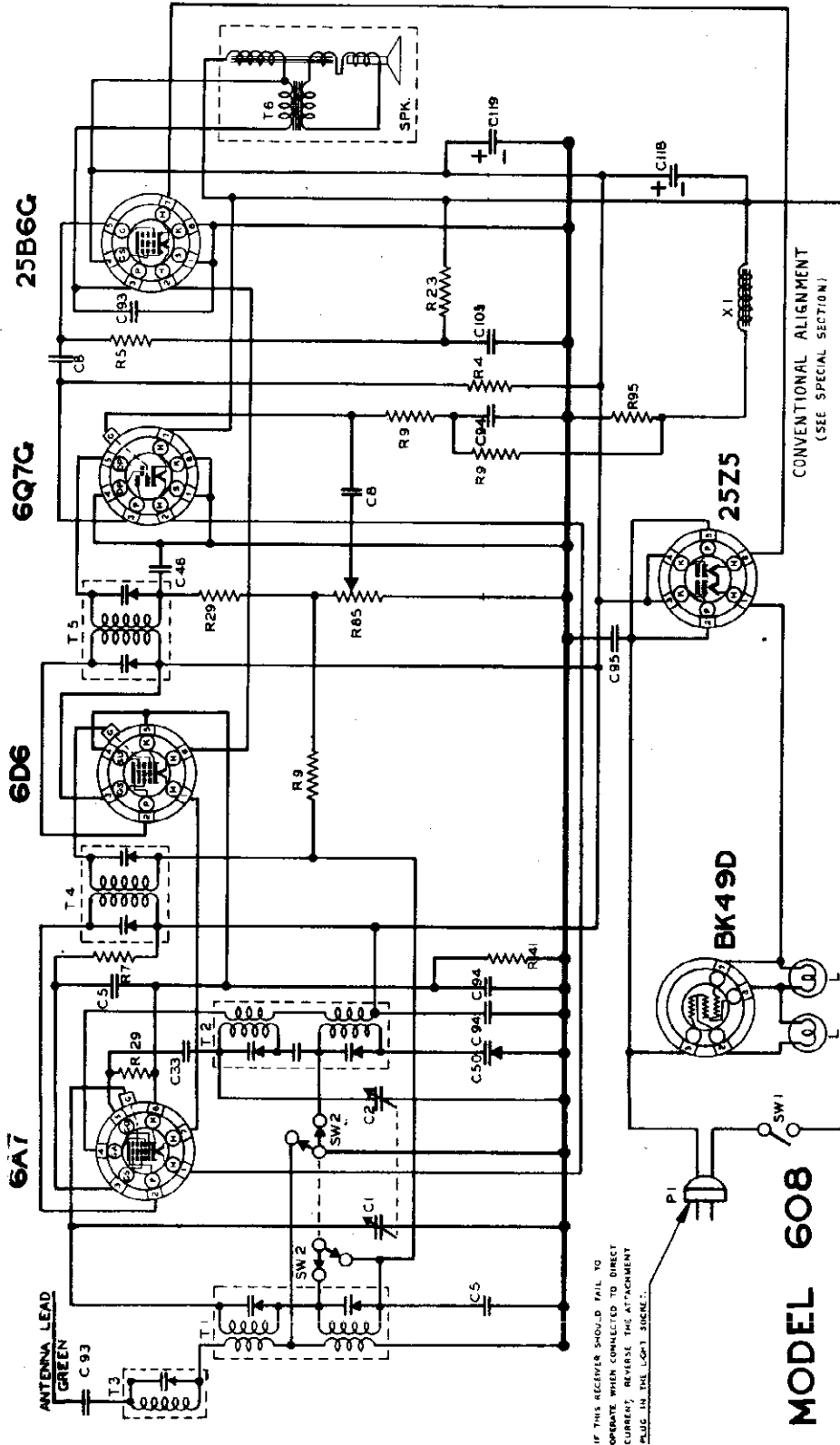
2. Rotate the tuning condenser entirely out of mesh and set dial pointer to 1650 KC. Adjust padder No.1 for maximum output with 1650 KC input from the signal generator.

3. Reset the balancing or signal generator to 1400 KC and retune the radio until the signal is received.

4. Adjust the padder No.2 for maximum output.

MODEL 608
Schematic
Parts

NOBLITT SPARKS INDUSTRIES



RESISTORS				CONDENSERS				TRANSFORMERS/SOCKETS				MISCELLANEOUS UNITS			
R	OHM	W	PART NO	C	CAPACITY	VOLT	PART NO	T	TYPE	SYMBOL	DESCRIPTION	PART NO			
4	200K	1/2	17-2389	1	100 MFC	17-10781	1	TRANSFORMERS	T5	T-50	MAZDA PILOT LIGHT	17-5781			
5	500K	1/2	17-2370	2	VARIABLE	17-10015	1	ANTENNA COIL	T1	PI	LINE COIL	17-5781			
1	20K	1/2	17-2372	3	50	200	17-10015	2	OSCILLATOR COIL	T2	DYNAMIC SPEAKER & OUTPUT TRANS ASSEMBLY	17-10023			
8	1MFC	1/2	17-2388	6	0	800	17-10016	3	WAVE TRAP	T3	SW. 1	17-10023			
23	250K	1/2	17-2301	53	.00005	800	17-10047	4	FIRST I.F. COIL	T4	SW. 2	17-10023			
28	50K	1/2	17-2360	48	.00005	800	17-4307	5	SECOND I.F. COIL	T5	BAND SWITCH	17-10023			
41	100	1/2	17-1032	83	.005	800	17-10114	6	OUTPUT TRANS	T6					
85	500K	1/2	17-1072	84	1	200	17-10015	7	OUTPUT TRANS	T7					
96	20	1/2	17-1182	85	.02	400	17-10125	8	CHOKES						
				103	.25	200	17-10125	9	CHOKES						
				118	1.5	150	17-10115	1	FILTER						
				118	2.4	150	17-10115	1	FILTER						
				20	2000-00000		17-10070								

I.F. PEAK 456 K.C.
"A" BAND - BALANCE AT 1400K.C.
PAD AT 600K.C.
"B" BAND - BALANCE AT 5.M.C.
CHECK AT 2. M.C.

NOBLITT SPARKS INDUSTRIES

MODELS 618, 618A, 628
628CS, 638, 638CS
Voltage, Resistance
Alignment, Sensitivity

FREQUENCY RANGE: 540 to 1750 Kilocycles
5.7 to 18.0 Megacycles

POWER OUTPUT: 3.75 Watts

SPEAKER: 6" Dynamic in Model 618, 8" Dynamic in 618, 618A,
628, 628CS

VOLTAGE AND FREQUENCY: 110 V. 60 cycles

SENSITIVITY: At any point on either broadcast or short wave band
not less than 60 microvolts for 50 milliwatts output.

Intermediate sensitivity: Not less than 100 microvolts for
50 milliwatts output.

WATTS POWER CONSUMPTION: 75 Watts

TUBES:

- 6A8G—Ist Detector Oscillator
- 6K7G—I. F. Amplifier
- 6Q7G—2nd Detector, 1st Audio Amplifier AVC
- 6F6G—Audio Output Amplifier
- 5Y3G—Full Wave Rectifier
- 6E5 —Electric Tuning Indicator

CONVENTIONAL ALIGNMENT
(see special section)

MODEL 618-618A-628-628CS SOCKET VOLTAGES
(INPUT VOLTAGE 110 V. RMS)

Tube	Heaters	Plate	Screen	Cathode	Suppressor	Anode Grid	Oscillator Grid	Target	Grid Bias
6A8G	6.3	238	95	3.2	.....	131	6-15	238	.....
6K7G	6.3	238	95	1.9	0	.....	.....	.....	.....
6Q7G	6.3	155	.....	0	.....	.....	.....	.....	1.5
6F6G	6.3	221	238	0	.....	.....	.....	.....	13.8
5Y3G	5.0	395	.....	355	.....	.....	.....	.....	.....
6E5	6.3	*40	.....	0	.....	.....	.....	.....	.....

* No Signal.

POINT TO POINT RESISTANCES

All Readings taken in ground unless otherwise specified. Tubes removed and speaker connected. Volume and tone control in full on position. All shell pins grounded.

6ABC	Plate to B+	11 Ω	Control Grid	750,000 Ω	
Heater	0	Control Grid	1,250,000 Ω	Screen Grid to B+	0
Heater	25 Ω			Plate to B+	500 Ω
Cathode	300 Ω	6Q7G			
Oscillator Grid	50,000 Ω	Heater	0	5Y3G	
Anode Grid to B+	20,000 Ω	Heater	25 Ω	Filament to B+	1,450 Ω
Screen to B+	30,000 Ω	Cathode	0	Filament to B+	1,450 Ω
Plate to B+	11 Ω	Diode Plate	300,000 Ω	Plate	600 Ω
Control Grid	1,350,000 Ω	Diode Plate	300,000 Ω	Plate	620 Ω
		Plate to B+	250,000 Ω	6E5	
		Control Grid	1,500,000 Ω	Heater	0
				Heater	25 Ω
6K7G		6F6G		Cathode	0
Heater	0	Heater	0	Control Grid	1,250,000 Ω
Heater	25 Ω	Heater	25 Ω	Plate to B+	1,000,000 Ω
Cathode	300 Ω	Cathode	0	Target to B+	0
Suppressor Grid	0				
Screen Grid to B+	30,000 Ω				

COIL TRANSFORMER AND SPEAKER RESISTANCES

T1 Antenna Coil Pri. (BC)	17 Ω	T5 1st I. F. Trans. Sec.	11 Ω	T8 Power Trans. Pri. 110 Volt	17 Ω
T1 Antenna Coil Sec. (BC)	3.5 Ω	T6 2nd I. F. Trans. Pri.	11 Ω	T8 Power Trans. Sec. Hi Volt	600-620 Ω
T1 Antenna Coil Pri. (SW)	3.0 Ω	T6 2nd I. F. Trans. Sec.	11 Ω	T8 Power Trans. Sec. 6 Volt	15 Ω
T1 Antenna Coil Sec. (SW)	87 Ω	T7 Output Trans. Pri. (618)	600 Ω	T8 Power Trans. Sec. 5 Volt	25 Ω
T3 Oscillator Coil Pri.	1 Ω	T7 Output Trans. Sec. (618)	1 Ω	T9 Wave Trap	2.3 Ω
T3 Oscillator Coil Sec.	2.3 Ω	T7 Output Trans. Pri. (618A-628-628CS)	500 Ω	Speaker Field	1,450 Ω
T5 1st I. F. Trans. Pri.	11 Ω	T7 Output Trans. Sec. (618A-628-628CS)	1 Ω		

ALIGNMENT

Models 618, 618A, 628, 628CS, 638, and 638CS are designed to utilize the full efficiency of the Permatune Intermediate Frequency transformers. Therefore all IF adjustments are eliminated. If a check of sensitivity is desired, connect the output of a standard signal generator thru a 200 MUF antenna dummy to grid cap of the 6A8G tube. Rotate the volume control to maximum position. The sensitivity at 455 KC should be 100 Microvolts for 50 Milliwatts at 3 ohms load across the output of the voice coil winding of speaker transformer.

1.- Rotate tuning condenser completely out of mesh and check to see that dial pointer is parallel to horizontal dial stripes.

2.- Connect Generator to receiver with a standard 200 MUF dummy antenna and after setting the wave band switch to the Short wave position, tune dial to 15 MC, and Generator to same frequency.

3.- Adjust padder No.1 and then padder No.2 for maximum output.

4.- Reset band switch to broadcast band. Set dial to 1500 KC and Generator to same frequency. Adjust padders No.3 and 4 for maximum output.

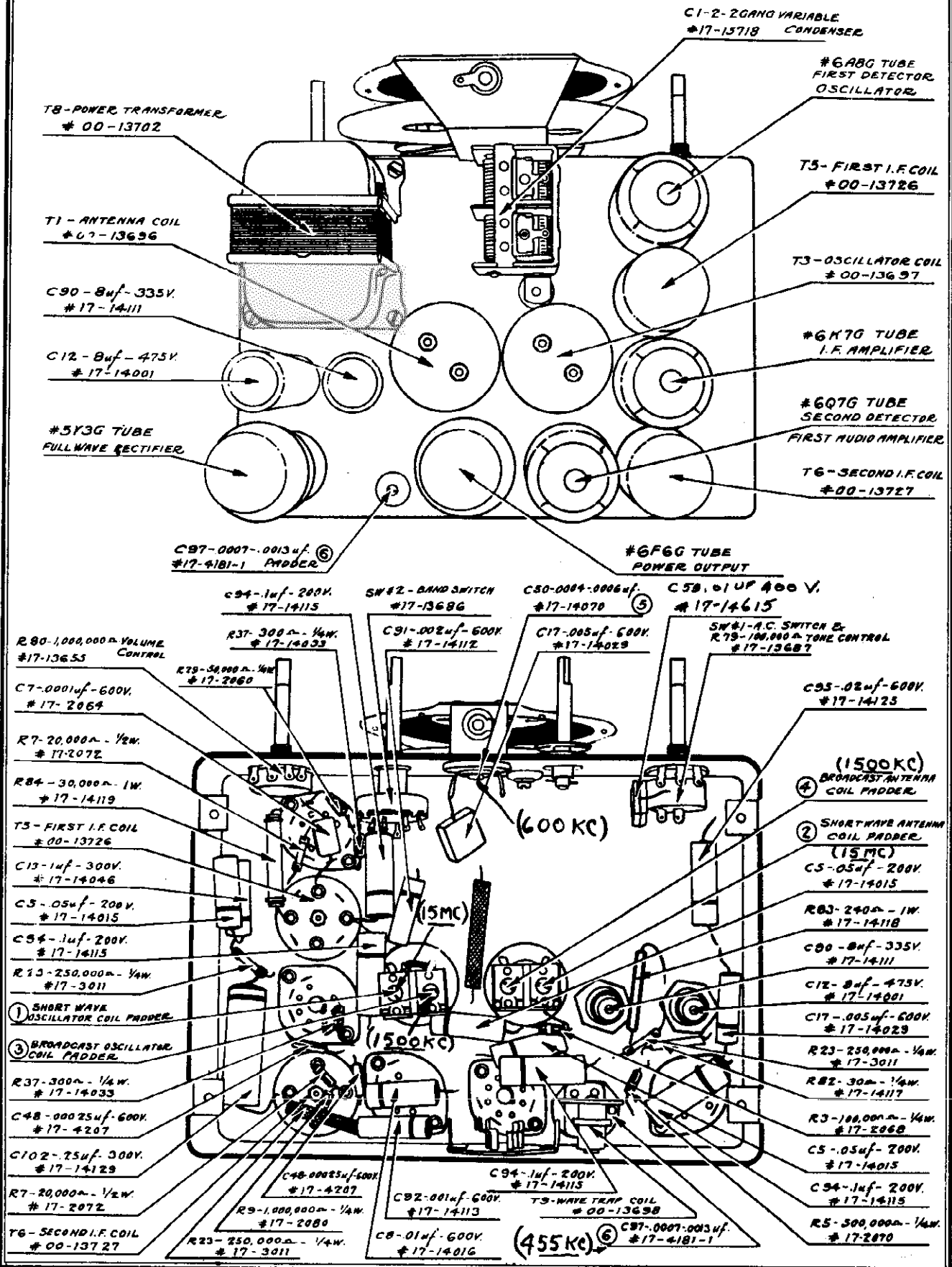
5.- Retune radio set to 600 KC, reset generator to same frequency, adjust padder No.5 for maximum output. Leave radio tuned to 600 KC, change Generator to 455 KC and increase the output of Generator until signal is heard thru the speaker. Adjust padder No.6 for minimum output. Repeat adjustments.

MODELS 618, 618A, 628

628CS, 638, 638CS

Socket, Trimmers, Chassis

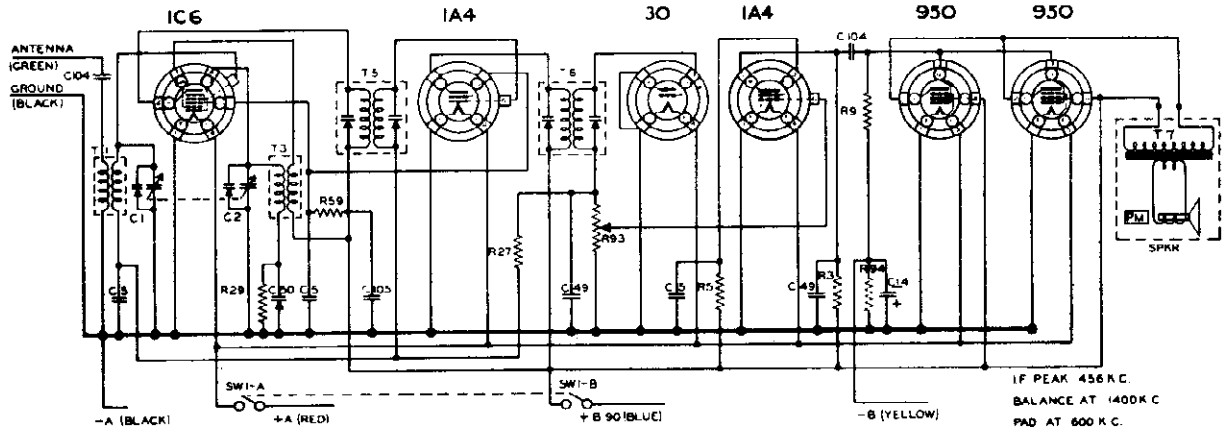
NOBLITT SPARKS INDUSTRIES



NOBLITT SPARKS INDUSTRIES

MODELS 618B, 628B
Schematic, Voltage
Alignment, Parts

ARVIN HOME RADIO MODELS 618B-628B



RESISTORS				CONDENSERS				COILS & TRANSFORMERS				MISCELLANEOUS UNITS			
QTY	TYPE	VALUE	PART NO.	QTY	TYPE	VALUE	PART NO.	QTY	TYPE	DESCRIPTION	QTY	TYPE	DESCRIPTION	QTY	TYPE
1	100K	100,000	17-2264	1	500	500	17-1413	1	ANTENNA COIL	17-226	1	SW	PERMANENT MAGNET DYNAMIC SPEAKER	1	17-1413
1	100K	100,000	17-2264	1	500	500	17-1413	1	OSCILLATOR COIL	17-226	1	SW	PERMANENT MAGNET DYNAMIC SPEAKER	1	17-1413
1	100K	100,000	17-2264	1	500	500	17-1413	1	2ND DET. COIL	17-226	1	SW	PERMANENT MAGNET DYNAMIC SPEAKER	1	17-1413
1	100K	100,000	17-2264	1	500	500	17-1413	1	1ST AF COIL	17-226	1	SW	PERMANENT MAGNET DYNAMIC SPEAKER	1	17-1413
1	100K	100,000	17-2264	1	500	500	17-1413	1	OUTPUT TRANS.	17-226	1	SW	PERMANENT MAGNET DYNAMIC SPEAKER	1	17-1413

POWER OUTPUT - 315 MILLIWATTS FREQUENCY RANGE - 540 TO 1725 KILOCYCLES
 VOLTAGE AND POWER CONSUMPTION - TUBES - 1C6 -1st Det. and Osc.
 "A" Battery -540 MA at 2.1 Volts 1A4 -1st IF Amplifier.
 "B" Battery -15 to 18 MA at 90 Volts. 30 -2nd Det., AVC.
 SENSITIVITY - 1500 to 600 KC - 50 Micro- 1A4 -1st AF Amplifier.
 volts minimum for 50 Milliwatts 950 -Power output.
 output. 950 -Power output.
 456 KC - 150 Microvolts minimum CONVENTIONAL ALIGNMENT
 for 50 Milliwatts output. (see special section)

MODEL 618B-628B SOCKET VOLTAGES

Tube	Filament	Plate	Screen	Control Grid	Anode Grid	Oscillator Grid
1C6	2.1	90	45	*10 V. max.	90	6 to 10 V.
1A4	2.1	90	45	*10 V. max.	.....	.....
30	2.1	0	.....	.....	.....	.....
1A4	2.1	26	15	*10 V. max.	.....	.....
950	2.1	90	90	8.2	.....	.....
950	2.1	90	90	8.2	.....	.....

Measured with vacuum tube voltmeter; 100,000 microvolts R. F. input to Antenna Terminal.

POINT TO POINT RESISTANCES

All tubes removed and speaker disconnected. Volume control to full-on position. All resistances to ground unless otherwise specified.

1C6	30	950
Filament..... 0	Filament..... 0	Filament..... 0
Filament..... 0	Filament..... 0	Filament..... 0
Plate to B+..... 15.0 Ω	Filament..... ∞	Filament..... ∞
Screen to B+..... 15,000 Ω	Grid..... 500,000 Ω	Plate to B+..... 750 Ω
Oscillator Grid..... 50,000 Ω	Plate..... 0	Screen to B+..... 0
Anode Grid to B+..... 4.0 Ω	Control Grid..... 0	Control Grid..... 1,000,000 Ω
Control Grid..... 2,500,000 Ω		
1A4	1A4	950
Filament..... 0	Filament..... 0	Filament..... 0
Filament..... 0	Filament..... 0	Filament..... 0
Plate to B+..... 15.0 Ω	Screen to B+..... 500,000 Ω	Plate to B+..... 750 Ω
Screen to B+..... 15,000 Ω	Plate to B+..... 100,000 Ω	Screen to B+..... 0
Control Grid..... 2,500,000 Ω	Control Grid..... 500,000 Ω	Control Grid..... 1,000,000 Ω

COIL, TRANSFORMER AND SPEAKER RESISTANCES

T1 Antenna Coil Pri..... 18.0 Ω	T5 1st I. F. Trans. Pri..... 15.0 Ω	T7 Output Trans. Pri..... 750 Ω
T1 Antenna Coil Sec..... 3.8 Ω	T5 1st I. F. Trans. Sec..... 15.0 Ω	T7 Output Trans. Sec..... 1.3 Ω
T3 Oscillator Coil Pri..... 4.0 Ω	T6 2nd I. F. Trans. Pri..... 15.0 Ω	Speaker Voice Coil..... 4.0 Ω
T3 Oscillator Coil Sec..... 3.8 Ω	T6 2nd I. F. Trans. Sec..... 15.0 Ω	

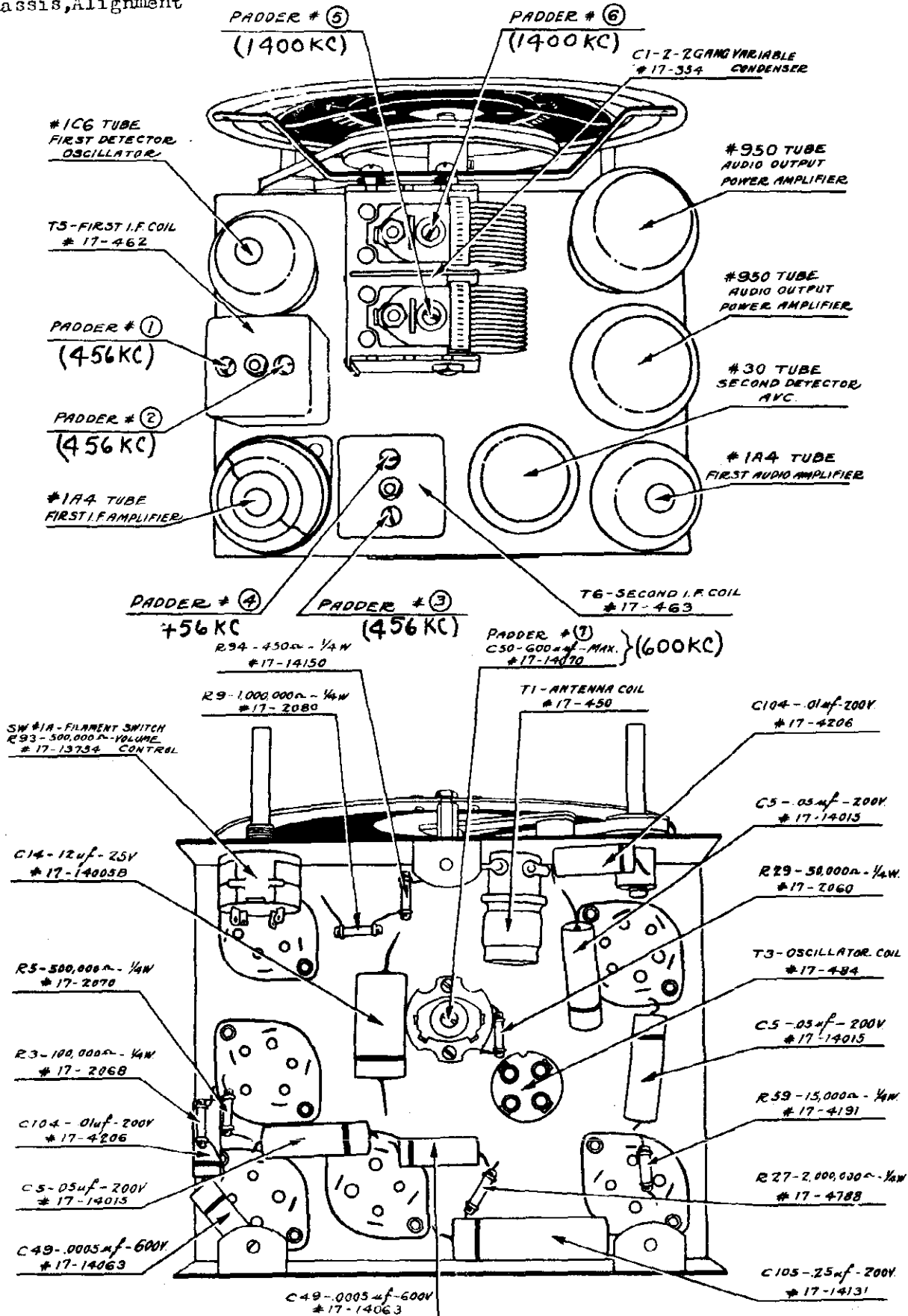
COLOR CODE OF BATTERY CABLES

+90 V. "B"..... BLUE +2.1 V. "A"..... RED
 -B..... YELLOW -2.1 V. "A"..... BLACK

ANTENNA..... GREEN
 GROUND..... BLACK

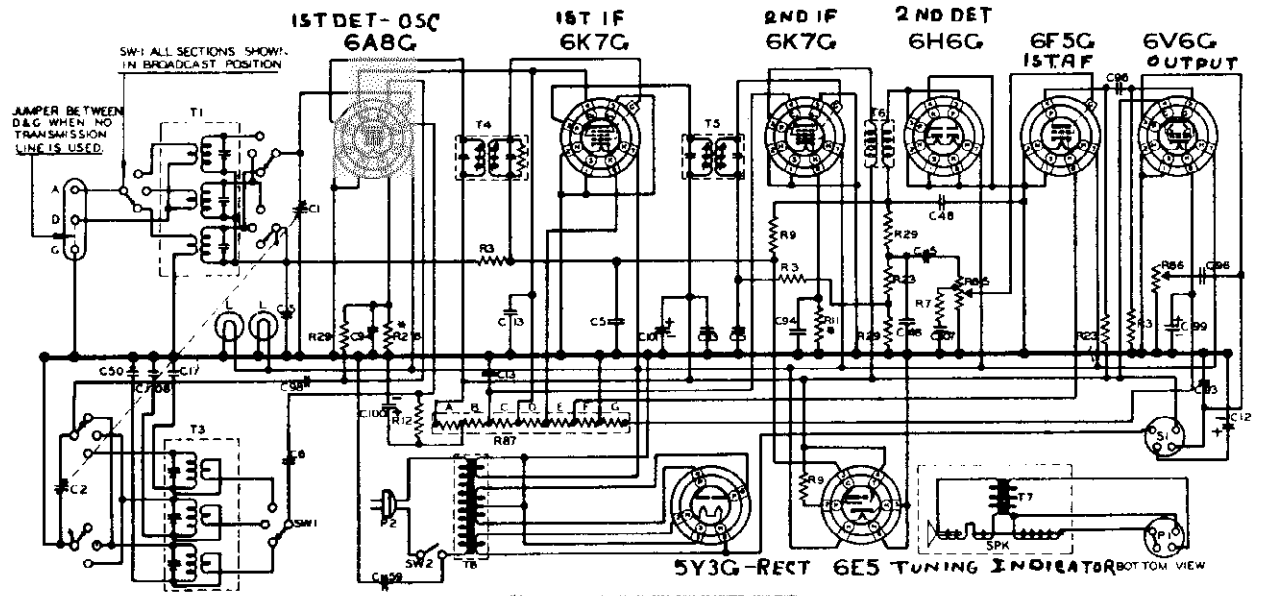
MODELS 618B, 628B
 Socket, Trimmers
 Chassis, Alignment

NOBLITT SPARKS INDUSTRIES



Parts, Alignment
Sensitivity, Resistance NOBLITT SPARKS INDUSTRIES

MODELS 818, 828
828A, 838CS
Schematic, Voltage



NOTE: R1 MAY BE WHELED FROM 400 TO 200 OHMS TO CONTROL SENSITIVITY

RESISTORS				CONDENSERS				TRANSFORMERS				MISCELLANEOUS			
NO.	TYPE	VALUE	PART NO.	TYPE	VALUE	PART NO.	TYPE	NO.	DESCRIPTION	SYMBOL	DESCRIPTION	PART NO.	DESCRIPTION	PART NO.	
1	100K OHM	100,000	100K-100	1	100 P.F.	100P-100	1	ANTENNA COIL	SP-1024	SPK	8" SPEAKER FOR MODEL 818	10-1274			
2	500K OHM	500,000	500K-100	2	VARIABLE	VAR-100	2	ORCH LATOR COIL	OO-1275	SPK	10" SPEAKER FOR MODEL 828	10-1275			
3	1M OHM	1,000,000	1M-100	3	100 P.F.	100P-100	3	1ST I.F. TRANS.	OO-1276	S1	SPEAKER SOCKET	10-1276			
4	5M OHM	5,000,000	5M-100	4	100 P.F.	100P-100	4	2ND I.F. TRANS.	OO-1277	S2	SPEAKER PLUG	10-1277			
5	10M OHM	10,000,000	10M-100	5	100 P.F.	100P-100	5	POWER TRANS.	OO-1278	S3	LINE 5000 S. PLUG	10-1278			
6	100K OHM	100,000	100K-100	6	100 P.F.	100P-100	6	3RD I.F. TRANS.	OO-1279	S4	5" DIAL LIGHT	10-1279			
7	500K OHM	500,000	500K-100	7	100 P.F.	100P-100	7	OUTPUT TRANS. 800	OO-1280	S5	BAND SWITCH	10-1280			
8	1M OHM	1,000,000	1M-100	8	100 P.F.	100P-100	8	OUTPUT TRANS. 828	OO-1281	S6	LINE SWITCH - ALL 800	10-1281			
9	5M OHM	5,000,000	5M-100	9	100 P.F.	100P-100	9	POWER TRANS.	OO-1282						

SENSITIVITY :
 BAND A -50 microvolts minimum
 BAND B -75 microvolts minimum
 BAND C -100 microvolts minimum

POWER OUTPUT :
 5 Watts maximum

FREQUENCY RANGE :
 BAND A - 540 to 1750 KC
 BAND B - 1750 to 5500 KC
 BAND C - 5.5 to 18 MC

MODEL 818-828 SOCKET VOLTAGES
 (INPUT VOLTAGE 110 V RMS)

Tube	Heaters	Plate	Screen	Cathode	Acc. Grid	Anode Grid	Control Grid Bias
6A8C	6.3	252	75	3.4	5 to 22V	155	.....
6K7G	6.3	252	75	5.8	.....	.....	.....
6K7G	6.3	252	114	3.1	.....	.....	.....
6H6G	6.3	.....	.....	0	.....	.....	.....
6F5G	6.3	135	.....	1.0	.....	.....	.....
6V6G	6.3	240	252	10.8	.....	.....	.....
6E5	6.3	150	.....	0	.....	.....	.....
5Y3G	5.0	365	.....	325	.....	.....	.....

† AVC Voltage developed approx. 30 volts with 100,000 Microvolts input to Antenna.

POINT TO POINT RESISTANCES
 (see special section)

All Readings taken to ground unless otherwise stated. Tubes removed but speaker connected. Volume control in full on position. All shell terminals grounded to chassis.

6A8C	6K7C	6V6G
Heater..... 0	Heater..... 0	Heater..... 0
Heater..... .05 Ω	Heater..... .05 Ω	Heater..... .05 Ω
Cathode..... 400 Ω	Cathode..... 400 Ω	Cathode..... 235 Ω
Oscillator Grid..... 50,400 Ω	Suppressor..... 0	Control Grid..... 100,000 Ω
Anode Grid to B+..... 11,640 Ω	Screen to B+..... 5,840 Ω	Screen Grid to B+..... 0
Screen to B+..... 7,750 Ω	Plate to B+..... 64 Ω	Plate to B+..... 760 Ω
Plate to B+..... 12.0 Ω	Control Grid..... 150,000 Ω	
Control Grid..... 1,450,000 Ω		
	6H6G	6E5
	Heater..... 0	Heater..... 0
	Heater..... .05 Ω	Heater..... .05 Ω
	Cathode..... 0	Cathode..... 0
	Plate..... 350,000 Ω	Control Grid..... 1,350,000 Ω
	Plate..... 350,000 Ω	Plate to B+..... 1,900,000 Ω
	Cathode..... 0	Target to B+..... 0
	6F5G	6Y3G
	Heater..... 0	Filament to B+..... 1,000 Ω
	Heater..... .05 Ω	Filament..... 11,860 Ω
	Cathode..... 50 Ω	Plate..... 155 Ω
	Control Grid..... 500,000 Ω	Plate..... 145 Ω
	Plate to B+..... 250,000 Ω	

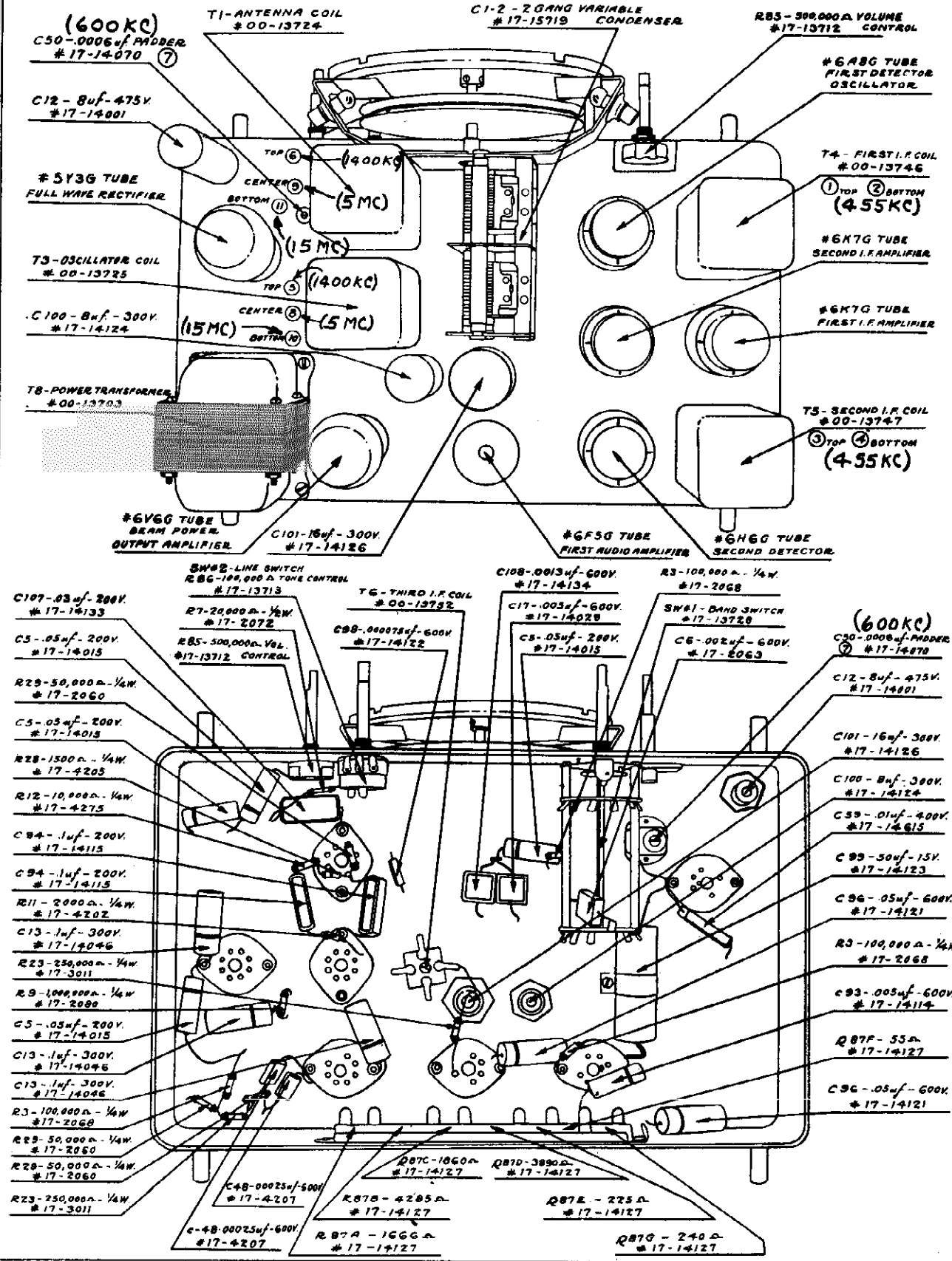
R87 TAPPED AS FOLLOWS: A-1,640 ohms; B-4,200 ohms; C-1,950 ohms; D-3,800 ohms; E-220 ohms; F-50 ohms; G-235 ohms.

COIL TRANSFORMER AND SPEAKER RESISTANCES

T1 A Band Ant. Pri..... 18.5 Ω	T3 A Band Osc. Sec..... 27 Ω	T7 Output Trans. Pri. (818)..... 760 Ω
T1 B Band Ant. Pri..... 1 Ω	T3 B Band Osc. Sec..... .06 Ω	T7 Output Trans. Sec. (818)..... 1 Ω
T1 C Band Ant. Pri..... .05 Ω	T3 C Band Osc. Sec..... .01 Ω	T7 Output Trans. Pri. (828)..... 760 Ω
T1 A Band Ant. Sec..... 350	T4 1st I. F. Trans. Pri..... 12.0 Ω	T7 Output Trans. Sec. (828)..... 1 Ω
T1 B Band Ant. Sec..... .07 Ω	T4 1st I. F. Trans. Sec..... 12.0 Ω	T8 Power Trans. 110 V. Pri..... 6.5 Ω
T1 C Band Ant. Sec..... .02 Ω	T5 2nd I. F. Trans. Pri..... 12.0 Ω	T8 Power Trans. Hi Volt. Sec..... 150.0-145 Ω
T3 A Band Osc. Pri..... 15 Ω	T5 2nd I. F. Trans. Sec..... 12.0 Ω	T8 Power Trans. 6 Volt Sec..... .05 Ω
T3 B Band Osc. Pri..... .08 Ω	T6 3rd I. F. Trans. Pri..... 64.0 Ω	T8 Power Trans. 5 Volt Sec..... .05 Ω
T3 C Band Osc. Pri..... .06 Ω	T6 3rd I. F. Trans. Sec..... 64.0 Ω	Speaker Field 818 or 828..... 1,000 Ω

MODELS 818, 828
828A, 838CS
Socket, Trimmers
Chassis

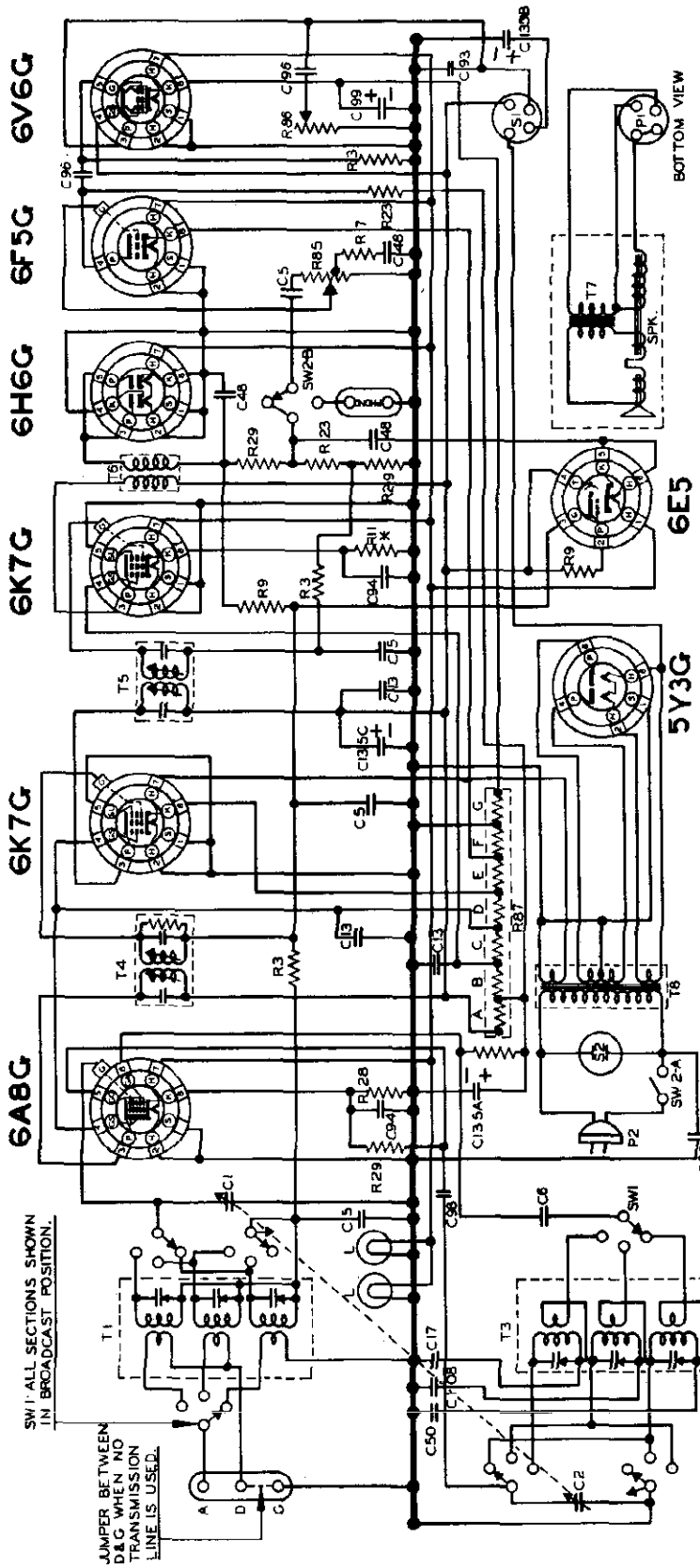
NOBLITT SPARKS INDUSTRIES



NOBLITT SPARKS INDUSTRIES

MODEL 848CS
Schematic, Part
Alignment

ARVIN HOME RADIO MODEL 848CS



NOTE: R MAY BE OBTAINED FROM 400 TO 2000 OHMS TO CONTROL SENSITIVITY.

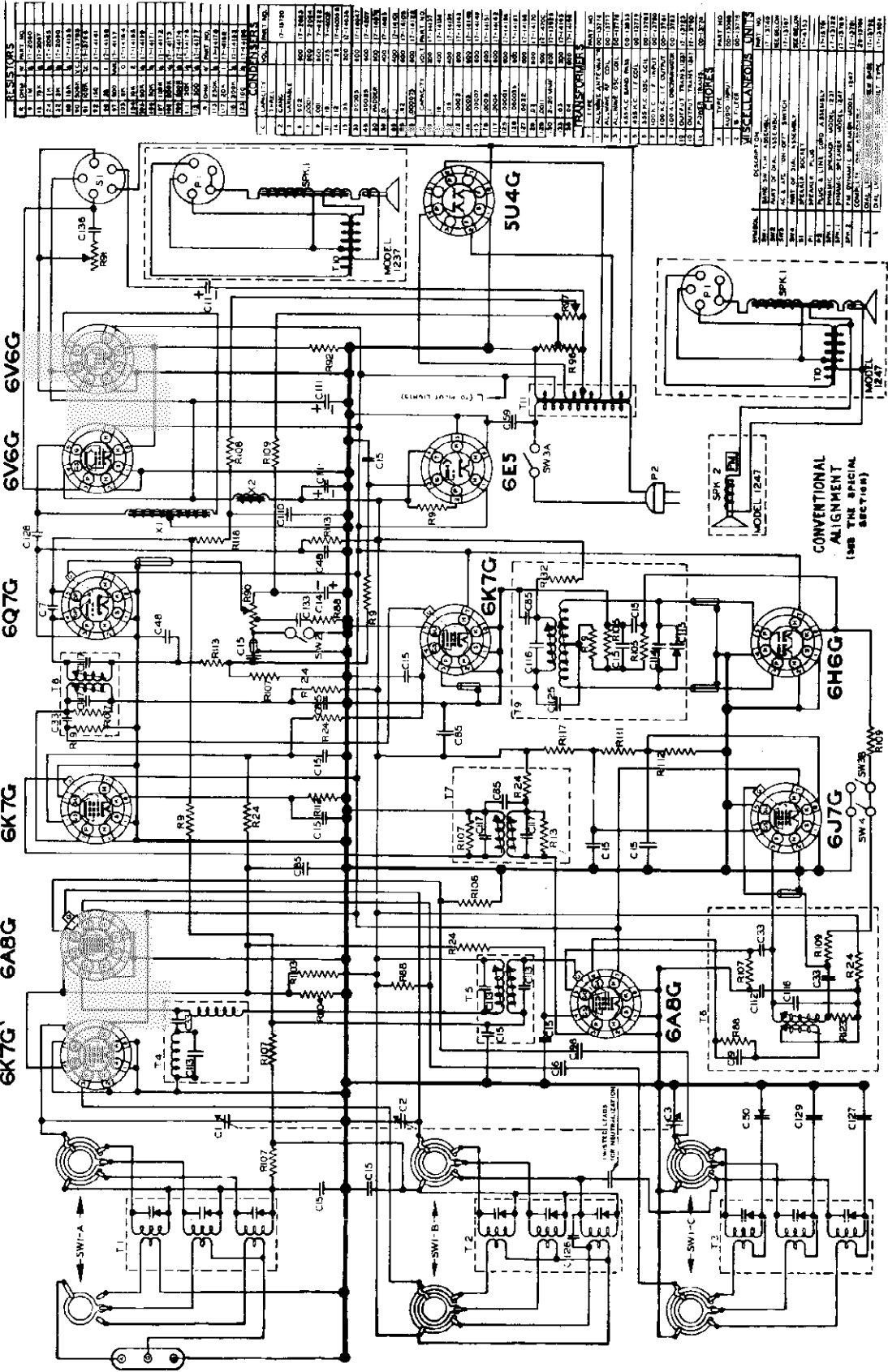
RESISTORS		CONDENSERS		TRANSFORMERS		MISCELLANEOUS UNITS	
W	PART NO.	W	PART NO.	TYPE	PART NO.	SYMBOL	DESCRIPTION
3	500K	1	7-4518	1	10-1374	SP1	DYNAMIC SPEAKER 1"
7	20K	2	17-14015	3	00-3725	SI	SPEAKER SOCKET
8	1M	98	50 ELECT	4	00-3748	S2	INDICATOR MOTOR SOCKET & CORD
11	2K	107	.05	5	00-3749	PI	SPEAKER PLUG PART OF SPEAKER
12	10K	108	.001 ± 5%	6	00-3747	P2	LINE CORD & PLUG
13	500K	109	.001 ± 5%	7	00-3752	DL	DIAL LIGHT
14	10K	110	.005 ± 5%	8	00-3751	SW1	SWITCH
15	100K	111	.0025	9	00-3753	SW2	AC & PHONO SWITCH
16	500K	112	.01	10	00-3703		CONVENTIONAL ALIGNMENT (SEE SPECIAL SECTION)
17	100K	113	.005				IF PEAK 455K.C.
18	100K	114	.002				BALANCE 15M.C. PAD 60M.C.
19	100K	115	.002				BALANCE 47M.C. CHECK 20M.C.
20	100K	116	.002				BALANCE 150M.C. CHECK 60M.C.

NOBLITT SPARKS INDUSTRIES

MODELS 1237, 1247
1247A

Schematic, Parts
Alignment

ARVIN HOME RADIO MODELS 1237 & 1247 & 1247A
6K7G 6A8G 6Q7G 6V6G 6V6G 5U4G



RESISTORS		CONDENSERS	
NO.	VALUE	TYPE	NO.
1	100K	50	100MFD
2	100K	50	100MFD
3	100K	50	100MFD
4	100K	50	100MFD
5	100K	50	100MFD
6	100K	50	100MFD
7	100K	50	100MFD
8	100K	50	100MFD
9	100K	50	100MFD
10	100K	50	100MFD
11	100K	50	100MFD
12	100K	50	100MFD
13	100K	50	100MFD
14	100K	50	100MFD
15	100K	50	100MFD
16	100K	50	100MFD
17	100K	50	100MFD
18	100K	50	100MFD
19	100K	50	100MFD
20	100K	50	100MFD
21	100K	50	100MFD
22	100K	50	100MFD
23	100K	50	100MFD
24	100K	50	100MFD
25	100K	50	100MFD
26	100K	50	100MFD
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33	100K	50	100MFD
34	100K	50	100MFD
35	100K	50	100MFD
36	100K	50	100MFD
37	100K	50	100MFD
38	100K	50	100MFD
39	100K	50	100MFD
40	100K	50	100MFD
41	100K	50	100MFD
42	100K	50	100MFD
43	100K	50	100MFD
44	100K	50	100MFD
45	100K	50	100MFD
46	100K	50	100MFD
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92	100K	50	100MFD
93	100K	50	100MFD
94	100K	50	100MFD
95	100K	50	100MFD
96	100K	50	100MFD
97	100K	50	100MFD
98	100K	50	100MFD
99	100K	50	100MFD
100	100K	50	100MFD

C BAND - 58 TO 140 MC.
BALANCE AT 150 MC.
CHECK AT 110 & 70 MC.

B BAND - 1750 TO 5.9 MC.
BALANCE AT 50 MC.
CHECK AT 30 & 2.0 MC.

A BAND - 540 TO 1750 MC.
BALANCE AT 1500 MC.
PRD AT 600 MC.
CHECK AT 1000 MC.

FIRST LF PEAK 455 KC.
SECOND LF PEAK 100 KC.
SECOND OSCILLATOR 355 KC.

CONVENTIONAL
ALIGNMENT
[SEE THE SPECIAL
SECTION]

MODEL 37-643

Alignment, Trimmers Notes

PHILCO RADIO & TELEV. CORP.

socket provided in the dry "A" battery. This lamp acts as a voltage regulator and maintains a constant potential of two volts on the filament of the receiver tubes.

"BC" battery—Philco Part No. 41-8007 is used to supply B and C batteries. This battery contains a socket into which the receiver battery cable plug is inserted.

TYPE CIRCUIT: Superheterodyne; battery operated; with Class "B" output circuit; the Philco Automatic Aerial Tuning System, and built-in connection for the Philco High-Efficiency Aerial.

BATTERY REQUIRED: "A" Philco 172-R, storage battery or a dry "A" battery Philco Part No. 41-8011. If a dry "A" battery is used, a ballast lamp Philco type 1Z1 must be inserted in the

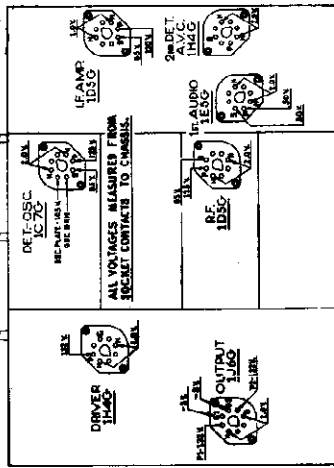


Fig. 1. Socket Voltages and R. F. Compensators

The voltages indicated by arrows were measured with a Philco 625 Circuit Tester which contains a voltmeter having a resistance of 1000 ohms per volt. Volume control is minimum; Range Switch in broadcast position; Storage Battery fully charged.

Aerial Connections

The red and black leads of the High Efficiency Aerial "transmission line" are connected to terminals 1 and 2 respectively, of the terminal panel provided on the rear of the chassis. Connect the jumper on the terminal panel across terminals 3 and 4.

If a temporary aerial is used, the jumper should be across terminals 2 and 3. The aerial connects to terminal 1 and the ground lead to terminal 3. A good ground connection is desirable in all installations.

Dial Calibration

In order to adjust this receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this rotate the tuning control to the extreme counter-clockwise position (maximum capacity). Loosen the set screw of the dial hub, then turn dial until the glowing indicator is centered on second index line of dial scale (see Fig. 2). Now tighten the dial hub set screw in this position.

Shadow Meter Adjustment

With receiver turned ON, remove aerial lead and adjust the shadow meter as follows:

1. Move the shadow meter coil backwards and forwards, until the opposite edges of the shadow are 1/4 of an inch from each end of the shadow screen, measuring along the bottom edge of the screen. Adjustment of the shadow meter light bracket may be necessary for perfect centering.
2. Remove the "B" Battery plug from its socket and rotate coil until shadow reaches minimum width. This width must not exceed 3/8 of an inch.
3. Replace the "B" Battery plug in its socket. The shadow should then widen until it is not more than 1/4 inch or less than 1/4 inch from each side of the screen, measuring along the bottom edge. If these limits are not obtained readjust the shadow meter as given in paragraphs 1 and 2 until they are obtained.

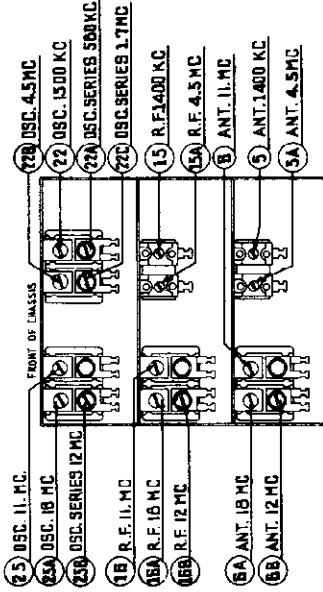


Fig. 6 R. F. Compensators

Alignment of Compensators

Tuning Range 7.5 to 11.6 M. C.

Range Switch	Receiver Dial	Compensators In Order
3	11.0 M. C.	(25) check image 10.06 M. C. on receiver
3	11.0 M. C.	(16), (6) use adjust on (25). Third lug from left side of R. F. Unit 6g.
		6. (See Note A)
		(31)

Tuning Range 6.7 to 7.4 M. C.

Range Switch	Receiver Dial	Compensators In Order
2	4.5 M. C.	(21B), (15A), (5A)
2	1.7 M. C.	(22C)
2	4.5 M. C.	(22B), (15A), (5A)

Tuning Range 800 to 1600 K. C.

Range Switch	Receiver Dial	Compensators In Order
1	1500 K. C.	(22), (15), (5)
1	500 K. C.	(22A) roll tuning condenser
1	1500 K. C.	(22)
1	1400 K. C.	(15), (5)

EQUIPMENT REQUIRED: (1) Signal Generator; Philco Model 086 (tuning range 110 to 11.6 M. C.). In correct instrument for this purpose; (2) output meter Philco Model 025, C. S. C. type, with 1000 ohm per volt meter and is recommended; (3) Fiberoptic screw driver (Philco Part No. 27-7009); (4) Special variable condenser (Philco Part No. 45-2433).

OUTPUT METER: The 025 Output Meter is connected between the plate and the 100 K. C. Driver tube and the chassis. Then adjust the meter to use the 40-80 volt scale.

INTERMEDIATE FREQUENCY CIRCUIT

- Set controls as follows:
- a. Range switch position one (broadcast)
 - b. Volume control maximum
 - c. Connect the 086 Signal Generator output lead through a .1 mfd. condenser to the control grid of the 1C7G tube, and the ground connection of the output lead to the chassis.
 - d. Receiver dial at 890 K. C.
 - e. Signal Generator 470 K. C.
 - f. Adjust compensators (24B), (34P), (33B), and (33P) for maximum output.

RADIO FREQUENCY CIRCUIT

- Tuning Range 11.5 to 16.2 M. C.**
1. Connect signal generator output lead with the .1 mfd. series condenser to terminal No. 1 and the ground lead to terminal No. 3. Terminals 2 and 3 must be connected with the shorting link provided on the aerial panel.
2. Adjust compensators as follows:

Range Switch	Receiver Dial	Compensators In Order
4	16.0 M. C.	(25A) check image at 17.06 M. C. on receiver dial (See Note B)
4	16.0 M. C.	(6A), (16A) use adjust condenser on 25A. First lug from left side of R. F. Unit 6g. (See Note A)
4	11.0 M. C.	(21B), (15A), (5A)
4	16.0 M. C.	(6A), (16A) use adjust condenser on 25A. First lug from left side of R. F. Unit 6g. 6. (See Note A)

NOTE "A":—To eliminate the effect of the Ant. and R. F. compensators decoupling the Osc. circuit, a variable tuning condenser, Philco Part No. 45-2333 is connected from the oscillator compensators to ground when designated in the padding instructions above. Turn the added condenser from the minimum capacity position to the maximum capacity position. The maximum capacity of the added condenser is indicated by the signal from the generator, resulting in a maximum indication on the output meter. Then adjust compensators as noted for maximum output.

NOTE "B":—To accurately adjust the compensator to the fundamental and not the image signal, turn the oscillator compensator to the maximum capacity position clockwise. Then slowly turn the compensator counter-clockwise until a second maximum peak is obtained on the output meter. The first peak in the image band is the maximum peak. The second peak is the fundamental. The procedure is correctly performed, the image signal will be found 940 K. C. below the frequency being used on any high frequency band.

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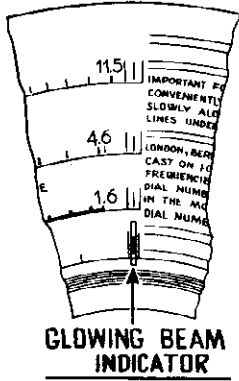


Fig. 2—Dial

SPEAKER:

- "B" KR-17
- "X" HR-12

CURRENT DRAIN:

- "A" battery 0.9 amps
- "B" battery 23 M.A.

FREQUENCY RANGES: Four:

- Range 1—530 to 1600 K. C.
- Range 2—1.58 to 4.8 M. C.
- Range 3—4.7 to 11.6 M. C.
- Range 4—11.5 to 18.2 M. C.

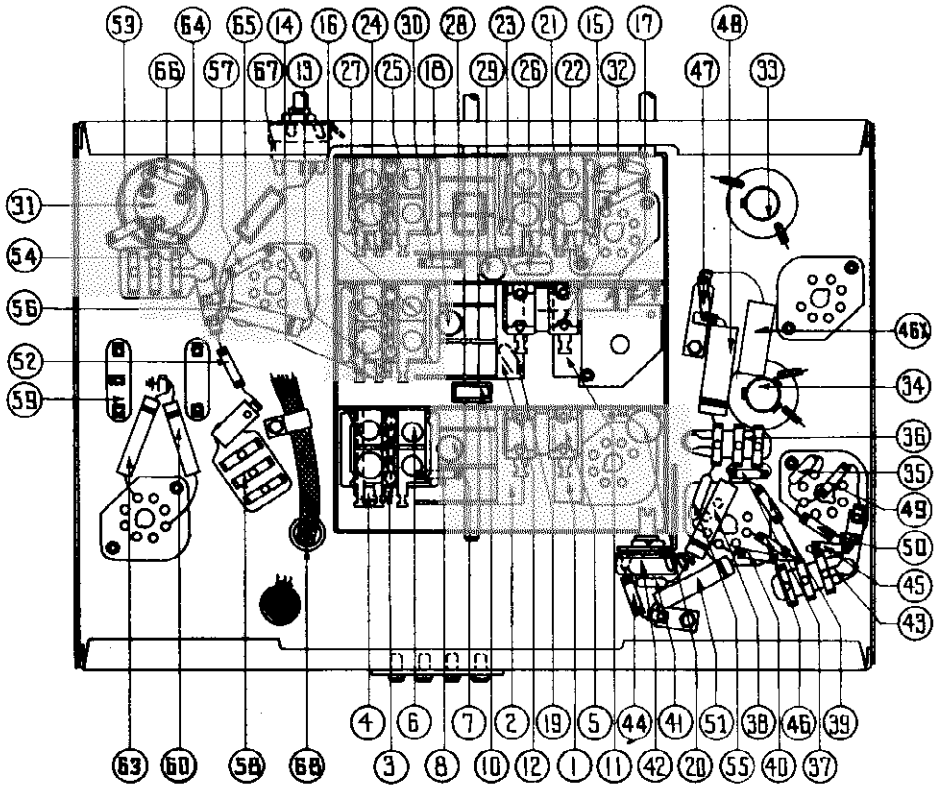


Fig. 4. Base View of Chassis

Replacement Parts—Model 37-643

Schem. No.	Description	Part No.	List Price	Schem. No.	Description	Part No.	List Price	Description	Part No.	List Price
1	Antenna Transformer (Range 1)	32-2108	\$1.60	47	Resistor (1,000 ohms, 1/2 watt)	33-210339	\$0.30	Volume Control Shaft	38-8060	\$0.12
2	Antenna Transformer (Range 2)	32-2146	1.20	47X	Shadow Meter	48-2907		Retaining Clip	28-4394	.01
3	Antenna Transformer (Range 3)	32-2180	1.20	48	Condenser (.25 mfd. tubular)	30-4446	.25	Spring	28-4117	.40
4	Antenna Transformer (Range 4)	32-2175	1.20	49	Resistor (1 megohm, 1/2 watt)	33-610339	.20	Tube Shield	28-2726	10
5	Compensator (two section)	31-6093	.40	50	Resistor (1 megohm, 1/2 watt)	33-610339	.20	Tube Shield Base	28-2898	.03
6	Compensator (three section)	31-6128	1.00	51	Condenser (.008 mfd. tubular)	30-4125	.20	Shield Shadow Meter	28-2917	.02
7	Condenser (.05 mfd. tubular)	30-4020	.20	52	Resistor (240,000 ohms, 1/2 watt)	33-424339	.20	Socket (7 prong)	27-6057	.11
8	Resistor (51,000 ohms, 1/2 watt)	33-351339	.20	53	Resistor (240,000 ohms, 1/2 watt)	33-424339	.20	Socket (8 prong)	27-6058	.11
9	Tuning Condenser	31-1855	4.50	54	Condenser (.15 mfd. tubular)	6287-SG	.20	Grommet Mtg. R. F. Unit	27-4317	.04
10	Condenser (40 mmfd. mica)	30-1076	.20	55	Condenser (250 mmfd. mica)	30-1032	.25	Sleeve Mtg. R. F. Unit	28-2257	.01
11	R. F. Transformer (Range 1)	32-2105	1.00	56	Condenser (.015 mfd. tubular)	30-4228	.20	Washer Mtg. R. F. Unit	27-7807	.50
12	R. F. Transformer (Range 2)	32-2147	.70	57	Resistor (1 megohm, 1/2 watt)	33-510339	.20	Screw Mtg. R. F. Unit	W-729	.45
13	R. F. Transformer (Range 3)	32-2161	.70	58	Condenser (.04 mfd. dual bakelite)	8327-DU	.40	Washer Mtg. R. F. Unit	27-7807	.50
14	R. F. Transformer (Range 4)	32-2176	1.20	59	Audio Transformer (Input)	32-7637	2.00	Screw Mtg. R. F. Unit	W-729	.45
15	Compensator (two section)	31-6120	.50	60	Condenser (.004 mfd. tubular)	30-4450	.20	Mtg. Rubber (Gang Condenser)	27-4325	.02
16	Compensator (three section)	31-6127	1.00	61	Output Transformer KR-17—HR-12	32-7639	1.60	Mtg. Spring (Shadow Meter)	28-8623	.70
17	Condenser (.05 mfd. tubular)	30-4020	.20	62	Cone and Voice Coil KR-17	36-3240	.80	Mtg. Plate (R. F. Transformer)	28-3808	.02
18	Condenser (.05 mfd. tubular)	30-4020	.20	63	Cone and Voice Coil HR-12	36-3557	1.20	Mtg. Spacer (R. F. Transformer)	27-8228	.01
19	Condenser (5 mmfd. mica)	30-1077	.20	64	Condenser (.004 mfd. tubular)	30-4456	.20	Mtg. Screw (R. F. Transformer)	W-1635	.30
20	Condenser (1 mfd. tubular)	30-4122	.20	65	Resistor (8,000 ohms, 1/2 watt)	33-280339	.20	Mtg. Busher (Cabinet)	27-4360	.04
21	Oscillator Transformer (Range 1)	32-2120	1.00	66	Resistor (1,000 ohms, 1/2 watt)	33-1223	.20	Mtg. Rubber (Cabinet)	3558	.03
22	Compensator (four section)	32-6108	.68	68	Resistor (2,000 ohms, 1/2 watt)	33-230339	.20	Speaker Cable	41-3207	.30
23	Oscillator Transformer (Range 2)	32-2149	.70	69	Switch and Tone Control	42-1241	1.00	Knob (Tuning)	27-4330	.10
24	Oscillator Transformer (Range 3)	32-2152	.70	70	Battery Cable Assembly	41-3198	1.40	Knob (Tuning Vernier)	27-4331	.10
25	Compensator (three section)	32-6126	.68	71	Ant. Range Switch	42-1202		Knob (Tone and Volume)	27-4332	.10
26	Condenser (650 mmfd. mica)	5883	.25	72	Oscillator Range Switch	42-1204		Knob (Range Switch)	27-4326	.10
27	Oscillator Transformer (Range 4)	32-2182	.70		Pilot Lamp (dial) and Shadow Meter	34-2150	.22	"A" Battery	172-K	
28	Condenser (2675 mmfd.)	30-1085	.40		Shadow Meter Receptacle Assem.	41-3225		"B" Battery	41-8007	
29	Condenser (.001 mfd. tubular)	30-4453	.20		Range Switch Shaft and Index Plate	42-1186	.50			
30	Resistor (3,000 ohms, 1/2 watt)	33-250339	.20		Pilot Lamp Assembly	38-7875	.45	"B" CABINET		
31	Electrolytic Condenser (8, 2, 2, mfd.)	30-2161	1.60		Hub	28-7187	.20	Speaker KR-17	36-1248	
32	Resistor (51,000 ohms, 1/2 watt)	33-351339	.20		Clamp	28-2837	.20	Baffle and Silk Assembly	40-5975	.40
33	1st I. F. Transformer	32-2253	1.80		Set Screw	W-1641	.02	Base Assembly	40-5946	.75
34	2nd I. F. Transformer	32-2255	1.80		Dial Hole Cover	27-8425	.02	Gasket	27-8312	.01
35	Condenser (110 mmfd. mica) 80 mmf.	30-1031	.20		Gear (Dial)	26-7185	.15	Screw	W-1644	.50
36	Condenser (110 mmfd. dual)	8035-DG	.25		Gear (Drive)	31-1884	.25	Glass	27-8299	.06
37	Resistor (99,000 ohms, 1/2 watt)	33-399339	.20		Thrust Spring	28-8611	.01	Ring	28-2987	.40
38	Condenser (.01 mfd. tubular)	30-4124	.20		Thrust Washer	28-3976	.20			
39	Resistor (490,000 ohms, 1/2 watt)	33-440339	.20		"C" Washer	28-3904	.30	"X" CABINET		
40	Resistor (1,000 ohms, 1/2 watt)	33-210339	.20		Mask	27-5240	.20	Baffle Silk Assembly	40-6036	1.20
41	Condenser (.75 mmfd. mica)	30-1053	.20		Mask Arm and Link Assembly	31-1859	.30	Speaker HR-12	38-1250	11.00
42	Volume Control	32-5158	1.00		Mask Washer	27-8318	.20	Base and Plate Assembly	40-5948	.80
43	Condenser (.015 mfd. bakelite)	3793-SU	.35		Mask Guide and Lamp Bracket	38-7844	.20	Glass	27-8300	.06
44	Resistor (51,000 ohms, 1/2 watt)	33-351339	.20		Indicator Bracket and Lens Assembly	31-1900	.30	Ring	28-2988	.45
45	Resistor (1 megohm, 1/2 watt)	33-510339	.20		Scale Guard	27-8324	.02	Gasket	27-8313	.01
46	Resistor (1000 ohms, 1/2 watt)	33-210339	.20					Screw	W-1644	.50
46X	Condenser (.05 mfd. tubular)	30-4020								

Prices Subject to Change Without Notice

MODEL 37-665

Voltage, Notes

Spkr. Wiring

PHILCO RADIO & TELEV. CORP.

Electrical Specifications

TYPE CIRCUIT:

Superheterodyne, with a High-Frequency tuning range; covering from 25 to 42 megacycles and a Push-Pull pentode audio output circuit.

POWER SUPPLY:

Voltage	Frequency	Power Consumption
115	50 to 60	130 watts
115	25 to 40	130 watts

Power transformers for the different voltage and frequency ratings are listed in the parts list.

Dial Calibration

In order to adjust this receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this rotate the tuning control to the extreme counter-clockwise position (maximum capacity). Loosen the set screw of the dial hub, then turn dial until the glowing indicator is centered on the middle index line of dial scale (see Fig. 5). Now tighten the dial hub set screw in this position.

Aerial Connections

To obtain the full advantage of the sensitivity of this receiver the Philco High Efficiency Aerial supplied with the receiver must be used. The connections for the aerial are as follows:

The red and black leads of the High-Efficiency Aerial "transmission line" are connected to terminals 1 and 2 respectively, of the terminal panel on the rear of the chassis. Connect the jumper on the terminal panel across terminals 3 and 4.

If a temporary aerial is used, the jumper should be across terminals 2 and 3. The aerial connects to terminal 1 and the ground lead to terminal 3. A good ground connection is desirable in all installations.

Shadow Meter Adjustment

Remove aerial and allow tubes to warm up. Then adjust shadow meter as follows:

1. Move the shadow meter coil backwards and forwards, until the opposite edges of the shadow are $\frac{1}{8}$ of an inch from end of the shadow screen, measuring along the bottom edge of the screen. Adjustment of the shadow meter light bracket may be necessary for perfect centering.

2. Remove the rectifier tube from its socket, and rotate coil until shadow reaches minimum width. This width must not exceed $\frac{1}{8}$ of an inch.

3. Replace the 5Y4G rectifier tube in its socket. The shadow should then widen to not more than $\frac{1}{4}$ of an inch or less than $\frac{1}{4}$ inch from each side of the screen measuring along the bottom edge. If these limits are not obtained readjust the shadow meter as given in paragraphs 1 and 2 until they are reached.

PHILCO TUBES USED: Nine.

Two 6K7G; two 6F6G; two 6J5G; one 6A8G; one 6K5G and one 5Y4G.

SPEAKERS: B Cabinet, K35. Part No. 36-1231.
X Cabinet, H26. Part No. 36-1238.

INTERMEDIATE FREQUENCY:

470 K. C.

TUNING RANGES: Four.

- Range 1—530 to 1720 K. C.
- Range 2—2.3 to 7.4 M. C.
- Range 3—7.35 to 22 M. C.
- Range 4—25 to 42 M. C.

UNDISTORTED OUTPUT: 7 watts.

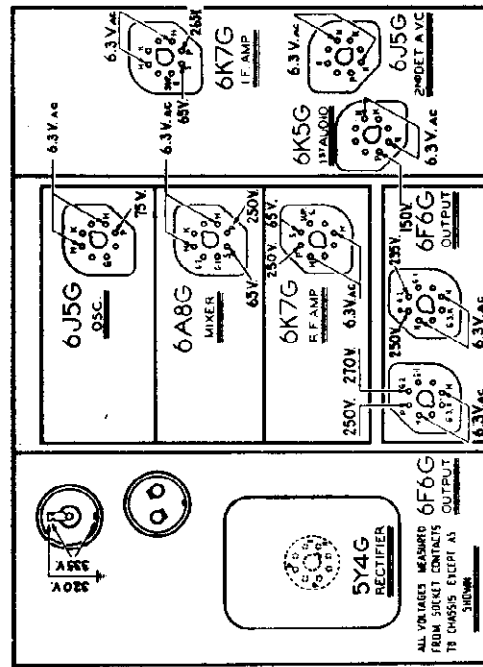


Fig. 1—Socket Voltages—Underside of Chassis View

The voltages indicated by arrows were measured with a Philco #25 Circuit Tester which contains a voltmeter having a resistance of 1000 ohms per volt. Volume Control at minimum, range switch in broadcast position, line voltage 115 A. C.

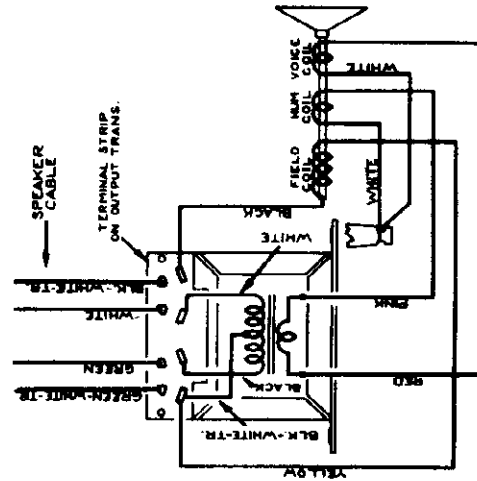
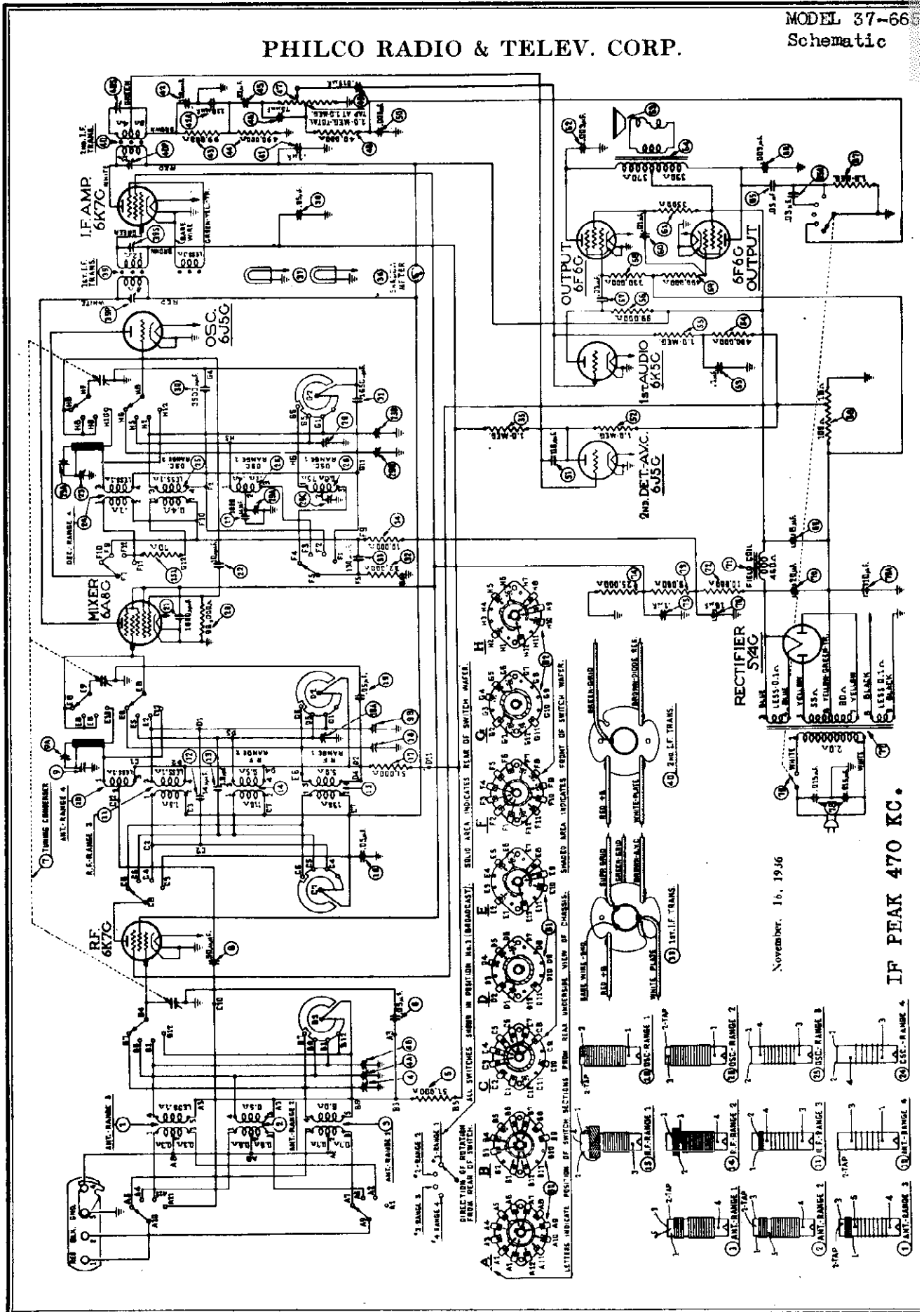


Fig. 2—Speaker Wiring, K-35, H-26

PHILCO RADIO & TELEV. CORP.



November, 18, 1936

IF PEAK 470 KC.

MODEL 37-665

Alignment
Trimmers

PHILCO RADIO & TELEV. CORP.

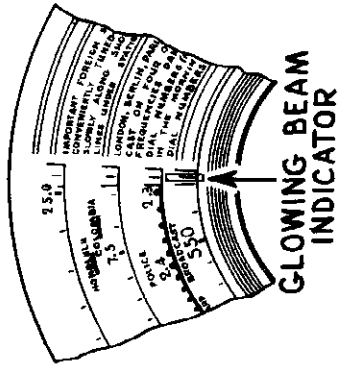


Fig. 5—Dial Calibration

Alignment of Compensators

- Equipment Required:** (1) Signal Generator; Philco Model 088 (fundamental frequency 110 to 20000 K. C.) is the correct instrument for this purpose; (2) output meter. Philco Model 025 Circuit Tester incorporates an accurate, sensitive output meter and is recommended; (3) Fibre handle screw-driver (Philco Part No. 27-7059); (4) Special variable condenser (Philco Part No. 45-2325).
- OUTPUT METER:** The 025 Output Meter is connected between the plate and cathode prongs of one of the 6F6G tubes. The meter is adjusted to use the (0-30) volt scale.
- Compensators in Order**
- (29B), (18), (4)
 - (29C) Roll gang
 - (29B)
 - (18), (4)

NOTE "A"—To accurately adjust the compensator to the fundamental and not the image signal, turn the oscillator compensator to the maximum capacity position clockwise. Then slowly turn the compensators counter-clockwise until a second maximum peak is obtained on the output meter. The first peak is the image signal and the receiver must not be adjusted to it. If the above procedure is correctly performed, the image signal will be found 940 K. C. below the frequency being used on any high frequency band.

NOTE "B"—To eliminate the effect of the Ant. and R. F. compensators detuning the Osc. circuit, a variable tuning condenser, Philco Part No. 43-2325 is connected from the oscillator compensators to ground when designated in the padding instruction above. Tune the added condenser from the minimum capacity position until the second harmonic of the receiver oscillator beats against the signal from the generator, resulting in a maximum indication on the output meter. Then adjust compensators as noted for maximum output.

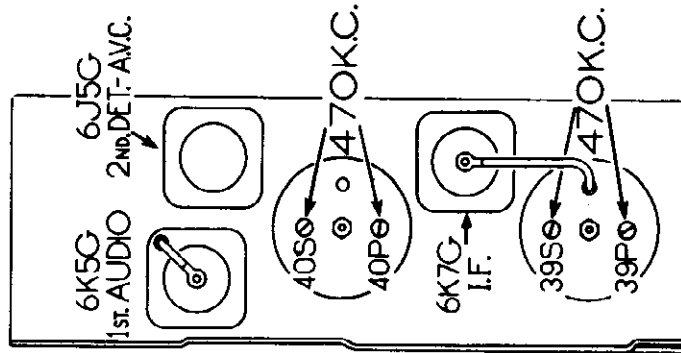


Fig. 6—I. F. Compensators

EQUIPMENT REQUIRED: (1) Signal Generator; Philco Model 088 (fundamental frequency 110 to 20000 K. C.) is the correct instrument for this purpose; (2) output meter. Philco Model 025 Circuit Tester incorporates an accurate, sensitive output meter and is recommended; (3) Fibre handle screw-driver (Philco Part No. 27-7059); (4) Special variable condenser (Philco Part No. 45-2325).

OUTPUT METER: The 025 Output Meter is connected between the plate and cathode prongs of one of the 6F6G tubes. The meter is adjusted to use the (0-30) volt scale.

INTERMEDIATE FREQUENCY CIRCUIT

1. Set controls as follows:
 - a. Range switch position one (broadcast)
 - b. Receiver dial 580 K. C.
 - c. Volume control maximum
 - d. Signal generator 470 K. C.
 - e. Connect the 068 signal generator output lead through a .1 mfd. condenser to the control grid of the 6A8G tube and the generator ground connection to the chassis.
2. Adjust the following I. F. compensators for maximum output: (39P), (39S), (40P) and (40S).

RADIO FREQUENCY CIRCUIT

- Tuning Range (26 to 42 M. C.)**
1. Set controls as follows:
 - a. Range switch position 4
 - b. Connect the signal generator output lead and ground to terminals 1 and 3 respectively on the aerial input panel. Terminals 2 and 3 must be connected with the shorting link provided on the aerial panel.
 2. Adjust compensators as follows for maximum output:

Signal Generator	Receiver Dial	Compensators in Order
13 M. C.	39 M. C.	(23) Check image signal at 38.06 on the Receiver Dial. (See Note A)
13 M. C.	39 M. C.	(9) Roll gang (23A)
13 M. C.	26 M. C.	(9A)
13 M. C.	26 M. C.	(23) check image (Note A)
13 M. C.	39 M. C.	(9) Roll gang

- Tuning Range 7.35 to 22 M. C.**
1. Set controls and adjust compensators for maximum output as follows:

Signal Generator & Receiver Dials	Compensators in Order
18 M. C.	(23B) check image 17.06 M. C.
18 M. C.	(9B), (4B) use shunt condenser on (23B). See Note B
7.0 M. C.	(29), (18A), (4A)
2.35 M. C.	(29A)
7.0 M. C.	(29)
6.0 M. C.	(18A), (4A)
- Tuning Range 2.3 to 7.4 M. C.**
1. Range Switch Position 2
 2. Signal Generator & Receiver Dials

Signal Generator & Receiver Dials	Compensators in Order
7.0 M. C.	(29), (18A), (4A)
2.35 M. C.	(29A)
7.0 M. C.	(29)
6.0 M. C.	(18A), (4A)

Fig. 7—R. F. Compensators

PHILCO RADIO & TELEV. CORP.

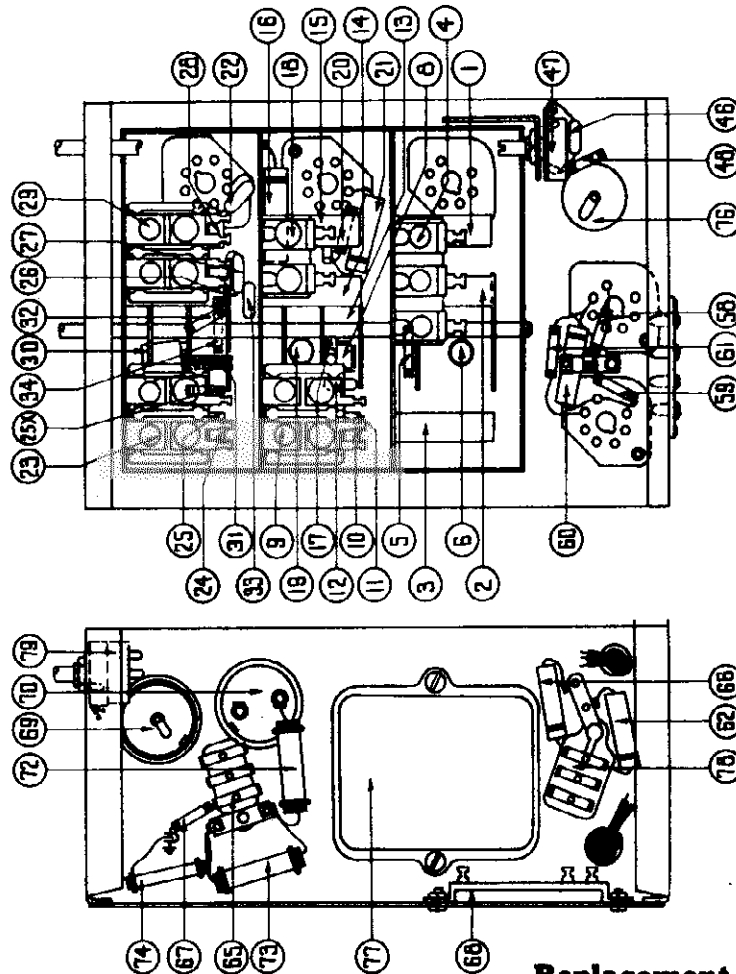
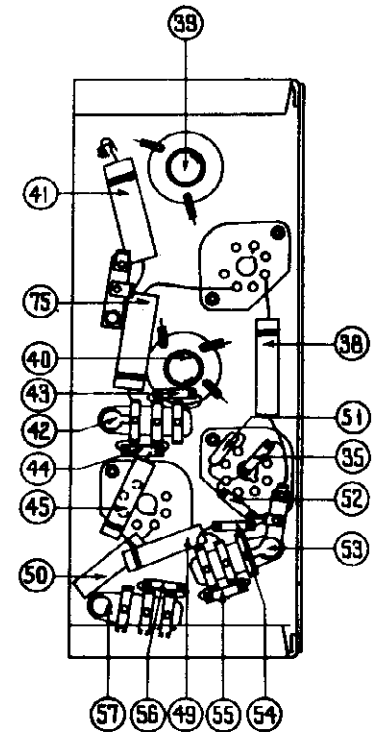


Fig. 4—Base View of Chassis



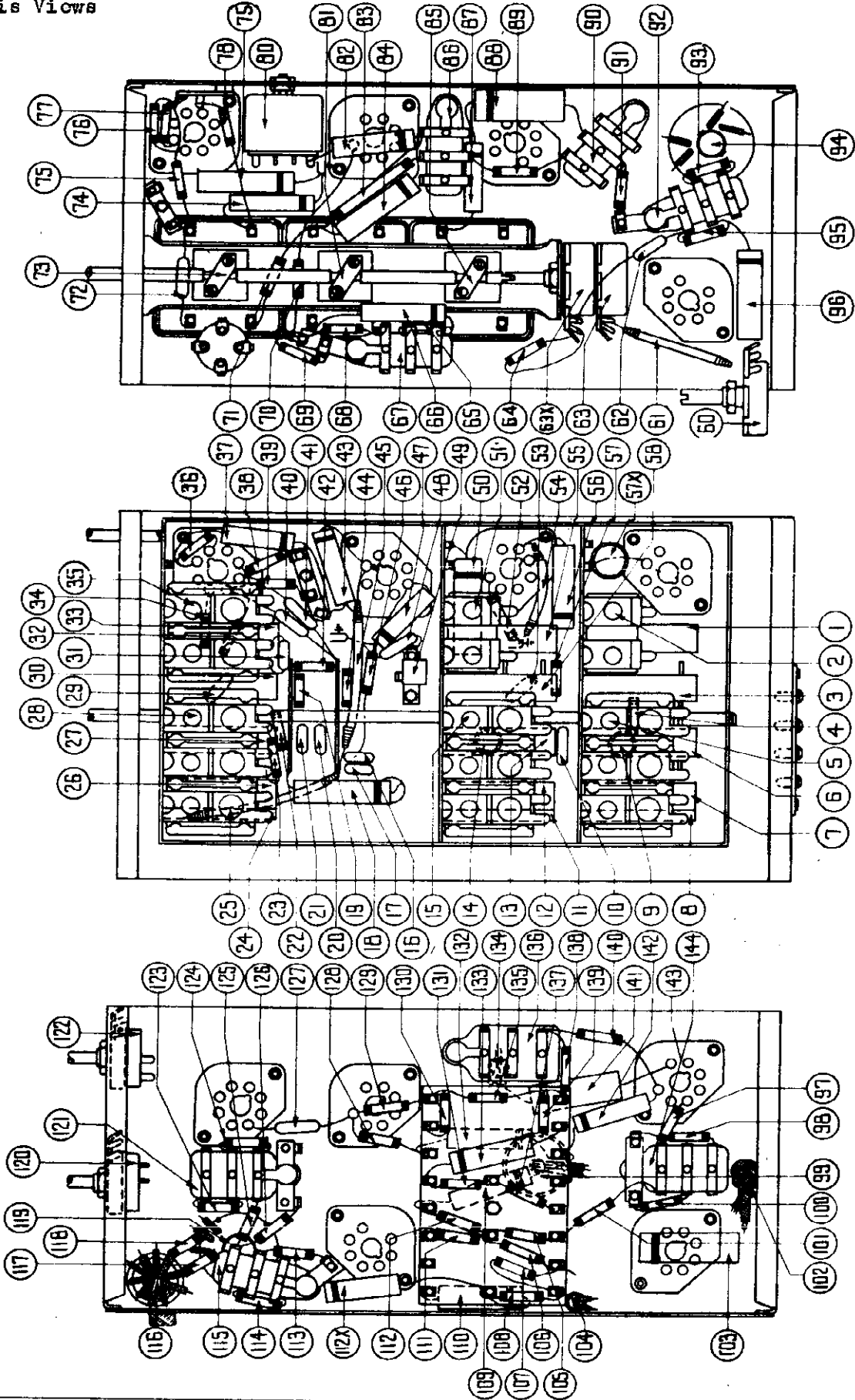
Replacement Parts

Schem. No.	Description	Part No.	List Price	Schem. No.	Description	Part No.	List Price	Schem. No.	Description	Part No.	List Price
1	Antenna Transformer (Range 3)	32-2109	\$1.20	48	Resistor (40,000 ohms, 1/2 watt)	33-340339	\$0.20		Thrust Washer	28-3976	\$0.30 C
2	Antenna Transformer (Range 2)	32-2110	1.20	49	Condenser (.015 mfd. tubular)	30-4358	.20		"C" Washer	28-3904	.01
3	Antenna Transformer (Range 1)	32-2108	1.60	50	Condenser (.006 mfd. tubular)	30-4125	.20		Mask	27-5240	.30
4	Compensator (three section)	31-6092	.60	51	Condenser (110 mfd. mica)	30-1031	.20		Mask Washer	27-8318	.50 C
5	Resistor (51000 ohms, 1/2 watt)	33-351339	.20	52	Resistor (1.0 megohm, 1/2 watt)	33-516339	.20		Mask Arm & Link Assembly	31-1987	.45
6	Condenser (.05 mfd. tubular)	30-4444	.20	53	Condenser (.1 mfd. Bakelite)	4989-5C1	.20		Mask Guide & Bracket	38-7876	.25
7	Tuning Condenser	31-1928	4.80	54	Resistor (490,000 ohms, 1/2 watt)	33-449339	.20		Indicator & Lens Assembly	31-1900	.30
8	Condenser (.60 mfd. mica)	30-1029	.20	55	Resistor (1.0 megohm, 1/2 watt)	33-516339	.20		Volume Control Shaft	38-8060	.12
9	Compensator (3 section)	31-6226	.20	56	Resistor (99,000 ohms, 1/2 watt)	33-399339	.20		Retaining Chip	28-4394	.01
10	Ant. Transformer (Range 4)	32-2192	.70	57	Condenser (.03 mfd. bakelite)	8318-SU	.35		Shaft Spring	28-4117	.40 C
11	R. F. Transformer (Range 3)	2-2126	.70	58	Resistor (330,000 ohms, 1/2 watt)	33-453339	.20		Shield (Tube)	28-2726	.10
12	Condenser (1/4 mfd.)	30-1073	.20	59	Resistor (490,000 ohms, 1/2 watt)	33-449339	.20		Base (Shield)	28-3898	.03
13	Condenser (1.0 mfd.) twisted wire and lug	38-7878	.04	60	Condenser (.01 mfd. tubular)	30-4199	.20		Socket 7 prong	27-6057	.11
14	R. F. Transformer (Range 2)	32-2106	.70	61	Resistor (3500 ohms, 1/2 watt)	33-335339	.20		Socket 8 prong	27-6058	.11
15	R. F. Transformer (Range 1)	32-2105	1.00	62	Condenser (.003 mfd. tubular)	30-4469	.20		Socket resistor	27-6052	.11
16	Condenser (.05 mfd. Tubular)	30-4123	.20	63	Cone & Voice Coil H26	36-3174	.80		Terminal Panel (Ant.)	28-7714	.15
17	Resistor (51000 ohms, 1/2 watt)	33-351339	.20		Cone & Voice Coil H26	36-3801			Grommet Mtg. R. F. Unit	27-4317	.04
18	Compensator (two section)	31-6093	.40	64	Output Transformer K35 and H26	32-7634	1.50		Sleeve Mtg. R. F. Unit	27-7907	.50 C
19	Condenser (.05 mfd. Tubular)	30-4444	.20	65	Condenser (.05, .03 mfd. dual bakelite)	3615-YU	.40		Screw Mtg. R. F. Unit	W-729	.45 C
20	Resistor (99,000 ohms)	33-399339	.20	66	Condenser (.003 mfd. tubular)	30-4469	.20		Rubber Mtg. (Gang Condenser)	27-4325	.02
21	Condenser (1000 mfd.)	30-4453	.20	67	Resistor (1.0 megohm, 1/2 watt)	33-510339	.20		Spring Mtg. Shadowmeter	28-8623	.70 C
22	Condenser (10 mfd.)	30-1066	.20	68	Resistor (28 ohms, wirewound)	33-3280	.30		Plate Mtg. R. F. Transformer	28-5908	.02
23	Compensator (three section)	31-6226	.20	69	Electrolytic Condenser (8 mfd.)	30-2024	1.10		Spacer Mtg. R. F. Transformer	27-8228	.01
24	Osc. Transformer (Range 4)	32-2196	1.20	70	Electrolytic Condenser (10, 20 mfd.)	30-2163	2.40		Screw Mtg. R. F. Transformer	W-1635	.30 C
25	Osc. Transformer (Range 3)	32-2110	.70	71	Field Coil Assembly K35 and H26	36-3887	4.00		Shield (Receiver Bottom)	38-8316	.10
26	Resistor (70 ohms, 1/2 watt)	33-070339	.20	72	Resistor (10,000 ohms, 3 watt)	33-310639	.30		Snap Fasteners	28-4279	.75 C
27	Osc. Transformer (Range 2)	32-2121	.70	73	Resistor (9000 ohms, 2 watt)	33-290639	.30		Cable Speaker	41-3202	.40
28	Condenser (1000 mfd. mica Green, White)	30-1007	.30	74	Resistor (25,000 ohms, 1 watt)	33-325439	.20		A. C. Cord	L-2183	.10
29	Osc. Transformer (Range 1)	32-2120	1.60	75	Condenser (.1 mfd. tubular)	30-4170	.25		Knob (tuning)	27-4830	.10
30	Compensator (four section)	31-6108	1.00	76	Electrolytic Condenser (16 mfd.)	30-2118	1.65		Knob (tuning vernier)	27-4831	.10
31	Condenser (1650 mfd.)	31-6096	.40	77	Power Transformer 115 V., 50 to 60 cycles	32-7606	6.25		Knob (tone & volume)	27-4832	.10
32	Resistor (32000 ohms, 1/2 watt)	33-332339	.20		Power Transformer 115 V., 25 to 40 cycles	32-7607	9.00		Receptacle (Shadowmeter)	41-3225	.40
33	Condenser (130 mfd.)	30-1060	.25		Power Transformer 115/220 V., 50 to 60 cycles	32-7608	8.00				
34	Resistor (10000 ohms, 1/2 watt)	33-310339	.20	78	Condenser (.015 mfd. dual bakelite)	3793-DG	.40		"B" CABINET		
35	Resistor (1.0 megohm, 1/2 watt)	33-510339	.20	79	Power & Tone Control Switch	42-1184	.75		Speaker K35	36-1281	7.25
36	Shadowmeter	45-3307	2.50	80	Range Switch Ant.	42-1227	1.25		Speaker & Silk Assembly	45-5975	.60
37	Shadowmeter and Pilot Lamp	34-2039	.07	81	Range Switch R. F.	42-1228	1.60		Bezel Assembly	40-5946	.75
38	Condenser (.05 mfd. tubular)	30-4020	.20	82	Range Switch Osc.	42-1229	1.60		Gasket	27-5312	.01
39	1st I. F. Transformer	32-2169	1.80		Switch Index Plate & Shaft	42-1186	.50		Screw	W-1644	.50 C
40	2nd I. F. Transformer	32-2171	1.80		Pilot Lamp Assembly	38-7706	.35		Glass	27-8299	.06
41	Condenser (.1 mfd. tubular)	30-4465	.25		Dial	27-8244	.70		Ring	28-3987	.40
42	Condenser (110 mfd. Dual Bakelite)	8035-DG	.25		Hub	28-7187	.12		"X" CABINET		
43	Resistor (99,000 ohms, 1/2 watt)	33-399339	.20		Clamp	28-2837	.10		Speaker H26	36-1238	8.25
44	Resistor (490,000 ohms, 1/2 watt)	33-449339	.20		Set Screw	W-1641	.02		Bezel Assembly	40-5948	.80
45	Condenser (.01 mfd. tubular)	30-4124	.25		Gear (Dial)	28-7185	.10		Gasket	27-8313	.01
46	Condenser (.75 mfd. mica)	30-1031	.20		Gear (Drive)	31-1884	.25		Ring	27-8300	.06
47	Volume Control	33-5158	1.00		Thrust Spring	28-8611	.01		Glass	38-3988	.10
									Speaker Baffle	16276	.70
									Silk	44-1165	.40

Prices Subject to Change Without Notice

MODEL 37-690
Chassis Views

PHILCO RADIO & TELEV. CORP.



PHILCO RADIO & TELEV. CORP.

Electrical Specifications

TYPE CIRCUIT: Superheterodyne, with Magnetic Tuning; Fidelity-selectivity control in the intermediate frequency unit; 10 K. C. audio filter circuit; individual A.V.C. circuits for the R.F. and I.F. amplifiers; Automatic Bass Compensation circuit and Class "A" audio output circuit.

TUNING DIAL: Philco Automatic Dial Tuning Mechanism.

POWER SUPPLY:

Voltage	Frequency	Consumption
115	50 to 60 cycles	275 watts
115	25 to 40 cycles	285 watts

PHILCO TUBES USED: Twenty.

Five 6K7G; two 6B4G; four 6J5G; two 5X4G; one 6N7G; one 6B8G; one 6L7G; one 6H6G; one 6A8G; one 6R7G; one 6F6G.

TONE CONTROLS:

- A. Treble response adjustable by the Fidelity-selectivity control.
- B. Continuously variable Bass Response.

SPEAKERS: One W2 Cathedral High-fidelity Speaker.
Two—CB2 High Frequency Speakers.

Aerial Connections

To obtain the full advantage of the sensitivity of this receiver the Philco High Efficiency Aerial supplied with the receiver must be used. The connections for the aerial are as follows:

The red and black leads of the High-Efficiency Aerial "transmission line" are connected to terminals 1 and 2 respectively, of the terminal panel provided on the rear of the chassis. Connect the jumper on the terminal panel across terminals 3 and 4.

If a temporary aerial is used, the jumper should be across terminals 2 and 3. The aerial connects to terminal 1 and the ground lead to terminal 3. A good ground connection is desirable in all installations.

Removing Cabinet Top and Adjusting Door Hardware

Remove screws from under side of top frame (on some cabinets it will be necessary to loosen the high frequency speaker baffle to reach screws above them). The top is located by two dowels and will lift off after screws are removed.

To adjust doors after removing top, pull nails from washers, loosen nuts, move hardware in direction to align doors. Tighten nuts and drive nails through holes in washers after turning washers to provide new nail hole locations.

If doors are to be removed, lift loose pin out of hardware in top frame; tip door forward slightly and lift off of pin in bottom frame. For this operation it is also necessary to first remove the top.

CAUTION: The top frame (that section which bears the Philco trademark) should never be removed from the cabinet.

Do not glue top when replacing it on cabinet.

Dial Calibration

In order to adjust this receiver correctly the dial must be aligned to track properly with the tuning condenser. To do this proceed as follows:

1. Loosen the set screws on the shaft coupling of the tuning condenser. Then turn the tuning condenser until the plates are in the maximum capacity position. Now set the glowing beam indicator on the index line at the low frequency end of the broadcast band. With dial and tuning condenser in this position tighten set screws.
2. Turn the tuning condenser control until the indicator is on the first division from the index line.
3. With the dial in this position, loosen the shaft coupling set screws. Then turn the dial until the indicator is again on the index line. Tighten the set screws in this position.

NOTE: Be careful when turning the dial that the position of the tuning condenser is not disturbed.

INTERMEDIATE FREQUENCY: 470 K. C.
UNDISTORTED OUTPUT: 15 watts.

TUNING RANGES: Five.

- Range 1—530 to 1600 K. C.
- Range 2—1.58 to 4.75 M. C.
- Range 3—4.7 to 7.4 M. C.
- Range 4—7.35 to 11.6 M. C.
- Range 5—11.5 to 18.2 M. C.

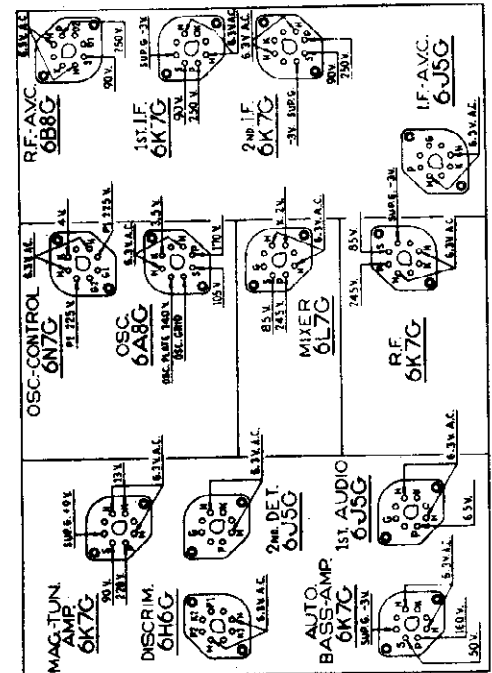


Fig. 1. Receiver Socket Voltage

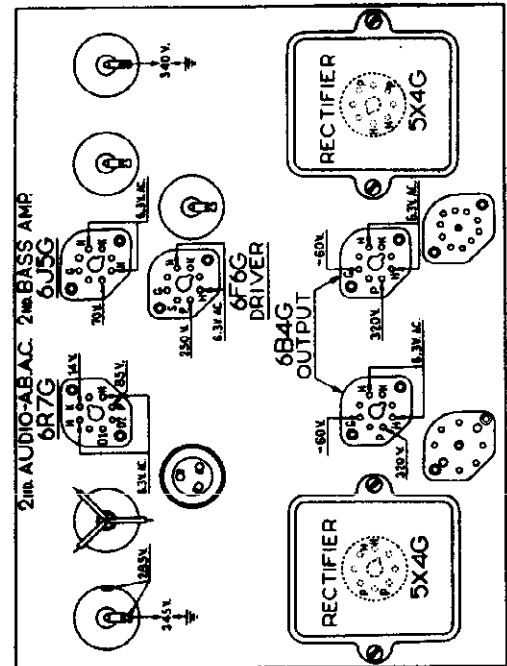


Fig. 2. Power Amplifier Socket Voltage
The voltages indicated by arrows were measured with a Philco 828 Circuit Tester which contains a voltmeter having a resistance of 1000 ohms per volt. Volume Control at minimum, range switch in broadcast position, line voltage 115 A. C.

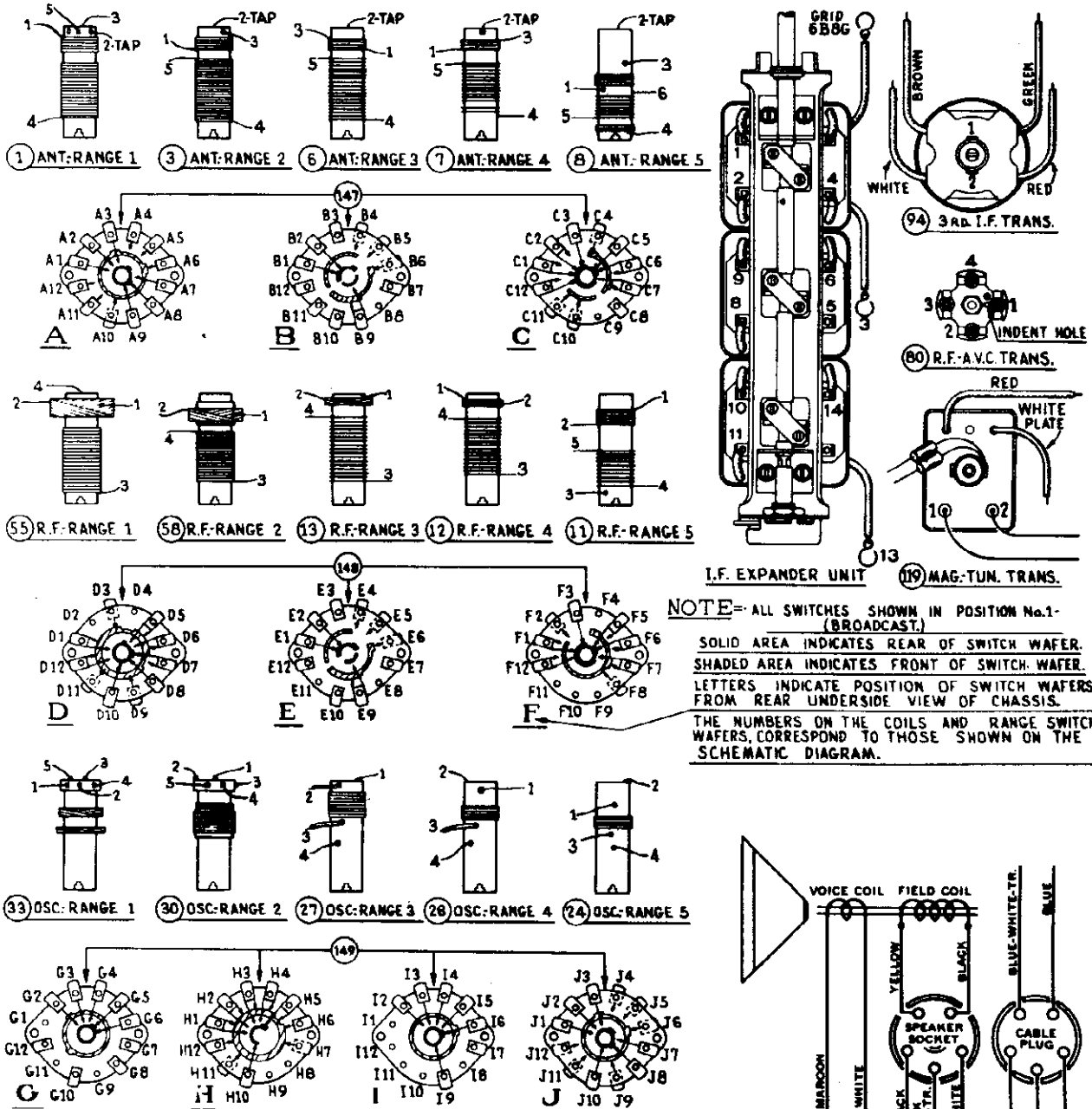
MODEL 37-69C

Coil & Switch
Connections

Spkr. Wiring, Notes

PHILCO RADIO & TELEV. CORP.

Coil and Range Switch Connections



Hum Adjustment and Elimination

Adjust compensator (185) for minimum hum with volume control retarded.

If abnormal hum develops with bass compensation control at maximum, change the 6K7G bass amplifier tube. It also may be necessary to interchange the 6B4G output tubes for perfect balance.

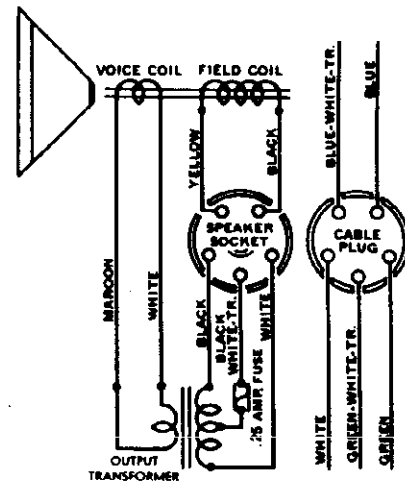


Fig. 3. Speaker Wiring W2

PHILCO RADIO & TELEV. CORP.

Parts

PRICES SUBJECT TO CHANGE WITHOUT NOTICE Replacement Parts—Model 37-690

Table with columns: Schem. No., Description, Part No., List Price. Includes sections for CABINET PARTS, MISCELLANEOUS PARTS, DIAL PARTS, and various electronic components like resistors, capacitors, and transformers.

November 1936

MODEL 37-2620
Alignment, Trimmers
Voltage, Chassis

PHILCO RADIO & TELEV. CORP.

Electrical Specifications

Type of Circuit: Superheterodyne with Pentode Output.

Power Supply:	Voltage	Frequency	Power Consumption
	115	50 to 60	65 Watts
	115	25 to 40	65 Watts
	220	50 to 60	65 Watts

Power transformers for the different voltages and frequencies are listed on the Parts List.
Intermediate Frequency: 470 K. C.
Tuning Ranges: Three. Range 1—150 to 350 K. C.; Range 2—530 to 1720 K. C.; Range 3—5.7 to 18 M. C.

Philco Tubes Used: *Six. Two 6K7EG; one 6A8EG; one 6Q7EG; one 6F6EG; one 5Y4G.
Speakers: "B" Cabinet—S7; "J" Cabinet—HS; "CS" Cabinet—K38.

*NOTE—Receivers in the United States use tubes without the "E" designation.

Alignment

MODEL NO. 37-2620

Signal Generator Connection	Signal Generator Frequency	Dial Position	Wave Band Switch Position	Trimmer Number (FIG. 1)	Output Signal
Control grid ¹ of 6A8G	470 k.c.	580 k.c.	Broadcast	37A	Max.
"	"	"	"	37	Max.
"	"	"	"	31A	Max.
"	"	"	"	31	Max.
Ant. term. ² #1	18 m.c.	18 m.c.	Range 3	23B	Max. ³
"	"	17.06 m.c.	5.7-18 m.c.		Image check
"	18 m.c. ⁴	18 m.c.	"	8B	Max.
"	"	"	"	4B	Max.
"	18 m.c. ⁵	"	"	23B	Max.
"	1600 k.c.	1600 k.c.	Broadcast	23A	Max.
"	"	"	"	8A	Max.
"	"	"	"	4A	Max.
"	580 k.c.	580 k.c.	"	25	Max.*
"	1600 k.c.	1600 k.c.	"	23A	Max.
"	"	"	"	8A	Max.
"	"	"	"	4A	Max.
"	1500 k.c.	1500 k.c.	"	8A	Max.
"	"	"	"	4A	Max.
Ant. term. ⁶ #1	300 k.c.	300 k.c.	Range 1	23	Max.
"	"	"	150-350 k.c.	8	Max.
"	"	"	"	4	Max.
"	160 k.c.	160 k.c.	"	21	Max.*
"	300 k.c.	300 k.c.	"	23	Max.
"	"	"	"	8	Max.
"	"	"	"	4	Max.
"	160 k.c.	160 k.c.	"	21	Max.*
"	300 k.c.	300 k.c.	"	23	Max.
"	"	"	"	8	Max.
"	"	"	"	4	Max.

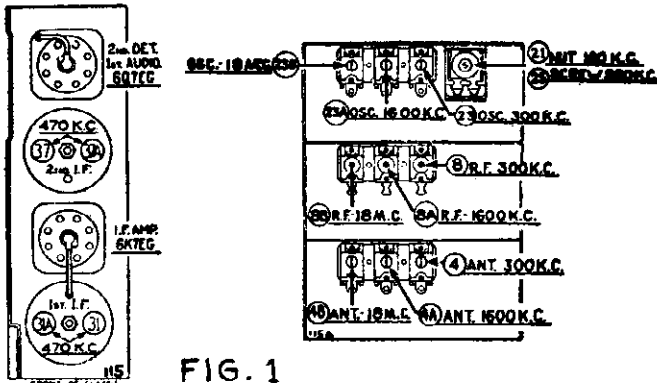
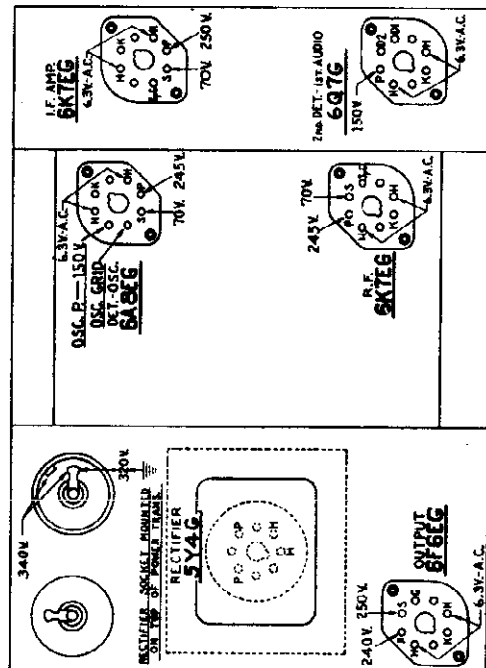
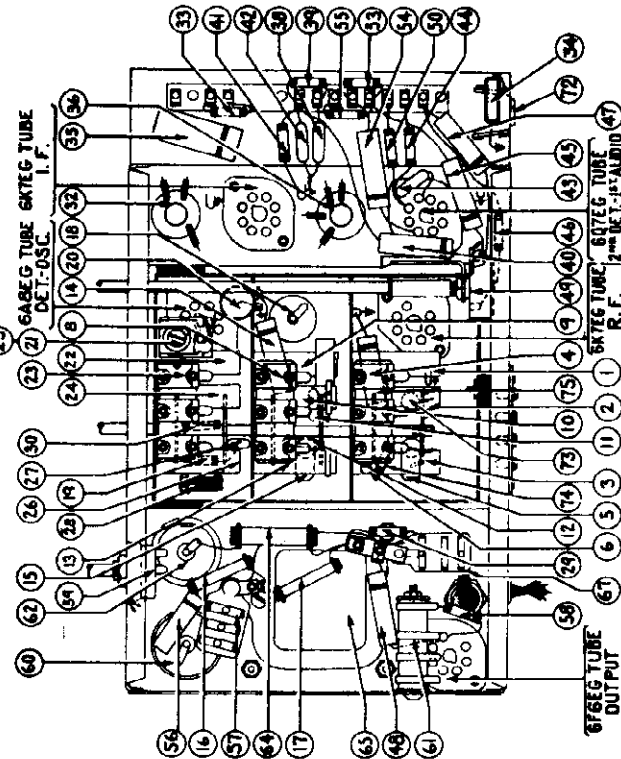


FIG. 1

- Note 1.—Through a .1 mfd. condenser.
- Note 2.—Link terminals 2 and 3 together.
- Note 3.—Use lower capacity peak.
- Note 4.—Connect an external variable condenser. (Philco Part No. 45-2325) from the oscillator compensator to ground (First contact from left rear underside view of r.f. unit). Tune the added condenser from the minimum capacity position until the second harmonic of the oscillator beats against the signal to produce maximum output.
- Note 5.—Remove the external variable condenser.
- Note 6.—Through a 250 mmfd. condenser.

* While rocking.

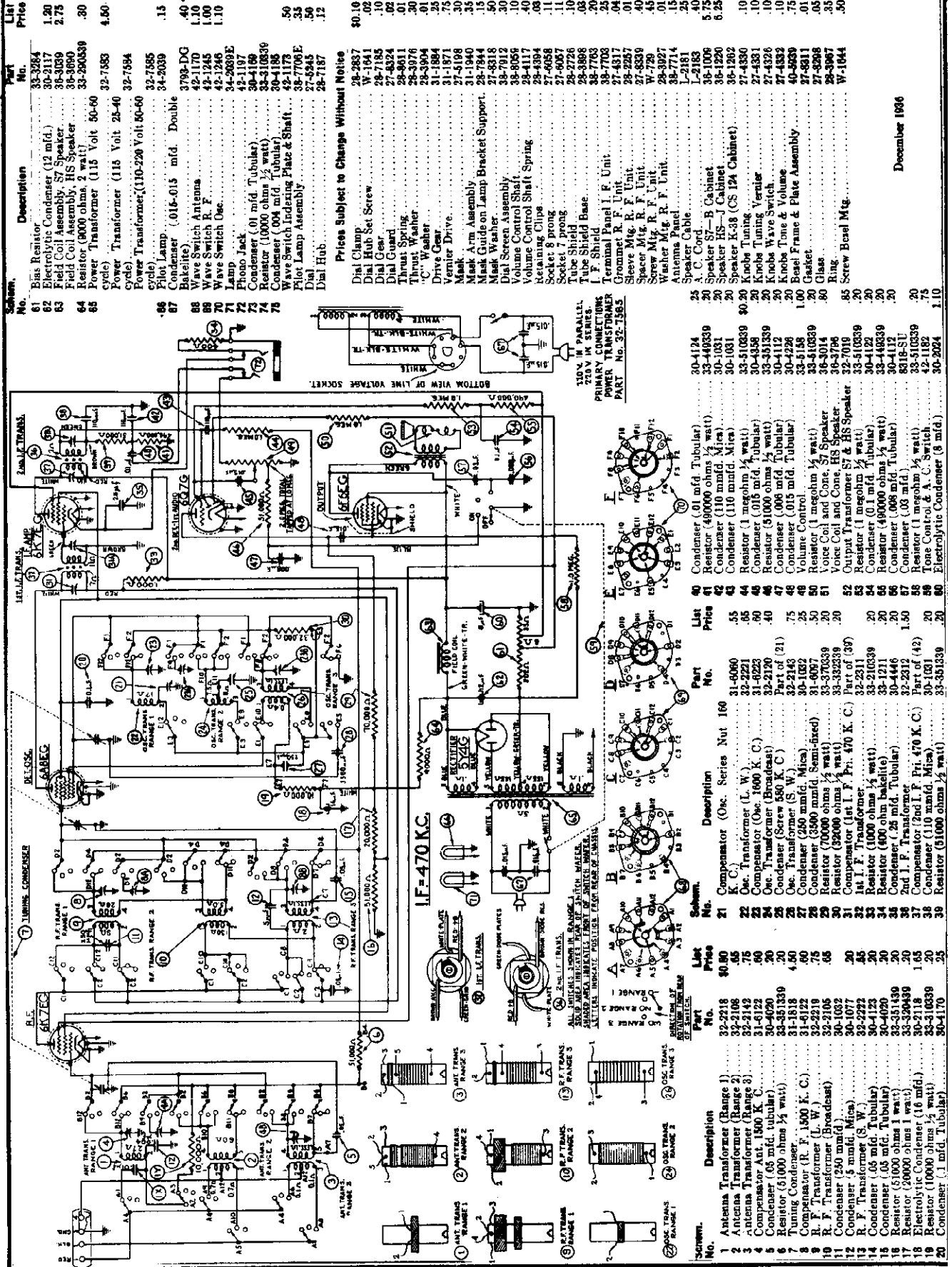
Fig. 4—Base View of Chassis



Socket Voltages, Measured from Underside of Chassis
The voltages indicated by arrows were measured with a Philco 625 Circuit Tester which contains a voltmeter having a resistance of 1000 ohms per volt. Volume Control at minimum, range switch in broadcast position, line voltage 115 A. C.

PHILCO RADIO & TELEV. CORP.

MODEL 37-2620 Schematic, Parts



Part No.	Description	List Price
61	Bias Resistor	1.20
62	Electrolytic Condenser (12 mid.)	2.75
63	Field Coil Assembly, S7 Speaker	.80
64	Field Coil Assembly, HS Speaker	4.60
65	Resistor (4000 ohms 2 watt)	
66	Power Transformer (115 Volt 20-0-80 cycle)	
67	Power Transformer (115 Volt 20-40 cycle)	
68	Power Transformer (110-220 Volt 80-0 cycle)	
69	Pilot Lamp	.15
70	Condenser (.015-.015 mid. Double Bakelite)	.40
71	Wave Switch Antenna	1.00
72	Wave Switch R. F.	1.00
73	Wave Switch Dec.	1.10
74	Lamp	
75	Phono Jack	
76	Condenser (.01 mid. Tubular)	
77	Resistor (1000 ohms 1/2 watt)	
78	Condenser (.004 mid. Tubular)	
79	Wave Switch Indexing Plate & Shaft	
80	Pilot Lamp Assembly	.50
81	Dial	.55
82	Dial Hub	.12

Prices Subject to Change Without Notice

28-2837	Dial Clamp	\$0.10
W-1641	Dial Hub Set Screw	.02
29-7185	Dial Gear	.10
29-8324	Dial Guard	.02
29-8611	Thrust Spring	.01
29-3076	Thrust Washer	.01
29-3904	"C" Washer	.30
31-1884	Drive Gear	.75
31-1871	Vernier Drive	.25
31-1940	Mask	.30
29-7944	Mask Arm Assembly	.35
27-8318	Mask Guide on Lamp Bracket Support	.15
39-8059	Mask Washer	.30
39-7912	Dial Screen Assembly	.40
29-4117	Volume Control Shaft	.10
29-4894	Volume Control Shaft Spring	.40
27-8659	Retaining Clips	.06
27-9507	Socket 7 prong	.11
29-7926	Tube Shield	.10
29-7926	Tube Shield Base	.08
34-7705	I. F. Shield	.20
34-7705	Terminal Panel I. F. Unit	.20
34-7705	Grommet R. F. Unit	.04
37-6309	Spacer Mfg. R. F. Unit	.04
37-6309	Screw Mfg. R. F. Unit	.40
38-3927	Washer Mfg. R. F. Unit	.40
38-3927	Antenna Panel	.15
38-3927	Antenna Cable	.15
38-3927	A. C. Cord	.40
38-1200	Speaker S7-B Cabinet	5.75
38-1200	Speaker HS-J Cabinet	8.25
37-4530	Speaker K-38 (CS 124 Cabinet)	
37-4530	Knobs Tuning	.10
37-4531	Knobs Tuning Vernier	.10
37-4532	Knobs Wave Switch	.10
37-4533	Knobs Tone & Volume	.75
40-8639	Bezel Frame & Plate Assembly	.05
37-8311	Gasket	.01
37-8308	Glass	.05
29-3907	Ring Bezel Mfg.	.35
W-1644	Screw Bezel Mfg.	.30

Part No.	Description	List Price
30-4124	Condenser (.01 mid. Tubular)	
32-48239	Resistor (4000 ohms 1/2 watt)	
30-1081	Condenser (.10 mid. Mica)	
30-1081	Condenser (.10 mid. Mica)	
33-510339	Resistor (1 meghom 1/4 watt)	
30-4358	Condenser (.015 mid. Tubular)	
33-51339	Resistor (51000 ohms 1/2 watt)	
30-4112	Condenser (.008 mid. Tubular)	
30-4226	Condenser (.015 mid. Tubular)	
33-5158	Volume Control	
33-510339	Resistor (1 meghom 1/4 watt)	
36-3014	Voice Coil and Cone, HS Speaker	
36-3014	Voice Coil and Cone, S7 Speaker	
32-7019	Output Transformer S7 & HS Speaker	
33-510339	Resistor (1 meghom 1/4 watt)	
30-4122	Condenser (.01 mid. Tubular)	
33-48639	Resistor (49000 ohms 1/2 watt)	
30-4117	Condenser (.008 mid. Tubular)	
33-5158	Condenser (.03 mid. Tubular)	
33-510339	Resistor (1 meghom 1/4 watt)	
32-1182	Tone Control, A. C. Switch	
30-2024	Electrolytic Condenser (8 mid.)	

Part No.	Description	List Price
31-6060	Compensator (Osc. Series Nut 160 K. C.)	
31-2221	Dec. Transformer (L. W.)	
31-6223	Compensator (Osc. 1600 K. C.)	
32-2120	Osc. Transformer (Broadcast)	
32-2120	Osc. Transformer (Sewer 580 K. C.)	
32-2143	Osc. Transformer (S. W.)	
31-1082	Condenser (250 mmfd. Mica)	
31-1082	Condenser (3500 mmfd. Semi-fixed)	
31-6067	Resistor (70000 ohms 1/2 watt)	
33-33239	Resistor (32000 ohms 1/2 watt)	
33-33239	Resistor (32000 ohms 1/2 watt)	
Part of (39)	Compensator (1st I. F. Pri. 470 K. C.)	
32-2311	1st I. F. Transformer	
33-210339	Resistor (1000 ohms 1/4 watt)	
33-1211	Resistor (1000 ohm bakelite)	
30-4020	Condenser (.05 mid. Tubular)	
33-330430	2nd I. F. Transformer	
30-2118	Resistor (20000 ohms 1 watt)	
33-310339	Electrolytic Condenser (16 mid.)	
30-4170	Condenser (.1 mid. Tubular)	

Part No.	Description	List Price
32-2218	Antenna Transformer (Range 1)	
32-2108	Antenna Transformer (Range 2)	
32-3142	Antenna Transformer (Range 3)	
31-6122	Compensator Ant. 1500 K. C.	
30-4020	Condenser (.05 mid. tubular)	
33-351339	Resistor (51000 ohms 1/2 watt)	
31-1818	Tuning Condenser	
31-6122	Compensator (R. F. 1500 K. C.)	
32-2219	R. F. Transformer (Broadcast)	
30-1082	Condenser (250 mmfd. Mica)	
32-2222	R. F. Transformer (L. W.)	
30-4123	Condenser (.05 mid. Tubular)	
30-4020	Condenser (.05 mid. Tubular)	
33-351430	Resistor (51000 ohms 1 watt)	
33-330430	Resistor (20000 ohms 1 watt)	
30-2118	Electrolytic Condenser (16 mid.)	
33-310339	Resistor (10000 ohms 1/2 watt)	
30-4170	Condenser (.1 mid. Tubular)	

December 1936

MODEL 37-2650
Chassis, Parts

PHILCO RADIO & TELEV. CORP.

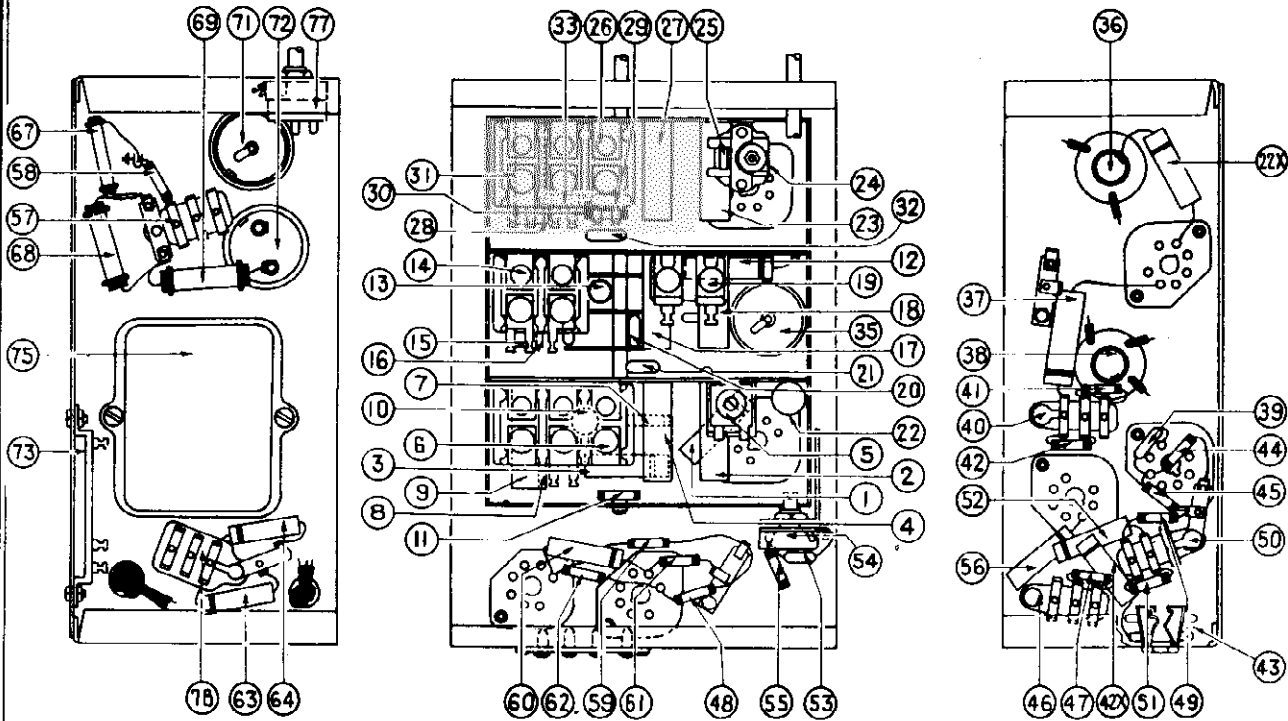


Fig. 4—View of Parts Underside of Chassis

Replacement Parts — Model 37-2650

Schem. No.	Description	Part No.	List Price	Schem. No.	Description	Part No.	List Price	Schem. No.	Description	Part No.	List Price
1	Condenser .004 mfd. tubular	30-4185	\$0.25	48	Resistor (330,000 ohms, 1/2 watt)	33-433339	\$0.20		Mask	27-5273	\$0.20
2	Ant. Trans. (Range 1)	32-2218	.50	49	Resistor (490,000 ohms, 1/2 watt)	33-449339	.20		Mask Arm & Link Assembly	31-1940	.15
3	Condenser (.01 mfd. tubular)	30-4169	.20	50	Condenser (.1 mfd. Bakelite)	4998-87	.35		Mask Washer	27-5318	.15
4	Ant. Transformer (Range 2)	32-2108	1.00	51	Resistor (1 megohm, 1/2 watt)	33-510339	.20		Mask Guide & Lamp Support Assy.	38-7844	.04
5	Compensator, Long Wave	31-6126	.40	52	Resistor (.015 mfd. tubular)	30-4358	.20		Mtg. Grommet (R. F. unit)	27-4317	.01
6	Compensator (Five sections)	31-6153	1.50	53	Condenser (.75 mmfd. mica)	30-1063	.20		Mtg. Sleeve (R. F. unit)	28-2257	.01
7	Resistor (10,000 ohms, 1/2 watt)	33-310339	.20	54	Volume Control	33-5158	1.00		Mtg. Screw (R. F. unit)	W-729	.45 C
8	Ant. Trans. (Range 3)	32-2150	1.20	55	Resistor (51,000 ohms, 1/2 watt)	33-351339	.20		Mtg. Washer (R. F. unit)	27-3927	.20
9	Ant. Trans. (Range 4)	32-2175	1.20	56	Condenser (.006 mfd. tubular)	30-4024	.25		Mtg. Washer (R. F. unit)	27-7907	.50 C
10	Condenser (.05 mfd. tubular)	30-4444	.20	57	Condenser (.03, .05 mfd. dual bakelite)	2616-YU	.40		Mtg. Bushing, Rubber (Chassis)	27-4360	.04
11	Resistor (51,000 ohms, 1/2 watt)	33-351339	.20	58	Resistor (1 megohm, 1/2 watt)	33-510339	.20		Mtg. Washer, Rubber (Chassis)	3556	.05
12	Condenser (.05 mfd. tubular)	30-4123	.20	59	Resistor (490,000 ohms, 1/2 watt)	33-449339	.20		Mtg. Washer, Rubber (Chassis)	28-2099	.50 C
13	Condenser (.05 mfd. tubular)	30-4444	.20	60	Condenser (.01 mfd. tubular)	30-4169	.20		Mtg. Bolt	W-783	2.20 C
14	Compensator, R. F. (Four sections)	31-6125	1.00	61	Resistor (3500 ohm, 1/2 watt)	33-255339	.20		Pilot Lamp Assembly	38-7706E	.35
15	R. F. Trans. (Range 4)	32-2176	1.20	62	Resistor (330,000 ohms, 1/2 watt)	33-433339	.20		Panel (Ant. & Ground)	38-7714	.15
16	R. F. Trans. (Range 3)	32-2151	.70	63	Condenser (.003 mfd. tubular)	30-4469	.20		Set Screw (Dial Drive)	W-1641	.02
17	R. F. Trans. (Range 2)	32-2165	1.00	64	Condenser (.003 mfd. tubular)	30-4469	.20		Sleeve Paper (Vol. Draft)	27-9897	
18	R. F. Trans. (Range 1)	32-2219	1.00	65	Output Trans.	32-7634	1.50		Socket (rectifier)	27-6052	.11
19	Compensator R. F. (Two sections)	31-6115	.50	66	Cone & Voice Coil, K 35	35-3174	1.00		Socket (7 prong)	27-6057	.11
20	Condenser (40 mmfd. mica)	30-1076	.20	67	Resistor (25,000 ohms, 1 watt)	33-325439	.20		Socket (8 prong)	27-6058	.11
21	Condenser (250 mmfd. mica)	30-1032	.25	68	Resistor (9000 ohms, 2 watts)	33-290639	.20		Shield (Shadowmeter Light)	28-2917	.02
22	Condenser (.1 mfd. tubular)	30-4455	.25	69	Resistor (10,000 ohms, 3 watts)	33-310639	.20		Shaft & Plate (range switch)	42-1237	.70
23	Condenser (.05 mfd. tubular)	30-4020	.20	70	Field Coil, K 35, H 26 Speakers	26-3887	4.00		Shaft (Volume control)	38-8060	.12
24	Osc. Trans. (Range 1)	32-2221	.50	71	Elect. Cond. (8 mfd.)	30-2024	1.10		Spring (Shadowmeter)	28-8623	.70 C
25	Compensator (Osc. two sections)	31-6074	.40	72	Elect. Cond. (20, 10 mfd.)	30-2163	2.40		Spring (Volume Shaft)	28-4117	.40 C
26	Condenser (35 mmfd. mica)	30-1044	.20	73	Bias Resistor (128 ohms, 1 tap)	33-3280	.30		Spring Thrust (Dial Drive)	28-8611	.01
27	Compensator (Osc. 6 sections)	31-6111	1.50	74	Pilot & Shadowmeter Lamps	34-2059	.15		Washer		
28	Osc. Trans. (Range 2)	32-2130	1.00	75	Power Trans. 115 volt (50 to 60 cycle)	32-7606	6.25		Washer "C" (Dial Drive)	28-3904	.01
29	Osc. Trans. (Range 3)	32-2152	.70	76	Power Trans. 115 volt (25 to 40 cycle)	32-7607	9.00		Washer, Thrust (Dial Drive)	28-3916	.30 C
30	Condenser (3000 mmfd. mica)	30-1028	.45	77	Power Trans. 110/220 volt (50 to 60 cycle)	32-7608	8.00		Washer, Felt (Range switch coupling)	27-8399	1.25
31	Resistor (32,000 ohm, 1/2 watt)	33-323339	.20								
32	Osc. Trans. (Range 4)	32-2182	.70								
33	Condenser (250 mmfd. mica)	30-1032	.25	78	Socket (line voltage socket)						
34	Resistor (10,000 ohms, 1/2 watt)	33-310339	.20	79	Power Switch & Tone Control	42-1184	.75				
35	Tuning Condenser	31-1957	5.00	80	Condenser (.015 mfd. Dual Bakelite)	3793-DG	.40		X CABINET		
36	Elect. Cond. (16 mfd.)	30-2119	1.65	81	Range Switch Ant.	42-1202	1.50		Baffle & Silk	40-5976	.60
37	First I. F. Trans.	32-2170	2.20	82	Range Switch R. F.	42-1254	1.50		Baffle (wood)	16271	
38	Condenser (.1 mfd. tubular)	30-4170	.25						Bezel & Frame Assembly	40-5947	.80
39	2nd I. F. Trans.	32-2172	2.20						Bolt (Speaker)	W-1495	1.60 C
40	Condenser (110 mmfd. mica)	30-1031	.20						Bracket (Bezel)	27-5313	.01
41	Condenser (110 mmfd. dual bakelite)	8093-DG	.25						Class (Bezel)	27-5300	.06
42	Resistor (240,000 ohms, 1/2 watt)	33-424339	.20						Ring (Bezel)	28-3988	.45
43	Resistor (240,000 ohms, 1/2 watt)	33-424339	.20						Speaker H 26	38-1238	8.25
44	Condenser (.01 mfd. tubular)	30-4479	.20						Shield (Chassis)	38-8276	.45
45	Phono Jack	42-1107	.60								
46	Resistor (1 megohm, 1/2 watt)	33-510339	.20						B CABINET		
47	Resistor (1 megohm, 1/2 watt)	33-510339	.20						Baffle & Silk	40-5975	.40
48	Condenser (.03 mfd. Bakelite)	8218-SU	.35						Bezel Assembly	40-5945	.70
49	Resistor (99,000 ohms, 1/2 watt)	33-399339	.20						Gasket (Bezel)	27-8312	.01
									Class (Bezel)	27-8299	.06
									Ring (Bezel)	28-3987	.40
									Speaker (K 35)	35-1231	7.25

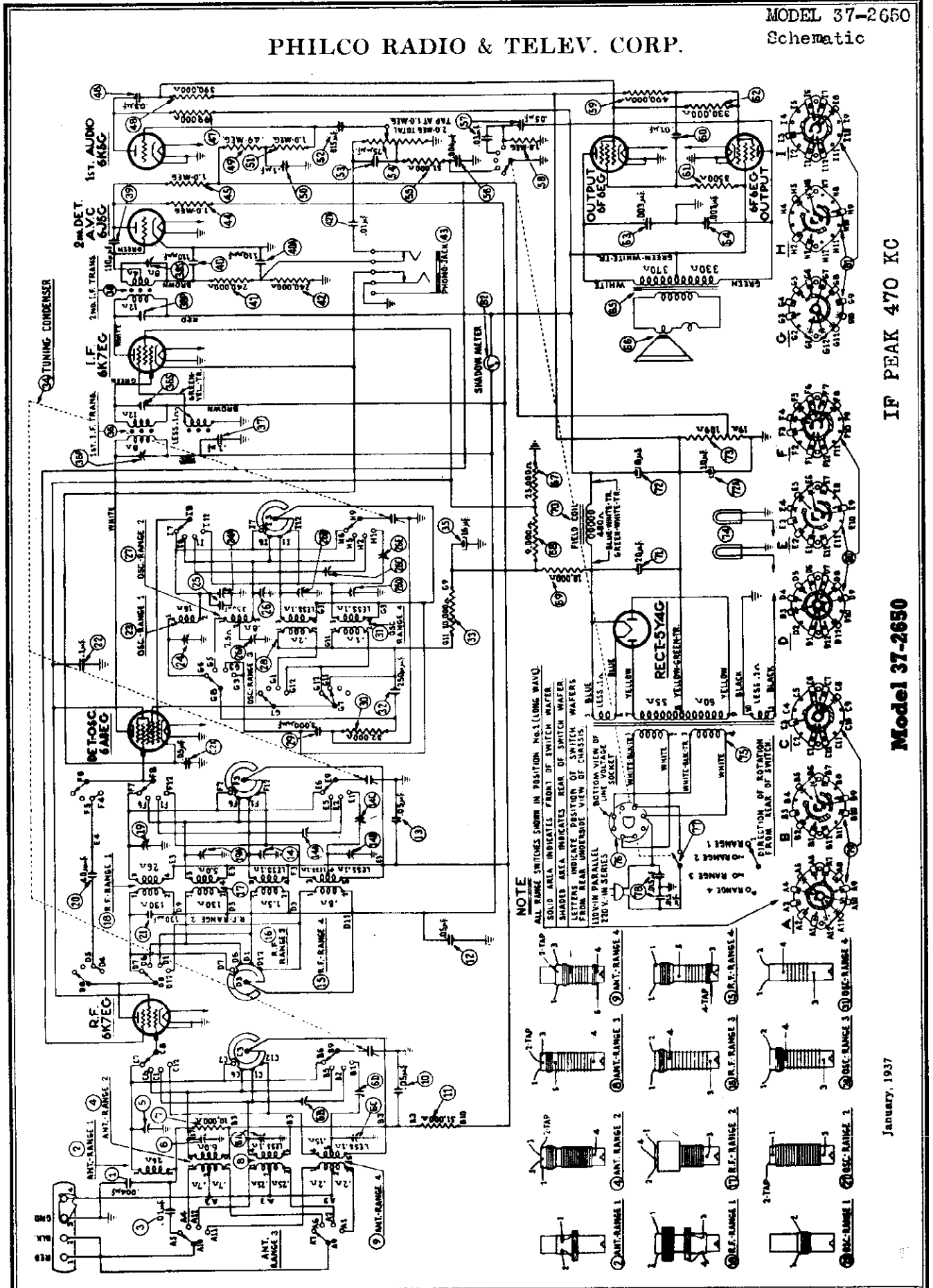
Prices Subject to Change Without Notice

EQUIPMENT REQUIRED: (1) Signal Generator; Philco Model 088 (fundamental frequency 110 to 20,000 K. C.) is the correct instrument for this purpose; (2) Output Meter; Philco Model 025 Circuit Tester incorporates an accurate, sensitive output meter and is recommended; (3) Fibre handle screw-driver (Philco Part No. 27-7059); (4) Philco fibre wrench part No. 3164.

JANUARY 1937

PHILCO RADIO & TELEV. CORP.

MODEL 37-2650
Schematic



IF PEAK 470 KC

Model 37-2650

January, 1937

MODEL 37-2650

Alignment, Trimmers

PHILCO RADIO & TELEV. CORP.

DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, rotate the tuning condenser control to the extreme counter-clockwise position (maximum capacity). Set range switch in the long wave position. Loosen the screw of dial hub, then turn dial until the glowing indicator is centered on the middle index line of dial scale (See Fig. 7.) Now tighten the dial hub set screw in this position.

INTERMEDIATE FREQUENCY CIRCUIT

1. Set controls as follows:
 - a. Range switch position 2 (Broadcast).
 - b. Receiver Dial at 580 K.C.
 - c. Adjust signal generator for 470 K. C.
 - d. Connect the 088 signal generator output lead through a .1 mfd. condenser to the control grid of the 6A8EG tube and the ground connection to the chassis.
2. Adjust the following I. F. compensators for maximum output: (36P), (36S), (38P), and (38S).

RADIO FREQUENCY CIRCUIT

Tuning Range 11.5 to 18.2 M. C.

1. Connect the signal generator output lead through .1 mfd. condenser to terminal No. 1 and the generator ground lead to terminal No. 3 on aerial input panel. Terminals 2 and 3 must be connected with the shorting link provided on the panel.
2. Set controls and adjust compensators for maximum output as follows:

Range Switch	Signal Generator and Receiver Dial	Compensators in Order
Position 4	18 M. C.	(26D) Check image at 17.060. See note A.
Position 4	18 M. C.	(14B) Use shunt condenser on (26D) (First contact from left side of chassis facing rear underside view.) when adjusting this compensator. See note C. then adjust (6C).
Position 4	18 M. C.	(26E), (14C), (16D)
Position 4	18 M. C.	(26D) Check image at 17.060 M. C. See note A.
Position 4	18 M. C.	(14B) Use shunt condenser on (26D) when adjusting this compensator. See note C. Then adjust (6C).
Position 4	18 M. C.	(26D) Check image at 17.060 M. C.

Tuning Range 5.7 to 11.6 M. C.

Range Switch	Signal Generator and Receiver Dial	Compensators in Order
Position 3	11 M. C.	(26B)
Position 3	11 M. C.	(14) Use shunt condenser on (26B) (Third contact from left side of chassis facing rear underside view.) when adjusting this compensator (See note C). Then adjust (6A).
Position 3	11 M. C.	(26B)
Position 3	6 M. C.	(26C), (14A), (6B)
Position 3	11 M. C.	(26B)
Position 3	11 M. C.	(14) Use shunt condenser on (26B) when adjusting this compensator. See Note C. Then adjust (6A).

Tuning Range 530 to 1720 K. C.

1. Set controls and adjust compensator for maximum output as follows:

Range Switch	Signal Generator and Receiver Dial	Compensators in Order
Position 2	1600 K. C.	(26), (6), and (19A)
Position 2	580 K. C.	(26A) Roll gang through signal for maximum output. See note B.
Position 2	1600 K. C.	(26)
Position 2	1500 K. C.	(6), (19A)

Tuning Range 150 to 350 K. C.

1. Connect the 088 signal generator lead through a 200 mmfd. condenser to terminal No. 1 of the aerial input panel. Set controls and adjust compensators for maximum output as follows:

Range Switch	Signal Generator and Receiver Dial	Compensators in Order
Position 1	300 K. C.	(24), (5), (19)
Position 1	160 K. C.	(24A) Roll gang for maximum output through signal. See note B.
Position 1	300 K. C.	(24), (5), (19)
Position 1	160 K. C.	(24A) Roll gang for maximum output through signal. See note B.

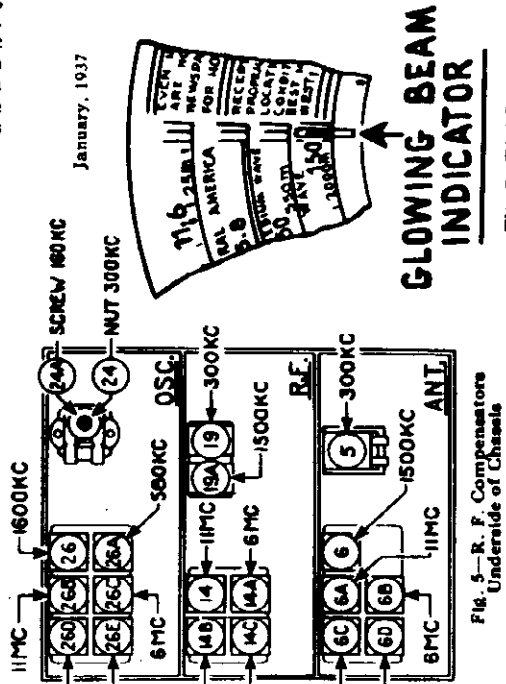


Fig. 7—Dial Scale

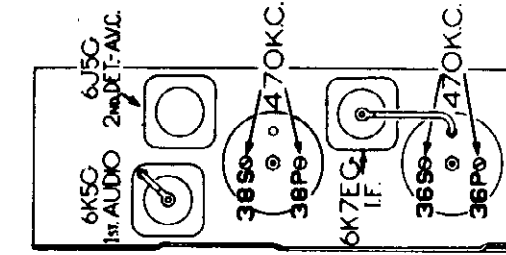


Fig. 5—R. F. Compensators Underside of Chassis

OUTPUT METER: The 025 Output Meter is connected to the plate and cathode terminals of one of the (6F6EG) tubes. Adjust the meter to use the (0-30) Volt Scale.

Fig. 6—I. F. Compensators Top of Chassis

NOTE A—To accurately adjust the compensator to the fundamental and not the image signal, turn the oscillator compensator to the maximum capacity position clockwise. Then slowly turn the compensators counter-clockwise until a second maximum peak is obtained on the output meter. The first peak is the image signal and the receiver must not be adjusted to it. If the above procedure is correctly performed, the image signal will be found 940 K. C. below the frequency being used on any high frequency band.

NOTE B—First tune the compensator for maximum output then vary the tuning condenser of the receiver for maximum output about the frequency mark on the dial. Now turn the compensator slightly to the right or left and again vary the receiver turning condenser for maximum output. If the output decreases, set the compensator in the opposite direction. This procedure of first setting the compensator and then varying the tuning condenser is continued until there is no further gain in output reading.

NOTE C—To eliminate the effect of the R. F. Compensator detuning the oscillator circuit, a variable condenser of approximately 350 mmfd. is connected to the oscillator compensator to ground where designated in the instructions above. Tune the added condenser from the minimum capacity position until the second harmonic of the receiver oscillator beats with the signal from the generator, resulting in a maximum reading on the output meter. Then adjust compensators as noted for maximum output.

PHILCO RADIO & TELEV. CORP.

MODEL 37-2650
Voltage, Notes
Spkr. Wiring

AERIAL CONNECTIONS

The red and black leads of the High-Efficiency Aerial "transmission line" are connected to terminals 1 and 2 respectively, of the terminal panel provided on the rear of the chassis. Connect the jumper on the terminal panel across terminals 3 and 4.

If a temporary aerial is used, the jumper should be across terminals 2 and 3. The aerial connects to terminal 1 and the ground lead to terminal 3. A good ground connection is desirable in all installations.

SHADOWMETER ADJUSTMENT

Apply power to the receiver and allow tubes to warm up. Then adjust shadowmeter as follows:

1. Move the shadow meter coil backwards and forwards, until the opposite edges of the shadow are $\frac{1}{8}$ of an inch from each end of the shadow screen, measuring along the bottom edge of the screen. Adjustment of the shadow meter light bracket may be necessary for perfect centering.
2. Remove the rectifier tube from its socket, and rotate coil until shadow reaches minimum width. This width must not exceed $\frac{1}{8}$ of an inch.
3. Replace the 5Y4G rectifier tube in its socket. The shadow should then widen to not more than $\frac{1}{8}$ inch or less than $\frac{1}{16}$ inch from each side of the screen measuring along the bottom edge. If these limits are not obtained readjust the shadow meter as given in paragraphs 1 and 2 again.

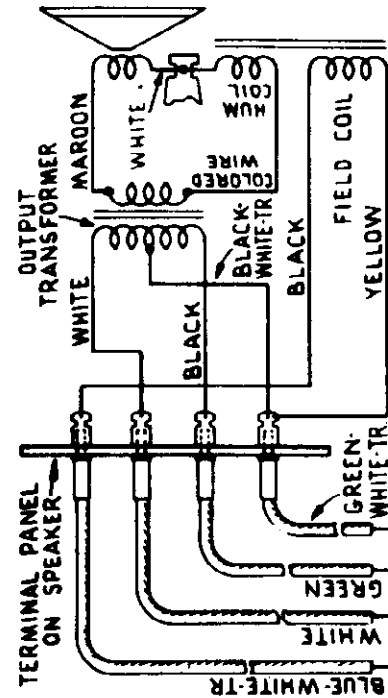


Fig. 2—Speaker Wiring, Type K35, H26

Tone Control:

Four positions, brilliant, bright, mellow, and deep.

Philco Tubes Used: Eight—Two 6K7EG; Two 6F6EG; one 6A8EG; one 6K5G; one 6J5G and one 5Y4G.

Note: Receivers in the United States use tubes without the "E" designation.

Speaker: K35, B cabinet.
H26, X cabinet.

Type of Circuit:

Superheterodyne, with four tuning ranges; Delayed A. V. C.; Connections for a phonograph; Shadowmeter tuning; Connections for the Philco High Efficiency Aerial, and a push-pull pentode audio output circuit.

Power Supply:

Voltage	Frequency	Consumption
115	50 to 60 cycle	110 watts
115	25 to 40 cycle	110 watts
110/220	50 to 60 cycle	110 watts

The 110/220 volt power transformer Part No. 32-7608 has a voltage selection plug and socket, mounted on top of the power transformer. Place the plug with arrow pointing towards voltage being used.

Tuning Ranges: Four

- Range 1—150 to 350 K. C.
- Range 2—530 to 1720 K. C.
- Range 3—5.7 to 11.6 M. C.
- Range 4—11.5 to 18.2 M. C.

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Intermediate Frequency: 470 K. C.

Undistorted Output: 7 watts.

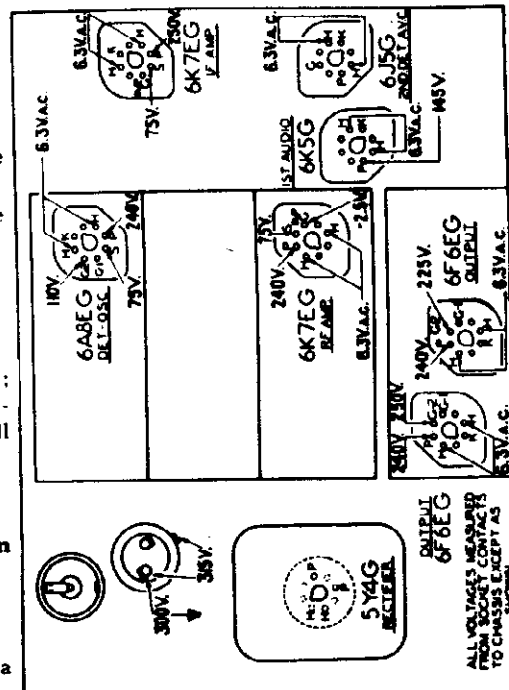


Fig. 1—Socket Voltages—Underside of Chassis View

The voltages indicated by arrows were measured with a Philco 925 Circuit Tester which contains a voltmeter having a resistance of 1000 ohms per volt. Volume Control at minimum, range switch in broadcast position, line voltage 115 A. C.

MODEL 37-2670
Voltage, Notes
Spkr. Wiring

PHILCO RADIO & TELEV. CORP.

Electrical Specifications

TYPE OF CIRCUIT: Superheterodyne, with five tuning ranges; push pull class A output; automatic volume control; bass compensation in the volume control circuit; tone control and connections for a phonograph.

POWER SUPPLY:

Voltage	Frequency	Consumption
115	50 to 60 cycle	130 watts
115	25 to 40 cycle	130 watts
110/220	50 to 60 cycle	130 watts

For 110/220 volt operation a transformer part no. 32-7642 is required. These transformers are built into export receivers only. The transformer has a plug and socket, mounted on top of the power transformer, adjacent to the rectifier tube. Place the plug with arrow pointing towards voltage being used.

INTERMEDIATE FREQUENCY: 470 K. C.

TUNING RANGES: Five.

- Range 1—150 to 350 K. C.
- Range 2—530 to 1600 K. C.
- Range 3—1.6 to 4.8 M. C.
- Range 4—4.6 to 11.5 M. C.
- Range 5—11.5 to 22 M. C.

UNDISTORTED OUTPUT: 10 watts

PHILCO TUBES USED: Two 6K7EG; one 6A8EG; Five 6J5G; Two 6F6EG; and one 5X4G.

NOTE: Receivers in the United States use tubes without the "E" designation.

TONE CONTROL: Four positions.

SPEAKER: "X" cabinet 11 28
"B" cabinet K 37

AERIAL CONNECTIONS

The red and black leads of the High-Efficiency Aerial "transmission line" are connected to terminals 1 and 2 respectively, of the terminal panel provided on the rear of the chassis. Connect the jumper on the terminal panel across terminals 3 and 4.

If a temporary aerial is used, the jumper should be across terminals 2 and 3. The aerial connects to terminal 1 and the ground lead to terminal 3. A good ground connection is desirable in all installations.

SHADOW METER ADJUSTMENT

Apply power to the receiver and allow tubes to warm up. Then adjust shadow meter as follows:

1. Move the shadow meter coil backwards and forwards, until the opposite edges of the shadow are $\frac{1}{8}$ of an inch from each end of the shadow screen, measuring along the bottom edge of the screen. Adjustment of the shadow meter light bracket may be necessary for perfect centering.
2. Remove the rectifier tube from its socket, and rotate coil until shadow reaches minimum width. This width must not exceed $\frac{1}{4}$ of an inch.
3. Replace the 5X4G rectifier tube in its socket. The shadow should then widen to not more than $\frac{1}{4}$ inch or less than $\frac{1}{8}$ inch from each side of the screen measuring along the bottom edge. If these limits are not obtained readjust the shadow meter as given in paragraphs 1 and 2 again.

Model 37-2670

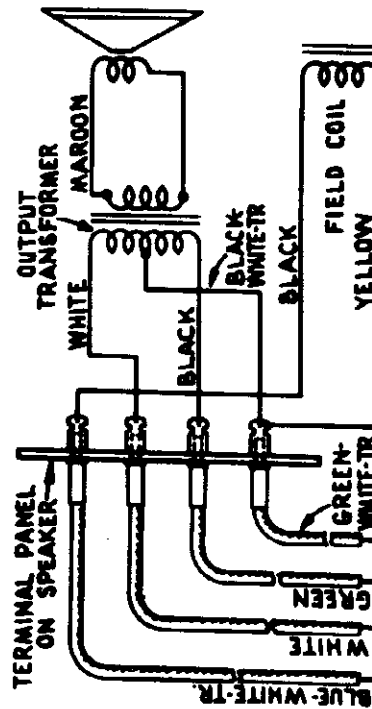


FIG. 2—Speaker Wiring K37, H28

The voltages indicated by arrows were measured with a Philco 025 Circuit Tester which contains a voltmeter having a resistance of 1000 ohms per volt. Volume Control at minimum, range switch in broadcast position, line voltage 115 A. C.

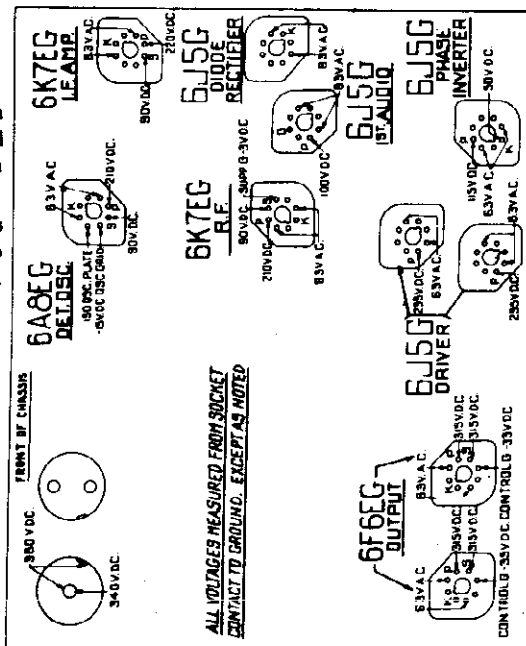
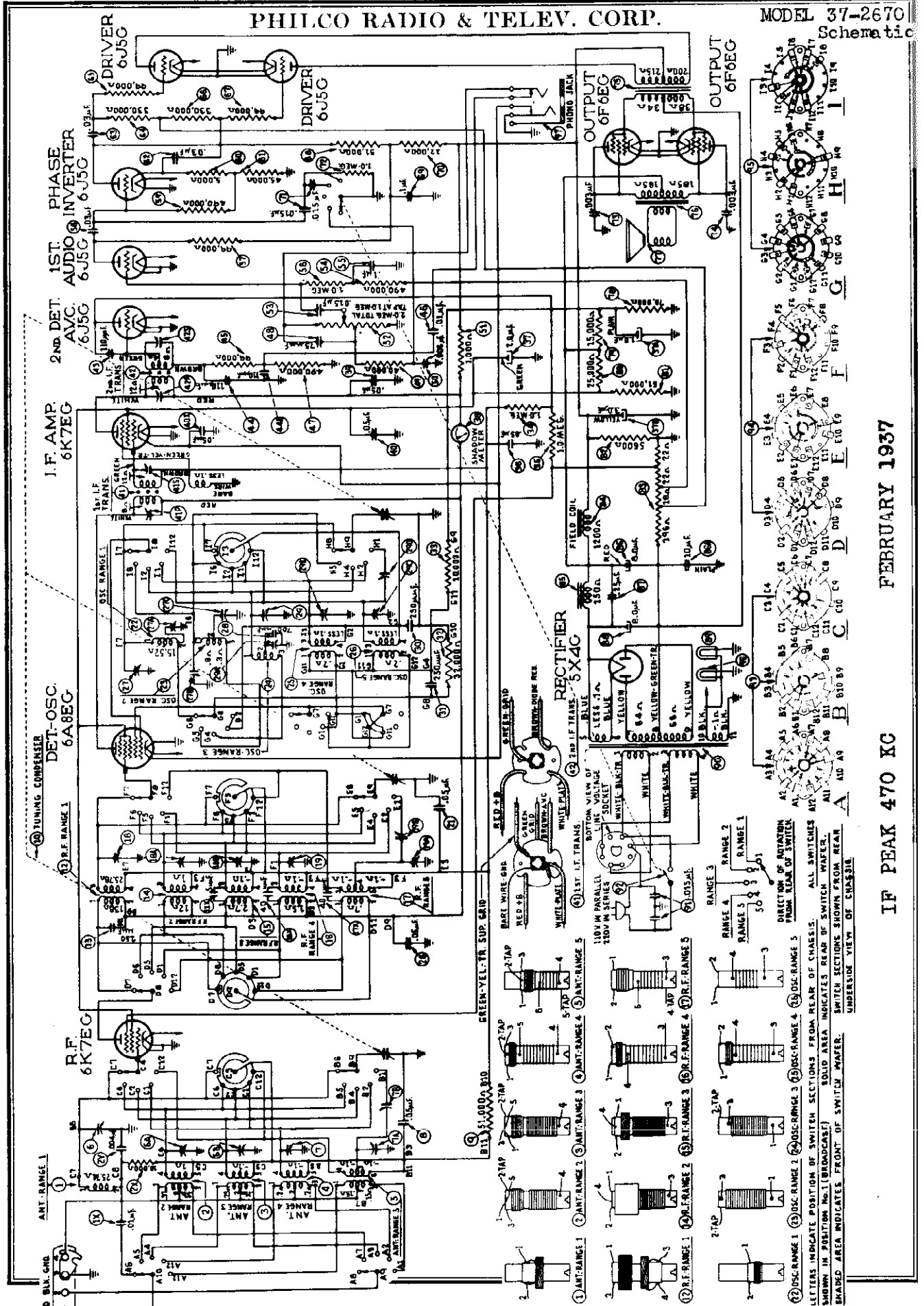


Fig. 1—Socket Voltages—Underside of Chassis View

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PHILCO RADIO & TELEV. CORP.

MODEL 37-2670 Schematic



FEBRUARY 1937

IF PEAK 470 KC

MODEL 37-2870

Alignment Trimmers

PHILCO RADIO & TELEV. CORP.

DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, rotate the tuning condenser control to the extreme counter-clockwise position (maximum capacity). Set range switch in the long wave position. Loosen the screw of dial hub, then turn dial until the glowing indicator is centered on the middle index line of dial scale (See Fig. 5.) Now tighten the dial hub set screw in this position.

OUTPUT METER: The Output Meter is connected to the plate and cathode terminals of one of the (6F6EG) tubes. Adjust the meter to use the (0-30) Volt Scale.

INTERMEDIATE FREQUENCY CIRCUIT

Frequency 470 K. C.

1. Set controls as follows:
 - a. Range switch position 2 (Broadcast).
 - b. Receiver dial at 580 K. C.
 - c. Adjust signal generator for 470 K. C.
 - d. Connect the 088 Signal generator output lead through a .1 mfd. condenser to the control grid of the 6A8EG tube and the ground connection to the chassis.
2. Adjust the following I. F. compensators for maximum output- (42S) (42P) (41S) (41P)

RADIO FREQUENCY CIRCUITS

Tuning Range 11.5-22 M. C.

1. Connect the signal generator output lead through a .1 mfd. condenser to terminal No. 1 and the generator ground lead to terminal no. 3 on aerial input panel. Terminals 2 and 3 must be connected with shorting link provided on the panel.
2. Set controls and adjust compensators for maximum output as follows:

Range Switch Position	Signal Generator and Receiver Dial	Compensators
5	20 M. C.	(29C) check image at 19.06 M. C. See Note A
5	20 M. C.	(19 A) Use shunt condenser on 29C (first contact from left underside view of chassis) when adjusting this compensator. Then adjust 7A. (See note C)
5	20 M. C.	(29C)
5	12 M. C.	(29D), (19B), (7B)
5	12 M. C.	(29D)
Range Switch Position	Signal Generator and Receiver Dial	Compensator
5	20 M. C.	(29C) check image
5	20 M. C.	(19A) use shunt, then adjust 7A
5	20 M. C.	(29C)

Tuning Range 4.6 to 11.5 M. C.

Range Switch Position	Signal Generator and Receiver Dial	Compensator
4	11 M. C.	(29B)
4	11 M. C.	(19) use shunt condenser on 29B (third contact from left underside view of R. F. unit) when adjusting this compensator. Then adjust 7.

Tuning Range 1.6 to 4.8 M. C.

Range Switch Position	Signal Generator and Receiver Dial	Compensator
3	4.5 M. C.	(29), (18B), (6B)
3	1.7 M. C.	(29A) (Note B).
3	4.5 M. C.	(29), (18B), (6B)

Tuning Range 530 to 1600 K. C.

Range Switch Position	Signal Generator and Receiver Dial	Compensator
2	1500 K. C.	(27B), (18A), (6A)
2	580 K. C.	(27C) See Note B
2	1500 K. C.	(27B)
2	1400 K. C.	(18A), (6A)

Tuning Range 150 to 350 K. C.

1. Connect the 088 signal generator lead through a 200 mmfd. condenser to terminal No. 1 of the aerial input panel. Set controls and adjust compensators for maximum output as follows:

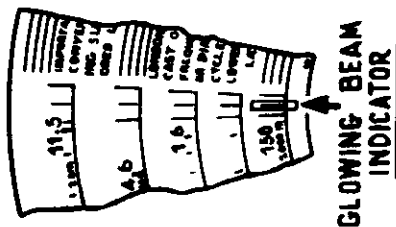


Fig. 5
Dial Calibration

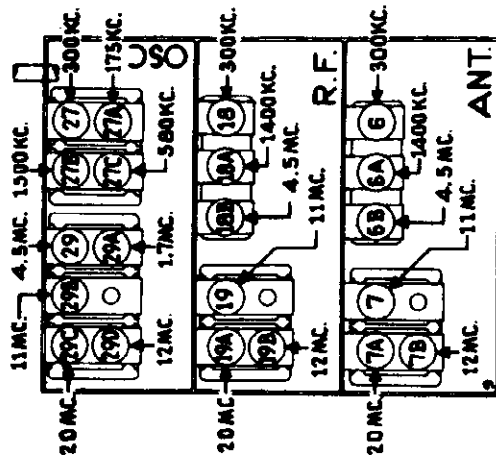


Fig. 7. R. F. Compensators

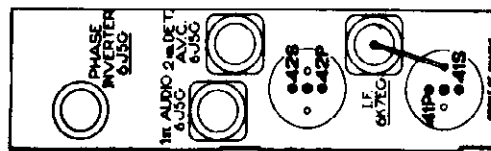


Fig. 6. I. F. Compensators

2. Range Switch Signal Generator and Receiver Dial Position

1	300 K. C.	Compensator (27), (18), (6)
1	175 K. C.	(27A) (See Note B)
1	300 K. C.	(27), (18), (6)
1	175 K. C.	(27A) Note B
1	300 K. C.	(27), (18), (6)

NOTE A—To accurately adjust the compensator to the fundamental and not the image signal, turn the oscillator compensator to the maximum capacity position clockwise. Then slowly turn the compensators counter-clockwise until a second maximum peak is obtained on the output meter. The first peak is the image signal and the receiver must not be adjusted to it. If the above procedure is correctly performed, the image signal will be found 940 K. C. below the frequency being used on any high frequency band.

NOTE B—First tune the compensator for maximum output then vary the tuning condenser of the receiver for maximum output about the frequency mark on the dial. Now turn the compensator slightly to the right or left and again vary the receiver tuning condenser for maximum output. If the output decreases, set the compensator in the opposite direction. This procedure of first setting the compensator and then varying the tuning condenser is continued until there is no further gain in output reading.

NOTE C—To eliminate the effect of R. F. compensator detuning the oscillator circuit, a variable condenser of approximately 350 mmfd. is connected from the oscillator compensator to ground where designated in the instructions above. Tune the added condenser from the minimum capacity position until the second harmonic of the receiver oscillator beats with the signal from the generator, resulting in a maximum reading on the output meter. Then adjust compensators as noted for maximum output.

PHILCO RADIO & TELEV. CORP.

MODEL 37-2670
Chassis, Parts

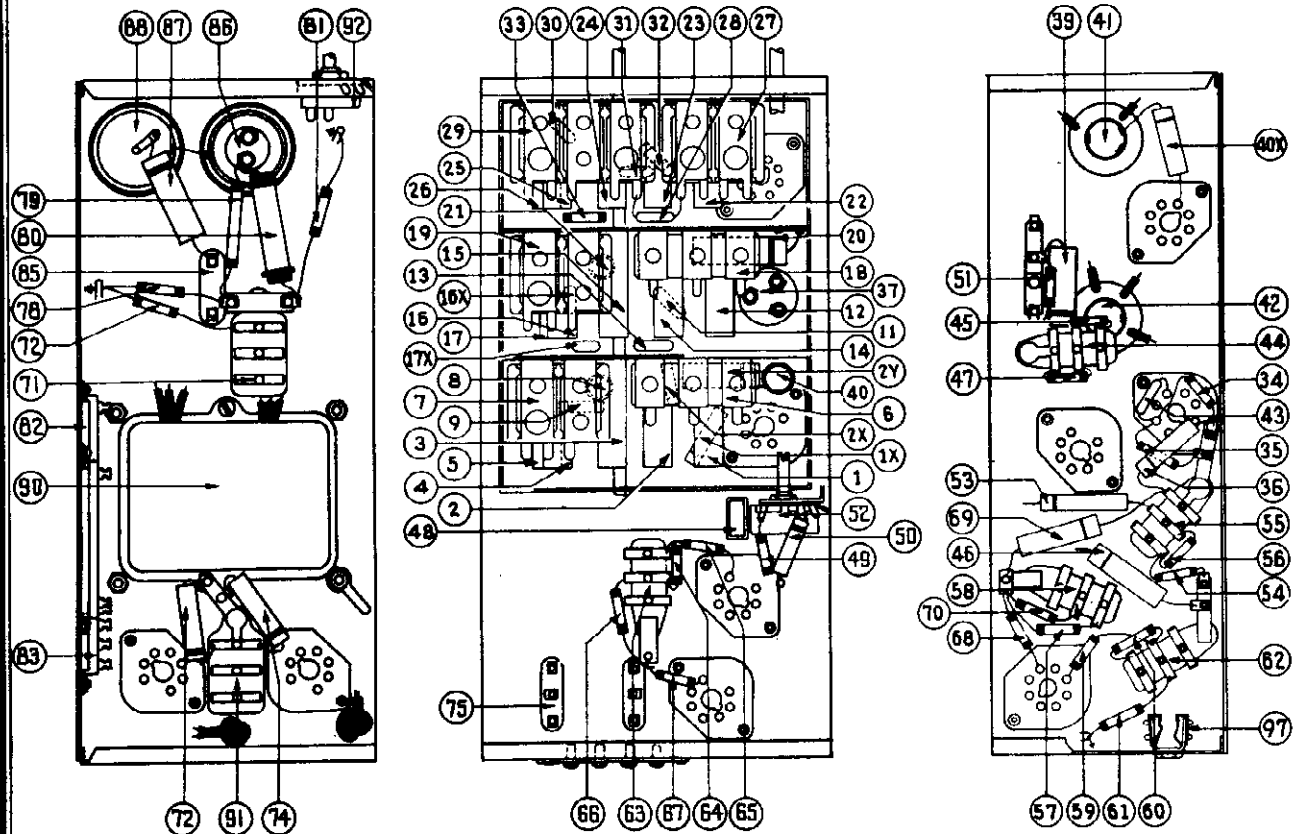


Fig. 4—View of Parts Underside of Chassis

REPLACEMENT PARTS—MODEL 37-2670

Schem. No.	Description	Part No.	List Price	Schem. No.	Description	Part No.	List Price	Schem. No.	Description	Part No.	List Price
1	Ant. Trans. (Range 1)	32-2218	\$0.50	48	Condenser (75 mmfd. mica)	30-1053	.20	92	Tone Control & A. C. Switch	42-1184	.75
1X	Condenser (.01 mfd.)	30-4479		49	Resistor (40000 ohms)	33-340339	.20	93	Range Switch (Ant.)	42-1211	1.50
2	Ant. Trans. (Range 2)	32-2198	1.60	50	Condenser (.005 mfd. tubular)	30-4467	.20	94	Range Switch (R. F.)	42-1255	1.60
2X	Resistor (10000 ohms, 1/2 watt)	33-510339	.20	51	Resistor (1000 ohms, 1/2 watt)	33-210339	.20	95	Range Switch Osc.	42-1253	1.60
2Y	Condenser (.004 mfd., Tubular)	30-4185	.25	52	Volume control	33-5158	1.00	96	Shadowmeter Lamp	34 2039E	
3	Ant. Trans. (Range 3)	32-2146	1.50	53	Condenser (.015 mfd. tubular)	30-4358	.20	97	Phono Jack	42-1197	
4	Ant. Trans. (Range 4)	32-2150	1.20	54	Resistor (490000 ohms, 1/2 watt)	33-446339	.20		Cable (speaker)	41-3210	.45
5	Ant. Trans. (Range 5)	32-2175	1.20	55	Condenser (.1 mfd. Bakelite)	498990			Cable (power)	L-2183	.40
6	Compensator	31-6131		56	Resistor (1 megohm, 1/2 watt)	33-510339	.20		Dial	27-3296	.50
7	Compensator	31-6135		57	Resistor (99000 ohms, 1/2 watt)	33-399339	.20		Dial Hub	28-7187	.12
8	Condenser (.05 mfd., Tubular)	30-4444	.20	58	Condenser (.03 mfd. Bakelite)	83185U	.35		Dial Set Screw	W-1641	.02
9	Resistor (51000 ohms, 1/2 watt)	33-351339	.20	59	Resistor (490000 ohms, 1/2 watt)	33-446339	.20		Mask	27-5206	.00
10	Tuning Condenser	31-1857	8.00	60	Resistor (8000 ohms, 1/2 watt)	33-250339	.20		Mask Arm Link	31-1887	.45
11	Condenser (5 mmfd. mica)	30-1090	.20	61	Resistor (49000 ohms, 1/2 watt)	33-348339	.20		Mask Washer	27-8318	.50C
12	R. F. Trans. (Range 1)	32-2219	1.00	62	Condenser (.08 mfd. Bakelite)	83188U	.35		Mask Guard	38-7876	.20
13	Condenser (250 mmfd. mica)	30-1032	.25	63	Condenser (.03 mfd. Bakelite)	83188U	.35		Pilot Lamp Assy	38-7706E	.36
14	R. F. Trans. (Range 2)	32-2105	1.00	64	Resistor (330000 ohms, 1/2 watt)	33-433339	.20		Shaft & Plate Range Switch	42-1187	.50
15	R. F. Trans. (Range 3)	32-2147	.70	65	Resistor (99000 ohm, 1/2 watt)	33-399339	.20		Screen & Lens Holder Assy	31-1967	.50
16	R. F. Trans. (Range 4)	32-2317		66	Resistor (330000 ohms, 1/2 watt)	33-433339	.20		Shadowmeter Receptacle Assy	41-3225	.40
16X	Condenser (40 mmfd.)	30-1076	.20	67	Resistor (99000 ohms, 1/2 watt)	33-399339	.20		Shadowmeter Spring	28-8623	70C
17	R. F. Trans. (Range 5)	32-2318		68	Resistor (51000 ohms, 1/2 watt)	33-351339	.20		Shield (tube)	28-2726	.10
17X	Condenser (40 mmfd.)	30-1076		69	Condenser (.1 mfd. tubular)	30-4455	.25		Shield Base (tube)	28-3808	.03
18	Compensator (Three Section)	31-6223	.75	70	Resistor (32000 ohms, 1/2 watt)	33-323339	.20		Socket 7 prong	27-6057	.11
19	Compensator (Three Section)	31-6136		71	Condenser (.015 Dual Bakelite)	3783DU	.40		Socket 8 prong	27-6058	.11
20	Condenser (.06 mfd. Tubular)	30-4123	.20	72	Resistor (1 megohm, 1/2 watt)	33-510339	.20		Socket Rectifier	27-6052	.11
21	Condenser (.05 mfd. Tubular)	30-4444	.20	73	Condenser (.003 mfd. tubular)	30-4469	.20		Socket E. Z. Switch	27-6053	.11
22	Oscillator Trans. (Range 1)	32-2221	.50	74	Condenser (.003 mfd. tubular)	30-4469	.20		Volume Control Shaft Assy	38-8060	.12
23	Osc. Trans. (Range 2)	32-2120	1.00	75	Transformer (input audio)	32-7671	2.50		Volume Control Spring	28-4394	.01
24	Osc. Trans. (Range 3)	32-2149	.70	76	Transformer (audio output) K37 H28					28-4117	.40C
25	Osc. Trans. (Range 4)	32-2152	.70								
26	Osc. Trans. (Range 5)	32-2182	.70								
27	Compensator (4 section, osc.)	31-6134		77	Cone & Voice Coil Assy. K37	32-7638	1.50				
28	Condenser (700 mmfd. mica)	5863	.25		Cone & Voice Coil Assy. H28	33-3020	1.00				
29	Compensator (5 section)	31-6133			Resistor (70,000 ohms, 1 watt)	33-370439	.20				
30	Condenser (250 mmfd.)	30-1038		78	Resistor (15,000 ohms, 1 watt)	33-315339	.20				
31	Condenser (250 mmfd. mica)	30-1032	.25	79	Resistor (25000 ohms, 3 watt)	33-326339	.30				
32	Resistor (32000 ohm, 1/2 watt)	33-332339	.20	80	Resistor (51000 ohm, 1/2 watt)	33-351339	.20				
33	Resistor (10,000 ohms, 1/2 watt)	33-310339	.20	81	Resistor (5800 ohm, wire wound)	33-3282					
34	Resistor (1 megohm, 1/2 watt)	33-510339	.20	82	Resistor (Three taps, wire wound)	33-3281	.60				
35	Resistor (1 megohm, 1/2 watt)	33-510339	.20	84	Field Coil Assy. (K37, H28)	32-7115	1.80				
36	Condenser (.05 mfd. Tubular)	30-4444	.20	85	Choke (Filter)	30-2045	1.80				
37	Elect. Cond. (1, 2, 3 mfd.)	49-2307	2.50	86	Elect. Cond. (8.10 mfd.)	30-4445	.25				
38	Shadowmeter	30-4123	.25	87	Condenser (.25 mfd. tubular)	30-4445	.25				
39	Condenser (.05 mfd. Tubular)	30-4123	.20	88	Elect. Condenser (8 mfd.)	30-2025	1.35				
40	Condenser (.05 mfd. Tubular)	30-4123	.20	89	Pilot lamp	34-2039	.07				
40X	Condenser (.05 mfd. Tubular)	30-4123	.20	90	Power Trans. 115 volt 50 to 60 cycle	32-7640	6.50				
41	1st I. F. Trans. Assy.	32-2169	1.80		Power Trans. 115 volt 25 to 40 cycle	32-7641	10.00				
42	2nd I. F. Trans. Assy.	32-2171	1.80		Power Trans. 110/220 50 - 60 cycle	32-7642	8.50				
43	Condenser (110 mmfd. mica)	30-1031	.20	91	Condenser (.015 mfd. Dual Bakelite)	3793DX	.40				
44	Condenser (110 mmfd. Dual Bakelite)	8035DG	.25								
45	Resistor (99000 ohms, 1/2 watt)	33-399339	.20								
46	Condenser (.01 mfd. Tubular)	30-4479	.20								
47	Resistor (49000 ohms, 1/2 watt)	33-449339	.20								

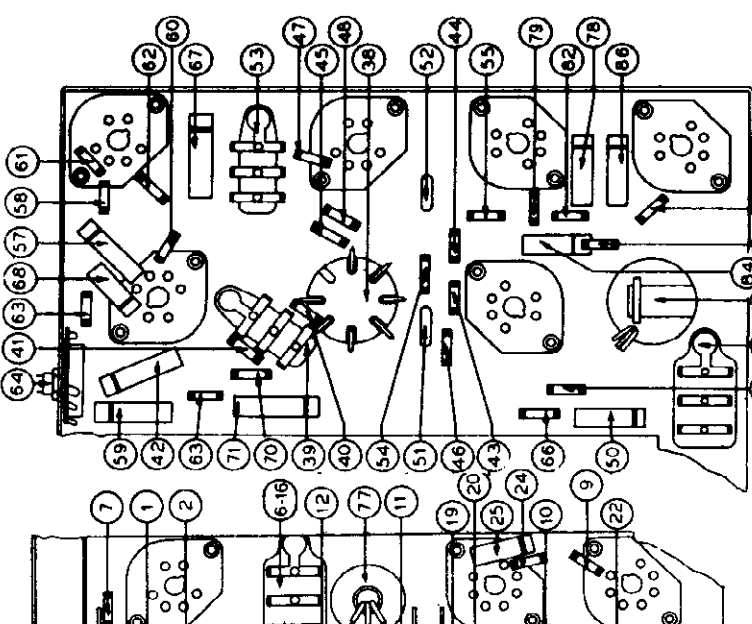
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MODEL 38-1, Code 121

Chassis, Parts

PHILCO RADIO & TELEV. CORP.

REPLACEMENT PARTS MODEL 38-1, Code 121



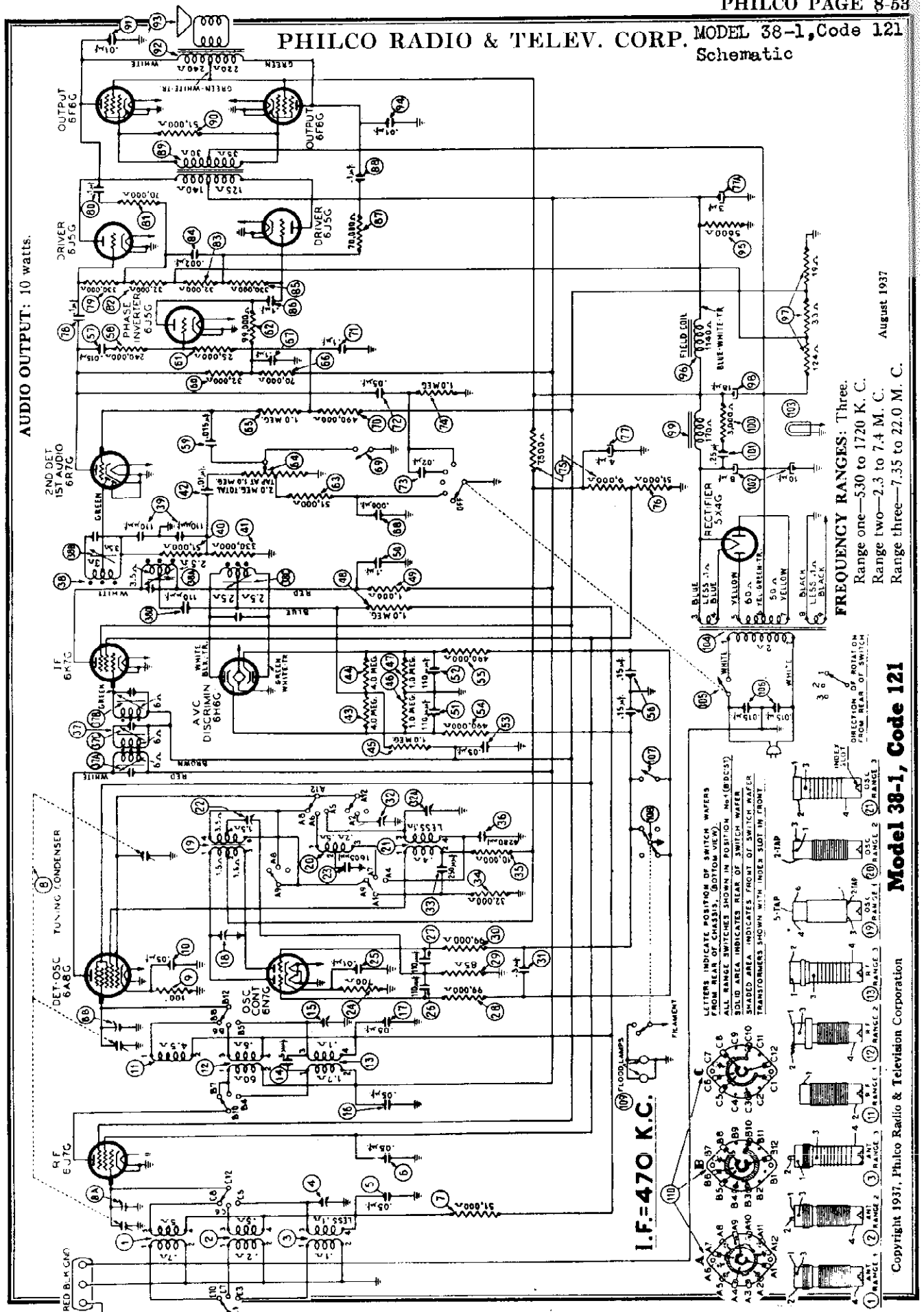
Schem. No.	Description	Part No.	List Price
1	Antenna Transformer (Range 1)	32-2575	\$0.70
2	Antenna Transformer (Range 2)	32-2576	.70
3	Antenna Transformer (Range 3)	32-2577	.70
4	Compensator, Antenna (Range 3)	31-9160	.30
5	Condenser (.05 μ f tubular)	38-4519	.40
6	Condenser (.05 μ f Bakelite)	38-4519DG	.20
7	Resistor (.05 μ f, 1/2 watt)	33-351349	.20
8	Tuning Condenser Assembly	30-2075	.20
9	Resistor (100 Ω , 1/2 watt)	33-110339	.20
10	Condenser (.05 μ f tubular)	30-4020	.40
11	R. F. Transformer (Range 1)	32-2379	1.00
12	R. F. Transformer (Range 2)	32-2382	1.00
13	R. F. Transformer (Range 3)	32-2385	1.20
14	Compensator (.5 μ f mica)	30-1097	.30
15	Compensator (R. F. Range 3)	31-6212	.20
16	Condenser (.05 μ f tubular)	30-4519	.20
17	Compensator, Osc. (Range 1)	31-6212	.20
18	Osc. Transformer (Range 1)	32-2373	1.60
19	Osc. Transformer (Range 2)	32-2383	.70
20	Osc. Transformer (Range 3)	32-2386	.70
21	Compensator, Range 1 series	31-9151	.40
22	Compensator (1805 μ f mica)	31-9201	.40
23	Resistor (700 Ω , 1/2 watt)	33-176339	.20
24	Resistor (700 Ω , 1/2 watt)	30-4479	.20
25	Condenser (.01 μ f tubular)	30-1051	.20
26	Condenser (110 μ f mica)	30-1051	.20
27	Resistor (99,000 Ω , 1/2 watt)	33-396339	.20
28	Resistor (85 Ω , 1/2 watt)	33-085339	.20
29	Resistor (99,000 Ω , 1/2 watt)	33-396339	.20
30	Compensator (2 sections)	687DG	.40
31	Compensator (250 μ f mica)	31-9211	.20
32	Resistor (32,000 Ω , 1/2 watt)	33-323339	.20
33	Resistor (10,000 Ω , 1/2 watt)	33-310339	.20
34	Resistor (4290 μ f mica)	31-9202	.350
35	1st I. F. Transformer	32-2741	3.50
36	2nd I. F. Transformer	32-2742	3.50
37	Compensator (110 μ f-110 μ f Bakelite)	603DG	.25
38	Resistor (51,000 Ω , 1/2 watt)	33-351339	.20
39	Resistor (330,000 Ω , 1/2 watt)	33-433339	.20
40	Resistor (330,000 Ω , 1/2 watt)	30-4479	.20
41	Compensator (.01 μ f tubular)	33-540339	.20
42	Resistor (4.0 meg., 1/2 watt)	33-540339	.20
43	Resistor (4.6 meg., 1/2 watt)	33-540339	.20
44	Resistor (4.6 meg., 1/2 watt)	33-510339	.20
45	Resistor (1.0 meg., 1/2 watt)	33-510339	.20
46	Resistor (1.0 meg., 1/2 watt)	33-510339	.20
47	Resistor (1.0 meg., 1/2 watt)	33-510339	.20
48	Resistor (1.0 meg., 1/2 watt)	33-510339	.20
49	Resistor (1.0 meg., 1/2 watt)	33-210339	.20
50	Condenser (.1 μ f tubular)	30-4455	.25
51	Condenser (110 μ f mica)	30-1051	.20
52	Condenser (110 μ f mica)	30-1051	.20
53	Compensator (.05 μ f Bakelite)	3615SG	.20
54	Resistor (490,000 Ω , 1/2 watt)	33-449339	.20
55	Resistor (490,000 Ω , 1/2 watt)	6987DG	.20
56	Condenser (.15 μ f-15 μ f Bakelite)	30-4226	.20
57	Resistor (240,000 Ω , 1/2 watt)	30-4239	.20
58	Resistor (105 μ f tubular)	30-4226	.20
59	Resistor (32,000 Ω , 1/2 watt)	33-323339	.20
60	Resistor (25,000 Ω , 1/2 watt)	33-323339	.20
61	Resistor (99,000 Ω , 1/2 watt)	33-396339	.20
62	Resistor (51,000 Ω , 1/2 watt)	33-351339	.20
63	Volume Control	32-5233	.20
64	Resistor (1.0 meg., 1/2 watt)	33-510339	.20
65	Resistor (20,000 Ω , 1/2 watt)	33-200339	.20
66	Resistor (1.0 μ f tubular)	30-4455	.25
67	Condenser (.006 μ f tubular)	30-4455	.25
68	Audio Shorting Switch (Part of Auto. Tuner—See parts (6) and (16) Bulletin 273)	30-4455	.25
69	Resistor (490,000 Ω , 1/2 watt)	33-449339	.20
70	Condenser (.1 μ f tubular)	30-1051	.20
71	Compensator (.05 μ f Bakelite)	3615SU	.20
72	Compensator (.02 μ f tubular)	30-4113	.35
73	Resistor (1.0 meg., 1/2 watt)	33-510339	.20
74	Resistor, wire-wound (7,500 Ω -9,000 Ω)	33-3320	.65

Fig. 3. Part Locations, Underside of Chassis

Schem. No.	Description	Part No.	List Price
76	Resistor (51,000 Ω , 1 watt)	33-351339	.20
77	Electrolytic Condenser (4 μ f-3 μ f)	30-2243	.20
78	Resistor (1 μ f tubular)	30-4455	.25
79	Resistor (330,000 Ω , 1/2 watt)	33-433399	.20
80	Condenser (1 μ f tubular)	30-4455	.25
81	Resistor (70,000 Ω , 1/2 watt)	33-370339	.20
82	Resistor (32,000 Ω , 1/2 watt)	33-323339	.20
83	Resistor (32,000 Ω , 1/2 watt)	33-323339	.20
84	Resistor (330,000 Ω , 1/2 watt)	30-4177	.25
85	Resistor (330,000 Ω , 1/2 watt)	33-433339	.20
86	Resistor (70,000 Ω , 1/2 watt)	30-4455	.25
87	Resistor (70,000 Ω , 1/2 watt)	33-370339	.20
88	Input Transformer	30-4455	.25
89	Resistor (51,000 Ω , 1/2 watt)	32-7671	2.50
90	Resistor (51,000 Ω , 1/2 watt)	33-351339	.20
91	Condenser (.01 μ f tubular)	30-4381	.20
92	Output Transformer	32-7914	1.85
93	Cone & Voice Coil Assembly (U28 Speaker)	36-3799	36-3799
94	Resistor (.01 μ f tubular)	30-4381	.25
95	Resistor (5,000 Ω , wire-wound)	33-3282	.60
96	Field & Pot Assembly (U28 Speaker)	35-3162	11.00
97	Resistor, Three Sections (124 Ω -83 Ω -19 Ω)	33-3319	.35
98	Coupling (Range Switch Shaft & Mask)	30-2200	.20
99	Choke	32-7115	.20
100	Resistor (3,000 Ω , 1/2 watt)	33-260339	.65

Part No.	Description	List Price
27-4332	Knob (Tone, Volume)	\$0.25
27-4564	Mig. Rubber (Chassis)	1.75
27-4197	Mig. Rubber (Rear of R. F. Unit)	.09
27-4581	Mig. Rubber (Front of R. F. Unit)	.09
35-9100	Pilot Lamp Assembly	32-7889
35-8969	Shield Base (Round)	32-7870
8004	Shield Base (Square)	32-7871
28-2725	Shield (8U7G Tube)	42-1288
28-5081	Shield (7B6 Tube)	40
8905	Socket (6 prong) (6F6G Tube)	45-2330
27-5066	Socket (7 prong)	42-1249
27-5067	Socket (U-28)	34-2064
36-1361	Support (Rear of R. F. Unit)	42-1392
38-8923	Terminal Panel (Ant.)	38-8533
38-8746	Bezel Assembly	28-4119
38-8833	Cover (Back of Cabinet)	41-3329
27-8865	AUTOMATIC TUNING MECHANISM	60
28-5092	*Cover (Handle)	28-4002
27-4358	*Dial	31-1961
31-2053	*Dial Screen Holder	36-8663
45-2472	*Resistor Tuning Mechanism (Station tab)	27-4330
45-2478	*These Automatic Tuning Mechanism parts differ from those shown in Service Bulletin 273.	27-4331

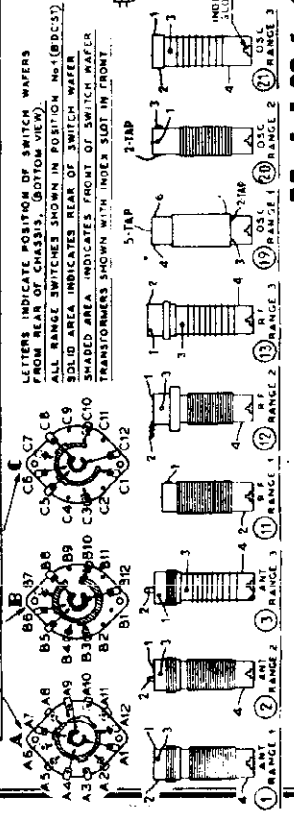
PHILCO RADIO & TELEV. CORP. MODEL 38-1, Code 121
Schematic



AUDIO OUTPUT: 10 watts.

I.F. = 470 K.C.

FREQUENCY RANGES: Three.
 Range one—530 to 1720 K. C.
 Range two—2.3 to 7.4 M. C.
 Range three—7.35 to 22.0 M. C.



Model 38-1, Code 121

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August 1937

MODEL 38-1, Code 121
Alignment, Trimmers
Voltage

PHILCO RADIO & TELEV. CORP.

Alignment of Compensators

EQUIPMENT REQUIRED: (1) Signal Generator, having a fundamental frequency range covering the intermediate and tuning frequencies of the receiver. Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36000 K. C. is the correct instrument for this purpose; (2) Output Meter, Philco Model 026 Circuit Tester incorporates a sensitive output meter and is recommended; (3) Philco Fiber Handle-Screw Driver, part number 27-7059 and Fibre Wrench, part number 3104.

OUTPUT METER: The 026 Output Meter is connected to the plate and cathode terminals of one of the 6F6G tubes. Adjust the meter to use the (0-30) volt scale and advance the attenuator control of the generator until a readable indication is noted on the output meter after signal is applied to stage being adjusted.

DIAL CALIBRATION: In order to adjust the compensators of this receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this proceed as follows:

1. Loosen the set screws on the shaft coupling of the tuning condenser. Then turn the tuning condenser until the plates are in the maximum capacity position. Now turn the dial until the glowing beam indicator is on the INDEX LINE at the low frequency end of Range 2. See Fig. 4. With dial and tuning condenser in this position tighten set screws.

2. Turn the tuning condenser control until the indicator is on the 2.2 M. C. mark.

3. With the dial in this position, loosen the shaft coupling set screws. Then turn the dial until the indicator is again on the INDEX LINE. Tighten the set screws in this position.

NOTE: Be careful when turning the dial that the position of the tuning condenser is not disturbed.

INTERMEDIATE FREQUENCY CIRCUIT

A. Set the receiver and signal generator controls as follows:

1. Range Switch (Broadcast Position)
2. Volume Control (Maximum)
3. Magnetic Tuning Switch "Off"
4. Tone Control First Position
5. Signal Generator Dial 470 K. C.

B. Connect the signal generator output cable through a .1 mfd. condenser to the grid of the 6A8G Det. Osc. tube and connect the cableground to the receiver chassis. Set the generator "attenuator" for maximum output. Adjust the I. F. Compensators as follows:

1. Turn compensator (37C) in until the output meter reading decreases almost to zero.
2. Now adjust the compensators, (37B) and (37A), for maximum output; then readjust (37C) for maximum output.
3. Turn compensator (38C) in about three turns, then adjust compensators (38B) and (38A) for maximum output. The adjustment of compensator 38C is given in the "Magnetic Tuning Circuit Adjustments" below.

RADIO FREQUENCY CIRCUIT

1. Set the controls as given under "Intermediate Frequency Circuit" 1 to 4 and set the range switch, signal generator and receiver dials as given under the adjustments of each tuning range in the following procedure.

Connect the Signal Generator output cable into the "Med" jack of the generator panel and connect the other end through a .1 mfd. condenser to the "Red" terminal of the receiver serial panel (rear of chassis). The ground connection of the cable should be connected to the "Blk" terminal.

2. Adjust the "R. F." compensators for maximum output as follows:

Tuning Range:	Signal Generator and Receiver Dial	Compensators in Order
530 to 1720 K. C.		(18), (8B), and (8A)
Range Switch Position	1550 K. C.	(22), Roll Tuning Condenser. See Note B.
1	580 K. C.	(18), (8B), (8A)
1	1550 K. C.	
Tuning Range 2.3 to 7.4 M. C.		Compensators in Order
Range Switch Position	6.0 M. C.	(32)
2	7.35 to 22.0 M. C.	
Tuning Range:	18.0 M. C.	Compensators in Order
Range Switch Position	310V-300V.	(32A), (15), (4)
3	18.0 M. C.	Roll tuning condensers when adjusting (15) and (4). See Note B, check image at 17.000. See Note A.
3	18.0 M. C.	(32A)

MAGNETIC TUNING CIRCUIT ADJUSTMENTS

1. Set the Magnetic Tuning switch in the "out" position.
2. Turn the signal generator indicator to 1000 K. C. and adjust the "Attenuator" control for a weak signal.
3. Adjust volume control for a readable indication on the output meter.
4. Now tune the receiver dial for maximum output at 1000 K. C. The dial must be tuned very accurately to the 1000 K. C. signal in order to make the following adjustment correctly.

5. Turn the Magnetic Tuning Switch "In" and adjust compensator (38C) for maximum output.

The above adjustments are now checked for accuracy as follows:

FREQUENCY TEST:

With the 1000 K. C. signal tuned for maximum output turn the Magnetic Tuning control back and forth; that is, from the "out" to "in" position. The reading of the output meter should not change in either position. If the output meter reading changes, the above magnetic tuning circuit adjustments should be repeated.

A further check on the magnetic tuning adjustment is to very carefully tune in a broadcasting station and turn the switch from the "out" to the "in" position. With the switch in either position, the tone of the station being received should not change. If a change of tone or hiss develops repeat the above Magnetic Tuning Adjustments.

SENSITIVITY TEST:

1. To check the magnetic tuning circuit for sensitivity, turn the magnetic tuning switch to the "off" position, and tune in the 1000 K. C. signal. Then adjust the "attenuator" control of the signal generator for a good audible signal. Approximately 20 volts on the output meter.

2. Now detune the signal (first above and then below the 1000 K. C. mark) to a point at which the signal is weakly heard. At each point turn the magnetic tuning control "on". When the control is turned on the signal should return to normal output strength. If the magnetic tuning circuit does not pull the signal into resonance, the compensator (38C) should be carefully readjusted.

NOTE "A": To accurately adjust the high frequency oscillator compensator to the fundamental instead of the image signal, turn the oscillator compensator to the maximum capacity position (clockwise). From this position slowly turn the compensator counter-clockwise until a second maximum peak is obtained on the output meter. Adjust the compensator for maximum output using this second peak. The first peak from maximum capacity position of the compensator is the image signal and must not be used in adjusting the compensator.

If the above procedure is correctly performed, the image signal will be found (much weaker) by turning the receiver dial 940 K. C. below the frequency being used on any high frequency range.

NOTE "B": When adjusting the low frequency compensator of Range One (Broadcast) or the antenna and R. F. compensators of the high frequency tuning range; the receiver Tuning Condenser must be adjusted (rolled) as follows: First tune the compensator for maximum output, then vary the tuning condenser of the receiver for maximum output about the frequency dial mark. Now turn the compensator slightly to the right or left and vary the receiver tuning condenser for maximum output. If the out reading increases, turn the compensator in the same direction a trifle more, and again vary the tuning condenser for maximum output. If the output decreases, set the compensator in the opposite direction. This procedure of first setting the compensator and then varying the tuning condenser is continued until there is no further gain in output reading.

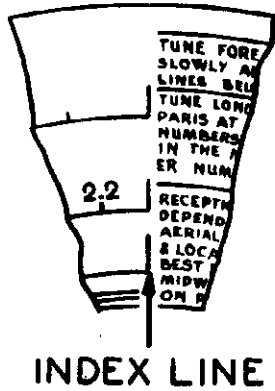


Fig. 4. Dial Calibration

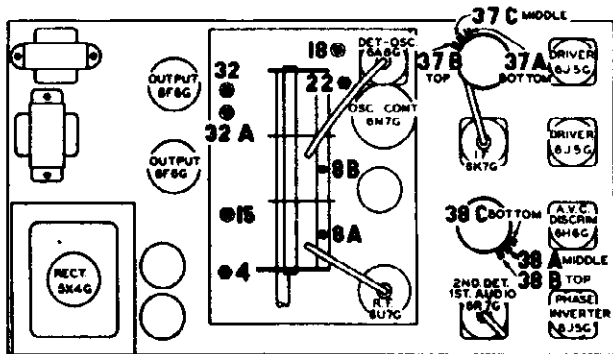


Fig. 5. Compensator Locations

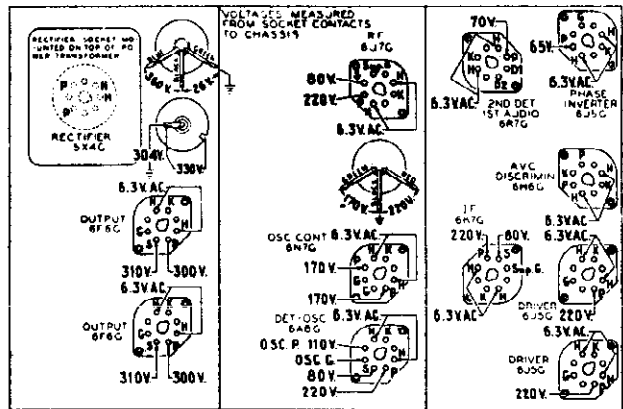
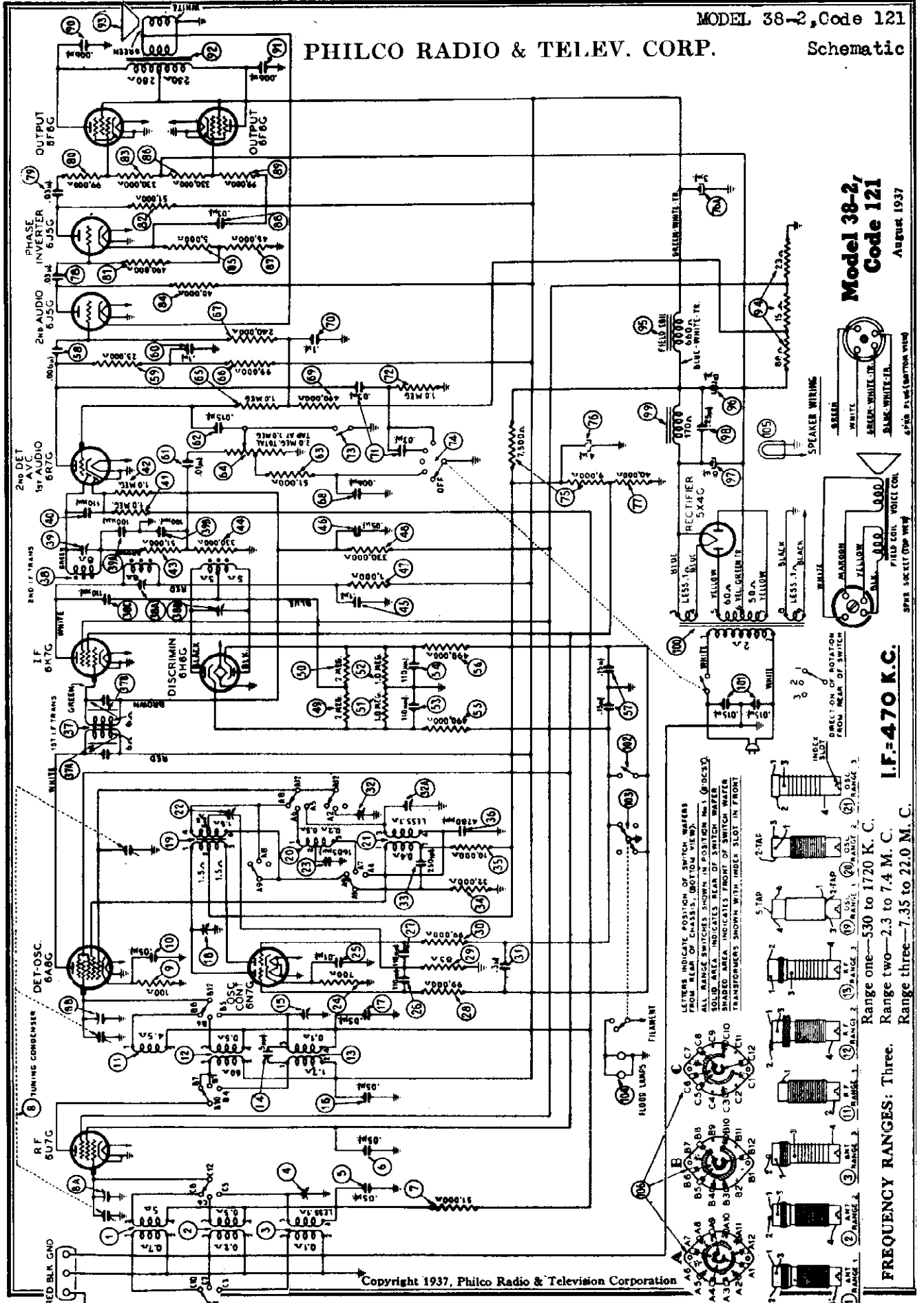


Fig. 1. Underside View of Chassis showing Socket Voltages

The voltages indicated by the arrows were measured with a Philco 026 Circ. It Tester, which contains a sensitive voltmeter. Line voltage 115 A. C.—Volume control minimum—Dial set at point where no signal is present—Range Switch in broadcast position.



**Model 38-2,
Code 121**
August 1937

**Model 38-2,
Code 121**
August 1937

I.F.=470 K.C.

Range one—530 to 1720 K. C.
Range two—2.3 to 7.4 M. C.
Range three—7.35 to 22.0 M. C.

FREQUENCY RANGES: Three.

MODEL 38-2, Code 121
Alignment, Trimmers
Voltage

PHILCO RADIO & TELEV. CORP.

Alignment of Compensators

EQUIPMENT REQUIRED: (1) Signal Generator, having a fundamental frequency range covering the intermediate and tuning frequencies of the receiver. Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36000 K. C. is the correct instrument for this purpose; (2) Output Meter, Philco Model 026 Circuit Tester incorporates a sensitive output meter and is recommended; (3) Philco Fibre Handle Screw Driver, Part No. 27-7059 and Fibre Wrench, Part No. 3164.

OUTPUT METER: The 026 Output Meter is connected to the plate and cathode terminals of one of the 6F6G tubes. Adjust the meter to use the (0-30) volt scale and advance the attenuator control of the generator until a readable indication is noted on the output meter after signal is applied to stage being adjusted.

DIAL CALIBRATION: In order to adjust the compensators of this receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this proceed as follows:

- Loosen the set screws on the shaft coupling of the tuning condenser. Then turn the tuning condenser until the plates are in the maximum capacity position. Now turn the dial until the glowing beam indicator is on the INDEX LINE at the low frequency end of Range 2. See Fig. 4. With dial and tuning condenser in this position, tighten set screws.
- Turn the tuning condenser control until the indicator is on the 2.2 M. C. Mark.
- With the dial in this position, loosen the shaft coupling set screws. Then turn the dial until the indicator is again on the INDEX LINE. Tighten the set screws in this position. Be careful when turning the dial that the position of the tuning condenser is not disturbed.

INTERMEDIATE FREQUENCY CIRCUIT

- A. Set the receiver and signal generator controls as follows:
- Range Switch (Broadcast)
 - Volume Control (Maximum)
 - Magnetic Tuning Switch "out"
 - Tone control & A. C. switch first position.
 - Signal generator dial 470 K. C.

B. Connect the signal generator output cable through a .1 mfd. condenser to the grid of the 6A8C Det. Osc. tube and connect the cable ground to the receiver chassis. Now adjust the following compensators for maximum output (38A), (39), (37B), and (37A).

RADIO FREQUENCY CIRCUIT

1. Set the controls as given under "Intermediate Frequency Circuit" 1 to 4 and set the range switch, signal generator and receiver dials as given under the adjustments of each tuning range in the following procedure.

Connect the Signal Generator output cable into the "Med" jack of the generator panel and connect the other end through a .1 mfd. condenser to the "Red" terminal of the receiver aerial panel (rear of chassis). The ground connection of the cable should be connected to the "Blk" terminal.

2. Adjust the "R. F." compensators for maximum output as follows:

Tuning Range: 530 to 1720 K. C.

Range Switch Position	Signal Generator and Receiver Dials	Compensators in Order
1	1550 K. C.	(18), (8B) and (8A)
1	580 K. C.	(22) Roll gang. Note B
1	1550 K. C.	(18), (8B), (8A)

Tuning Range 2.3 to 7.4 M. C.

Range Switch Position	Signal Generator and Receiver Dial	Compensators in Order
2	6.0 M. C.	(32)

Tuning Range 7.35 to 22.0 M. C.

Range Switch Position	Signal Generator and Receiver Dial	Compensators in Order
3	20.0 M. C.	(32A), (15), (4)

Roll tuning condensers when adjusting (15) and (4). See Note B. Check image at 17.060. See Note A. (32A)

MAGNETIC TUNING CIRCUIT ADJUSTMENTS

- Set the Magnetic Tuning switch in the "out" position.
- Turn the signal generator indicator to 1000 K. C. and adjust the "Attenuator" control for a weak signal.
- Adjust volume control for a readable indication on the output meter.
- Now tune the receiver dial for maximum output at 1000 K. C. The dial must be tuned very accurately to the 1000 K. C. signal in order to make the following adjustment correctly.
- Turn the Magnetic Tuning switch "in" and adjust compensator (38B) for maximum output.

The above adjustments are now checked for accuracy as follows:

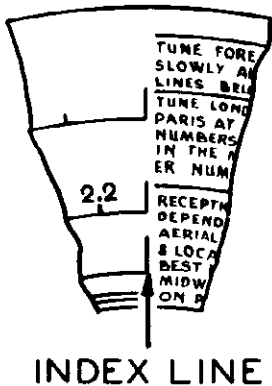


Fig. 4. Dial Calibration

FREQUENCY TEST

With the 1000 K. C. signal tuned for maximum output turn the Magnetic Tuning control back and forth; that is, from the "out" to "in" position. The reading of the output meter should not change in either position. If the output meter reading changes, the above magnetic tuning circuit adjustments should be repeated.

A further check on the Magnetic Tuning adjustment is to very carefully tune in a broadcasting station and turn the switch from the "out" to the "in" position. With the switch in either position, the tone of the station being received should not change. If a change of tone or hiss develops repeat the above Magnetic Tuning Adjustments.

SENSITIVITY TEST

1. To check the magnetic tuning circuit for sensitivity, turn the magnetic tuning switch to the "out" position, and tune in the 1000 K. C. signal. Then adjust the "attenuator" control of the signal generator for a good audible signal. Approximately 20 volts on the output meter.

2. Now detune the signal (first above and then below) the 1000 K. C. mark to a point at which the signal is weakly heard. At each point turn the magnetic tuning control "on". When the control is turned on the signal should return to normal output strength. If the magnetic tuning circuit does not pull the signal into resonance, the compensator should be carefully readjusted.

NOTE "A"—To accurately adjust the high frequency oscillator compensator to the fundamental instead of the image signal, turn the oscillator compensator to the maximum capacity position (clockwise). From this position slowly turn the compensator counter-clockwise until a second maximum peak is obtained on the output meter. Adjust the compensator for maximum output using this second peak. The first peak from maximum capacity position of the compensator is the image signal and must not be used in adjusting the compensator.

If the above procedure is correctly performed, the image signal will be found (much weaker) by turning the receiver dial 940 K. C. below the frequency being used on any high frequency range.

NOTE "B"—When adjusting the low frequency compensator of Range One (Broadcast) or the antenna and R. F. compensators of the high frequency tuning ranges; the receiver Tuning Condenser must be adjusted (rolled) as follows: First tune the compensator for maximum output, then vary the tuning condenser of the receiver for maximum output about the frequency dial mark. Now turn the compensator slightly to the right or left and vary the receiver tuning condenser for maximum output. If the out reading increases, turn the compensator in the same direction a trifle more, and again vary the tuning condenser for maximum output. If the output decreases, set the compensator in the opposite direction. This procedure of first setting the compensator and then varying the tuning condenser is continued until there is no further gain in output reading.

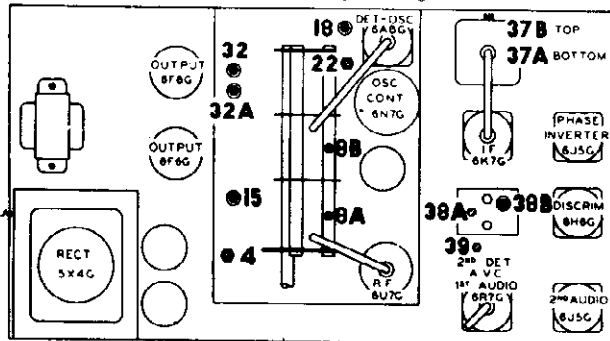


Fig. 5. Compensator Locations

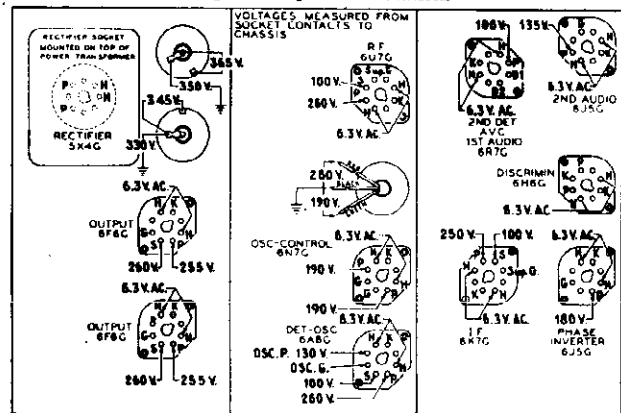
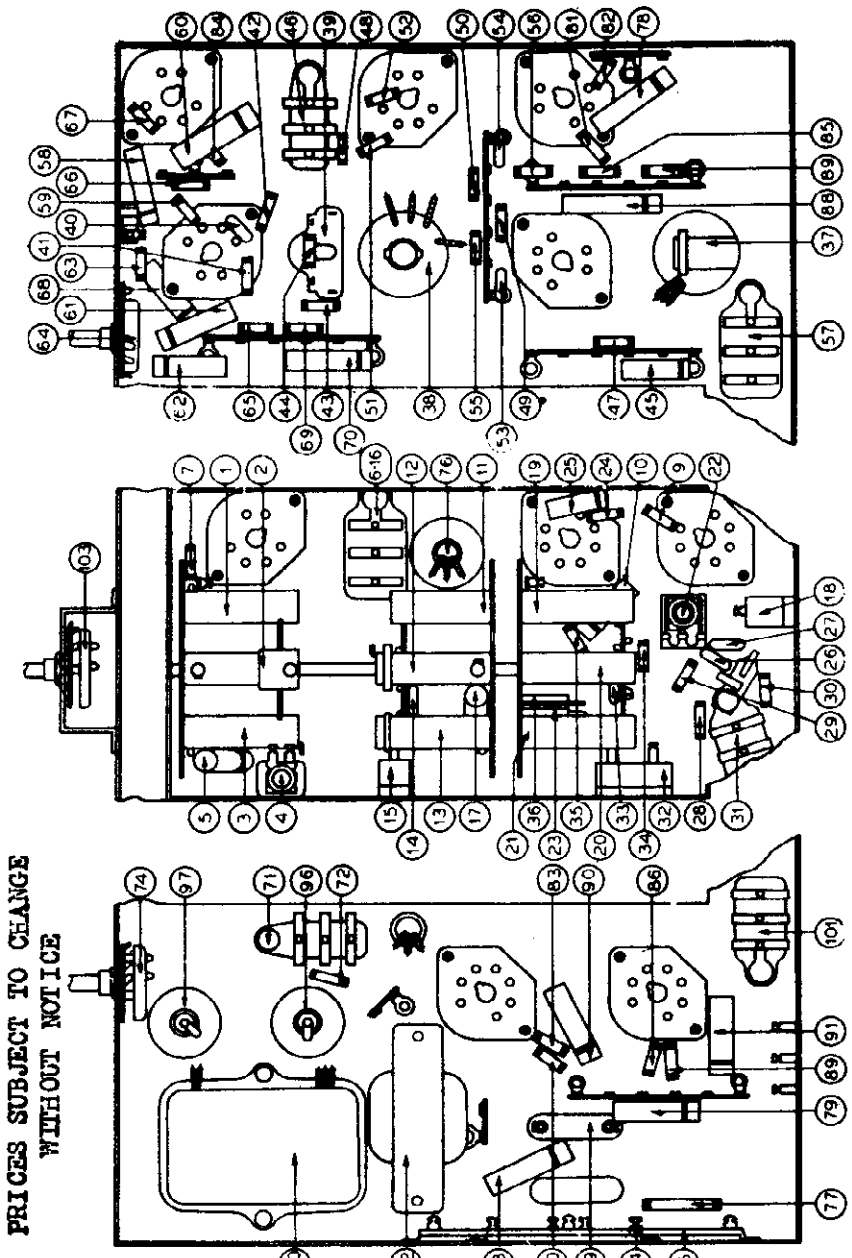


Fig. 1. Underside View of Chassis showing Socket Voltages

The voltages indicated by the arrows were measured with a Philco 026 Circuit Tester, which contains a sensitive voltmeter. Line voltage 115 A. C.—Volume control minimum—Dial set at point where no signal is present—Range Switch in broadcast position.

PHILCO RADIO & TELEV. CORP. Chassis, Parts



PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Schem. No.	Description	Part No.	List Price
1	Antenna Transformer (Range 1)	32-2575	\$0.70
2	Antenna Transformer (Range 2)	32-2576	.70
3	Antenna Transformer (Range 3)	32-2577	.70
4	Compensator (Antenna Range 3)	31-6180	.30
5	Compensator (.05 μf. tubular)	30-4519	.20
6	Condenser (.05 μf. Bakelite)	3615DGC	.40
7	Resistor (51,000 Ω, 1/2 Watt)	33-3513319	.20
8	Tuning Condenser Assembly	31-2076	.20
9	Resistor (100 Ω, 1/2 Watt)	33-110059	.20
10	Condenser (.05 μf. tubular)	30-4020	.20
11	R. F. Transformer (Range 1)	32-2379	.40
12	R. F. Transformer (Range 2)	32-2382	1.00
13	R. F. Transformer (Range 3)	32-2385	1.20
14	Condenser (5 μf. Mica)	30-1067	.20
15	Compensator (R. F. Range 3)	31-6212	.20
16	Condenser (.05 μf. Tubular)	30-4519	.20
17	Compensator (Range 1)	31-6212	.20
18	Compensator (Range 2)	32-2373	1.60
19	Compensator (Range 3)	32-2383	.70
20	Compensator (Range 3)	32-2386	.70
21	Compensator (Range 3)	31-6181	.40
22	Compensator (Range 1 Series)	31-6201	.40
23	Compensator (1605 μf. Mica)	35-1706319	.30
24	Resistor (200 Ω, 1/2 Watt)	30-4479	.20
25	Condenser (.01 μf. Tubular)	30-1031	.20
26	Condenser (.10 μf. Mica)	30-1031	.20
27	Resistor (90,000 Ω, 1/2 Watt)	35-3983319	.20
28	Resistor (85 Ω, 1/2 Watt)	35-0853319	.20
29	Resistor (90,000 Ω, 1/2 Watt)	35-3983319	.20
30	Resistor (90,000 Ω, 1/2 Watt)	35-3983319	.20
31	Condenser (3 μf. Bakelite)	628TDG	.40
32	Compensator (2 Sections)	31-6211	.25
33	Compensator (.250 μf. Mica)	30-1032	.25
34	Resistor (32,000 Ω, 1/2 Watt)	33-3326319	.20
35	Resistor (10,000 Ω, 1/2 Watt)	33-3103319	.20
36	Condenser (.250 μf. Mica)	31-6202	.50
37	1st. F. Transformer	32-2004	2.20
38	2nd. F. Transformer	32-2562	3.30
39	Compensator	31-6203	.30
40	Compensator (1.0 μf. Mica)	30-1031	.20
41	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
42	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
43	Resistor (51,000 Ω, 1/2 Watt)	33-3513319	.20
44	Resistor (330,000 Ω, 1/2 Watt)	33-6533319	.25
45	Condenser (.1 μf. Tubular)	30-4455	.25
46	Compensator (.05 μf. Bakelite)	3615DC	.35
47	Resistor (100 Ω, 1/2 Watt)	33-2103319	.20
48	Resistor (320,000 Ω, 1/2 Watt)	33-6333319	.20
49	Resistor (2.0 Meg. 1/2 Watt)	33-2033319	.20
50	Resistor (2.0 Meg. 1/2 Watt)	33-2033319	.20
51	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
52	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
53	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
54	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
55	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
56	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
57	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
58	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
59	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
60	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
61	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
62	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
63	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
64	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
65	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
66	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
67	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
68	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
69	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
70	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
71	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
72	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
73	Resistor (1.0 Meg. 1/2 Watt)	35-5103319	.20
74	Tone Control	42-1268	.75
75	Resistor (7,500 Ω, 1/2 Watt)	33-33230	.65
76	Resistor (7,500 Ω, 1/2 Watt)	33-33230	.65
77	Resistor (7,500 Ω, 1/2 Watt)	33-33230	.65
78	Resistor (7,500 Ω, 1/2 Watt)	33-33230	.65
79	Resistor (7,500 Ω, 1/2 Watt)	33-33230	.65
80	Resistor (7,500 Ω, 1/2 Watt)	33-33230	.65
81	Resistor (7,500 Ω, 1/2 Watt)	33-33230	.65
82	Resistor (7,500 Ω, 1/2 Watt)	33-33230	.65
83	Resistor (7,500 Ω, 1/2 Watt)	33-33230	.65
84	Resistor (7,500 Ω, 1/2 Watt)	33-33230	.65
85	Resistor (7,500 Ω, 1/2 Watt)	33-33230	.65
86	Resistor (7,500 Ω, 1/2 Watt)	33-33230	.65
87	Resistor (7,500 Ω, 1/2 Watt)	33-33230	.65
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89	Resistor (7,500 Ω, 1/2 Watt)	33-33230	.65
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97	Resistor (7,500 Ω, 1/2 Watt)	33-33230	.65
98	Resistor (7,500 Ω, 1/2 Watt)	33-33230	.65
99	Resistor (7,500 Ω, 1/2 Watt)	33-33230	.65
100	Resistor (7,500 Ω, 1/2 Watt)	33-33230	.65

Fig. 3. Part Locations, Underside of Chassis

Part No.	Description	List Price
27-4581	Mix. Rubber (Front of R. F. Unit)	\$0.10
28-4660	Shield (R. F. Unit)	.10
28-3726	Shield (Tube) (Square)	.05
30-005	Shield (Tube) (Round)	.05
28-2725	Shield Base (Square)	.11
28-2100	Socket Assembly (Pilot Lamp)	.11
27-6068	Socket (6 prong) (6F6G tubes)	.11
27-6057	Socket (7 prong)	.11
27-4057	Support (rear of R. F. Unit)	.15
30-1260	Speaker H-33	.20
30-8923	Terminal Panel (Antenna)	2.60
38-8746	Terminal Panel (Antenna)	1.00
38-8533	Bracket Assembly	.50
27-5072	Cover (Back of cabinet)	.74
27-5064	Cover (Back of cabinet)	.74
29-5002	*Cover (handle)	.10
27-5358	*Dial Service Holder	.10
31-2053	*Escutcheon Assembly (Station tube)	.10
45-2472	*These Automatic Tuning Mechanism Parts differ from those shown in Service Bulletin 273.	.68

MODEL 38-3
Chassis, Parts

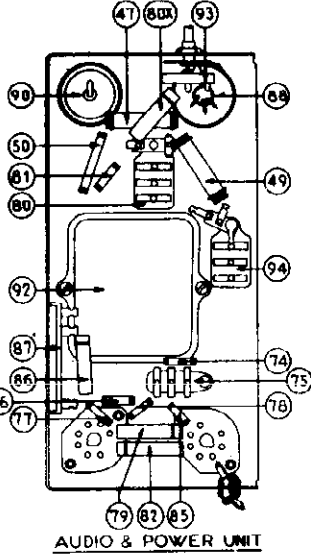
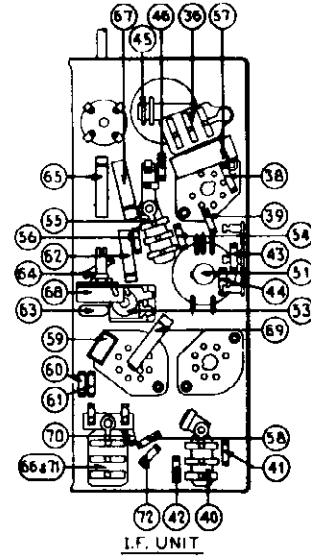
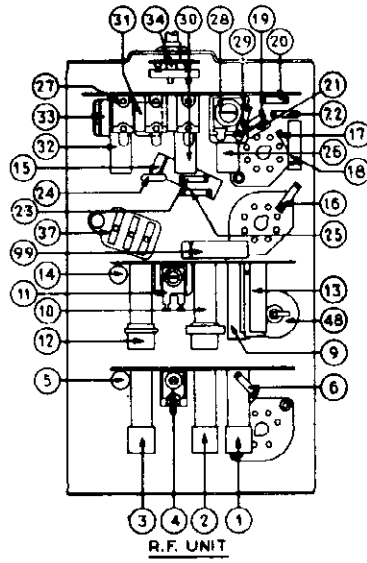
PHILCO RADIO & TELEV. CORP.

Replacement Parts — Model 38-3

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Schem. No.	Description	Part No.	List Price
1	Antenna transformer (range 1)	32-2575	.80
2	Antenna transformer (range 2)	32-2576	.70
3	Antenna transformer (range 3)	32-2577	.80
4	Compensator antenna, single	31-5161	.75
5	Compensator (0.05 mf. tubular)	30-4444	.75
6	Resistor (1,000 ohms, 1/2 watt)	33-351339	.07
7	Tuning Condenser	31-1963	.07
8	Remove prior to production		
9	R. F. transformer (range 1)	32-2579	.40
10	R. F. transformer (range 2)	32-2582	1.00
11	R. F. transformer (range 3)	31-5190	1.30
12	Compensator (single) R. F.	32-2585	1.20
13	R. F. Transformer (range 3)	30-4122	.20
14	Condenser (0.05 mf. tubular)	30-4020	.20
15	Condenser (0.05 mf. tubular)	30-4020	.20
16	Resistor (100 ohms, 1/2 watt)	33-110339	.20
17	Resistor (700 ohms, 1/2 watt)	33-170339	.20
18	Condenser (0.01 mf. tubular)	30-4479	.20
19	Condenser (110 mf. mica)	30-1031	.20
20	Resistor (90,000 ohms, 1/2 watt)	33-399339	.20
21	Condenser (110 mf. mica)	30-1031	.20
22	Resistor (99,000 ohms, 1/2 watt)	33-399339	.20
23	Resistor (10,000 ohms, 1/2 watt)	33-310339	.20
24	Resistor (200 mf. mica)	30-1032	.20
25	Resistor (32,000 ohms, 1/2 watt)	33-32739	.20
26	Dec. transformer (range 1)	32-2573	1.00
27	Compensator (sec. series)	31-5151	.40
28	Resistor (85 ohms, 1/2 watt)	31-5170	.75
29	Dec. transformer (range 2)	33-399339	.20
30	Dec. transformer (1600 mf. tracking)	31-5155	.40
31	Dec. transformer (range 3)	32-2586	.70
32	Switch (magnetic tuning, manual)	31-5156	.60
33	Switch (magnetic tuning, automatic dial)	42-1269	.75
34	Condenser (0.15 mf. double bakelite)	45-2530	1.20
35	Condenser (0.3 mf. double bakelite)	5287 DG	.40
36	Resistor (490,000 ohms, 1/2 watt)	33-446339	.20
37	Resistor (490,000 ohms, 1/2 watt)	33-446339	.20
38	Condensers (110 mf. dual bakelite)	8065 DG	.20
39	Resistor (1.0 meg., 1/2 watt)	33-510339	.20
40	Resistor (2.0 meg., 1/2 watt)	33-520339	.20
41	Resistor (2.0 meg., 1/2 watt)	33-520339	.20
42	Resistor (2.0 meg., 1/2 watt)	33-520339	.20
43	Resistor (2.0 meg., 1/2 watt)	33-520339	.20
44	Resistor (2.0 meg., 1/2 watt)	33-520339	.20
45	1st I. F. transformer	32-2804	.20
46	Resistor (1000 ohms, 1/2 watt)	33-210339	.20
47	Resistor (9000 ohms, 2 watts)	33-290339	.80
48	Condenser (16 mf. electrolytic)	30-2194	1.60
49	Resistor (7500 ohms, 3 watts)	33-276339	1.60
50	Resistor (32,000 ohms, 1/2 watt)	33-32739	.20
51	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
52	Resistor (490,000 ohms, 1/2 watt)	33-446339	.20
53	Resistor (380,000 ohms, 1/2 watt)	30-4169	.20
54	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
55	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
56	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
57	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
58	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
59	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
60	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
61	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
62	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
63	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
64	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
65	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
66	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
67	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
68	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
69	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
70	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
71	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
72	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
73	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
74	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
75	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
76	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
77	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
78	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
79	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
80	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
81	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
82	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
83	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
84	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
85	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
86	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
87	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
88	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
89	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
90	Resistor (180,000 ohms, 1/2 watt)	33-319339	.20
91	Pilot Lamp	34-2039	.07
92	Power transformer (115 volts, 26 cycle)	32-7606	9.00
93	Power transformer (115 volts, 26 cycle)	32-7606	9.00

*A complete list of the automatic tuning mechanism parts is given in Bulletin 273. Those parts shown above marked with an asterisk differ from those shown on Bulletin 273.



PHILCO RADIO & TELEV. CORP.

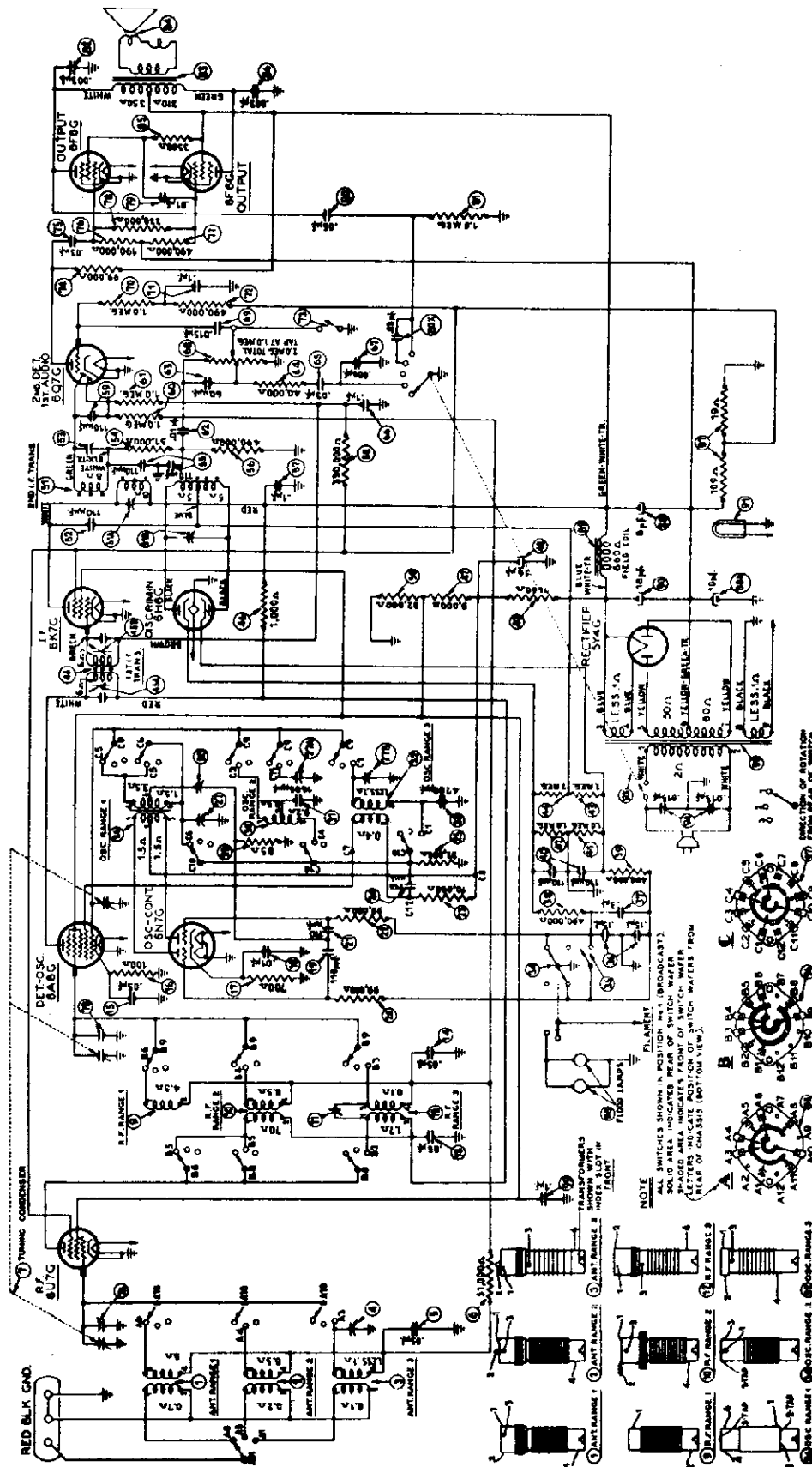


Fig. 4. Schematic Diagram Model 38-3

Electrical Specifications

INTERMEDIATE FREQUENCY: 470 K. C.

UNDISTORTED OUTPUT: 5 watts.

PHILCO TUBES USED: Nine. One 6U7GR, one 6K7G I. F. amplifier, one 6A8C, Det. Osc., one 6N7G, osc. control; one 6H6C, discriminator; one 6Q7G, 2nd det. 1st audio; two 6F6G output, and one 5Y4G rectifier.

TUNING RANGE: Three. Range one—830 to 1720 K. C. Range two—2.3 to 7.4 M. C. Range three—7.35 to 22 M. C.

TOPE CONTROL: Four positions.

SPEAKER: 1100

TYPE CIRCUIT: Superheterodynes, with such features as: magnetic tuning control on the broadcast range; automatic volume control; iron core adjusted first I. F. transformer; push-pull Pentode audio output, using screen phase inversion; Base compensation in the Volume Control circuit, and the Philco Automatic Tuning Mechanism.

Consumption

Frequency 50 to 60 cycles

25 to 40 cycles

116

115

Different Transformers are required for operation on the frequencies list above. These are shown on the parts list.

April, 1937

MODEL 38-3

Alignment, Voltage
Trimmers

PHILCO RADIO & TELEV. CORP.

Alignment of Compensators

EQUIPMENT REQUIRED: (1) Signal Generator; Philco Model 077 signal generator, using fundamental frequency from 115 to 36000 K. C. is the correct instrument for the purpose; (2) Output meter; Philco model 026 circuit tester incorporates a sensitive output meter and is recommended; (3) Philco fibre handle screw-driver, part No. 27-7059 and fibre wrench part No. 3164.

OUTPUT METER: The 026 output meter is connected to the plate and cathode terminals of one of the 6F6G tubes. Adjust the meter to use the (0-30) volt scale and advance volume control of receiver until a readable indication is noted after signal generator is connected in the following adjustments.

DIAL CALIBRATION: In order to adjust this receiver correctly the dial must be aligned to track properly with the tuning condenser. To do this proceed as follows:

1. Loosen the shaft coupling set screws. Then turn the tuning condenser fully closed and the dial to the first index line. Now tighten the shaft coupling set screws, and rotate the dial until the 520 K. C. mark is midway between the index line and the glowing beam indicator.
2. With condenser in this position loosen the set screws of the shaft coupling on the tuning condenser.
3. Then turn the tuning dial until the glowing beam indicator is entered on the index line.

NOTE: Be careful when turning the dial that the position of the tuning condenser is not disturbed.

4. Now tighten the shaft coupling set screws.

INTERMEDIATE FREQUENCY CIRCUIT

With signal generator output lead connected through a .1 mfd. condenser to the grid of the 6AB8 det-osc.tube; and controls set as follows, adjust I. F. compensators for maximum output.

- a. Magnetic Tuning Knob (34) off
- b. Tone Control (98) normal
- c. Volume Control (98) maximum
- d. Receiver dial 580 K. C.
- e. Signal generator 470 K. C.
- f. Range Switch position (Broadcast)
- g. Compensators in order (53), (51A), (45A), (45B).

RADIO FREQUENCY CIRCUIT

Tuning Range 530 to 1720 K. C.

1. Connect the signal generator output lead through a .1 mfd. condenser to "RED" terminal of the aerial panel and the generator ground to the chassis of the receiver.
2. Other controls set as given under intermediate frequency circuit, with the exception of those as follows: Adjust compensators for maximum output as follows:

Range Switch	Signal Generator	Receiver Dial	Compensators in Order
1	1500 K. C.	1600 K. C.	(27) (7B) (7A)
1	580 K. C.	580 K. C.	(28) Roll gang through signal when padding this compensator. (See Note B)
1	1600 K. C.	1600 K. C.	(27)
1	1500 K. C.	1600 K. C.	(7B) (7A)

Tuning Range 2.3 to 7.4 M. C. Adjust compensators for maximum output as follows:

Range Switch	Signal Generator	Receiver Dial	Compensators in Order
2	6 M. C.	6 M. C.	(27A)

Tuning Range 7.35 to 22 M. C. Adjust compensators for maximum output as follows:

Range Switch	Signal Generator	Receiver Dial	Compensators in Order
3	18 M. C.	18 M. C.	(27B) check image at 17.96 M. C. (See Note A)
			(11) (4) Use shunt condenser on (27B) or roll gang through signal when padding compensator No. 11 (See Note C)
3	18 M. C.	18 M. C.	(27B)

MAGNETIC TUNING ADJUSTMENT: Set the range switch in position one (530 to 1720 K. C.) and the magnetic tuning switch in the "out" position. Now turn the signal generator and receiver dial to any frequency in the Broadcast band. The receiver dial must be adjusted very accurately for maximum output.

Set the magnetic tuning control in the "on" position (clockwise). Compensator (51B) of the magnetic tuning transformer is now adjusted for maximum output.

The above adjustment is now checked for accuracy, by turning the magnetic tuning control "off" and "on." In either position, there should be no change in the tone of the signal. If a change of tone or hiss develops, it indicates a shift in frequency and the adjustment must be repeated.

NOTE A—To accurately adjust the high frequency oscillator compensator to the fundamental instead of the image signal, turn the oscillator compensator to the maximum capacity position (clockwise). Then slowly turn compensator counter-clockwise until a second maximum peak is obtained on the output meter. This second peak is the fundamental signal, and the compensator must be adjusted for maximum output with it. The first peak from maximum capacity position of the compensator is the image signal and must not be used in adjusting this compensator.

If the above procedure is correctly performed, the image signal will be found (much weaker) 940 K. C. below the frequency being used on any high frequency range.

NOTE B—First tune compensator (28) for maximum output, then vary the tuning condenser of the receiver for maximum output about the 580 K. C. dial mark. Now turn compensator (28) slightly to the right or left and vary the receiver tuning condenser for maximum output. If the output reading increases, turn compensator (28) in the same direction a trifle more, and again vary the tuning condenser for maximum output. If the output decreases, set the compensator in the opposite direction. This procedure of first setting the compensator and then varying the tuning condenser is continued until there is no further gain in output reading.

NOTE C—To eliminate the effect of the R. F. compensator detuning the Osc. circuit, a variable tuning condenser of approximately 350 mmfd. is connected from the oscillator compensator to ground when designated in the padding instruction above. Tune the added condenser until the second harmonic of the receiver oscillator beats against the signal from the generator, resulting in a maximum indication on the output meter. Then adjust compensators as noted for maximum output.

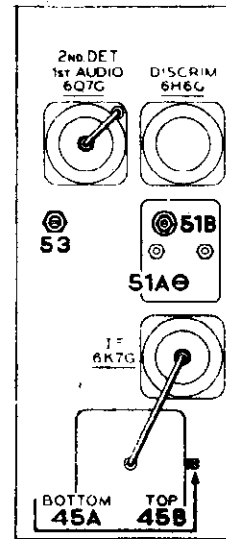


Fig. 2. I. F. Compensators Top of Chassis

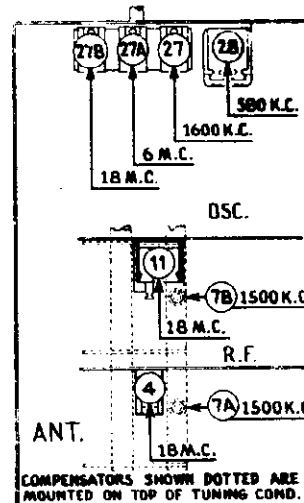


Fig. 3. R. F. Compensators Underside of Chassis

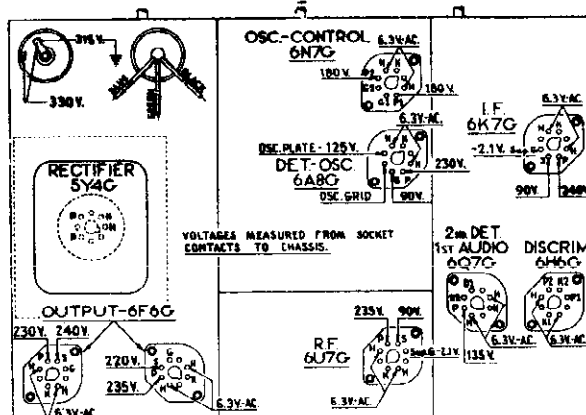
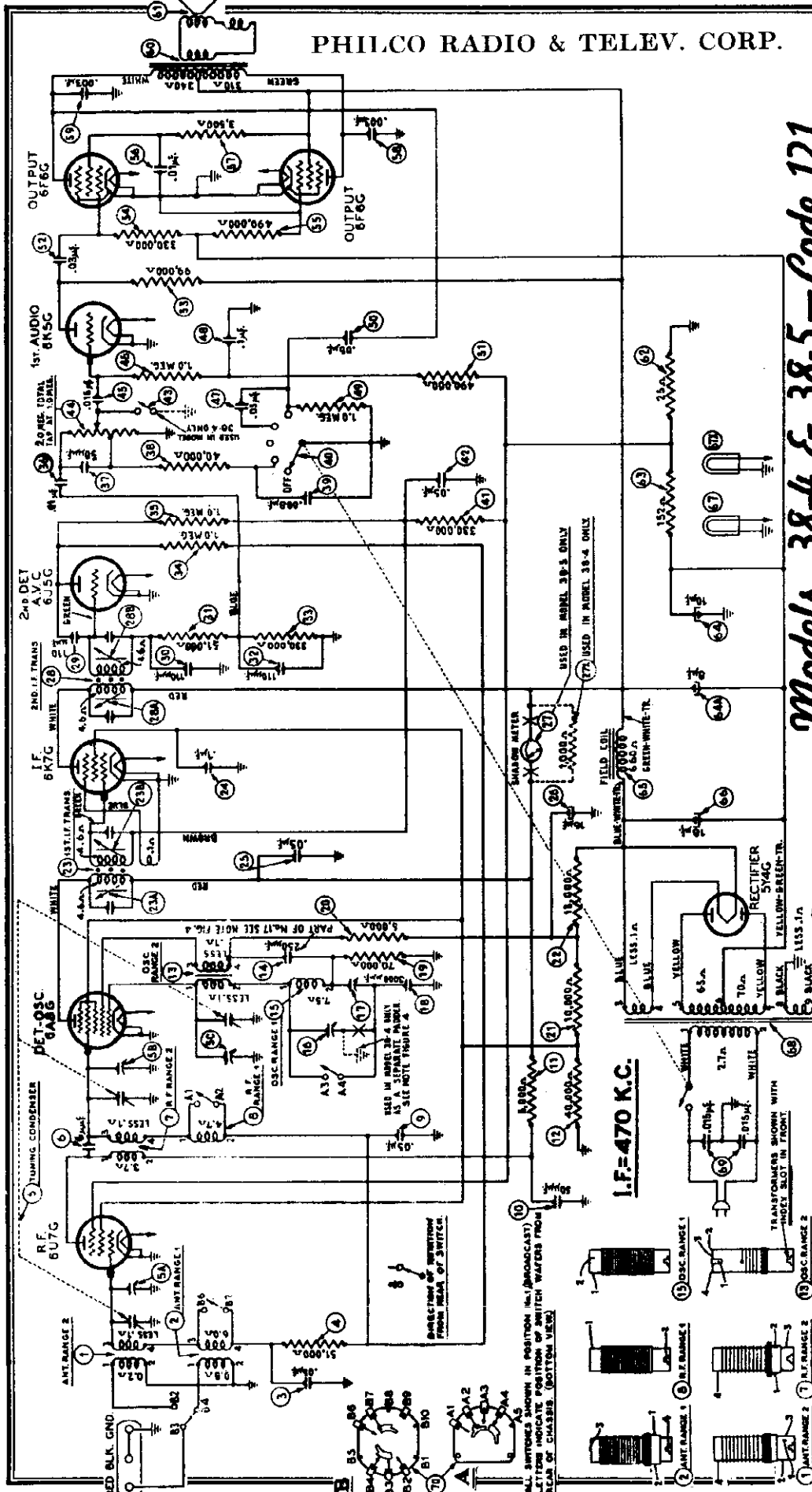


Fig. 1. Socket Voltages, Underside of Chassis—The voltages indicated by arrows were measured with a Philco 026 Circuit Tester which contains an accurate voltmeter. Volume Control at minimum, range switch in broadcast position, line voltage 115 A. C.

PHILCO RADIO & TELEV. CORP.

MODELS 38-4, 38-5
Schematic Notes

Code 121



Models 38-4 & 38-5 - Code 121

TUNING RANGES: Two Range 1—540 to 1720 K. C.
Range 2—5.7 to 18.2 M. C.

INTERMEDIATE FREQUENCY: 470 K. C.

POWER SUPPLY: Voltage

Frequency	Consumption
60 cycle	95 watts
25 to 40 cycle	95 watts
50 to 60 cycle	95 watts

SPEAKERS:

Model	Cabinet
38-4	B cabinet
38-5	X cabinet
	XX cabinet

UNDISTORTED OUTPUT: 5 watts.
TONE CONTROL: Four positions.

Different transformers are required for operation on the frequencies listed above. The part numbers of these transformers are listed on page 3.

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May, 1937

MODELS 38-4, 38-5 Code 121
Alignment, Parts

PHILCO RADIO & TELEV. CORP.

REPLACEMENT PARTS—Models 38-4, 38-5

Subm. No.	Description	Part No.	List Price	Subm. No.	Description	Part No.	List Price
1	Armature transformer (range 2)	23-2528		42	Condenser (0.01 mfd., tubular)	30-6419	90.30
2	Armature transformer (range 1)	23-2530		43	(Used on Model 38-4 only) Audio shorting switch, section of 45-2470 Selector arm		
3	Condenser (30 mfd., tubular)	30-4444	90.30	44	Volume Control (Model 5)	33-2504	
4	Resistor (4900 ohms, 1/2 watt)	33-351309	30	45	Volume Control (Model 6)	33-2720	
5	Tuning Condenser assembly (Model 4)	31-2038		46	Condenser (0.015 mfd., tubular)	30-4288	30
6	Tuning Condenser (Model 6)	31-2002		47	Resistor (1.0 megohms, 1/2 watt)	33-510929	
7	R. F. transformer (range 2)	23-2632		48	Condenser (.02 mfd., bakelite)	30-4427	
8	R. F. transformer (range 1)	23-2630		49	Condenser (0.1 mfd., bakelite)	49005G	35
9	Condenser (.05 mfd., tubular)	30-4444	30	50	Resistor (1.0 megohms, 1/2 watt)	33-510930	30
10	Condenser (80 mfd., mica)	30-1029	30	51	Condenser (.05 mfd., bakelite)	33-25559	30
11	Resistor (5000 ohms, 1/2 watt)	33-250281	30	52	Resistor (49000 ohms, 1/2 watt)	33-449200	20
12	Resistor (4000 ohms, 1 watt)	33-340430	20	53	Resistor (9000 ohms, 1/2 watt)	33-399330	30
13	Transformer (range 2)	37-2633	1.25	54	Resistor (33000 ohms, 1/2 watt)	33-449330	30
14	Condenser (300 mfd.) on compensator section. See Note Fig. 4			55	Resistor (40000 ohms, 1/2 watt)	33-449330	30
15	Out. transformer (range 1)	32-2831		56	Condenser (0.01 mfd., tubular)	30-4160	30
16	Compensators (dual, 1500 and 580 K.C. Model 5)	31-4194		57	Resistor (3000 ohms, 1/2 watt)	33-25559	30
17	Compensator (air type, 1500 K.C. Model 4)	31-4196		58	Condenser (0.005 mfd., tubular)	30-4460	30
18	Compensator (580 K.C. Model 6; Part of 16)			59	Condenser (0.003 mfd., tubular)	30-4460	30
19	Compensator (580 K.C. Model 6, condenser 1/16 part of this unit)	31-4199		60	Out. transformer (H29, K39)	32-7794	1.50
20	Condenser (3000 mfd., mica)	30-1029	.45	61	Voice Coil and Cone Assembly (K39)	34-3174	1.00
21	Resistor (70,000 ohms, 1/2 watt)	33-370330	30	62	Voice Coil and Cone Assembly (H29)	36-3801	1.40
22	Resistor (5000 ohms, 1/2 watt)	33-250330	30	63	Bias resistor (25 ohms and 152 ohms)	33-3317	
23	Resistor (1000 ohms, 1 watt)	33-310330	30	64	Dual Electrolytic Condenser (8 & 10 mfd.)		
24	Resistor (3000 ohms, 2 watt)	33-333330	30	65	Field Coil and Pot Assembly (H29)	30-2201	1.75
25	First I. F. transformer	32-2643		66	Field Coil and Pot Assembly (K39)	34-3216	6.25
26	Condenser (0.1 mfd., tubular)	30-4455	.35	67	Electrolytic Condenser (10 mfd.)	30-2200	1.40
27	Condenser (0.01 mfd., tubular)	30-4455	.35	68	Pilot Lamp	34-2064	.01
28	Condenser (electrolytic, 10 mfd.)	30-2212	1.00	69	Lamp (Shadowmeter Model 6)	34-2064	
29	Shadowmeter (Model 38-4)	45-2007	2.50	70	Power Transformer, 115V, 50/60 cycles	34-7833	4.25
30	Resistor (1000 ohms, 1/2 watt)	33-310330	2.50		" " 115V, 25/40 cycles	32-7808	8.00
31	Second I. F. transformer	32-2943			" " 115V/250V, 50-60 dual bakelite	32-7859	7.00
32	Condenser (110 mfd., mica)	30-1071	.20	71	Condensers (0.015 mfd. dual bakelite)	32-8350	.40
33	Condenser (110 mfd., mica)	30-1071	.20	72	Range Switch (Model 5)	42-1255	
34	Condenser (110 mfd., mica)	30-1071	.20	73	Range Switch (Model 4)	42-1340	
35	Resistor (1000 ohms, 1/2 watt)	33-310330	.20	74	Brns (38-4, Tuning Unit)	28-5119	
36	Condenser (110 mfd., mica)	30-1071	.20	75	Cable (Speaker) (8 & 38-4)	41-3274	
37	Resistor (33000 ohms, 1/2 watt)	33-433230	.20	76	Cable Power	1-2773	.50
38	Resistor (1.0 megohm, 1/2 watt)	33-510930	.20	77	Cable (Shadowmeter, Model 6)	41-3225	.50
39	Resistor (1.0 megohm, 1/2 watt)	33-510930	.20	78	Clip (R. F. Transformer)	28-5007	.20
40	Condenser (0.01 mfd., tubular)	30-4124	.20		Dial (38-4, Supplied by Distributor, in each district)	27-5337	
41	Condenser (50 mfd., mica)	30-1079	.20		Dial Pointer Assembly	28-8028	
	Resistor (4000 ohms, 1/2 watt)	33-250281	.20		Dial Pin	27-5337	
	Condenser (0.005 mfd., tubular)	30-4112	.20		Dial Washer 38-5	37-4808	
	Tune Control Switch and on-off switch	42-1341	.20		Dial Clamp 38-5	38-1009	.20
	Resistor (30000 ohms, 1/2 watt)	42-433230	.20				

Prices subject to change without notice.

to 1000 and the "Attenuator" for maximum output.

- Turn the receiver dial to 580 K. C.
- Receive Volume Control maximum.
- Range Switch Broadcast Position.
- Adjust compensators (28B), (28A), (23B), and (23A) for maximum output. If the output meter goes off scale when adjusting the compensators retard signal generator attenuator.

RADIO FREQUENCY CIRCUIT

- Tuning Range: 5.7 to 16.2 M. C.
- With one end of the shielded lead of the signal generator output lead in the "Med" jack, connect the other end through the .1 mfd. condenser to the "Red" terminal of the aerial panel of the receiver. The output lead ground must be connected to the black terminal or to the chassis.

- Set the controls and adjust the R. F. compensators as follows:

Volume Control	Max.
Range Switch	2
Signal Generator	18 M. C.
Compensator Control	2
Compensator Dial	(5C) See Note A

Tuning Range: 530 to 1720 K. C.

- | | | |
|------------------|---|------------|
| Range Switch | 1 | 1500 K. C. |
| Signal Generator | 1 | 580 K. C. |
| Compensator Dial | 1 | 1500 K. C. |

NOTE A—To accurately adjust the high frequency oscillator compensator to the fundamental instead of the image signal, turn the oscillator compensator to the maximum capacity position (clockwise). From this position slowly turn the compensator counter-clockwise until a second maximum peak is obtained on the output meter. Adjust the compensator for maximum output using this second peak. The first peak from maximum capacity position of the compensator is the image signal and must not be used in adjusting the compensator.

If the above procedure is correctly performed, the image signal will be found (much weaker) by turning the receiver dial 940 K. C. below the frequency being used on the high frequency range.

Service Data

FOR CONE-CENTRIC TUNING MECHANISM—MODEL 4

Complete information for setting the stations on the Cone-Centric Tuning mechanism of Model 38-4 will be found in the instruction sheet (Form No. 39-5533) which is supplied with each set.

The locations of a few assemblies of the Cone-Centric Automatic Tuning mechanism is illustrated in Fig. 2. The part numbers and prices of these assemblies are listed on page 3. A complete list of replacement parts and detailed service data for the mechanism will be found in bulletin 282.

Aerial Connections

To obtain the full advantage of the sensitivity of these receivers, the Philco High Efficiency Aerial Part No. 40-6112 must be used. For attaching the aerial to the receiver a terminal panel is provided at the rear of the chassis. This panel contains three screw terminals marked "Red", "Blk" and "Gnd". Connect the red and black wires of the Philco High Efficiency Aerial transmission line to the "Red" and "Blk" terminals respectively.

If you use a temporary aerial, connect it to the "Red" terminal. A good ground connection is necessary for best reception. The terminal mark "Gnd" should be connected to a water pipe or any other good ground source.

Electrical Specifications

TYPE CIRCUIT: An eight tube A.C. operated super-heterodyne circuit is incorporated in these receivers with features, such as Philco foreign tuning systems; a high gain R.F. amplifier; two tuning ranges; iron core adjusted I.F. transformers; automatic volume control; bias compensation; and a pentode push-pull audio output circuit. The same circuit is used in both models. The features, however, such as tuning mechanism; speaker, and cabinets differ in each model.

PHILCO TUBES USED: Eight—6U7G, R. F. amp.; 6A8G, Det. Osc.; 6K7G, I. F. amp.; 613C, 2nd Det., A.V.C.; 6K5G, 1st audio; two 6F6G, audio output; and one 5Y4G rectifier.

Alignment of Compensators

EQUIPMENT REQUIRED: (1) Signal Generator, having a fundamental frequency range covering the tuning and intermediate frequencies of the receiver. Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36000 K. C. is the correct instrument for this purpose; (2) Output meter, Philco Model 026 circuit tester incorporates a sensitive output meter and is recommended; (3) Philco Fibre Handle Screw Driver, part No. 27-7059 and Fibre Wrench, part No. 3164.

OUTPUT METER: The 026 output meter is connected to the plate and cathode terminals of one of the 6F6G tubes. Adjust the meter to use the (0-30) volt scale and advance the attenuator control of the generator until a readable indication is noted on the output meter after signal is applied.

DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial of each model proceed as follows:

Model 38-4

- Loosen the tuning condenser shaft coupling set screws (use wrench Part No. 45-248D), and turn the tuning condenser to the maximum capacity position (Plates fully meshed). Turn the selector knob until the dial pointer is on the small black dot at the low frequency end of the Range One scale. With condenser and pointer set in this position tighten set screws.
- Now turn the selector knob clockwise until the dial pointer moves 1/16 of an inch to the left of the small dot and the first straight line on the scale (See Fig. 6). Hold pointer and condenser in this position, and carefully loosen shaft coupling set screws.
- After set screws are loose, turn the selector knob until dial pointer is again on the small black dot at the low frequency end of Range One scale.

Be careful when turning the selector knob that the position of the tuning condenser is not disturbed. Tighten shaft coupling set screws with condenser and dial pointer in this position.

Model 38-5

- Turn the tuning condenser to maximum capacity position (plate fully meshed).
- Holding the tuning condenser in this position, loosen the dial clamp by turning the dial until the indicator is centered on the middle index line (See Fig. 7). Tighten clamp in this position. Before any of the following adjustments are made, the receiver should be turned "on" for at least 5 minutes.

INTERMEDIATE FREQUENCY CIRCUIT

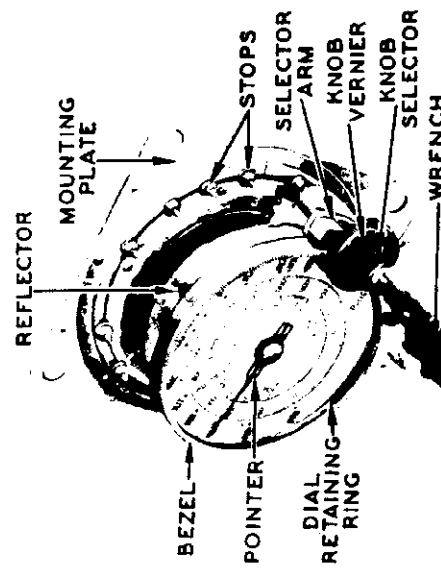
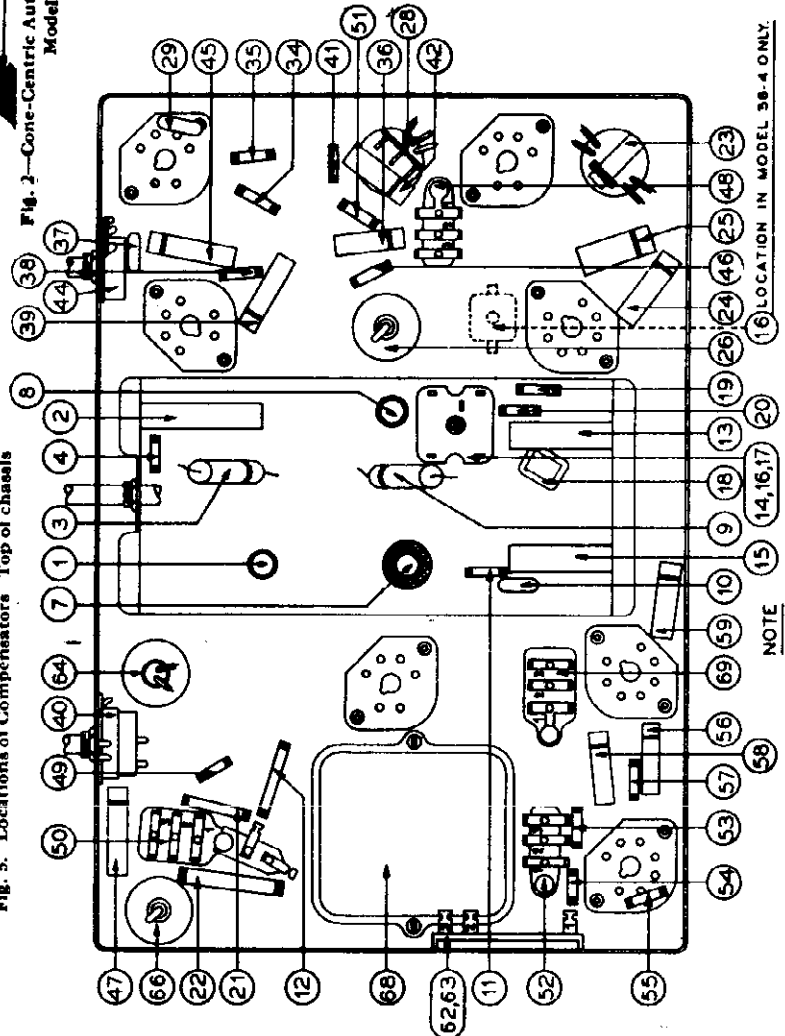
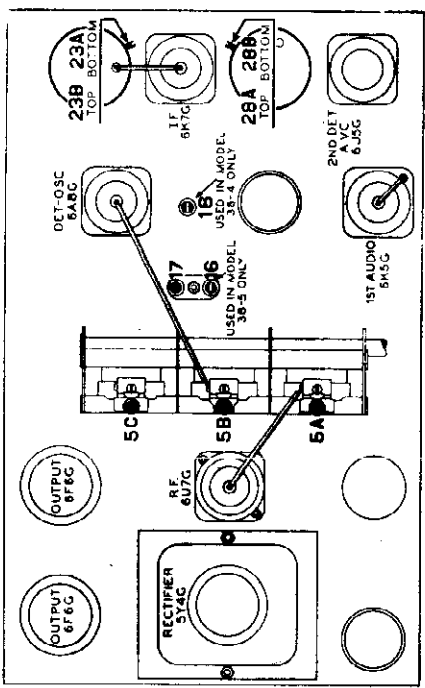
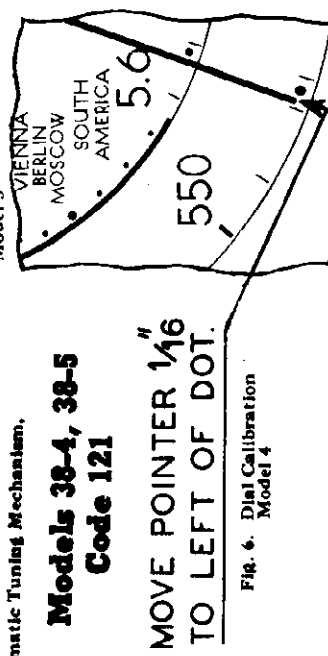
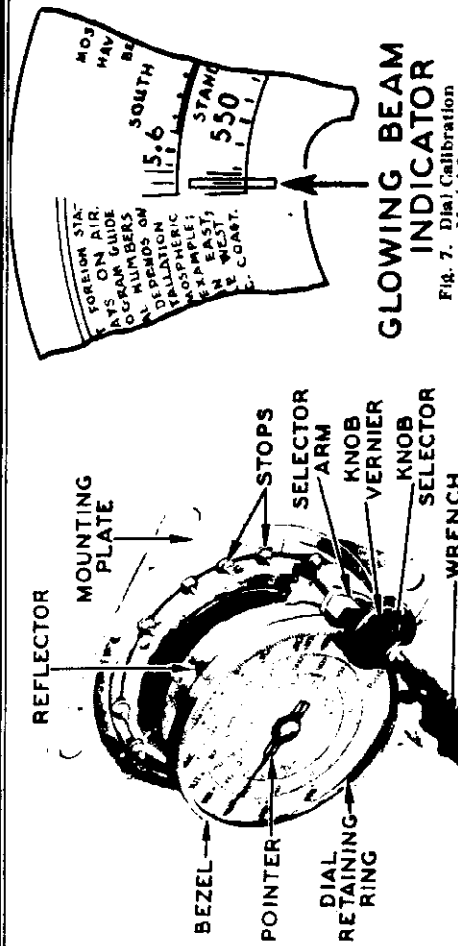
Insert the signal generator shielded output lead into the "Med" jack on the panel of the generator. Connect the other end of the output lead through a .1 mfd. condenser to the grid of the 6A8G, det. osc. tube and the ground connection of the signal generator to the chassis. Set the signal generator and receiver control, and adjust the I. F. compensators as follows:

- Set Signal Generator at 470 K. C. Turn "Multiplier" Control

Dial Adjustments

PHILCO RADIO & TELEV. CORP.

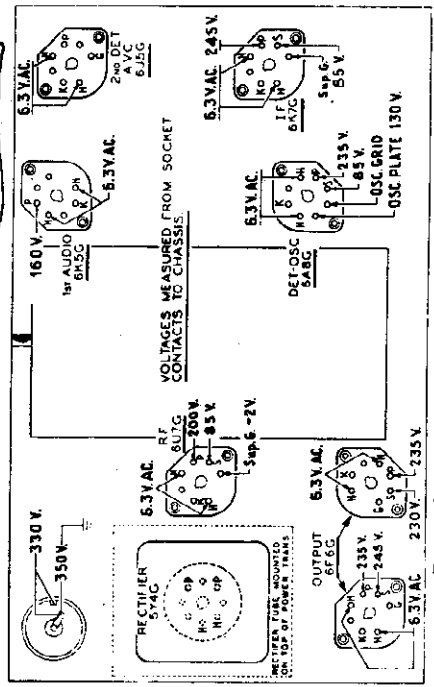
MODELS 38-4, 38-5
Trimmers, Voltage
Chassis Code 121



Models 38-4, 38-5
Code 121

MOVE POINTER 1/16"
TO LEFT OF DOT.

Fig. 6. Dial Calibration Model 4



The Voltages indicated by arrows were measured with a Philco 026 Circuit Tester which contains a sensitive voltmeter. Volume Control at minimum, range switch in broadcast position, line voltage 115 A. C.

MODELS 38-7(121,124)

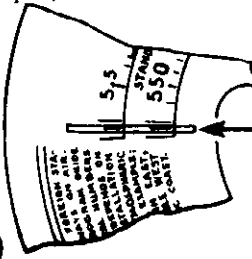
38-8(121),38-9(121) PHILCO RADIO & TELEV. CORP.

Voltage, Trimmers, Chassis

PHILCO TUBES USED: Six—one 6A8G, det. osc.; one 6K7G, I. F. amp.; one 6J5G, 2nd Det. A. V. C.; one 6K5G 1st audio; one 6F6G, output; one 5Y4G rectifier.

CABINETS AND SPEAKERS:

	Cabinet	Speaker
38-7 Code 121	XX	H31
38-7 Code 121	T	K41
38-7 Code 124	CS	K41
38-8 Code 121	X	HS
38-9 Code 121	K	HS
38-9 Code 121	T	S7
38-9 Code 121	X	HS



GLOWING BEAM INDICATOR
Fig. 4 Dial Calibration
Models 38-7, 38-9

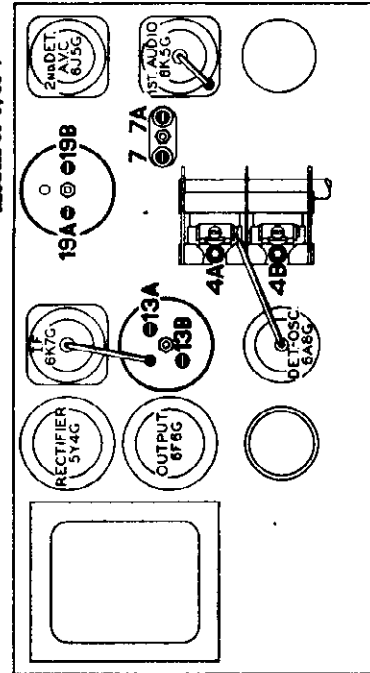


Fig. 4—Locations of Compensators—Top of Chassis

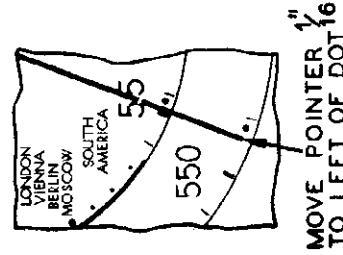
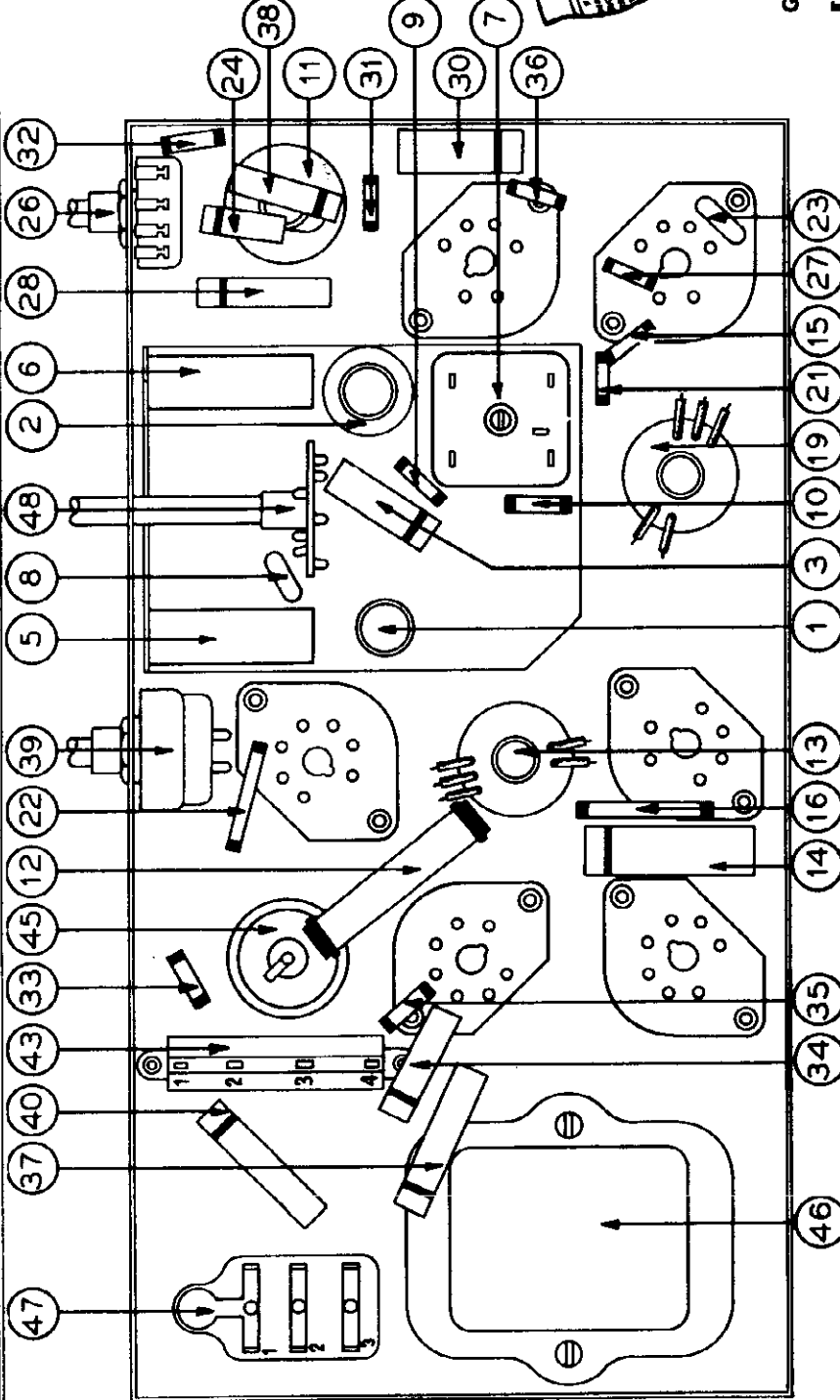


Fig. 5 Dial Calibration
Model 38-7

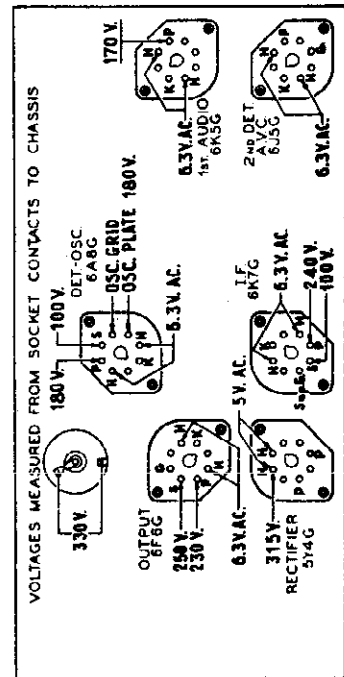
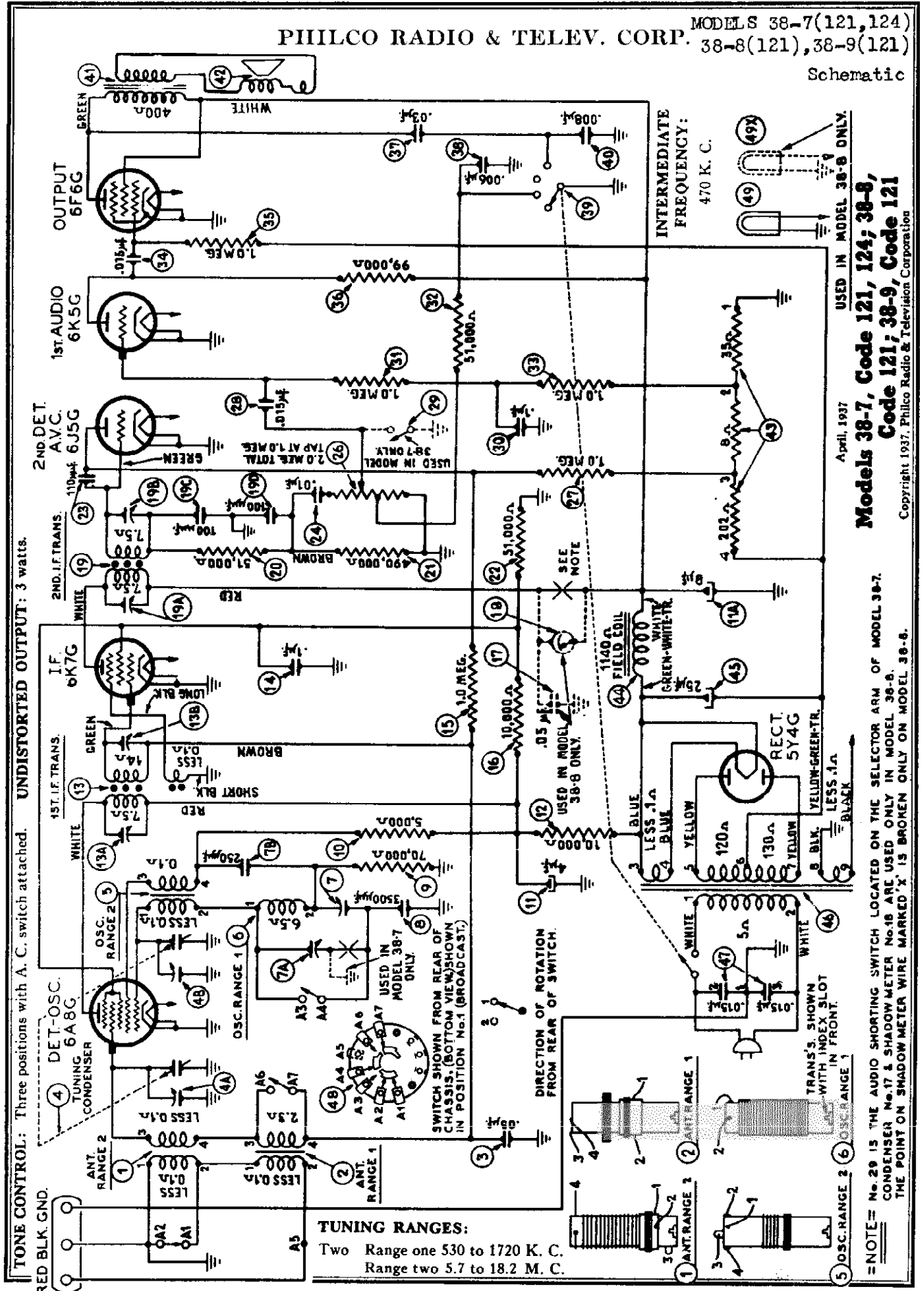


Fig. 1—Socket Voltages—Underside of Chassis View

The Voltages indicated by arrows were measured with a Philco 826 Circuit Tester which contains a sensitive voltmeter. Volume Control at minimum, range switch in broadcast position, line voltage 115 A. C.

PHILCO RADIO & TELEV. CORP. MODELS 38-7(121,124) 38-8(121),38-9(121)

Schematic



TONE CONTROL: Three positions with A. C. switch attached. UNDISTORTED OUTPUT: 3 watts.

RED BLK. GND.

TUNING RANGES:
Two Range one 530 to 1720 K. C.
Range two 5.7 to 18.2 M. C.

INTERMEDIATE FREQUENCY: 470 K. C.

APRIL 1937

USED IN MODEL 38-8 ONLY.
Models 38-7, Code 121, 124; 38-8, Code 121; 38-9, Code 121
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NOTE: No. 29 IS THE AUDIO SHORTING SWITCH LOCATED ON THE SELECTOR ARM OF MODEL 38-7. CONDENSER No. 17 & SHADOW METER No. 18 ARE USED ONLY IN MODEL 38-8. THE POINT ON SHADOW METER WIRE MARKED 'X' IS BROKEN ONLY ON MODEL 38-6.

MODELS 38-7(121,124)
38-8(121),38-9(121)
Alignment,Parts

PHILCO RADIO & TELEV. CORP.

REPLACEMENT PARTS

Schem. No.	Description	Part No.	List Price	Schem. No.	Description	Part No.	List Price	Schem. No.	Description	Part No.	List Price
1	Antenna Transformer—Short Wave	33-2558		40	Condenser .008 mf.	30-4112	\$0.20		Bearing (Main Shaft)	28-7242	
2	Antenna Transformer—Broadcast	33-2487		41	Output Transformer (Model 7)	32-7893			Bezel Assembly (Scale)	40-4136	
3	Condenser .05 mf.	30-4319	\$1.25	42	Output Transformer (Models 8 and 9)	32-7818	.25		Coupling Assembly	31-2252	
4	Tuning Condenser, Models 8 and 9	31-2025	.30		Cone and Voice Coil Assembly (HS1)	36-3801	1.40		Dial Model 7, supplied by your distributor	27-5338	
5	Tuning Condenser, Model 7	31-2049			Cone and Voice Coil Assembly (HS2)	36-3178	1.00		Dial Retaining Ring	28-5107	
6	Dec. Transformer—Short Wave	33-2559			Cone and Voice Coil Assembly (HS3)	36-3798	1.20		Dial Mechanism, Cone-centric complete	31-2252	
7	Dec. Transformer—Broadcast	33-2559	1.25		Cone and Voice Coil Assembly (S1)	36-3157	1.00		Distichous Ring	28-5128	
8	Compensator, Short Wave Models 8 and 9	31-6188		43	Base Resistor	25-2316			Felt (Stop Cover)	27-4872	
9	Compensator, Short Wave Model 7	31-6183		44	Field Coil Assembly (HS1)	36-3965	1.25		Gear, Tuning Condenser (small)	45-2491	
10	Compensator, Short Wave (1000 KC.)	31-6190		45	Field Coil Assembly (HS2)	36-3931			Gear, Tuning Condenser (large)	45-2491	
11	Compensator, Short Wave (500 KC.)	31-6190		46	Field Coil Assembly (HS3)	36-3930	3.50		Knob (Selector)	27-4372	
12	Resistor 10,000 ohms (3 watt)	33-21049	.30	47	Field Coil Assembly (S7)	36-3879	3.50		Knob (Versar)	45-2477	
13	1st I. F. Transformer	33-2489		48	Power Transformer, 110V, 50/60 cycle	32-7833			Knob Spring	28-6761	
14	Condenser .1 mf.	30-4446	.25	49	Power Transformer, 115/230V, 50/60 cycle	32-7827			Knob Retaining Screw	28-6272	
15	Resistor 1.0 meg. (1/2 watt)	33-51033	.20	50	Power Transformer, 115/230V, 50/60 cycle	32-7827			Reflector Assembly	45-2476	
16	Resistor 10,000 ohms (1 watt)	33-51043	.20	51	Condenser .015—.015 mf., 25 mf.	32-7835	.40		Stop Assembly	36-6975	
17	Condenser .05 mf. (38-8 only)	30-4474	.20	52	Wave Switch	37-6000			Stop Cover (Mounted on Selector Crank)	31-2066	
18	Resistor 10,000 ohms (1/2 watt)	33-51033	.20	53	Pilot Lamp, Models 8 and 9	34-2054			Shaft (Tuning Condenser Gear)	28-4875	
19	Condenser .05 mf. (38-8 only)	30-4474	.20	MODELS 38-7, 8 & 9 PARTS					Pointer Assembly	28-928	
20	2nd I. F. Transformer	33-2489		54	Pilot Lamp, Model 7	34-2184			Wrench (Setting Steps)	45-3478	
21	Resistor 51,000 ohms (mounted in I.F.)	33-51033	.20	55	Cable (Cover)	1-2178	.40		CABINET PARTS MODEL 7		
22	Resistor 490,000 ohms (1/2 watt)	33-51043	.20	56	Cable (Speaker)	1-2840			Baffle and Silk Assembly (X)	40-4448	
23	Resistor 51,000 ohms (1 watt)	33-51043	.20	57	Cable (Shadowmeter, Model 8)	41-2225	.40		Bezel Plate Assembly (X)	40-4128	
24	Condenser .01 mf.	30-4474	.20	58	Dial, Models 8 and 9	37-4372			Bezel Gasket	27-5300	.00
25	Removed from Production			59	Dial Clamp	37-5085			Bezel Ring	28-5080	.00
26	Volume Control	33-5216		60	Dial Washer	37-4400	.10		CABINET PARTS MODEL 8		
27	Resistor 1 meg. (1/2 watt)	33-51033	.20	61	Knob	27-4331	.10		Baffle and Silk Assembly (X cabinet)	40-4448	
28	Condenser .015 mf. (38-8 only)	30-4438	.20	62	Knob	27-4332	.10		Baffle and Silk Assembly (K cabinet)	40-4136	
29	Audio Shorting Switch (38-7 only) Part of Selector Crank			63	Knob	27-4333	.10		Baffle and Silk Assembly (T cabinet)	40-4136	
30	Resistor 1 mf.	30-4490	.20	64	Knob	27-4334	.10		Baffle and Silk Assembly (T cabinet)	40-4136	
31	Resistor 1.0 meg. (1/2 watt)	33-51033	.20	65	Mig. Cutter, Rubber (Phasus)	31-2047			Baffle and Silk Assembly (T cabinet)	40-4136	
32	Resistor 10,000 ohms (1/2 watt)	33-51033	.20	66	Mig. Rubber (Tuning Condenser)	27-4599			Bezel Plate Assembly (S, X)	40-4128	
33	Condenser .015 mf. (38-8 only)	30-4438	.20	67	Screen Brkt. Assembly (Models 8 and 9)	31-2047			Bezel Plate Assembly (T)	40-4128	
34	Condenser .015 mf.	30-4438	.20	68	Sockets (Spring)	37-6086			Bezel Plate Assembly (T)	40-4128	
35	Resistor 1.0 meg. (1/2 watt)	33-51033	.20	69	Sockets (Prong)	37-6086			Bezel Gasket (X, K)	27-5313	.01
36	Resistor 10,000 ohms (1/2 watt)	33-51033	.20	70	Sockets (Prong)	37-6086			Bezel Gasket (T)	27-5313	.01
37	Condenser .03 mf.	30-4447	.20	71	Sockets (Prong)	37-6086			Bezel Gasket (X, K)	27-5313	.01
38	Condenser .08 mf.	30-4467	.20	72	Verrier Drive Assy., Models 8 and 9	31-2072			Bezel Glass (T)	27-5208	.04
39	Tone Control	45-1377		73	Bracket Assembly	45-2479			Bezel Ring (K, X)	28-5080	.00
				74	Brace (Mig. Unit)	28-5111			Bezel Ring (T)	28-5080	.00

Prices subject to change without notice.

needed: (3) Philco Fibre Handle Screw Driver, part No. 27-7059 and Fibre Wrench No. 3164.

OUTPUT METER: The 025 output meter is connected to the plates and cathode terminals of the 6F6G tube. Adjust the meter to use the (0-30) volt scale and advance the attenuator control of the generator until a readable indication is noted on the output meter.

DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial of each model proceed as follows:

Model 38-7: 1. Loosen the shaft coupling set screws, using wrench Part No. 45-2481; then turn the tuning condenser to the maximum capacity position (plate fully meshed). Now turn the selector knob until the dial pointer is on the small black circle at the low frequency end of the Range One scale. With condenser and pointer set in this position tighten set screws. 2. Now turn the selector knob (clockwise) until the dial pointer moves 1/16 of an inch from the small circle (clockwise), see Fig. 3. Leave pointer in this position and loosen coupling set screws. 3. After loosening set screws, turn the selector knob until pointer is again on the small black dot at low frequency end of Range One scale. Be careful when turning the selector knob that the position of tuning condenser is not disturbed. Tighten coupling set screws with condenser and dial pointer in this position.

Models 8 and 9: 1. Turn the tuning condenser to maximum capacity position (plates fully meshed). 2. Loosen the clamp of dial, then turn the dial—being careful that position of tuning condenser is not disturbed—until the glowing indicator is centered on the middle index line at the low frequency end of Range One scale. Tighten the dial clamp in this position.

Note—Before the following adjustments are performed, the receiver must be tuned on and allowed to heat for 15 minutes.

INTERMEDIATE FREQUENCY CIRCUIT

Insert the signal generator output lead into the "Med." jack on the panel of the generator. Connect the other end of the output lead through a .1 mf. condenser to the grid of the 6AG5, det. osc. tube and the ground connection of the signal generator to the chassis. Set the signal generator and receiver controls, and adjust the I. F. compensator as follows:

1. Set Signal Generator at 470 K. C. Turn "Multiplier" Control to 1000 and the "Attenuator" for maximum output.
2. Turn the receiver dial to 580 K. C.
3. Receiver Volume Control maximum.
4. Range Switch Broadcast Position.
5. Adjust compensators (19B), (19A), (13B), and (13A) for maximum output. If the output meter goes off scale when adjusting the compensators retard signal generator attenuator.

RADIO FREQUENCY CIRCUIT

Tuning Range: 5.7 to 18 M. C.

1. Insert the Signal Generator output lead in the "Med." jack on the panel, and connect the other end through the .1 mf. condenser to the "Red" terminal of the aerial panel of the receiver. The output lead ground must be connected to the "Blk." terminal or to the chassis.
2. Leave the receiver volume control at maximum. Then set the controls and adjust the R. F. compensators as follows:

Range Switch	2	Signal Generator	Compensators
and Receiver Dial	18 M. C.	In Order	In Order
		4B See Note A	
Tuning Range: 5.7 to 17.9 K. C.		Signal Generator	Compensators
		and Receiver Dial	In Order
		1500 KC.	(7A), (4A)
		580 KC.	7
		1500 KC.	7A

Electrical Specifications

Models 38-7, 38-8 and 38-9 receivers employ a six tube A. C. operated superheterodyne circuit with such features as: Two tuning ranges covering standard and short wave broadcasts; Philco foreign tuning system; automatic volume control; bass compensation; tone control, and pentode audio output circuit.

The same circuit is used for each receiver. The features, however, such as, tuning mechanism, speakers and cabinets differ in each model.

Model 38-7 in addition to the features given above employs the Philco automatic tuning mechanism with cone-centric tuning. The chassis of this model is built into a console cabinet type XX, Table Cabinet Type "T", and is designated code 121. The same chassis built into a type "CS" cabinet is identified as code 124.

Model 38-8 differs from the 38-7 in that a manually operated tuning mechanism with shadowmeter tuning is used. This receiver is built into a type "X" cabinet with a type "HS" dynamic speaker.

Model 38-9 is identical to the same as model 38-8 with the exception that the shadowmeter is not used, and that the speaker and cabinet types differ. This model is assembled in a type "T" cabinet with dynamic speaker type "S" and a "K" type cabinet using a dynamic speaker type "HS".

POWER SUPPLY:

Voltage	Frequency	Consumption
115	50 to 60 cycles	70 Watts
115	25 to 40 cycles	70 Watts
115/220V	50 to 60 cycles	70 Watts

Different transformers are required for operation on the frequencies listed above. These are shown on the Parts List.

SERVICE DATA FOR AUTOMATIC TUNING MECHANISM—MODEL 7

Complete information for setting the stations on the cone-centric tuning mechanism of Model 38-7 is covered in the instruction form no. (30-5533) which is supplied with each set.

A few major assemblies of the automatic cone-centric tuning mechanism are listed on page 3 of this bulletin. A complete list of replacement parts, however, and detailed service data for the automatic mechanism, will be found in bulletin 282.

SHADOW METER ADJUSTMENT Model 38-8

Apply power to the receiver and allow tubes to warm up. Then adjust shadow meter as follows:

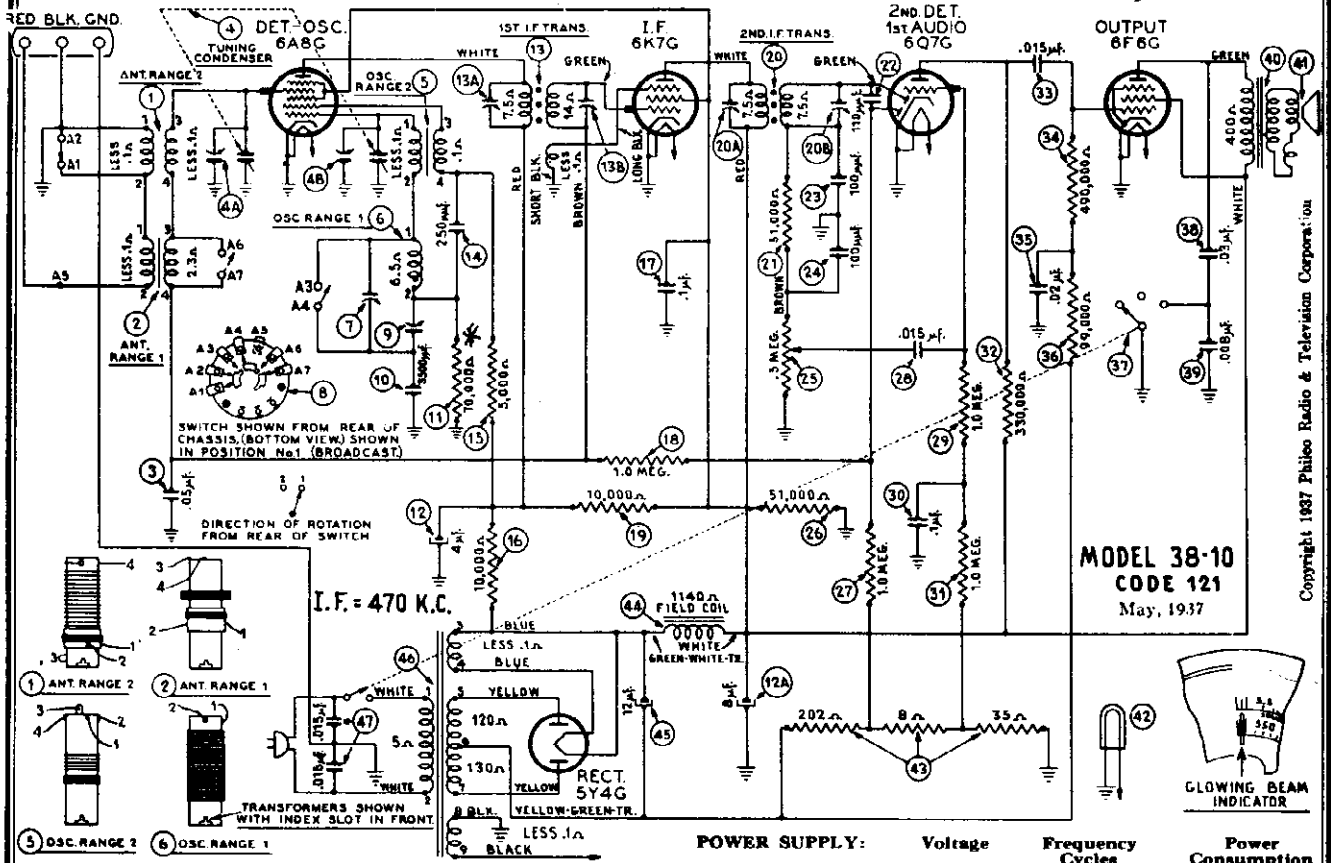
1. Move the shadow meter coil backwards and forwards, until the opposite edges of the shadow are 1/4 of an inch from each end of the shadow screen, measuring along the bottom edge of the screen. Adjustment of the shadow meter light bracket may be necessary for perfect centering.
2. Remove the rectifier tube from its socket, and rotate the shadowmeter coil until shadow reaches minimum width. This width should not exceed 3/32 of an inch.
3. Replace the 5V4G rectifier tube in its socket. The shadow should then widen to not more than 3/16 inch or less than 1/16 inch from each side of the screen measuring along the bottom edge. If these limits are not obtained readjust the shadow meter as given in paragraphs 1 and 2 again.

Alignment of Compensator

EQUIPMENT REQUIRED: (1) Signal Generator, using fundamental frequency covering the intermediate and tuning ranges of the receivers. Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36000 K. C. is the correct instrument for this purpose; (2) Output meter, Philco Model 026 circuit tester incorporates a sensitive output meter and is recom-

PHILCO RADIO & TELEV. CORP.

MODEL 38-10, Code 121
Schematic, Voltage
Trimmers, Chassis



MODEL 38-10
CODE 121
May, 1937

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Electrical Specifications

TYPE OF CIRCUIT: Five tube, A.C. operated superheterodyne circuit with features, such as two tuning ranges covering the frequencies shown under "Tuning Ranges"; Automatic Volume Control; and a Pentode Audio Output Stage.

PHILCO TUBES USED: Five—one 6A8G, Det. osc.; one 6K7G, I. F.; one 6Q7G, 2nd Det. 1st audio; one 6F6G, output, and one 5Y4G, Rectifier.

tone control: Two position with A.C. switch attached.

SPEAKERS: Type S7 in T Cabinet, HS in F Cabinet.

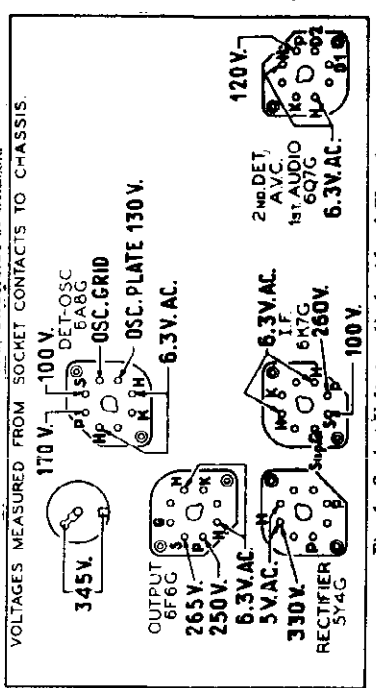
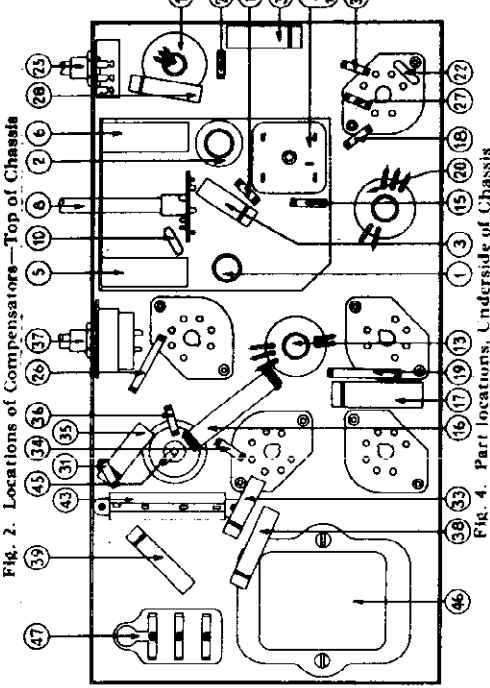
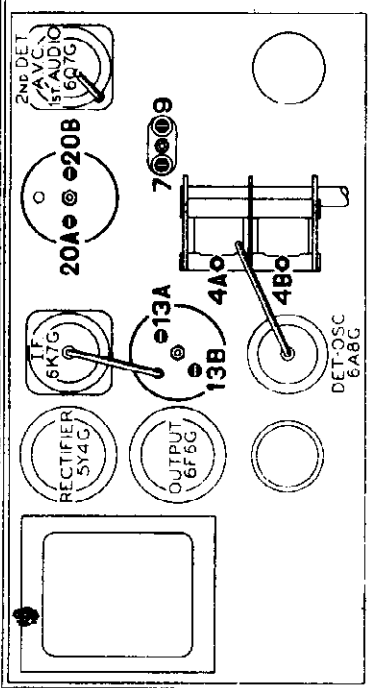
Power Supply:	Voltage	Frequency Cycles	Power Consumption
	115	50 to 60	60 watts
	115	25 to 40	60 watts
	115/230	50 to 60	60 watts

The part number of these transformers are shown on the Parts List Page

INTERMEDIATE FREQUENCY: 470 K. C.

TUNING RANGES: Two—Range 1, 540 to 1720 K. C.
Range 2, 5.7 to 18 M. C.

UNDISTORTED OUTPUT: 3 watts.



VOLTAGES MEASURED FROM SOCKET CONTACTS TO CHASSIS.

Fig. 1. Socket Voltages, Underside of Chassis
The voltages indicated by arrows were measured with a Philco #26 Circuit Tester which contains an accurate voltmeter. Volume Control at minimum, range switch in broadcast position, line voltage 115 A. C.

MODEL 38-10, Code 121
Alignment, Parts

PHILCO RADIO & TELEV. CORP.

Alignment of Compensators

EQUIPMENT REQUIRED: (1) Signal Generator, using a fundamental frequency range covering the tuning and intermediate frequencies of the receiver. Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36,000 K. C. is the correct instrument for this purpose; (2) Output Meter, Philco Model 026 Circuit Tester incorporates a sensitive output meter and is recommended; (3) Philco Fibre Handle Screw Driver, part No. 27-7059 and Fibre Wrench, part No. 3164.

OUTPUT METER: The 026 Output Meter is connected to the plate and cathode terminals of the 6F6C tubes. Adjust the meter to use the (0-30) volt scale and advance the attenuator control of the generator until a readable indication is noted on the output meter after signal is applied.

DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows:

1. Turn the tuning condenser to maximum capacity position (plate fully meshed).
2. Holding the tuning condenser in this position, loosen the clamp and turn the dial until the indicator is centered on the middle index line (See Fig. 3). Tighten clamp with dial in this position.

INTERMEDIATE FREQUENCY CIRCUIT

Insert the signal generator shielded output lead into the "Med" jack on the panel of the generator. Connect the other end of the output lead through a .1 mfd. condenser to the grid of the 6AR5, det. osc. tube and the ground connection of the signal generator to the chassis. Set the Signal Generator and receiver controls, and adjust the I. F. compensators as follows:

1. Set Signal Generator at 470 K. C. Turn "Multiplier" Control to 1000 and the "Attenuator" for maximum output.
 2. Turn the receiver dial to 580 K. C.
 3. Receiver volume control maximum.
 4. Range Switch Broadcast Position.
 5. Adjust compensators (20B), (20A), (13B), (13A) for maximum output.
- If the output meter goes off scale when adjusting the compensators retard signal generator attenuator.

RADIO FREQUENCY CIRCUIT

Tuning Range: 5.7 to 18 M. C.

1. With one end of the shielded lead of the signal generator output lead in the "Med" jack, connect the other end through the .1 mfd. condenser to the "Red" terminal of the aerial panel of the receiver. The output lead ground must be connected to the black terminal or to the chassis.

2. Set the controls and adjust the R. F. compensators as follows:

Volume Control	Range Switch	Signal Generator and Receiver Dial	Compensators in Order
Max.	2	18 M. C.	4B
Tuning Range: 530 to 1770 K. C.			
Range Switch	Signal Generator and Receiver Dial	Compensators in Order	
1	1500 K. C.	7, 4A	
1	580 K. C.	(9)	
1	1500 K. C.	7, 4A	

NOTE A—To accurately adjust the high frequency oscillator compensator to the fundamental instead of the image signal, turn the oscillator compensator to the maximum capacity position (clockwise). From this position slowly turn the compensator counterclockwise until a second maximum peak is obtained on the output meter. Adjust the compensator for maximum output using this second peak. The first peak from maximum capacity position of the compensator is the image signal, and must not be used in adjusting this compensator.

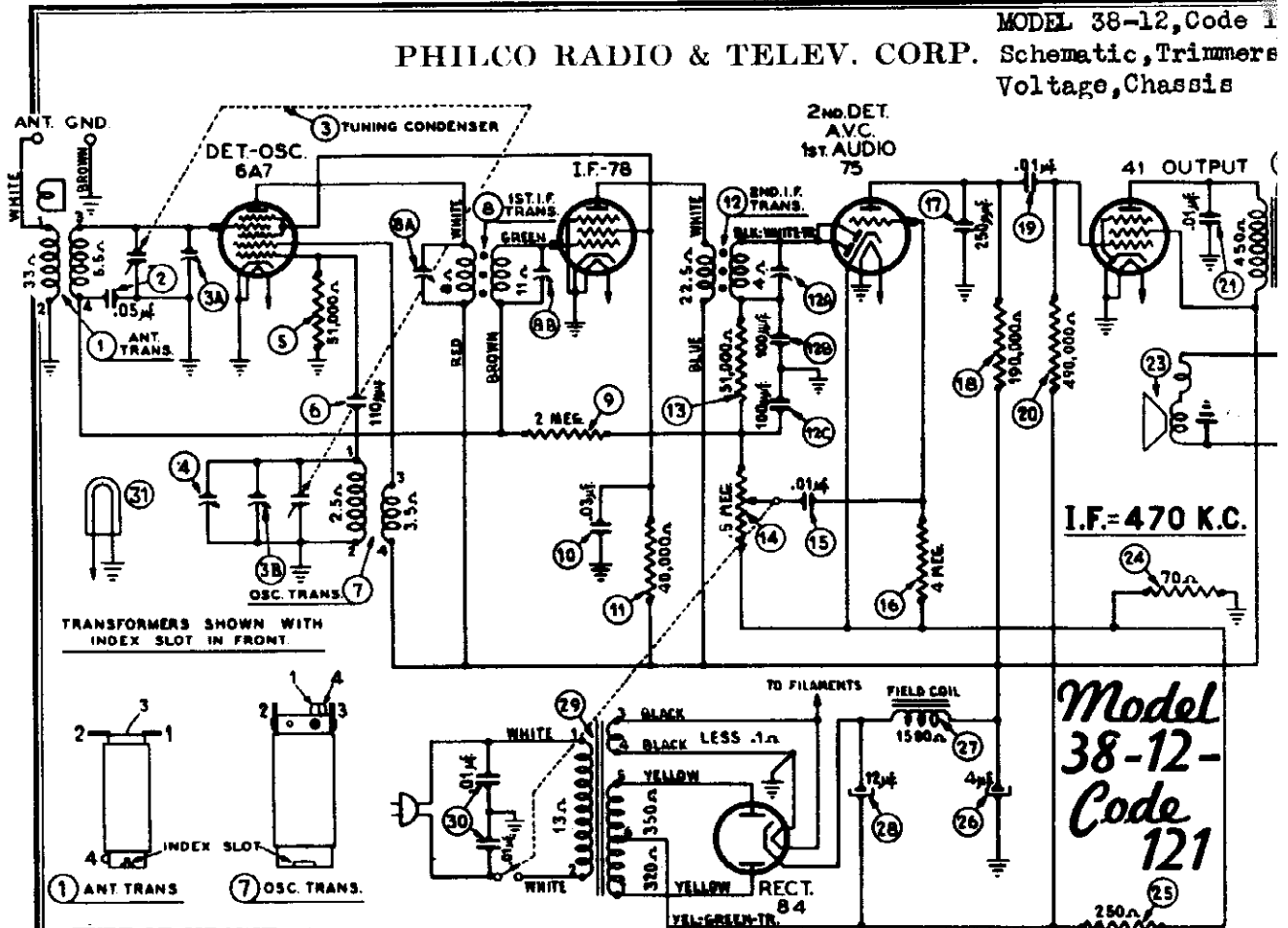
If the above procedure is correctly performed, the image signal will be found (much weaker) by turning the receiver dial 940 K. C. below the frequency being used on the high frequency range.

Replacement Parts

Prices to subject to change without notice.

Schem. No.	Part No.	Description	List Price	Schem. No.	Description	Part No.	List Price
1	32-2558	Antenna Transformer (range 2)	\$0.70	43	Bias Resistor	38-3316	.35
2	32-2557	Antenna Transformer (range 1)	1.25	44	Field Coil Assembly (S7)	36-3059	3.50
3	30-4519	Condenser (0.05 mfd. tubular)	.20	45	Field Coil Assembly (HS)	36-3060	3.50
4	31-2076	Tuning Condenser Assembly	5.00	46	Condenser (electrolytic, 12 mfd.)	36-2210	1.20
5	32-2560	Osc. Transformer (range 2)	.50	47	Power Transformer	32-7833	4.00
6	32-2559	Osc. Transformer (range 1)	.50		110 volt, 50 to 60 cycle	32-7837	5.50
7	31-0188	Compensators (dual, 1500 K. C.)	.75		Power Trans. 115/250, 50 to 60 cycles	32-7835	4.40
8	42-1325	Range Switch	.40		Condenser (0.015 mfd., dual bakelite)	37-9310	.40
9	30-1064	Compensator (Part of 7, 580 K. C.)	.50		Cable (Power)	1-2778	.40
10	33-570339	Condenser (3900 mmfd., mica)	.30		Dial Washer	27-4357	.03
11	30-2217	Resistor (70,000 ohms, 1/2 watt)	.20		Dial Clamp	28-5089	.10
12	32-2580	Condenser (dual electrolytic 4 and 8 mfd.)	.50		Knob (Tuning)	27-4330	.10
13	33-570339	1st I. F. Transformer	.20		Knob (Volume)	27-4331	.10
14	33-250339	Condenser (250 mmfd.) Part of 7	.20		Mfg. Cushions (Tuning Condenser)	27-4332	.20
15	33-210639	Resistor (15,000 ohms, 1/2 watt)	.20		Rubber (Chassis)	27-4364	.10
16	30-4485	Condenser (0.1 mfd., tubular)	.20		Pilot Lamp Assembly	35-8844	.11
17	33-510339	Resistor (10,000 ohms, 3 watts)	.30		Screen Bracket Assembly	31-2047	.11
18	33-510339	Resistor (1.0 megohm, 1/2 watt)	.20		Socket (6 prong)	27-8686	.11
19	33-510339	Resistor (10,000 ohms, 1 watt)	.20		Socket (7 prong)	27-8687	.11
20	32-2382	2nd I. F. Transformer	.50		Socket (7 prong)	27-8653	.11
21	33-551339	Resistor (51,000 ohms, 1/2 watt)	.20		Terminal Panel (Ant.)	36-8746	.11
22	33-551339	Resistor (110 mmfd., mica)	.20		Verrier Drive	31-2072	.60
23	33-551339	Condenser (100 mmfd.) part of No. (20)	.20		Speaker (HS)	36-1220	\$6.25
24	33-551339	Condenser (100 mmfd.) part of No. (20)	.20		Bezel Plate & Frame	46-5126	.01
25	33-551339	Volume Control	.20		Bezel Gasket	27-8312	.06
26	33-551339	Resistor (51,000 ohms, 1 watt)	.20		Bezel Glass	27-8279	.06
27	33-551339	Resistor (1.9 megohm, 1/2 watt)	.20		Bezel Ring	28-5079	.60
28	30-4358	Condenser (0.015 mfd. tubular)	.20		Speaker S7	38-1009	5.75
29	33-510339	Resistor (1.0 megohm, 1/2 watt)	.20		Bezel Plate & Frame	46-5124	.00
30	30-4489	Condenser (0.1 mfd. tubular)	.20		Bezel Gasket	27-8311	.01
31	33-510339	Resistor (1.0 megohm, 1/2 watt)	.20		Bezel Glass	27-8298	.05
32	33-510339	Resistor (330,000 ohms, 1/2 watt)	.20		Bezel Ring	28-5078	.55
33	30-4515	Condenser (0.015 mfd. tubular)	.20				
34	33-449339	Resistor (490,000 ohms, 1/2 watt)	.20				
35	30-4215	Condenser (0.02 mfd., tubular)	.20				
36	33-399339	Resistor (95,000 ohms, 1/2 watt)	.20				
37	42-1328	Tone Control off-on switch	.20				
38	30-4447	Condenser (0.03 mfd., tubular)	.20				
39	30-4112	Condenser (0.008 mfd., tubular)	.20				
40	32-7019	Output Transformer	.85				
41	36-3157	Cone and Voice Coil Assembly (S-7)	1.00				
42	36-3796	Cone and Voice Coil Assembly (HS)	1.20				
	34-2064	Pilot Lamp	.09				

MODEL 38-12, Code 1
 PHILCO RADIO & TELEV. CORP. Schematic, Trimmers
 Voltage, Chassis



TYPE OF CIRCUIT: A.C. operated, superheterodyne with automatic volume control, Pentode audio output, and covers the standard broadcast and state police frequencies.

INTERMEDIATE FREQUENCY: 470 K.C.

R.F. TUNING RANGE: 540 to 1720 K.C.

June, 15

POWER SUPPLY:

Voltage	Frequency Cycles	Power Consumption
115	50 to 60	40 watts

AUDIO OUTPUT: 2 watts.

TUNING MECHANISM: 8 to 1 Ratio using Pulley

CABINET: Type "T" and "C." and Cord.

PHILCO TUBES USED: Five: One 6A7, Det. Osc.; One 78, I.F.; One 75, 2nd Det., 1st Audio; One 41, Output, and One 84, Rectifier.

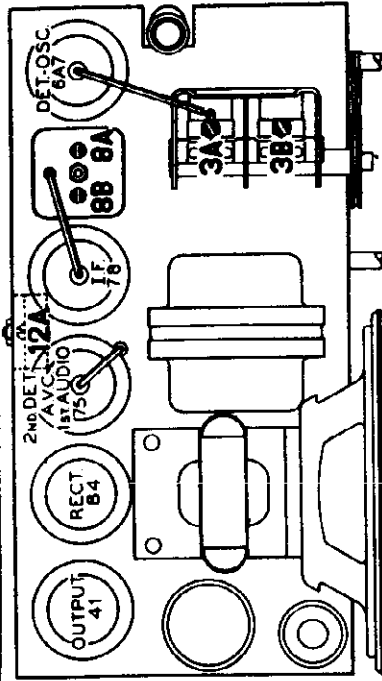


FIG. 2.—Locations of Components.

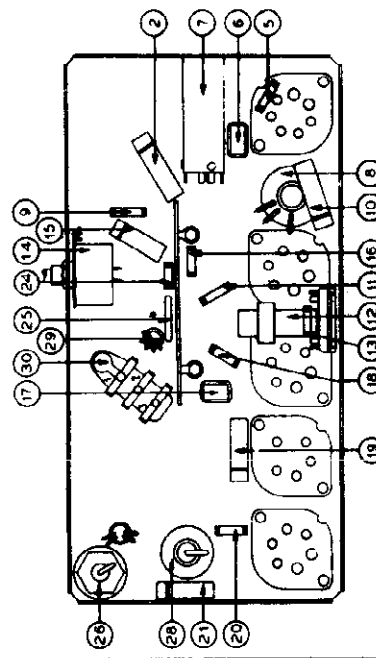
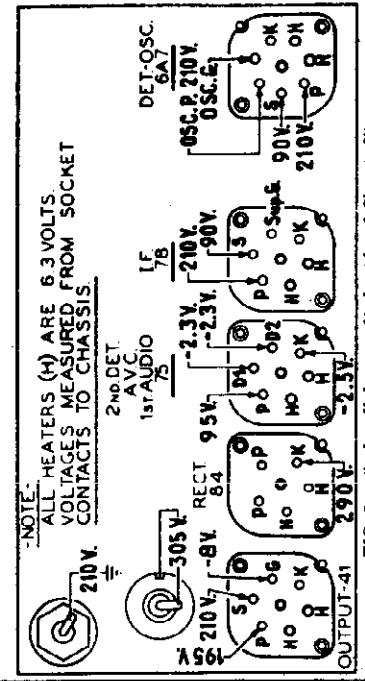


FIG. 3.—Part Locations Underside of Chassis.



NOTE:
 ALL HEATERS (H) ARE 6.3 VOLTS.
 VOLTAGES MEASURED FROM SOCKET CONTACTS TO CHASSIS

FIG. 4.—Socket Voltages—Underside of Chassis View.
 The Voltages indicated by arrows were measured with a Philco 026 Circuit

MODEL 38-12, Code 121

Alignment, Parts

PHILCO RADIO & TELEV. CORP.

Alignment of Compensators

EQUIPMENT REQUIRED: (1) Signal Generator, using a fundamental frequency range covering the tuning and intermediate frequencies of the receiver. Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36,000 K.C. is the correct instrument for this purpose; (2) Output Meter, Philco Model 026 Circuit Tester incorporates a sensitive output meter and is recommended; (3) Philco Fibre Handle Screw Driver, Part No. 27-7059 and Fibre Wrench, Part No. 3164.

OUTPUT METER: The 026 Output Meter is connected to the plate and cathode terminals of the 41 tube. Adjust the meter to use the (0-30) volt scale and advance the attenuator control of the generator until a readable indication is noted on the output meter after signal is applied.

DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows:

- 1 Turn the tuning condenser to maximum capacity position (plates fully meshed).
- 2 Holding the tuning condenser in this position, turn the pointer until it is $\frac{1}{16}$ of an inch below the three lines of the scale at the 550 K.C. end. (See Fig. 3.) This is the correct position of pointer at maximum capacity of tuning condenser.

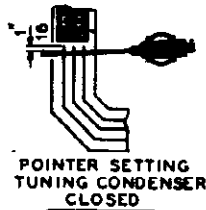


FIG. 3.—Dial Pointer Calibration.

Intermediate Frequency Circuit

Insert the signal generator shielded output lead into the "Med." jack on the panel of the generator. Connect the other end of the output lead through a .1 mfd. condenser to the grid of the 6A7 Det. Osc. tube, and the ground connection of the signal generator to the chassis. Set the Signal Generator and receiver controls, and adjust the I.F. compensators as follows:

- 1 Set Signal Generator at 470 K.C. Turn "Multiplier" Control to 1000 and the "Attenuator" for maximum output.
- 2 Turn the receiver dial to 580 K.C.
- 3 Receiver volume control maximum.
- 4 Adjust compensators, (12A), (8B), (8A), for maximum output. If the output meter goes off scale when adjusting the compensators, retard the signal generator attenuator.

Radio Frequency Circuit

TUNING RANGE: 540 to 1720 K.C.

- 1 With one end of the shielded lead of the signal generator output lead in the "Med." jack, connect the other end through a 100 mmfd. condenser to the white aerial wire (rear of chassis). Connect the signal generator ground to the brown lead or to the chassis of the receiver.
- 2 Set the controls and adjust the R.F. compensators as follows:

Volume Control Max.	Signal Generator and Receiver Dial 1500 K.C.	R.F. Compensators in Order (3B) (3A)
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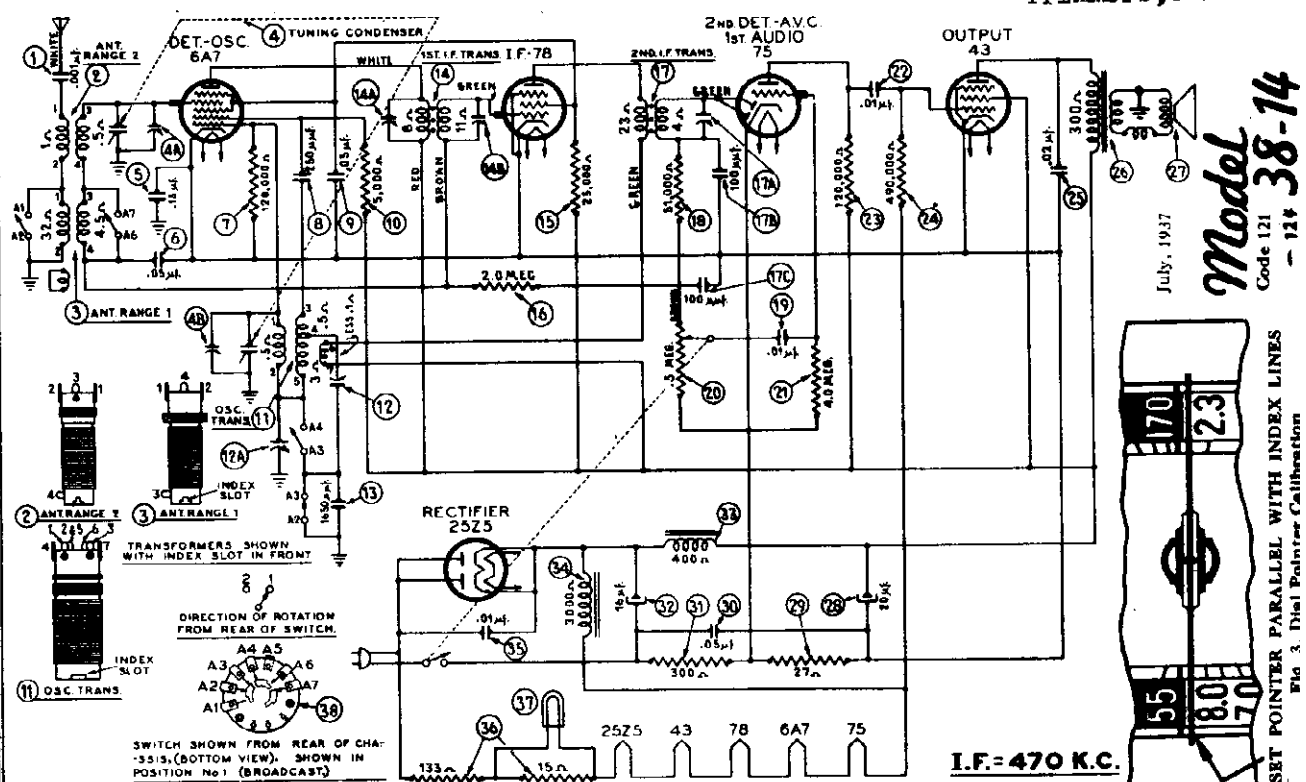
Replacement Parts Model 38-12

Schematic No.	Description	Part No.	List Price
1	Antenna Transformer ...	32-2583	
2	Condenser (0.05 mfd. tubular)	30-4444	\$0.20
3	Tuning Condenser Assembly)	31-2068	
4	Compensator (Part of tuning condenser 3)		
5	Resistor (51,000 ohms, $\frac{1}{2}$ watt)	33-351339	.20
6	110 mmfd. mica	30-1031	.20
7	Oscillator Transformer ..	32-2586	
8	First I.F. Transformer ...	32-2672	
9	Resistor (2 megohms) ...	33-520339	.20
10	Condenser (0.03 mfd. tubular)	30-4449	.20
11	Resistor (40,000 ohms, $\frac{1}{2}$ watt)	33-340339	.20
12	Second I.F. Transformer.	32-2674	
13	Resistor (51,000 ohms, $\frac{1}{2}$ watt)	33-351339	.20
14	Volume Control	33-5230	1.45
15	Condenser (0.01 mfd. tubular)	30-4479	.20
16	Resistor (4 megohms, $\frac{1}{2}$ watt)	33-540339	.20
17	Condenser (250 mmfd. mica)	30-1032	.25
18	Resistor (190,000 ohms, $\frac{1}{2}$ watt)	33-419339	.20
19	Condenser (0.01 mfd. tubular)	30-4169	.20
20	Resistor (490,000 ohms, $\frac{1}{2}$ watt)	33-449339	.20
21	Condenser (0.01 mfd. tubular)	30-4169	.20
22	Output Transformer	32-7861	
23	Cone and Voice Coil Assembly	36-3981	
24	Resistor (70 ohms, $\frac{1}{2}$ watt)	33-070339	.20
25	Resistor (250 ohms, $\frac{1}{2}$ watt)	33-1259	
26	Condenser (Electrolytic 4 mfd.)	30-2236	.90
*27	Field coil assembly (not supplied; see Note)		
28	Condenser (Electrolytic 12 mfd.)	30-2235	1.20
29	Power Transformer (115V, 50 to 60 cycle)	32-7826	3.00
30	Condenser (0.01 mfd., .01 mfd.)	3903-DG	.30
31	Pilot Lamp	34-2068	.12
	Bezel and Glass Assembly	40-6158	
	Bezel Clamp	28-5153	.01
	Bracket (Tuning Condenser)	28-5060	
	Cable (Power)	L-2778	.40
	Clip (R.F. Trans. small)	28-5002	.02
	Clip (R.F. Trans. large)	28-5003	.03
	Clip (Tuning Shaft)	28-8610	.03
	Dial Assembly	31-2097	
	Dial Pointer	28-5185	.15
	Dial Drive Cord Assembly	31-2082	.10
	Dial Drive Drum	28-6662	
	Dial Drive Spring	28-8751	
	Knob (Tuning and Volume)	27-4604	
	Shaft Assembly (Tuning)	38-9102	
	Shield (Tube)	28-5059	
	Socket (6 prong)	27-6036	.11
	Socket (7 prong)	27-6037	.11
	Socket (5 prong)	27-6035	.11
	Stop—Rubber	27-4540	
	Speaker Model BO-1	36-1366	
	Pilot Lamp Assembly	38-9041	

* Entire Speaker must be replaced when field coil is open or damaged.

Prices Subject to Change without Notice

MODEL 38-14, Codes 121, 124
 PHILCO RADIO & TELEV. CORP. Schematic, Voltage
 Trimmers, Chassis



July, 1937
 Model 38-14
 Code 121
 - 124

POWER SUPPLY: Voltage 115 Power Consumption 55 watts

INTERMEDIATE FREQUENCY: 470 K. C.

R. F. TUNING RANGES: 540 to 1720 K. C.
 2.3 to 7.4 M. C.

AUDIO OUTPUT: 1 watt

PHILCO TUBES USED: Five: one 6A7, Det. osc.; one 78, I. F.; one 75, 2nd Det., 1st Audio; one 43, Output, and one 25Z5 Rectifier.

TUNING MECHANISM: 12 to 1 Ratio using Pulley and Cord.

CABINET: Type "T," Code 121
 Type "CS," Code 124

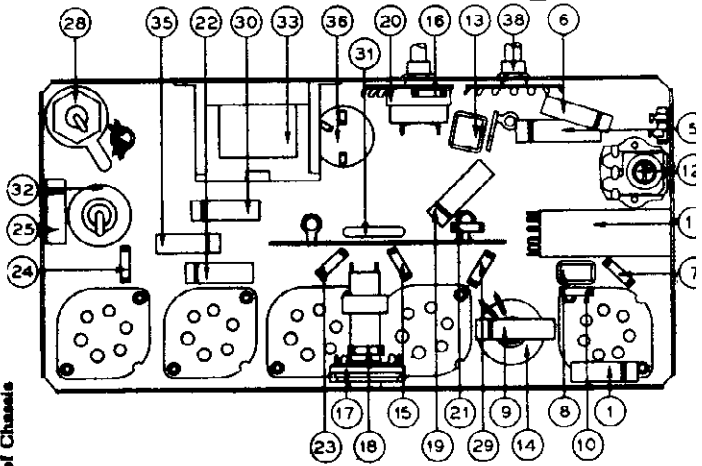
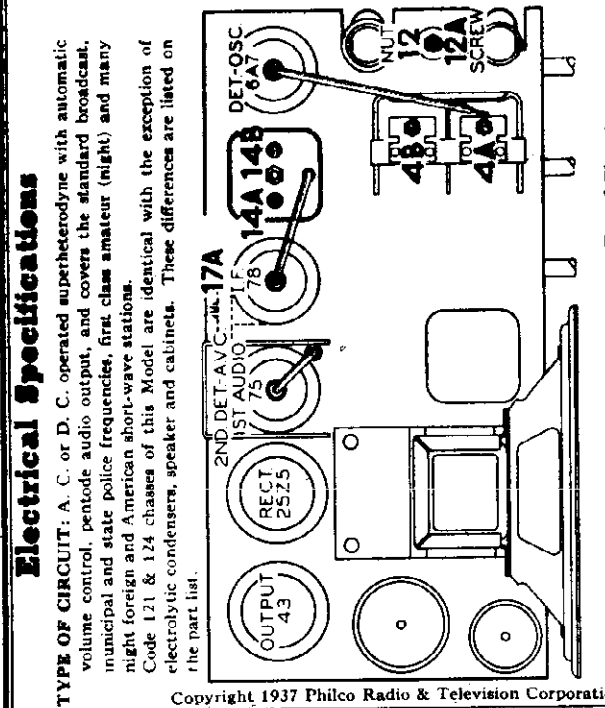


Fig. 5. Part locations, Underside of Chassis

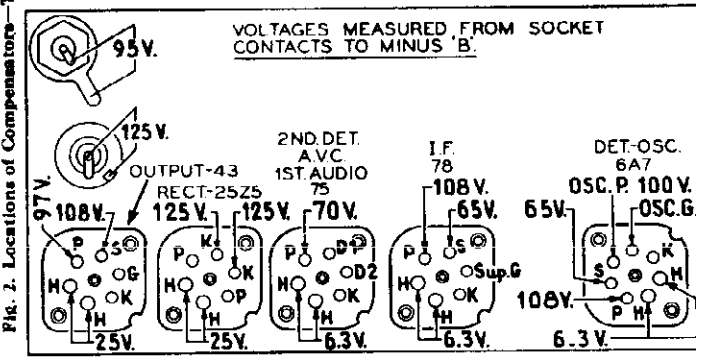


Fig. 1. Socket Voltage—Underside of Chassis View
 The voltages indicated by arrows were measured with a Philco 626 Circuit Tester, which contains a sensitive voltmeter. Volume Control at minimum—Tuning Condenser set for no signal—line voltage 115 A. C.

MODEL 38-14, Codes 121, 124
Alignment, Parts

PHILCO RADIO & TELEV. CORP.

Replacement Parts

Schem. No.	Description	Part No.	List Price	Schem. No.	Description	Part No.	List Price
1	Coil. (tubular .001 mf.)	30-4453	\$0.20	33	Choke	32-7888	
2	Ant. Trans. (Range 2)	32-2730		34	Field Coil and Pot. Assembly (S-18)	36-3985	
3	Ant. Trans. (Range 1)	32-2718			*Field Coil and Pot. Assembly (B 0-2)	(See Speaker Note below).	
4	Tuning Cond. Assembly	31-2064		35	Condenser (tubular .01 mf.)	30-4169	.20
5	Cond. (tubular .15 mf.)	30-4191	.25	36	Filament Resistor (133 ohm-15 ohm)	33-3322	.65
6	Cond. (tubular .05 mf.)	30-4519	.30	37	Pilot Lamp	34-2068	.12
7	Resistor (120,000 ohm 1/2 watt)	33-412300	.30	38	Range Switch	42-1266	.70
8	Cond. (mica 250 mmf.)	30-1032	.25		Cable Speaker (Code 124)	L-2084	
9	Cond. (tubular .05 mf.)	30-4444	.30		Cable (Power)	L-2773	.40
10	Resistor (5000 ohm 1/2 watt)	33-250330	.30		Clip, Small (Mtg. R. F. Coil)	28-5002	.02
11	Osc. Trans.	33-3719			Clip, Large (Mtg. R. F. Coil)	28-5003	.03
12	Compensator	31-0300			Dial As'y	31-2068	
13	Cond. (mica 1650 mmf.)	5877	.35		Dial Pointer	28-5201	.20
14	I. F. Trans. (1st)	33-2673	2.20		Dial Drive Cord	31-2066	.10
15	Resistor (25,000 ohm 1/2 watt)	33-323330	.20		Dial Drive Shaft	38-9001	
16	Resistor (2 meg. 1/2 watt)	33-520330	.20		Insulator Washer (Electrolytic)	27-8882	
17	I. F. Trans. (2nd)	32-2674	1.50		Insulator Washer (Electrolytic)	27-8883	
18	Resistor (51,000 ohm 1/2 watt)	33-351330	.20		Insulator Cover 1 1/2 (Elec. Cond. 32)	27-8900	
19	Cond. (tubular .01 mf.)	30-4479	.20		Insulator Cover 2 1/4 (Elec. Cond. 32)	27-8905	
20	Volume Control	33-5236			Mtg. Rubber Dial	27-4150	\$0.01
21	Resistor (4.0 meg. 1/2 watt)	33-540330	.30		Mtg. Rubber (Tuning Condenser)	27-4596	
22	Resistor (120,000 ohm 1/2 watt)	33-412330	.30		Pilot Lamp As'y	33-9137	
23	Resistor (490,000 ohm 1/2 watt)	33-440330	.30		Pilot Lamp	34-2068	.12
24	Cond. (tubular .02 mf.)	30-4215	.30		Pully (Tuning Condenser)	31-1283	.30
25	Output Trans. (B 0-2)	32-7874			Speaker (B 0-2, Code 121)	36-1367	
26	Output Trans. (S-18)	32-7395	1.10		Speaker (S-18, Code 124)		
27	Cone and Voice Coil Assembly (S-18)	36-3014			Socket (6 prong)	27-6036	.11
	Cone and Voice Coil Assembly (B-0-2)	26-3981			Socket (7 prong)	27-6037	.11
28	Electrolytic Cond. (20 mf. Code 121)	30-2245	.95		Washer "C" (Tuning Shaft)	33-3904	.01
	Electrolytic Cond. (Code 124)	30-2275			Bezel and Glass (Code 121)	40-6156	
29	Resistor (27 ohm 1/2 watt)	33-027330	.20		Bezel and Glass (Code 124)	40-6394	
30	Cond. (tubular .06 mf.)	30-4444	.30		Bezel Clamp	33-6153	.02
31	Resistor (300 ohm, 2 watt)	33-1358					
32	Electrolytic Cond. (16 mf. Code 121)	30-2245	.90				
	Electrolytic Cond. (Code 124)	30-2277					

*Entire Speaker must be replaced when field coil is open or damaged.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Alignment of Compensators

EQUIPMENT REQUIRED: (1) Signal Generator, using a fundamental frequency range covering the tuning and intermediate frequencies of the receiver. Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36,000 K. C. is the correct instrument for this purpose; (2) Output meter, Philco Model 026 circuit tester incorporates a sensitive output meter and is recommended; (3) Philco Fibre Handle Screw Driver, Part No. 27-7059 and Fibre Wrench, Part No. 3164.

OUTPUT METER: The 026 Output Meter is connected to the plate and cathode terminals of the 43 tube. Adjust the meter to use the (0-30) volt scale and advance the attenuator control of the generator until a readable indication is noted on the output meter after signal is applied.

DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows:

1. Turn the tuning condenser to maximum capacity position (plates fully meshed).
2. Holding the tuning condenser in this position, turn the pointer until it is parallel with the index lines (see Fig. 3). This is the correct position of pointer at maximum capacity of tuning condenser.

INTERMEDIATE FREQUENCY CIRCUIT

When adjusting the following compensators, a Philco Set Transformer Part No. 32-2763 must be connected in the signal generator output circuit as follows: Insert the signal generator output lead into the "Med" jack and the ground lead into the "Gnd" jack of the signal generator.

Connect the other end of the output lead to terminal No. 1 on the Set Transformer and the cable ground to Terminal No. 2. No. 3 and 4 terminals of Set Transformer are then connected to the chassis and 6A7 grid respectively of the receiver with short pieces of wire. Insert a 0.1 mfd. in series with the No. 4 lead which connects to the grid.

Set the signal generator and receiver controls and adjust the I. F. compensators as follows:

1. Set Signal Generator at 470 K. C. Turn "Multiplier" Control to 1000 and the "Attenuator" for maximum output.
2. Turn the receiver dial to 580 K. C.
3. Range Switch Broadcast position.
4. Receiver volume control maximum.
5. Adjust compensators, (17A), (14B), (14A), for maximum output. If the output meter goes off scale when adjusting the compensators, retard the signal generator attenuator.

RADIO FREQUENCY CIRCUIT

Tuning Range: 2.3 to 7.4 M. C.

1. Remove terminal No. 4 lead of set transformer from the 6A7 grid and connect to the aerial wire of the receiver through a 400 ohm resistor. Remove the .1 mfd. condenser when using the 400 ohm resistor.

2. Set the controls and adjust the R. F. compensators as follows:

Range	Signal Generator
Switch	and Receiver Dial
Control	R. F. Compensators
Shortwave	6 M. C.
Max.	(4B)

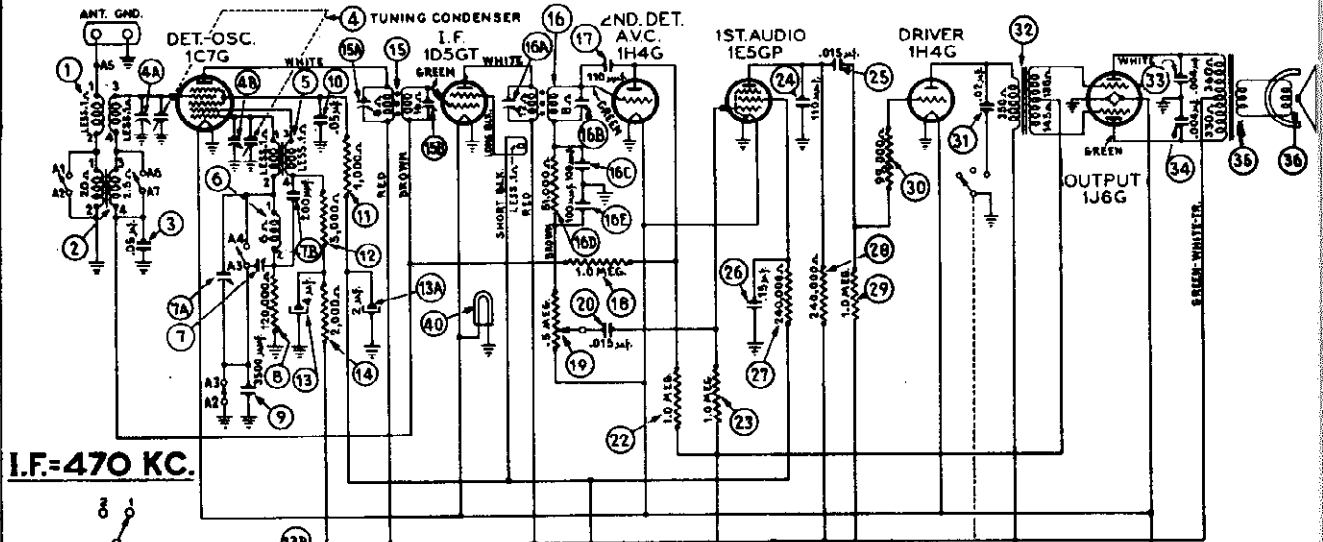
Tuning Range: 530 to 1730 K. C.

1. Remove the 400 ohm resistor from the No. 4 lead and replace with a 100 mmfd. condenser and reconnect to the aerial wire.

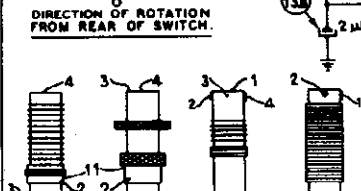
Set the controls and adjust the R. F. compensators as follows:

Range	Signal Generator	R. F. Compensators
Switch	and Receiver Dial	In Order
Broadcast	Control	
Max.	1550 K. C.	(12A), (4A)
Max.	580 K. C.	(17) Roll Tuning Condenser
Max.	1550 K. C.	(12A), (4A)

MODEL 38-38, Code 121
 PHILCO RADIO & TELEV. CORP. Schematic, Voltage
 Trimmers, Chassis



I.F.=470 KC.



TRANSFORMERS SHOWN WITH INTERMEDIATE FREQUENCY: 470 K. C.
 TUNING RANGES: Two—Range 1, 5.30 to 1720 K. C.
 Range 2, 5.7 to 18.0 M. C.
 POWER OUTPUT: 1 watt.
 TYPE AERIAL: "L" type, Philco Part No. 45-2428.

CABINETS AND SPEAKERS USED:
 July, 1937
Model 38-38, Code 121

Cabinet Type	Speaker Used
T	KR26
K	HR20
X	HR20

TYPE OF CIRCUIT: Six tube, battery operated superheterodyne circuit, having two tuning ranges covering broadcast and short-wave frequencies; Automatic Volume Control; Tone Control, and a class "B" output stage.
 BATTERIES REQUIRED:
 "A" Battery: Two volt storage battery Philco type 172R or Dry "A" battery Philco Part No. 41-8011.
 If a dry A Battery is used, a ballast lamp "type 1F1" MUST be inserted in the socket provided in the (41-8011) battery. This lamp acts as a voltage regulator and maintains a constant potential of two volts on the filament of the tubes.
 "BC" Battery: Philco battery Part No. 41-8007 is used to supply "B" and "C" voltages. This battery contains a socket into which the receiver battery cable plug is inserted.

PHILCO TUBES USED: One 1C7G, 1st Det. & Osc.; one 1D5GT, I. F. amplifier; One 1H4G, 2nd Det. (A.V.C.), one 1E5GP, 1st Audio; one 1H4G, Audio Driver, and one 1J6G, output.

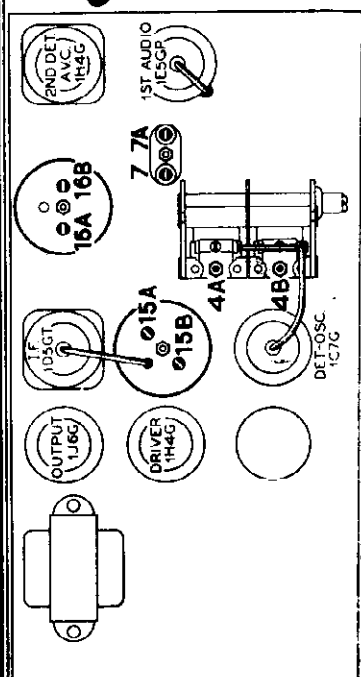


Fig. 2. Locations of Compensators—Top of Chassis

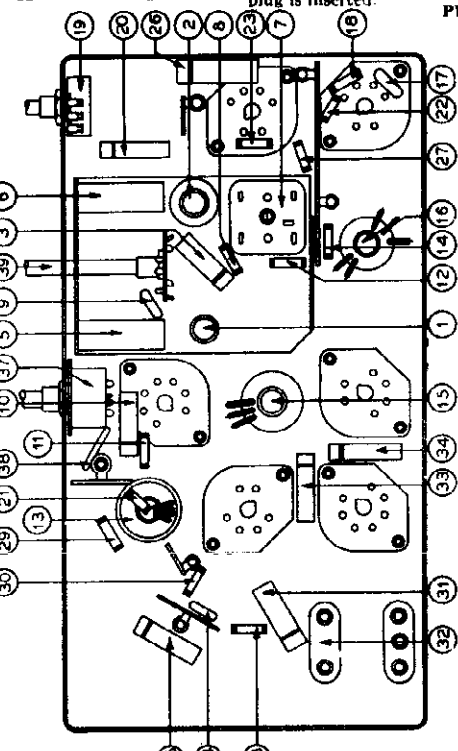


Fig. 4. Part locations, Underside of Chassis

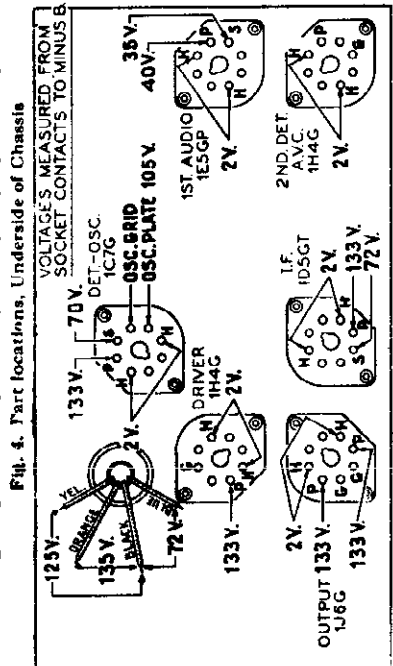


Fig. 1. Socket Voltages, Underside of Chassis
 The voltages indicated by arrows were measured with a Philco 0.2% Circuit Tester which contains a sensitive voltmeter. Volume Control at minimum, range switch

Replacement Parts

Schem. No.	Description	Part No.	List Price
1	Antenna Transformer Range (2)	32-2558	\$0.70
2	Antenna Transformer Range (1)	32-2667	1.60
3	Condenser (0.5 μ f, tubular)	30-4519	.20
4	Tuning Condenser	31-2025	5.00
5	Oscillator Coil Range (2)	32-2668	1.25
6	Oscillator Coil Range (1)	32-2659	.50
7	Padding Condenser	31-6188	
8	Resistor (120,000 Ω , $\frac{1}{2}$ W.)	33-412339	.20
9	Condenser (3500 μ mf, Mica)	30-1094	.40
10	Condenser (.05 μ f, tubular)	30-4444	.20
11	Resistor (1000 Ω , $\frac{1}{2}$ W.)	33-210339	.20
12	Resistor (5000 Ω , $\frac{1}{2}$ W.)	33-250339	.20
13	Electrolytic Condenser (4-2-2 μ f)	30-2241	1.50
14	Resistor (2000 Ω , $\frac{1}{2}$ W.)	33-220339	.20
15	First I. F. Transformer	32-2664	2.20
16	Second I. F. Transformer	32-2666	2.20
17	Condenser (110 μ mf, Mica)	30-1031	.20
18	Resistor (1 megohm, $\frac{1}{2}$ W.)	33-510339	.20
19	Volume Control	33-5234	1.00
20	Condenser (.015 μ f, tubular)	30-4358	.20
21	Resistor (8000 Ω , $\frac{1}{2}$ W.)	33-280339	.20
22	Resistor (1 megohm, $\frac{1}{2}$ W.)	33-510339	.20
23	Resistor (1 megohm, $\frac{1}{2}$ W.)	33-510339	.20
24	Condenser (110 μ mf, Mica)	30-1031	.20
25	Condenser (.015 μ f, tubular)	30-4515	.20
26	Condenser (.15 μ f, tubular)	30-4191	.25
27	Resistor (240,000 Ω , $\frac{1}{2}$ W.)	33-424339	.20
28	Resistor (240,000 Ω , $\frac{1}{2}$ W.)	33-424339	.20
29	Resistor (1 megohm, $\frac{1}{2}$ W.)	33-510339	.20
30	Resistor (99,000 Ω , $\frac{1}{2}$ W.)	33-399339	.20
31	Condenser (.02 μ f, tubular)	30-4215	.20
32	Input Transformer	32-7637	2.00
33	Condenser (.004 μ f, tubular)	30-4456	.20
34	Condenser (.004 μ f, tubular)	30-4456	.20
35	Output Transformer	32-7756	1.50
36	Cone and Voice Coil Assembly	34-3540	1.00
37	Power and Tone Switch	42-1351	
38	Resistor (900 Ω , 1 W.)	33-1223	.20
39	Range Switch	42-1356	.75
40	Pilot Light	34-2150	.22
	Cable (Battery)	41-3198	1.40
	Cable (Speaker)	41-3325	.40
	Clip (Mtg. R. P. Trans.)	28-5882	
	Dial	27-5323	.66
	Dial Washer	27-5896	.66
	Dial Clamp	27-5898	
	Knob (Tuning)	27-4380	
	Knob (Vernier)	27-4331	
	Knob (Tone Volume)	27-4323	
	Mtg. Rubber (Chassis)	27-4604	
	Mtg. Rubber (Tuning Condenser)	27-4600	
	Mtg. Rubber (Screen Bezel)	27-4600	
	Screen	27-5890	
	Shield (Tube)	28-2725	
	Socket Assembly (Pilot Lamp)	28-5880	
	Socket (6 pins)	27-5895	.11
	Socket (7 pins)	27-5887	.11
	Terminal Panel (Ant.)	36-5889	.70
	Vernier Drive Assembly	31-2072	1.00

MODEL 38-38T

Bezel Frame Assembly	40-6134	\$6.90
Bezel Gasket	27-5811	.01
Bezel Glass	27-5898	.06
Bezel Ring	28-5878	.55
Speaker KR-20	36-1353	10.00

MODEL 38-38 K, X

Bezel Frame Assembly	40-6128	1.06
Bezel Gasket	27-5813	.01
Bezel Glass	27-5900	.06
Bezel Ring	28-5880	.70
Speaker (HR-20)	36-1361	
Battery (A)	1732	
Battery (B)	41-8087	

PRICES SUBJECT TO CHANGE
WITHOUT NOTICE

Alignment of Compensators

EQUIPMENT REQUIRED: (1) Signal Generator, having a fundamental frequency range covering the tuning and intermediate frequencies of the receiver. Philco Model 077 A. C. operated Signal Generator or Model 088, battery operated Signal Generator which have the required frequency range are the correct instruments for this purpose; (2) Output meter, Philco Model 026 circuit tester incorporates a sensitive output meter and is recommended; (3) Philco Fibre Handle Screw Driver, Part No. 27-7059 and Fibre Wrench, Part No. 3164.

OUTPUT METER: The 026 Output Meter is connected to the plate terminals of the 1J6G tube. Adjust the meter to use the (0-30) volt scale and advance the attenuator control of the generator until a readable indication is noted on the output meter after signal is applied.

DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows:

1. Turn the tuning condenser to maximum capacity position (plates fully meshed).
2. Holding the tuning condenser in this position, loosen the dial clamp; then turn the dial until the indicator is centered on the middle index line. Tighten clamp in this position. See Fig. 3

INTERMEDIATE FREQUENCY CIRCUIT

Insert the signal generator shielded output lead into the "Med" jack on the panel of the generator. Connect the other end of the output lead through a .1 mfd. condenser to the grid of the 1C7G Det. Osc. tube and the ground connection of the signal generator to the chassis. Set the signal generator and receiver controls and adjust the I. F. compensators as follows:

1. Set Signal Generator at 470 K. C. Turn "Multiplier" Control to 1000 and adjust the attenuator for a readable indication on the output meter.
2. Turn the receiver dial to 580 K. C.
3. Receiver Volume Control maximum.
4. Range Switch Broadcast Position.
5. Adjust compensators (16B), (16A), (15B) and (15A) for maximum output. If the output meter goes off scale when adjusting the compensators retard signal generator "attenuator."

RADIO FREQUENCY CIRCUIT

Tuning Range: 5.7 to 18 M. C.

1. With one end of the shielded lead of the signal generator output cable in the "Med" jack, connect the other end through a 400 ohm carbon resistor to the "Ant." terminal of the aerial panel of the receiver. The output lead ground must be connected to the "Gnd" terminal or to the chassis.

2. Set the controls and adjust the R. F. compensators as follows:

Volume Control	Range Switch	Signal Generator and Receiver Dial	Compensators in Order
Max.	2	18 M. C.	(4B) See Note A

Tuning Range: 530 to 1720 K. C.

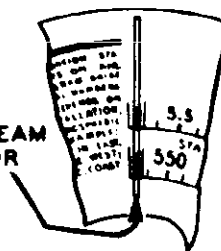
Remove the 400 ohm resistor from the generator output cable and replace with a 200 mfd. condenser. Then set the controls and adjust the compensators as follows:

Volume Control	Range Switch	Signal Generator and Receiver Dial	Compensators in Order
Max.	1	1500 K. C.	(7A), (4A)
Max.	1	580 K. C.	(7)
Max.	1	1500 K. C.	(7A), (4A)

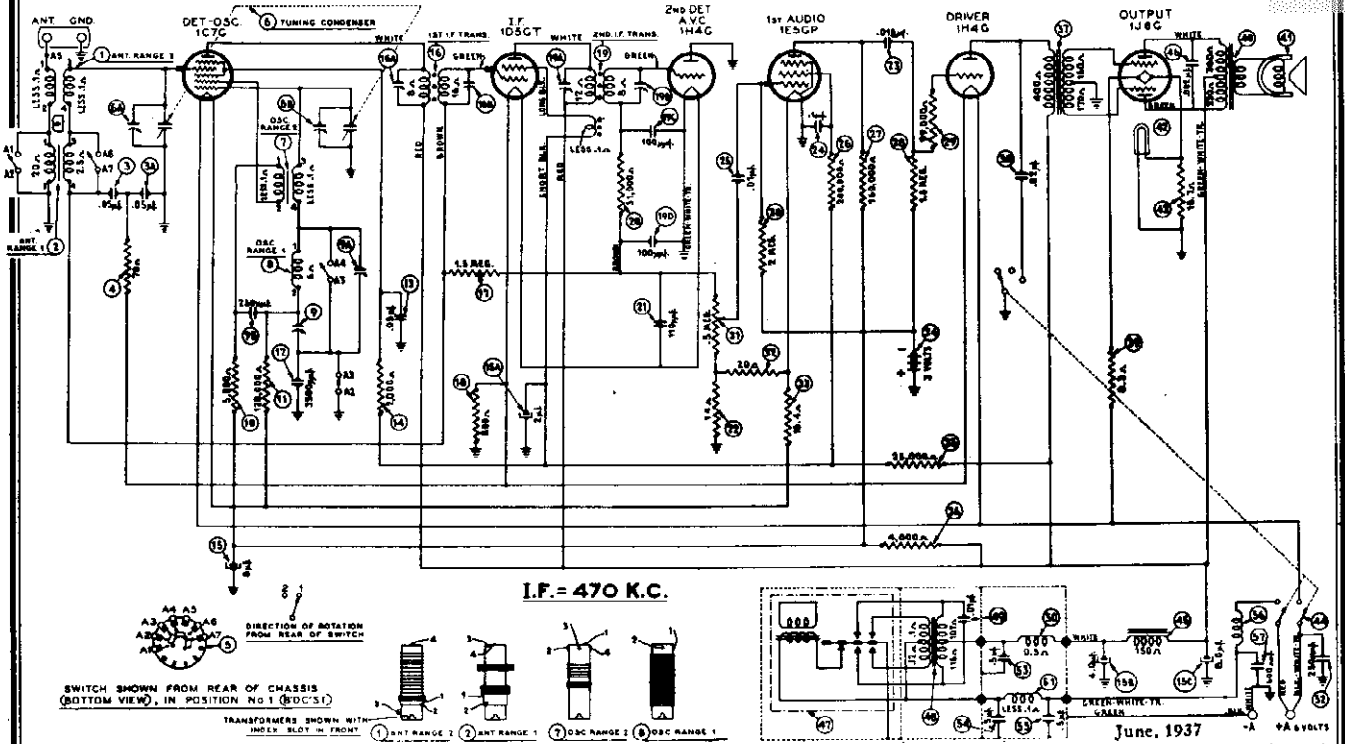
NOTE A—To accurately adjust the high frequency oscillator compensator to the fundamental instead of the image signal, turn the oscillator compensator to the maximum capacity position (clockwise). From this position slowly turn the compensator counter-clockwise until a second maximum peak is obtained on the output meter. Adjust the compensator for maximum output using this second peak. The first peak from maximum capacity position of the compensator is the image signal and must not be used in adjusting the compensator.

If the above procedure is correctly performed, the image signal will be found (much weaker) by turning the receiver dial 940 K. C. below the frequency being used on the high frequency range.

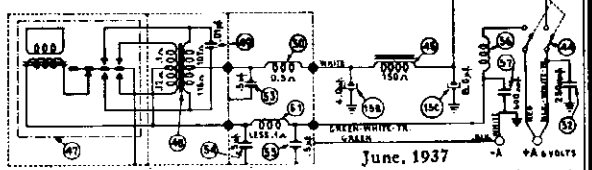
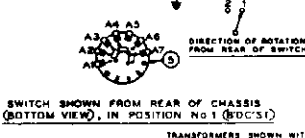
GLOWING BEAM INDICATOR
Dial Calibration



MODEL 38-39, Code 121
 PHILCO RADIO & TELEV. CORP. Schematic, Voltage
 Trimmers, Chassis



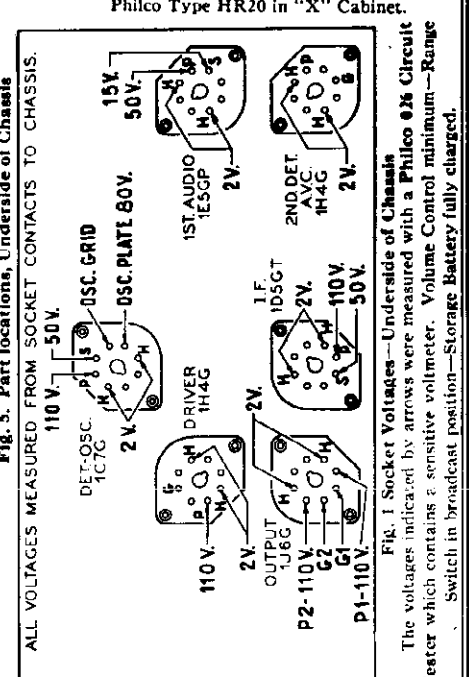
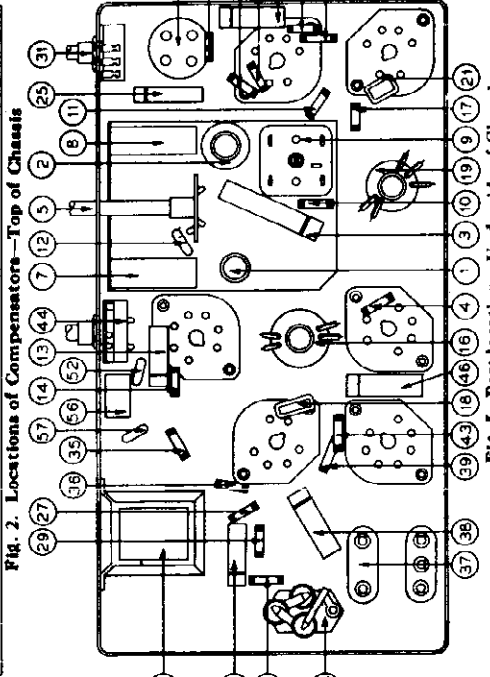
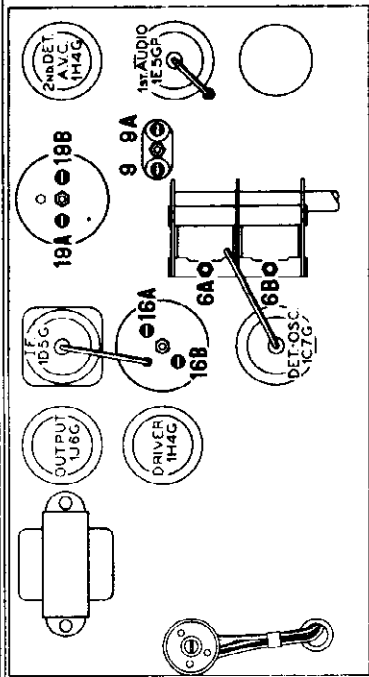
IF = 470 K.C.



TYPE OF CIRCUIT: A six tube superheterodyne circuit is used in this model having two tuning ranges covering standard and short wave broadcasts. The receiver is operated by a 6 volt storage battery and uses a synchronous vibrator for supplying "B" voltage. The vibrator unit is mounted in the cabinet and connected to the receiver chassis through a cable and plug. Additional design features included in this model are: Automatic Volume Control: two point tone control: Class "B" audio output circuit. The receiver is designed to operate from a standard "I" type aerial, Philco Part No. 45-242R. This aerial system should be used to obtain the maximum performance from the receiver. Instructions for installing the aerial are provided in each kit.

Model 38-39, Code 121

- POWER SUPPLY:** 6 volt storage battery Philco Type 116K
Current Drain 1.4 Amps.
- INTERMEDIATE FREQUENCY:** 470 K. C.
- FREQUENCY RANGES:** Range one 530 to 1720 K. C.
Range two 5.7 to 18.0 M. C.
- OUTPUT:** 1.5 watts.
- SPEAKERS USED:** Philco Type KR26 in "T" Cabinet.
Philco Type HR20 in "K" Cabinet.
Philco Type HR20 in "X" Cabinet.



MODEL 38-39, Code 121

Alignment, Parts

PHILCO RADIO & TELEV. CORP.

Alignment of Compensators

EQUIPMENT REQUIRED: (1) Signal Generator, having a fundamental frequency range covering the tuning and intermediate frequencies of the receiver. Philco Model, 077 A. C. operated, Signal Generator or Model 088 Battery operated, Signal Generator, which have the required frequency range are the correct instruments for this purpose; (2) Output meter, Philco Model 026 circuit tester incorporates a sensitive output meter and is recommended; (3) Philco Fibre Handle Screw Driver, part no. 27-7059 and Fibre Wrench, part no. 3164.

OUTPUT METER: The 026 output meter is connected to the plate terminals of the 1J6G tube. Adjust the meter to use the (0-30) volt scale and advance the attenuator control of the generator until a readable indication is noted on the output meter after signal is applied.

DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows:

1. Turn the tuning condenser to maximum capacity position (plate fully meshed).
2. Holding the tuning condenser in this position, loosen the dial clamp; then turn the dial until the indicator is centered on the middle index line (See Fig. 2). Tighten clamp in this position.

INTERMEDIATE FREQUENCY CIRCUIT

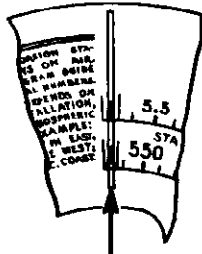
Insert the signal generator shielded output lead into the "Med" jack on the panel of the generator. Connect the other end of the output lead through a .1 mfd. condenser to the grid of the 1C7G Det. Osc. tube and the ground connection of the signal generator to the chassis. Set the signal generator and receiver controls and adjust the I. F. compensators as follows:

1. Set Signal Generator at 470 K. C. Turn "Multiplier" Control to 1000 and adjust the attenuator for a readable indication on the output meter.
2. Turn the receiver dial to 580 K. C.
3. Receiver Volume Control maximum.
4. Range Switch Broadcast Position.
5. Adjust compensators (19B), (19A), (16B) and (16A) for maximum output. If the output meter goes off scale when adjusting the compensators retard signal generator "attenuator."

RADIO FREQUENCY CIRCUIT

Tuning Range: 5.7 to 18 M. C.

1. With one end of the shielded lead of the signal generator output cable in the "Med" jack, connect the other end through a 400 ohm carbon resistor to the "Ant." terminal of the aerial panel of the receiver. The output lead ground must be connected to the "Gnd." terminal or to the chassis.



GLOWING BEAM INDICATOR

Fig. 2. Dial Calibration

Volume Control	Range Switch	Signal Generator and Receiver Dial	Compensators in Order
Max.	2	18 M. C.	(6B) See Note A

Tuning Range: 530 to 1720 K. C.

Remove the 400 ohm resistor from the generator output cable and replace with a 200 mmfd. condenser. Then set the controls and adjust the compensators as follows:

Volume Control	Range Switch	Signal Generator and Receiver Dial	Compensators in Order
Max.	1	1500 K. C.	(9A), (6A)
Max.	1	580 K. C.	(9)
Max.	1	1500 K. C.	(9A), (6A)

NOTE A—To accurately adjust the high frequency oscillator compensator to the fundamental instead of the image signal, turn the oscillator compensator to the maximum capacity position (clockwise). From this position slowly turn the compensator counter-clockwise until a second maximum peak is obtained on the output meter. Adjust the compensator for maximum output using this second peak. The first peak from maximum capacity position of the compensator is the image signal and must not be used in adjusting the compensator.

If the above procedure is correctly followed, the image signal will be found (much weaker) by turning the receiver dial 940 K. C. below the frequency being used on the high frequency range.

MODEL 38-39T CABINET		
Bezel Frame Assembly	40-6124	.90
Bezel Gasket	27-8311	.01
Bezel Glass	27-8298	.05
Bezel Ring	28-5078	.55
Speaker KR-26	36-1853	10.00

Replacement Parts

Schem. No.	Description	Part No.	List Price
1	Transformer, Antenna Short Wave	32-2558	\$0.70
2	Transformer, Antenna Broadcast	32-2647	1.60
3	Condenser (.05 μ f--06 μ f)	30-4489	.25
4	Resistor (70 Ω , 1/2 Watt)	32-070339	.20
5	Wave Switch	43-1828	.75
6	Tuning Condenser Assembly	31-3046	
7	Transformer, Oscillator Short Wave	32-2648	1.25
8	Transformer, Oscillator Broadcast	32-2659	.50
9	Padder	31-4188	.50
10	Resistor (5000 Ω , 1/2 Watt)	32-2644	.20
11	Resistor (120,000 Ω , 1/2 Watt)	32-412239	.20
12	Condenser, Mica (3500 μ f)	30-1094	.40
13	Condenser, (.05 μ f)	30-4444	.20
14	Resistor (2000 Ω , 1/2 Watt)	32-2644	.20
15	Electrolytic Condenser	30-2226	
16	I. F. Transformer, First	32-2644	2.20
17	Resistor (1.5 megohms, 1/2 Watt)	32-412239	.20
18	Resistor (900 Ω , 1/2 Watt)	32-1235	.20
19	I. F. Transformer, Second	32-2646	2.20
20	Resistor (51,000 Ω , 1/2 Watt)	32-351339	.20
21	Condenser, Mica (110 μ f)	30-1081	.20
22	Resistor (11.7 Ω , 1/2 Watt)	32-1264	.20
23	Condenser (.015 μ f)	30-4515	.20
24	Condenser (1 μ f)	30-4122	.20
25	Condenser (.01 μ f)	30-4470	.20
26	Resistor (240,000 Ω , 1/2 Watt)	32-424339	.20
27	Resistor (240,000 Ω , 1/2 Watt)	32-424339	.20
28	Resistor (1 megohm, 1/2 Watt)	32-410339	.20
29	Resistor (99,000 Ω , 1/2 Watt)	32-399339	.20
30	Resistor (2.0 megohms, 1/2 Watt)	32-420339	.20
31	Volume Control (.5 megohm)	32-5234	1.00
32	Resistor (20 Ω , 1/2 Watt)	32-1265	.20
33	Resistor (16.4 Ω , 1/2 Watt)	32-1266	.20
34	Bias Cell Assembly	32-7275	.20
35	Resistor (23,000 Ω , 1/2 Watt)	32-325339	.20
36	Resistor (4,000 Ω , 1/2 Watt)	32-240239	.20
37	Transformer—Push-pull Input	32-7637	2.00
38	Condenser (.02 μ f)	30-4215	.20
39	Resistor (8.3 Ω , 1/2 Watt)	32-1268	.20
40	Transformer—Output	32-7758	
41	Cone & Voice Coil Assembly (KR26)	36-3540	1.00
	Cone & Voice Coil Assembly (HR20)	36-3797	
42	Dial Lamp	34-3160	.22
43	Resistor (16.7 Ω , 1/2 Watt)	32-1267	.20
44	Power Switch Tone Control	42-1363	1.00
45	Choke	32-7843	1.85
46	Condenser, (0.002 μ f tubular)	30-4177	.25
47	Vibrator	41-3222	5.25
48	Power Transformer	32-7852	2.20
49	Condenser (.01 μ f)	30-4381	.25
50	Choke ("B")	32-1932	.25
51	Choke ("A")	32-1954	.40
52	Condenser, Mica, 250 μ f	5858	.25
53	Condenser, (.3 μ f)	30-4296	.60
54	Condenser, (.5 μ f)	30-4296	.60
55	Condenser, (.5 μ f)	30-4296	.60
56	Choke	32-2347	
57	Condenser, (600 μ f) mica	30-1049	.25

MODEL 38-39 (Code 121)

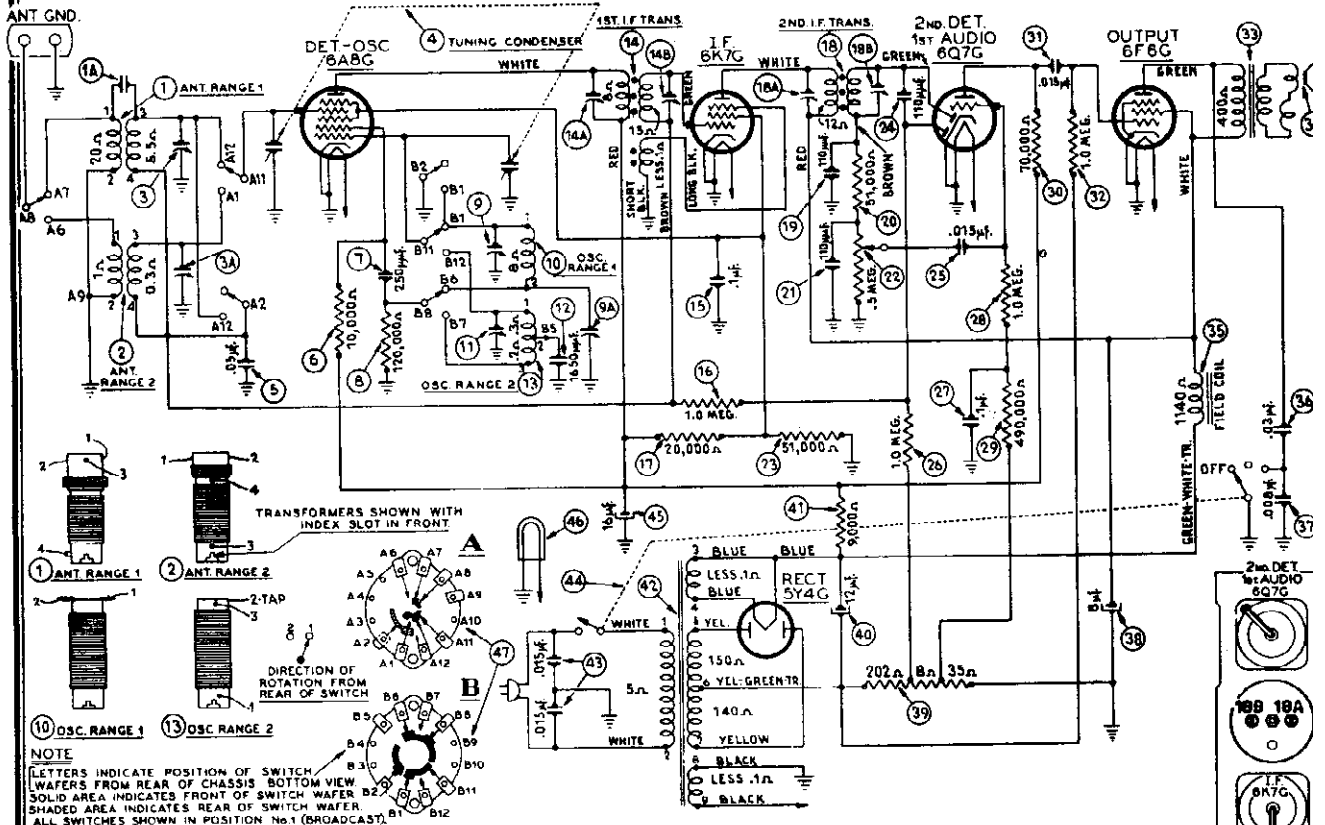
Cable (Vibrator Unit)	41-3328
Cable (Battery)	41-3204
Cable (Speaker)	41-3326
Clip (R. F. Coils)	28-5002
Dial	27-8333
Dial Washer	27-4598
Dial Clamp	28-5099
Knob (Tuning)	27-4330
Knob (Tuning Vernier)	27-4331
Knob (Tone & Volume)	27-4332
Mtg. Panel (Bias Cell)	38-9104
Mtg. Corner (Chassis)	27-4864
Mtg. Rubber (Vibrator) (Small)	27-4307
Mtg. Rubber (Vibrator, Assem.) (large)	27-4585
Mtg. Rubber (Vibrator) (Square)	27-4287
Mtg. Sleeve (Vibrator)	28-6521
Mtg. Screw (Vibrator)	W-414
Shield (Vibrator)	38-3022
Shield (Tube)	28-3726
Screen	27-4330
Socket (Pilot Lamp)	38-9006
Socket (6 prong)	27-8086
Socket (7 prong)	27-8087
Socket (Vibrator)	27-8036
Terminal Panel (Ant.)	28-8849
Vernier Drive	31-3072
Vibrator Socket Assembly	41-3327

MODEL 38-39X and K CABINETS

Speaker H. R. 20	36-1851	
Bezel Frame Assembly	40-6128	1.05
Bezel Basket	27-8313	.01
Bezel Glass	27-8300	.05
Bezel Ring	28-5080	.70
Battery	118R	

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODEL 38-60, Code 125
 PHILCO RADIO & TELEV. CORP. Schematic, Voltage Trimmers, Chassis



NOTE
 LETTERS INDICATE POSITION OF SWITCH WAFERS FROM REAR OF CHASSIS. BOTTOM VIEW SOLID AREA INDICATES FRONT OF SWITCH WAFER. B2 TO B11 SHADDED AREA INDICATES REAR OF SWITCH WAFER. ALL SWITCHES SHOWN IN POSITION No. 1 (BROADCAST). B1

Model 38-60—Code 125 INTERMEDIATE FREQUENCY: 470 K. C.
 TUNING RANGE: Two—Range one 530 to 1720 K. C.
 Range two 2.3 to 7.4 M. C.
 UNDISTORTED OUTPUT: 3 watts.
 TONE CONTROL: Two position.

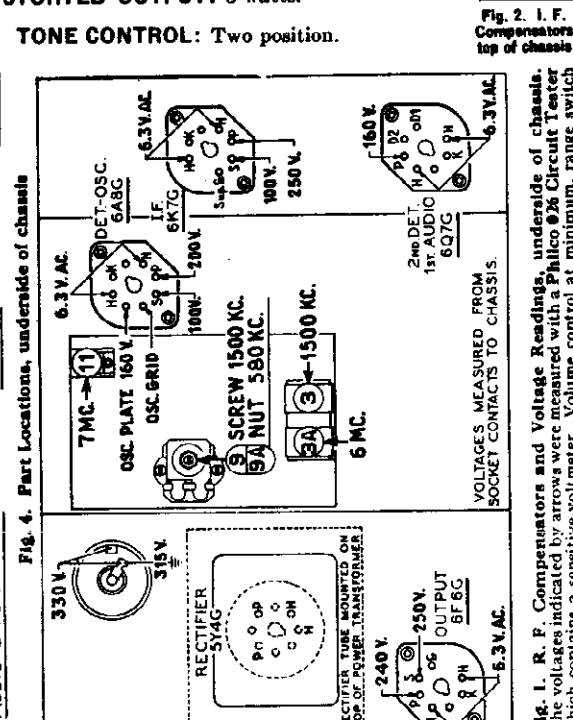
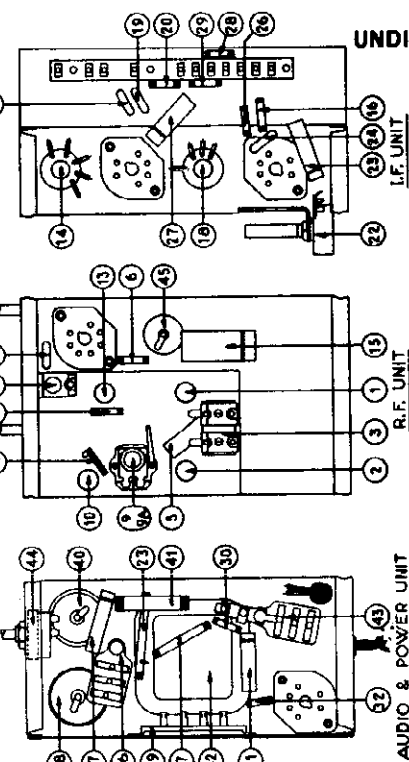
Electrical Specifications

TYPE CIRCUIT: Superheterodyne, with Automatic Volume Control and a pentode audio output circuit.

POWER SUPPLY: Voltage
 115
 115
 115/220

Consumption
 60 watts
 60 watts
 60 watts

PHILCO TUBES USED: One 6A8G, Det. Osc.; one 6K7G, I. F.; one 6Q7G, 2nd Det. audio; one 6F6G, audio output; and one 5Y4G, Rectifier.



MODEL 38-60, Code 125
Alignment, Parts

PHILCO RADIO & TELEV. CORP.

Alignment of Compensators

EQUIPMENT REQUIRED: (1) Signal Generator using a fundamental frequency range covering the intermediate and tuning ranges of the receiver. Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36,000 K. C., is the correct instrument for this purpose; (2) output meter, Philco Model 026 circuit tester incorporates a sensitive output meter, and is recommended; (3) Philco Fibre Handle Screw Driver, part No. 27-7059 and Fibre Wrench part No. 3164.

OUTPUT METER: The 026 output meter is connected to the plate and cathode terminals of the 6F6G tube. Adjust the meter to use the (0-30) volt scale and advance attenuator control of the generator until a readable indication is noted on the output meter after a signal is applied to the receiver in the following adjustments.

DIAL CALIBRATION: In order to adjust this receiver correctly the dial must be aligned to track properly with the tuning condenser. To do this proceed as follows:

1. Turn the tuning condenser to the maximum capacity position, then loosen dial hub, set screws and rotate the dial (condenser at maximum capacity) until the glowing beam indicator is centered between the first and second index lines at the low frequency end of the broadcast scale.

2. With dial in this position, tighten dial hub set screws.

INTERMEDIATE FREQUENCY CIRCUIT

Connect the 077 signal generator output lead through a .1 mfd. condenser to the control grid of the 6A8G tube and the ground connection of the output lead to the chassis. Then set the controls of the signal generator and receiver as follows:

- a. Signal Generator 470 K. C.
- b. Receiver dial at 580 K. C.
- c. Range switch of receiver at Range One.
- d. Volume Control maximum.
- e. Adjust I. F. Compensator (18B), (18A), (14B), (14A) for maximum output.

RADIO FREQUENCY CIRCUIT

Tuning Range 530 to 1720 K. C.

1. Connect the signal generator output lead through a 200 mmfd. condenser from the "med" post of the generator to the aerial terminal; and the output lead ground connection to the chassis.

2. The R. F. Compensators are adjusted as follows for maximum output:

Range Switch Position	Signal Generator and Receiver Dial	Compensators in Order
1	1500 K. C.	(9) (3)
1	580 K. C.	(9A) Note A
1	1500 K. C.	(9) (3)

Tuning Range 2.3 to 7.4 M. C.

Remove the 200 mmfd. from the output lead and replace with a 400 ohm carbon resistor and reconnect to the antenna terminal.

Range Switch Position	Signal Generator and Receiver Dial	Compensators in Order
2	7.0 M. C.	(11)
2	6.0 M. C.	(3A)

NOTE A—First tune compensator (9A) for maximum output, then vary the tuning condenser of the receiver for maximum output about the 580 K. C. dial mark. Now turn compensator (9A) slightly to the right or left and vary the receiver tuning condenser for maximum out-

Replacement Parts

Schem. No.	Description	Part No.	List. Price
1	Antenna transformer (range 1)	32-2588	\$1.00
2	Antenna transformer (range 2)	32-2246	.70
3	Compensator (2 section)	31-6093	.40
4	Tuning condenser	31-1826	3.00
5	Condenser (.05 mf. tubular)	30-4444	.20
6	Resistor (10,000 ohms, 1/2 watt)	33-310339	.20
7	Condenser (250 mmf. mica)	30-1032	.25
8	Resistor (120,000 ohms, 1/2 watt)	33-412339	.20
9	Compensator (2 section)	31-6100	.40
10	Oscillator transformer (range 1)	32-2380	.50
11	Compensator	31-6101	.20
12	Condenser (1650 mmf.)	31-6096	.40
13	Oscillator transformer (range 2)	32-2121	.70
14	I. F. Transformer (first)	32-2580	2.20
15	Condenser (.1 mf. tubular)	30-4455	.25
16	Resistor (1 meg., 1/2 watt)	33-510339	.20
17	Resistor (20,000 ohms, 1 watt)	33-320439	.20
18	Second I. F. transformer	32-2582	2.20
19	Condenser (110 mmf.) Part of 18		
20	Resistor (51,000 ohms)	33-351339	.20
21	Condenser (110 mmf.) Part of 18		
22	Volume control	33-5137	1.00
23	Resistor (51,000 ohms, 1 watt)	33-351439	.20
24	Condenser (110 mmf. mica)	30-1031	.20
25	Condenser (.015 mf. tubular)	30-4366	.20
26	Resistor (1 meg., 1/2 watt)	33-510339	.20
27	Condenser (.1 mf. tubular)	30-4132	.20
28	Resistor (1 meg., 1/2 watt)	33-510339	.20
29	Resistor (490,000 ohms, 1/2 watt)	33-449339	.20
30	Resistor (70,000 ohms, 1/2 watt)	33-370339	.20
31	Condenser (.015 mf. tubular)	30-4226	.20
32	Resistor (1 meg., 1/2 watt)	33-510339	.20
33	Output transformer (S7)	32-7019	.85
34	Cone and voice coil assembly	36-3157	1.00
35	Field coil assembly (S7)	36-3039	3.50
36	Condenser (.03 mf. bakelite)	8328-SU	.35
37	Condenser (.008 mf. tubular)	30-4317	.20
38	Condenser (8 mf. electrolytic)	30-2211	
39	Bias resistor (wire wound)	33-3316	
40	Condenser (12 mf. electrolytic)	30-2210	
41	Resistor (9000 ohms, 2 watts)	33-290639	.30
42	Power transformer		
	115 volts, 50-60 cycle	32-7583	4.50
	115 volts, 25-40 cycle	32-7584	6.50
	115/230 volts, 50-60 cycle	32-7585	6.50
43	Condenser (.015 mf.-.015 mf. dual bakelite)	3793-DG	.40
44	Tone control and off-on switch	42-1180	.75
45	Condenser (16 mf. electrolytic)	30-2212	
46	Pilot lamp	34-2039	.07
47	Range switch	42-1333	
	Cable Speaker	L-2181	.25
	Cable A. C.	L-2778	
	Dial	27-5196	.45
	Dial Hub	28-7152	.10
	Dial Clamp	28-2837	.10
	Dial Set Screw	W-1606	2.00 C
	Knob (Tuning)	27-4321	.10
	Knob (Tone & Volume)	27-4332	.10
	Pilot Lamp Socket Assembly	38-7706	.35
	Screen Bracket Assembly	31-1878	.25
	Speaker S7	36-1009	5.75
	Shaft (Vol. Cont.)	38-8058	.12
	Shaft Spring	28-4117	.40 C
	Shaft Clip	28-4394	.01
	Socket (6 prong)	27-6086	
	Socket (7 prong)	27-6087	
	Vernier Drive Assembly	31-1863	

F CABINET

Baffle & Silk	40-6142	
Bezel Assembly	40-6130	\$1.00
Bezel Gasket	27-8312	.01
Bezel Glass	27-8299	.06
Bezel Ring	28-5079	.60

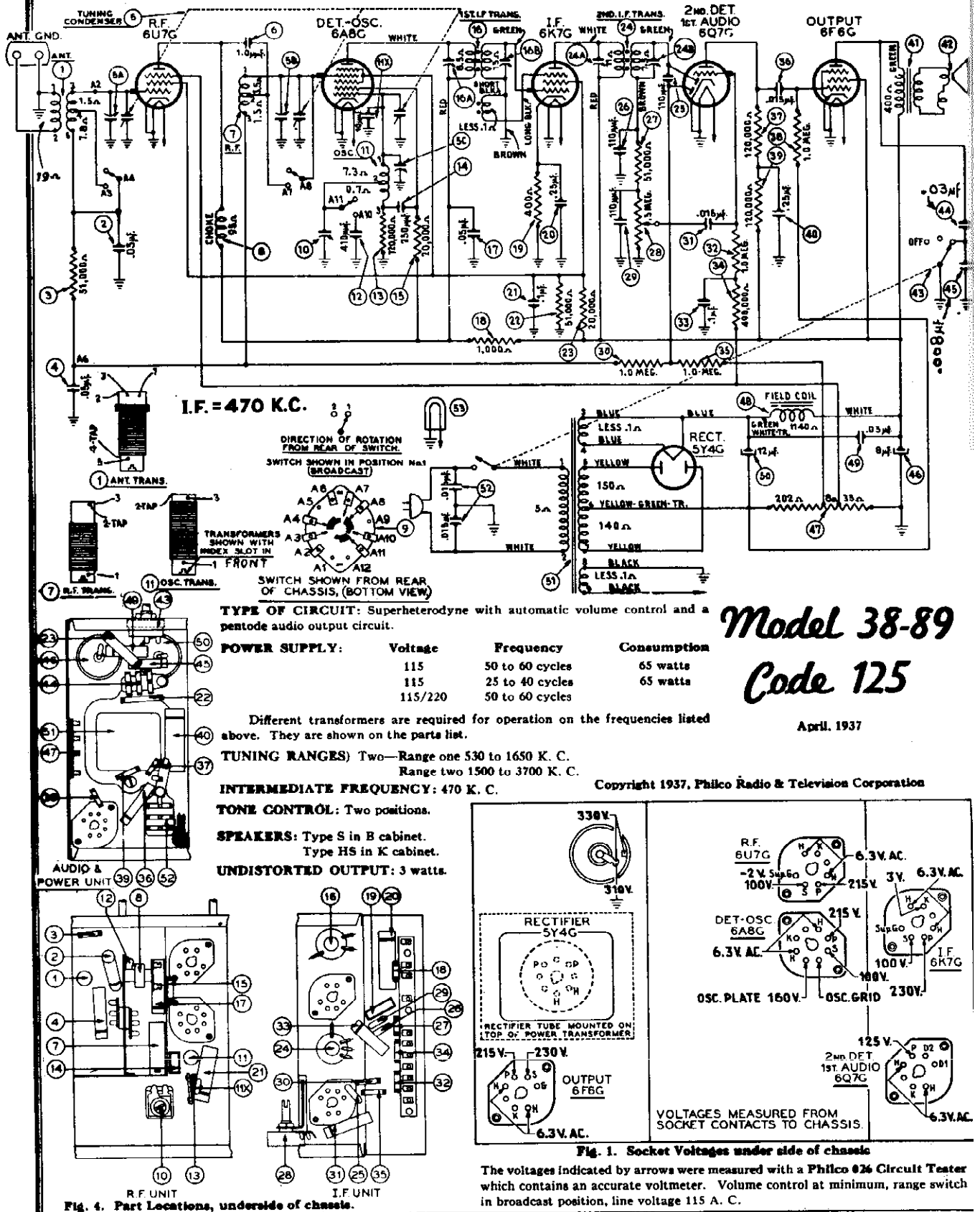
B CABINET

Baffle & Silk	40-6093	
Bezel Plate & Frame	40-6117	.90
Bezel Gasket	27-8311	.01
Bezel Glass	27-8208	.06
Bezel Ring	27-5078	.55

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

If the output reading increases, turn compensator (9A) in the same direction a trifle more, and again vary the tuning condenser for maximum output. If the output decreases, set the compensator in the opposite direction. This procedure of first setting the compensator and then varying the tuning condenser is continued until there is no further gain in output reading.

PHILCO RADIO & TELEV. CORP. Schematic, Voltage Chassis



*Model 38-89
Code 125*

April, 1937

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MODEL 38-89, Code 125
Alignment, Trimmers
Parts

PHILCO RADIO & TELEV. CORP.

Replacement Parts

Schem. No.	Description	Part No.	List Price
1	Antenna transformer	32-2562	
2	Condenser (0.05 mf. tubular)	30-4519	\$0.20
3	Resistor (51,000 ohms, 1/2 watt)	33-351339	.20
4	Condenser (0.05 mf. tubular)	30-4519	.20
5	Tuning Condenser assembly	31-2033	
6	Condenser (1.0 mmf. twisted wire)		
7	R. F. transformer	32-2128	.70
8	R. F. choke coil	32-2139	.35
9	Wave Switch	42-1334	
10	Compensator	31-6056	.55
11X	Condenser (10 mmf. mica)	30-1065	.30
11	Oscillator transformer	32-2120	1.00
12	Condenser (410 mmf. mica)	30-1000	.25
13	Resistor (120,000 ohms, 1/2 watt)	33-412339	.20
14	Condenser (250 mmf. mica)	30-1032	.25
15	Resistor (20,000 ohms, 1/2 watt)	33-320339	.20
16	1st I. F. transformer	32-2580	2.20
17	Condenser (0.05 mf. tubular)	30-4123	.20
18	Resistor (1,000 ohms, 1/2 watt)	33-210339	.20
19	Resistor (400 ohms, 1 watt, wire wound)	33-1211	.20
20	Condenser (0.25 mf. tubular)	30-4446	.25
21	Condenser (0.1 mf. tubular)	30-4455	.25
22	Resistor (51,000 ohms, 1/2 watt)	33-351, 339	.20
23	Resistor (20,000 ohms, 1/2 watt)	33-320, 339	.20
24	2nd I. F. transformer	32-2582	2.20
25	Condenser (110 mmf. mica)	30-1031	.20
26	Condenser (110 mmf. mica)	30-1031	.20
27	Resistor (51,000 ohms, 1/2 watt)	33-351, 339	.20
28	Volume Control	33-5157	1.00
29	Condenser (110 mmf. mica)	30-1031	.20
30	Resistor (1.0 meg., 1/2 watt)	33-510, 339	.20
31	Condenser (0.015 mf. tubular)	30-4358	.20
32	Resistor (1.0 meg., 1/2 watt)	33-510, 339	.20
33	Condenser (0.1 mf. tubular)	30-4122	.20
34	Resistor (490,000 ohms, 1/2 watt)	33-449, 339	.20
35	Resistor (1.0 meg., 1/2 watt)	33-510, 339	.20
36	Condenser (0.015 mf. tubular)	30-4226	.20
37	Resistor (120,000 ohms, 1/2 watt)	33-412, 339	.20
38	Resistor (1.0 meg., 1/2 watt)	33-510, 339	.20
39	Resistor (120,000 ohms, 1/2 watt)	33-412, 339	.20
40	Condenser (0.25 mf. tubular)	30-4449	.20
41	Output transformer	32-7019	.85
42	Cone and voice coil assembly (S16)	36-3014	1.00
43	Cone and voice coil assembly (HS3)	36-3796	
44	Tone control and power switch	42-1180	
45	Condenser (0.03 mf. bakelite)	32-28-SU	.35
46	Condenser (0.008 mf. tubular)	30-4317	.20
47	Condenser (electrolytic, 8 mf.)	30-2211	
47	Bias resistor	33-3284	.30
48	Field coil assembly (S16)	36-3664	
48	Field coil assembly (HS3)	36-3928	
49	Condenser (0.05 mf. tubular)	30-4020	.20
50	Condenser (electrolytic, 12 mf.)	30-2210	
51	Power transformer (115 v., 50-60 cycles)	32-7583	4.50
	(115 v., 25-40 cycles)	32-7584	6.50
	(115/230 v., 50-60 cycles)	32-7585	6.50
52	Condensers (0.015 mf. dual bakelite)	3703-DG	.40
53	Pilot Lamp	34-2064	.07
	Cable (Power)	L-2778	
	Cable (Speaker)	L-2181	.25
	Dial	27-5204	.35
	Dial Hub	28-7182	.10
	Dial Clamp	28-2837	.10
	Dial Set Screws	W-1506	2.00c
	Knob (Tuning)	27-4321	.10
	Knob (Vol., Range, Tone)	27-4332	.10
	Mtg. Spacer Bushing	27-4359	.02
	Mtg. Rubber Chassis	5189	.03
	Pilot Lamp Assembly	38-7706	.35
	Screen Bracket assembly	31-1878	
	Shield Tube, Round	28-5031	
	Shield Tube, Square	28-2726	\$0.10
	Shield Base (Tube)	27-5030	.35
	Shaft (Volume Control)	38-8058	.12
	Socket 7 prong	27-6087	
	Socket 6 prong	27-6086	
"K" CABINET			
	Baffle & Silk	40-6139	
	Bezel Frame & Plate	40-6130	1.00
	Bezel Gasket	27-8312	.01
	Bezel Glass	27-8299	.06
	Bezel Ring	28-5079	
	Speaker (HS3)	36-1350	
"B" CABINET			
	Baffle & Silk Assembly	40-6063	
	Bezel Frame & Plate Assembly	40-6117	.90
	Bezel Gasket	27-8311	.01
	Bezel Glass	27-8398	.06
	Bezel Ring	28-5078	
	Speaker (S16)	36-1225	5.75

PRICES SUBJECT TO CHANGE
WITHOUT NOTICE

Alignment of Compensators

EQUIPMENT REQUIRED: (1) Signal Generator—Philco Model 077 Signal Generator—using fundamental frequency from 115 to 36000 K. C. is the correct instrument for the purpose; (2) Output Meter, Philco Model 026 circuit tester incorporates a sensitive output meter and is recommended; (3) Philco Fibre Handle Screw Driver, part No. 27-7059 and Fibre Wrench part No. 3164.

OUTPUT METER: The 026 output meter is connected to the plate and cathode terminals of the 6F6G tube. Adjust the meter to use the (0-30) volt scale and advance attenuator control of the generator until a readable indication is noted.

DIAL CALIBRATION: In order to adjust this receiver correctly the dial must be aligned to track properly with the tuning condenser. To do this proceed as follows:

1. Turn the tuning condenser to the maximum capacity position. Then loosen dial hub, set screws and rotate the dial (condenser at maximum capacity) until the glowing beam indicator is center on second index line at the low frequency end of the broadcast scale.

2. With dial in this position, tighten dial hub set screws.

INTERMEDIATE FREQUENCY CIRCUIT

Insert the signal generator output lead in the med. jack, and connect the other end through a .1 mfd. condenser to the grid of the 6A8G det. osc. tube. The ground connection of the signal generator is connected to the chassis. Set the signal generator controls and adjust the I. F. compensators as follows:

- a. Set 077 Signal Generator indicator at 470 K. C. Turn the multiplier control to 1000, and set the gain control for maximum output.
- b. Receiver Dial 580 K. C.
- c. Receiver volume control full "on".
- d. Adjust compensator (24B), (24A), (16B) and (16A) for maximum output.

If the output meter goes off scale when adjusting the compensators retard signal generator attenuator.

RADIO FREQUENCY CIRCUIT

Tuning Range 530 to 1650 K. C.

1. Insert the signal generator output lead in the "medium jack" on the panel, and connect the other end through the .1 mfd. condenser to the antenna terminal of the receiver. The output lead ground must be connected to the chassis.

2. Leave the receiver volume control full on. Then set the controls and adjust the R. F. compensators as follows:

Range Switch Position	Signal Generator and Receiver Dial	Compensators In Order
1	1500 K. C.	(5C), (5B), (5A)
1	580 K. C.	(10) (See Note A)
1	1500 K. C.	(5C), (5B), (5A)

Tuning Range 1500 to 3700 K. C.

The alignment of this tuning range is taken care of by the Range 1 adjustments.

NOTE A—First tune compensator (10) for maximum output, then vary the tuning condenser of the receiver for maximum output about the 580 K. C. dial mark. Now turn compensator (10) slightly to the right or left and vary the receiver tuning condenser for maximum output. If the out reading increases, turn compensator (10) in the same direction a trifle more, and again vary the tuning condenser for maximum output. If the output decreases, set the compensator in the opposite direction. This procedure of first setting the compensator and then varying the tuning condenser is continued until there is no further gain in output reading.

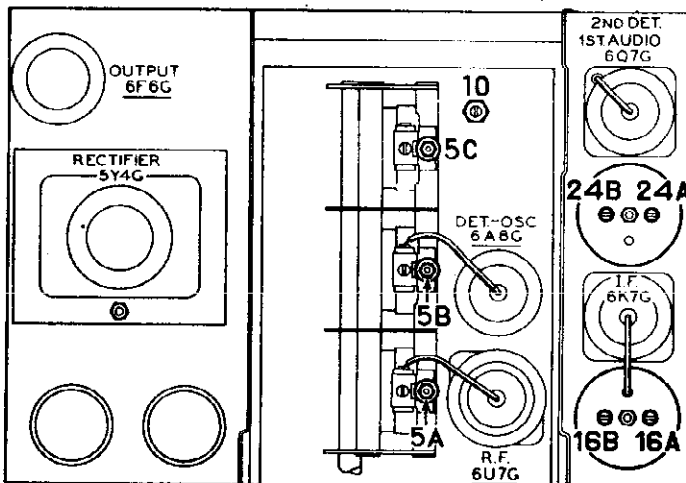
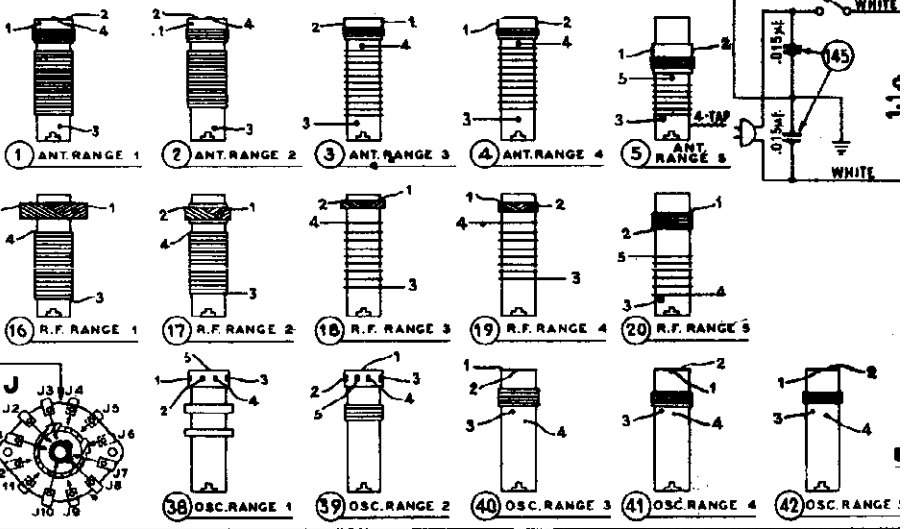
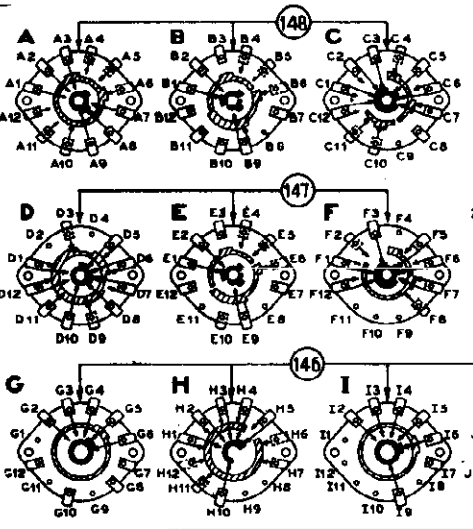
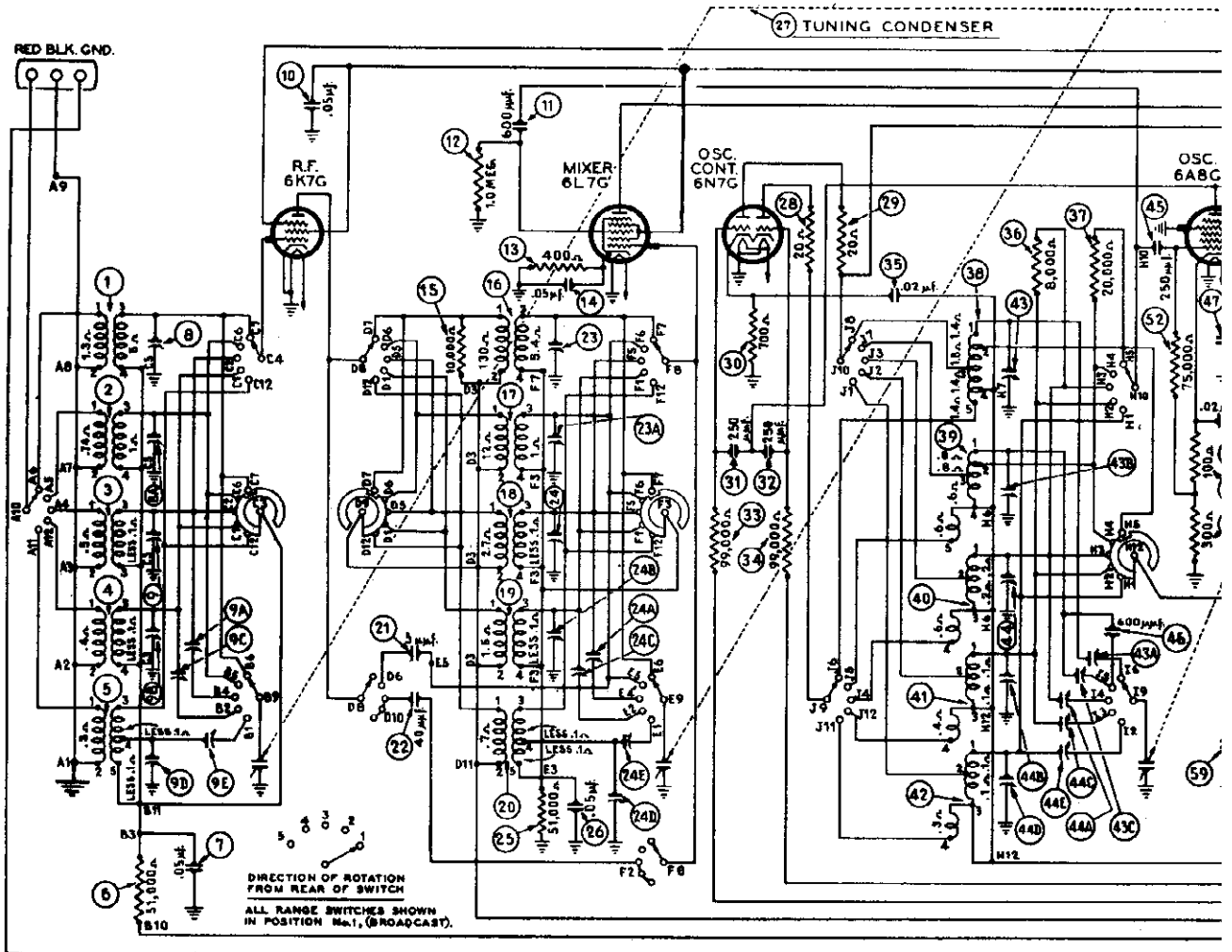
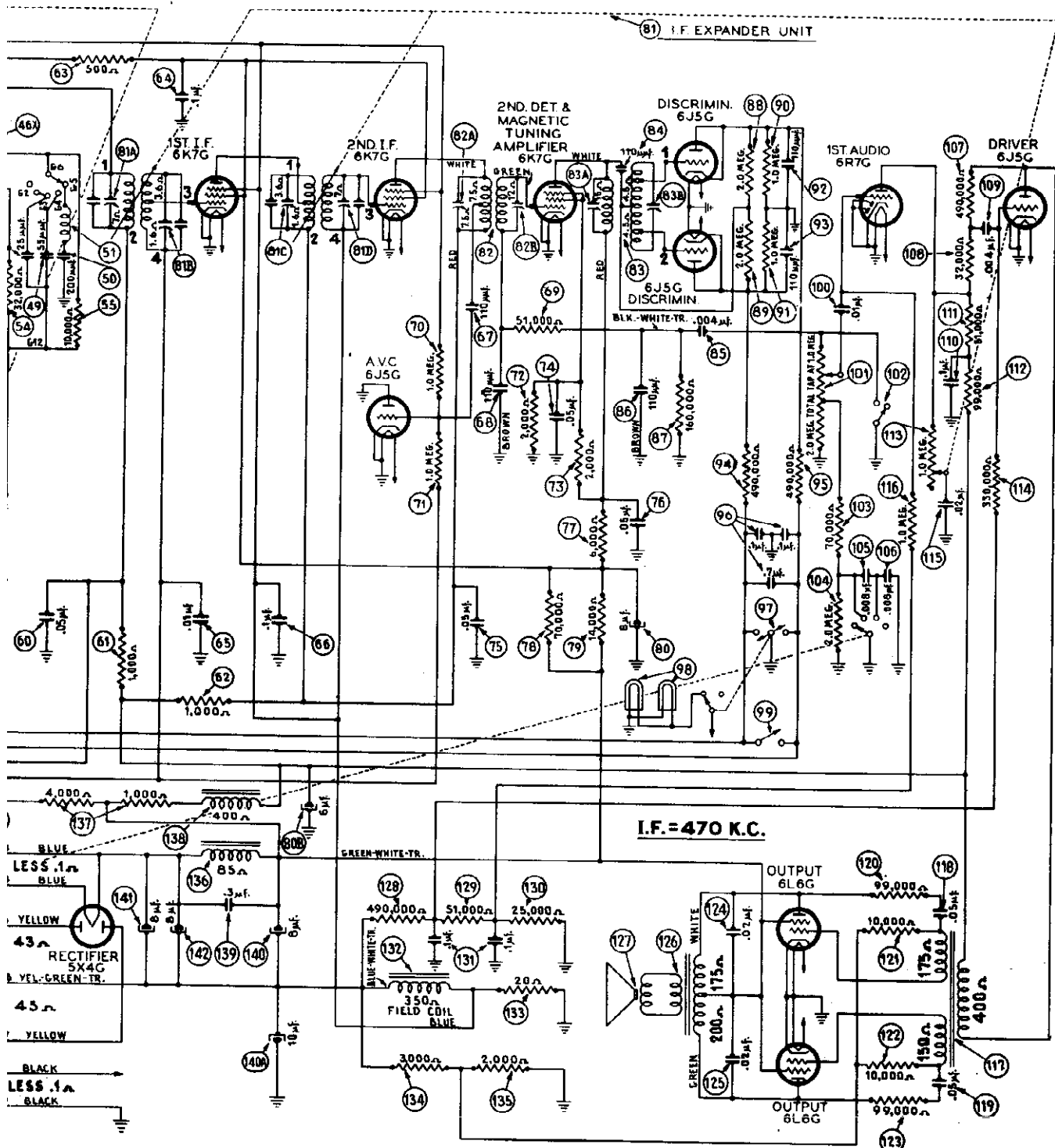


Fig. 2. Locations of Compensators. Top of chassis.



MODEL 38-116, Code 121
Schematic

TELEV. CORP.



the
rary

in broadcast position.

For a weak signal, and turn the indicator to 100V K. C. when adjust the receiver dial for maximum output at this frequency.

AREA INDICATES RING AT REAR OF SWITCH WAFER.
ED AREA INDICATES RING AT FRONT OF SWITCH WAFER.
R: INDICATE POSITION OF SWITCH WAFERS FROM REAR OF CHASSIS, (BOTTOM VIEW)

Model 38-116, Code 121
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Alignment of Compensators

EQUIPMENT REQUIRED: (1) Signal Generator, having a fundamental frequency range covering the tuning and intermediate frequencies of the receiver. Philco Model 077 Signal Generator which has a fundamental frequency range from 11.5 to 36000 K. C. is the correct instrument for this purpose; (2) Output Meter, Philco Model 926 Circuit Tester incorporates a sensitive output meter and is recommended; (3) Philco Fibre Handle Screw Driver, Part No. 27-7059 and Fibre Wrench, Part No. 3164.

OUTPUT METER: The 026 Output Meter is connected to the plate and cathode terminals of one of the 6L6G tubes. Adjust the meter to use the (0-30) volt scale and advance the attenuator control of the generator until a readable indication is noted on the output meter after signal is applied to stage being adjusted.

DIAL CALIBRATION: In order to adjust the compensators of this receiver correctly the dial must be aligned to track properly with the tuning condenser. To do this proceed as follows:

1. Loosen the set screws on the shaft coupling of the tuning condenser. Then turn the tuning condenser until the plates are in the maximum capacity position. Now turn the dial until the glowing beam indicator is on the Index Line at the low frequency end of the broadcast band. See Fig. 6. With dial and tuning condenser in this position tighten set screws.
2. Turn the tuning condenser control until the indicator is on the 520 K.C. mark. See Fig. 6.
3. With the dial in this position, loosen the shaft coupling set screws. Then turn the dial until the indicator is again on the Index Line. Tighten the set screws in this position.

NOTE: Be careful when turning the dial that the position of the tuning condenser is not disturbed.

INTERMEDIATE FREQUENCY CIRCUIT

1. Viewing each instrument from the front, set the receiver and Signal Generator controls as follows:

- a. Selectivity-fidelity control (clockwise)
- b. Volume Control at maximum (clockwise)
- c. Magnetic Tuning switch (off)
- d. Bass Compensator switch first position from "off"
- e. Range Switch position one (broadcast)
- f. Receiver dial 580 K. C.
- g. Signal Generator indicator set at 470 K.C. and the "Attenuator" control for maximum output.

GLOWING BEAM INDICATOR

Fig. 6. Dial Calibration

2. Connect the Signal Generator output cable through a .1 mfd. condenser to the grid of the second 6K7G I. F. tube. Then adjust the I. F. compensators as follows:

- a. Close compensator (82B) by turning to the extreme clockwise position, then pad compensator (82A) for maximum output. Now readjust compensator (82B) for maximum output.
- b. Connect the Signal Generator output lead through the .1 mfd. condenser to the grid of the 6L7G tube, and adjust the following compensators for maximum output: (81D), (81C), (81A), (81B).
- c. Repeat (82A)—See Note A. Check for two equal peaks. Fidelity control in expanded position (counter-clockwise).

RADIO FREQUENCY CIRCUIT

1. Set the controls as given under "Intermediate Frequency Circuit" (a-b-c-d) and set the Range Switch, Signal Generator and Receiver Dials as given under the adjustments of each tuning range in the following procedure. Connect the Signal Generator output cable to the "Red" and "Blk" terminals on the aerial panel (rear of chassis). The ground connection of the cable should be connected to the "Blk" terminal.
2. Set the controls and adjust the compensators for maximum output as follows:

Tuning Ranges 530 to 1600 K. C.

Range Signal Generator Switch and Receiver Dial
Compensators in Order
Position 1 1500 K. C.
Position 2 1600 K. C.

See Note B

- (43)
(8), (23)

Compensators in Order

- (44)
(44A), (24)
(44), (9), (24)
(44A), (9A), (24A)
(44), (9), (24)

Compensators in Order

- (44B), (9B), (24B) Roll Tuning Condenser. See Note B
(44C), (9C), (24C)
(44B), (9B), (24B) Roll Tuning Condenser. See Note B

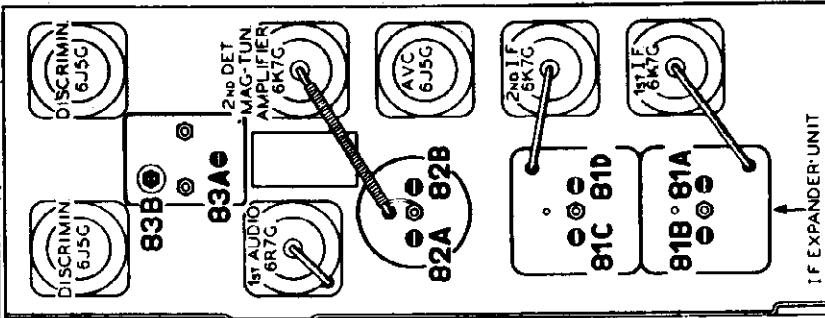
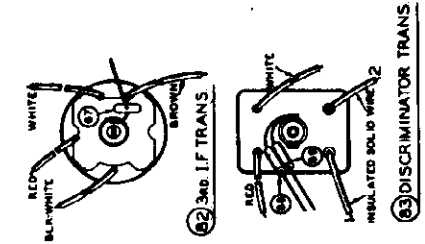


Fig. 7. I.F. Compensators



- Position 1 1500 K. C.
Position 1 1400 K. C.

Tuning Range 4.7 to 7.4 M. C.
Signal Generator and Receiver Dial

- Position 3 7.0 M. C.
Position 3 5.0 M. C.
Position 3 7.0 M. C.
Position 3 5.0 M. C.
Position 3 7.0 M. C.

Tuning Range 7.35 to 11.6 M. C.
Signal Generator and Receiver Dial

- Position 4 11.0 M. C.
Position 4 7.5 M. C.
Position 4 11.0 M. C.
Position 4 7.5 M. C.
Position 4 11.0 M. C.

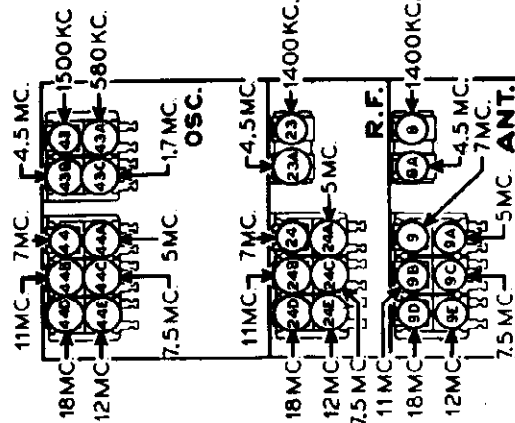
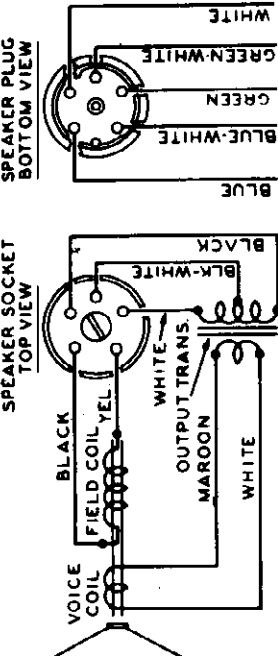


Fig. 8. R.F. Compensator Underneath of Chassis



MODEL 38-116, Code 121
Alignment, Part 2
Voltage

PHILCO RADIO & TELEV. CORP.

Aerial Connections

To obtain the full advantage of the sensitivity of this receiver the Philco High Efficiency Aerial supplied with the instrument must be used. Connect the aerial as follows: the "Red" and "Blk" terminals respectively. Connect the "Gnd" terminal to a good ground source. If a temporary aerial is used, connect it to the "Red" terminal.

The aerial terminal panel located on the rear of the chassis, contains three terminals marked "Red," "Blk" and "Gnd". Connect the red and black wires of the aerial lead in (Transmission Line) to

NOTE: The receiver dial **MUST** be tuned very accurately to the 1000 K. C. signal in order to make the following adjustments correctly.

e. After adjusting the receiver dial, turn the Magnetic Tuning switch "on."

f. Now, turn compensator (83B) slightly to the right or left (about 1/4 turn) and proceed with adjustment "g."

g. Adjust compensator (83A) primary of the discriminator transformer for **minimum** output; then readjust compensator (83B) secondary of discriminator transformer for **maximum** output.

The above adjustments are now checked for accuracy as follows:

- Frequency Test:**
With the 1000 K. C. signal tuned for maximum output turn the Magnetic Tuning control back and forth; that is, from the "out" to "in" position. The reading of the output meter should not change in either position. If the output meter reading changes, the above magnetic tuning circuit adjustments should be repeated.
- Sensitivity Test:**
1. To check the magnetic tuning circuit for sensitivity, turn the magnetic tuning switch to the "off" position, and tune in the 1000 K. C. signal. Then adjust the "attenuator" control of the signal generator for a good audible signal. Approximately 20 volts on the output meter.
2. Now detune the signal (first above and then below the 1500 K. C. mark) to a point at which the signal is weakly heard. At each point turn the magnetic tuning control "on." When the control is turned on the signal should return to normal output strength. If the magnetic tuning circuit does not pull the signal into resonance, the primary compensator (83A) should be carefully readjusted.

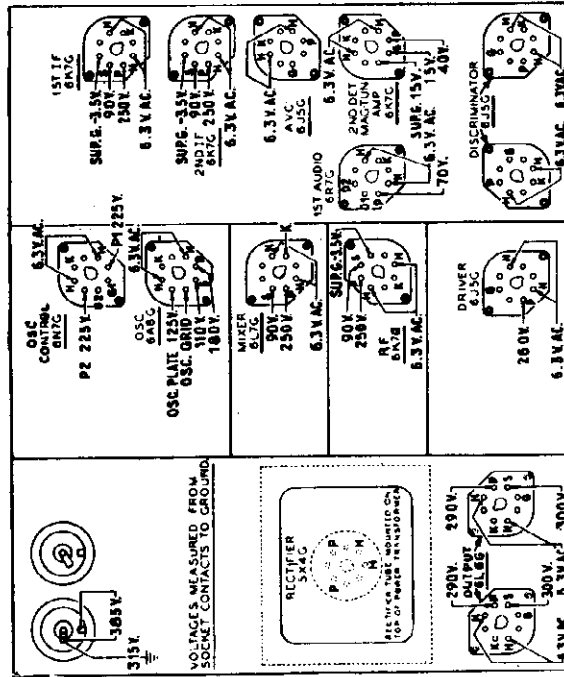


Fig. 1. Underside View of Chassis showing Socket Voltages
The voltages indicated by the arrows were measured with a Philco 926 Circuit Tester, which contains a sensitive voltmeter. Line voltage 115 A. C.—Volume control minimum—Dial set at point where no signal is present.—Range Switch in broadcast position.

- Tuning Range 1.58 to 4.75 M. C.**
- Range Switch and Receiver Dial
 - Position 2 4.5 M. C.
 - Position 2 1.7 M. C.
 - Position 2 4.5 M. C.
- Tuning Range 11.5 to 18.2 M. C.**
- Range Switch and Receiver Dial
 - Position 5 18.0 M. C.
 - Position 5 12.0 M. C.
 - Position 5 18.0 M. C.
- Position 5 12.0 M. C.
 - Position 5 18.0 M. C.

NOTE "A":—Slowly shift signal generator indicator between 460 and 480 K. C. As the indicator is turned, two peaks will be noted on the Output Meter; one about 465 K. C. and the other about 475 K. C. These peaks should give the same deflection or resting on the output meter. If the peaks are unequal Compensator (82A) must be slightly readjusted to the right or left (not more than 1/4 of a turn) until the peaks are equalized. This adjustment is used to compensate for slight differences between peaks. If the compensator must be turned more than 1/4 of a turn in either direction to equalize the peaks, all "B" and "C" adjustments should be carefully readjusted as given under "Intermediate Frequency Circuit" adjustment procedure. Each time the compensator is set in another position, rotate the signal generator through the 400 or 480 K. C. range and note the reading of each peak.

NOTE "B":—When adjusting the low frequency compensator of Range One (Broadcast) or the antenna and R. F. compensator of the high frequency tuning ranges; the receiver Tuning Condenser must be adjusted (rolled) as follows: First tune the compensator for maximum output, then vary the tuning condenser of the receiver for maximum output about the frequency dial mark. Now turn the compensator slightly to the right or left and vary the receiver tuning condenser for maximum output. If the output reading increases, turn the compensator in the same direction a trifle more, and again vary the tuning condenser for maximum output. If the output decreases set the compensator in the opposite direction. This procedure of first setting the compensator and then varying the tuning condenser is continued until there is no further gain in output reading.

NOTE "C":—To accurately adjust the high frequency oscillator compensator to the fundamental instead of the image signal, turn the oscillator compensator to the maximum capacity position (clockwise). From this position slowly turn the compensator counter-clockwise until a second maximum peak is obtained on the output meter. Adjust the compensator for maximum output using this second peak. The first peak from maximum capacity position of the compensator is the image signal and must not be used in adjusting the compensator.

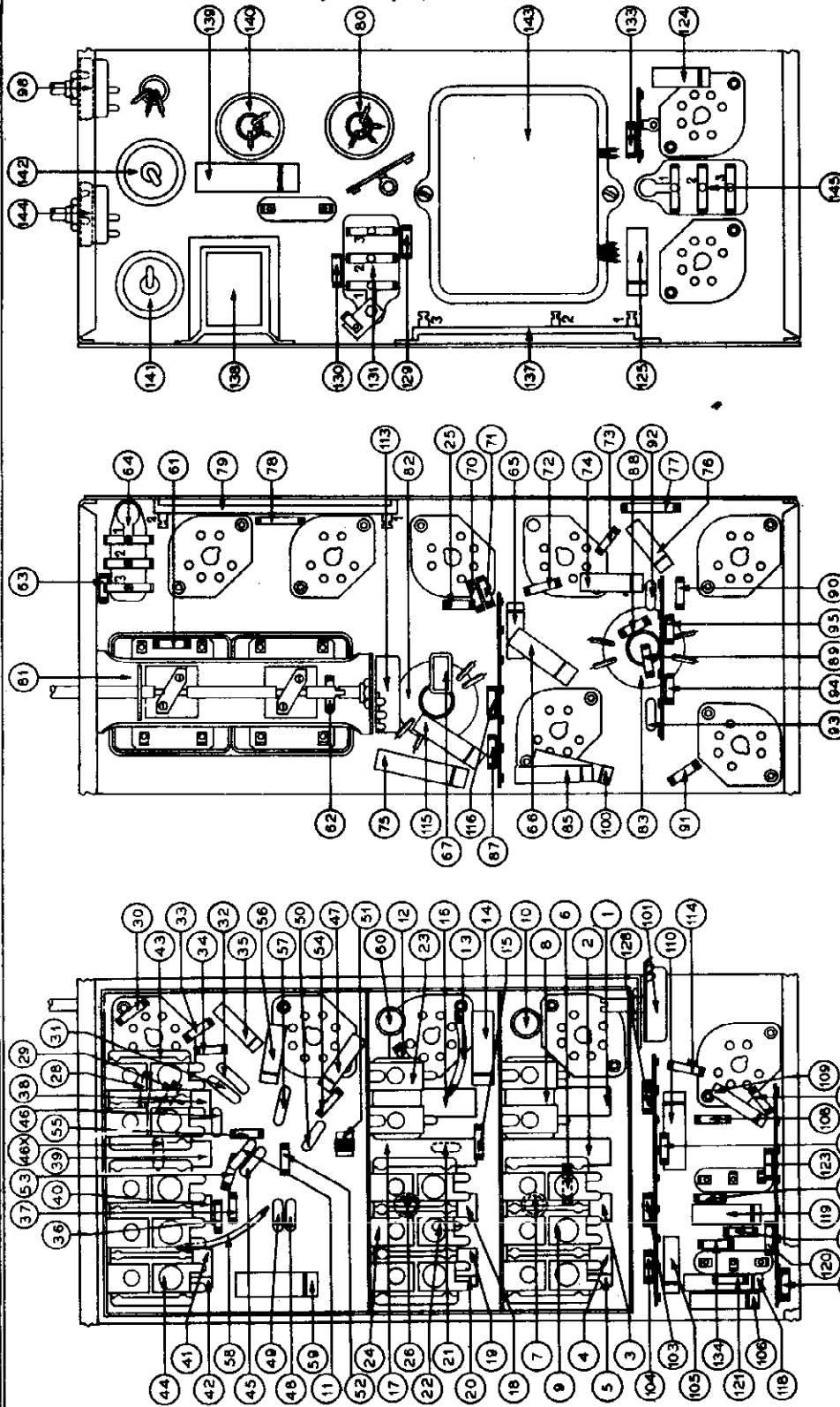
If the above procedure is correctly performed, the image signal will be found (much weaker) by turning the receiver dial 940 K. C. below the frequency being used on any high frequency range.

MAGNETIC TUNING CIRCUIT ADJUSTMENT

- a. Set the Magnetic Tuning switch in the "out" position (counter-clockwise).
- b. Volume control maximum (extreme clockwise).
- c. Turn Treble-Selectivity control to the expanded position (extreme clockwise).
- d. Now, adjust the "Attenuator" control of the signal generator for a weak signal, and turn the indicator to 1000 K. C. Then adjust the receiver dial for maximum output at this frequency.

PHILCO RADIO & TELEV. CORP. Chassis, Notes

PHILCO TUBES USED: 6K7G R.F.; 6L7G Mixer; 6A8G Oscillator; 6N7G Oscillator control; two 6K7G I. F.; 6K7G 2nd Detector Magnetic tuning amplifier; two 6J5G discriminator; 6J5G A. V. C.; 6R7G 1st audio; 6J5G audio driver; two 6L6G audio output, and one 5X4G rectifier.



FREQUENCY RANGES:

- Range One 530 to 1600 K.C.
- Two 1.58 to 4.75 M.C.
- Three 4.7 to 7.4 M.C.
- Four 7.35 to 11.6 M.C.
- Five 11.5 to 18.2 M.C.

UNDISTORTED OUTPUT:
15 watts.

CABINET: Type XX.

Fig. 2. Underside View of Chassis
Different transformers are required for operation on the voltages and frequencies listed above. The part numbers for these transformers are listed on page 5. A special transformer for operation on either 115 or 230 volt—50 to 60 cycle A.C. power circuit can be obtained. This transformer is provided with a plug and socket for selection of either voltage rating. Place the plug with arrow pointing toward voltage being used.

PLCO SPEAKERS USED: One type "W4" with three acoustic clarifiers.

TONE CONTROLS: Two—1. High audio-frequency tone varied by Treble-Selectivity control.
2. Low audio-frequency tone varied by "Bass Tone Control," in the volume control circuit.

TYPE OF CIRCUIT: Model 38-116, code 121 employs a fifteen tube A.C. operated superheterodyne circuit with a spread-band dial having five tuning ranges covering a frequency range from 530 K.C. to 18.2 M.C.

Incorporated in this model are design features such as: magnetic tuning control on each tuning range; automatic volume control; treble-selectivity expander unit in the intermediate frequency circuit; audio bass compensation; acoustic clarifiers to eliminate cabinet resonance; special push-pull audio output circuit using 6L6G beam tubes; and the Philco automatic tuning mechanism.

POWER SUPPLY:	Voltage	Frequency Cycles	Power Consumption
	115	50 to 60	165 watts
	115	25 to 40	165 watts

REPLACEMENT PARTS—Models 38-116, Code 121

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Schem. No.	Part No.	Description	List Price	Schem. No.	Part No.	Description	List Price
1	32-2208	1 Ant. Trans. (Range 1)	\$1.20	77	33-260439	Resistor (6,000 1 watt)	2.00
2	32-2146	2 Ant. Trans. (Range 2)	1.20	78	33-370439	Resistor (70,000 1 watt)	1.80
3	32-2183	3 Ant. Trans. (Range 3)	1.20	79	33-3291	Resistor (14,000 wire wound)	1.30
4	32-2189	4 Ant. Trans. (Range 4)	1.20	80	30-2232	Condenser (Elec. 8—8.6 mf.)	1.40
5	32-2179	5 Ant. Trans. (Range 5)	1.20	81	30-2232	Condenser (Elec. 8—8.6 mf.)	2.50
6	33-331339	6 Resistor (51,000 1/2 watt)	1.20	82	38-9612	I. F. Expander Unit (For 1st and 2nd I. F. Trans. See Note)	10.00
7	33-331339	7 Resistor (51,000 1/2 watt)	1.20	83	32-2060	I. F. Transformer (3rd)	
8	30-4444	8 Condenser (.03 mf. tubular)	.40	84	32-2661	I. F. Transformer (3rd)	
9	31-6053	9 Condenser (.03 mf. tubular)	.40	85	30-1031	Discriminator Trans.	
10	31-6112	10 Condenser (.03 mf. tubular)	1.40	86	30-4456	110 mf. Condenser (Part of 83)	.20
11	30-4173	11 Condenser (.06 mf. tubular)	.20	87	33-520339	Condenser (.004 mf.)	.20
12	30-1049	12 Condenser (.600 mf. mica)	.25	88	33-520339	Condenser (.004 mf.)	.20
13	33-510339	13 Resistor (100k 1/2 watt)	.25	89	33-520339	Resistor (2 meg. 1/2 watt)	.20
14	33-1211	14 Resistor (400 ohms 1 watt wire wound)	.20	90	33-510339	Resistor (2 meg. 1/2 watt)	.20
15	33-1211	15 Resistor (400 ohms 1 watt wire wound)	.20	91	33-510339	Resistor (2 meg. 1/2 watt)	.20
16	33-10339	16 Resistor (10,000 ohms 1/2 watt)	1.00	92	30-1031	Condenser (.110 mf. mica)	.20
17	32-2147	17 R. F. Trans. (Range 1)	.70	93	30-1031	Condenser (.110 mf. mica)	.20
18	32-2147	18 R. F. Trans. (Range 2)	.70	94	33-449339	Resistor (490,000 ohms, 1/2 watt)	.20
19	32-2178	19 R. F. Trans. (Range 3)	.70	95	33-449339	Resistor (490,000 ohms, 1/2 watt)	.20
20	32-2178	20 R. F. Trans. (Range 4)	.70	96	30-4466	Condenser (.1—1—7 mf.)	1.40
21	30-1077	21 Condenser (3 mmf. mica)	.20	97	42-1216	Flood Light	.75
22	30-1076	22 Condenser (40 mmf. mica)	.20	98	34-2064	A. F. C. Shorting Switch (Part of Mech. Tuner)	.09
23	31-8065	23 Compensator (R. F. Range 1 & 2 Ant.)	1.40	99	45-2330	A. F. C. Shorting Switch (Part of Mech. Tuner)	1.20
24	31-9113	24 Compensator (R. F. Range 3, 4, & 5)	1.40	100	30-4169	Volume Control	.20
25	33-351339	25 Resistor (31,000 1/2 watt)	.20	101	33-5158	Volume Control	1.00
26	31-1882	26 Tuning Condenser	3.75	102		Tuner—See parts (8) and (16) Bulletin 273	
27	33-026339	27 Resistor (20 ohms, 1/2 watt)	.20	103	33-370339	Resistor (70,000 ohms, 1/2 watt)	.20
28	33-026339	28 Resistor (20 ohms, 1/2 watt)	.20	104	33-520339	Resistor (2 meg. 1/2 watt)	.20
29	33-170339	29 Resistor (700 ohms, 1/2 watt)	.20	105	30-4112	Condenser (.008 mf. tubular)	.20
30	30-1032	30 Condenser (.250 mf. mica)	.25	106	33-449339	Resistor (490,000 ohms, 1/2 watt)	.20
31	33-398339	31 Resistor (98,000 ohms, 1/2 watt)	.20	107	33-322339	Resistor (32,000 ohms, 1/2 watt)	.20
32	33-398339	32 Resistor (98,000 ohms, 1/2 watt)	.20	108	30-4456	Condenser (.004 mf. tubular)	.25
33	30-4481	33 Condenser (.02 mf. tubular)	.20	109	33-351339	Resistor (35,100 ohms, 1/2 watt)	.20
34	33-280339	34 Resistor (8,000 ohms, 1/2 watt)	.20	110	33-351339	Resistor (35,100 ohms, 1/2 watt)	.20
35	33-320339	35 Resistor (20,000 1/2 watt)	.20	111	33-399339	Resistor (39,900 ohms, 1/2 watt)	.20
36	32-2191	36 Osc. Trans. (Range 1)	1.00	112	33-399339	Resistor (39,900 ohms, 1/2 watt)	.20
37	32-2194	37 Osc. Trans. (Range 2)	1.00	113	33-5235	Patentometer	.20
38	32-2197	38 Osc. Trans. (Range 3)	.70	114	33-433339	Resistor (530,000 ohms, 1/2 watt)	.20
39	32-2198	39 Osc. Trans. (Range 4)	.70	115	30-4481	Condenser (.02 mf. tubular)	.20
40	32-2199	40 Osc. Trans. (Range 5)	.70	116	35-510339	Resistor (51,000 1/2 watt)	.20
41	31-6124	41 Compensator (Range 1 & 2 Osc.)	1.00	117	32-7865	Input Trans.	.20
42	31-6124	42 Compensator (Range 3, 4 & 5 Osc.)	1.20	118	30-4518	Condenser (.05 mf. tubular)	.20
43	30-1032	43 Condenser (.250 mf. mica)	.25	119	30-4518	Condenser (.05 mf. tubular)	.20
44	30-1049	44 Condenser (.500 mf. mica)	.25	120	33-399339	Resistor (39,900 ohms, 1/2 watt)	.20
45	30-1049	45 Condenser (.500 mf. mica)	.25	121	33-310339	Resistor (31,000 1/2 watt)	.20
46	30-1067	46 Condenser (.01 mf. tubular)	.20	122	33-310339	Resistor (31,000 1/2 watt)	.20
47	30-1067	47 Condenser (.01 mf. tubular)	.20	123	33-399339	Resistor (39,900 ohms, 1/2 watt)	.20
48	30-1045	48 Condenser (.25 mmf. mica)	.20	124	30-4481	Condenser (.02 mf. tubular)	.20
49	30-1078	49 Condenser (.200 mf. mica)	.25	125	30-4189	Condenser (.02 mf. tubular)	.20
50	32-2242	50 Choke (R. F.)	.30	126	30-7751	Output Trans.	.35
51	33-376339	51 Resistor (75,000 1/2 watt)	.20	127	36-3647	Cone and Voice Coil Assembly	2.50
52	33-320339	52 Resistor (20,000 1/2 watt)	.20	128	33-449339	Resistor (490,000 1/2 watt)	2.00
53	33-320339	53 Resistor (20,000 1/2 watt)	.20	129	33-351339	Resistor (35,100 1/2 watt)	2.50
54	33-322339	54 Resistor (32,000 1/2 watt)	.20	130	33-320339	Resistor (32,000 1/2 watt)	.20
55	33-310339	55 Resistor (31,000 1/2 watt)	.20	131	4893DG	Field Coil Assembly	15.00
56	33-310339	56 Resistor (31,000 1/2 watt)	.20	132	36-3788	Field Coil Assembly	15.00
57	33-1219	57 Resistor (10 ohms wire wound)	.20	133	33-020339	Resistor (20 ohms, 1/2 watt)	.20
58	33-3121	58 Resistor (300 ohms, wire wound)	.25	134	33-20339	Resistor (2,000 ohms, 1/2 watt)	.20
59	30-4123	59 Condenser (.05 mf. tubular)	.20	135	33-20339	Resistor (2,000 ohms, 1/2 watt)	.20
60	33-210339	60 Resistor (21,000 ohms, 1/2 watt)	.20	136	33-20339	Resistor (2,000 ohms, 1/2 watt)	.20
61	33-210339	61 Resistor (21,000 ohms, 1/2 watt)	.20	137	33-7050	Resistor (4,000—1,000 ohms, wire wound)	2.20
62	33-210339	62 Resistor (21,000 ohms, 1/2 watt)	.20	138	33-3290	Choke (400 ohm)	.50
63	33-150339	63 Resistor (15,000 ohms, 1/2 watt)	.20	139	33-7772	Condenser (.3 mf. tubular)	1.20
64	4893SG	64 Condenser (.1 mf. Bakelite)	.35	140	30-4455	Condenser (.3 mf. tubular)	.25
65	30-4514	65 Condenser (.01 mf. tubular)	.20	141	30-2026	Elac. Cond. (8—10 mf.)	1.75
66	30-4499	66 Condenser (.01 mf. tubular)	.20	142	30-2026	Elac. Cond. (8 mf.)	1.05
67	30-1031	67 Condenser (.110 mf. mica)	.20	143	33-7686	Power Transformer (115 V., 50 to 60 cycle)	7.50
68	30-1031	68 Condenser (.110 mf. mica)	.20	144	33-7700	Power Transformer (115 V., 25 to 40 cycle)	32-7700
69	33-351339	69 Resistor (31,000 ohms, 1/2 watt, Part of 82)	.20	145	33-7701	Power Transformer (115/220 V., 50 to 60 cycle)	32-7701
70	33-510339	70 Resistor (51,000 ohms, 1/2 watt)	.20	146	42-1196	Power and Tone Switch	80.75
71	33-510339	71 Resistor (51,000 ohms, 1/2 watt)	.20		3793DG	Condenser (.015—015 Bakelite)	.40
72	33-220339	72 Resistor (22,000 ohms, 1/2 watt)	.20				
73	33-220339	73 Resistor (22,000 ohms, 1/2 watt)	.20				
74	30-4444	74 Condenser (.05 mf. tubular)	.20				
75	30-4518	75 Condenser (.05 mf. tubular)	.20				
76	30-4444	76 Condenser (.05 mf. tubular)	.20				

MISCELLANEOUS MOUNTING PARTS

Bolt (Mtg. Speaker)	W-862	.01
Bushing (Mtg. R. F. Unit)	28-2257	.01
Clip (Volume Shaft Front Section)	28-4394	.15
Cover (Back of Cabinet)	27-8866	.08
Felt (Mtg. Speaker)	27-8408	
Rubber Grommet (Mtg. R. F. Unit)	27-4317	
Rubber Bushing (Mtg. Chassis)	27-4202	
Rubber Bushing (Mtg. Chassis)	27-4390	
Rubber Cushion (Mtg. Chassis)	3358	
Pin (I. F. Shaft)	3014	
Screw (Mtg. R. F. Unit Rear Section)	W-729	
Screw (I. F. Cord Clamp)	W-1324	
Screws (Back Cover, Cabinet)	W-1803	
Snap Fastener (Range Switch Coupling)	28-4279	
Spacer (Mtg. R. F. Unit)	27-7807	
Spring (Retaining I. F. Shaft Front Section)	28-8010	
Spring Clip (I. F. Shaft, Rear Section)	28-4117	per C. 40
Washer—Flat—(I. F. Shaft)	W-174	
Washer (Mtg. R. F. Unit)	28-3937	.01
Washer—Spring—(Mtg. I. F. Shaft)	28-4186	per C. 75

*These Automatic Tuning Mechanism Parts differ from those shown in Service Bulletin 273.

†I. F. Transformer Section

‡Pilot and Floodlight Socket Assembly, 3 Sockets. Used on later type receivers.

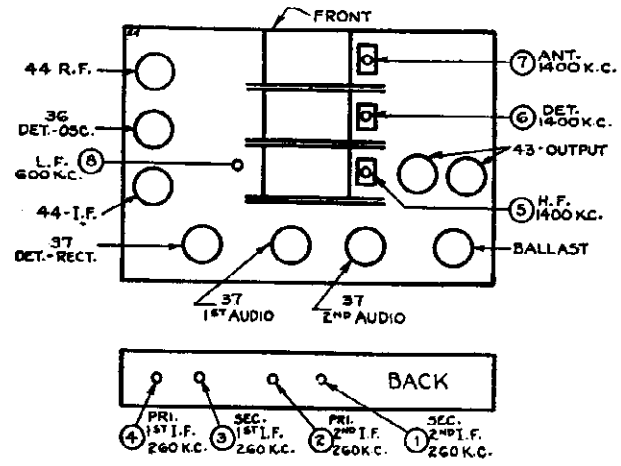
MODEL 47
MODEL 48
MODELS 90, 90A (with 1-47)
Alignment, Trimmers

PHILCO RADIO & TELEV. CORP.

MODEL NO. 47

Signal Generator Connection	Signal Generator Frequency	Dial Position	Wave Band Switch Position	Trimmer Number	Output Signal
Remove grid clip from det.-osc.					
Control grid of det.-osc.	260 k.c.	60	...	1 ¹	Max.
"	"	"	...	2 ¹	Max.
"	"	"	...	3 ¹	Max.
"	"	"	...	4 ¹	Max.
Connect grid clip to det.-osc.					
Ant.*	1400 k.c.	140	...	5	Max.
"	"	"	...	6	Max.
"	"	"	...	7	Max.
"	600 k.c.	60	...	8 ²	Max.**
"	1400 k.c.	140	...	5	Max.

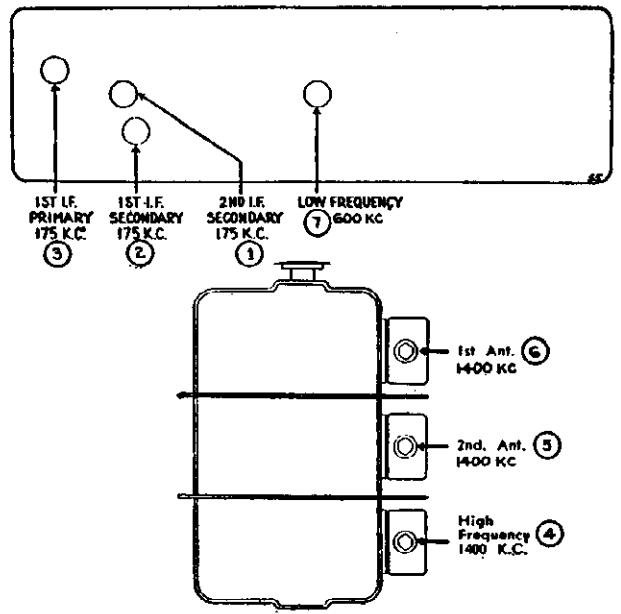
Note 1.—Accessible through holes in rear of chassis.
 Note 2.—Accessible through hole from top of chassis.
 * Connect a 200-mmf. condenser between signal generator and antenna post of set, at the antenna post.
 ** Adjust while rocking.



MODEL NO. 48

Signal Generator Connection	Signal Generator Frequency	Dial Position	Trimmer Number	Output Signal
Remove grid clip from det.-osc.				
Control grid of det.-osc.	175 k.c.	60	1	Max.
"	"	"	2	Max.
"	"	"	3	Max.
Connect grid clip to det.-osc.				
Ant.*	1400 k.c.	140	4	Max.
"	"	"	5	Max.
"	600 k.c.	60	7	Max.
"	1400 k.c.	140	4	Max.

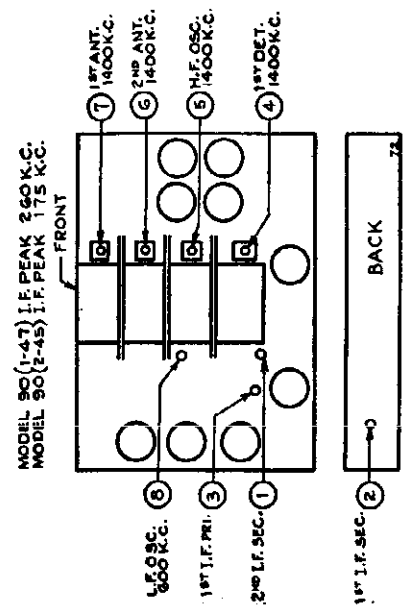
* Connect a 200-mmf. condenser between signal generator and antenna post of set, at the antenna post.



MODEL NOS. 90, 90A, (with 1-47)

Signal Generator Connection	Signal Generator Frequency	Dial Position	Wave Band Switch Position	Trimmer Number	Output Signal
Remove grid clip from 1st det.					
Control grid of 1st det.	Note 1	55	...	1	Max.
"	"	"	...	2	Max.
"	"	"	...	3	Max.
Connect grid clip to 1st det.					
Ant.*	1400 k.c.	140	...	5	Max.
"	"	"	...	4	Max.
"	"	"	...	6	Max.
"	600 k.c.	60	...	7	Max.
"	1400 k.c.	140	...	8	Max.**
"	1400 k.c.	140	...	5	Max.

* Connect a 200-mmf. condenser between signal generator and antenna post of set, at the antenna post.
 ** While rocking.
 Note 1.—175 k.c. for models with two 45 and 260 k.c. for models with one 47.



MODEL 70 (Below Ser.#B22,000)

270

PHILCO RADIO & TELEV. CORP.

MODEL 80

MODEL 81

Alignment, Trimmers

MODEL NOS. 70 (below ser. #B22,000), 270

Signal Generator Connection	Signal Generator Frequency	Dial Position	Wave Band Switch Position	Trimmer Number	Output Signal
Remove grid clip from 1st det.					
Control grid of 1st det.	260 k.c.	55	...	1	Max.
"	"	"	...	2	Max.
"	"	"	...	3	Max.
Connect grid clip to 1st det.					
Ant.*	1400 k.c.	140	...	4	Max.
"	"	"	...	5	Max.
"	"	"	...	6	Max.
"	600 k.c.	60	...	7	Max.**
"	1400 k.c.	140	...	4	Max.

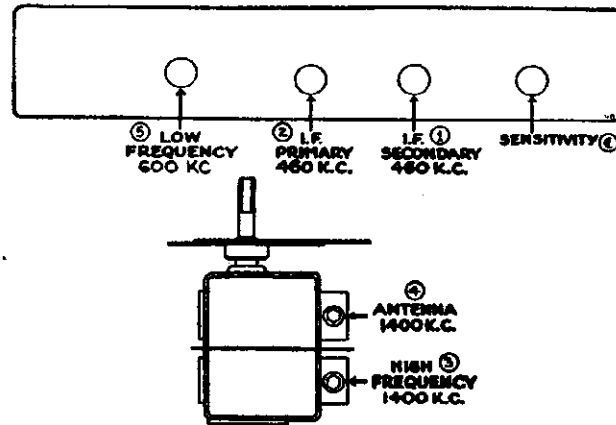
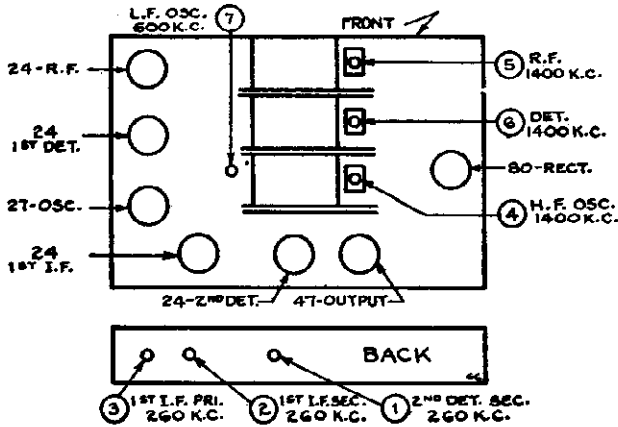
* Connect a 200-mmf. condenser between signal generator and antenna post of set, at the antenna post.
 ** While rocking.

MODEL NO. 80

Signal Generator Connection	Signal Generator Frequency	Dial Position	Wave Band Switch Position	Trimmer Number	Output Signal
Remove grid clip from det.-osc.					
Control grid of det.-osc.	460 k.c.	55	...	1	Max.
"	"	"	...	2	Max.
Connect grid clip to det.-osc.					
Ant.*	1400 k.c.	140	...	3	Max.
"	"	"	...	4	Max.
"	600 k.c.	60	...	5	Max.**
"	1400 k.c.	140	...	3	Max.**
Note 1	Note 1	Note 1	...	6	Note 1

* Use a 100-mmf. condenser as dummy antenna.
 ** While rocking.

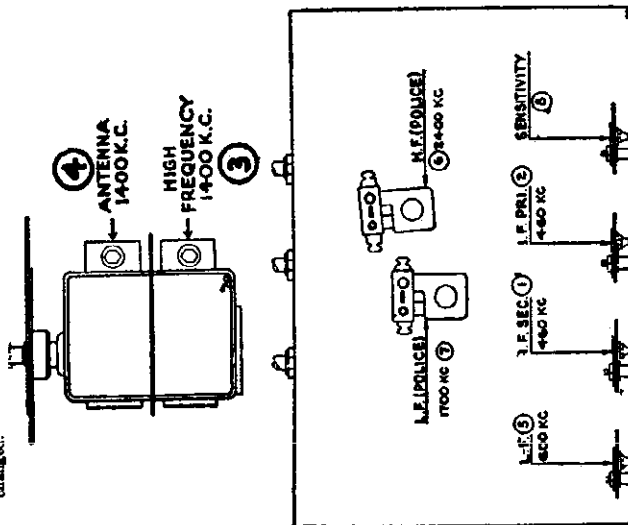
Note 1.—Connect antenna to receiver. Tune in station, first at about 130 and adjust (6) to a point just before squealing starts. Tune in stations along other points on dial. If squealing is present at any point readjust (6) slightly until there is none at any point along dial. This adjustment may have to be changed if set is moved to different location or if antenna length or 2nd det. tube is changed.



MODEL NO. 81

Signal Generator Connection	Signal Generator Frequency	Dial Position	Wave Band Switch Position	Trimmer Number	Output Signal
Remove grid clip from det.-osc.					
Control grid of det.-osc.	460 k.c.	55	Broadcast	1	Max.
"	"	"	"	2	Max.
Connect grid clip to det.-osc.					
Ant.*	1400 k.c.	140	"	3	Max.
"	"	"	"	4	Max.
"	600 k.c.	60	"	5	Max.**
"	1400 k.c.	140	"	3	Max.
"	2400 k.c.	2400 k.c.	Police	6	Max.
"	1700 k.c.	1700 k.c.	"	7	Max.
Note 1	Note 1	Note 1	Broadcast	8	Note 1

* Use a 100-mmf. condenser as dummy antenna.
 ** While rocking.
 Note 1.—Connect antenna to receiver. Tune in station, first at about 130 and adjust (6) to a point just before squealing starts. Tune in stations along other points on dial. If squealing is still present, back off (8) slightly until there is none at any point along dial. This adjustment may have to be changed if antenna length or 2nd det. tube are changed.



Alignment, Trimmers

PHILCO RADIO & TELEV. CORP.

MODELS 95, 96, 296
 MODEL 503
 MODEL 504
 MODEL 505

MODEL NOS. 95, 96, 296

MODEL NO. 505					
Signal Generator Connection	Signal Generator Frequency	Dial Position	Wave Band Switch Position	Trimmer Number	Output Signal
Remove grid clip from 6A7					
Control grid of 6A7	460 k.c.	55	Broadcast	1	Max.
"	"	"	"	2	Max.
"	"	"	"	3	Max.
Connect grid clip to 6A7					
Ant.*	"	"	"	Wave ¹ Trap	Min.
"	1400 k.c.	140	"	H.F. Osc. ²	Max.
"	600 k.c.	60	"	Ant. ²	Max.**
"	1400 k.c.	140	"	H.F. Osc.	Max.
"	Note 3	Low-freq. end	Police	5	Max.

Signal Generator Connection	Signal Generator Frequency	Dial Position	Trimmer Number	Output Signal
Ant.*	1300 k.c.	130	Det. ¹	Max.
"	"	"	3rd ¹	Max.
"	"	"	R.F.	Max.
"	"	"	2nd ¹	Max.
"	"	"	R.F.	Max.
"	"	"	Ant. ¹	Max.

Note 1.—Located on top of chassis, behind gang condenser and between r.f. coil shields.

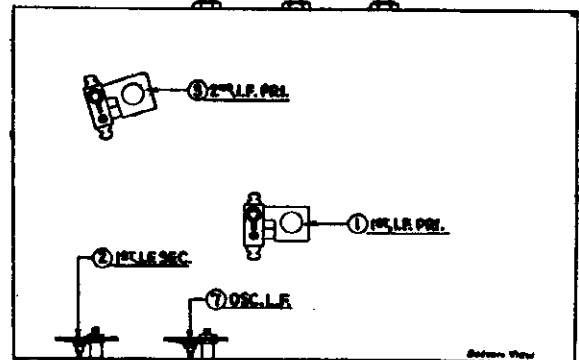
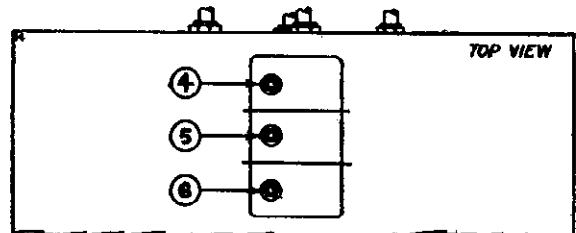
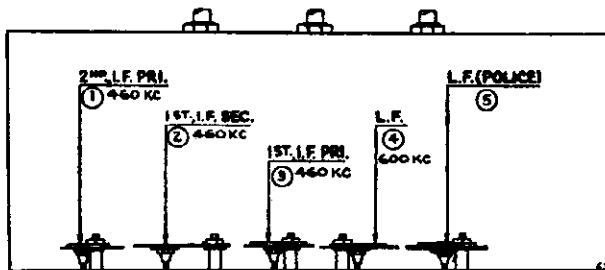
* Connect a 200-mmf. condenser between the signal generator and the antenna post of the set, at the antenna post.

Note 1.—Wave trap in series with antenna was not used on early production.
 Note 2.—H.F. osc. and ant. trimmers are located on tuning-condenser frame—the ant. trimmer is nearest front of chassis.
 Note 3.—Set signal generator frequency to same as point on dial chosen near low frequency end. Adjustment of (5) will correct the dial calibration.
 * Connect a 200-mmf. condenser between signal generator and antenna post of set, at the antenna post.
 ** While rocking.

MODEL NO. 503

Signal Generator Connection	Signal Generator Frequency	Dial Position	Wave Band Switch Position	Trimmer Number	Output Signal
Remove grid clip from 6A7					
Control grid of 6A7	260 k.c.	55	...	3	Max.
"	"	"	...	2	Max.
"	"	"	...	1	Max.
Connect grid clip to 6A7					
Ant.**	1500 k.c.	150	...	6	Max.
"	1400 k.c.	140	...	5	Max.
"	1400 k.c.	"	...	4	Max.
"	600 k.c.	60	...	7	Max.*
"	1500 k.c.	150	...	8	Max.

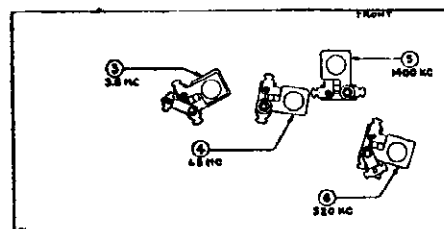
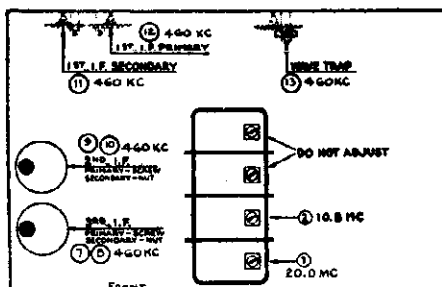
* While rocking.
 ** Connect a 200-mmf. condenser between signal generator and antenna post of set, at antenna post.



MODEL NO. 504

Signal Generator Connection	Signal Generator Frequency	Dial Position	Wave Band Switch Position	Trimmer Number	Output Signal
Remove grid clip from 6A7					
Control grid of 6A7	460 k.c.	520 k.c.	Range 1	7 ¹	Max.
"	"	"	"	8 ²	Max.
"	"	"	"	9 ¹	Max.
"	"	"	"	10 ²	Max.
"	"	"	"	11	Max.
"	"	"	"	12	Max.
Connect grid clip to 6A7					
Ant.*	"	"	"	13	Min.
"	20 m.c.	20 m.c.	Range 4	1	Max.
"	10.8 m.c.	10.8 m.c.	Range 3	2	Max.
"	3.6 m.c.	3.6 m.c.	Range 2	3	Max.
"	1500 k.c.	1.5 m.c.	"	4	Max.
"	1400 k.c.	1400 k.c.	Range 1	5	Max.
"	520 k.c.	520 k.c.	"	6	Max.

* Use a 200-mmf. condenser as dummy antenna on broadcast band and a 400-ohm carbon resistor on shortwave band.
 Note 1.—Nut adjustment.
 Note 2.—Screw adjustment.
 Caution: The two trimmers on the rear sections of the tuning condenser gang are correctly adjusted and sealed at the factory. Do not change this adjustment.



MODEL 98

Chassis, Parts

PHILCO RADIO & TELEV. CORP.

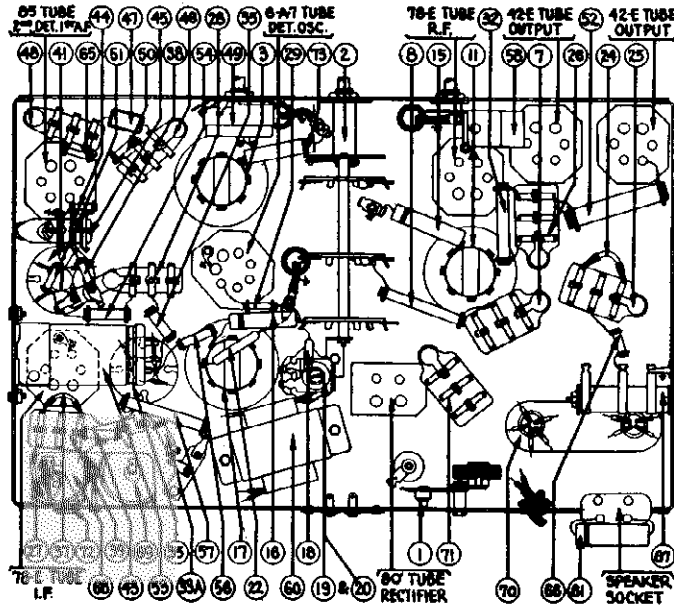


Fig. 3. Bottom View of Chassis

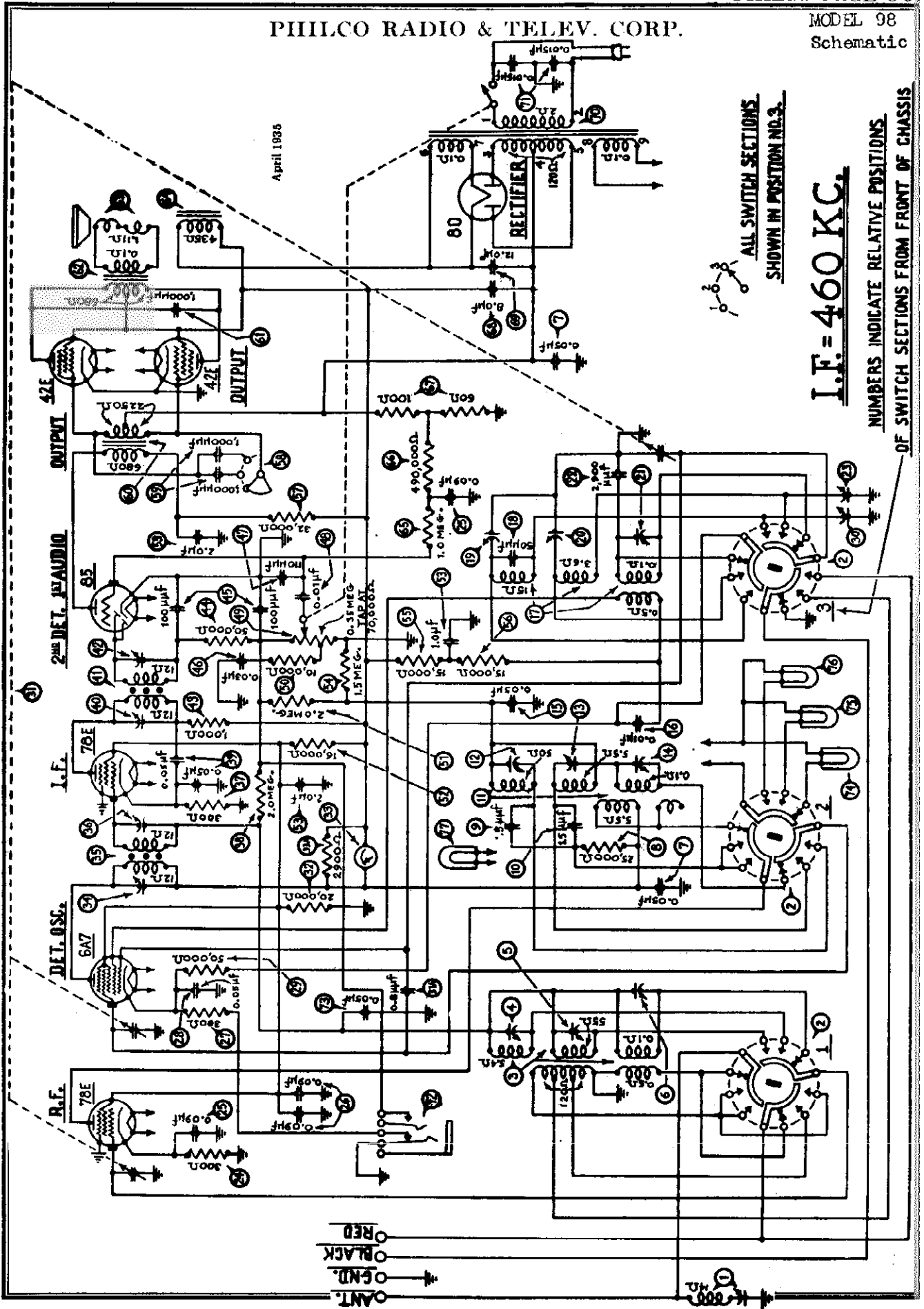
Description	Part No.
1 Wavetrap	38-6718
2 Waveband Switch	42-1106
3 Ant. Transformer	32-1664
4 Compensating Condenser (Ant., Medium Wave)	Part of 3
5 Compensating Condenser (Ant., Long Wave)	Part of 3
6 Compensating Condenser (Ant., Short Wave)	Part of 3
7 Condenser (.05 Mfd. Twin Bakelite Block)	3615-DG
8 Resistor (25000 ohms) (Red, Green, Orange)	3656
9 Condenser (.0000015 Mfd.)	Part of 11
10 Condenser (.0000015 Mfd.)	Part of 11
11 R.F. Transformer	32-1666
12 Compensating Condenser (R.F. Long Wave)	Part of 11
13 Compensating Condenser (R.F. Medium Wave)	Part of 11
14 Compensating Condenser (R.F. Short Wave)	Part of 11
15 Condenser (.05 Mfd. Tubular)	30-4020
16 Condenser (.01 Mfd. Tubular)	30-4169
17 Oscillator Transformer	32-1665
18 Condenser (.00005 Mfd. Mica)	30-1029
19 Compensating Condenser (Osc., Long Wave Series)	31-6044
20 Compensating Condenser (Osc., Medium Series)	31-6044
21 Compensating Condenser (Osc., Short Wave)	Part of 17
22 Condenser (.0029 Mfd. Mica)	30-1054
23 Compensating Condenser (Osc., Medium H.F. End)	Part of 17
24 Resistor (300 ohms Flexible) (Orange, Black, Brown)	33-3010
25 Condenser (.09 Mfd. Twin Bakelite Block)	4989-DG
26 Condenser (.09 Mfd. Twin Bakelite Block)	4989-DG
27 Resistor (300 ohms Flex.) (Orange, Black, Brown)	33-3010
28 Condenser (.05 Mfd. Bakelite Block)	3615-SG
29 Resistor (50000 ohms) (Green, Brown, Orange)	6098

Description	Part No.
30 Compensating Condenser (Osc., Long Wave, H.F. End)	Part of 17
31 Tuning Condenser Assembly	31-1362
31A Condenser (.8 Mmfd.)	Part of 31
32 Resistor (20000 ohms) (Red, Black, Orange)	6649
33 Shadow Tuning Meter	45-2028
33A Resistor (2900 ohms) (Red, White, Red)	5309
34 Compensating Condenser (1st I.F. Pri.)	Part of 36
35 First I.F. Transformer	32-1631
36 Compensating Condenser (1st I.F. Sec.)	Part of 35
37 Resistor (300 ohms Flex.) (Orange, Black, Brown)	33-3010
38 Resistor (2 Megs.) (Red, Black, Green)	33-1172
39 Condenser (.05 Mfd. Twin Bakelite Block)	3615-DG
40 Compensating Condenser (2nd I.F. Pri.)	Part of 41
41 2nd I.F. Transformer	32-1632
42 Compensating Condenser (2nd I.F. Sec.)	Part of 41
43 Resistor (1000 ohms) (Brown, Black, Red)	5837
44 Resistor (50000 ohms) (Green, Brown, Orange)	6098
45 Condenser (.00011 Mfd. Twin Bakelite Block)	8035-DG
46 Condenser (.03 Mfd. Bakelite Block)	6287-P
47 Condenser (.00011 Mfd. Mica)	30-1031
48 Condenser (.01 Mfd. Bakelite Block)	3903-SU
49 Volume Control & On-Off Switch	33-5102
50 Resistor (10000 ohms) (Brown, Black, Orange)	33-1000
51 Resistor (2 Megs.) (Red, Black, Green)	33-1172
52 Resistor (16000 ohms) (Brown, Blue, Orange)	7500
53 Condenser (Electrolytic, 1 Mfd., 2 Mfd., 2 Mfd.)	30-2114
54 Resistor (1.5 Meg.) (Brown, Green, Green)	7009
55 Resistor (15000 ohms) (Brown, Green, Orange)	6208
56 Resistor (15000 ohms) (Brown, Green, Orange)	6208
57 Resistor (32000 ohms) (Orange, Red, Orange)	3525
58 Tone Control	30-4311
59 Condensers (in Tone Control)	Part of 58
60 Input (Audio) Transformer	32-7372
61 Condenser (.001 Mfd. Tubular)	30-4201
62 Output Transformer (on Speaker)	2585
63 Voice Coil & Cone Assembly	{ K-31 36-3174 H-21 02625
64 Field Coil & Pot Assembly	{ K-31 36-3463 H-21 36-3461
65 Resistor (1 Meg.) (Brown, Black, Green)	33-1171
66 Resistor (490000 ohms) (Yellow, White, Yellow)	33-1169
67 Resistor (Wirewound Porcelain Base, 60 ohms, 100 ohms)	33-3208
68 Condenser (Electrolytic, 8 Mfd.)	30-2025
69 Condenser (Electrolytic, 12 Mfd.)	30-2117
70 Power Transformer	{ 115 volts 60 cycles 32-7369 115 volts 25 cycles 32-7370 230 volts 50 cycles 32-7371
71 Condenser (.015 Mfd. Twin Bakelite Block)	3793-DG
72 Headphone Jack	6585
73 Condenser (.05 Mfd. Tubular)	30-4020
74 Dial Lamp (Long Wave Band)	34-2031
75 Dial Lamp (Medium Wave Band)	34-2031
76 Dial Lamp (Short Wave Band)	34-2031
77 Pilot Lamp for Shadow Tuning Meter	Part of 89
Tube Socket 4 Prong	27-6019
Tube Socket 6 Prong	27-6020
Tube Socket 7 Prong	27-6012
Socket (Speaker)	27-6018
Tube Shield Body	28-1107
Tube Shield Base	28-1110
Dial Assembly	31-1514
Electric Cord & Plug	L-943A

PHILCO RADIO & TELEV. CORP.

MODEL 98
Schematic

April 1935



ALL SWITCH SECTIONS
SHOWN IN POSITION NO. 3.

I.F. = 460 KC.

NUMBERS INDICATE RELATIVE POSITIONS
OF SWITCH SECTIONS FROM FRONT OF CHASSIS

MODEL 98

Alignment, Voltage
Trimmers

PHILCO RADIO & TELEV. CORP.

Adjusting Compensating Condensers

The adjustment of the compensating condensers in Model 98 requires a signal generator covering the broadcast and police band, and also one capable of producing a signal on several frequencies in the short wave band. We recommend the Philco model 024 or 048A instrument for the broadcast frequencies, and the Model 091 crystal controlled short wave signal generator for the "short wave" frequencies. The location of all compensating condensers is shown in Fig. 4.

Adjustment of I. F.

1. Remove the antenna connection from the receiver, disconnect the grid clip from the first detector (type 6A7 tube), and connect the "ANT" output terminal of the Model 048A or 024 signal generator to the grid cap of this tube; connect the "GND" terminal of the signal generator to the "GND" terminal of the receiver.
2. Connect the 0 to 20 volt range of the output meter in the Model 048A or 025 tester to the plate prongs of the two output (42E) tubes or to the two bottom prongs of the speaker plug.
3. Adjust the signal generator to a frequency of 460 K.C. Place the receiver in operation with the dial turned to the low frequency end of the scale, wave band switch to center position, and with the volume control adjusted near its maximum setting. Adjust the signal generator attenuator for approximately half-scale reading of the output meter.
4. The I.F. compensating condensers are located at the tops of the I.F. coil shields (smaller square top cans) and adjusted thru hole in top. The primary is adjusted by the screw, and the secondary by the nut. Adjust condensers ④ and ⑤ (2d I.F.) for maximum reading in the output meter, and then condensers ③ and ⑥ (1st I.F.).

Adjustment of Wave-Trap

Connect the signal generator leads to the antenna and ground terminals of the receiver. Replace the grid clip on the 6A7 grid cap.

With the signal generator still in operation at 460 K.C., adjust the wave-trap ① condenser until a MINIMUM reading is obtained on the output meter. The Philco fibre wrench, part No. 3164, is used for this adjustment.

Adjustment of High and Low Frequency Compensators

1. Leaving the output meter connected to the receiver connect the Philco Model 091 signal generator to the antenna and ground terminals of the chassis and place the signal generator in operation
2. Turn the wave-band switch to the extreme right (short-wave) and adjust the station selector to 18.0 megacycles, at which point the fifth harmonic of the 3600 K.C. signal will be heard. By means of the Philco wrench, part No. 3164, adjust the oscillator S.W., R.F.S.W. and antenna S.W. compensators for maximum reading in the output meter. These are numbered ⑩, ⑪ and ⑫, respectively in figure No. 2.
3. It will now be necessary to again use the broadcast type signal generator Models 024, 048 or equivalent. Connect the output of this signal generator to the antenna and ground terminals of the chassis. Turn the waveband switch to center position and set the station selector dial at 1700 K.C. Adjust the signal generator to the same frequency. Adjust the three compensators for the H.F. end of the broadcast (medium) scale. These are ⑬, ⑭ and ⑮.
4. Turn the dial to 60 and set the signal generator at 600 K.C. Adjust compensator ⑯ (nut) for maximum output.
5. Turn the waveband switch to the extreme left (long-wave) and set the dial at 30 and the signal generator at 300. Adjust condensers ⑰, ⑱ and ⑲ (oscillator, R.F. and antenna) for maximum output.
6. Turn the dial to 17 and set signal generator at 170. Adjust condenser ⑲ (screw) (long-wave series) for maximum output.

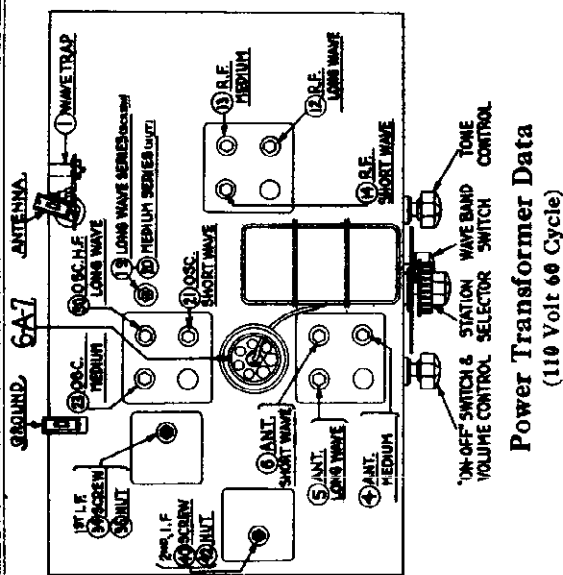


Fig. 4. Locations of Compensating Condensers

Power Transformer Data
(110 Volt 60 Cycle)

Terminals	A.C. Volts	Current	Circuit	Color
1-2	120	.....	Primary	White
3-5	710	118 M.A.	Secondary	Yellow
6-7	5.0	2.0 A.	Fil. Rect.	Blue
8-9	6.3	3.5 A.	Filaments	Black
4	.....	.....	Center Tap of 3-5	Yellow, Green Tracer

Tube Socket Voltages
Measured to Ground

78E R.F.	98	92	2.3	6A7: G. t. = 165.
6A7 Det. Osc.	246	92	2.5	
78E I.F.	250	92	2.3	
85 2d Det.	100	...	0	
47E Output	246	287	0	
Tube				
Plate Long & Medium Wave... Short Wave.....	98	260		
Screen Grid	92			
Cathode	2.3			

Above voltages were obtained by using a PHILCO type 025 Circuit Tester (or 048A All-purpose Tester), using test prods applied to underside of chassis. Volume control at maximum; dial at low frequency end.

PHILCO RADIO & TELEV. CORP.

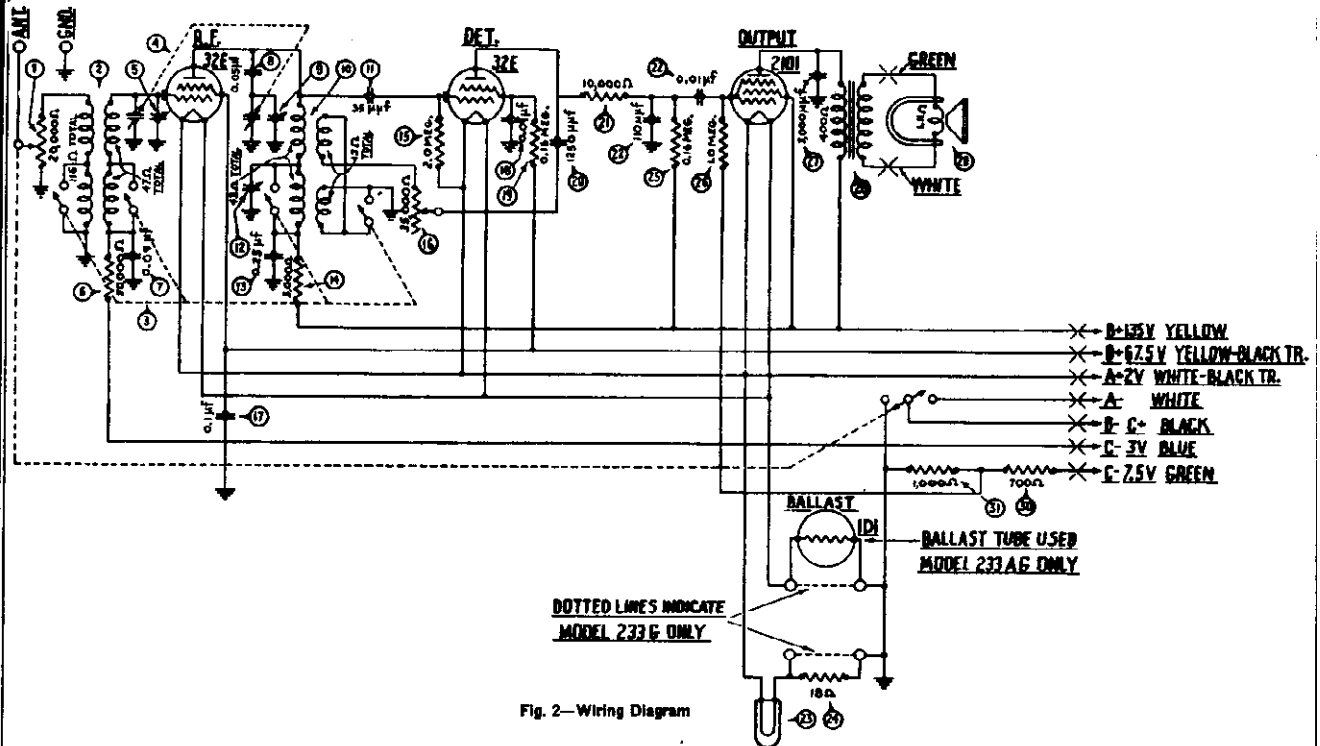


Fig. 2—Wiring Diagram

Replacement Parts for Model 233

Nos. on Diagram	Description	Part No.	Nos. on Diagram	Description	Part No.
①	Volume Control (20,000 ohms) & On-Off Switch	33-5075		Shorting Jumper Wire	38-6138
②	Antenna Transformer	32-1451		Speaker Cable	L-1729
③	Wave-Band Switch	42-1081		Battery Cable (233G)	41-3110
④	Tuning Condenser Assembly	31-1361		Battery Cable (233AG)	41-3111
⑤	Compensating Condenser (R. F.)	Part of ④		Pilot Lamp Bracket Assembly	38-6052
⑥	Resistor (50,000 ohms) (Green-Brown-Orange)	6098		Tube Shield	8C05
⑦	Condenser (.09 Mfd.) (Bakelite Block Type)	4989F			
⑧	Condenser (.05 Mfd.) (Tubular)	30-4020			
⑨	Compensating Condenser (Det.)	Part of ④			
⑩	Detector Transformer	32-1452			
⑪	Condenser (35 Mfd. Mica)	30-1055			
⑫	Compensating Condenser (Low Frequency)	04000E			
⑬	Condenser (.25 Mfd. Tubular)	30-4146			
⑭	Resistor (3,000 ohms) (Red-White-Red)	5309			
⑮	Resistor (2 Meg.) (Red-Black-Green)	33-1025			
⑯	Regeneration Control	33-5076			
⑰	Condenser (.1 Mfd. Tubular)	30-4122			
⑱	Condenser (.09 Mfd. Bakelite Block)	4989F			
⑲	Resistor (160,000 ohms) (Brown-Blue-Yellow)	5331			
⑳	Condenser (.00125 Mfd. Mica)	5888			
㉑	Resistor (10,000 ohms) (Brown-Black-Orange)	33-1000			
㉒	Condenser (.00011 Mfd. & .015 Mfd.)	8035D			
㉓	Pilot Lamp	5316			
㉔	Pilot Lamp Resistor*	33-3185			
㉕	Resistor (160,000 ohms) (Brown-Blue-Yellow)	5331			
㉖	Resistor (1 Meg.) (Brown-Black-Green)	33-1096			
㉗	Condenser (.003 Mfd. Tubular)	30-4042			
㉘	Output Transformer	32-7287			
㉙	Voice Coil and Cone Assembly (KR-8 Speaker)	36-3159			
㉚	Resistor (700 ohms)	6443			
㉛	Resistor (1,000 ohms)	33-3017			
㉜	Four Prong Socket	7545			
㉝	Five Prong Socket	27-6013			

*Shorted by Jumper wire on 233G. Jumper removed on 233AG.

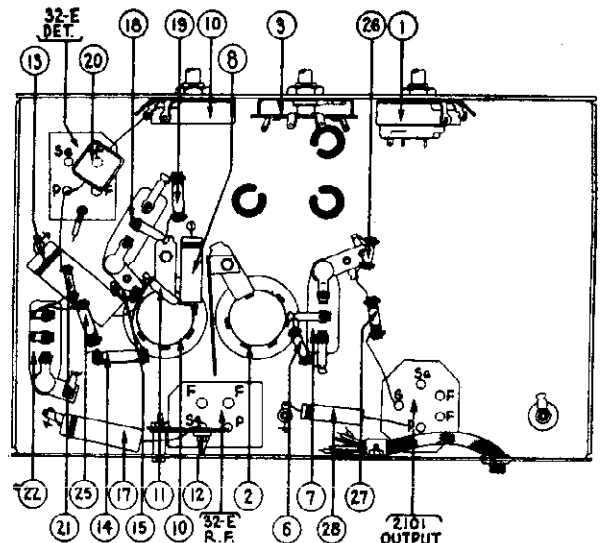


Fig. 3—Bottom of Chassis.

MODELS 264, 265
Voltage, Alignment
Trimmers
Transformer Data

PHILCO RADIO & TELEV. CORP.

MODELS 233G, 233AG
Alignment, Trimmers

Models 264 and 265

Philco Models 264 and 265 are five-tube superheterodyne radio receivers designed for operation on alternating current. The voltage and frequency for which each type of these models is intended is indicated on the chassis nameplate.

These receivers cover two bands or ranges of receivable frequencies: (1) Long waves or low frequency from 140 to 320 kilocycles (2140 to 935 meters), and (2) medium wave or standard (American) frequencies, from 540 to 1600 kilocycles (555 to 200 meters). A switch on the panel permits quick change from one to the other range.

The tubes used are: 1 type 6A7 detector-oscillator; 1 type 78-E intermediate frequency; 1 type 75 2d detector-1st A. F.; 1 type 42-E output, and 1 type 80 rectifier. The intermediate frequency is 125 kilocycles (K. C.) and the power consumption is 65 watts. The chief difference between Models 264 and 265 is that the latter is equipped with a shadow tuning meter and a phonograph jack.

Power Transformer Data
500 VOLT TYPE RECEIVER

Terminals	A. C. Volts	Circuit	Color
1-4	250	Primary	White
3-5	6.3	Filaments	Black
6-7	6.3	PI. of Rect.	Blue
8-10	500	Sec. High Vol.	Yellow
9	...	Center Tap of Sec.	Black-Yellow D.
4	...	Center Tap of 4-10	Yel.-Green Th.

Tube Socket Voltages*

6A7 Det.-Osc.	75 2d Det. A. F.	78-E Output
250	255	150
45	100	287
3.2	3.4	0

6A7, 75 to Grid, 78-E, 80 PI. to chassis 24.
*Values made with high resistance voltmeter. Refer to Fig. 1.

Models 233G and 233AG

Models 233G and 233AG are battery operated radio receivers covering a frequency range of 535 to 1510 kilocycles (standard wave) and 145 to 310 kilocycles (long wave). A two-position switch changes from one range to the other. The upper scale on the dial covers standard frequencies; the lower scale, low frequencies or long waves.

Model 233G is to be operated from a 2-volt storage (wet) cell for the filament voltage; model 233AG uses a dry battery for the filament supply. The 233AG requires the use of a ballast tube (in the socket provided on the chassis); in model 233G the ballast tube is not needed, and the jumper clip should be left across the two contacts of the ballast tube socket.

These sets use two type 32-E tubes,—one as radio frequency amplifier and one as detector—and one pentode output tube, type 210L.

Models 233G and 233AG utilize the regeneration or "reaction" circuit. This feature is controlled by the reaction control knob (see Fig. 1).

The filament current drain is 0.42 Ampere and the "B" or plate battery drain varies from 12 M. A. to 14 M. A.

Adjusting Compensating Condensers

There are three compensating condensers in these sets. Two are located on the top of the sections of the tuning condenser gang; and one underneath chassis and reached from the rear (thru hole in sub-base).

Connect the set up to the batteries and the antenna lead from signal generator to antenna post of set. Set signal generator at 1500 K.C. Turn wave-band switch to right and set dial at 150. (If set is removed from cabinet, obtain a piece of flat steel, .006" thick, about 1/2" wide and four or five inches long; open condenser gang and bring heel of detector section down on this steel strip; then remove the strip without disturbing setting of condenser gang).

Turn volume control full on and reaction control about 3/4 of the way to full on; then with a suitable hex wrench (such as Philco No. 3164) adjust condensers (A) and (B) (located on tuning condenser gang) to obtain maximum reading in the output meter, which should be connected to primary terminals of the output transformer.

While making the adjustment, advance the reaction control as far as possible without causing oscillation, working for maximum output on both condensers.

Now throw wave-band switch to left and turn dial to 300 K. C. (30 on lower scale of dial). In this position the condenser gang is approximately open. Now adjust condenser (C) (reached from rear) for maximum output, keeping the reaction control advanced as explained above, to just below point of oscillation.

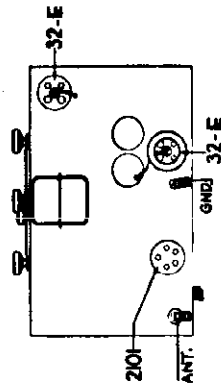


Fig. 1 - Tube Locations

Adjusting Compensating Condensers

H. F. and L. F. (long-wave band)—Turn wave-band switch to the left. Set signal generator at 300 and dial at 30 (lower scale). Adjust condenser (A) to give maximum response in output meter. This condenser is reached from underneath chassis.

Now turn dial to 15 and set signal generator at 150. Adjust condenser (B) for maximum response. Condenser (C) is reached from the rear of the chassis.

NOTE: If reading on output meter is too great during adjustments, turn down "attenuator" on signal generator.

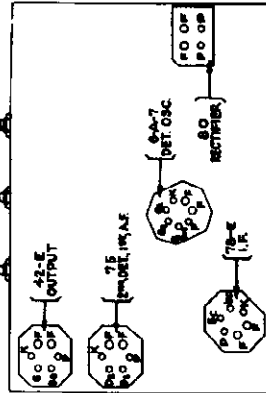


Fig. 2 - Tube Substituents on Rear From Bottom of Chassis

Adjustment of compensating condensers in Models 264 and 265 requires the use of an accurate signal generator (such as the Philco Model 024), an output meter (Philco Model 012 or 025 is recommended), and a special adjusting wrench (Philco No. 3164). The L. F. or intermediate frequency of the set is 125 K. C. Adjustments are made in the following order:

L. F.—Set signal generator at 125 K. C. Remove grid clip from cap of 6A7 tube and connect antenna lead from signal generator to cap of tube, contact ground lead to ground post of set. Set dial of receiver at 55 (upper scale) and wave-band switch at right. See that the antenna is connected to proper current and voltage terminals. Connect the antenna lead to the three L. F. compensating condensers (A), (B), and (C) to give maximum response in the output meter. These adjustments are all made from the rear of the chassis (see Fig. 3), through holes in sub-base.

ANT., DET. and OSC.-H. F. (standard wave)—These are condenser assembly and adjusted from above. (A) is the one nearest the front of chassis.

Set signal generator at 1500. Remove grid clip on cap of 6A7 tube and connect antenna and ground leads from signal generator direct to antenna and ground posts of set. Turn dial of set to 150 and adjust condensers (A), (B) and (C) for maximum reading in output meter.

OSC.-L. F. (standard wave)—Set signal generator at 300 and turn dial of set to 30. Adjust condenser (B), reached from rear of chassis, to give maximum reading in output meter.

PHILCO RADIO & TELEV. CORP.

MODEL 245
Schematic, Parts
Chassis

I. F. - 460 K. C.

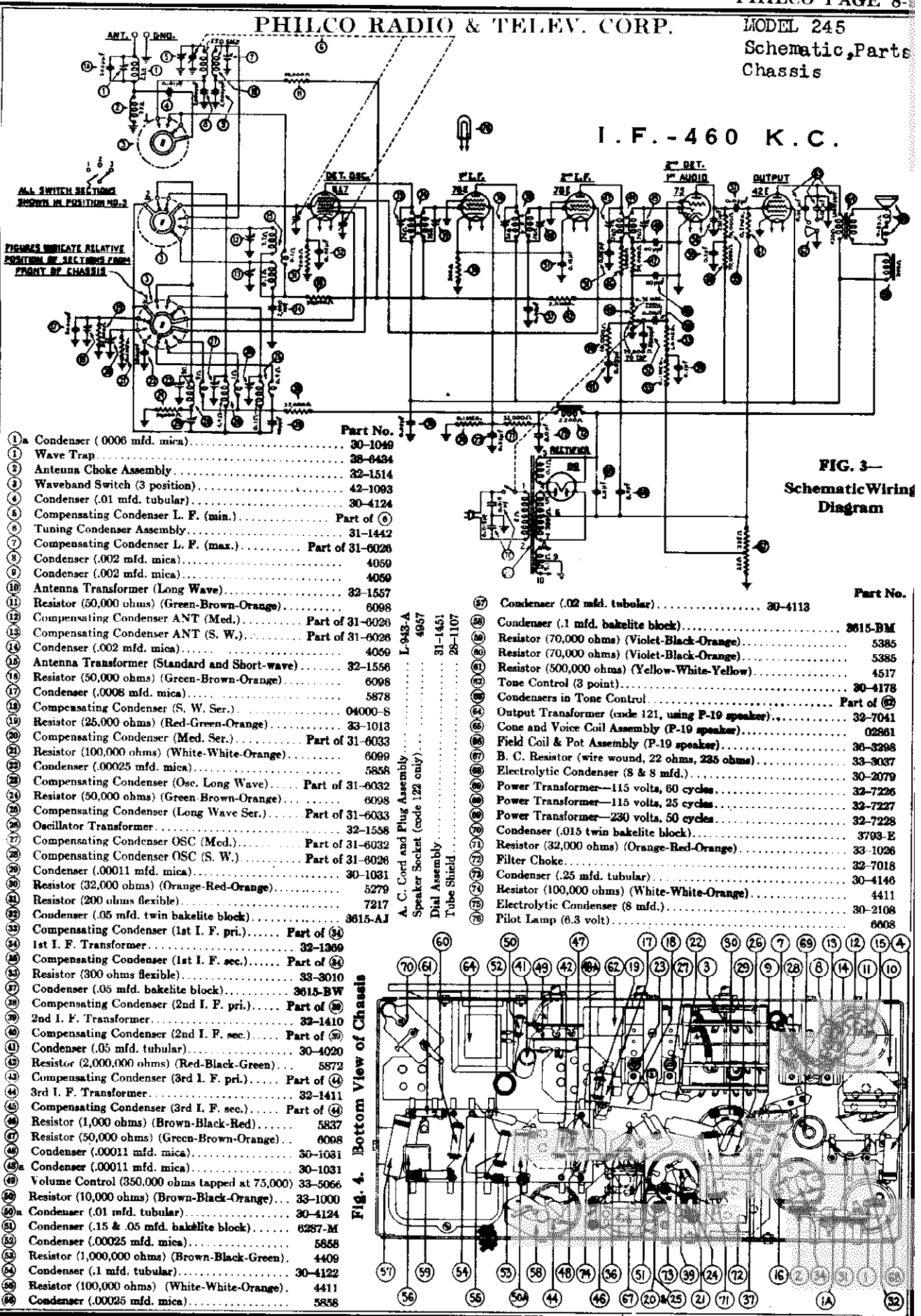
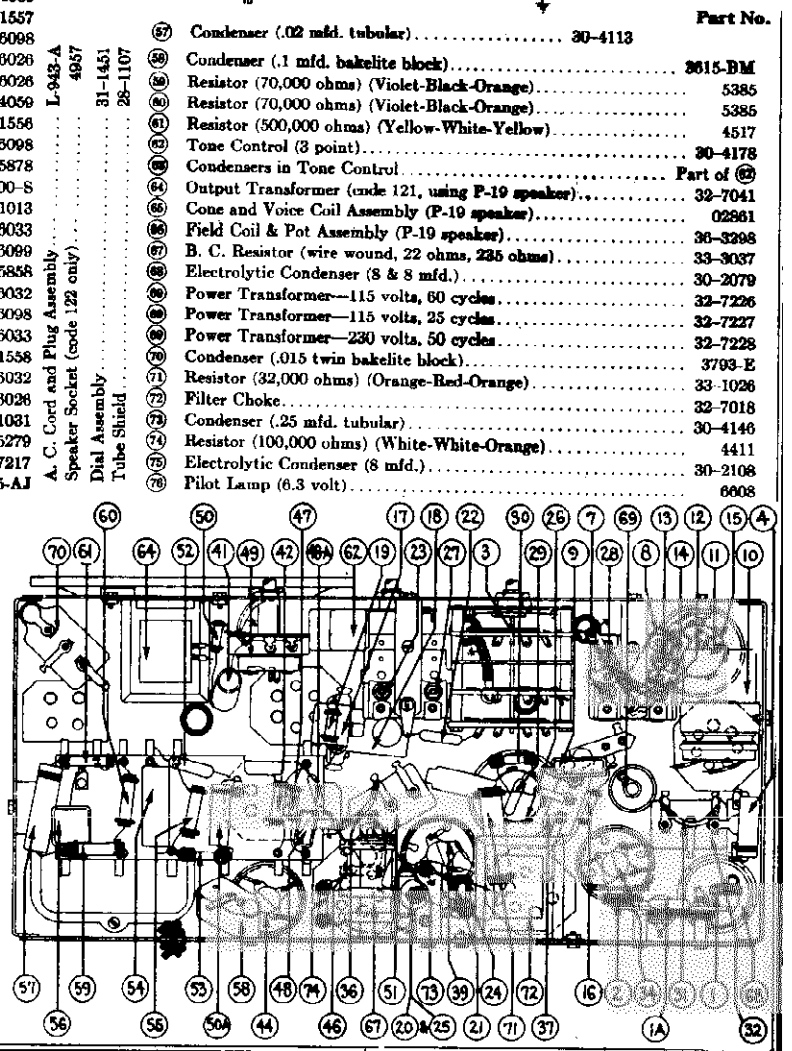


FIG. 3—
Schematic Wiring
Diagram

- | | | |
|----|--|------------------|
| 1 | Condenser (.0006 mfd. mica) | Part No. 30-1049 |
| 2 | Wave Trap | 38-6434 |
| 3 | Antenna Choke Assembly | 32-1514 |
| 4 | Waveband Switch (3 position) | 42-1083 |
| 5 | Condenser (.01 mfd. tubular) | 30-4124 |
| 6 | Compensating Condenser L. F. (min.) | Part of 6 |
| 7 | Tuning Condenser Assembly | 31-1442 |
| 8 | Compensating Condenser L. F. (max.) | Part of 31-6026 |
| 9 | Condenser (.002 mfd. mica) | 4059 |
| 10 | Condenser (.002 mfd. mica) | 4059 |
| 11 | Antenna Transformer (Long Wave) | 32-1557 |
| 12 | Resistor (50,000 ohms) (Green-Brown-Orange) | 6098 |
| 13 | Compensating Condenser ANT (Med.) | Part of 31-6026 |
| 14 | Compensating Condenser ANT (S. W.) | Part of 31-6026 |
| 15 | Condenser (.002 mfd. mica) | 4059 |
| 16 | Antenna Transformer (Standard and Short-wave) | 32-1558 |
| 17 | Resistor (50,000 ohms) (Green-Brown-Orange) | 6098 |
| 18 | Condenser (.0008 mfd. mica) | 5878 |
| 19 | Compensating Condenser (S. W. Ser.) | 04000-S |
| 20 | Resistor (25,000 ohms) (Red-Green-Orange) | 33-1013 |
| 21 | Compensating Condenser (Med. Ser.) | Part of 31-6033 |
| 22 | Resistor (100,000 ohms) (White-White-Orange) | 6099 |
| 23 | Condenser (.00025 mfd. mica) | 5858 |
| 24 | Compensating Condenser (Osc. Long Wave) | Part of 31-6032 |
| 25 | Resistor (50,000 ohms) (Green-Brown-Orange) | 6098 |
| 26 | Compensating Condenser (Long Wave Ser.) | Part of 31-6033 |
| 27 | Oscillator Transformer | 32-1558 |
| 28 | Compensating Condenser OSC (Med.) | Part of 31-6032 |
| 29 | Compensating Condenser OSC (S. W.) | Part of 31-6026 |
| 30 | Condenser (.00011 mfd. mica) | 30-1031 |
| 31 | Resistor (32,000 ohms) (Orange-Red-Orange) | 5279 |
| 32 | Resistor (200 ohms flexible) | 7217 |
| 33 | Condenser (.05 mfd. twin bakelite block) | 3615-AJ |
| 34 | Compensating Condenser (1st I. F. pri.) | Part of 34 |
| 35 | 1st I. F. Transformer | 32-1369 |
| 36 | Compensating Condenser (1st I. F. sec.) | Part of 34 |
| 37 | Resistor (300 ohms flexible) | 33-3010 |
| 38 | Condenser (.05 mfd. bakelite block) | 3615-BW |
| 39 | Compensating Condenser (2nd I. F. pri.) | Part of 39 |
| 40 | 2nd I. F. Transformer | 32-1410 |
| 41 | Compensating Condenser (2nd I. F. sec.) | Part of 39 |
| 42 | Condenser (.05 mfd. tubular) | 30-4020 |
| 43 | Resistor (2,000,000 ohms) (Red-Black-Green) | 5872 |
| 44 | Compensating Condenser (3rd I. F. pri.) | Part of 44 |
| 45 | 3rd I. F. Transformer | 32-1411 |
| 46 | Compensating Condenser (3rd I. F. sec.) | Part of 44 |
| 47 | Resistor (1,000 ohms) (Brown-Black-Red) | 5837 |
| 48 | Resistor (50,000 ohms) (Green-Brown-Orange) | 6098 |
| 49 | Condenser (.00011 mfd. mica) | 30-1031 |
| 50 | Condenser (.00011 mfd. mica) | 30-1031 |
| 51 | Volume Control (350,000 ohms tapped at 75,000) | 33-5066 |
| 52 | Resistor (10,000 ohms) (Brown-Black-Orange) | 33-1000 |
| 53 | Condenser (.01 mfd. tubular) | 30-4124 |
| 54 | Condenser (.15 & .05 mfd. bakelite block) | 6287-M |
| 55 | Condenser (.00025 mfd. mica) | 5858 |
| 56 | Resistor (1,000,000 ohms) (Brown-Black-Green) | 4409 |
| 57 | Condenser (.1 mfd. tubular) | 30-4122 |
| 58 | Resistor (100,000 ohms) (White-White-Orange) | 4411 |
| 59 | Condenser (.00025 mfd. mica) | 5858 |

Fig. 4. Bottom View of Chassis



MODEL 245
Trimmers, Socket

PHILCO RADIO & TELEV. CORP.

Voltage, Alignment
Transformer Data

PHILCO Model 245 is a six-tube superheterodyne receiver designed to receive three different ranges or bands of radio frequencies, viz: (1) Low frequency, 125 to 340 kilocycles (K. C.); (2) Medium or standard American broadcast frequencies, 540 to 1500 kilocycles; and (3) Short-wave, or high frequencies, from 5.5 to 16.0 megacycles (5500 to 16000 K. C.). A three-position waveband switch changes the reception from one band to the next, starting with low frequency, at the left-hand or counter-clockwise position.

This model has three-point tone control with fixed bass compensation, automatic volume control and pentode output. The tubes used are: Type 6A7 detector oscillator, two type 78-E intermediate frequency, type 75 second detector—1st audio frequency, and type 42-E pentode output tube. A type 80 is used as rectifier. The intermediate frequency of the set is 460 K. C. and the power consumption is 65 watts. This receiver is designed for alternating current (AC) only, of the voltage and cycles indicated on the chassis nameplate.

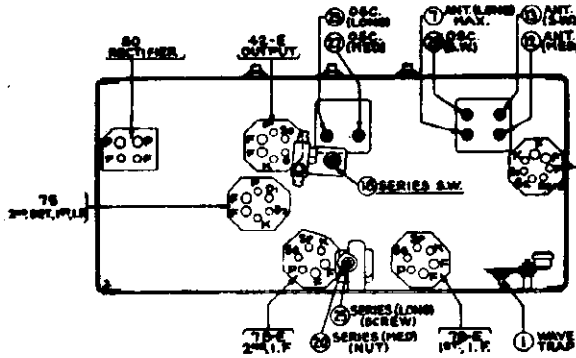


FIG. 1--View of Tube Sockets and Compensating Condensers underneath Chassis.

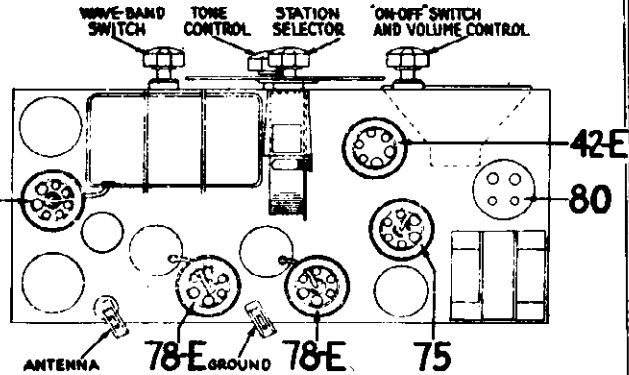


FIG. 2--Tube Sockets and Controls as seen from top of Chassis.

Tube Socket Voltages
(At Line Voltage 115V)

Tube	6A7	78-E	78-E	75	42-E
P to Chassis	272	272	265	170	253
S G to Chassis	95	95	95	..	272
K to Chassis	3	3.9	3.9	0	0

6A7. G₂ to Chassis: 180V; G₁ = -27V.

Above voltages obtained with PHILCO Model 025 or Model 048 Set Tester, from socket terminals of Set, underneath chassis. See Fig. 1. Volume control at minimum. Dial at 60.

Power Transformer Data
(115 Volt 60 Cycle Type)

Terminal	A. C. Volts	Circuit	Color of Leads
1-2	115	Primary	White
3-4	5.0	Fil. of 80	Blue
5-7	680	Plates of 80	Yellow
8-10	6.3	Filaments	Black
6	.....	Center Tap 5-7	Yellow, Green Tr.
9	.....	Center Tap 8-10	Black-Yellow Tr.

Adjusting Compensating Condensers
(Intermediate Frequency 460 K. C.)

The adjustment of compensating condensers in Model 245 requires the use of signal generators capable of producing a signal on both standard and long-wave broadcast frequencies, as well as short-waves or high frequencies. For the former two we suggest Philco Model 024 Signal Generator, and for the Short-Wave, Model 091 Crystal Controlled Oscillator. The Model 024 covers frequencies from 105 to 2000 K. C. and the other has a fundamental frequency of 3600 K. C. (3.6 M. C.) any harmonic of which may be used.

Other equipment needed includes some form of output meter, and a suitable insulated-handle wrench and screwdriver for adjusting the condensers. Philco equipment available includes Model 025 or 012 output meter and Part 3164 wrench and 27-7059 screwdriver.

First connect the output meter to the plate and cathode prongs of the 42-E output tube.

Adjustments are then made in the following order; positions of all compensators are shown in Fig. 1.

ADJUSTMENT OF THE INTERMEDIATE FREQUENCY

Remove the grid clip from the type 6A7 tube and connect the "ANT" output terminal of the signal generator to the grid cap of the tube. Connect the "GND" terminal of the signal generator to the "GND" terminal of the receiver chassis.

Set the signal generator at 460 K. C. (the intermediate frequency of Model 245) and with the receiver and signal generator turned on, the wave band switch at center and dial at 600 K. C., adjust each of the I. F. compensating condensers in turn, to give maximum response in the output of the receiver. The three pairs of I. F. compensating condensers are located one pair at the top of each of the three I. F. transformer shields. These are the three metal "cans" near the rear of the chassis. Each of the transformers has a dual compensating condenser mounted at its top, and accessible through a hole in the top of the coil shield. In the dual compensators the Primary circuit is adjusted by turning the screw; the Secondary circuit is adjusted by turning the hex-head nut. The condenser numbers, referring to Fig. 2, are ①, ②, ③, ④, ⑤ and ⑥.

ADJUSTMENT OF THE WAVE TRAP

Replace the grid clip upon the Detector-Oscillator tube (Type 6A7). Connect the output leads from the signal generator directly to the antenna and ground terminals of the receiver. Set the Wave-Band Switch of the receiver to the standard broadcast band (center position) and the Station Selector at the low frequency (340 K. C.) end. Adjust the Wave Trap condenser to give a MINIMUM response to a 460 K. C. signal from the

signal generator. The Wave Trap ① is located at rear and underneath the chassis, and is shown in Fig. 1. It is reached from the rear of the chassis, by inserting the fibre wrench through the hole near rear corner of chassis.

ADJUSTMENT OF SHORT-WAVE COMPENSATORS

H. F. end: The crystal controlled signal generator is used for these adjustments. Turn the wave band switch to the right and the signal generator "on." Turn the dial of the set to about half way between 14 and 15 megacycles (right hand scale) and you should there pick up the 4th harmonic of the 3.6 M. C. signal. Adjust the ant. S. W. compensator ② and the oscillator S. W. compensator ③ (see Fig. 1) to give maximum response in the output meter.

L. F. end: Turn dial of set to a little more than 7 megacycles at which point the second harmonic of the signal generator (7.2 M. C.) should be heard. Adjust condenser ④ (S. W. series) for maximum response. This condenser is also reached from underneath the chassis.

ADJUSTMENT OF MEDIUM OR STANDARD WAVES

The standard broadcast signal generator is now used again. H. F. end: Turn waveband switch to center position. Set signal generator at 1500 K. C. and dial at 150 (center scale). Now adjust condensers ⑤ (Antenna Medium) and ⑥ (oscillator medium) to get maximum response. L. F. end: Turn dial to 60 and set signal generator at 600. Adjust condenser ⑦ (nut) (Series Medium) for maximum output.

ADJUSTMENT OF LONG-WAVE COMPENSATORS

Turn wave-band switch to left-hand position (long wave). Set signal generator at 300 K. C. and dial at 300 (left-hand scale). Connect antenna lead from signal generator to grid cap of 6A7 tube instead of to antenna post of set. Adjust condenser ⑧ (oscillator, long-wave) to get maximum response.

Transfer antenna lead of signal generator to antenna post, and adjust condenser ⑨ (long-wave, maximum) to get maximum response.

Turn dial so that condenser gang is open (dial just beyond end of scale) and adjust condenser ⑩ (antenna long wave minimum) so that there is no oscillation, and noise is reduced to a minimum. This adjustment is located on top of one section of the tuning condenser and is reached from above. Turn the dial to the other end of scale and be sure no oscillation occurs. Finally set signal generator at 175 and dial of set at approximately 175. Adjust condenser ⑪ (screw) (long-wave series) to get maximum reading.

PHILCO RADIO & TELEV. CORP.

MODEL 261
Schematic
Parts

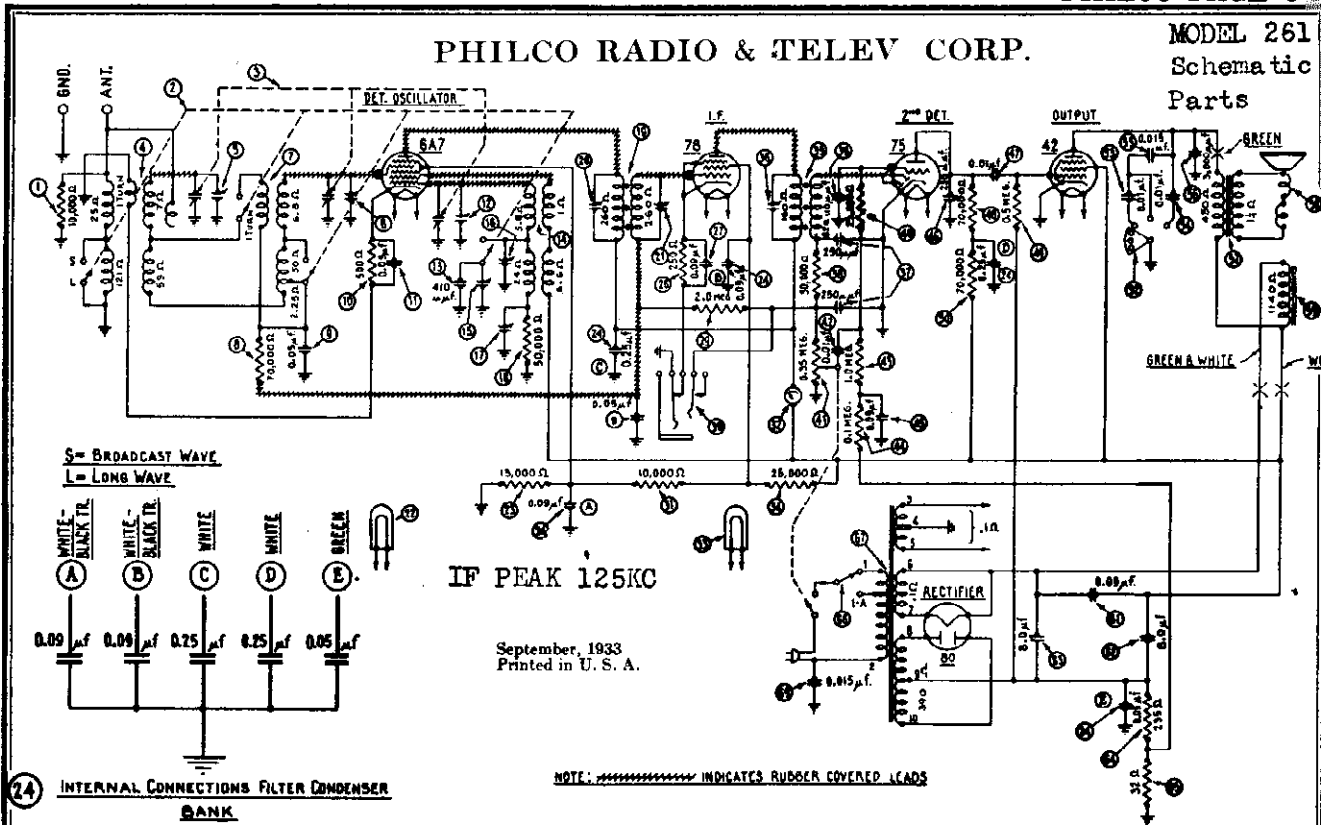


Fig. 3—Schematic Wiring Diagram

COMPONENT PARTS FOR MODEL 261

No. on Figs.	Description	Part No.	No. on Figs.	Description	Part No.
①	Resistor (10,000) (Brown-Black-Orange) (½ watt)	4412	②⑤	Resistor (50,000) (Green-Brown-Orange) (½ watt)	4518
②	Wave-band Switch	42-1001	③⑥	Condenser (110 MMf) (Blue-Yellow)	4519
③	Tuning Condenser Assembly	31-1037	④	Resistor (25,000) (Red-Green-Orange) (½ watt)	4516
④	Antenna (H. F.) Transformer	32-1157	⑤	Volume Control and "On-Off" Switch	33-5006
⑤	Compensating Condenser (Ant.; Part of ③)		⑥	Condenser (.01)	3903-A M
⑥	Compensating Condenser (Det.; Part of ③)		⑦	Resistor (1. meg.) (Brown-Black-Green) (½ watt)	4409
⑦	Detector Transformer	32-1158	⑧	Resistor (.1 meg.) (White-White-Orange) (½ watt)	4411
⑧	Resistor (70,000) (Violet-Black-Orange) (½ watt)	5385	⑨	Condenser (.09)	4989-D
⑨	Condenser (.05) (Double)	3615-A J	⑩	Condenser (250 MMf) (Yellow)	3062
⑩	Resistor (500) (Flexible Wire-Wound) (Green-Black-Brown)	6977	⑪	Condenser (.01)	3903-W
⑪	Condenser (.09)	4989-AB	⑫	Resistor (70,000) (Violet-Black-Orange) (½ watt)	5385
⑫	Compensating Condenser (Osc.; Part of ③)		⑬	Resistor (.5 meg.) (Yellow-White-Yellow) (½ watt)	4517
⑬	Condenser (410 MMf)	5120	⑭	Resistor (70,000) (Violet-Black-Orange) (½ watt)	5385
⑭	Oscillator Transformer	32-1159	⑮	Tone Control	30-4043
⑮	Compensating Condenser (Osc.; Series Broadcast Wave)	04000-S	⑯	Condenser (Internal to ⑮) (.01)	
⑯	Compensating Condenser (Osc.; Long Wave)	04000-D	⑰	Condenser (Internal to ⑮) (.01)	
⑰	Compensating Condenser (L. F. Series Oscillator)	04000-S	⑱	Condenser (Internal to ⑮) (.015)	
⑱	Resistor (50,000) (Green-Brown-Orange) (½ watt)	4518	⑲	Condenser (3,000 MMf)	30-4042
⑲	1st I. F. Transformer	32-1160	⑳	Output Transformer (Mounted on Speaker)	2580
⑳	Compensating Condenser (1st I. F. Primary)	04000-A	㉑	Voice Coil and Cone Assembly	{ K-7 (Code 121) 36-3020 H-9 (Code 122) 02625
㉑	Compensating Condenser (1st I. F. Sec.)	04000-A	㉒	Speaker Field assembled with Pot.	{ K-7 (Code 121) 02741 H-9 (Code 122) 02807
㉒	Pilot Lamp (Station Selector)	6608	㉓	Condenser (.09)	4989-AB
㉓	Resistor (13,000) (Brown-Orange-Orange) (1 watt)	3766	㉔	Electrolytic Condenser (8. Mf)	7557
㉔	Filter Condenser Bank	30-4044	㉕	Electrolytic Condenser (8. Mf)	7558
㉕	Resistor (250) (Flexible Wire-Wound) (Red-Black-Brown)	7217	㉖	Resistor (Wire-Wound) (235 ohms section)	7998
㉖	Condenser (.09)	4989-D	㉗	Resistor (Wire-Wound) (32. ohms section)	7998
㉗	Resistor (2. meg.) (Red-Black-Green) (½ watt)	5872	㉘	Mains Transformer (200-260 V., A. C.; 40-60 ~)	
㉘	Gramophone Jack	6585	㉙	with Tapped Primary	32-7074
㉙	Resistor (10,000) (Brown-Black-Orange) (½ watt)	4412	㉚	Tap Switch; Part of ㉙ (in schematic)	3116
㉚	Shadow Tuning Meter	6497	㉛	Condenser (.015)	3793-Z
㉛	Pilot Lamp (Shadow Tuning Meter; Part of ㉚)		㉜	Valve Shield	28-1107
㉜	Resistor (25,000) (Red-Green-Orange) (1 watt)	3656	㉝	Four-Prong valve holder	7544
㉝	2nd I. F. Transformer	32-1223	㉞	Six-Prong valve holder	7547
㉞	Compensating Condenser (2nd I. F. Primary)	04000-W	㉟	Seven-Prong valve holder	27-6005
㉟	Condenser (250MMf) (Double)	8317-B			

MODEL 261

Voltage, Socket

PHILCO RADIO & TELEV. CORP.

Trimmers, Chassis Alignment

THE MODEL 261 is a five-valve superheterodyne receiver, designed for dual wave reception, of 525-1510 kilocycles (570-200 meters), and 140-320 kilocycles which completely covers the 1000-2000 meter band. This Model contains a Type 6A7E valve as combination first detector and oscillator, a Type 78E valve for the intermediate frequency, a Type 75 valve as second detector and first low frequency stage, a Type 42E as low frequency power output, and a Type 80 rectifier valve. The intermediate frequency is 125 K. C. The power consumption is 63 watts.

Table 1—Valve Holder Data—A. C. Mains Voltage, 240 Volts*

Circuit	Det. Osc.	I. F.	2nd Det. and L. F.	L. F. Power Output	Rectifier
Valve Type	6A7E	78E	75	42E	80
Low Tension—F to F (Volts)	6.3	6.3	6.3	6.3	5.0
High Tension—P to K (Volts)	250	250	190	240	360
Screen Grid Volts—SG to K (6A7E; G3/5 to K)	50	100	25	260	
Control Grid Volts—CG to K (6A7E; G4 to K)	0	4	25	5	
Cathode Volts—K to F	2.2	2.7	0	0	

Table 2—Mains Transformer Data

Terminal	A. C. Volts	Circuit	Color
1	230-260	Primary (Full Primary Winding)	White—20% Black Tr.
1A	200-230	Primary (Tapped Primary Winding)	Green
2	200-260 with ① or ①A	Primary (Common)	White
3-5	6.3	Low Tension	Black
6-7	5.0	L. T. of "80" Valve	Blue
8-10	660	H. T. (Anodes of "80")	Yellow
4		Center Tap of 3-5	Black-Yellow Tracer
9		Center Tap of 8-10	Yellow-Green Tracer

Additional Type 6A7E Values: G1 to K = .4 volt; G2 to K = 260 volts.
 * All of the above values were obtained from the under side of chassis, using test prods and leads with a suitable A. C. voltmeter for L. T. voltages, and a high-resistance, multi-range D. C. voltmeter for all other values. Volume control at maximum and station selector at 525 K. C. Mains Transformer Primary tap on 230-260. Readings taken with a plug-in adaptor will NOT be satisfactory.

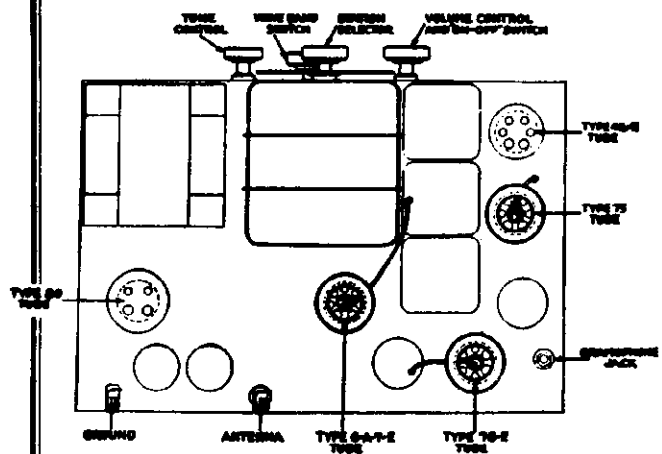


Fig. 1—Top View of Chassis

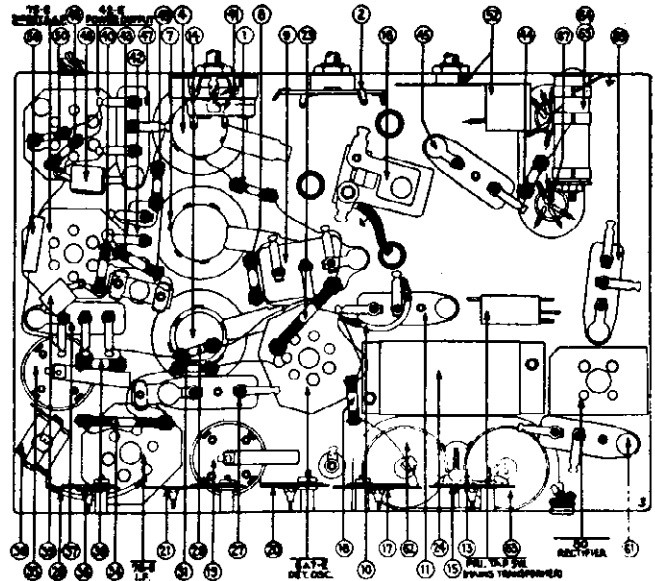


Fig. 2 Bottom View of Chassis, Showing Parts

ADJUSTMENT OF MODEL 261

The receivers are accurately adjusted prior to shipment from the factory. Adjustments of the compensating condensers should only be undertaken with proper instructions and equipment available. An accurately calibrated signal generator is necessary. One will be found in the Philco 048 All-Purpose Set Tester.

The adjustment of the compensating condensers is similar to the procedure outlined in Service Bulletin No. 120-C.

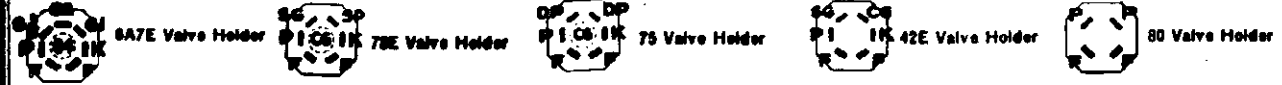
Location of the several compensating condensers can be ascertained by reference to Fig. 3 for their electrical location in the receiver, and to Fig. 2 for the physical location of the compensating condensers at the rear and upon the underside of the receiver chassis.

The intermediate frequency compensating condensers first

should be adjusted. The intermediate frequency is 125 kilocycles. These condensers are ⑳, ㉑, and ㉒, accessible from the rear of the chassis.

The Antenna ⑤, Detector ⑥, and High Frequency (1400 K. C.) Oscillator ⑫ compensating condensers next should be adjusted. These are mounted upon the tuning condenser ③. ④ is nearest the front of chassis. The low frequency compensating condensers are adjusted last. These are ⑬, ⑭, and ⑮. ⑬ is the 600 K. C. compensating condenser; ⑭ the 300 K. C. compensating condenser; and ⑮ the 150 K. C. compensating condenser. The sequence of adjustment should be: ⑬, ⑭, ⑮. ⑬ and ⑮ are accessible from rear of chassis; ⑭ is mounted upon the underside of the chassis.

The I. F. compensating condensers should be given a final retrimming after these adjustments are completed



Terminal Arrangement of Valve Holders, Viewed From Under Side of Chassis

PHILCO RADIO & TELEV. CORP.

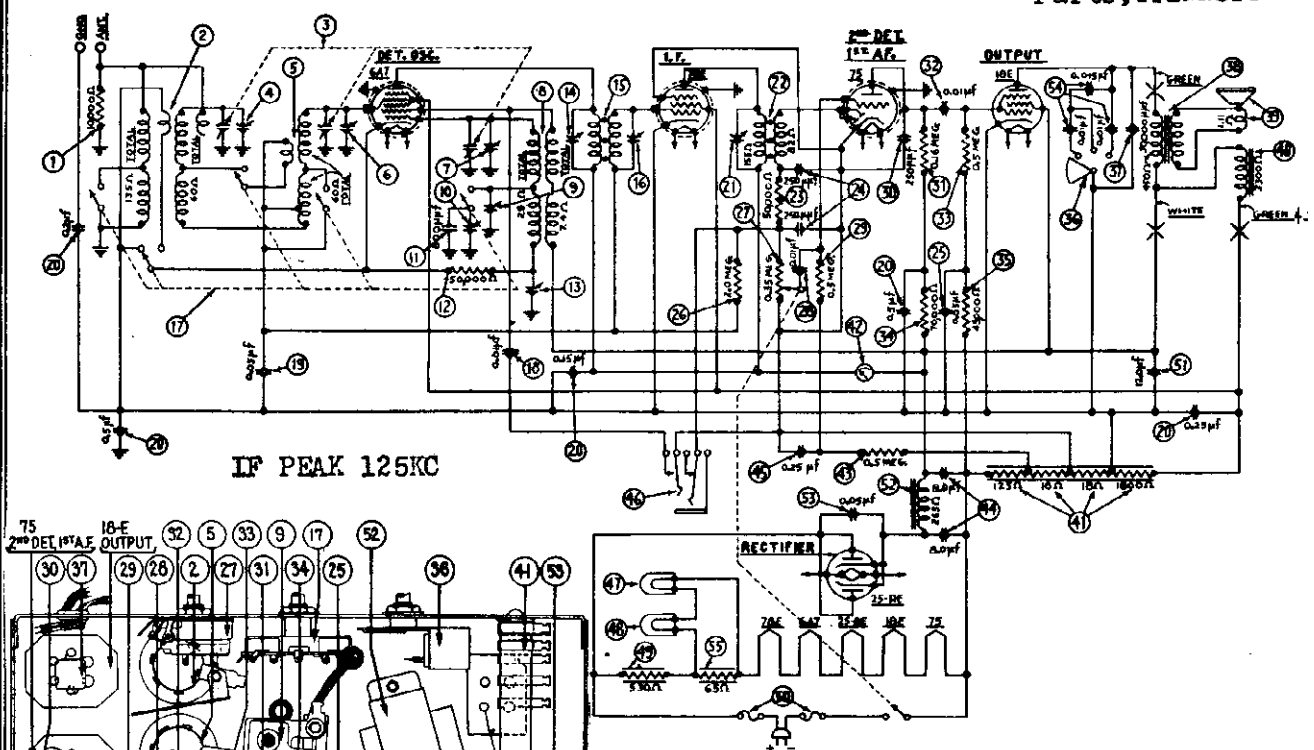


Fig. 4—Wiring Diagram

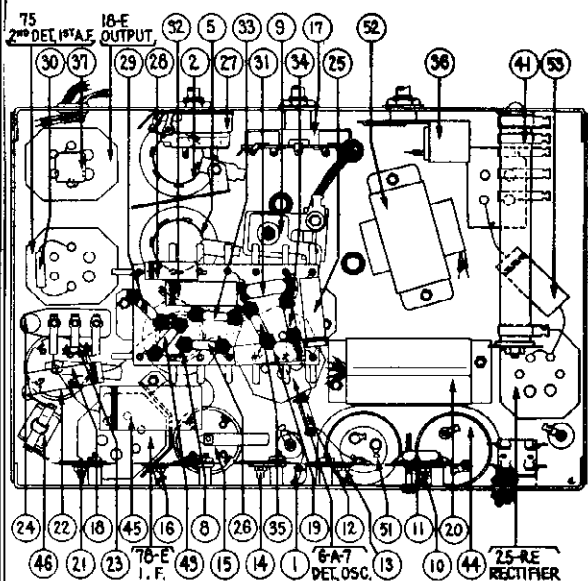


Fig. 3—Bottom of Chassis, showing components

MODEL 263-E COMPONENTS

1	Resistor (10,000 ohms) (Brown-Black-Orange).....	33-1000
2	Antenna Transformer.....	32-1351
3	Tuning Condenser Assembly.....	31-1171
4	Compensating Condenser (Ant.).....	Part of 3
5	Detector Transformer.....	32-1150
6	Compensating Condenser (Det.).....	Part of 3
7	Compensating Condenser (Osc. H. F. Standard).....	Part of 3
8	Oscillator Transformer.....	32-1158
9	Compensating Condenser (Osc. Long-wave).....	04000-D
10	Compensating Condenser (Osc. Series Standard).....	04000-S
11	Condenser (.0008 mfd.) (Mica).....	5120
12	Resistor (50,000 ohms) (Green-Brown-Orange).....	4518
13	Compensating Condenser (Long-wave Series Osc.).....	04000-S
14	Compensating Condenser (1st I. F. Pri.).....	04000-A
15	First I. F. Transformer.....	32-1180
16	Compensating Condenser (1st I. F. Sec.).....	04000-A
17	Wave-band Switch.....	42-1057
18	Condenser (.01 mfd.) (Tubular).....	30-4145
19	Condenser (.05 mfd.) (Tubular).....	30-4020
20	Condenser Block (.5-.25-.2-.15-.5).....	30-4157

21	Compensating Condenser (2nd I. F. Pri.).....	04000-M
22	Second I. F. Transformer.....	32-1223
23	Resistor (50,000 ohms) (Green-Brown-Orange).....	6008
24	Condenser (.00025 mfd. Twin) (Block Type).....	8317-C
25	Condenser (.05 mfd.) (Tubular).....	30-4020
26	Resistor (2 megs.) (Red-Black-Green).....	5872
27	Volume Control and On-Off Switch.....	33-5005
28	Condenser (.01 mfd.) (Tubular).....	30-4124
29	Resistor (.5 meg.) (Yellow-White-Yellow).....	4517
30	Condenser (.00025 mfd.) (Mica).....	5858
31	Resistor (160,000 ohms) (Brown-Blue-Yellow).....	5331
32	Condenser (.01 mfd.) (Tubular).....	30-4145
33	Resistor (.5 meg.) (Yellow-White-Yellow).....	4517
34	Resistor (70,000 ohms) (Violet-Black-Orange).....	5285
35	Resistor (45,000 ohms) (Yellow-Green-Orange).....	5256
36	Tone Control.....	30-4043
37	Condenser (.002 mfd.) (Mica).....	6253
38	Output Transformer.....	2590
39	Voice Coil and Cone Assembly:	
	H-18.....	02625
	K-25.....	36-3174
40	Speaker Field Coil.....	02803
41	B. C. Resistor (125, 18, 18, 1800 ohms).....	33-3136
42	Shadowmeter.....	45-2028
43	Resistor (.5 meg.) (Yellow-White-Yellow).....	4517
44	Condenser (Electrolytic—8 mfd.—8 mfd.).....	30-2028
45	Condenser (25 mfd.) (Tubular).....	30-4134
46	Phonograph Jack.....	6585
47	Pilot Lamp.....	6008
48	Pilot Lamp (Shadowmeter).....	Part of 42
49	Line Resistor (530 ohms).....	33-3134
50	Line Fuses (2).....	7227
51	Condenser: Electrolytic—12 mfd.—(8 mfd.+4 mfd.).....	30-2030
52	Filter Choke.....	4819
53	Condenser (.05 mfd.).....	30-4123
54	Condensers (Inside 53).....	Part of 53
55	Resistor (65 ohms) (Pilot Lamp).....	33-3136

October, 1934.
 Printed in U. S. A.

MODEL 263-E
 Socket, Voltage
 Alignment

PHILCO RADIO & TELEV. CORP.

Model 263-E

Philco model 263-E is a five-valve superheterodyne receiver designed for reception of two bands of frequencies; either 530 to 1500 kilocycles (K.C.) or 140 to 320 kilocycles. It may be operated on either 230 volts (50-60 cycles) alternating current (A.C.), or 230 volts direct current (D.C.) It employs the following valves: One type 6A7 detector oscillator; one type 78-E intermediate frequency; one type 75, second detector and first low frequency; one type 18-E low frequency power output; and one type 25RE as rectifier.

The intermediate frequency of the set is 125 kilocycles and the power consumption is 90 watts.

Valve-holder Voltages (Mains Voltage 230 A.C.)

Valve	6A7	78-E	75	18-E	25RE
Circuit P to K	190	190	100	185	235
Sg to K	70	70	....	220	....

6A7: G₁ to K = .2 volt
 6A7: G₂ to K = 200 volts

Above readings made with high resistance D.C. voltmeter using test prods on valve-holders under chassis (see Fig. 1).

ADJUSTING COMPENSATING CONDENSERS

The Intermediate Frequency of Model 263-E is 125 kilocycles.

With the exception of the three compensating condensers located on the three sections of the tuning condenser, all are located underneath chassis, and are reached either through the rear holes in sub-base, or from underneath. Fig. 3 shows all condensers which are located under the chassis.

For proper adjustment, an accurate signal generator having a range from 100 to at least 1600 K.C. is required; also an output meter and a suitable adjusting wrench. Philco Model 024 signal generator, model 012 output meter and No. 3164 fibre hex wrench, are recommended.

Connect the output meter to the plate and cathode prongs of the output valve (type 18E). Turn on the set and signal generator. Turn wave band switch of set to right.

I. F. Compensating Condensers

Remove grid clip from cap of 6A7 valve and connect shielded antenna lead from signal generator to cap of valve. Connect ground terminal of signal generator to ground post of set. Set signal generator at 125 K.C., dial of set at 55 (wave band switch to right). Adjust each of the I. F. condensers (⑨, ⑩ and ⑪ in Figs. 3 and 4) in turn, to give maximum reading in the output meter. These condensers are all reached from the rear of the chassis.

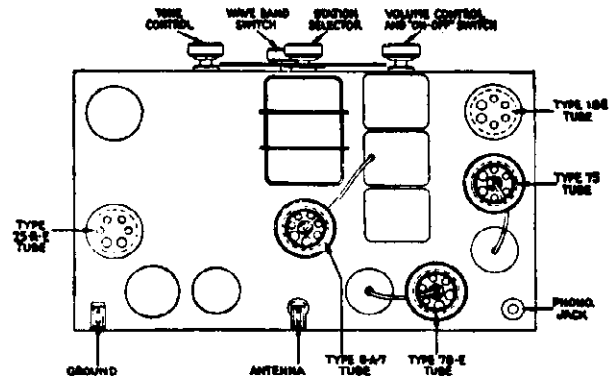


Fig. 1—Top View of Chassis

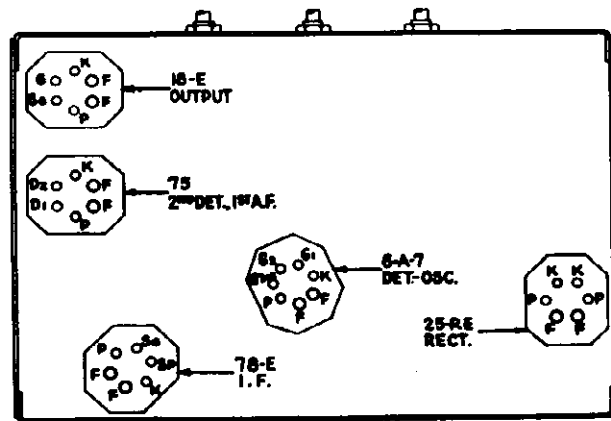


Fig. 2—Valve-holder Terminals
 (Viewed from underneath—for tests)

Antenna, Detector and Osc. HF. (Standard Wave)

Remove antenna lead of signal generator from grid cap of 6A7 valve and replace grid clip. Connect signal generator antenna lead to antenna post on set. Set signal generator at 1500 and turn dial of set to 150. Adjust condensers ①, ② and ③ (located on sections of tuning condenser assembly), so as to get maximum reading in output meter. ① is located nearest front of chassis and ③ nearest rear.

Osc. Long Wave and Long Wave Series; Standard Wave Series

These are condensers ④, ⑤ and ⑥ in the order named. ④ is reached from underneath the chassis; ⑤ and ⑥ from the rear.

First adjust ⑥ (series or L. F. standard wave) with signal generator set at 600 and dial at 60, for maximum output.

Then turn waveband switch to left. Set signal generator at 300 and dial at 30 (lower scale) and adjust ④ for maximum signal; then turn dial to 15 and set signal generator at 150 and adjust ⑤ for maximum signal.

PHILCO RADIO & TELEV. CORP.

MODELS 264, 265
Schematic, Chassis
Parts

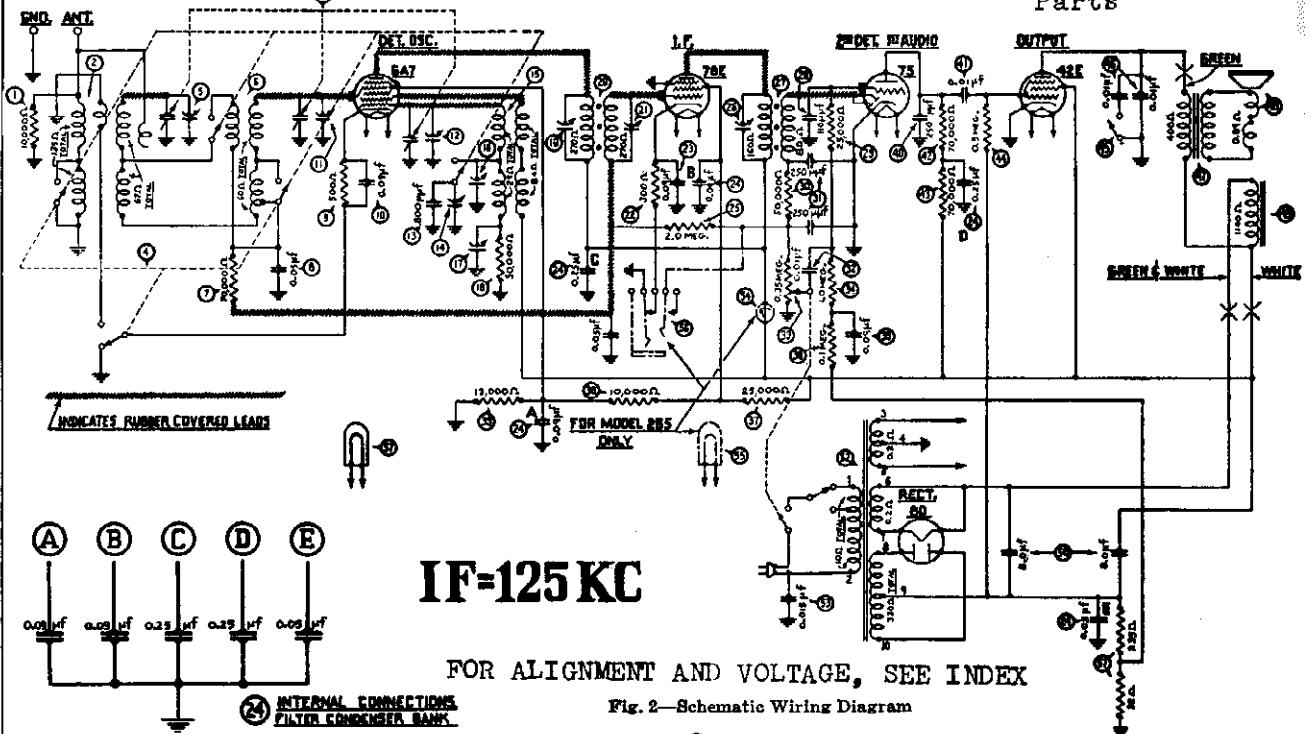


Fig. 2—Schematic Wiring Diagram

No. on Figs.	Description	Part No.
1	Resistor (10,000 ohms) (Brown-Black-Orange)	33-1000
2	Antenna Transformer	32-1157
3	Tuning Condenser Assembly (Model 264)	31-1091
	(Model 265)	31-1037
4	Wave-Band Switch	42-1057
5	Compensating Condenser (Antenna)	Part of 3
6	Detector Transformer	32-1158
7	Resistor (70,000 ohms) (Violet-Black-Orange)	5385
8	Condenser (Bakelite block type, .05 mfd. twin)	3615-AJ
9	Resistor (500 ohms—Flexible wirewound)	6077
10	Condenser (.09 mfd.—Bakelite block type)	4989-AB
11	Compensating Condenser (Det.)	Part of 3
12	Compensating Condenser (Osc. H. F.)	Part of 3
13	Condenser (.0008 mfd.—Mica)	5878
14	Compensating Condenser (H. F. Series)	04000-S
15	Oscillator Transformer	32-1159
16	Compensating Condenser (Osc. Long Wave)	04000-D
17	Compensating Condenser (L. F. Series)	04000-S
18	Resistor (50,000 ohms) (Green-Brown-Orange)	6098
19	Compensating Condenser (1st I. F. Pri.)	04000-A
20	First I. F. Transformer	32-1160
21	Compensating Condenser (1st I. F. Sec.)	04000-A
22	Resistor (300 ohms—Flexible wirewound)	33-3010
23	Condenser (.00 mfd.—Bakelite block)	4989-D
24	Condenser (Metal Case; 25—.09—.09—.25—.05)	30-4044
25	Resistor (2 megohms) (Red-Black-Green)	5972
26	Compensating Condenser (2d I. F. Pri.)	04000-M
27	2d I. F. Transformer	32-1223
28	Condenser (.00011 mfd.—Mica)	30-1031
29	Resistor (25,000 ohms) (Red-Green-Orange)	33-1013
30	Resistor (50,000 ohms) (Green-Brown-Orange)	6098
31	Condenser (.00025 mfd. twin—Bakelite Black)	5317-B
32	Condenser (.01 mfd.—Bakelite block)	3903-AM
33	"On-Off" Switch and Volume Control	33-5008
34	Resistor (1 megohm) (Brown-Black-Green)	33-1096
35	Condenser (.09 mfd.—Bakelite block)	4989-D
36	Resistor (.1 meg.) (White-White-Orange)	4411
37	Resistor (25,000 ohms) (Red-Green-Orange)	3656
38	Resistor (10,000 ohms) (Brown-Black-Orange)	4412
39	Resistor (13,000 ohms) (Brown-Orange-Orange)	3766
40	Condenser (.00025 mfd.—Mica)	3082

- 41 Condenser (.01 mfd.—Bakelite block) 3903 W
- 42 Resistor (70,000 ohms) (Violet-Black-Orange)..... 5385
- 43 Resistor (70,000 ohms) (Violet-Black-Orange)..... 5385
- 44 Resistor (.5 meg.) (Yellow-White-Yellow)..... 4517
- 45 Tone Control (Two-position)..... 30-4046
- 46 Condensers in Tone Control..... Part of 46
- 47 Output Transformer (S-7 Speaker)..... 32-7019
- 48 Voice Coil and Cone Assembly (S-7)..... 36-3157
- 49 Field Coil and Pot Assembly..... 36-3039
- 50 Condenser (Electrolytic) (8 mfd.—8 mfd.)..... 30-2028
- 51 Resistor (Wirewound, 235, 32 ohms)..... 7998
- 52 Power Transformer { 115 Volt, 50-60 Cycles..... 8046*
- { 230 Volt, 50-60 Cycles..... 8048
- { 230 Volt, 25-40 Cycles..... 32-7074
- 53 Condenser (.015 mfd.—Bakelite block)..... 3793-Z
- 54 Shadow Tuner (Model 265 only)..... 6497
- 55 Pilot Lamp for Shadow Tuner (Model 265 only)..... Part of 54
- 56 Phonograph Jack (Model 265 only)..... 6585

*Model 265 only.

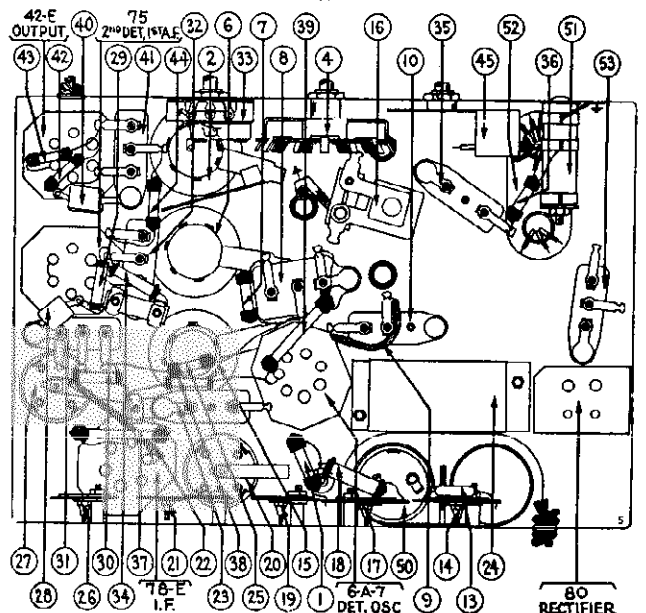
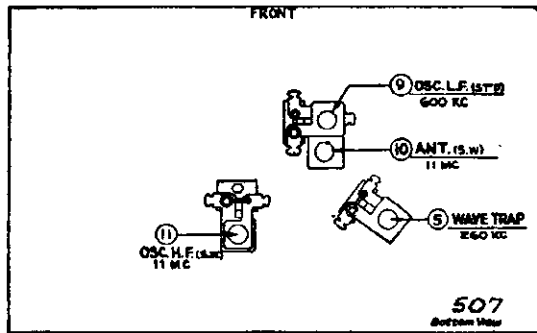


Fig. 3—Bottom View of Chassis

MODEL 507
MODEL 509
Alignment
Trimmers

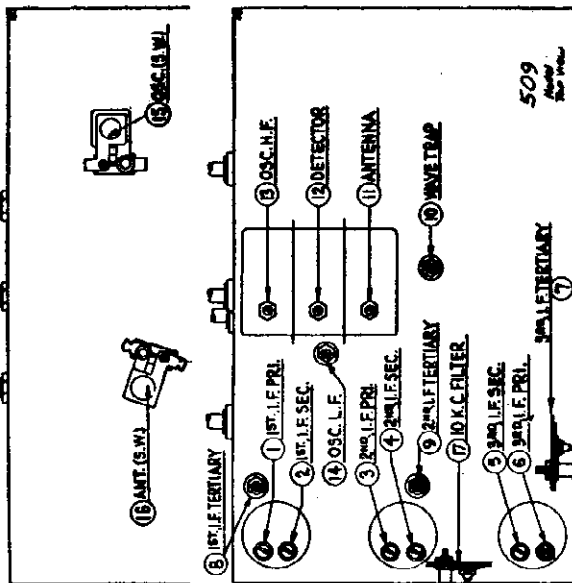
PHILCO RADIO & TELEV. CORP.



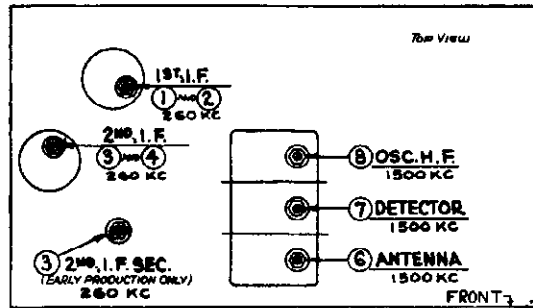
MODEL NO. 507

Signal Generator Connection	Signal Generator Frequency	Dial Position	Wave Band Switch Position	Trimmer Number	Output Signal
Remove grid clip from 6A7					
Control grid of 6A7	260 k.c.	55	Broadcast (left)	4 ¹	Max.
"	"	"	"	3 ²	Max.
"	"	"	"	2 ¹	Max.
"	"	"	"	1 ²	Max.
Connect grid clip to 6A7					
Ant.*	"	"	"	5	Min.
"	1500 k.c.	150	"	6	Max.
"	"	"	"	7	Max.
"	"	"	"	8	Max.
"	600 k.c.	60	"	9	Max.
"	11 m.c.	11 m.c.	Short Wave (right)	10	Max.
"	"	"	"	11	Max.

MODEL 509



* Use a 200-mmf. condenser gummy antenna on broadcast band and a 400-ohm carbon resistor on shortwave band.
Note 1.—Nut adjustment.
Note 2.—Screw adjustment.



MODEL NO. 509

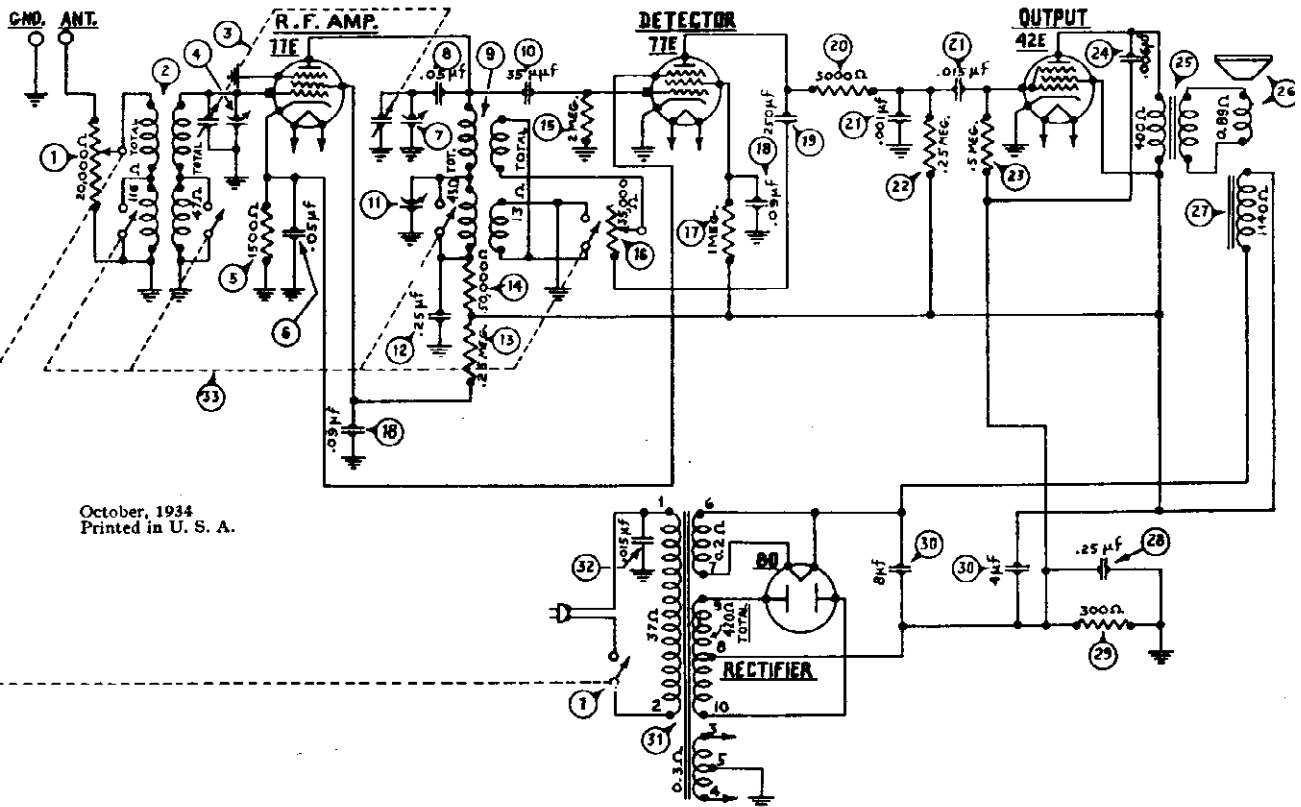
Signal Generator Connection	Signal Generator Frequency	Dial Position	Wave Band Switch Position	Trimmer Number	Output Signal
Remove grid clip from 6A7					
Control grid of 6A7	260 k.c. ¹	550 k.c.	Broadcast ² (left)	1	Min. ³
"	"	"	"	2	Min.
"	"	"	"	3	Min.
"	"	"	"	4	Min.
"	"	"	"	5	Min.
"	260 k.c. ⁵	"	"	6	Min.
"	260 k.c. ⁵	"	"	7	Note 7
"	"	"	"	8	Max.
"	"	"	"	9	Max.
"	Note 10	"	"	8	Note 10
Connect grid clip to 6A7					
Ant.	260 k.c. ¹¹	"	"	10	Max.
Ant. ¹²	1500 k.c.	1500 k.c.	"	11	Min.
"	"	"	"	12	Min.
"	"	"	"	13	Min.
"	600 k.c.	600 k.c.	"	14	Min. [*]
Ant. ¹³	11.0 m.c.	11.0 m.c.	Short Wave (right)	15 ¹⁴	Max. ¹⁵
"	"	10.48 m.c.	"	Image check	
"	"	11.0 m.c.	"	16	Max.
Note 16	10 k.c.	...	...	17	Min.

- Note 1.—Adjust signal generator to give an unmodulated output, which should be regulated to give a reading of about two volts on the voltmeter scale (see note 8) during the first i-f. adjustment.
- Note 2.—Turn fidelity-selectivity control all the way to the left.
- Note 3.—The usual output meter cannot be used with an unmodulated signal. Use indirect indication through a v.c. system (for all adjustments unless otherwise noted) by connecting a high-resistance d.c. voltmeter (ohms 0-5 or 0-10 volts) across the i-f. cathode resistor. This method will give minimum scale reading for maximum receiver output, and vice-versa. The voltmeter will indicate about 3.3 volts bias when no signal is applied to the antenna and will decrease upon application of signal.
- Note 4.—Connect 500 mmfd. condenser from plate of second i-f. tube to ground.
- Note 5.—Remove 500 mmfd. condenser (note 4) from plate of second i-f. tube and connect across the third i-f. secondary. Remove this condenser after adjustment is completed.
- Note 6.—Set signal-generator for maximum output.
- Note 7.—Adjust (7) to give minimum width on shadow-tuning meter of receiver.
- Note 8.—Set signal-generator output to give reading of 2 volts on voltmeter.
- Note 9.—Turn fidelity-selectivity control all the way to the right.
- Note 10.—When varying signal-generator frequency through 260 k.c. and 267 k.c., a definite peak on the voltmeter should be noted for each. If these two readings are not the same, they can be equalized by slight readjustment of (8).
- Note 11.—Turn fidelity-selectivity control all the way to the left.
- Note 12.—Through 200 mmfd. condenser.
- Note 13.—Remove voltmeter from cathode resistor and connect regular output meter to plates of output tubes in the usual manner for adjustment of (15), (16) and (17).
- Note 14.—Use "lower capacity peak" for adjustment of (18) to maximum indication on output meter. Neglect "higher capacity peak".
- Note 15.—The accurate adjustment of the 10 k.c. audio filter (17) requires a calibrated audio oscillator. Connect the low side of the audio oscillator to ground and the high side to the variable tap on the receiver volume control.

* While rocking.

PHILCO RADIO & TELEV. CORP.

MODEL 267-E
Schematic, Chassis
Parts Trimmers



October, 1934
Printed in U. S. A.

Fig. 2—Schematic Wiring Diagram

NOTE: In current production a 2500 ohm resistor Part No. 33-1100, is connected across the two contacts of the wave band switch nearest (in diagram) to the volume control (9).

REPLACEMENT PARTS—MODEL 267-E

No. on Figs.	Description	Part Number	No. on Figs.	Description	Part Number
1	Volume Control (20,000 ohms) and On-off Switch	33-5055	31	Power Transformer (50-60 Cycles)	7423
2	Antenna Transformer	32-1451	32	Condenser (.015 Mfd. Bakelite Block)	3793-AJ
3	Tuning Condenser Assembly	31-1361	33	Wave-Band Switch	42-1081
4	Compensating Condenser (Antenna)	Part of 3			
5	Resistor (1500 ohms) (Brown-Green-Red)	7951			
6	Condenser (.05 Mfd. Bakelite Block)	3615-AA			
7	Compensating Condenser (Detector)	Part of 3			
8*	Condenser (.05 Mfd. Tubular)	30-4012			
9	Detector Transformer	32-1452			
10	Condenser (.00035 Mfd. Mica)	30-1048			
11	Compensating Condenser (Low Frequency)	04000E			
12	Condenser (.25 Mfd. Tubular)	30-4146			
13	Resistor (.25 Meg.) (Red-Yellow-Yellow)	33-1097			
14	Resistor (50,000 ohms) (Green-Brown-Orange)	6098			
15	Resistor (2 Meg.) (Red-Black-Green)	33-1025			
16	Regeneration Control (35,000 ohms)	33-5076			
17	Resistor (1 Meg.) (Brown-Black-Green)	33-1096			
18	Condenser (.09 Mfd. Twin Bakelite Block)	4989-AK			
19	Condenser (.00025 Mfd. Mica)	30-1032			
20	Resistor (5,000 ohms) (Green-Black-Red)	5310			
21	Condenser (.0001 and .015 Bakelite Block)	7762-B			
22	Resistor (.25 Meg.) (Red-Yellow-Yellow)	33-1097			
23	Resistor (.5 Meg.) (Yellow-White-Yellow)	6097			
24	Condenser (.006 Mfd., Tubular)	30-4024			
25	Output transformer (On Speaker)	32-7019			
26	Voice Coil and Cone Assembly (SB Speaker)	36-3157			
27	Speaker Field Coil and Pot. Assembly	36-3243			
28	Condenser (.25 Mfd. Tubular)	30-4146			
29	Resistor (Wirewound, 390 ohms)	7465			
30	Condenser (Electrolytic 4 and 8 Mfd.)	30-2013			

* Production after 10-23-34 uses Part No. 30-4123.

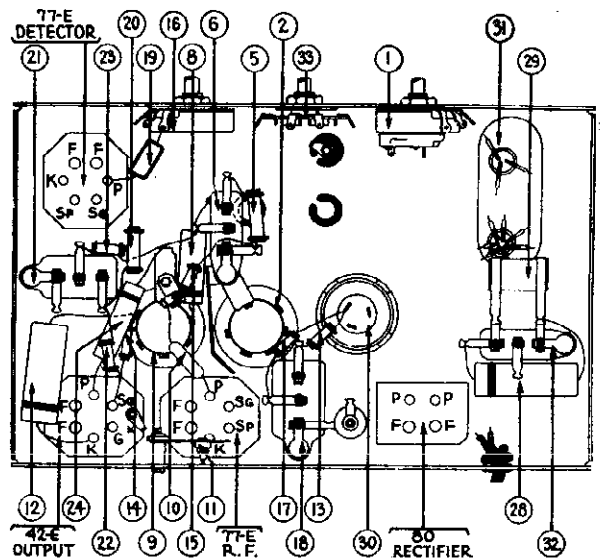


Fig. 3—Bottom View of Chassis Showing Parts, and Location of Tube Sockets for Voltage Tests

MODEL 267-E
 Socket, Voltage
 Alignment
 Transformer Data

PHILCO RADIO & TELEV. CORP.

MODEL 267-E

Philco Model 267-E is a four tube receiver designed for operation on 230 volts 50-60 cycles alternating current (A. C.). It receives over two frequency ranges, viz: 535 to 1510 kilocycles (standard wave) and 145 to 310 K.C. (long wave). The circuit used is the regenerative or "reaction" circuit. Model 267-E employs the following tubes: Type 77-E R. F., type 77-E detector, type 42-E pentode output and type 80 as rectifier. The power consumption is 46 watts.

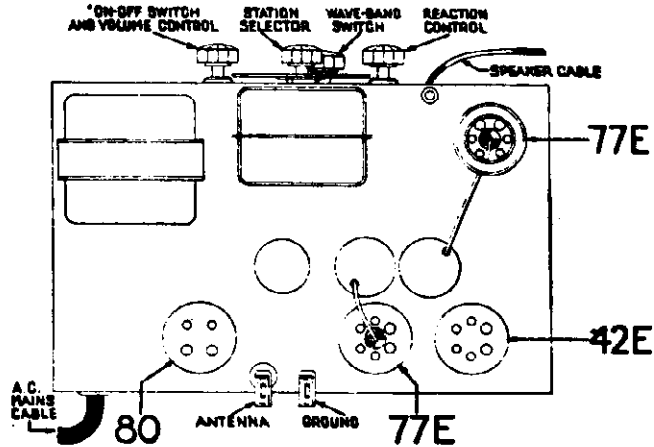


Fig. 1—Top View

Power Transformer Data (Line Voltage 240)

Terminals (See Fig. 2)	A. C. Voltage	Current	Circuit	Color
1-2	240	.....	Primary	White
3-4	6.3	1.5 A	Filaments	Black
6-7	5.0	2.0 A	Filaments of 80	Blue
9-10	6.30	55 MA	Plates of 80	Yellow
5	.....	.....	Center tap of 3-4	Black-Yellow tracer
8	.....	.....	Center tap of 9-10	Yellow-Green tracer

Tube Socket Voltage (Line Voltage 230)

	R. F. 77-E	Det 77-E	Output 42-E
P-K.....	42	137	245
SG-K.....	35	87	255
K to Gnd.....	0	3.8	0

Above values were obtained by a high resistance D.C. voltmeter and test prods applied to underside of chassis. See Fig. 3.

ADJUSTING COMPENSATING CONDENSERS

There are three compensating condensers in these sets. Two are located on the top of the sections of the tuning condenser gang; and one underneath chassis and reached from the rear (thru hole in sub-base).

Connect the set up to the A. C. line and the antenna lead from signal generator to antenna post of set. Set signal generator at 1500 K.C. Turn wave-band switch to right and set dial at 150. (If set is removed from cabinet, obtain a piece of flat steel, .006" thick, about 1/2" wide and four or five inches long; open condenser gang and bring heel of detector section down on this steel strip; then remove the strip without disturbing setting of condenser gang).

Turn volume control full on and reaction control about 3/4 of the way to full on; then with a suitable hex wrench (such as Philco No. 3164) adjust condensers ④ and ⑦ (located on tuning condenser gang) to obtain maximum reading in the output meter, which should be connected to primary terminals of the output transformer.

While making the adjustment, advance the reaction control as far as possible without causing oscillation, working for maximum output on both condensers.

Now throw wave-band switch to left and turn dial to 300 K.C. (30 on lower scale of dial). In this position the condenser gang is approximately open. Now adjust condenser ⑩ (reached from rear) for maximum output, keeping the reaction control advanced as explained above, to just below point of oscillation.

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September, 1934
Printed in U. S. A.

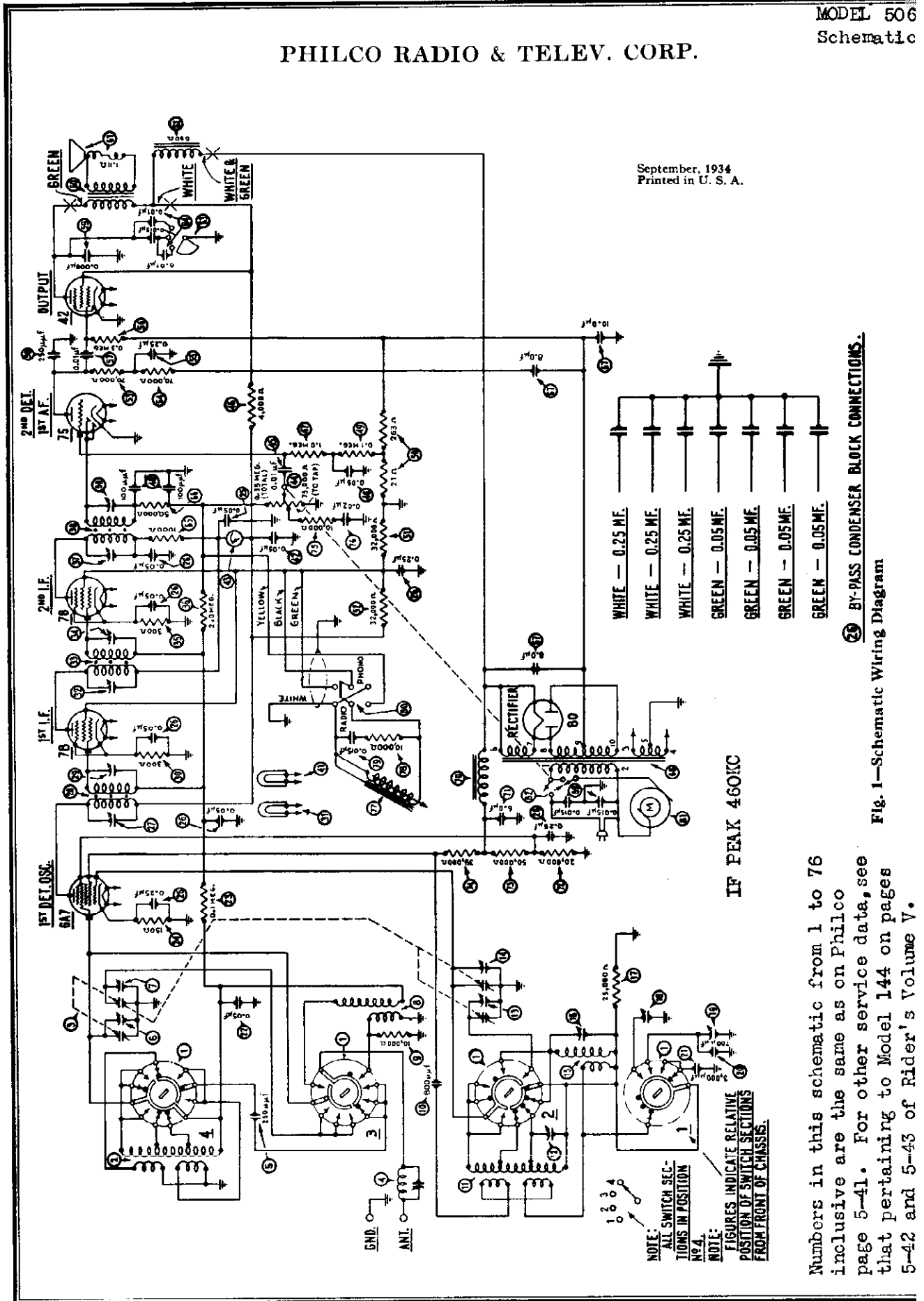


Fig. 1—Schematic Wiring Diagram
BY-PASS CONDENSER BLOCK CONNECTIONS.

Numbers in this schematic from 1 to 76 inclusive are the same as on Philco page 5-41. For other service data, see that pertaining to Model 144 on pages 5-42 and 5-43 of Rider's Volume V.

MODEL 506
Notes, Parts

PHILCO RADIO & TELEV. CORP.

Radio-Phonograph Model 506

PHILCO MODEL 506 has the same superheterodyne broadcast and short-wave receiver chassis as Model 144, and must be operated upon the exact frequency (cycles) of alternating current given upon the name-label of the radio receiver chassis,—for correct speed of the phonograph motor.

Service Bulletin No. 193 on Model 144 gives the data necessary to test and adjust the radio receiver of Model 506, and includes a full description of the adjustment of its compensating condensers.

The radio circuits are the same as those of Model 144,—with the additional phonograph reproducing circuits. Complete schematic wiring diagram of Model 506 is given in Figure 1 of this Bulletin. The audio frequency system of the radio chassis amplifies the impulses generated in the pick-up.

Replacement Parts for the radio chassis and speaker are given in Service Bulletin No. 193 (Model 144); the additional *phonograph* parts are:

No. on Fig. 1	Description	Part No.	List Price	No. on Fig. 1	Description	Part No.	List Price
⑦	Pick-up and Tone Arm Assembly	35-2002			Motor Board	28271	\$3.00
⑧	Resistor (10,000 ohm) (Brown-Black-Orange)	33-1000	\$0.20		Motor Board Mounting Screw	W-461B	.01
⑨	Condenser (.015 Mfd.)	3793-S	.35		Motor Board Mounting Washer (Finishing)	W-464B	1.50 per C.
⑩	Phonograph-Radio Switch	42-1067	.65		Mounting Board Rubber Washer	4074	.06
⑪	Phonograph Motor (115 volt, 60 cycle)	35-1002	23.00		Motor Mounting Screw	W-247A	.30 per C.
	Phonograph Motor (115 volt, 25 cycle)	35-1008	35.00		Motor Mounting Washer	W-151A	.20 per C.
⑫	Automatic-Stop Switch (Motor)	6345	3.15		Motor Mounting Nut	W-139A	.35 per C.
	Phonograph-Radio Switch Indicator	4277	.02		Pick-up Mounting Screw	W-230B	.30 per C.
	Phonograph-Radio Switch Plate	28-2250	.10		Pick-up Mounting Washer	W-151A	.20 per C.
	Radio-Phono Cord Assembly	35-3002	1.35		Pick-up Mounting Nut	W-139A	.35 per C.
	Turntable	35-3001	12.50		Pick-up Needle Screw	4108	.18
	Speed-Change Lever	28-1648	.25		Cord-Connector Plug	4091	.30
	Speed-Change Lever Spacer	28-6103	.03		Needle Cup	28-2222	.05
	Speed-Change Lever Spring	28-1649	.05		Needle Cup Cover	28-2223	.05

NOTE: Part ⑦ electrolytic condenser is 30-2014 in Model 506 instead of a 30-2020 as used in early Model 144 (30-2026 in current 144).

The electric pick-up is of the high-impedance type. Its impedance, at 1000 cycles, is 10,000 ohms. Its D. C. resistance is 700 ohms. A description of the adjustment of the pick-up is given in Service Bulletin No. 89, "Adjusting the Electric Pick-up".

The electric motor depends upon the frequency (cycles) of the power supply for its correct speed. The power line frequency must be the same as that given in the name-label upon the radio chassis and upon the motor frame. Only a motor of the correct frequency will give the proper turntable speed.

The motor is of the self-starting, synchronous type. The motor should be lubricated at least once every six months. To do this, lift off the turntable and place a few drops of a good grade of light machine oil in the oil-hole in the top-plate of the motor.

If the electric motor should develop a fault, it should be replaced. Do not attempt to repair it; get in touch with your Distributor regarding the faulty motor.

The tone arm must be free to rotate upon its axis at all times. Damage to records will result if it is not.

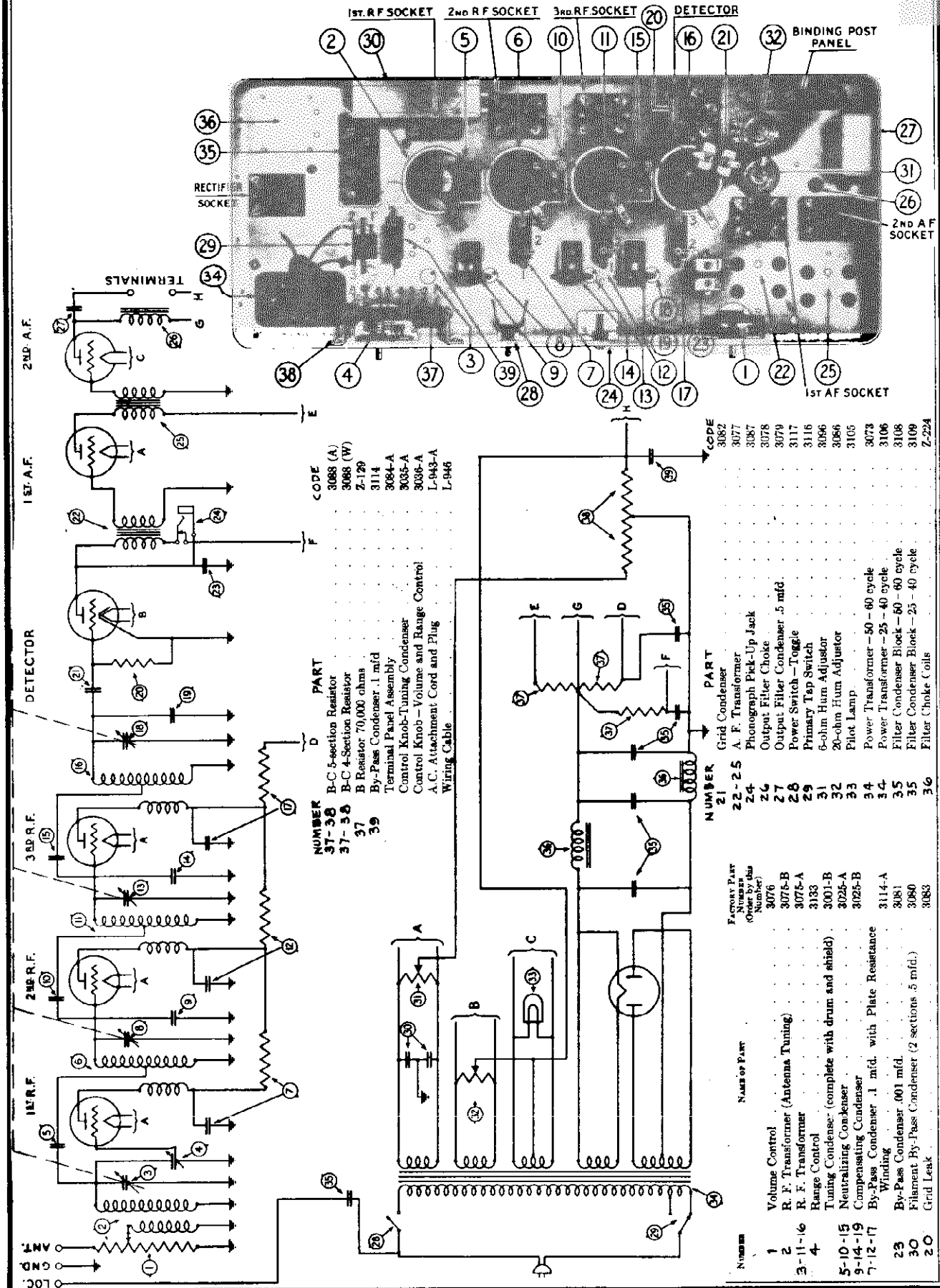
The speaker unit of Model 506 is Type H-16.

The power consumption of Model 506,—with motor running,— is 100 watts.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

PHILCO RADIO & TELEV. CORP.

MODEL 511
Schematic, Chassis
Parts



NUMBER	PART	CODE
37-38	B-C 5-section Resistor	3088 (A)
37-38	B-C 4-section Resistor	3088 (W)
37	B Resistor 70,000 ohms	Z-129
39	By-Pass Condenser .1 mfd	3114
	Terminal Panel Assembly	3084-A
	Control Knob-Tuning Condenser	3035-A
	Control Knob - Volume and Range Control	3036-A
	A.C. Attachment Cord and Plug	L-943-A
	Wiring Cable	L-946

NUMBER	PART	FACTORY PART NUMBER (Order by this Number)	NAME OF PART
21	Grid Condenser	3082	
22-25	A. F. Transformer	3077	
24	Phonograph Pick-Up Jack	3078	
26	Output Filter Choke	3079	
27	Output Filter Condenser .5 mfd.	3117	
28	Power Switch - Toggle	3116	
29	Primary Tap Switch	3086	
31	6-ohm Hum Adjustor	3066	
32	20-ohm Hum Adjustor	3105	
33	Pilot Lamp	3073	
34	Power Transformer - 50 - 60 cycle	3106	
34	Power Transformer - 25 - 40 cycle	3108	
35	Filter Condenser Block - 50 - 60 cycle	3109	
35	Filter Condenser Block - 25 - 40 cycle	3109	
36	Filter Choke Coils	Z-224	

MODEL 642

Chassis, Parts

PHILCO RADIO & TELEV. CORP.

Replacement Parts for Model 642

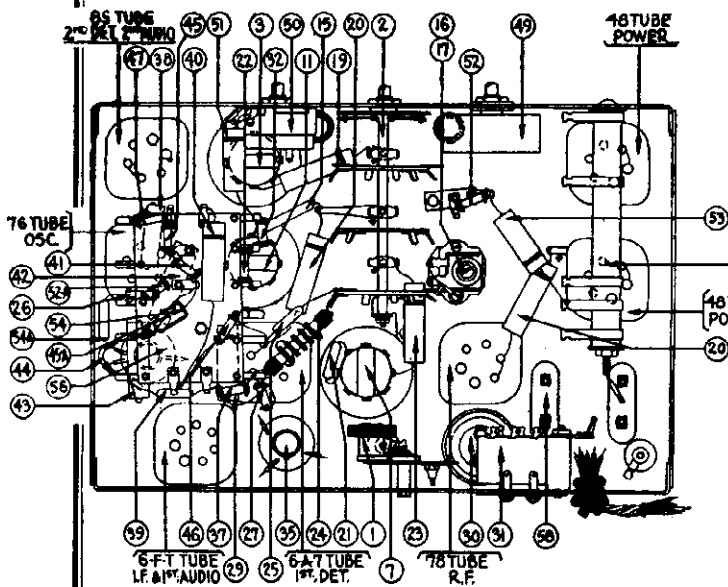


Fig. 4. Bottom View of Chassis

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Description	Part No.	List Price
1 Wavetrap.....	38-6972	\$0.75
2 Waveband Switch.....	42-1107	1.75
3 Antenna Transformer.....	32-1867	3.00
4 Compensating Condenser (Std.).....	Part of 3	.....
6 Compensating Condenser (Police).....	Part of 3	.....
6 Compensating Condenser (S. W.).....	Part of 3	.....
7 R. F. Transformer.....	32-1868	3.00
8 Compensating Condenser (Std.).....	Part of 7	.....
8 Compensating Condenser (Police).....	Part of 7	.....
10 Compensating Condenser (S. W.).....	Part of 7	.....
11 Oscillator Transformer.....	32-1869	2.50
12 Compensating Condenser (Std.).....	Part of 11	.....
13 Compensating Condenser (Police).....	Part of 11	.....
14 Compensating Condenser.....	Part of 11	.....
15 Condenser (.0047 mf.).....	30-1052	.55
16 Compensating Condenser (L. F. Police).....	31-6027	.70
17 Compensating Condenser (L. F. Std.).....	Part of 16	.....
18 Tuning Condenser.....	31-1526	2.75
18 Condenser (0.05 mf.).....	30-4020	.20
20 Condenser (0.05 mf.).....	30-4020	.20
21 Condenser (.000050 mf.).....	30-1029	.20
22 Resistor (99,000 ohms).....	6099	.20
23 Condenser (0.05 mf.).....	30-4020	.20
24 Choke (R.F.).....	32-1842	.50
26 Condenser (.00015 mf.).....	30-1033	.25
26 Resistor (20,000 ohms).....	33-1178	.20
27 Resistor (13,000 ohms).....	8267	.20
28 Choke (Filter).....	32-7215	.90
28 Condenser (0.05 mf.).....	30-4020	.20

Description	Part No.	List Price
30 Condenser (5.0 mf.).....	30-2132	\$0.70
31 Condenser (0.15-0.15 mf.).....	6287-DU	.40
32 Resistor (2.0 meg.).....	33-1025	.20
33 Condenser (0.05 mf.).....	30-4020	.20
34 Compensating Condenser (1st I. F. Pri.).....	Part of 36	.....
35 I. F. Transformer (1st).....	32-1843	1.50
36 Compensating Condenser (1st I. F. Sec.).....	Part of 36	.....
37 Resistor (170,000 ohms).....	33-1191	.20
38 Condenser (0.02 mf.).....	30-4215	.20
39 Condenser (.00011 mf.).....	30-1031	.20
40 Condenser (0.02 mf.).....	30-4124	.25
41 Resistor (2 meg.).....	33-1025	.20
42 Condenser (0.05 mf.).....	30-4020	.20
43 Condenser (0.05 mf.).....	30-4020	.20
44 Resistor (300 ohms).....	33-3010	.20
45 Resistor (1.0 meg.).....	33-1096	.20
46 Resistor (1.0 meg.).....	33-1096	.20
47 Resistor (1.0 meg.).....	33-1096	.20
48 B. C. Resistor.....	38-7026	.30
49 Tone Control.....	30-4332	.75
50 Volume Control.....	33-5120	1.45
51 Condenser (0.02 mf.).....	30-4215	.20
52 Resistor (25,000 ohms).....	33-1013	.20
53 Condenser (0.02 mf.).....	30-4215	.20
54 Condenser (.00011 mf.).....	30-1031	.20
54A Condenser (.00011 mf.).....	30-1031	.20
56 Compensating Condenser (2nd I. F. Pri.).....	Part of 56	.....
56 2nd I. F. Transformer.....	32-1844	1.50
57 Compensating Condenser (2nd I. F. Sec.).....	Part of 56	.....
58 Input Transformer.....	3242	2.50
59 Output Transformer.....	32-7309	1.30
60 Speaker Cone Assembly..... (K-29)	36-3159	.80
Field Coil Assembly.....	36-3407	3.25
5 Prong Socket.....	27-6035	.11
6 Prong Socket.....	27-6036	.11
7 Prong Socket.....	27-6037	.11
R. F. Shield Assembly.....	38-6938	.35
Tube Shield Body.....	28-2726	.10
Tube Shield Base.....	28-2725	.03
Pilot Lamp.....	34-2068	.16
Dial.....	27-5098	.25
Hub and Set Screw Assembly.....	31-1550	.15
Spring Clamp.....	28-2837	.10
Speaker Cable.....	L-1885	.25
Bezel.....	28-3163	.50
Bezel Glass.....	27-8006	.55
Bezel Gasket.....	27-7980	.01
Bezel Frame Gasket.....	27-7971	.02
Knob (Station Selector).....	27-4206	.12
Knob (Fine Tuning).....	27-4207	.10
Knob (Volume Control, Tone Control).....	27-4208	.10
Knob (Wave Band Switch).....	27-4225	.10

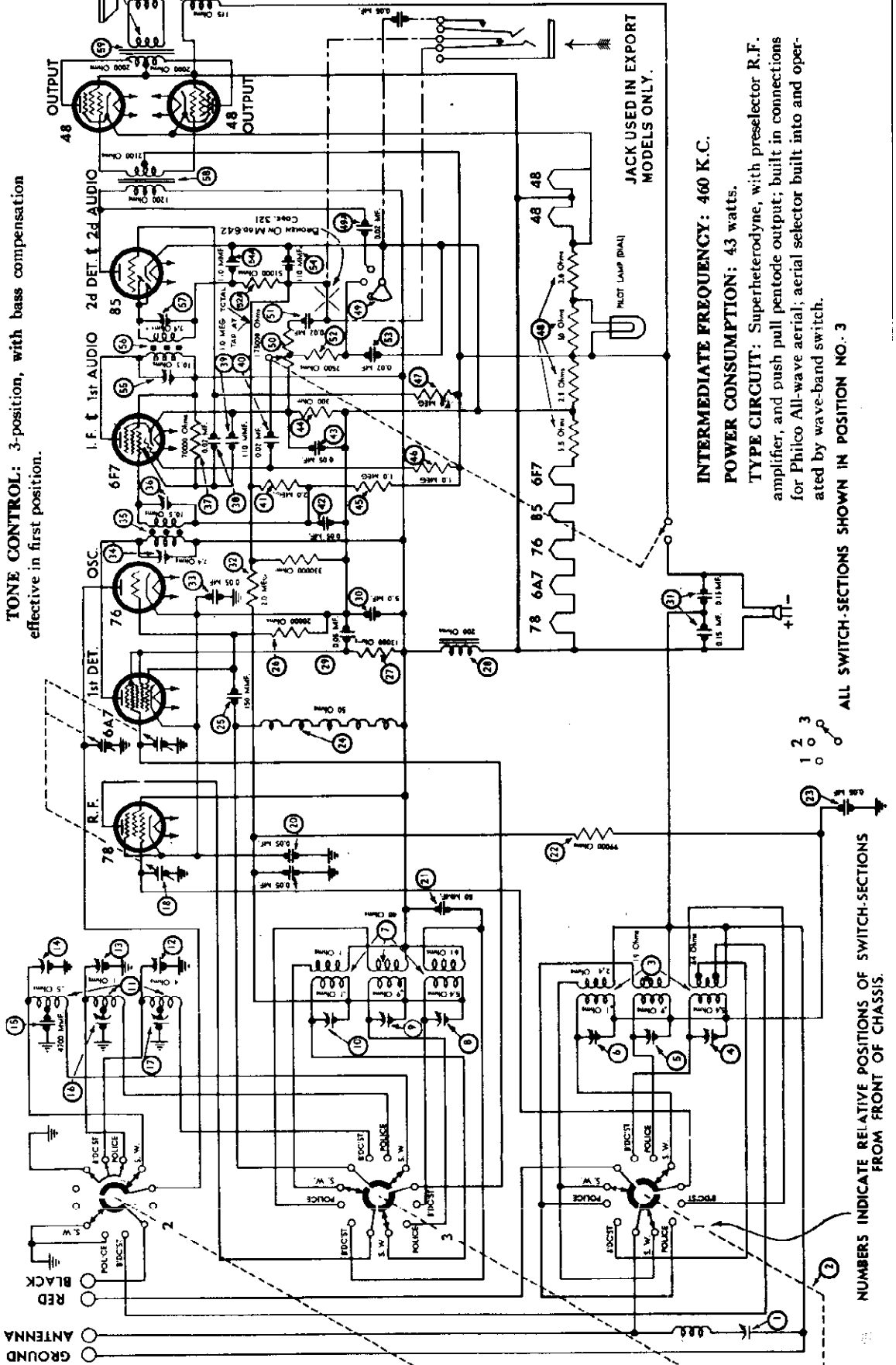
PHILCO RADIO & TELEV. CORP.

MODEL 642
Schematic

COVERAGE OF EACH BAND: Band 1, 540-1750 K.C.;
Band 2, 1750 to 5800 K.C. (1.75-5.8 megacycles); Band 3,
5700-18000 K.C. (5.7 to 18.0 megacycles).
TUNING DRIVE: Two-speed gear drive, ball bearing.
50 to 1 ratio for slow-speed tuning.
STONE CONTROL: 3-position, with bass compensation
effective in first position.

POWER SUPPLY: Direct Current, 32 volt.

WAVE BANDS: Three—(1) standard (with some Police);
(2) Police, Aircraft and Amateur; (3) Short-wave.



INTERMEDIATE FREQUENCY: 460 K.C.

POWER CONSUMPTION: 43 watts.

TYPE CIRCUIT: Superheterodyne, with preselector R.F. amplifier, and push pull pentode output; built in connections for Philco All-wave aerial; aerial selector built into and operated by wave-band switch.

ALL SWITCH-SECTIONS SHOWN IN POSITION NO. 3

NUMBERS INDICATE RELATIVE POSITIONS OF SWITCH-SECTIONS FROM FRONT OF CHASSIS.

PHILCO RADIO & TELEV. CORP.

MODEL 642
Voltage, Socket
Trimmers, Alignment

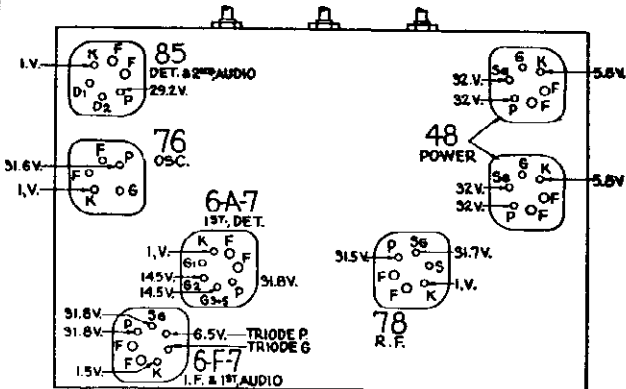


Fig. 1. Tube Sockets as viewed from bottom and Voltage Measurements

Above voltages were obtained by using a PHILCO type 025 Circuit Tester (or 048A All purpose Tester), using test prods applied to underside of chassis. Volume control at minimum; dial at 55; waveband switch counter-clockwise (band 1). Use Fig. 1 for test points. Line voltage 32 volts.

Adjusting Compensating Condensers

The adjustment of the compensating condensers in Model 642 requires a signal generator covering the broadcast and police band, and also one capable of producing a signal at certain frequencies in the short wave band. Philco Model 088 All-wave signal generator is ideal for these requirements. The location of all compensating condensers is shown in Fig. 5. An output meter is also needed, such as the Philco Model 025.

Adjustment of I. F.

I. F. ADJUSTMENTS: Set the signal generator at 460 K.C. with attenuator set at minimum, and attach its antenna lead to the grid of the 6F7 I. F. amplifier tube (removing grid cap). Connect ground lead to ground terminal on set. Set the dial at 55 and turn the waveband switch to position 1 (standard). Adjust the volume control of set to almost maximum (just before oscillator hiss becomes noticeable), and the signal generator attenuator so that about one-fourth ($\frac{1}{4}$) scale reading is had on the output meter. With a fibre screw driver adjust condensers (14) and (15) (2nd I. F.) for maximum reading on output meter. Turn attenuator of signal generator to minimum and remove its antenna lead from the grid of the 6F7 I. F. tube, replacing grid cap. Then place the antenna lead on the grid of the 6A7. Adjust attenuator as before, then proceed to adjust condensers (16) and (17) (1st I. F.) for maximum reading. Care should be taken to keep the output meter reading during adjustments at about one-fourth scale reading. This should be done by using the signal generator attenuator control.

Adjustment of Wave-Trap

1. Connect the signal generator leads to the antenna and ground terminals of the receiver.
2. With the wave-band switch of the receiver still in the extreme left (standard band), (540-1750 K.C.), turn the station selector to 55.
3. With the signal generator in operation at 460 K.C., adjust the wave-trap (1) condenser until a MINIMUM reading is obtained on the output meter. The Philco fibre wrench, part No. 3164, is used for this adjustment. The wave-trap compensator is reached from rear of chassis.

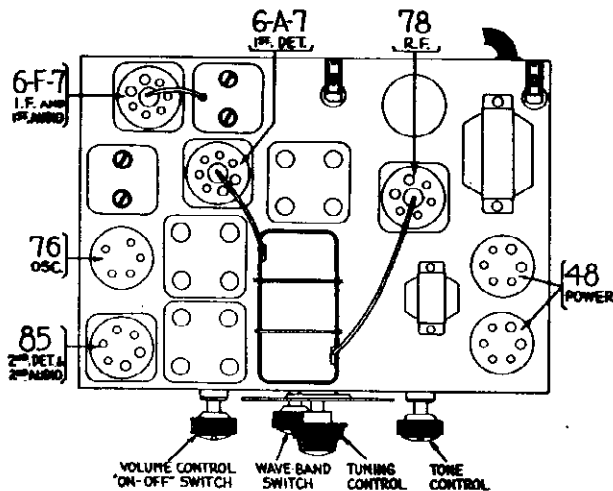


Fig. 2. Location of Tubes (Top View)

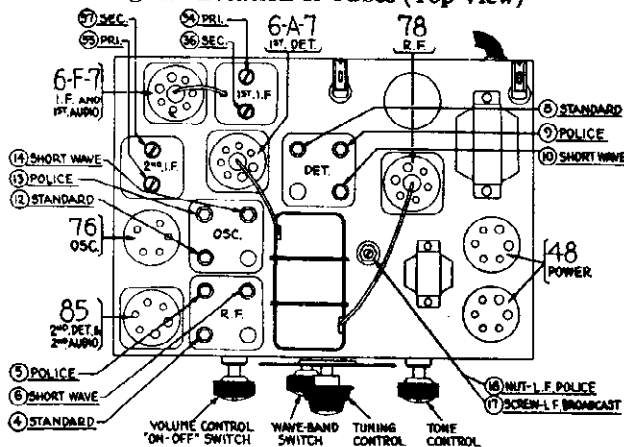


Fig. 5. Location of Compensating Condensers

Adjustment of R. F., Oscillator and Detector Stages

1. **SHORT WAVE:** Connect the antenna lead of the signal generator to the grid of the 78 R.F. tube (removing grid clip), and the ground lead to the ground terminal of the set. Set the signal generator dial at 18.0 MC. Turn waveband switch to position 3. Turn the set dial to 18.0 MC. Turn condenser (10) one-half turn from tight. Adjust condenser (14) for maximum output. Turn the set dial and signal generator dial to 6.0 MC and adjust condenser (16) for maximum reading. Remove the signal generator antenna lead from the 78 grid (replacing grid clip) and connect to the antenna post of the set. Tune the set and signal generator back to 18.0 MC and adjust condenser (8) for maximum output. Check image frequency at approximately 17.1 MC.
2. **POLICE:** Turn the waveband switch to position 2 and tune the set and signal generator to 5.5 MC. Adjust condensers (5), (9) and (13) for maximum output. Next tune the set and signal generator to 1800 K.C. and adjust condenser (19) (Nut) for maximum output. Tune the set and signal generator again to 5.5 MC and re-adjust condenser (13) for maximum output.
3. **STANDARD:** Throw waveband switch to position 1. Tune the set and signal generator to 1500 K.C. Adjust condensers (1), (11) and (12) for maximum output. Next tune the set and signal generator to 580 K.C. and adjust condenser (17) (Screw) for maximum output. Readjust the set at 1500 K.C. by tuning condenser (12) for maximum output.

PHILCO RADIO & TELEV. CORP. MODEL 821P Schematic, Chassis Parts

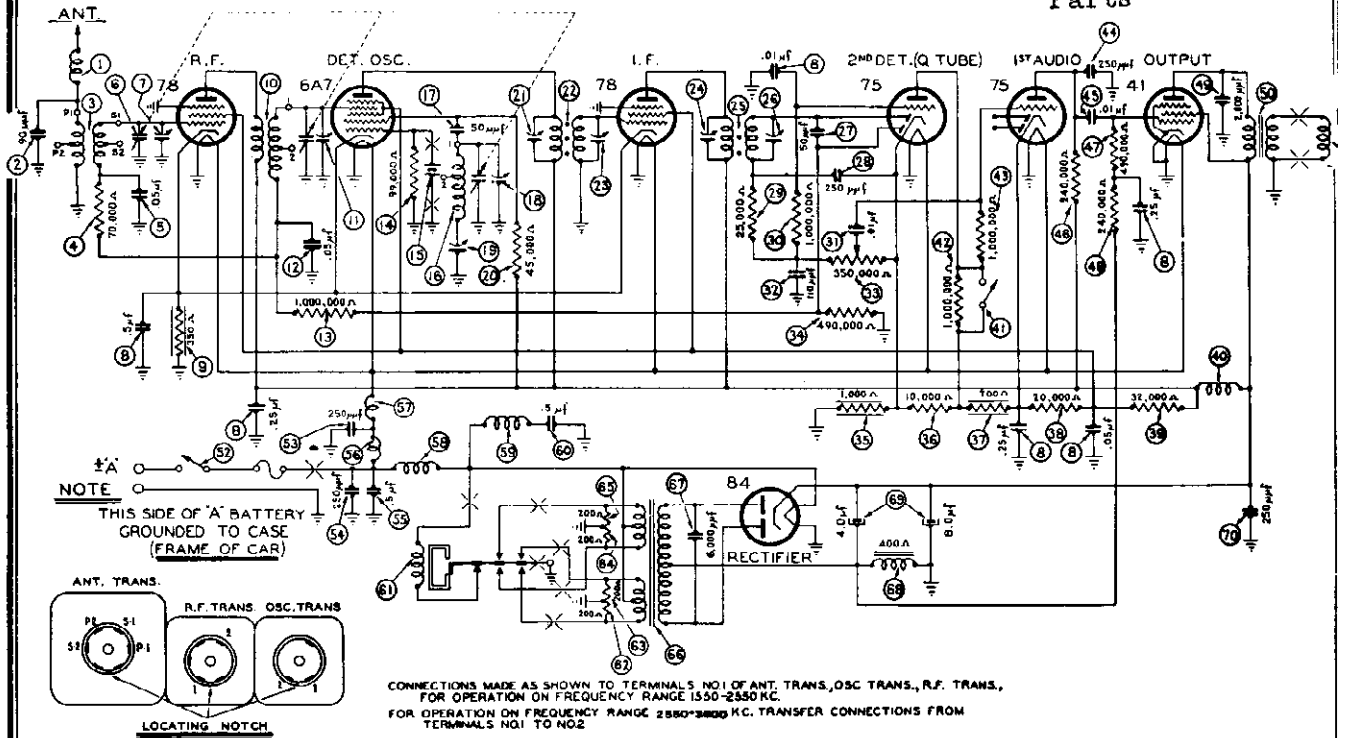


Figure 3

PARTS LIST — MODEL 821P

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	38-8697	27	Condenser (50 mmfd.)	30-1029
2	Condenser (90 mmfd.)	30-1046	28	Condenser (250 mmfd.)	30-1032
3	Antenna Transformer	32-2605	29	Resistor (25,000 ohms)	33-325344
4	Resistor (70,000 ohms)	33-870344	30	Resistor (1,000,000 ohms)	33-510344
5	Condenser (.05 mfd.)	30-4444	31	Condenser (.01 mfd.)	3903-08U
6	Tuning Condenser	31-2046	32	Condenser (110 mmfd.)	30-1031
7	First Padder (on Tun. Cond.)		33	Volume Control (350,000 ohms)	33-5148
8	Condenser (.01-.05-.25-.25-.5 mfd.)	30-4526	34	Resistor (490,000 ohms)	33-449344
9	Resistor (350 ohms)	33-1241	35	Resistor (1,000 ohms)	33-210344
10	R. F. Transformer	32-2596	36	Resistor (10,000 ohms)	33-310344
11	Second Padder (on Tun. Cond.)		37	Resistor (700 ohms)	33-1220
12	Condenser (.05 mfd.)	3615-08U	38	Resistor (20,000 ohms)	33-320344
13	Resistor (1,000,000 ohms)	33-510344	39	Resistor (32,000 ohms)	33-332434
14	Resistor (89,000 ohms)	33-399344	40	'B' Choke	32-1281
15	Crystal (821P)		41	Sensitivity Switch	42-1140
16	1875 K. C.	45-2101	42	Resistor (1,000,000 ohms)	33-510344
17	Frequencies 1596-1610-1626 K. C.		43	Resistor (1,000,000 ohms)	33-510344
18	1908 K. C.	45-2194	44	Condenser (.01 mfd.)	3903-08U
19	Frequencies 1630-1634-1642-1650-1658-1666 K. C.		45	Resistor (240,000 ohms)	33-424344
20	1953 K. C. Crystal	45-2195	46	Resistor (490,000 ohms)	33-449344
21	Frequencies 1674-1683-1690-1698-1706-1712 K. C.		47	Resistor (240,000 ohms)	33-424344
22	2578 K. C.	45-2251	48	Condenser (2,000 mmfd.)	30-4177
23	Frequencies 2310-2318-2326-2334 K. C.		49	Output Transformer	32-7831
24	2618 K. C. Crystal	45-2231	50	Complete Speaker (DR-4)	36-1342
25	Frequencies 2342-2350-2358-2366-2374 K. C.		51	On & Off Switch	42-1188
26	2658 K. C. Crystal	45-2196	52	Condenser (250 mmfd.)	30-1032
27	Frequencies 2382-2390-2398-2408-2414 K. C.		53	Condenser (250 mmfd.)	30-1032
28	2696 K. C. Crystal	45-2197	54	Condenser (.5 mfd.)	30-4015
29	Frequencies 2422-2430-2442-2450 K. C.		55	'A' Choke	32-1604
30	2734 K. C. Crystal	45-2198	56	Filament Choke	32-2535
31	Frequencies 2458-2466-2474-2482-2490 K. C.		57	Vibrator Choke	32-2039
32	3000 K. C. Crystal	45-2230	58	Choke	32-1374
33	Frequencies 2726 K. C.		59	Condenser (.5 mfd.)	30-4015
34	3380 K. C. Crystal	45-2496	60	Vibrator	41-3315-3
35	Frequencies 2105 K. C.		61	Resistor (200 ohms)	33-120344
36	Oscillator Transformer	32-2597	62	Resistor (200 ohms)	33-120344
37	Condenser (50 mmfd.)	30-1029	63	Resistor (200 ohms)	33-120344
38	Third Padder (on Tun. Cond.)		64	Resistor (200 ohms)	33-120344
39	Low Frequency Padder	31-6079	65	Power Transformer	32-7820
40	Resistor (45,000 ohms)	33-345344	66	Condenser (6,000 mmfd.)	30-4512
41	Padder (Pri. 1st I.F. Trans.)		67	Filter Choke	32-7545
42	First I. F. Transformer	32-2026	68	Filter Condenser (4-8 mfd.)	30-2150
			69	Condenser (250 mmfd.)	30-1032
			70	Control Assembly	42-5591

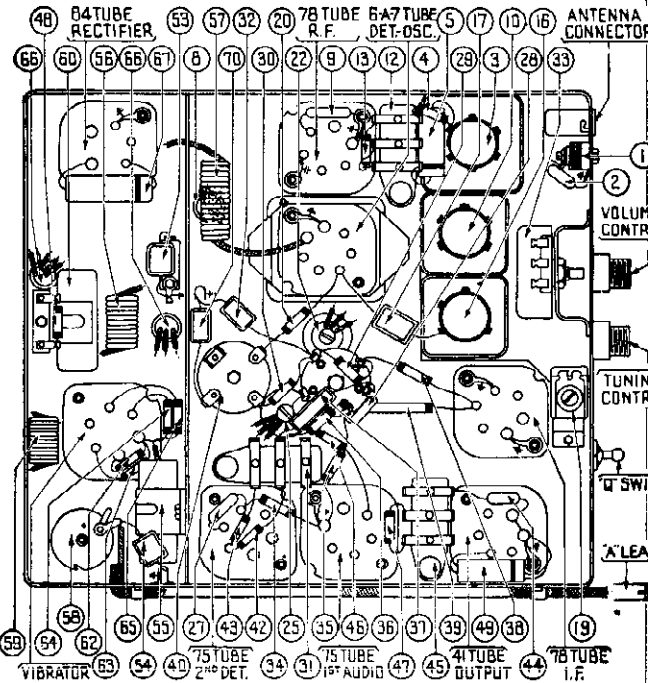


Figure 4

No.	Description	Part No.	Description	Part No.
	Volume Shaft	28-8620	Speaker Clamp	28-3131
	Volume Knob	27-4208	Clamp Nut	W-124
	Antenna Lead	41-3191	Fuse	7227
	Four Prong Socket	27-6044	Fuse Insulator	27-7729
	Five Prong Socket	27-6035	Receiver Mtg. Plate	28-4650
	Six Prong Socket	27-6036	Receiver Housing	38-8777
	Seven Prong Socket	27-6037		

MODEL 821P

Alignment
Trimmers

PHILCO RADIO & TELEV. CORP.

The Model 821P, in addition to utilizing all the precautions requisite for circuit stability, uses a sealed, precision QUARTZ CRYSTAL to control the oscillator circuit and hold it on the required frequency. This feature is indispensable in any fixed frequency Receiver used for emergency service

The Receivers, when used with the proper crystals, can be adjusted for any specified frequency between 1550 K.C. and 3600 K.C. Different crystals are used to obtain these frequencies. The crystal frequency, however, is no indication of the Receiver frequency adjustment.

FREQ. OF CRYSTAL	RECEIVER FREQ.	PART No. CRYSTAL
1875 K. C.	1596-1610-1626 K. C.	45-2101
1908 K. C.	1630-1634-1642	
	1650-1658-1666 K. C.	45-2194
1953 K. C.	1674-1683-1690	
	1698-1706-1712 K. C.	45-2195
2578 K. C.	2310-2318-2326-2334 K. C.	45-2251
2618 K. C.	2342-2350-2358-2366-2374 K. C.	45-2231
2658 K. C.	2382-2390-2398	
	2406-2414 K. C.	45-2196
2696 K. C.	2422-2430-2442	
	2450 K. C.	45-2197
2734 K. C.	2458-2466-2474	
	2482-2490 K. C.	45-2198
3000 K. C.	2726 K. C.	45-2230
3360 K. C.	3105 K. C.	45-2496

I. F. STAGES — The signal generator must be set exactly to the predetermined frequency and the generator lead connected to the grid cap of the 6A7 detector oscillator tube in series with a .1 mfd. condenser. Adjust padders ⑪, ⑫, ⑬ and ⑭ on the first and second I. F. transformers for maximum reading on the output meter.

R. F. STAGE — Tune the signal generator to the frequency of the transmitter and connect the output of the signal generator to the grid cap of the R. F. tube in series with a .1 mfd. condenser. Turn the tuning condenser to the input frequency and adjust padders ⑮ and ⑯ for maximum reading on the output meter. Notice the position of the padders. They should be out as far as possible, yet with sufficient tension to keep them firmly in place. If the padders are too tight, turn the tuning condenser plates in mesh slightly and repad ⑮ and ⑯. If the padders are too loose, turn the tuning condenser plates out of mesh slightly and repad ⑮ and ⑯. Repeat these adjustments until the correct padding settings are obtained.

The low frequency padder ⑰ must be adjusted to a position where padders ⑮ and ⑯ are not too tight or too loose, i.e., if padder ⑮ is too tight and padder ⑰ too loose, turn the tuning condenser plates out of mesh slightly and screw in a little on padder ⑰. If padder ⑮ is too loose and padder ⑰ too tight, turn the tuning condenser plates in mesh slightly and loosen the padder ⑰ somewhat.

For any given frequency padder ⑰ should be screwed in almost tight (approximately a 1/2 to 3/4 of a turn from tight) for best results and at the same time obtain the correct tuning condenser setting and adjustments of padders ⑮ and ⑯.

The I. F. stages can be tuned to any frequency between 242 K. C. and 278 K. C.

Special attention must be given to the adjustment of the oscillator padder ⑱, which should be backed off the peak slightly to obtain stable crystal operation.

The I. F. frequency used in each Receiver is the difference between the frequency of the crystal in the Receiver and the frequency of the transmitter, i.e., the transmitter frequency is 2422 K. C., the crystal used is 2696 K. C., the difference is 274 K. C., which is the frequency to which the I. F. amplifier must be tuned.

ANTENNA STAGE — Connect the antenna lead, Part No. 41-3191, to the antenna receptacle on the Receiver in series with a 55 mmfd. condenser and set the signal generator to the frequency of the transmitter. Adjust padders ①, ②, ③, ④ and ⑤ for maximum reading on the output meter.

The Receiver must be padded while warm and repadded after it has been operated for several hours.

DO NOT OPEN THE CRYSTAL HOLDER. If for any reason whatever it has been opened, the crystal plates should be very carefully cleaned with carbon tetrachloride. After cleaning, the crystal must not be touched by the fingers. Use a clean cloth for handling.

The Receiver "Q" switch must be in the off position, cutting out the carrier relay circuit.

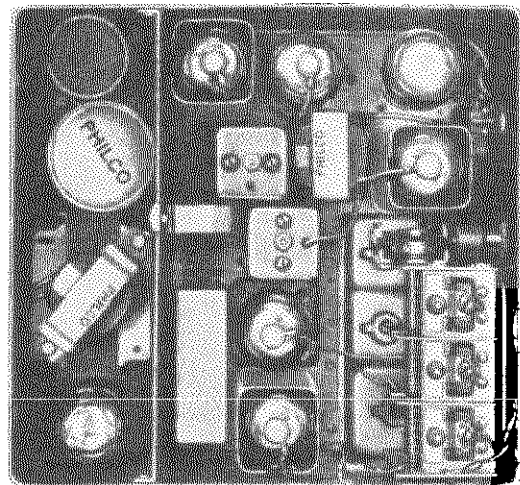
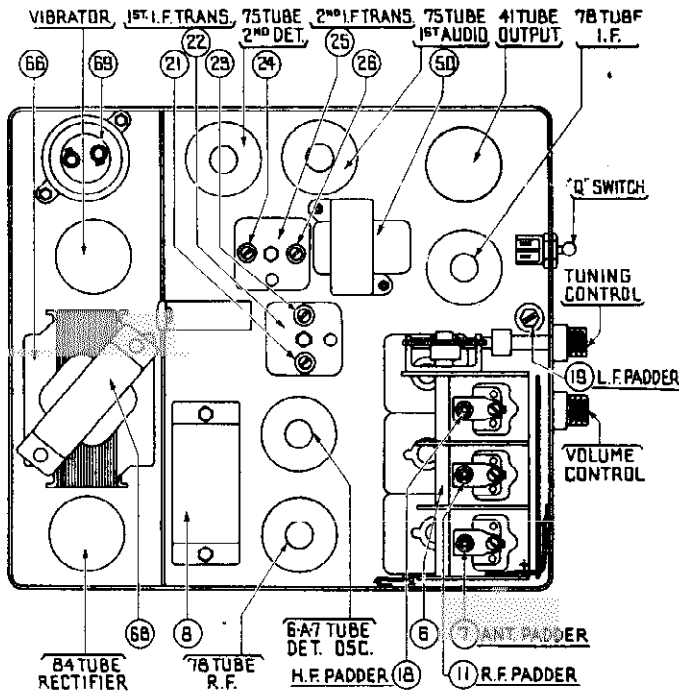
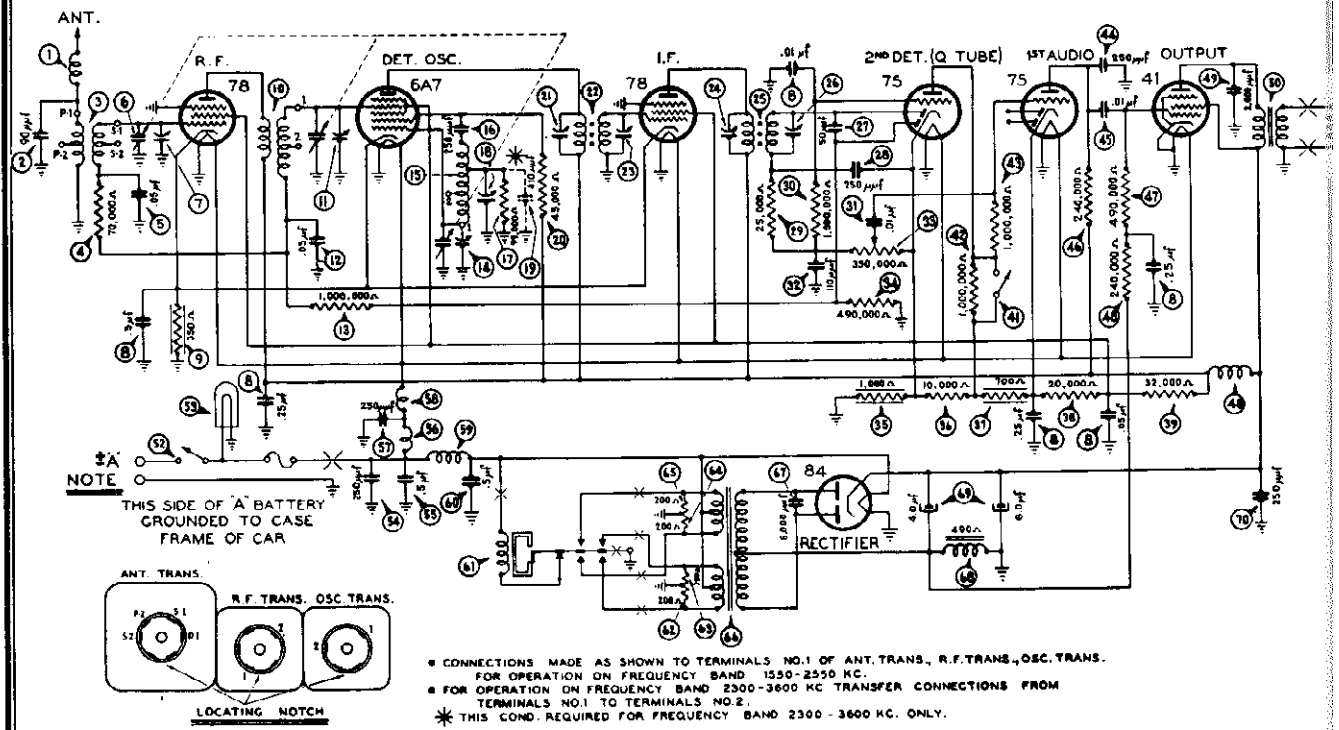


Figure 5 — Model 821P Top View

JULY, 1937

PHILCO RADIO & TELEV. CORP.

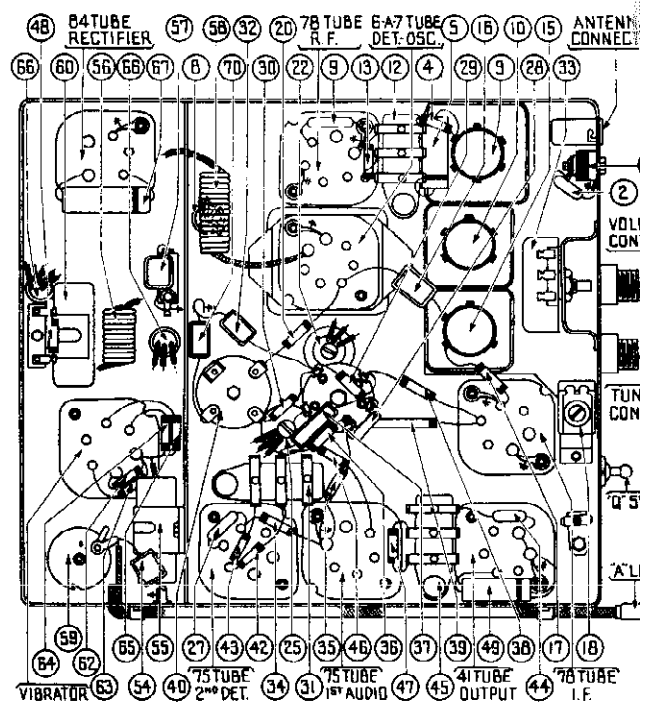
MODEL 821PV
Schematic, Chassis
Parts



I.F.=260 KC

PARTS LIST — MODEL 821PV

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	38-8697	34	Condenser (250 mmfd.)	30-1032
2	Condenser (90 mmfd.)	30-1046	35	Condenser (.01 mfd.)	3903-0SU
3	Antenna Transformer	32-2805	36	Resistor (240,000 ohms)	33-424344
4	Resistor (70,000 ohms)	33-370344	37	Resistor (490,000 ohms)	33-449344
5	Condenser (.05 mfd.)	30-4444	38	Resistor (240,000 ohms)	33-424344
6	Tuning Condenser	31-2031	39	Condenser (2,000 mmfd.)	30-4177
7	First Padder (on Tun. Cond.)		40	Output Transformer	32-7831
8	Condenser (.01-.05-.25-.25-.5 mfd.)	30-4520	41	Complete Speaker (DR-4)	36-1342
9	Resistor (350 ohms)	33-1241	42	On & Off Switch	42-1318
10	R. F. Transformer	32-2596	43	Pilot Lamp	34-2040
11	Second Padder (on Tun. Cond.)		44	Condenser (250 mmfd.)	30-1032
12	Condenser (.05 mfd.)	3615-0SU	45	Condenser (.5 mfd.)	30-4015
13	Resistor (1,000,000 ohms)	33-510344	46	"A" Choke	32-1604
14	Third Padder (on Tun. Cond.)		47	Condenser (250 mmfd.)	30-1032
15	Oscillator Transformer	32-2598	48	Filament Choke	32-2535
16	Condenser (250 mmfd.)	30-1032	49	Vibrator Choke	32-2039
17	Resistor (99,000 ohms)	33-399344	50	Condenser (.5 mfd.)	30-4015
18	Low Frequency Padder	31-6079	51	Vibrator	41-3315-3
19	Condenser (410 mmfd.)	30-1093	52	Resistor (200 ohms)	33-120344
20	Resistor (45,000 ohms)	33-345344	53	Resistor (200 ohms)	33-120344
21	Padder (Pri. 1st I.F. Trans.)		54	Resistor (200 ohms)	33-120344
22	First I. F. Transformer	32-2026	55	Power Transformer	32-7820
23	Padder (Sec. 1st I.F. Trans.)		56	Condenser (6,000 mmfd.)	30-4512
24	Padder (Pri. 2nd I.F. Trans.)		57	Filter Choke	32-7545
25	Second I. F. Transformer	32-2027	58	Filter Condenser (4-8 mfd.)	30-2150
26	Padder (Sec. 2nd I.F. Trans.)		59	Condenser (250 mmfd.)	30-1032
27	Condenser (.50 mmfd.)	30-1029	60	Four Prong Socket	27-6044
28	Condenser (250 mmfd.)	30-1032	61	Five Prong Socket	27-6035
29	Resistor (25,000 ohms)	33-325344	62	Six Prong Socket	27-6036
30	Resistor (1,000,000 ohms)	33-510344	63	Seven Prong Socket	27-6037
31	Condenser (.01 mfd.)	3903-0SU	64	Speaker Clamp	28-3131
32	Condenser (.110 mmfd.)	30-1031	65	Clamp Nut	W-124
33	Volume Control (350,000 ohms)	33-5148	66	Control Assembly	42-5739
34	Resistor (490,000 ohms)	33-449344	67	Scale Assembly	42-5736
35	Resistor (1,000 ohms)	33-210344	68	Tuning & Volume Shaft	38-8740
36	Resistor (10,000 ohms)	33-310344	69	Pilot Lamp Assembly	38-7734
37	Resistor (700 ohms)	33-1320	70	Tuning & Volume Knob	27-4521
38	Resistor (20,000 ohms)	33-320344	71	Switch Lever Knob	27-4525
39	Resistor (32,000 ohms)	33-532434	72	Antenna Lead	41-3191
40	"B" Choke	32-1281	73	Fuse	7227
41	Sensitivity Switch	42-1140	74	Fuse Insulator	27-7729
42	Resistor (1,000,000 ohms)	33-510344	75	Receiver Mtg. Plate	28-4850
43	Resistor (1,000,000 ohms)	33-510344	76	Receiver Housing	38-8777



MODEL 821PV
Alignment, Trimmers
Notes
MODEL 821P Notes

PHILCO RADIO & TELEV. CORP.

MODELS 821PV

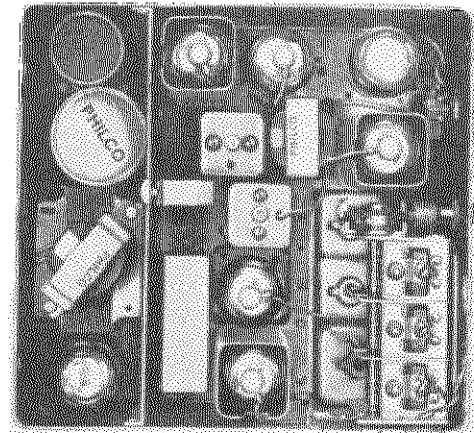
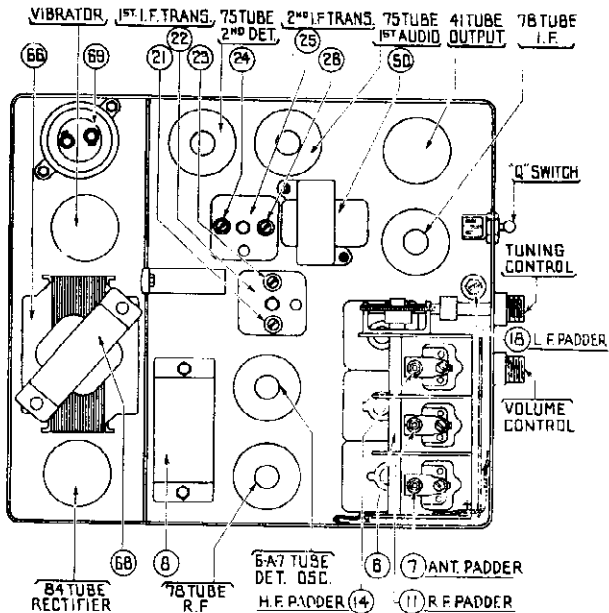
OPERATION	FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
1	*260 K. C.	To Grid of 78 Tube—I.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection Turn Tuning Condenser Plates out of mesh as far as they will go	24 - 26
2	*260 K. C.	To Grid of 6A7 Tube	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection Turn Tuning Condenser Plates out of mesh as far as they will go	21 - 23 24 - 26
FOR FREQUENCIES BETWEEN 1550 K. C. AND 2550 K. C.					
3	*2550 K. C.	To Grid of 78 Tube—R.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection Turn Tuning Condenser Plates out of mesh as far as they will go	14 - 11
4	*1650 K. C.	To Grid of 78 Tube—R.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection Turn Tuning Condenser to 1650 K. C.	18 Note 1
5	*2550 K. C.	To Grid of 78 Tube—R.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection Turn Tuning Condenser Plates out of mesh as far as they will go	14
6	*2400 K. C.	Note 2	55 Mmfd. Condenser Note 2	Turn Tuning Condenser to 2400 K. C.	7 - 11
FOR FREQUENCIES BETWEEN 2550 K. C. AND 3600 K. C.					
7	*3600 K. C.	To Grid of 78 Tube—R.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection Turn Tuning Condenser Plates out of mesh as far as they will go	14 - 11
8	*2400 K. C.	To Grid of 78 Tube—R.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection Set Tuning Condenser at 2400 K. C.	18 Note 1
9	*3600 K. C.	To Grid of 78 Tube—R.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection Turn Tuning Condenser Plates out of mesh as far as they will go	14
10	*3400 K. C.	Note 2	55 Mmfd. Condenser Note 2	Set Tuning Condenser at 3400 K. C.	7 - 11

Adjust for maximum reading on the output meter.

NOTE 1—Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then re-adjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 2—Connect the antenna lead, Part No. 41-3191, to the antenna receptacle on the Receiver in series with a 55 mmfd. condenser.

* The Receiver "Q" switch must be in the off position, cutting out the carrier relay circuit.



JULY 1937

Figure 8 — Model 821PV Top View

RECEIVER
FREQUENCY
RANGE

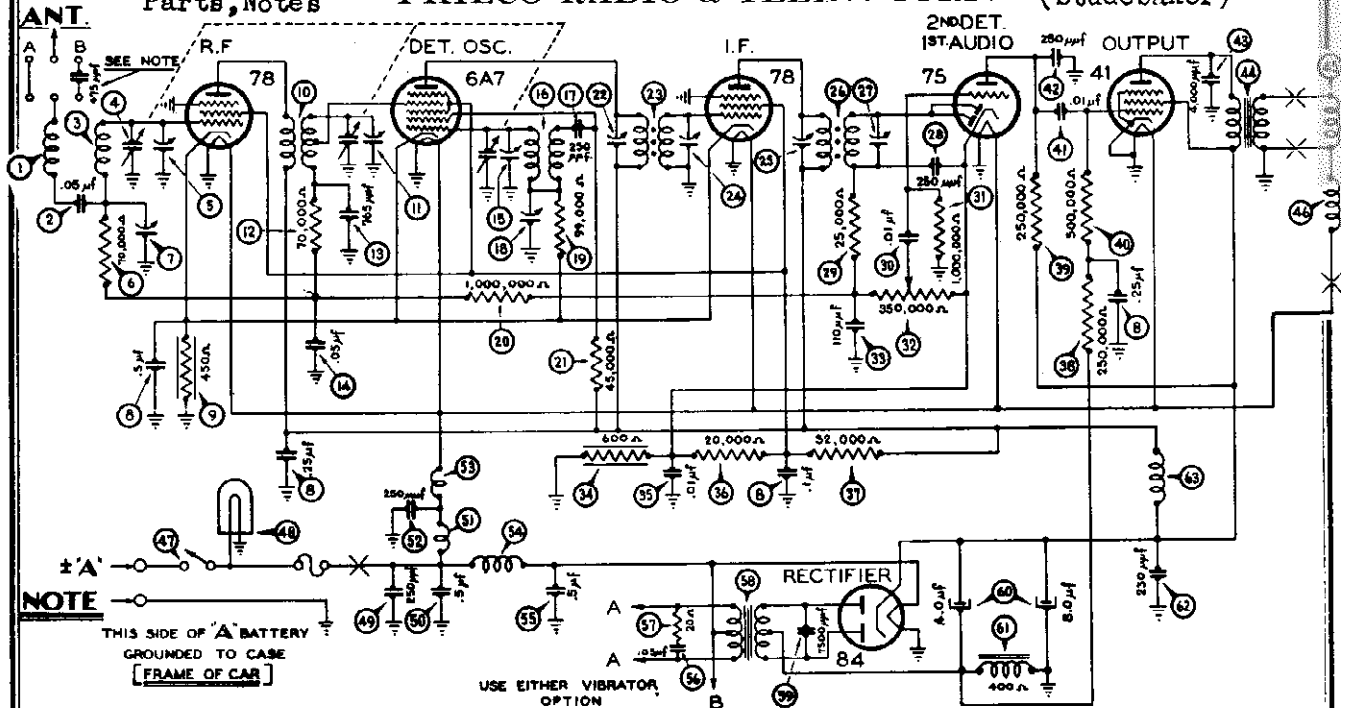
The Model 821P is a fixed frequency, crystal controlled Receiver designed for the medium high frequencies. These are the frequencies used by the Municipal Police, State Police, Marine Fire, Geophysical and Temporary Service and the Forestry, Forest Fire Control, Flood Control, National Park Service, Coast Guard Service, etc. (1550 K. C. to 3600 K. C.).

The Model 821PV is a variable frequency Receiver, designed for use in these same services when it is necessary to receive signals from transmitters operating on different frequencies within these bands. The Model 821PV normally covers the frequency band of 1550 K. C. to 2550 K. C. It can be obtained for use on the higher frequencies, 2300 K. C. to 3600 K. C., on special order at a slight increase in cost.

Schematic, Chassis

PHILCO RADIO & TELEV. CORP.

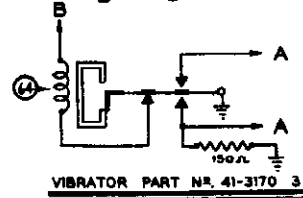
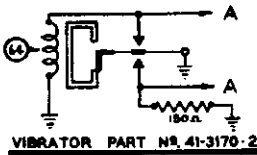
MODELS 826, S-1416
(Studebaker)



NOTE
THIS SIDE OF "A" BATTERY
GROUNDED TO CASE
[FRAME OF CAR]

USE EITHER VIBRATOR
OPTION

FIGURE 1



FEBRUARY 1937

I.F. = 260 KC

NOTE: When the Receiver is installed in a car having a top antenna, under-car antenna, spare wheel antenna or antenna having a similar low relative capacitance (50 mmf. to 450 mmf.) use connector plug in "A".
When the Receiver is installed in a car having a metal insert top antenna, insulated door antenna, insulated trunk cover antenna or antenna having similarly high relative capacitance (450 mmf. to 2500 mmf.) use condenser plug in "B".

MODEL 826 PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	38-8532	31	Condenser (250 mmfd.)	30-1032
2	Condenser (.05 mfd.)	30-4444	32	Condenser (4000 mmfd.)	30-4185
3	Antenna Transformer	32-2516	33	Output Transformer	32-7495
4	Tuning Condenser	31-1930	34	Cone & Voice Coil	36-3526
5	First Padder (on Tun. Cond.)		35	Field Coil Assembly	32-9236
6	Resistor (70,000 ohms)	33-370344	36	On & Off Switch	42-1318
7	Antenna Compensator		37	Complete Speaker	36-1279
8	Condenser	31-6082	38	Pilot Lamp	34-2040
9	Condenser (1.25-25-5 mfd.)	30-4415	39	Condenser (250 mmfd.)	30-1032
10	Resistor (450 ohms)	33-1218	40	Condenser (.5 mfd.)	30-4015
11	R. F. Transformer	32-2307	41	"A" Choke	32-1604
12	Second Padder (on Tun. Cond.)		42	Condenser (250 mmfd.)	30-1032
13	Resistor (70,000 ohms)	33-370344	43	Filament Choke	32-2535
14	Condenser (785 mmfd.)	30-1069	44	Vibrator Choke	32-2039
15	Condenser (.05 mfd.)	3615-08G	45	Condenser (.5 mfd.)	30-4015
16	Third Padder (on Tun. Cond.)		46	Condenser (.05 mfd.)	30-4444
17	Oscillator Transformer	32-230A	47	Resistor (20 ohms)	33-020344
18	Condenser (250 mmfd.)	30-1032	48	Power Transformer	32-7550
19	Low Frequency Padder	31-6102	49	Condenser (7500 mmfd.)	30-4420
20	Resistor (99,000 ohms)	33-399344	50	Filter Condenser (4-8 mfd.)	30-2150
21	Resistor (1,000,000 ohms)	33-510344	51	Filter Choke	32-7545
22	Resistor (45,000 ohms)	33-345344	52	Condenser (250 mmfd.)	30-1032
23	Padder (Pri. 1st I. F. Trans.)		53	"B" Choke	32-1281
24	First I. F. Transformer	32-2026	54	Vibrator (Optional)	41-3170-2
25	Padder (Sec. 1st I. F. Trans.)		55	Four Prong Socket	27-4044
26	Padder (Pri. 2nd I. F. Trans.)		56	Five Prong Socket	27-6035
27	Second I. F. Transformer	32-2027	57	Six Prong Socket	27-6036
28	Padder (Second 2nd I. F. Trans.)		58	Seven Prong Socket	27-6037
29	Condenser (250 mmfd.)	30-1032	59	Tuning & Volume Knob	27-4521
30	Resistor (25,000 ohms)	33-325344	60	On & Off Knob	27-4525
31	Condenser (.01 mfd.)	3903-05U	61	Pilot Lamp Assembly	38-7734
32	Resistor (1,000,000 ohms)	33-510344	62	Scale Assembly	42-5714
33	Volume Control (350,000 ohms)	33-5148	63	Tuning & Volume Shaft	28-8740
34	Condenser (110 mmfd.)	30-1031	64	Control Assembly	42-5713
35	Resistor (600 ohms)	33-1212	65	Distributor Resistor	33-1196
36	Condenser (.01 mfd.)	3903-08G	66	Interference Condenser	30-4007
37	Resistor (20,000 ohms)	33-320344	67	Antenna Condenser	30-4412
38	Resistor (32,000 ohms)	33-332434	68	Antenna Connector	28-6423
39	Resistor (250,000 ohms)	33-424344	69	Insulator	27-8199
40	Resistor (250,000 ohms)	33-424344	70	Fuse	7227
41	Resistor (500,000 ohms)	33-449344	71	Fuse Insulator	27-7729
42	Condenser (.01 mfd.)	3903-08U	72	Tee Bolt	28-6161
			73	Nut	W518
			74	Receiver Housing	38-8562

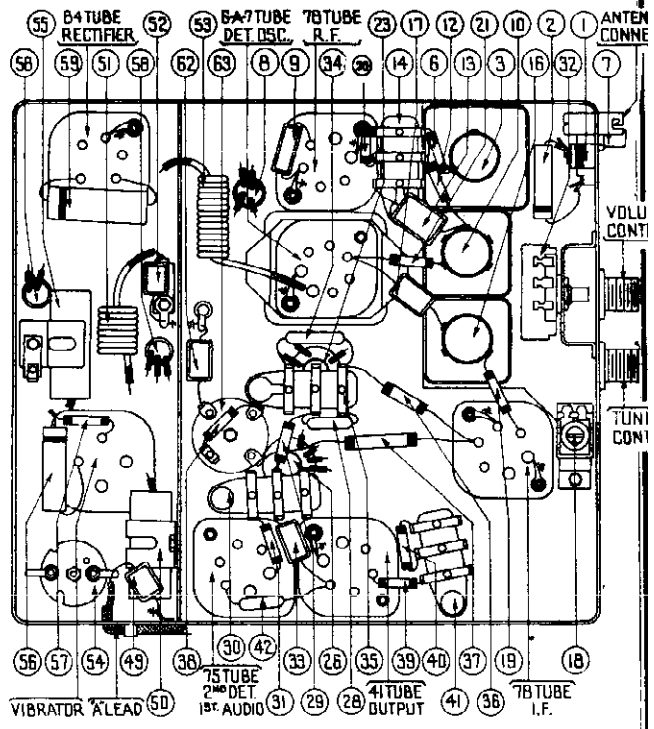


FIGURE 2

The circuit of the Model S-1416 is similar to the Model 826 with the following exception: The Model S-1416 does not use a condenser plug or connector plug in the Antenna connector on the Receiver. The Antenna connector is changed so that this is not necessary.

MODELS 826, 827, S1416

Socket, Trimmers

Alignment

PHILCO RADIO & TELEVISION CORP.

I. F. TRANSFORMERS AND PADDERS

The I. F. Transformers are assembled complete with padding condensers.

Both the primary and the secondary padders are placed side by side in the top of the transformer shield can. The adjusting screws are accessible thru the holes in the top of the shield. (See Figure 4).

The coil windings terminate in leads instead of terminals or lugs. The color scheme of the leads is given in Figure 3.

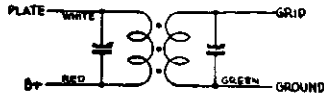


FIGURE 3

If replacements are ever necessary, replace the entire coil assembly, 32-2026 for the first I. F. stage and 32-2027 for the second I. F. stage. Neither the coil nor the padders will be furnished separately. Order only by the above numbers.

ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment

Fully charged heavy duty storage battery or 6-volt power pack, 048A or 099 Philco Set Tester, 3164 Padding wrench, 27-7159 Padding screw driver.

General

OUTPUT METER — The output meter must be connected by means of an adapter to the plate of the type 41 output tube and to the Receiver chassis.

SIGNAL GENERATOR — With the Receiver and signal generator set up for operation at the prescribed frequency, turn the Receiver volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the signal generator output lead must be connected to the Receiver housing.

Procedure

I. F. — Set the signal generator at exactly 260 K. C. Connect the generator lead to the grid cap of the 78 I. F. tube in series with a .1 mfd. condenser (without removing the grid cap).

Adjust the secondary screw padder (7) on the second I. F. transformer for maximum reading on the output meter. Then adjust the primary screw padder (8) for maximum reading. (See Figure 4 for location of padders).

Remove the generator lead from the 78 tube.

Connect the generator lead to the grid cap of the 6A7 tube in series with a .1 mfd. condenser (without removing the grid cap). Adjust the secondary screw padder (24) on the first I. F. transformer for maximum reading on the output meter. Then adjust the primary screw padder (25) for maximum reading. Readjust padders (8) and (7) with the generator lead connected to the type 6A7 tube. (See Figure 4 for location of padders).

HIGH FREQUENCY AND R. F. After padding the first I. F. stage remove the generator lead from the 6A7 tube.

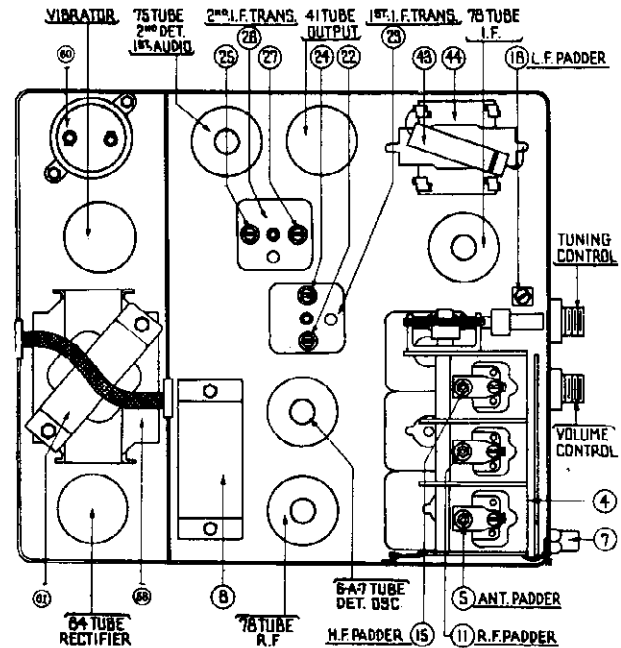
Set the signal generator at 1550 K. C. and then connect the generator lead to the grid cap of the 78 R. F. tube in series with a .1 mfd. condenser (without removing the grid cap).

Turn the tuning condenser plates out of mesh as far as they will go.

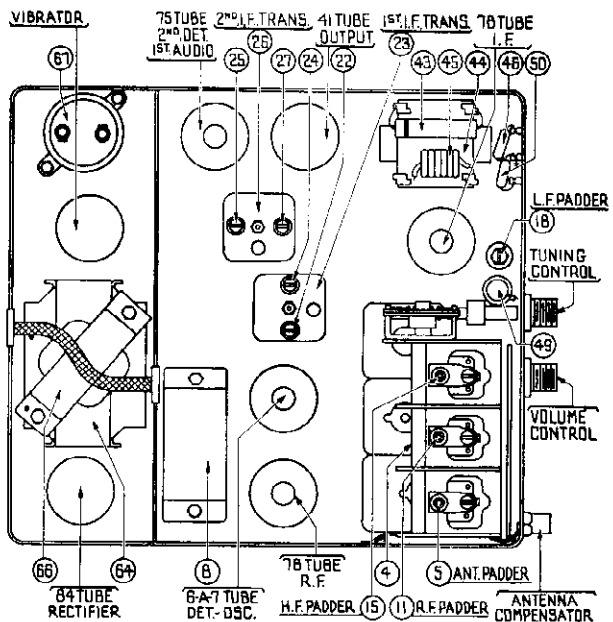
With the tuning condenser in this position, adjust the high frequency padder (15) and the R. F. padder (11) until the maximum reading is obtained on the output meter. This is the true setting for 1550 K. C., 155 on the dial scale.

LOW FREQUENCY—Turn the tuning condenser plates in mesh to approximately 580 K. C., 58 on the dial scale and set the signal generator at 580 K. C. Roll the tuning condenser and adjust the low frequency padder screw (18) for maximum reading on the output meter.

HIGH FREQUENCY READJUSTMENT Turn the tuning condenser plates out of mesh to 1550 K. C. and set the signal generator at 1550 K. C. Then adjust the high frequency padder (15) again for maximum reading on the output meter.



MODEL 826 — S-1416 FIGURE 4



MODEL 827 FIGURE 4

Remove the generator lead from the 78 R. F. tube. **ANTENNA—WHEN PADDING THE ANTENNA STAGE IT IS EXTREMELY IMPORTANT THAT THE PROPER DUMMY ANTENNA BE CONSTRUCTED AND USED.**

Connect the signal generator lead to the antenna cable assembly (made up of Part No. 41-3191 cable and a 200 mmfd. condenser Part No. 30-1013) in series between the Receiver antenna receptacle and the signal generator. Plug the cable into the antenna receptacle on the end of the Receiver.

Turn the tuning condenser to 1400 K. C. and set the generator at 1400 K. C. Adjust the padders (11) and (15) for the maximum reading on the output meter.

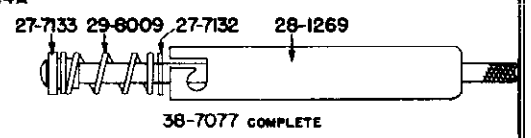
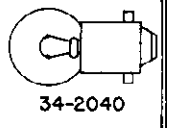
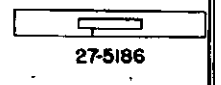
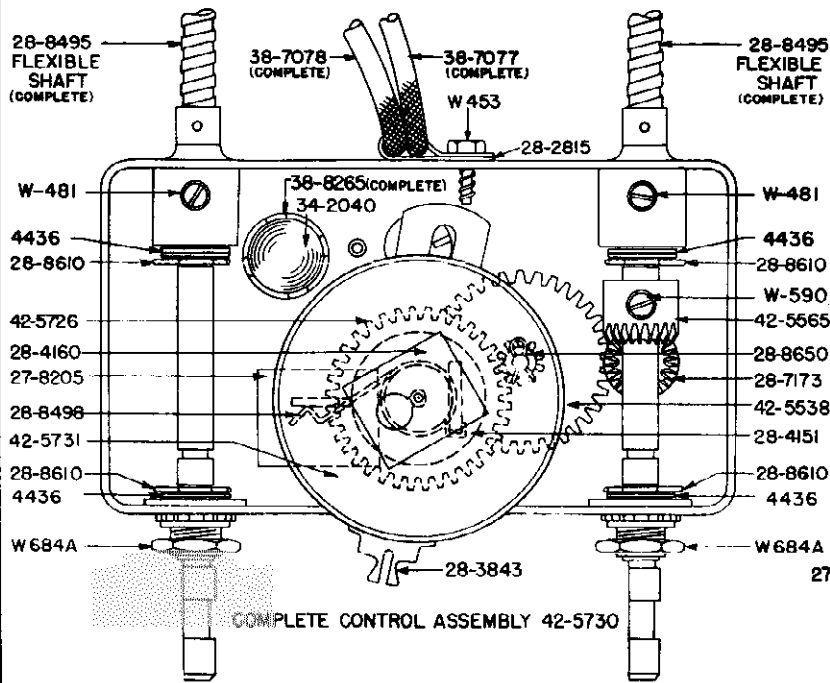
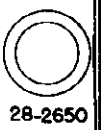
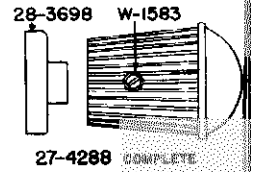
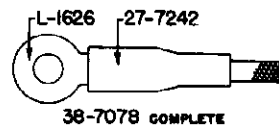
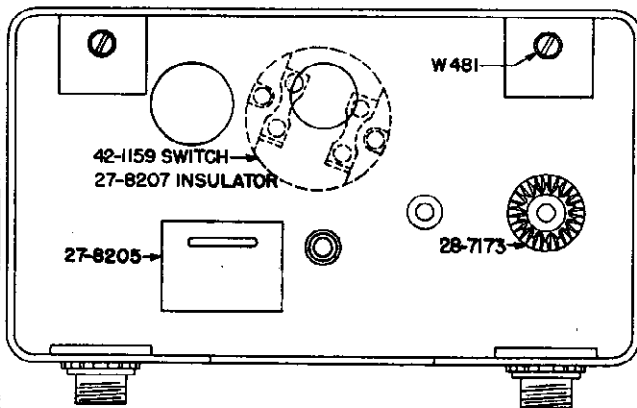
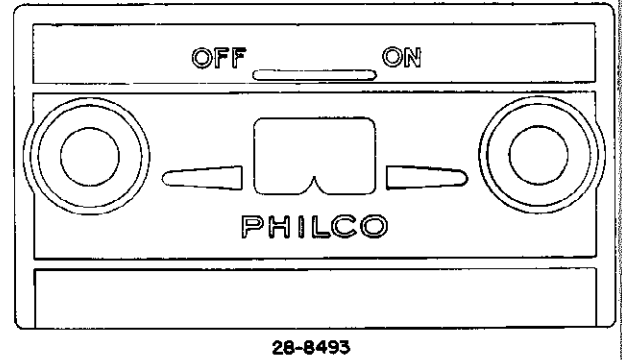
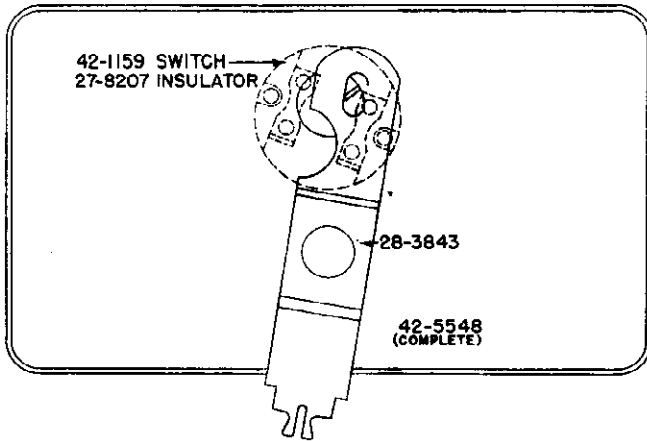
When the antenna stage adjustment is made with the Receiver installed in the car, the Receiver antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

MODELS 826, 827, 827K
828, 828K

PHILCO RADIO & TELEV. CORP.

Chevrolet Control

CHEVROLET CONTROL MODELS 826 - 827 - 827K - 828 - 828K Parts

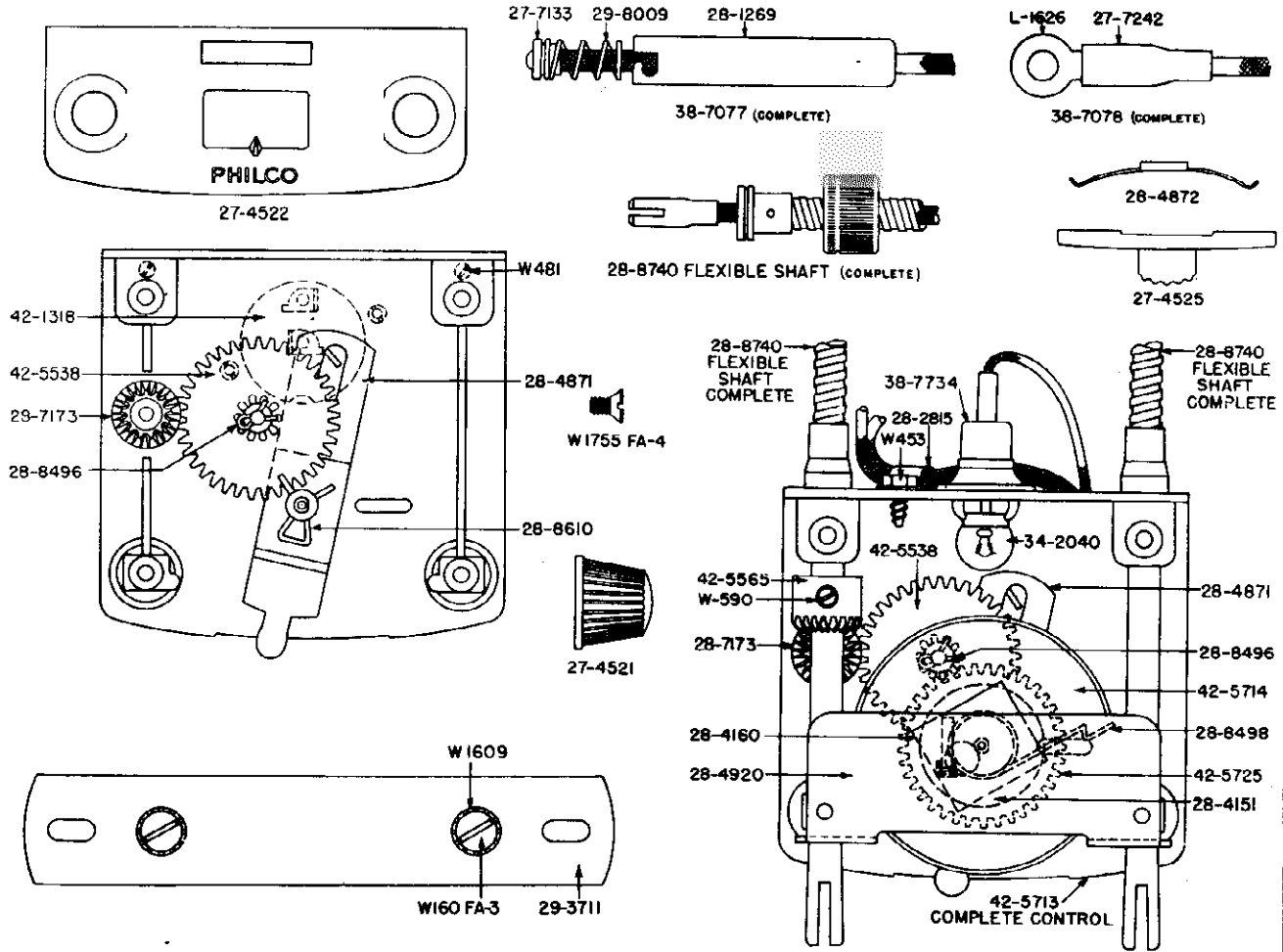


AUGUST 1937

MODELS 826, 827, 827K
828, 828K
Standard Control
Parts

PHILCO RADIO & TELEV. CORP.

STANDARD CONTROL MODELS 826 - 827 - 827K - 828 - 828K



AUGUST 1937

PARTS LIST AND PRICES
(Prices Subject to Change Without Notice)

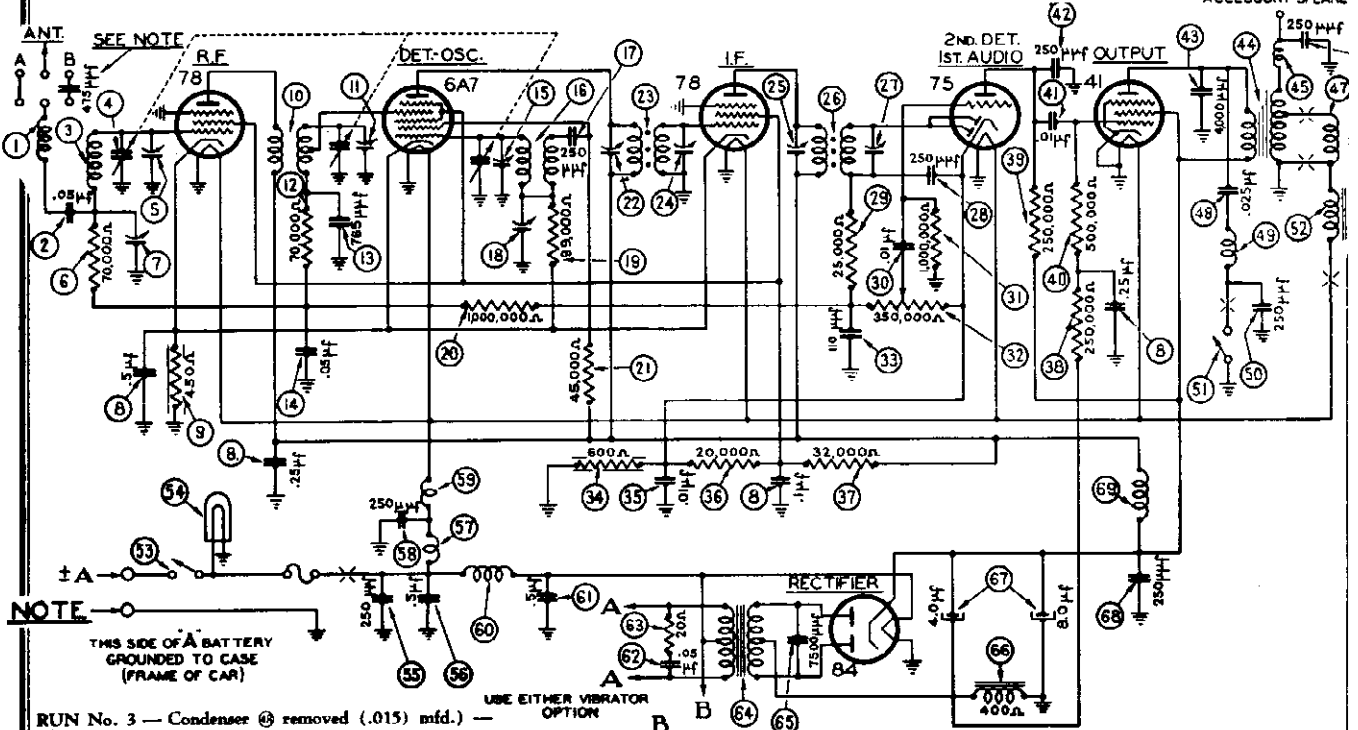
PART NUMBER	DESCRIPTION	LIST PRICE	PART NUMBER	DESCRIPTION	LIST PRICE
L-1626	Lug	\$.01	28-4893	Bezel Plate	.10
W-160FA3	Screw (Brkt. mtg.)	.30	28-4920	Shaft Bearing Plate	*
W-453	Screw	1.80	28-7173	Miter Gear	.10
W-481	Screw	2.00	28-8405	Flexible Shaft	1.15
W-590	Screw	2.00	28-8496	Spring	.05
W-684FA3	Nut	1.25	28-8498	Anti-back Lash Spring	.10
W-1433	Washer	.50	28-8610	Spring	.03
W-1609	Lockwasher	.50	28-8653	Spring	.03
W-1755FA4	Screw (Cover mtg.)	.30	28-8740	Flexible Shaft	1.00
4436	Washer	1.50	29-3711	Bracket	.05
27-4288	Knob	.15	28-8009	Spring	.03
27-4314	Knob	.04	34-2040	Pilot Lamp	.07
27-4521	Knob	.10	38-7077	Fuse Lead Assembly	.15
27-4522	Cover	.75	38-7078	Ammeter Lead Assembly	.15
27-4525	Switch Lever Knob	.10	38-7734	Pilot Lamp Assembly	.35
27-5186	Light Shield	.01	38-8265	Pilot Lamp Assembly	.30
27-7133	Ferrule	.01	42-1318	On & Off Switch	.40
27-7242	Insulator	.40	42-5538	Intermediate Gear Assembly	.15
27-8205	Shield	.50	42-5548	Cover Assembly	.15
28-1269	Fuse Housing	.01	42-5565	Miter Gear Assembly	.15
28-2650	Washer	.45	42-5713	Standard Control	6.75
28-2815	Clamp	.01	42-5714	Scale Assembly	.35
28-3088	Knob Base	.04	42-5725	Drum Drive Gear Assembly	*
28-4151	Friction Washer	.02	42-5726	Drum Gear and Shaft Assembly	*
28-4160	Friction Spring	.01	42-5730	Chevrolet Control	6.00
28-4871	Switch Lever	*	42-5731	Scale Assembly	.30
28-4872	Switch Knob Retaining Spring	.02			

*Prices not available at this time.

Parts

PHILCO RADIO & TELEV. CORP.

MODEL 827 Schematic, Chassis ACCESSORY SPEAKER



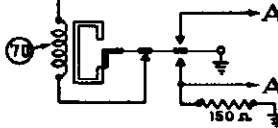
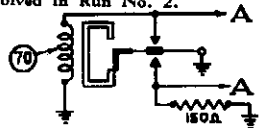
NOTE
THIS SIDE OF A BATTERY GROUNDED TO CASE (FRAME OF CAR)

RUN No. 3 — Condenser ⑨ removed (.015 mfd.) —
Part No. 7653-OSU added (.025 mfd.).
No major changes were involved in Run No. 2.

USE EITHER VIBRATOR OPTION

FEBRUARY 20, 1937

FIGURE 1



VIBRATOR PART NO 41-3170-2

VIBRATOR PART NO 41-3170-3

NOTE: When the Receiver is installed in a car having a top antenna, under-car antenna, spare wheel antenna or antenna having a similar low relative capacitance (50 mmf. to 450 mmf.) use connector plug in "A".
When the Receiver is installed in a car having a metal insert top antenna, insulated door antenna, insulated trunk cover antenna antenna having similarly high relative capacitance (450 mmf. to 2500 mmf.) use condenser plug in "B".

I.F. = 260KC

MODEL 827 PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
①	Antenna Choke	38-8651	③	Vibrator (OPTIONAL)	41-3170-2
②	Condenser (.05 mfd.)	30-1444	④	Four Prong Socket	27-6044
③	Antenna Transformer	32-2516	⑤	Five Prong Socket	27-6035
④	Tuning Condenser	31-1930	⑥	Six Prong Socket	27-6036
⑤	First Padder (on tun. cond.)	33-370344	⑦	Seven Prong Socket	27-6037
⑥	Resistor (70,000 ohms)	33-370344	⑧	Tuning & Volume Knob	27-4521
⑦	Antenna		⑨	On & Off Knob	27-4525
⑧	Compensating Condenser	31-6082	⑩	Pilot Lamp Assembly	38-7734
⑨	Condenser (.1-25-.25-5 mfd.)	30-4415	⑪	Scale Assembly	42-5714
⑩	Resistor (450 ohms)	33-1218	⑫	Tuning & Volume Shaft	28-8740
⑪	R. F. Transformer	32-2307	⑬	Tone Control Shaft	L-2767
⑫	Second Padder (on tun. cond.)	33-370344	⑭	Control Assembly	42-5713
⑬	Resistor (70,000 ohms)	33-370344	⑮	Distributor Resistor	33-1196
⑭	Condenser (765 mmfd.)	30-1069	⑯	Interference Condenser	30-4007
⑮	Condenser (.05 mfd.)	3615-0SG	⑰	Antenna Condenser	30-4412
⑯	Third Padder (on tun. cond.)	32-2308	⑱	Antenna Connector	28-6423
⑰	Oscillator Transformer	32-2308	⑲	Insulator	27-8199
⑱	Condenser (250 mmfd.)	30-1032	⑳	Fuse	7227
⑲	Low Frequency Padder	31-6102			
⑳	Resistor (99,000 ohms)	33-399344			
㉑	Resistor (1,000,000 ohms)	33-510344			
㉒	Resistor (45,000 ohms)	33-345344			
㉓	Padder (Pri. 1st I.F. Trans.)	32-2026			
㉔	First I. F. Transformer	32-2026			
㉕	Padder (Sec. 1st I. F. Trans.)	32-2027			
㉖	Second I. F. Transformer	32-2027			
㉗	Padder (Sec. 2nd I.F. Trans.)	30-1032			
㉘	Condenser (250 mmfd.)	33-325344			
㉙	Resistor (25,000 ohms)	33-449344			
㉚	Condenser (.01 mfd.)	3903-OSU			
㉛	Resistor (1,000,000 ohms)	33-510344			
㉜	Volume Control	33-5148			
㉝	Condenser (350,000 ohms)	30-1031			
㉞	Resistor (110 mmfd.)	33-1212			
㉟	Resistor (600 ohms)	33-382434			
㊱	Condenser (.01 mfd.)	3903-OSG			
㊲	Resistor (20,000 ohms)	33-320344			
㊳	Resistor (32,000 ohms)	33-382434			
㊴	Resistor (250,000 ohms)	33-424344			
㊵	Resistor (250,000 ohms)	33-424344			
㊶	Resistor (500,000 ohms)	33-449344			
㊷	Condenser (.01 mfd.)	3903-OSU			
㊸	Condenser (250 mmfd.)	30-1032			
㊹	Condenser (4000 mmfd.)	30-4185			

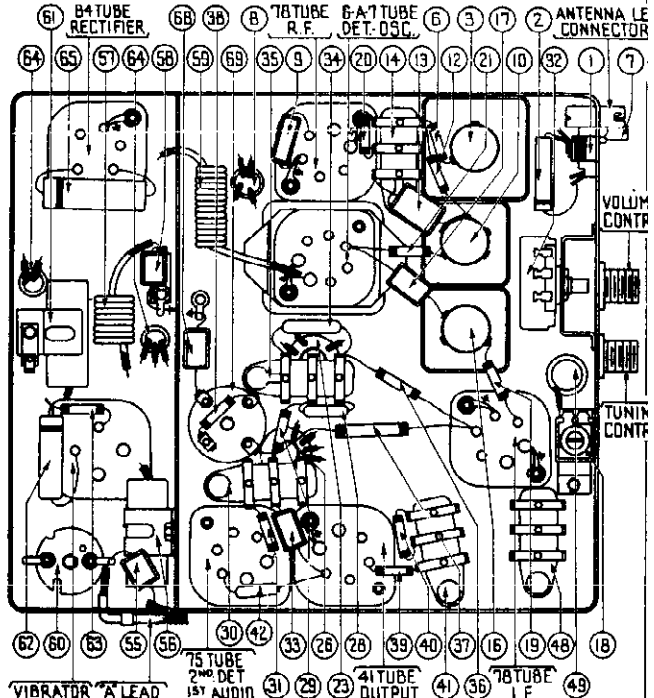


FIGURE 2

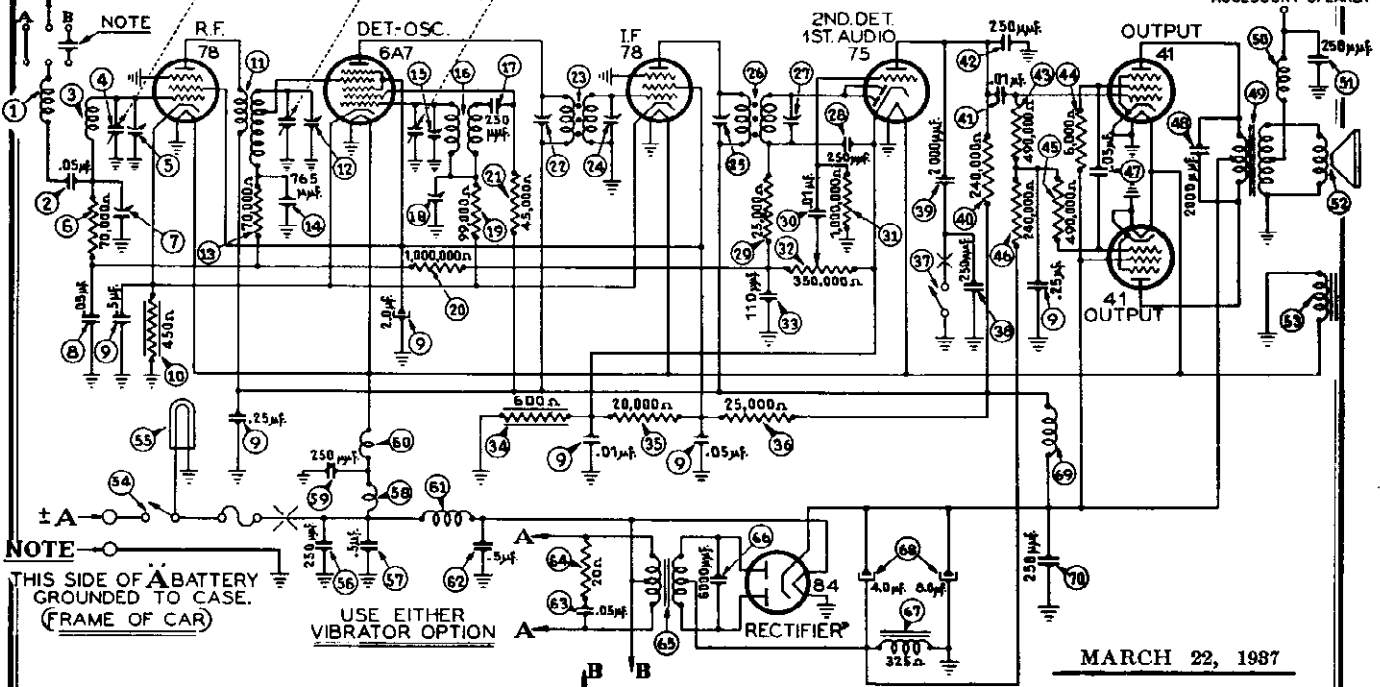
No.	Description	Part No.	No.	Description	Part No.
㊺	Fuse Insulator	27-7729	㊻	Nut	W-5
㊼	Tea Bolt	28-6161	㊽	Receiver Housing	38-85

MODEL 828

Schematic, Chassis

PHILCO RADIO & TELEV. CORP.

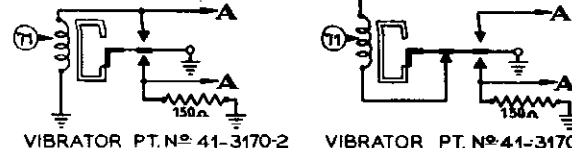
ANT Parts



NOTE - THIS SIDE OF BATTERY GROUNDED TO CASE. (FRAME OF CAR)

USE EITHER VIBRATOR OPTION

MARCH 22, 1937



VIBRATOR PT. N° 41-3170-2

VIBRATOR PT. N° 41-3170-3

I.F. = 260 KC.

NOTE: When the Receiver is installed in a car having a top antenna, under-car antenna, spare wheel antenna or antenna having a similarly low relative capacitance (50 mmf. to 450 mmf.) use connector plug in "A"
 When the Receiver is installed in a car having a metal insert top antenna, insulated door antenna, insulated trunk cover antenna or antenna having similarly high relative capacitance (450 mmf. to 2500 mmf.) use condenser plug in "B"

MODEL 828 PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	38-8351	57	Condenser (.05 mfd.)	30-4444
2	Condenser (.05 mfd.)	30-4444	58	Output Transformer	32-7818
3	Antenna Transformer	32-2516	59	Choke	32-1464
4	Tuning Condenser	31-1930	60	Condenser (250 mmfd.)	30-1032
5	First Padder (on Tun. Cond.)	31-1930	61	Cone & Voice Coil	36-3586
6	Resistor (70,000 ohms)	33-370344	62	Field Coil Assembly	36-3597
7	Antenna		63	Complete Speaker (CB)	36-1208
8	Compensating Condenser	31-6082	64	On & Off Switch	42-1318
9	Condenser (.05 mfd.)	3615-08G	65	Pilot Lamp	34-2040
10	Condenser (.01-.05-.25-.25-.5-2 mfd.)	30-4510	66	Condenser (250 mmfd.)	30-1032
11	Resistor (150 ohms)	33-1218	67	Condenser (.5 mfd.)	30-4015
12	R. F. Transformer	32-2307	68	"A" Choke	32-1604
13	Second Padder (on Tun. Cond.)	31-6102	69	Condenser (250 mmfd.)	30-1032
14	Resistor (70,000 ohms)	33-370344	70	Pilament Choke	32-2535
15	Condenser (765 mmfd.)	30-1069	71	Vibrator Choke	32-2039
16	Third Padder (on Tun. Cond.)	31-6102	72	Condenser (.5 mfd.)	30-4015
17	Oscillator Transformer	32-2308	73	Condenser (.05 mfd.)	30-4114
18	Condenser (250 mmfd.)	30-1032	74	Resistor (20 ohms)	33-020344
19	Low Frequency Padder	31-6102	75	Power Transformer	32-7821
20	Resistor (99,000 ohms)	33-399344	76	Condenser (6000 mmfd.)	30-4512
21	Resistor (1,000,000 ohms)	33-510344	77	Filter Choke	32-7822
22	Resistor (15,000 ohms)	33-345344	78	Filter Condenser (4-8 mfd.)	30-2150
23	Padder (Pri. 1st I. F. Trans.)	32-2026	79	"B" Choke	32-1281
24	First I. F. Transformer	32-2026	80	Condenser (250 mmfd.)	30-1032
25	Padder (Sec. 1st I. F. Trans.)	32-2027	81	Vibrator (OPTIONAL)	41-3170-2
26	Padder (Pri. 2nd I. F. Trans.)	32-2027	82	Four Prong Socket	27-6044
27	Second I. F. Transformer	32-2027	83	Five Prong Socket	27-6035
28	Padder (Sec. 2nd I. F. Trans.)	32-2027	84	Six Prong Socket	27-6036
29	Condenser (250 mmfd.)	30-1032	85	Seven Prong Socket	27-6037
30	Resistor (25,000 ohms)	33-325344	86	Tuning & Volume Knob	27-4521
31	Condenser (.01 mfd.)	3903-08U	87	On & Off Knob	27-4525
32	Volume Control (1,000,000 ohms)	33-510344	88	Pilot Lamp Assembly	38-7734
33	Volume Control (350,000 ohms)	33-5148	89	Scale Assembly	42-5714
34	Condenser (110 mmfd.)	30-1031	90	Tuning & Volume Shaft	28-8740
35	Resistor (600 ohms)	33-1212	91	Tone Control Cable	L-2767
36	Resistor (20,000 ohms)	33-320344	92	Control Assembly	42-5713
37	Resistor (25,000 ohms)	33-325444	93	Distributor Resistor	33-1196
38	Tone Control Switch	42-1225	94	Interference Condenser	30-4007
39	Condenser (250 mmfd.)	30-1032	95	Antenna Condenser	30-4412
40	Condenser (2000 mmfd.)	30-4177	96	Antenna Connector	28-6423
41	Resistor (240,000 ohms)	33-424344	97	Insulator	27-8199
42	Condenser (.01 mfd.)	3903-08U	98	Fuse	7227
43	Condenser (250 mmfd.)	30-1032	99	Fuse Insulator	27-7729
44	Resistor (490,000 ohms)	33-449344	100	Tea Bolt	28-6161
45	Resistor (6,000 ohms)	33-260344	101	Nut	W518
46	Resistor (490,000 ohms)	33-449344	102	Receiver Housing	38-8571
47	Resistor (240,000 ohms)	33-424344			

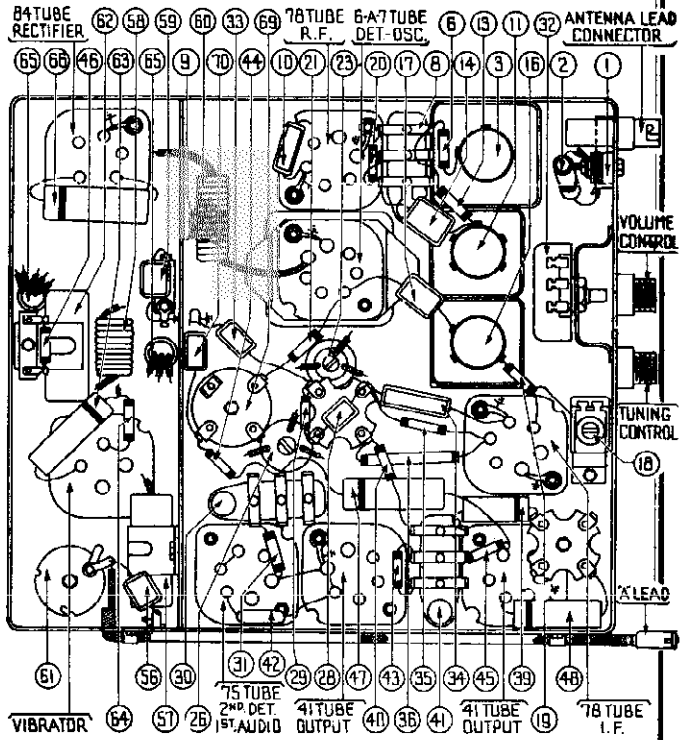


FIGURE 2

PHILCO RADIO & TELEV. CORP.

MODEL 827K
Schematic, Chassis
Parts ACCESSORY SPEAKER

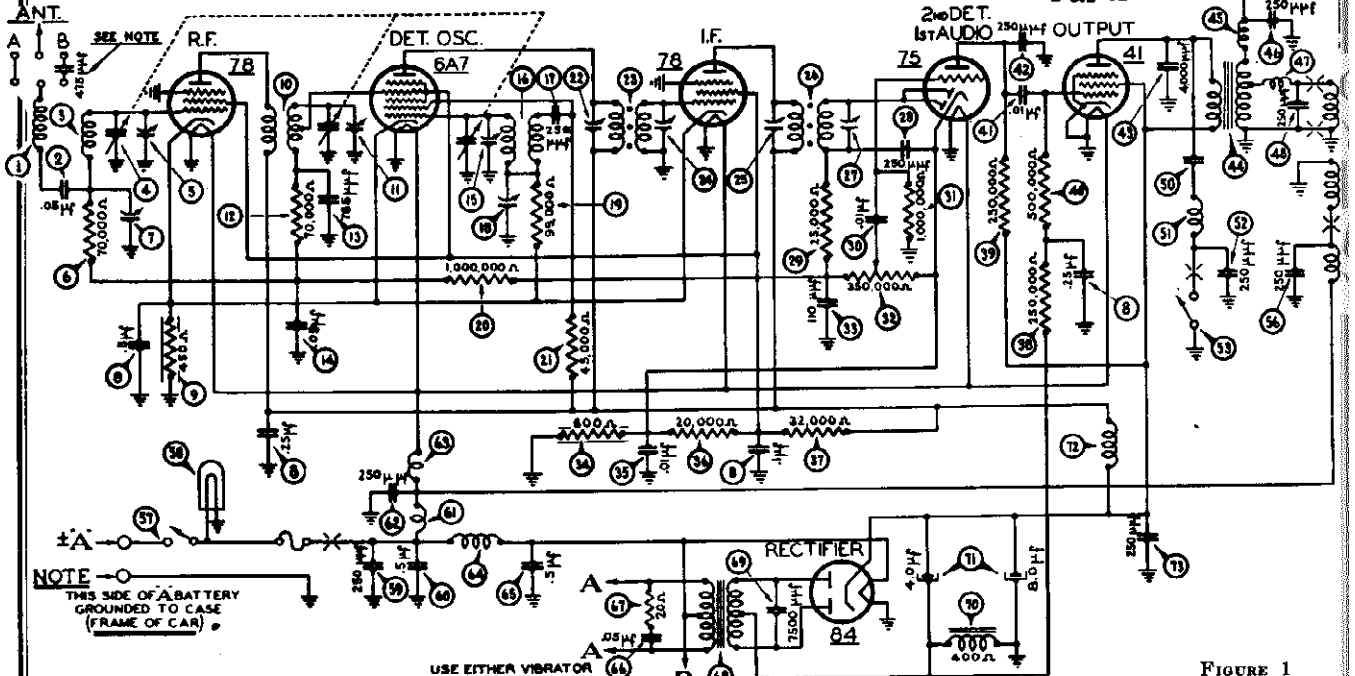


FIGURE 1

MARCH 15, 1937

I.F. = 260 KC.

NOTE: When the Receiver is installed in a car having a top antenna, under-car antenna, spare wheel antenna or antenna having a similar low relative capacitance (50 mmf. to 450 mmf.) use connector plug in "A".
When the Receiver is installed in a car having a metal insert top antenna, insulated door antenna, insulated trunk cover antenna or antenna having similarly high relative capacitance (450 mmf. to 2500 mmf.) use condenser plug in "B".

MODEL 827K PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	38-8651	31	Condenser (250 mmfd.)	30-1032
2	Condenser (.05 mfd.)	30-4444	32	Choke	32-2535
3	Antenna Transformer	32-2516	33	Condenser (250 mmfd.)	30-1032
4	Tuning Condenser	31-1930	34	Cone & Voice Coil	36-3159
5	First Padder (on Tun. Cond.)	33-370344	35	Condenser (.025 mfd.)	7653-0SU
6	Resistor (70,000 ohms)	33-370344	36	Choke	32-1464
7	Antenna		37	Condenser (250 mmfd.)	30-1032
8	Compensating Condenser	31-6082	38	Tone Control Switch	42-1225
9	Condenser (.1-.25-.25-.5 mfd.)	30-4115	39	Field Coil Assembly	56-8513
10	Resistor (450 ohms)	33-1218	40	Complete Speaker (A47)	38-1831
11	R. F. Transformer	32-2307	41	Choke	32-1930
12	Second Padder (on Tun. Cond.)	33-370344	42	Condenser (250 mmfd.)	30-1032
13	Resistor (70,000 ohms)	33-370344	43	On & Off Switch	42-1318
14	Condenser (765 mmfd.)	30-1089	44	Pilot Lamp	34-2040
15	Condenser (.05 mfd.)	3615-0SG	45	Condenser (250 mmfd.)	30-1032
16	Third Padder (on Tun. Cond.)		46	Condenser (.5 mfd.)	30-4015
17	Oscillator Transformer	32-2308	47	"A" Choke	32-1604
18	Condenser (250 mmfd.)	30-1032	48	Condenser (250 mmfd.)	30-1032
19	Low Frequency Padder	31-6102	49	Filament Choke	32-2535
20	Resistor (99,000 ohms)	33-398344	50	Vibrator Choke	32-2039
21	Resistor (1,000,000 ohms)	33-510344	51	Condenser (.5 mfd.)	30-4015
22	Resistor (45,000 ohms)	33-345344	52	Condenser (.05 mfd.)	30-4444
23	Padder (Pri. 1st I.F. Trans.)	32-2026	53	Resistor (20 ohms)	33-020344
24	Padder (Sec. 1st I.F. Trans.)	32-2026	54	Power Transformer	32-7550
25	Padder (Pri. 2nd I.F. Trans.)	32-2027	55	Condenser (7500 mmfd.)	30-4420
26	Padder (Sec. 2nd I.F. Trans.)	32-2027	56	Filter Choke	32-7545
27	Condenser (250 mmfd.)	30-1032	57	Filter Condenser (4-8 mfd.)	30-2150
28	Resistor (25,000 ohms)	33-325344	58	"B" Choke	32-1281
29	Condenser (.01 mfd.)	3903-0SU	59	Condenser (250 mmfd.)	30-1032
30	Resistor (1,000,000 ohms)	33-510344	60	Vibrator (OPTIONAL)	41-3170-2
31	Volume Control (350,000 ohms)	33-5148	61	Four Prong Socket	27-6044
32	Condenser (110 mmfd.)	30-1031	62	Five Prong Socket	27-6035
33	Resistor (600 ohms)	33-1212	63	Six Prong Socket	27-6036
34	Condenser (.01 mfd.)	3903-0SG	64	Seven Prong Socket	27-6037
35	Resistor (20,000 ohms)	33-320344	65	Tuning & Volume Knob	27-4521
36	Resistor (32,000 ohms)	33-332434	66	On & Off Knob	27-4525
37	Resistor (250,000 ohms)	33-424344	67	Pilot Lamp Assembly	38-7734
38	Resistor (250,000 ohms)	33-424344	68	Scale Assembly	42-5714
39	Resistor (500,000 ohms)	33-449344	69	Tuning & Volume Shaft	28-8740
40	Condenser (.01 mfd.)	3903-0SU	70	Tone Control Shaft	L-2767
41	Condenser (250 mmfd.)	30-1032	71	Distributor Resistor	33-1196
42	Condenser (4000 mmfd.)	30-4185	72	Interference Condenser	30-4007
43	Output Transformer	32-7816	73	Antenna Condenser	30-4412
44	Choke	32-1374	74	Antenna Connector	28-6428
45			75	Insulator	27-8199
46			76	Fuse	7227

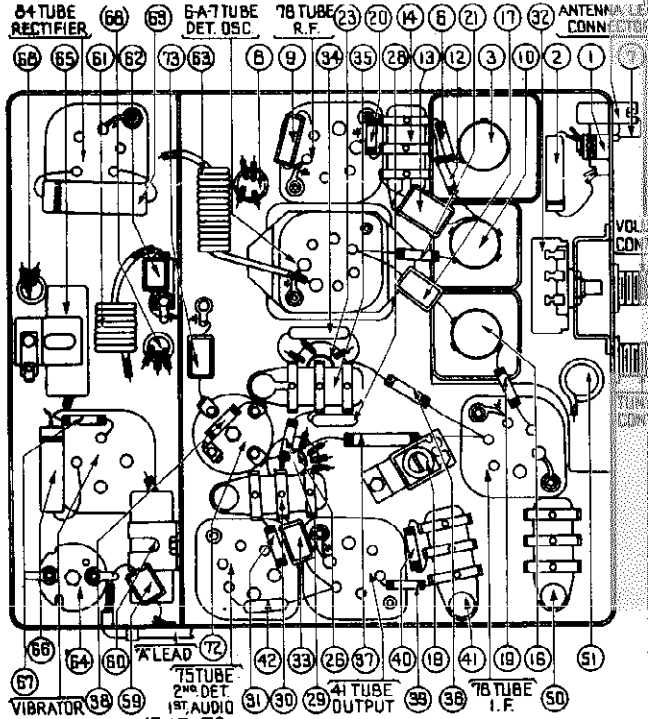


FIGURE 2

No.	Description	Part No.	No.	Description	Part No.
77	Fuse Insulator	27-7729	85	Receiver Housing	38-85
78	Tee Bolt (Rec. Mtg.)	28-6161	86	Stud (Speaker Mtg.)	61
79	Nut (Rec. Mtg.)	W518	87	Nut (Speaker Mtg.)	W

MODEL 827K

Socket, Trimmers
Alignment

PHILCO RADIO & TELEV. CORP.

I. F. TRANSFORMERS AND PADDERS

The I. F. Transformers are assembled complete with padding condensers.

Both the primary and the secondary padders are placed side by side in the top of the transformer shield can. The adjusting screws are accessible thru the holes in the top of the shield. (See Figure 4).

The coil windings terminate in leads instead of terminals or lugs. The color scheme of the leads is given in Figure 3.

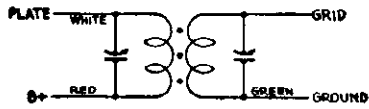


FIGURE 3

If replacements are ever necessary, replace the entire coil assembly, 82-2026 for the first I. F. stage and 32-2027 for the second I. F. stage. Neither the coil nor the padders will be furnished separately. Order only by the above numbers.

MODEL 827-K ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment

Fully charged heavy duty storage battery or 6-volt power pack, 048A or 099 Philco Set Tester, 3164 Padding wrench, 27-7159 Padding screw driver.

General

OUTPUT METER — The output meter must be connected by means of an adapter to the plate of the type 41 output tube and to the Receiver chassis.

SIGNAL GENERATOR — With the Receiver and signal generator set up for operation at the prescribed frequency, turn the Receiver volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the signal generator output lead must be connected to the Receiver housing.

Procedure

I. F. — Set the signal generator at exactly 260 K. C. Connect the generator lead to the grid cap of the 78 I. F. tube in series with a .1 mfd. condenser (without removing the grid cap).

Adjust the secondary screw padder (27) on the second I. F. transformer for maximum reading on the output meter. Then adjust the primary screw padder (25) for maximum reading. (See Figure 4 for location of padders).

Remove the generator lead from the 78 tube.

Connect the generator lead to the grid cap of the 6A7 tube in series with a .1 mfd. condenser (without removing the grid cap). Adjust the secondary screw padder (24) on the first I. F. transformer for maximum reading on the output meter. Then adjust the primary screw padder (22) for maximum reading. Readjust padders (25) and (27) with the generator lead connected to the type 6A7 tube. (See Figure 4 for location of padders).

HIGH FREQUENCY AND R. F. — After padding the first I. F. stage remove the generator lead from the 6A7 tube.

Set the signal generator at 1550 K. C. and then connect the generator lead to the grid cap of the 78 R. F. tube in series with a .1 mfd. condenser (without removing the grid cap).

Turn the tuning condenser plates out of mesh as far as they will go.

With the tuning condenser in this position, adjust the high frequency padder (15) and the R. F. padder (11) until the maximum reading is obtained on the output meter. This is the true setting for 1550 K. C., 155 on the dial scale.

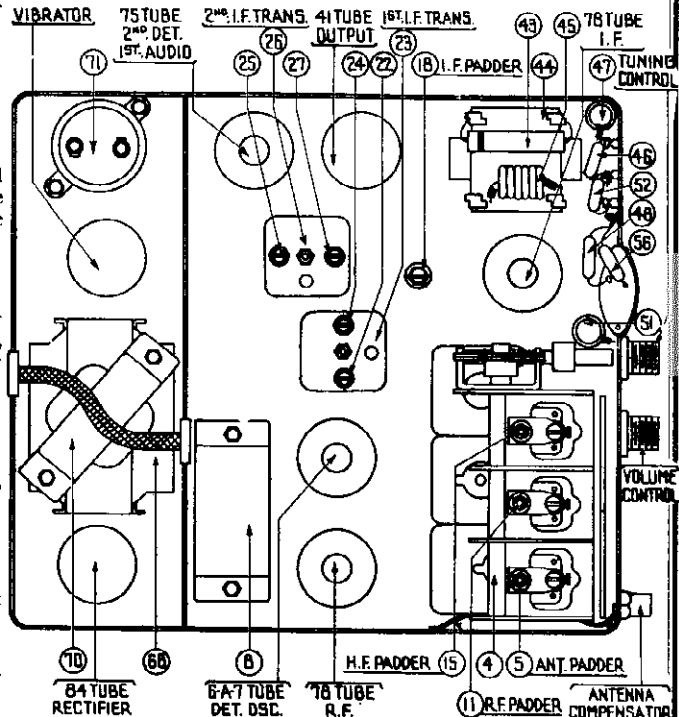


FIGURE 4

LOW FREQUENCY — Turn the tuning condenser plates in mesh to approximately 580 K. C., 58 on the dial scale and set the signal generator at 580 K. C. Roll the tuning condenser and adjust the low frequency padder screw (18) for maximum reading on the output meter.

HIGH FREQUENCY READJUSTMENT — Turn the tuning condenser plates out of mesh to 1550 K. C. and set the signal generator at 1550 K. C. Then adjust the high frequency padder (15) again for maximum reading on the output meter.

Remove the generator lead from the 78 R. F. tube.

ANTENNA — WHEN PADDING THE ANTENNA STAGE IT IS EXTREMELY IMPORTANT THAT THE PROPER DUMMY ANTENNA BE CONSTRUCTED AND USED.

Connect the signal generator lead to the antenna lead assembly (made up of Part No. 41-3191 lead and a 200 mmfd condenser, Part No. 30-1013), in series between the lead and the signal generator. Plug the lead into the antenna lead connector on the end of the Receiver.

Turn the tuning condenser to 1400 K. C. and set the generator at 1400 K. C. Adjust the padders (4) and (5) for the maximum reading on the output meter.

When the antenna stage adjustment is made with the Receiver installed in the car, the Receiver antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

PHILCO RADIO & TELEV. CORP.

MODEL 828K

Schematic, Chassis

Parts

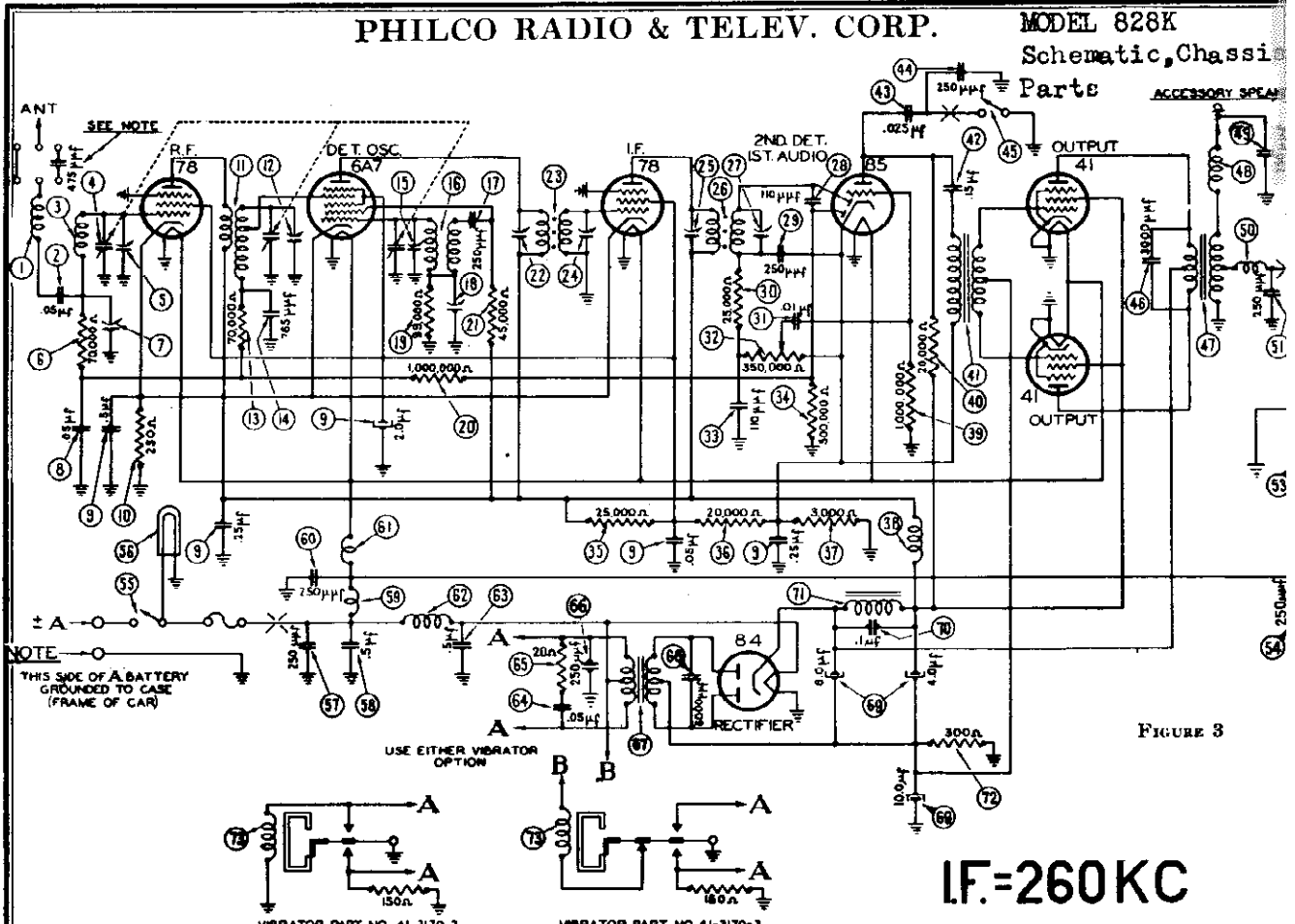


FIGURE 3

IF=260KC

NOTE: When the Receiver is installed in a car having a top antenna, under-car antenna, spare wheel antenna or antenna having a similar low relative capacitance (50 mmf. to 450 mmf.) use connector plug in "A".
 When the Receiver is installed in a car having a metal insert top antenna, insulated door antenna, insulated trunk cover antenna or antenna having similarly high relative capacitance (450 mmf. to 2500 mmf.) use condenser plug in "B".

MODEL 828K PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	38-8532	60	Condenser (3000 mmfd.)	30-4469
2	Condenser (.05 mfd.)	30-4444	61	Output Transformer	32-7829
3	Antenna Transformer	32-2516	62	Choke	32-1484
4	Tuning Condenser	31-1770	63	Condenser (250 mmfd.)	30-1032
5	First Padder (on tun. cond.)	33-370344	64	Choke	32-2269
6	Antenna Compensating Condenser	31-6082	65	Condenser (250 mmfd.)	30-1032
7	Condenser (.05 mfd.)	3615-05G	66	Cone & Voice Coil	36-3159
8	Condenser (.05-25-25-5-2 mfd.)	30-4513	67	Field Coil Assembly	36-3513
9	Resistor (250 ohms)	33-1259	68	Complete Speaker (A48)	36-1332
10	R. F. Transformer	32-2307	69	Condenser (250 mmfd.)	30-1032
11	Second Padder (on tun. cond.)	33-370344	70	On & Off Switch	42-1318
12	Condenser (.765 mmfd.)	30-1069	71	Pilot Lamp	34-2040
13	Third Padder (on tun. cond.)	33-390344	72	Condenser (250 mmfd.)	30-1032
14	Oscillator Transformer	32-2308	73	Condenser (.5 mfd.)	30-4015
15	Condenser (250 mmfd.)	30-1032	74	"A" Choke	32-1604
16	Low Frequency Padder	31-6102	75	Condenser (250 mmfd.)	30-1032
17	Resistor (99,000 ohms)	33-390344	76	Filament Choke	32-2535
18	Resistor (1,000,000 ohms)	33-510844	77	Vibrator Choke	32-2039
19	Resistor (45,000 ohms)	33-345344	78	Condenser (.5 mfd.)	30-4015
20	Padder (Pri. 1st I.F. Trans.)	32-2028	79	Condenser (.05 mfd.)	30-4444
21	Padder (Sec. 1st I.F. Trans.)	30-2034	80	Resistor (20 ohms)	33-020344
22	Padder (Pri. 2nd I.F. Trans.)	30-1031	81	Condenser (250 mmfd.)	30-1032
23	Condenser (110 mmfd.)	30-1032	82	Power Transformer	32-7821
24	Resistor (25,000 ohms)	33-325344	83	Condenser (6000 mmfd.)	30-4512
25	Resistor (20,000 ohms)	33-320344	84	Filter Condenser (4-8 10 mfd.)	30-2213
26	Resistor (3,000 ohms)	33-230844	85	Condenser (.1 mfd.)	30-4455
27	"B" Choke	32-1281	86	Filter Choke	32-7827
28	Resistor (1,000,000 ohms)	33-510844	87	Resistor (300 ohms)	33-1258
29	Resistor (20,000 ohms)	33-320344	88	Vibrator (OPTIONAL)	41-3170-2
30	Input Transformer	32-7828	89	Four Prong Socket	27-6044
31	Condenser (.15 mfd.)	30-4505	90	Five Prong Socket	27-6055
32	Condenser (.025 mfd.)	7653-05U	91	Six Prong Socket	27-6036
33	Condenser (250 mmfd.)	30-1032	92	Seven Prong Socket	27-6037
34	Tone Control Switch	42-1225	93	Tuning & Volume Knob	27-4521
35			94	On & Off Knob	27-4525
36			95	Pilot Lamp Assembly	38-7734
37			96	Scale Assembly	42-5714
38			97	Tuning & Volume Shaft	38-8740
39			98	Tone Control Cable	1-2787
40			99	Control Assembly	42-5713
41			100	Distributor Resistor	33-1196
42			101	Interference Condenser	30-4007
43			102	Antenna Condenser	30-4412
44			103	Antenna Connector	28-6423
45			104	Insulator	27-8199
46			105	Fuse	7227
47			106	Fuse Insulator	27-7729
48			107	Tec Bolt	28-6161
49			108	Nut	Receiver Housing
50			109	Receiver Housing	38-87

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

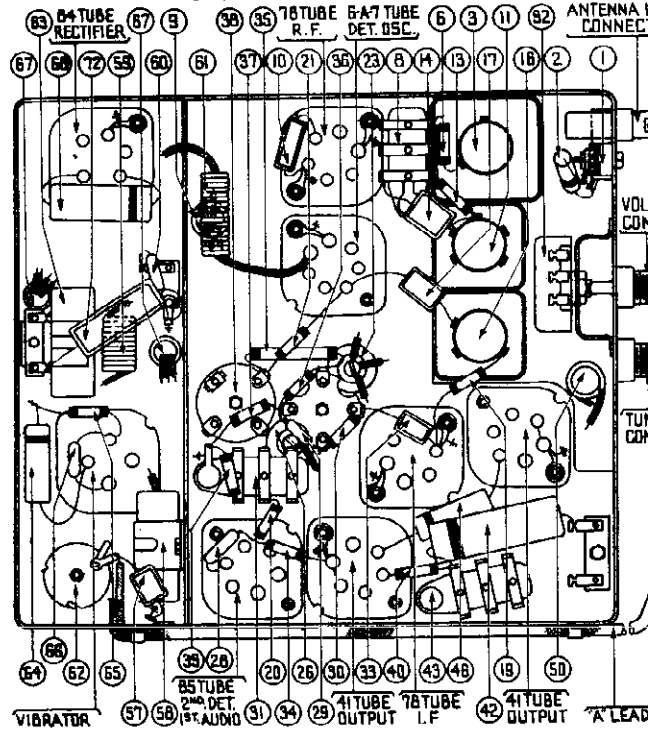


FIGURE 4

MODELS 828, 828K
 Socket, Trimmers
 Alignment

PHILCO RADIO & TELEV. CORP.

I. F. TRANSFORMERS AND PADDERS

The I. F. Transformers are assembled complete with padding condensers.

Both the primary and the secondary padders are placed side by side in the top of the transformer shield can. The adjusting screws are accessible thru the holes in the top of the shield. (See Figure).

The coil windings terminate in the leads instead of terminals or lugs. The color scheme of the leads is given in Figure 5

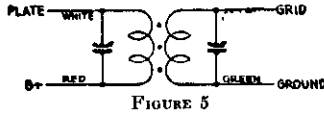


FIGURE 5

If replacements are ever necessary, replace the entire coil assembly, 32-2026 for the first I. F. stage and 32-2084 for the second I. F. stage. Neither the coil nor the padders will be furnished separately. Order only by the above numbers.

ADJUSTMENTS

OUTPUT METER — The output meter must be connected by means of an adapter to the plate of the type 41 output tube and to the Receiver chassis.

SIGNAL GENERATOR — With the Receiver and signal generator set up for operation at the prescribed frequency, turn the Receiver volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the signal generator output lead must be connected to the Receiver housing.

Procedure

I. F. — Set the signal generator at exactly 260 K. C. Connect the generator lead to the grid cap of the 78 I. F. tube in series with a .1 mfd. condenser (without removing the grid cap).

Adjust the secondary screw padder (2) on the second I. F. transformer for maximum reading on the output meter. Then adjust the primary screw padder (1) for maximum reading. (See Figure 6 for location of padders).

Remove the generator lead from the 78 tube.

Connect the generator lead to the grid cap of the 6A7 tube in series with a .1 mfd. condenser (without removing the grid cap). Adjust the secondary screw padder (2) on the first I. F. transformer for maximum reading on the output meter. Then adjust the primary screw padder (1) for maximum reading. Readjust padders (2) and (1) with the generator lead connected to the type 6A7 tube. (See Figure for location of padders).

HIGH FREQUENCY AND R. F. — After padding the first I. F. stage remove the generator lead from the 6A7 tube.

Set the signal generator at 1550 K. C. and then connect the generator lead to the grid cap of the 78 R. F. tube in series with a .1 mfd. condenser (without removing the grid cap).

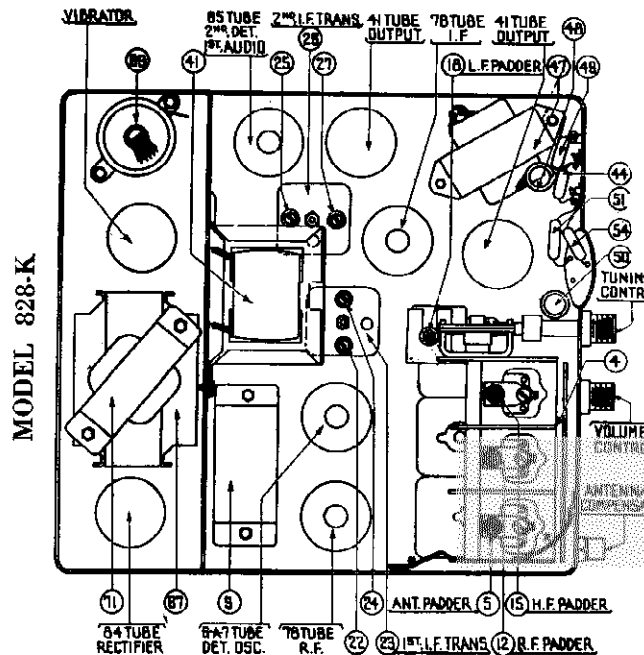
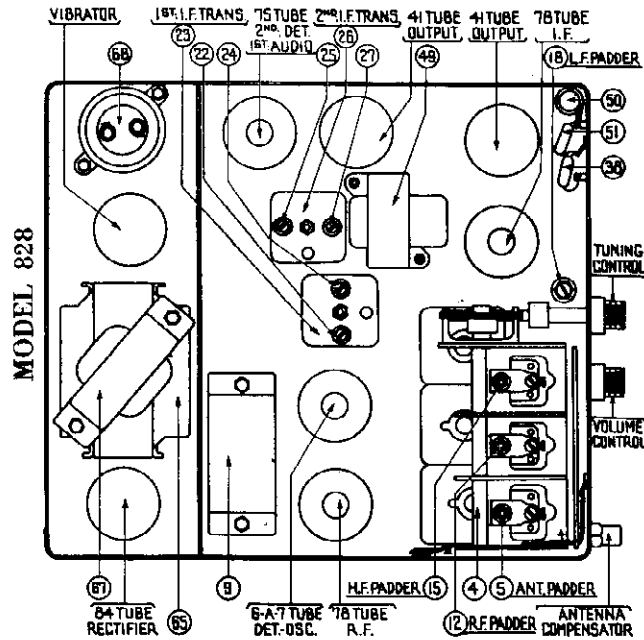
Turn the tuning condenser plates out of mesh as far as they will go.

With the tuning condenser in this position, adjust the high frequency padder (4) and the R. F. padder (5) until the maximum reading is obtained on the output meter. This is the true setting for 1550 K. C., 155 on the dial scale.

LOW FREQUENCY — Turn the tuning condenser plates in mesh to approximately 580 K. C., 58 on the dial scale and set the signal generator at 580 K. C. Roll the tuning condenser and adjust the low frequency padder screw (3) for maximum reading on the output meter.

HIGH FREQUENCY READJUSTMENT — Turn the tuning condenser plates out of mesh to 1550 K. C. and set the signal generator at 1550 K. C. Then adjust the high frequency padder (4) again for maximum reading on the output meter.

Remove the generator lead from the 78 R. F. tube.



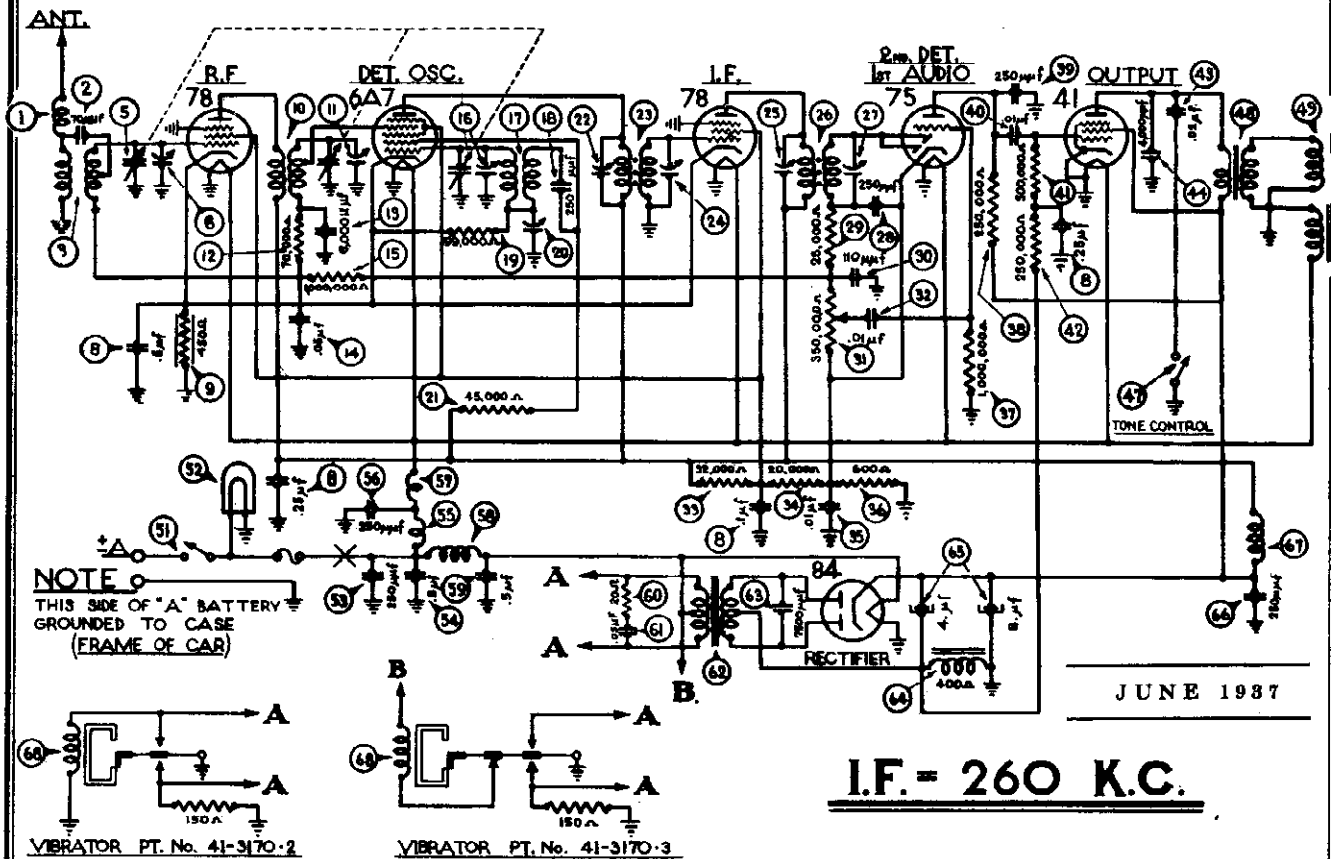
ANTENNA — WHEN PADDING THE ANTENNA STAGE IT IS EXTREMELY IMPORTANT THAT THE PROPER DUMMY ANTENNA BE CONSTRUCTED AND USED.

Connect the signal generator lead to the antenna lead assembly (made up of Part No. 41-3191 lead and a 200 mmfd. condenser, Part No. 30-1013), in series between the lead and the signal generator. Plug the lead into the antenna lead connector on the end of the Receiver.

Turn the tuning condenser to 1400 K. C. and set the generator at 1400 K. C. Adjust the padders (4) and (5) for the maximum reading on the output meter.

When the antenna stage adjustment is made with the Receiver installed in the car, the Receiver antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

PHILCO RADIO & TELEV. CORP. W-1419 Willys-Overland
 MODELS R-1415 Reo
 Schematic, Chassis,
 Parts



I.F. = 260 K.C.

FIGURE 1

PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	33-8623	21	Resistor (600 ohms)	33-1212
2	Condenser (70 mmfd.)	30-1088	22	Resistor (1,000,000 ohms)	33-510344
3	Antenna Transformer	32-2494	23	Resistor (250,000 ohms)	33-424544
4	Tuning Condenser	31-2004	24	Condenser (250 mmfd.)	30-1032
5	First Padder (on Tun. Cond.)	32-2495	25	Condenser (.01 mfd.)	3903-08U
6	Condenser	30-4415	26	Resistor (500,000 ohms)	33-449344
7	Resistor (450 ohms)	33-1218	27	Resistor (250,000 ohms)	33-424344
8	R. F. Transformer	32-2495	28	Condenser (.02 mfd.)	30-4419
9	Second Padder (on Tun. Cond.)	32-2496	29	Condenser (4,000 mmfd.)	30-4185
10	Resistor (70,000 ohms)	33-370344	30	Tone Control Switch	42-1140
11	Condenser (6,000 mmfd.)	30-4467	31	Output Transformer	32-7495
12	Condenser (.05 mfd.)	3615-08G	32	Cone & Voice Coil	36-3586
13	Resistor (1,000,000 ohms)	33-510344	33	Field Coil Assembly	36-3597
14	Third Padder (on Tun. Cond.)	32-2496	34	On & Off Switch	42-5617
15	Oscillator Transformer	32-2496	35	Pilot Lamp	34-2040
16	Condenser (250 mmfd.)	30-1032	36	Condenser (250 mmfd.)	30-1032
17	Resistor (99,000 ohms)	33-399344	37	Condenser (.5 mfd.)	30-4015
18	Low Frequency Padder	31-8056	38	"A" Choke	32-1604
19	Resistor (45,000 ohms)	33-345344	39	Condenser (250 mmfd.)	30-1032
20	Padder (Pri. 1st I. F. Trans.)	32-2026	40	Filament Choke	32-2535
21	First I. F. Transformer	32-2026	41	Vibrator Choke	32-2039
22	Padder (Sec. 1st I. F. Trans.)	32-2027	42	Condenser (.5 mfd.)	30-4015
23	Padder (Pri. 2nd I. F. Trans.)	32-2027	43	Resistor (20 ohms)	33-020844
24	Second I. F. Transformer	32-2027	44	Condenser (.05 mfd.)	30-4444
25	Padder (Sec. 2nd I. F. Trans.)	32-2027	45	Power Transformer	32-7560
26	Condenser (250 mmfd.)	30-1032	46	Condenser (7,500 mmfd.)	30-4420
27	Resistor (25,000 ohms)	33-325344	47	Filter Choke	32-7545
28	Condenser (110 mmfd.)	30-1051	48	Filter Condenser (4-8 mfd.)	30-2150
29	Volume Control	33-6139	49	Condenser (250 mmfd.)	30-1032
30	Condenser (.01 mfd.)	3903-08U	50	"B" Choke	32-1281
31	Resistor (32,000 ohms)	33-382434	51	Vibrator (OPTIONAL)	41-3170-2
32	Resistor (20,000 ohms)	33-320344	52	Vibrator	41-3170-3
33	Condenser (.01 mfd.)	3903-08G	53	Inductive Suppressor	33-2250
34	On & Off Switch (R-1415)	42-5493	54	Interference Condenser	30-4007
35	On & Off Switch (W-1419)	42-5817	55	Glass (R-1415)	27-7825
36	Pilot Lamp (R-1415)	34-2039	56	Knob (R-1415)	27-4161
37	Pilot Lamp (W-1419)	34-2040	57	Scale Assembly (W-1419)	42-5696
38			58	Tun. & Vol. Knob (W-1419)	27-4824

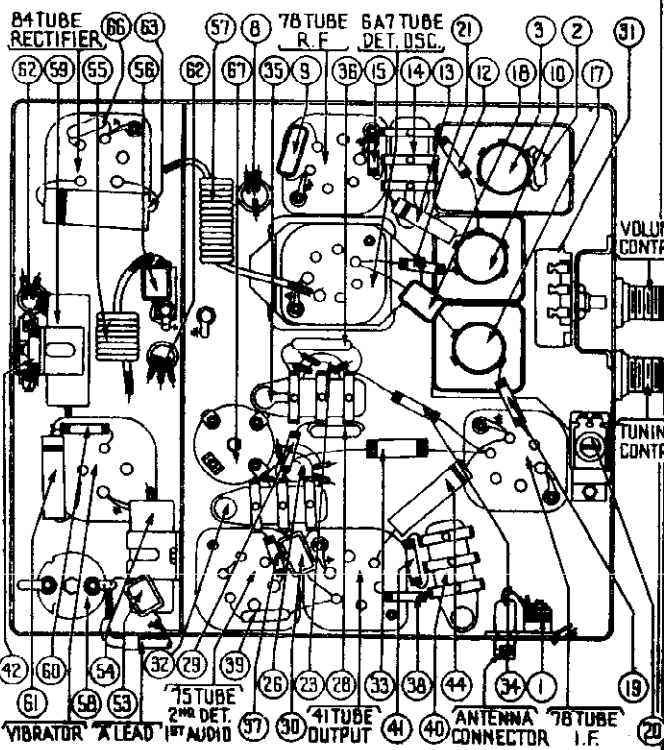


FIGURE 2

MODELS R-1415 Reo
Socket, Trimmers
Alignment

W-1419 Willys-Overland

PHILCO RADIO & TELEV. CORP.

I. F. TRANSFORMERS AND PADDERS

The I. F. transformers are assembled complete with padding condensers.

Both the primary and the secondary padders are placed side by side in the top of the transformer shield can. The adjusting screws are accessible thru the holes in the top of the shield. (See Figure 4).

The coil windings terminate in leads instead of terminals or lugs. The color scheme of the leads is given in Figure 3.

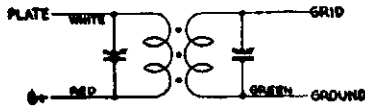


FIGURE 3

If replacements are ever necessary, replace the entire coil assembly, 32-2026 for the first I. F. stage and 32-2027 for the second I. F. stage. Neither the coil nor the padders will be furnished separately. Order only by the above numbers.

ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required the procedure given below must be followed in detail.

Equipment

Fully charged heavy duty storage battery or 6-volt power pack, 048A or 099A Philco Set Tester, 3164 Padding wrench, 27-7159 Padding screw driver.

General

OUTPUT METER — The output meter must be connected by means of an adapter to the plate of the type 41 output tube and to the Receiver chassis.

SIGNAL GENERATOR — With the Receiver and signal generator set up for operation at the prescribed frequency, turn the Receiver volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the signal generator output lead must be connected to the Receiver housing.

Procedure

I. F. — Set the signal generator at exactly 260 K. C. Connect the generator lead to the grid cap of the 78 I. F. tube in series with a .1 mfd. condenser (without removing the grid cap).

Adjust the secondary screw padder ② on the second I. F. transformer for maximum reading on the output meter. Then adjust the primary screw padder ③ for maximum reading. (See Figure 4 for location of padders).

Remove the generator lead from the 78 tube.

Connect the generator lead to the grid cap of the 6A7 tube in series with a .1 mfd. condenser (without removing the grid cap). Adjust the secondary screw padder ④ on the first I. F. transformer for maximum reading on the output meter. Then adjust the primary screw padder ⑤ for maximum reading. Readjust padders ② and ③ with the generator lead connected to the type 6A7 tube. (See Figure 4 for location of padders).

HIGH FREQUENCY AND R. F. — After padding the first I. F. stage remove the generator lead from the 6A7 tube.

Set the signal generator at 1550 K. C. and then connect the generator lead to the grid cap of the 78 R. F. tube in series with a .1 mfd. condenser (without removing the grid cap).

Turn the tuning condenser plates out of mesh as far as they will go. With the tuning condenser in this position, adjust the high frequency padder ⑥ and the R. F. padder ⑪ until the maximum reading is obtained on the output meter. This is the true setting for 1550 K. C., 155 on the dial scale.

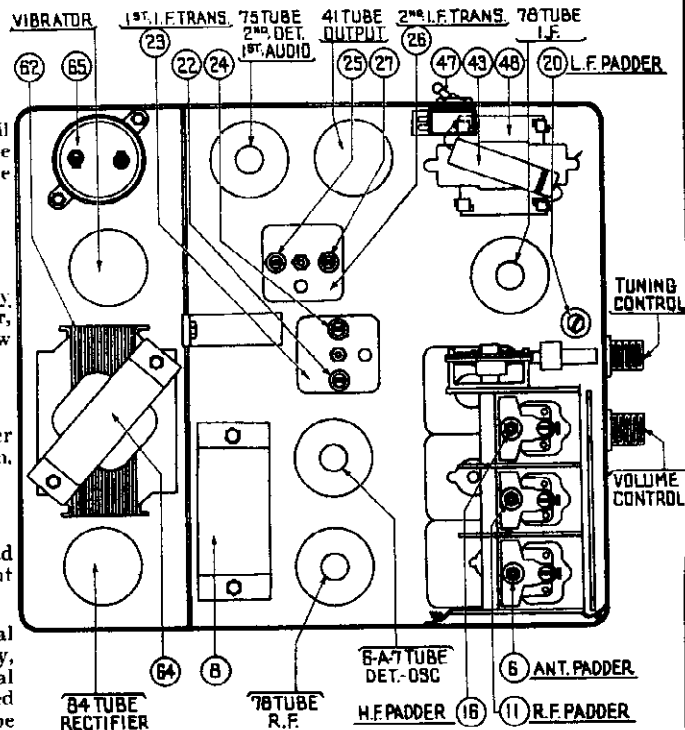


FIGURE 4

LOW FREQUENCY — Turn the tuning condenser plates in mesh to approximately 600 K. C., 60 on the dial scale and set the signal generator at 600 K. C. Rock the tuning condenser and adjust the low frequency padder screw ⑩ for maximum reading on the output meter.

HIGH FREQUENCY READJUSTMENT — Turn the tuning condenser plates out of mesh as far as they will go and set the signal generator at 1550 K. C. Then adjust the high frequency padder ⑥ again for maximum reading on the output meter.

Remove the generator lead from the 78 R. F. tube.

Connect the signal generator lead to the antenna lead, Part No. 41-3191.

Turn the tuning condenser to 1400 K. C. and set the generator at 1400 K. C. Adjust the padders ⑩ and ⑥ for the maximum reading on the output meter.

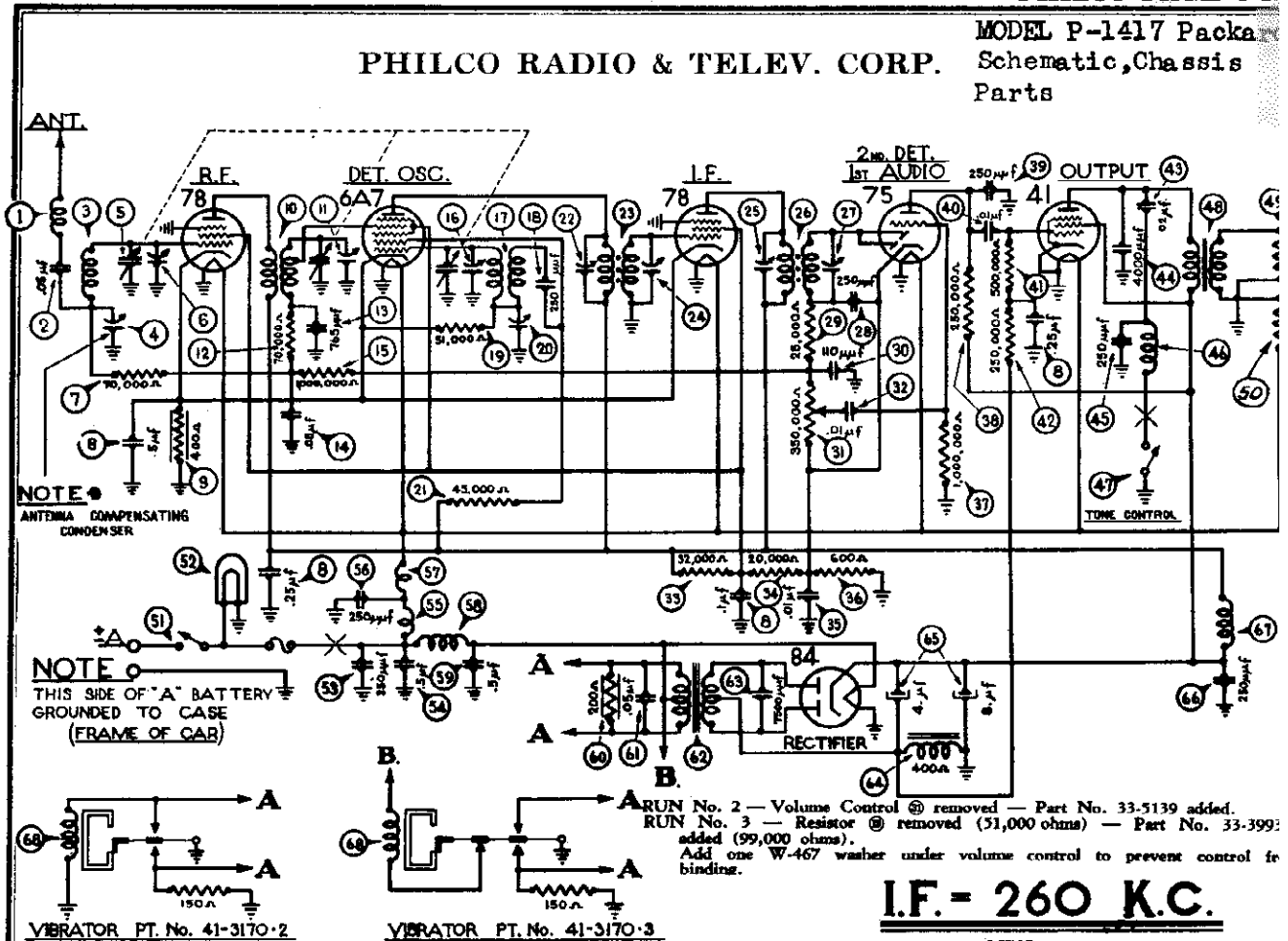
When the antenna stage adjustment is made with the Receiver installed in the car, the Receiver antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

JUNE 1937

The Model R-1415 is a Special Custom Receiver used exclusively by the Reo Motor Car Company.
The Model W-1419 is a Special Custom-Built Receiver used exclusively by the Willys-Overland Motors Inc.

PHILCO RADIO & TELEV. CORP.

MODEL P-1417 Packa
Schematic, Chassis
Parts



I.F. = 260 K.C.

OCTOBER 1, 1936

MODEL - P-1417 PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
1	Antenna choke	32-2344	38	Condenser (250 mmfd.)	30-1032
2	Condenser (.05 mfd.)	30-4444	39	Choke	32-2063
3	Antenna transformer	32-2306	40	Tone control switch	42-5603
4	Antenna coupling condenser	31-6082	41	Output transformer	32-7495
5	Tuning condenser	31-1769	42	Cone & voice coil	36-3586
6	First padder (On tun. cond.)	33-370334	43	Field coil assembly	36-3597
7	Resistor (70,000 ohms)	33-370334	44	On & Off switch assembly	42-5606
8	Condenser (.1-.25-.5 mfd)	30-4415	45	Pilot lamp	34-2040
9	Resistor (400 ohms)	33-1211	46	Condenser (250 mmfd.)	30-1032
10	R. F. transformer	32-2307	47	Condenser (.05 mfd.)	30-4015
11	Second padder (On tun. cond.)	33-370334	48	"A" choke	32-1432
12	Resistor (70,000 ohms)	33-370334	49	Condenser (250 mmfd.)	30-1032
13	Condenser (.765 mmfd.)	30-1069	50	Filament choke	32-2038
14	Condenser (.05 mfd.)	3615-OSG	51	Vibrator choke	32-2039
15	Resistor (1,000,000 ohms)	33-510344	52	Resistor (200 ohms)	33-1210
16	Third padder (On tun. cond.)	30-1032	53	Condenser (.05 mfd.)	30-4444
17	Oscillator transformer	32-2308	54	Power transformer	32-7550
18	Condenser (250 mmfd.)	30-1032	55	Condenser (7500 mmfd.)	30-4420
19	Resistor (51,000 ohms)	33-351344	56	Filter choke	33-7545
20	Low frequency padder	31-6102	57	Filter condenser (4-8 mfd.)	30-2150
21	Resistor (45,000 ohms)	33-345844	58	Condenser (250 mmfd.)	30-1032
22	Padder (Pri. 1st I. F. trans.)	32-2026	59	"B" choke	32-1281
23	First I.F. transformer	32-2026	60	Vibrator (Optional)	41-3170-2
24	Padder (Sec. 1st I.F. trans.)	32-2027	61	Four prong socket	27-6044
25	Padder (Pri. 2nd I.F. trans.)	32-2027	62	Five prong socket	27-6035
26	Second I.F. transformer	32-2027	63	Six prong socket	27-6036
27	Padder (Sec. 2nd I.F. trans.)	30-1032	64	Seven prong socket	27-6037
28	Condenser (250 mmfd.)	33-325344	65	Ground clamp	41-3194
29	Resistor (25,000 ohms)	33-1031	66	Antenna loop	38-8080
30	Condenser (110 mmfd.)	33-5139	67	Interference condenser	45225
31	Volume control (350,000 ohms)	33-5139	68	Interference condenser	30-4007
32	Condenser (.01 mfd.)	3903-OSU	69	Distributor resistor	4851
33	Resistor (32,000 ohms)	33-332344	70	Fuse	7227
34	Resistor (20,000 ohms)	33-320334	71	Fuse insulator	27-7729
35	Condenser (.01 mfd.)	3903-OSU	72	Tuning & volume control knob	27-4318
36	Resistor (500 ohms)	33-1212	73	Tone control lever	28-7203
37	Resistor (1,000,000 ohms)	33-510344	74	Knob base	28-4184
38	Resistor (250,000 ohms)	33-424344	75	Tee bolt	28-6268
39	Condenser (250 mmfd.)	30-1032	76	Nut (Rec. mtg.)	W718A
40	Condenser (.01 mfd.)	3903-OSU	77	Tuning & volume shaft	28-8862
41	Resistor (500,000 ohms)	33-449344	78	Dial assembly	42-5635
42	Resistor (240,000 ohms)	33-424344	79	Antenna lead (on Receiver)	L-2308
43	Condenser (.02 mfd.)	30-4419			
44	Condenser (4000 mmfd.)	30-4185			

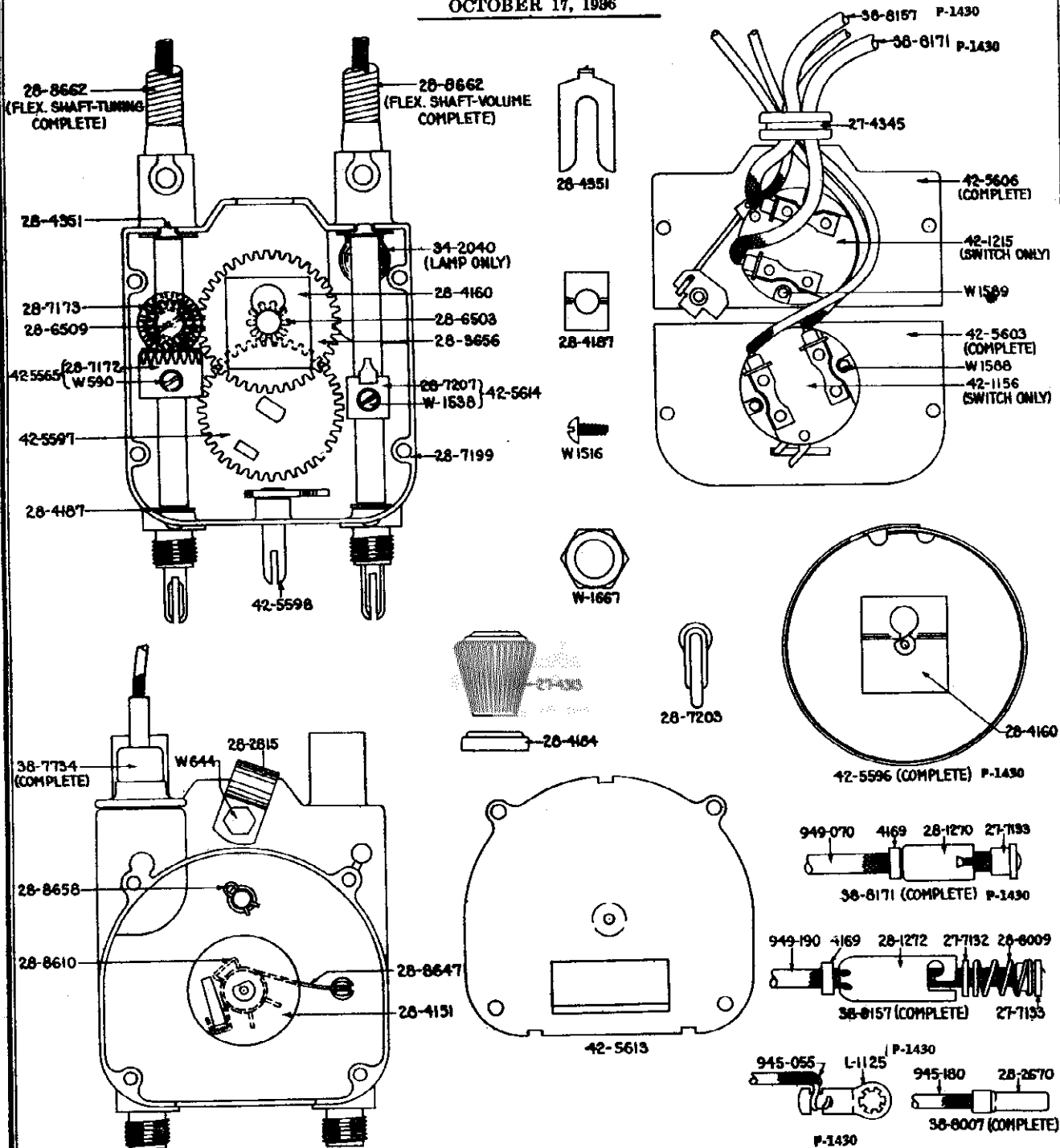
Note: The items marked with an asterisk are rarely required for service and in many cases will not be carried in stock by local service station. In such cases it will be necessary to order these parts from Philco Transitone, Philadelphia or Chicago

MODELS P-1417, P-1430

Packard
Control Parts

PHILCO RADIO & TELEV. CORP.

OCTOBER 17, 1936



PARTS LIST

Part No.	Description	Part No.	Description	Part No.	Description	Part No.	Description
L-1125	Lug (P-1430)	27-4345	Grommet	28-7172	Miter Gear	38-8157	"A" Lead (P-1430)
L-1833	Lug (P-1417)	27-7192	Washer	28-7173	Miter Idler Gear	38-8171	"A" Lead (P-1430)
W-590	Set Screw	27-7193	Ferrule	28-7199	Control Housing	42-1156	Sensitivity Switch Only
W-644	P.K. Screw	28-1270	Housing	28-7203	Knob	42-1215	On & Off Switch Only
W-1516	Screw	28-1272	Housing	28-7207	Switch Arm	42-5585	Miter Gear Assembly
W-1538	Set Screw	28-2670	Prong	28-8009	Spring	42-5586	Scale Assembly (P-1430)
W-1588	Rivet	28-2815	Clamp	28-8610	Gear Retaining Spring	42-5587	Shaft & Gear Assembly
W-1589	Rivet	28-3656	Intermediate Gear (large)	28-8647	Back Lash Spring	42-5588	Sensitivity Switch Assembly
W-1687	Nut	28-4151	Drum Washer	28-8658	Retaining Spring	42-5803	Sensitivity Switch Assembly
945-055	Wire	28-4160	Drum Spring	28-8662	Tuning & Volume Shaft	42-5806	On & Off Switch Assembly
949-070	Wire	28-4184	Knob Base	34-2040	Pilot Lamp	42-6613	Top Cover
949-180	Wire	28-4187	Spring Washer	38-7082	"A" Lead (P-1417)	42-5614	Switch Arm Assembly
949-190	Wire	28-4351	Shaft Retainer	38-7621	"A" Lead (P-1417)	42-5635	Scale Assembly (P-1417)
4169	Rubber Washer	28-6503	Intermediate Gear (small)	38-7734	Pilot Lamp Assembly		
27-4313	Tuning & Volume Knob	28-6509	Miter Idler Screw	38-8007	Sensitivity Lead Assembly		

MODEL N-1418 Nash

Socket, Trimmers
Alignment

PHILCO RADIO & TELEV. CORP. MODEL P-1417 Packard
MODEL G-1418 Graham

I. F. TRANSFORMERS AND PADDERS

The I. F. transformers are assembled complete with padding condensers.

Both the primary and the secondary padders are placed side by side in the top of the transformer shield can. The adjusting screws are accessible thru the holes in the top of the shield.

The coil windings terminate in leads instead of terminals or lugs. The color scheme of the leads is given in Figure 7.

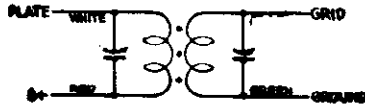


FIGURE 7

If replacements are ever necessary, replace the entire coil assembly, 32-2026 for the first I. F. stage and 32-2027 for the second I. F. stage. Neither the coil nor the padders will be furnished separately. Order only by the above numbers.

General

OUTPUT METER—The output meter must be connected by means of an adapter to the plate of the type 41 output tube and to the Receiver chassis.

SIGNAL GENERATOR—With the Receiver and signal generator set up for operation at the prescribed frequency, turn the Receiver volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the signal generator output lead must be connected to the Receiver housing.

Procedure

I. F.—Set the signal generator at exactly 260 K. C. Connect the generator lead to the grid cap of the 78 I. F. tube in series with a .1 mfd. condenser (without removing the grid cap).

Adjust the secondary screw padder (20) on the second I. F. transformer for maximum reading on the output meter. Then adjust the primary screw padder (25) for maximum reading. (See Figure 8 for location of padders).

Remove the generator lead from the 78 tube.

Connect the generator lead to the grid cap of the 6A7 tube in series with a .1 mfd. condenser (without removing the grid cap). Adjust the secondary screw padder (25) on the first I. F. transformer for maximum reading on the output meter. Then adjust the primary screw padder (20) for maximum reading. Readjust padders (25) and (20) with the generator lead connected to the type 6A7 tube. (See Figure 8 for location of padders).

HIGH FREQUENCY AND R. F.—After padding the first I. F. stage remove the generator lead from the 6A7 tube.

Set the signal generator at 1550 K. C. and then connect the generator lead to the grid cap of the 78 R. F. tube in series with a .1 mfd. condenser (without removing the grid cap).

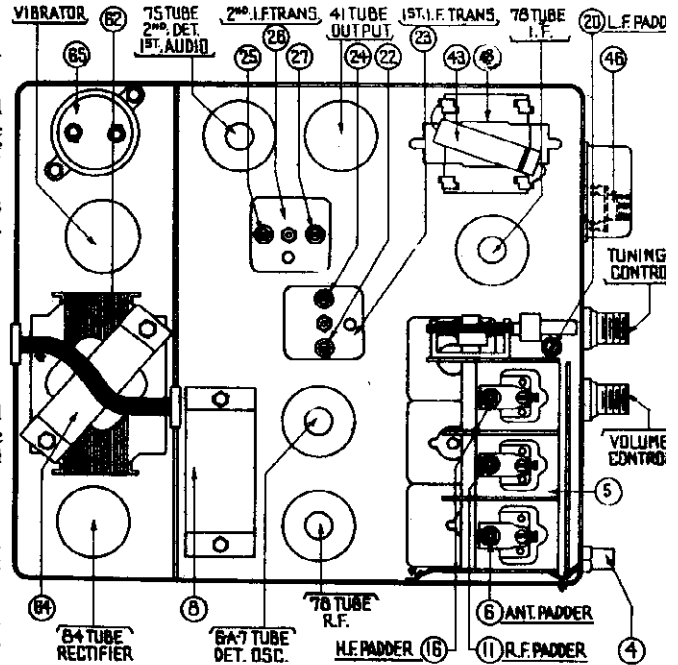
Turn the tuning condenser plates out of mesh as far as they will go.

With the tuning condenser in this position, adjust the high frequency padder (16) and the R. F. padder (11) until the maximum reading is obtained on the output meter. This is the true setting for 1550 K. C., 155 on the dial scale.

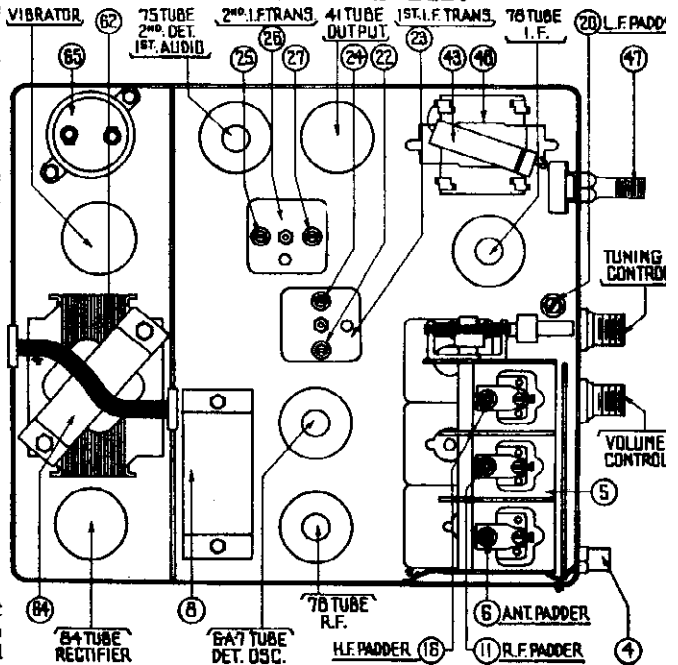
LOW FREQUENCY—Turn the tuning condenser plates in mesh to approximately 600 K. C., 60 on the dial scale and set the signal generator at 600 K. C. Roll the tuning condenser and adjust the low frequency padder screw (8) for maximum reading on the output meter.

HIGH FREQUENCY READJUSTMENT—Turn the tuning condenser plates out of mesh to 1550 K. C. and set the signal generator at 1550 K. C. Then adjust the high frequency padder (16) again for maximum reading on the output meter.

Remove the generator lead from the 78 R. F. tube.



MODEL P-1417



MODEL G-1418 MODEL N-1418

ANTENNA—WHEN PADDING THE ANTENNA STAGE IT IS EXTREMELY IMPORTANT THAT THE PROPER DUMMY ANTENNA BE CONSTRUCTED AND USED.

Connect the signal generator lead to the antenna cable assembly (made up of Part No. 38-7295 cable and a 155 mmfd condenser in series between the lead and the signal generator. Plug the cable into the antenna receptacle on the top of the Receiver.

Turn the tuning condenser to 1400 K. C. and set the generator at 1400 K. C. Adjust the padders (16) and (11) for the maximum reading on the output meter.

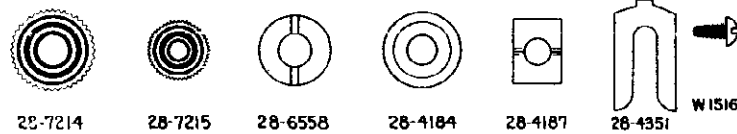
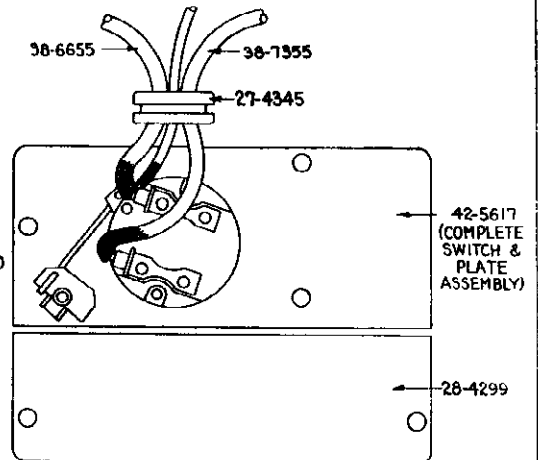
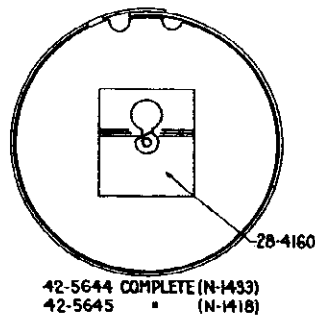
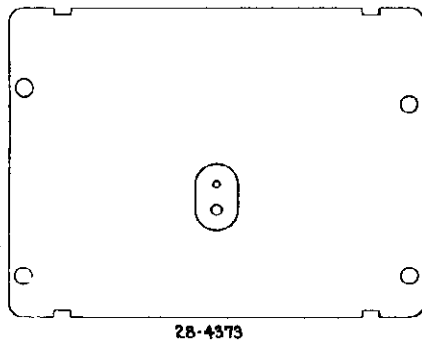
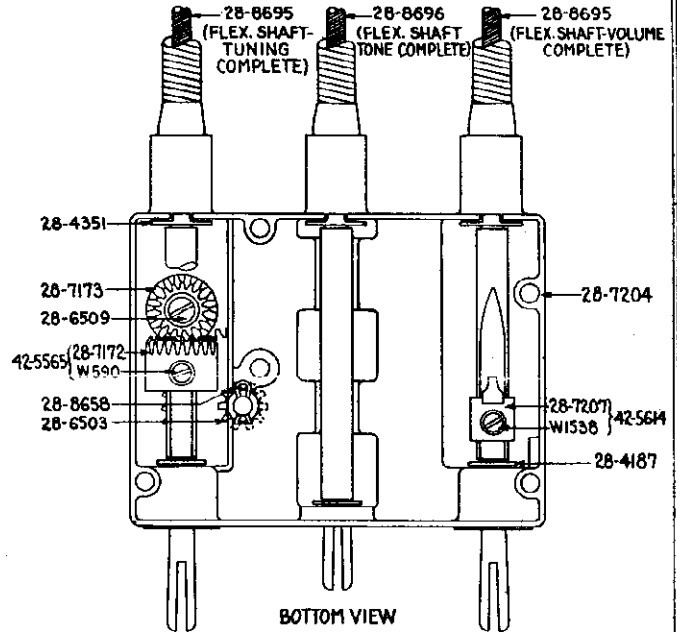
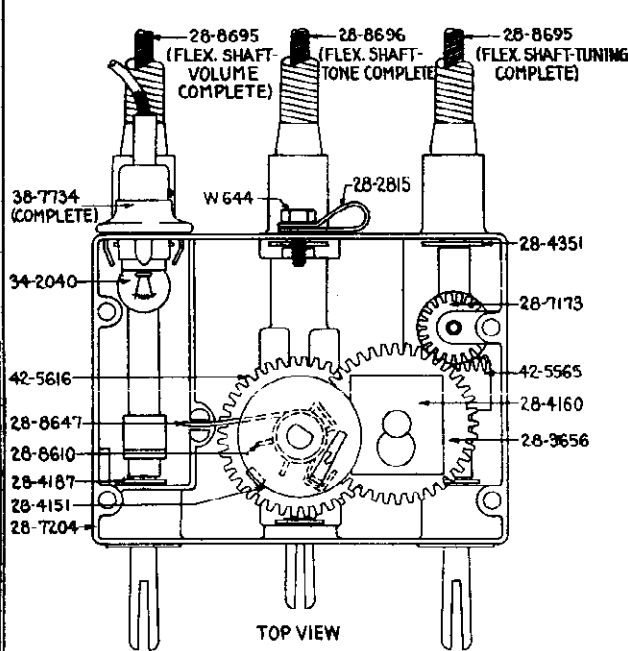
When the antenna stage adjustment is made with the Receiver installed in the car, the Receiver antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

MODELS N-1418, N-1433

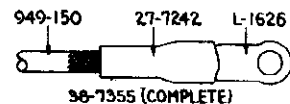
Nash

PHILCO RADIO & TELEV. CORP.

Control Parts



PARTS LIST



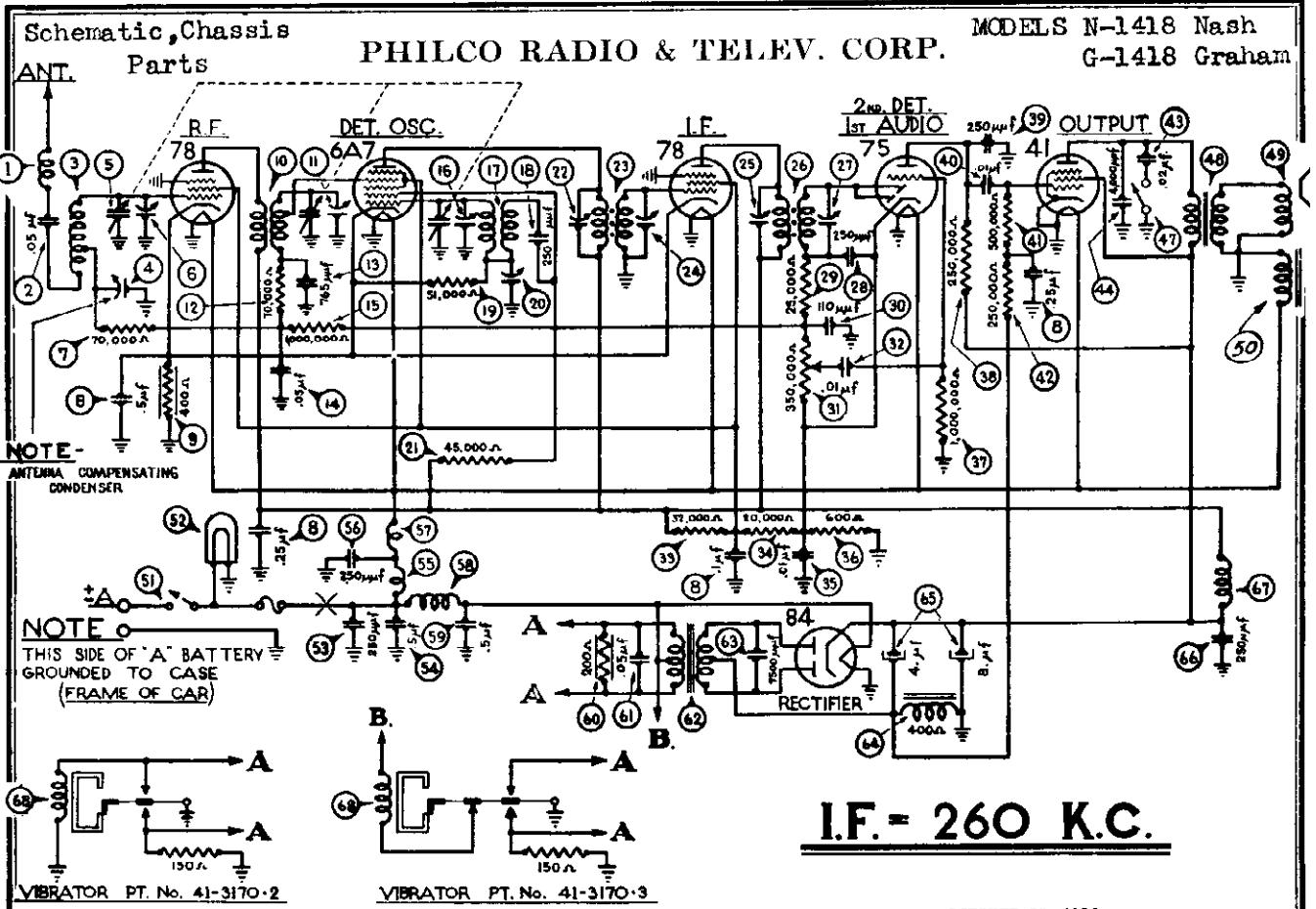
Part No.	Description
L-1626	Lug
W-590	Set Screw
W-644	Screw (clamp mtg.)
W-1516	Screw
W-1538	Set Screw
949-150	Wire
949-190	Wire
27-4345	Grommet
27-7133	Ferrule
27-7242	Sleeve
28-1269	Fuse Housing

Part No.	Description
28-2815	Clamp
28-3656	Intermediate Gear (large)
28-4151	Drum Friction Washer
28-4160	Drum Spring
28-4184	Knob Base
28-4187	Spring Washer
28-4299	Cover
28-4351	Shaft Retainer
28-4373	Cover
28-6503	Intermediate Gear (small)
28-6509	Miter Idler Screw

Part No.	Description
28-6558	Gland Nut
28-7172	Miter Gear
28-7173	Miter Idler Gear
28-7204	Control Housing
28-7207	Switch Arm
28-7214	Tuning and Volume Knob
28-7215	Tone Control Knob
28-8009	Spring
28-8610	Gear Retaining Spring
28-8647	Back Lash Spring
28-8658	Retaining Spring

Part No.	Description
28-8695	Tuning and Volume Control Shaft
28-8696	Tone Control Shaft
34-2040	Pilot Lamp
38-7734	Pilot Lamp Assembly
38-6055	"A" Lead
38-7355	"A" Lead
42-5614	Switch Arm Assembly
42-5616	Drum Shaft and Gear Assembly
42-5617	On and Off Switch Assembly
42-5644	Scale Assembly (N-1433)
42-5645	Scale Assembly (N-1418)
42-5665	Miter Gear Assembly

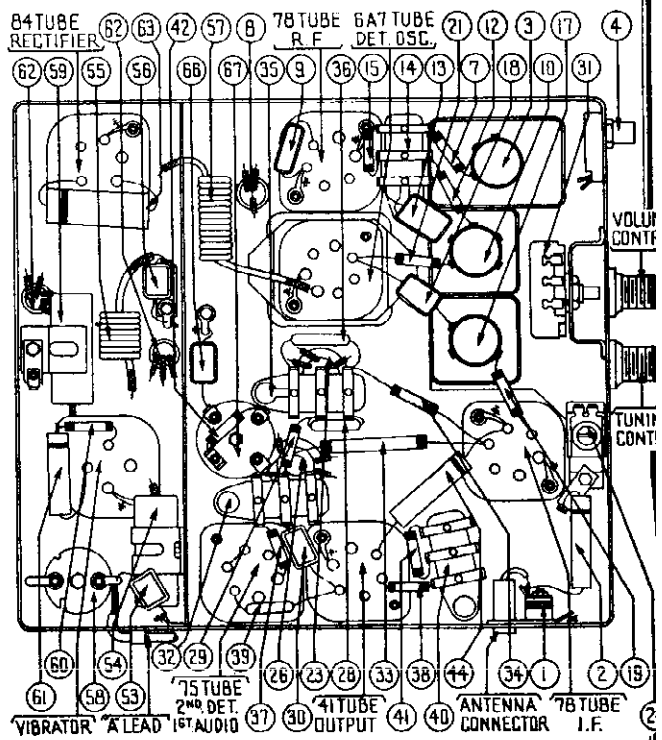
NOVEMBER 15, 1936



MODEL G-1418 PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	38-8244	44	Condenser (4000 mmfd.)	30-4185
2	Condenser (.05 mfd.)	30-4444	45	Condenser (250 mfd.)	30-1032
3	Antenna Transformer	32-2326	46	Choke	32-2063
4	Antenna Coupling Condenser	31-6082	47	Tone Control Switch	42-5646
5	Tuning Condenser	31-1769	48	Output Transformer	32-7495
6	First Padder (on tun. cond.)	33-370334	49	Cone & Voice Coil	38-3586
7	Resistor (70,000 ohms)	33-370334	50	Field Coil Assembly	26-3597
8	Condenser (1-.25-.25-.5 mfd.)	30-4415	51	On & Off Switch Assembly	42-5617
9	Resistor (400 ohms)	33-1211	52	Pilot Lamp	34-2040
10	R. F. Transformer	32-2307	53	Condenser (250 mmfd.)	30-1032
11	Second Padder (on tun. cond.)	33-370334	54	Condenser (.05 mfd.)	30-4015
12	Resistor (70,000 ohms)	33-370334	55	"A" Choke	32-1432
13	Condenser (.765 mmfd.)	30-1069	56	Condenser (250 mmfd.)	30-1032
14	Condenser (.05 mfd.)	3615-08G	57	Filament Choke	32-2038
15	Resistor (1,000,000 ohms)	33-510344	58	Vibrator Choke	32-2039
16	Third Padder (on tun. cond.)	33-370334	59	Condenser (.5 mfd.)	30-4015
17	Oscillator Transformer	32-2308	60	Resistor (200 ohms)	33-1210
18	Condenser (250 mmfd.)	30-1032	61	Condenser (.05 mfd.)	30-4444
19	Resistor (51,000 ohms)	33-351344	62	Power Transformer	32-7550
20	Low Frequency Fadder	31-6102	63	Condenser (7500 mmfd.)	30-4420
21	Resistor (45,000 ohms)	33-345344	64	Filter Choke	32-7545
22	Padder (Pri. 1st I. F. Trans.)	32-2026	65	Filter Condenser (4-8 mfd.)	30-2150
23	First I. F. Transformer	32-2026	66	Condenser (250 mmfd.)	30-1032
24	Padder (Sec. 1st I. F. Trans.)	32-2027	67	"B" Choke	32-1281
25	Padder (Pri. 2nd I. F. Trans.)	32-2027	68	Vibrator (Optional)	41-3170-2
26	Second I. F. Transformer	32-2027	69	Four-prong Socket	27-6044
27	Padder (Sec. 2nd I. F. Trans.)	33-325344	70	Five-prong Socket	27-6035
28	Condenser (250 mmfd.)	30-1032	71	Six-prong Socket	27-6036
29	Resistor (25,000 ohms)	33-325344	72	Seven-prong Socket	27-6037
30	Condenser (110 mmfd.)	30-1031	73	Interference Condenser	30-4007
31	Volume Control	33-5139	74	Distributor Resistor	33-1196
32	Condenser (.01 mfd.)	3903-08U	75	Fuse	7227
33	Resistor (800 ohms)	33-1212	76	Fuse Insulator	27-7729
34	Resistor (1,000,000 ohms)	33-510344	77	Tuning & Volume Control Knob	27-4428
35	Resistor (250,000 ohms)	33-424344	78	Tone Control Knob	27-4430
36	Condenser (250 mmfd.)	30-1032	79	Knob Base	26-4184
37	Condenser (.01 mfd.)	3903-08U	80	Control Wrench	28-4380
38	Resistor (800 ohms)	33-1212	81	Tee Bolt (Rec. mtg.)	28-6161
39	Resistor (1,000,000 ohms)	33-510344	82	Nut (Rec. mtg.)	W-518A
40	Resistor (250,000 ohms)	33-424344	83	Tuning & Volume Shaft	28-8684
41	Condenser (.01 mfd.)	3903-08U	84	Tone Control Shaft	28-8686
42	Resistor (500,000 ohms)	33-449344	85	Dial Assembly	42-5652
43	Resistor (240,000 ohms)	33-424344	86	Pilot Lamp Assembly	38-7734
44	Condenser (.02 mfd.)	30-4419			

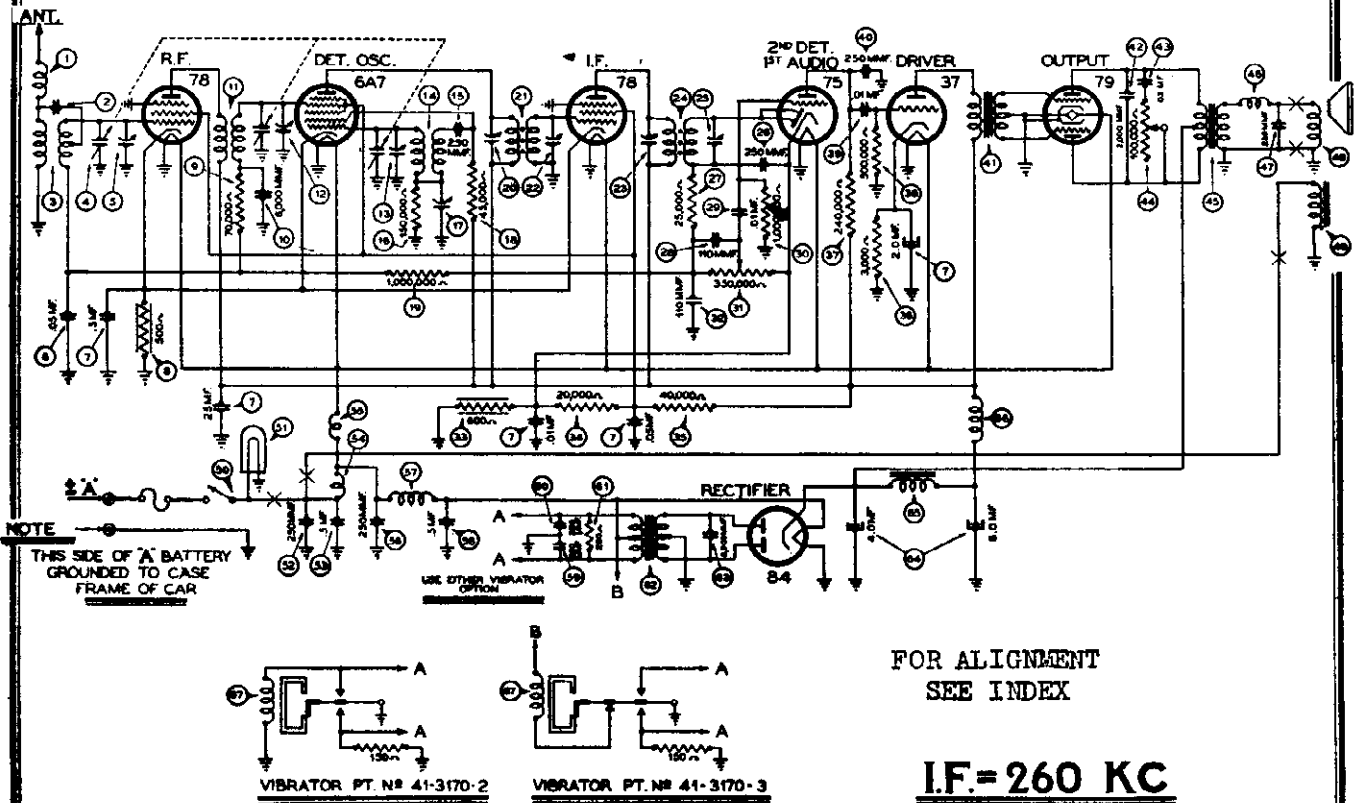
NOTE: The items marked with an asterisk are rarely required for service and in many cases will not be carried in stock by the service station. In such cases it will be necessary to order these parts from Philco Transitone, Philadelphia or Chicago.



MODELS L-1420, L-1424

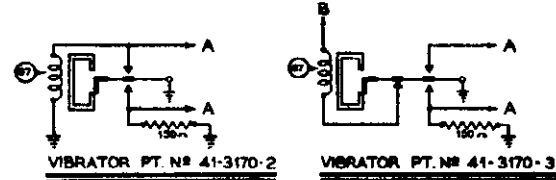
L-1425, Lincoln PHILCO RADIO & TELEV. CORP.

Schematic, Chassis Parts



NOTE
THIS SIDE OF 'A' BATTERY
GROUNDED TO CASE
FRAME OF CAR

USE EITHER VIBRATOR
OPTION



FOR ALIGNMENT
SEE INDEX

I.F. = 260 KC

MODEL L-1424 — PARTS LIST

No.	Description	Part No.	Description	Part No.
1	Antenna Choke	33-8210	Choke	32-2269
2	Condenser (90 mmfd.)	30-1048	Condenser (250 mmfd.)	30-1032
3	Antenna Transformer	32-2385	Cone & Voice Coil	36-3159
4	Tuning Condenser	31-1954	Field Coil Assembly	36-3513
5	First Padder (on tun. cond.)	30-4445	On & Off Switch	42-5617
6	Condenser (.05 mfd.)	30-4444	Pilot Lamp	34-2040
7	Condenser (.01, .05, .25, .5, 2 mfd.)	30-4493	Condenser (250 mmfd.)	30-1032
8	Resistor (500 ohms)	33-1213	Condenser (.5 mfd.)	30-4474
9	Resistor (70,000 ohms)	33-370314	"A" Choke	32-1374
10	Condenser (6000 mmfd.)	30-4445	Filament Choke	32-1561
11	R. F. Transformer	32-2231	Condenser (250 mmfd.)	30-1032
12	Second Padder (on tun. cond.)	30-4445	Vibrator Choke	32-2249
13	Third Padder (on tun. cond.)	30-4445	Condenser (.5 mfd.)	30-4474
14	Oscillator Transformer	32-2232	Condenser (250 mmfd.)	30-1032
15	Condenser (250 mmfd.)	30-1032	Condenser (250 mmfd.)	30-1032
16	Resistor (150,000 ohms)	33-415344	Resistor (200 ohms)	33-120344
17	Low Frequency Padder	31-8056	Power Transformer	32-7720
18	Resistor (45,000 ohms)	33-345344	Condenser (8000 mmfd.)	30-4420
19	Resistor (1,000,000 ohms)	33-510344	Filter Condenser (4-8 mfd.)	30-2167
20	Padder (Pri. 1st I.F. trans.)	30-4445	Filter Choke	32-7722
21	First I.F. Transformer	32-2286	"B" Choke	32-1281
22	Padder (Sec. 1st I.F. trans.)	30-4445	Vibrator (OPTIONAL)	41-3170-2
23	Padder (Pri. 2nd I.F. trans.)	30-4445	Four Prong Socket	27-6044
24	Second I.F. Transformer	32-2167	Five Prong Socket	27-6035
25	Padder (Sec. 2nd I.F. trans.)	30-4445	Six Prong Socket	26-6036
26	Condenser (250 mmfd.)	30-1032	Seven Prong Socket	27-6037
27	Resistor (25,000 ohms)	33-325344	Fuse	7227
28	Condenser (110 mmfd.)	30-1031	Fuse Insulator	27-7729
29	Condenser (.01 mfd.)	30-4479	Water Gauge Condenser	30-4007
30	Resistor (1,000,000 ohms)	33-510344	Generator Condenser	30-4181
31	Volume Control (350,000 ohms)	33-5202	Oil Gauge Condenser	30-4307
32	Condenser (110 mmfd.)	30-1031	Gas Gauge Condenser	30-4863
33	Resistor (20,000 ohms)	33-320344	Distributor Condenser	30-4404
34	Resistor (40,000 ohms)	33-340444	Antenna Shield Loom	L-2569
35	Resistor (3000 ohms)	33-230344	Plate (Rec. mtg.)	29-3734
36	Resistor (240,000 ohms)	33-424344	Screw (Rec. mtg.)	W-1614
37	Resistor (500,000 ohms)	33-449344	Speaker Cable	41-3260
38	Condenser (.01 mfd.)	30-4145	Adapter Plate	25-4566
39	Condenser (250 mmfd.)	30-1032	Wrench	28-4380
40	Input Transformer	32-7779	Tuning Shaft	28-8704
41	Condenser (2000 mmfd.)	30-4177	Volume Shaft	28-8700
42	Condenser (.03 mfd.)	30-4447	Tone Control Shaft	28-8701
43	Tone Control (100,000 ohms)	33-5141	Scale Assembly	42-5688
44	Tone Control (L-1425)	33-5101	Pilot Lamp Assembly	34-7734
45	Output Transformer	32-7778	Tuning & Volume Knob	27-4426
46	Output Transformer (L-1425)	32-7788	Tone Knob	27-4427
47			Receiver Housing	38-1756

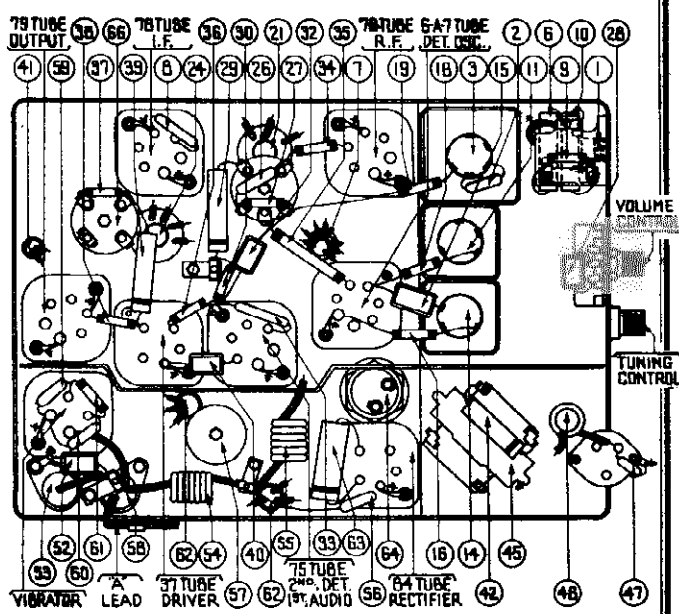


FIGURE 136

CHANGES — "Run Numbers" are stamped on the chassis sub-base for identification. These "Run Numbers" are changed consecutively as major changes are made in the Receiver wiring and parts.

RUN No. 2 — Volume Control removed — Part No. 33-5202 added.

SEE INDEX FOR ALIGNMENT

The Circuit of the Model L-1420 and L-1425 is identical to the Model L-1424 with the following exception:—
The Field for the L-1425 is supplied from the center tap of chokes 64 and 65.

The Models L-1420, L-1424 and L-1425 are Special Custom-Built Receivers used exclusively by the Lincoln Motor Company in their 1937 cars.

Socket, Trimmers
Alignment

PHILCO RADIO & TELEV. CORP.

MODELS L1420, P1421, P1422
L1424, L1425, P1426
P1439, L1460
MODELS F1440, F1442

MODELS L1420, P1421, P1422, L1424, L1425, P1426 AND P1439, L-1460

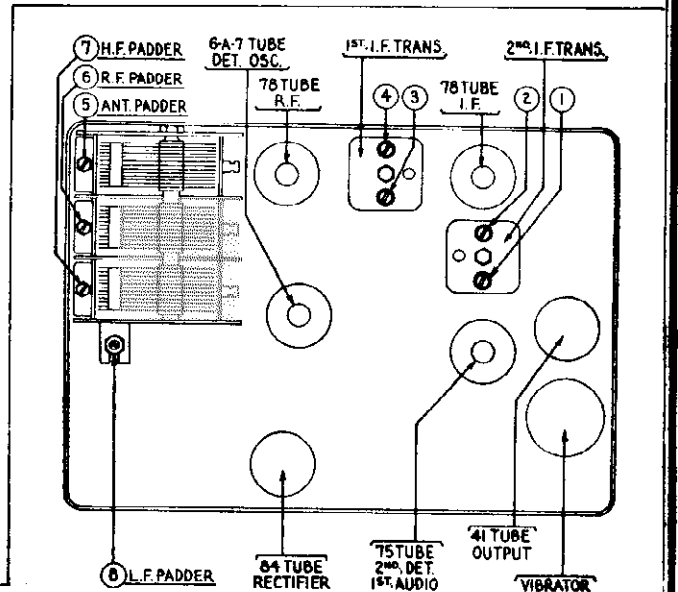
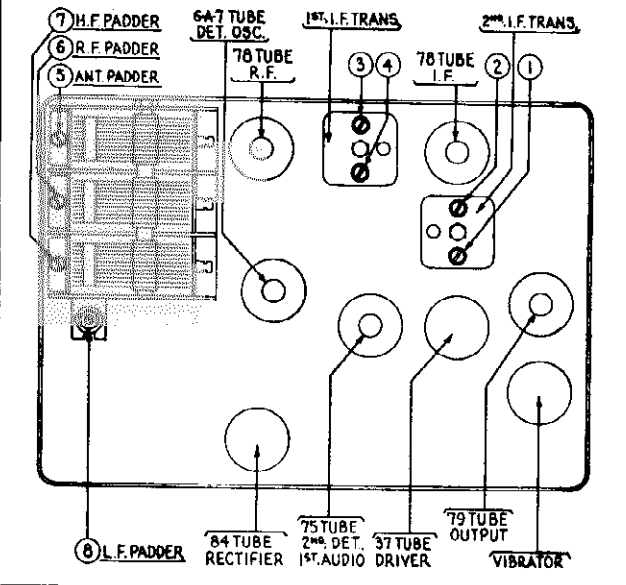
OPERATION	SIGNAL GENERATOR		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
	FREQUENCY	CONNECTION			
1	260 K. C.	To Grid of 78 Tube—I.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection	1-2
2	260 K. C.	To Grid of 6A7 Tube	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection	3-4 1-2
3	1500 K. C.	To Grid of 78 Tube—R.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection Note 1	7-6
4	580 K. C.	To Grid of 78 Tube—R.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection Set Tuning Condensers at 580 K. C.	8 Note 2
5	1550 K. C.	To Grid of 78 Tube—R.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection Set Tuning Condensers at 1550 K. C.	7
6	1400 K. C.	Note 4	Note 4	Set Tuning Condensers at 1400 K. C.	6-5

Adjust for maximum reading on the output meter.

NOTE 1—Turn the condenser rotor plates completely out of mesh. Use a piece of bond letterhead paper as a gauge between the heel of the rotor plates and the stator plates and turn the condenser plates in mesh until they strike against the paper.

NOTE 2—Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then re-adjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 4—Connect the Antenna lead Part No. 41-3191 to the Antenna receptacle on the Receiver in series with the correct dummy capacity. For the L1420, L1424 and L1425 use a 866 mmfd. condenser, for the P1421, P1426 and P1439 use a 230 mmfd. condenser.



MODELS F1440 AND F1442

OPERATION	SIGNAL GENERATOR		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
	FREQUENCY	CONNECTION			
1	260 K. C.	To Grid of 78 Tube—I.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection	1-2
2	260 K. C.	To Grid of 6A7 Tube	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection	3-4 1-2
3	1500 K. C.	To Grid of 78 Tube—R.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection Note 1	7-6
4	580 K. C.	To Grid of 78 Tube—R.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection Set Tuning Condensers at 580 K. C.	8 Note 2
5	1550 K. C.	To Grid of 78 Tube—R.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection Set Tuning Condensers at 1550 K. C.	7
6	1400 K. C.	Note 4	Note 4	Set Tuning Condensers at 1400 K. C.	6-5

Adjust for maximum reading on the output meter.

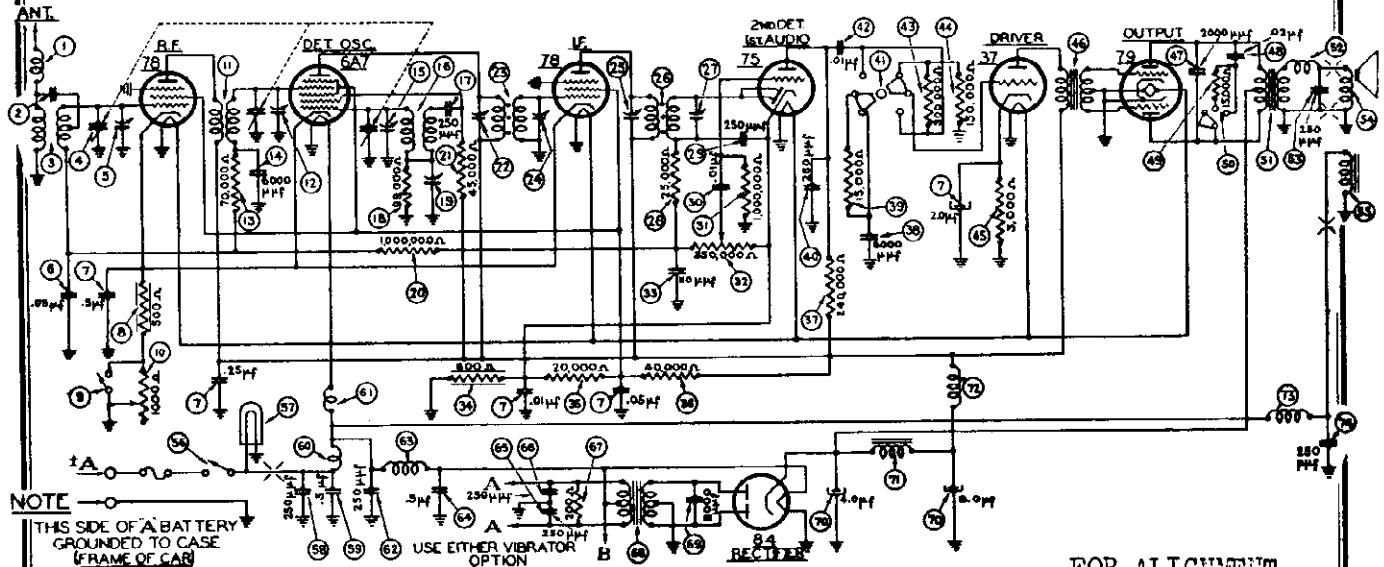
NOTE 1—Turn the condenser rotor plates completely out of mesh. Use a piece of bond letterhead paper as a gauge between the heel of the rotor plates and the stator plates and turn the condenser plates in mesh until they strike against the paper.

NOTE 2—Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then re-adjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 4—For the F1440 use the Ford Antenna transformer and lead assembly, connected in series to the signal generator with a 15 mmfd. condenser. For the F1442 use the standard antenna lead Part No. 41-3191 connected directly to the Antenna terminal of the signal generator.

MODEL P-1426 Packard
Schematic, Chassis
Changes, Parts

PHILCO RADIO & TELEV. CORP.



FOR ALIGNMENT
SEE INDEX

I.F. = 260 KC.

FOR ALIGNMENT
SEE INDEX

PARTS LIST

No.	Description	Part No.	Description	Part No.
1	Antenna Choke	38-8074	Tone Control Switch	42-1315
2	Condenser (80 mmfd.)	30-1066	Output Transformer	32-7778
3	Antenna Transformer	32-2230	Choke	32-2269
4	Tuning Condenser	31-1913	Condenser (250 mmfd.)	30-1032
5	First Padder (on Tun. Con.)	33-5129	Conc & Voice Coil	36-3159
6	Condenser (.05 mfd.)	30-4444	Field Coil Assembly	36-3513
7	Condenser (.01-.05-.25-.5-2 mfd.)	30-4498	Speaker Assembly (A-41)	36-1260
8	Resistor (500 ohms)	33-1068	On & Off Switch	42-5615
9	Sensitivity Control Switch	42-1225	Pilot Lamp	34-2040
10	Sensitivity Control	33-5129	Condenser (250 mmfd.)	30-1032
11	R. F. Transformer	32-2231	Condenser (.5 mfd.)	30-4474
12	Second Padder (on Tun. Con.)	33-5134	"A" Choke	32-1374
13	Resistor (70,000 ohms)	33-370344	Filament Choke	32-1561
14	Condenser (6000 mmfd.)	30-4445	Condenser (250 mmfd.)	30-1032
15	Third Padder (on Tun. Con.)	33-5134	Vibrator Choke	32-2249
16	Oscillator Transformer	32-2232	Condenser (.5 mfd.)	30-4474
17	Condenser (250 mmfd.)	30-1032	Condenser (250 mmfd.)	30-1032
18	Resistor (99,000 ohms)	33-39344	Condenser (250 mmfd.)	30-1032
19	Low Frequency Padder	31-8056	Resistor (200 ohms)	33-120344
20	Resistor (1,000,000 ohms)	33-510344	Power Transformer	32-7720
21	Resistor (45,000 ohms)	33-345344	Condenser (8000 mmfd.)	30-4420
22	Padder (Pri. 1st I.F. Trans.)	33-510344	Filter Condenser (4-8 mfd.)	30-2167
23	First I. F. Transformer	32-2286	Filter Choke	32-7811
24	Padder (Sec. 1st I.F. Trans.)	33-510344	"B" Choke	32-1374
25	Padder (Pri. 2nd I.F. Trans.)	33-510344	Choke	32-2286
26	Second I. F. Transformer	32-2167	Condenser (250 mmfd.)	30-1032
27	Padder (Sec. 2nd I.F. Trans.)	33-510344	Vibrator (OPTIONAL)	41-3170-2
28	Resistor (25,000 ohms)	33-325344	Four Prong Socket	27-6044
29	Condenser (250 mmfd.)	30-1032	Five Prong Socket	27-6035
30	Condenser (.01 mfd.)	30-4479	Six Prong Socket	27-6036
31	Resistor (1,000,000 ohms)	33-510344	Seven Prong Socket	27-6037
32	Volume Control (350,000 ohms)	38-8596	Speaker Socket	27-6030
33	Condenser (110 mmfd.)	30-1031	Receiver Housing	38-1830
34	Resistor (800 ohms)	33-1212	Inductive Suppressor	32-2250
35	Resistor (20,000 ohms)	33-320344	Interference Condenser (gen.)	30-4475
36	Resistor (40,000 ohms)	33-340344	Interference Condenser (Dome Light)	30-4476
37	Resistor (240,000 ohms)	33-424344	Interference Condenser	30-4477
38	Condenser (6000 mmfd.)	30-4445	Fuse	7227
39	Condenser (15,000 ohms)	33-315344	Fuse Insulator	27-7729
40	Condenser (250 mmfd.)	30-1032	Stud	28-6231
41	Base Compensation Switch	42-1316	Nut	W-55
42	Condenser (.01 mfd.)	30-4145	Washer	4486
43	Resistor (300,000 ohms)	33-430344	Washer	6681
44	Resistor (150,000 ohms)	33-415344	Dial	27-5247
45	Resistor (3000 ohms)	33-230344	Tuning Shaft	28-8656
46	Input Transformer	32-7779	Volume Shaft	28-8657
47	Condenser (200 mmfd.)	30-4177	Pilot Lamp Assembly	38-8750
48	Condenser (.02 mfd.)	30-4419	Switch & Lead Assembly	41-3217
49	Resistor (15,000 ohms)	33-315344		

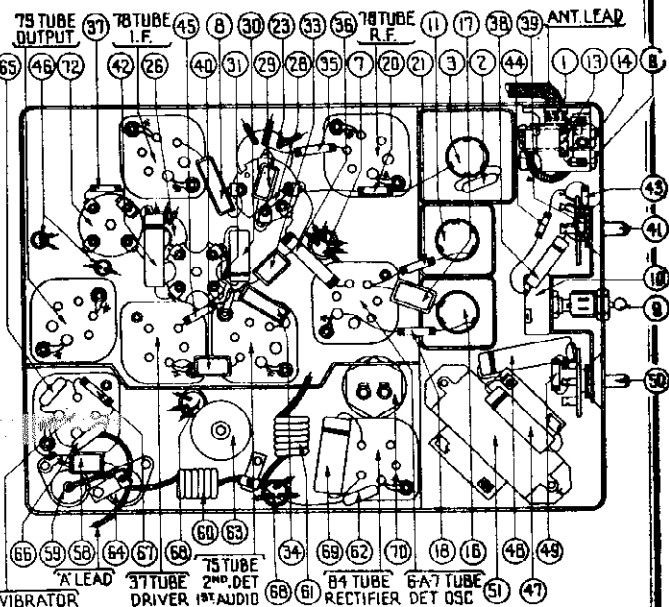


FIGURE 138

CHANGES — "Run Numbers" are stamped on the chassis sub-base for identification. These "Run Numbers" are changed consecutively as major changes are made in the Receiver wiring and parts.

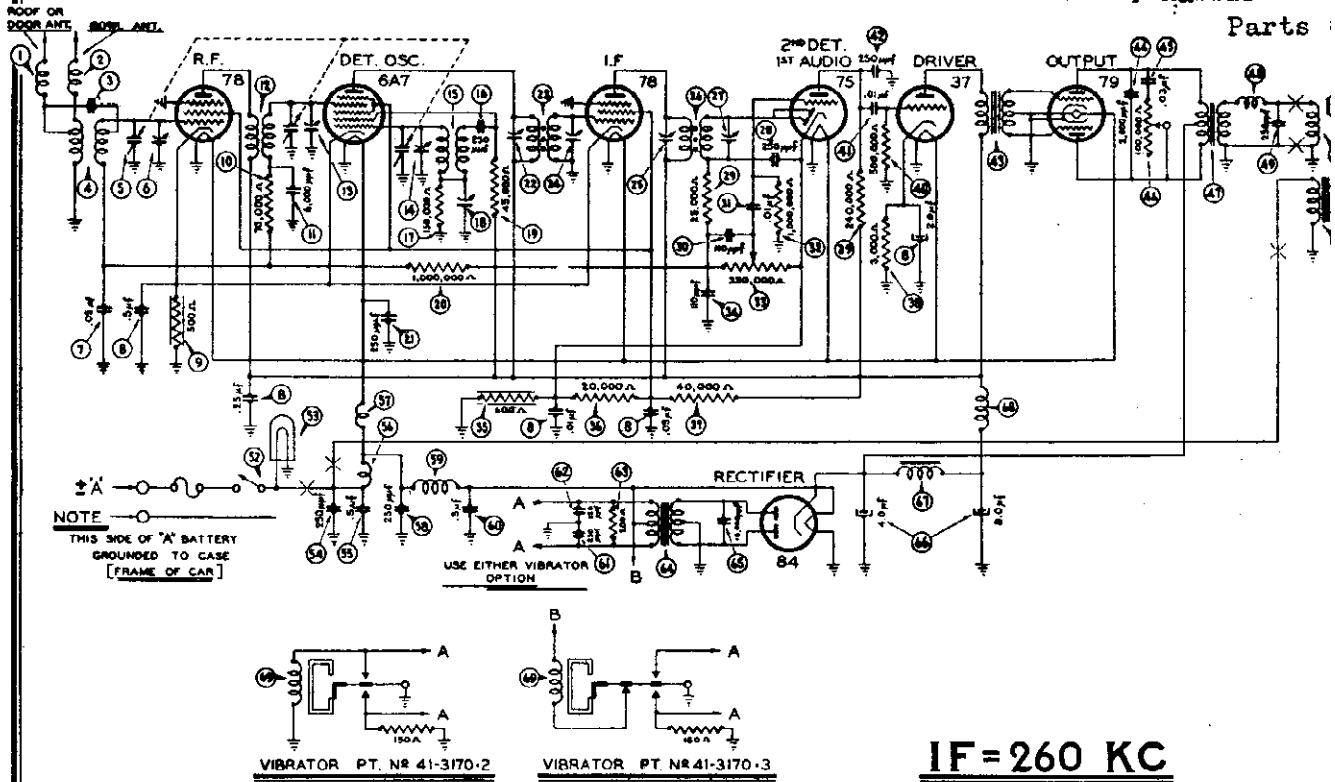
RUN No. 2 — Condenser 2 removed (110 mmfd.) — Part No. 30-1066 added (80 mmfd.).

The Model P-1426 is a Special Custom-Built Receiver used exclusively by the Packard Motor Company in the 1937 Packard cars.

PHILCO RADIO & TELEV. CORP.

Schematic, Chassis

Parts



IF=260 KC

PARTS LIST

No.	Description	Part No.	Description	Part No.
1	Antenna Choke	38-8106	Output Transformer (L-1429)	32-7788
2	Antenna Choke	38-8106	Choke	32-1432
3	Condenser (50 mmfd.)	30-1029	Condenser (250 mmfd.)	30-1032
4	Antenna Transformer	32-2517	Cone & Voice Coil	38-3159
5	Tuning Condenser	31-1984	Field Coil Assembly	38-3513
6	First Padder (on Tun. Cond.)	30-4444	Speaker Assembly (A-44)	36-1326
7	Condenser (.05 mfd.)	30-4444	On & Off Switch	42-5617
8	Condenser (.01-.05-.25-.5-2 mfd.)	30-4493	Pilot Lamp	34-2040
9	Resistor (500 ohms)	33-1213	Condenser (250 mmfd.)	30-1032
10	Resistor (70,000 ohms)	33-370344	Condenser (.5 mfd.)	30-4474
11	Condenser (6000 mmfd.)	30-4445	"A" Choke	32-1374
12	R. F. Transformer	32-2231	Filament Choke	32-1604
13	Second Padder (on Tun. Cond.)	30-4493	Condenser (250 mmfd.)	30-1032
14	Third Padder (on Tun. Cond.)	30-4493	Vibrator Choke	32-2537
15	Oscillator Transformer	32-2232	Condenser (.5 mfd.)	30-4474
16	Condenser (250 mmfd.)	30-1032	Condenser (250 mmfd.)	30-1032
17	Resistor (150,000 ohms)	33-415344	Condenser (250 mmfd.)	30-1032
18	Low Frequency Padder	31-6056	Power Transformer	32-7720
19	Resistor (45,000 ohms)	33-345344	Condenser (8000 mmfd.)	30-4420
20	Resistor (1,000,000 ohms)	33-510344	Filter Condenser (4-8 mfd.)	30-2167
21	Condenser (250 mmfd.)	30-1032	Filter Choke	33-7722
22	Padder (Pri. 1st I.F. Trans.)	32-2286	"B" Choke	32-1281
23	First I. F. Transformer	32-2286	Vibrator (OPTIONAL)	41-3170-2
24	Padder (Sec. 1st I.F. Trans.)	30-4493		41-3170-3
25	Padder (Pri. 2nd I.F. Trans.)	30-4493	Four Prong Socket	27-6044
26	Second I. F. Transformer	32-2167	Five Prong Socket	27-6035
27	Padder (Sec. 2nd I.F. Trans.)	30-4493	Six Prong Socket	27-6036
28	Condenser (250 mmfd.)	30-1032	Seven Prong Socket	27-6037
29	Resistor (25,000 ohms)	33-325344	Fuse	7227
30	Condenser (.110 mmfd.)	30-1031	Fuse Insulator	27-7729
31	Condenser (.01 mfd.)	30-4479	Water Gauge Condenser	30-4007
32	Resistor (1,000,000 ohms)	33-510344	Generator Condenser	30-4181
33	Volume Control (350,000 ohms)	33-5202	Oil Gauge Condenser	30-4307
34	Condenser (.110 mmfd.)	30-1031	Gas Gauge Condenser	30-4663
35	Resistor (600 ohms)	33-1212	Distributor Condenser	30-4404
36	Resistor (20,000 ohms)	33-320344	Plate (Rec. Mtg.)	28-3734
37	Resistor (40,000 ohms)	33-340444	Screw (Rec. Mtg.)	W-1814
38	Resistor (3000 ohms)	33-230344	Speaker Cable	41-3260
39	Resistor (240,000 ohms)	33-424344	Adapter Plate	42-5691
40	Resistor (500,000 ohms)	33-449344	Wrench	28-4386
41	Condenser (.01 mfd.)	30-4145	Tuning Shaft	28-8704
42	Condenser (250 mmfd.)	30-1032	Volume Shaft	28-8700
43	Input Transformer	32-7779	Tone Control Shaft	28-8701
44	Condenser (2000 mmfd.)	30-4177	Scale Assembly	42-5666
45	Condenser (.03 mfd.)	30-4447	Pilot Lamp Assembly	33-7734
46	Tone Control (100,000 ohms)	33-5141	Tuning & Volume Knob	27-4426
47	Output Transformer (L-1427)	32-7778	Tone Control Knob	27-4427
48			Receiver Housing	38-8565

FOR ALIGNMENT
SEE INDEX

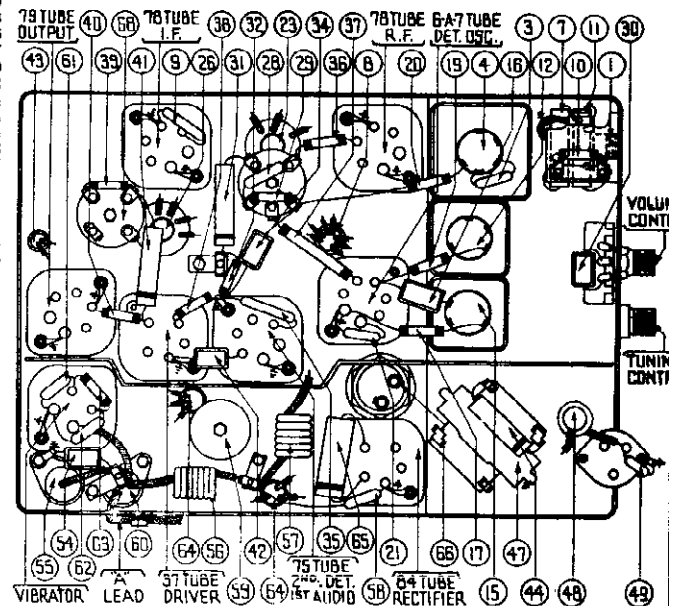


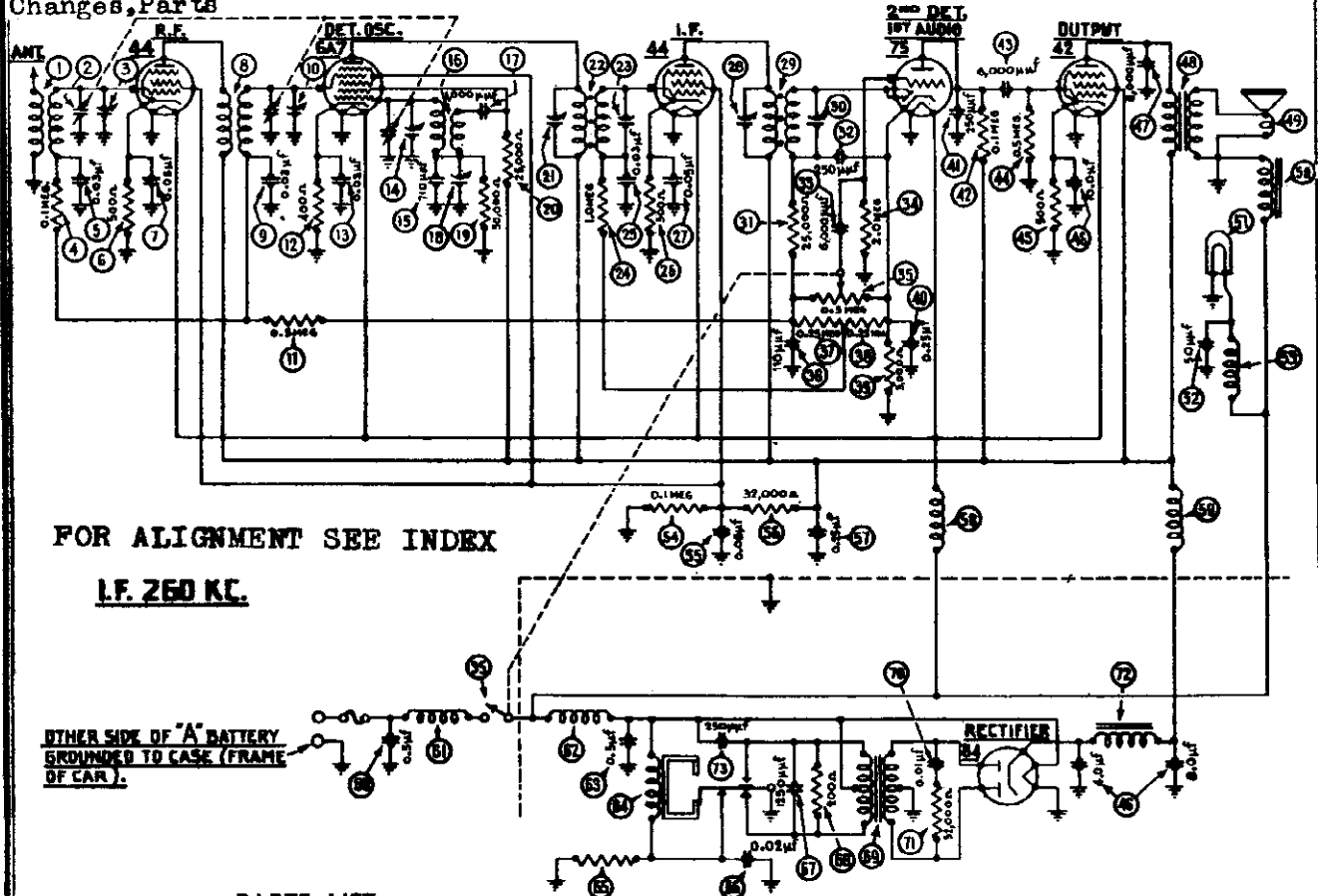
FIGURE 140

The circuit for the Model L-1429 is the same as for the L-1427.

The Models L-1427 and L-1429 are Special Custom-Built Receivers used exclusively by the Lincoln Motor Company in their 1937 cars.

MODELS DP, DPV Police
Schematic, Chassis
Changes, Parts

PHILCO RADIO & TELEV. CORP.



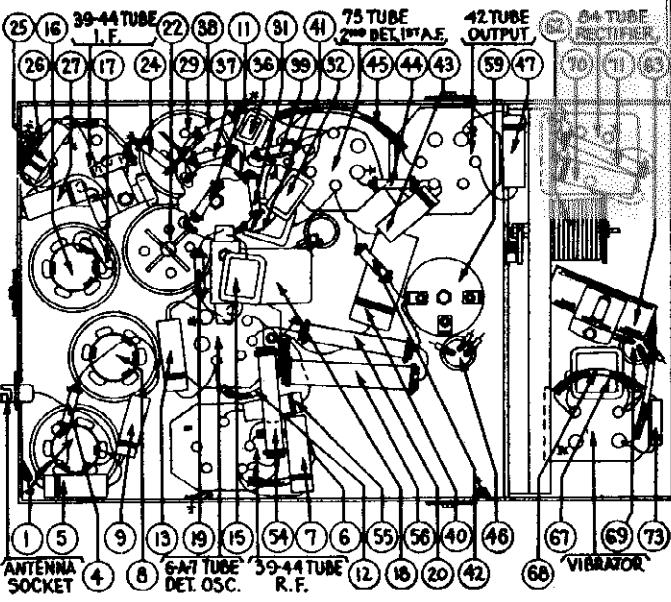
FOR ALIGNMENT SEE INDEX

L.F. 250 KC.

OTHER SIDE OF "A" BATTERY
SPROUNDED TO CASE (FRAME
OF CAR).

PARTS LIST

No.	Description	Part No.	Description	Part No.
1	Antenna Transformer	32-1445	Condenser (.25 mfd.)	30-4146
2	Tuning Condenser	31-1321	Condenser (250 mmfd.)	5858
3	First Padder (on Tun. Cond.)		Resistor (100,000 ohms)	6099
4	Resistor (100,000 ohms)	6099	Condenser (6,000 mmfd.)	30-4125
5	Condenser (.03 mfd.)	30-4025	Resistor (500,000 ohms)	6097
6	Resistor (500 ohms)	33-3031	Resistor (500 ohms)	33-3031
7	Condenser (.05 mfd.)	30-4020	Condenser (4-8-10 mfd.)	30-2072
8	R. F. Transformer	32-1446	Condenser (6,000 mmfd.)	30-4024
9	Condenser (.03 mfd.)	30-4025	Output Transformer	32-7214
10	Second Padder (on Tun. Cond.)		Coe & Voice Coil	02861
11	Resistor (500,000 ohms)	6097	Field Coil Assembly	36-3097
12	Resistor (400 ohms)	33-3016	Pilot Lamp	34-2031
13	Condenser (.03 mfd.)	30-4025	Condenser (50 mmfd.)	30-1029
14	Third Padder (on Tun. Cond.)		Choke	32-1438
15	Condenser (710 mmfd.)	5863	Resistor (100,000 ohms)	4411
16	Oscillator Transformer	32-1447	Condenser (.05 mfd.)	30-4020
17	Condenser (1,000 mmfd.)	30-1007	Resistor (32,000 ohms)	33-1026
18	Padder	04000R	Condenser (.25 mfd.)	04360
19	Resistor (50,000 ohms)	6098	Choke	32-1402
20	Resistor (25,000 ohms)	3656	R. F. Choke	32-1281
21	Padder (Pri. 1st. I. F. Trans.)		Condenser (.5 mfd.)	30-4147
22	First I. F. Transformer	32-1448	"A" Choke	32-1374
23	Padder (Sec. 1st. I. F. Trans.)		Vibrator Choke	32-1282
24	Resistor (1,000,000 ohms)	33-1096	Condenser (.5 mfd.)	30-4015
25	Condenser (.03 mfd.)	30-4025	Vibrator	41-3186
26	Resistor (500 ohms)	33-3031	Resistor (300 ohms)	33-3010
27	Condenser (.05 mfd.)	30-4020	Condenser (.02 mfd.)	30-4039
28	Padder (Pri. 2nd I. F. Trans.)		Condenser (1.250 mmfd.)	5886
29	Second I. F. Transformer	32-1449	Resistor (200 ohms)	7217
30	Padder (Sec. 2nd I. F. Trans.)		Power Transformer	32-7218
31	Resistor (25,000 ohms)	33-1013	Condenser (.01 mfd.)	30-4051
32	Condenser (250 mmfd.)	5858	Resistor (32,000 ohms)	7836
33	Condenser (6,000 mmfd.)	30-4125	"B" Filter Choke	32-7215
34	Resistor (2,000,000 ohms)	33-1025	Condenser (250 mmfd.)	5858
35	Vol. Con. & Switch Assm.	38-5534	Glass (variable frequency)	27-7325
36	Condenser (110 mmfd.)	30-1031	Flexible Shafts	28-8206
37	Resistor (250,000 ohms)	33-1097	Knobs	27-4058
38	Resistor (250,000 ohms)	33-1097	Glass (red) fixed frequency	27-7710
39	Resistor (5,000 ohms)	6096	Pointer	28-1957



CHANGES — "Run numbers" are stamped on the chassis sub-base for identification. These "Run numbers" are changed consecutively as major changes are made in the Receiver wiring and parts.

RUN No. 2 — Condenser 47 removed (6000 mmfd.) — Part No. 30-4145 added (.01 mfd.)
Condenser 80 removed (.5 mfd.) — Part No. 30-4306 added (.5 mfd.)

ADJUSTMENT — The correct padding procedure for the Models DP and DPV is given

PHILCO RADIO & TELEV. CORP. MODELS DP, DPV
 MODELS P1430, S1431, P1432
 N1433, N1434, G1436
 S1437

Socket, Trimmers, Alignment

MODELS DP and DPV POLICE RADIO

OPERATION	SIGNAL GENERATOR		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
	FREQUENCY	CONNECTION			
1	260 K. C.	To Grid of Detector Oscillator Tube	.1 Mfd. Condenser in Series with Generator Lead	Note 3	1-2 3-4
2	3500 K. C.	Note 4	150 Mmfd. Condenser Note 4	Note 1	7-6-5 8
3	1600 K. C.	Note 4	150 Mmfd. Condenser Note 4	Set Tuning Condenser at 1.6 K. C.	Note 2

Adjust for maximum reading on the output meter.

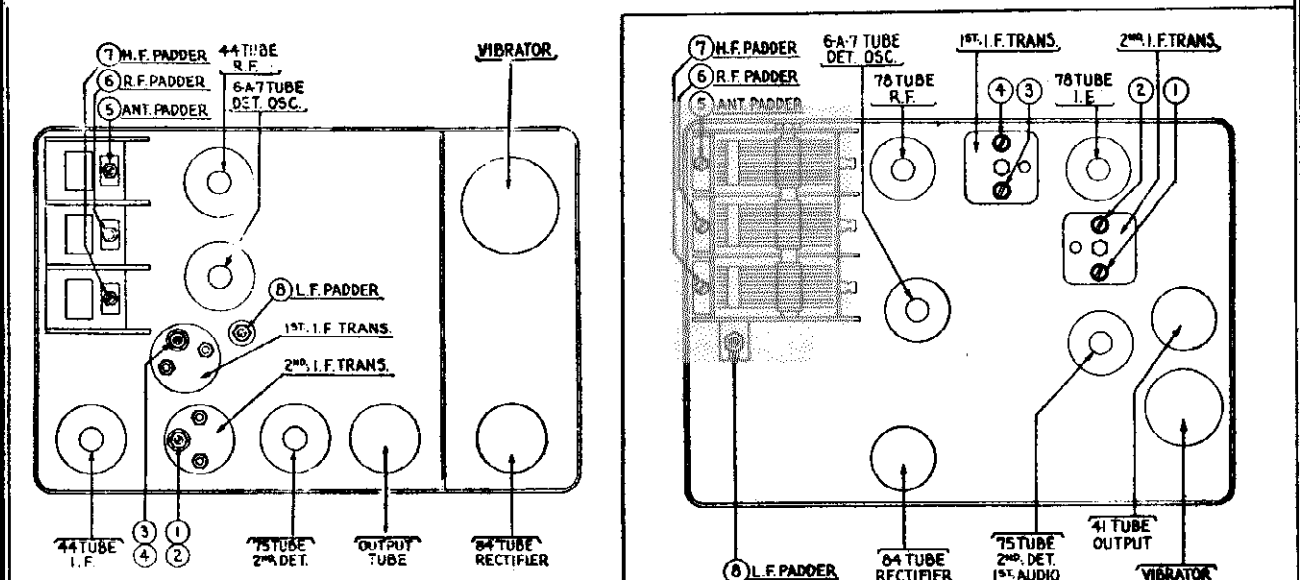
NOTE—When using the Model DPV as a fixed frequency Receiver, use the procedure given above first and then lock the tuning condenser at the desired frequency. If possible, the R.F. and Antenna padders should be adjusted while using the signal from the police transmitter.

NOTE 1—Turn the condenser rotor plates completely out of mesh. Use a piece of bond letterhead paper as a gauge between the heel of the rotor plates and the stator plates and turn the condenser plates in mesh until they strike against the paper.

NOTE 2—Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then re-adjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 3—Turn the adjusting screw all the way in, then adjust the nut for maximum reading on the output meter. Next adjust the screw for maximum reading on the output meter. This adjustment is critical. Note the maximum reading obtained, turn the screw in again, and readjust, bringing the adjustment up to the maximum reading. Do not pass it and back off.

NOTE 4—Connect the antenna lead, Part No. 41-3191, to the antenna receptacle on the Receiver in series with a 150 mmfd. condenser



MODELS P1430, S1431, P1432, N1433, N1434, G1436, AND S1437

OPERATION	SIGNAL GENERATOR		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
	FREQUENCY	CONNECTION			
1	260 K. C.	To Grid of 78 Tube—I.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection	1-2
2	260 K. C.	To Grid of 6A7 Tube	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection	3-4 1-2
3	1500 K. C.	To Grid of 78 Tube—R.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection Note 1	7-6 8
4	580 K. C.	To Grid of 78 Tube—R.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection Set Tuning Condensers at 580 K. C.	Note 2
5	1550 K. C.	To Grid of 78 Tube—R.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection Set Tuning Condensers at 1550 K. C.	7
6	1400 K. C.	Note 4	Note 4	Set Tuning Condensers at 1400 K. C.	8-5

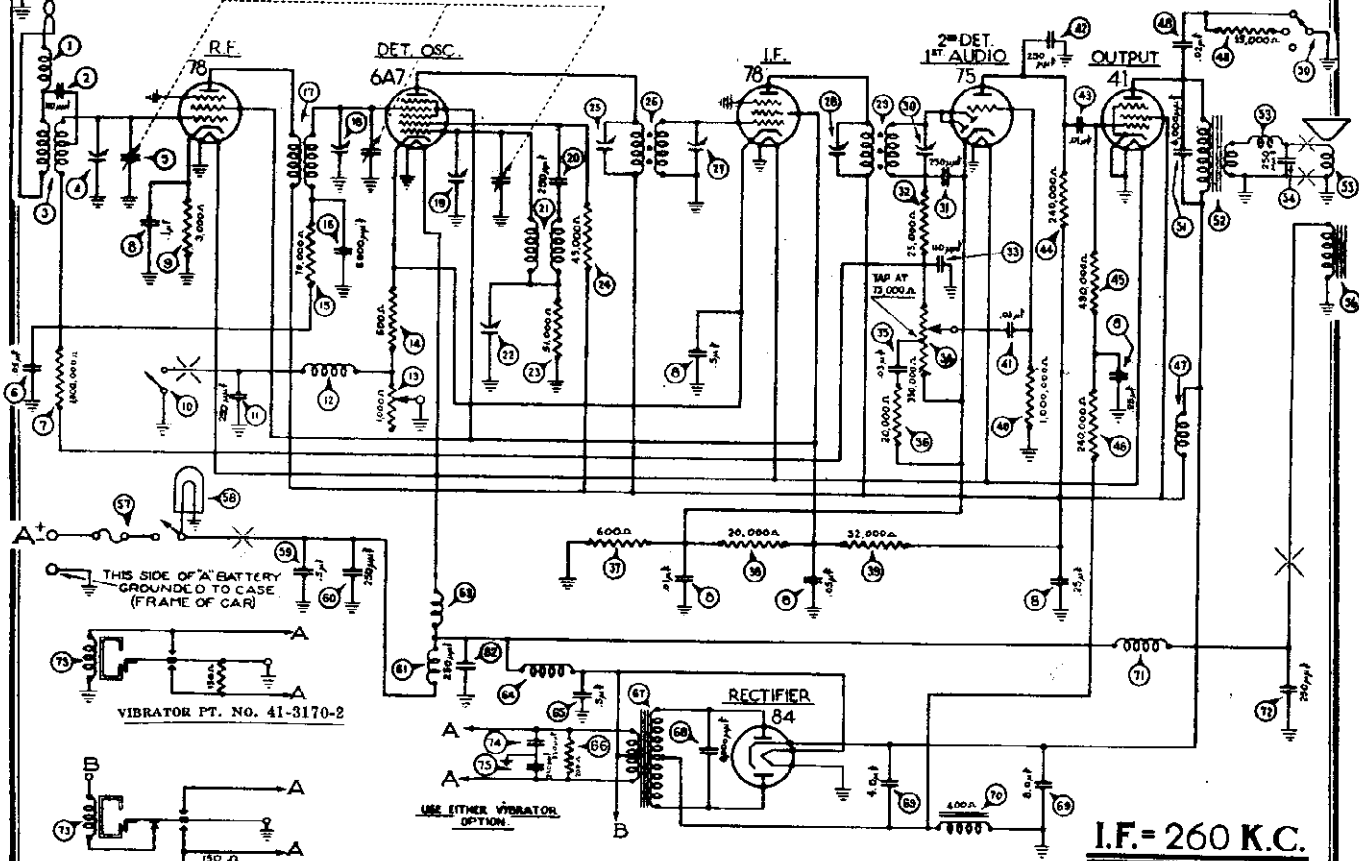
Adjust for maximum reading on the output meter.

NOTE 1—Turn the condenser rotor plates completely out of mesh. Use a piece of bond letterhead paper as a gauge between the heel of the rotor plates and the stator plates and turn the condenser plates in mesh until they strike against the paper.

NOTE 2—Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then re-adjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 4—Connect the Antenna lead Part No. 41-3191 to the Antenna receptacle on the Receiver in series with the correct dummy capacity. For the P1430 and P1432 use a 230 mmfd. condenser, for the S1431 use a 25 mmfd. condenser (connect lead to the Roof Antenna connector), for the N1433 use a 50 mmfd. condenser (connect lead to the Roof Antenna connector), for the N1434 and S1437 use the standard antenna lead connected directly to the output terminal on the signal generator, for the G1436 use a 1690 mmfd. condenser.

MODEL P-1430 Packard
Schematic, Chassis PHILCO RADIO & TELEV. CORP.
Parts



I.F. = 260 K.C.

FOR ALIGNMENT SEE INDEX

OCTOBER 1, 1936

MODEL P-1430 PARTS LIST

No.	Description	Part No.	Description	Part No.
1	Antenna Choke	32-1372	Condenser (.01 mfd.)	30-4145
2	Condenser (110 mmfd.)	30-1031	Resistor (240,000 ohms)	33-424344
3	Antenna Transformer	32-2230	Resistor (490,000 ohms)	33-449844
4	First Padder (on tun. cond.)	32-2063	Resistor (240,000 ohms)	33-424344
5	Tuning Condenser	31-1912	"B" Choke	32-1261
6	Condenser (.05 mfd.)	30-4444	Condenser (.02 mfd.)	30-4419
7	Resistor (1,000,000 ohms)	33-510344	Resistor (15,000 ohms)	33-315344
8	Condenser (.01-.05-1-25-25-.5 mfd.)	30-4478	Tune Control Switch	42-1139
9	Resistor (3,000 ohms)	33-230344	Condenser (4000 mmfd.)	30-4185
10	Sensitivity Switch	42-5603	Output Transformer	32-7721
11	Condenser (250 mmfd.)	30-1032	Choke	32-1374
12	Choke	32-2063	Condenser (250 mmfd.)	30-1032
13	Sensitivity Control	33-5129	Cone & Voice Coil	36-3159
14	Resistor (600 ohms)	33-1212	Field Coil Assembly	36-3513
15	Resistor (70,000 ohms)	33-370344	On & Off Switch	42-5606
16	Condenser (6,000 mmfd.)	30-4445	Pilot Lamp	34-2039
17	R. F. Transformer	32-2231	Condenser (.5 mfd.)	30-4474
18	Second Padder (on tun. cond.)	32-2063	Condenser (250 mmfd.)	30-1032
19	Third Padder (on tun. cond.)	32-2063	"A" Choke	32-1374
20	Condenser (250 mmfd.)	30-1032	Condenser (250 mmfd.)	30-1032
21	Oscillator Transformer	32-2232	Filament Choke	32-1561
22	Low Frequency Fadder	31-6056	Vibrator Choke	32-2249
23	Resistor (51,000 ohms)	33-351344	Condenser (.5 mfd.)	30-4474
24	Resistor (45,000 ohms)	33-345344	Resistor (200 ohms)	33-120344
25	Padder (Pri. 1st I. F. Trans.)	32-2286	Power Transformer	32-7720
26	Padder (Sec. 1st I. F. Trans.)	32-2286	Condenser (8000 mmfd.)	30-4420
27	Padder (Pri. 2nd I. F. Trans.)	32-2167	Filter Condenser (4-8 mfd.)	30-2168
28	Second I. F. Transformer	32-2167	Filter Choke	32-7722
29	Padder (Sec. 2nd I. F. Trans.)	32-2167	Choke	32-2249
30	Condenser (250 mmfd.)	30-1032	Condenser (250 mmfd.)	30-1032
31	Resistor (25,000 ohms)	33-325344	Vibrator (Optional)	41-3170-2
32	Condenser (110 mmfd.)	30-1031	Condenser (250 mmfd.)	30-1032
33	Volume Control	33-5121	Condenser (250 mmfd.)	30-1032
34	Condenser (350,000 ohms)	33-5121	Four Prong Socket	27-6041
35	Resistor (.03 mfd.)	30-4449	Five Prong Socket	27-6035
36	Resistor (20,000 ohms)	33-320344	Six Prong Socket	27-6036
37	Resistor (600 ohms)	33-1212	Seven Prong Socket	27-6037
38	Resistor (20,000 ohms)	33-320344	Tuning & Volume Shaft	28-8662
39	Resistor (32,000 ohms)	33-332444	Sensitivity Shaft	28-8652
40	Resistor (1,000,000 ohms)	33-510344	Scale Assembly	42-5598
41	Condenser (.01 mfd.)	30-4479	Sensitivity Switch Knob	28-7203
42	Condenser (250 mmfd.)	30-1032	Tuning & Volume Knob	27-4313
43	Condenser (250 mmfd.)	30-1032	Knob Base	28-4184

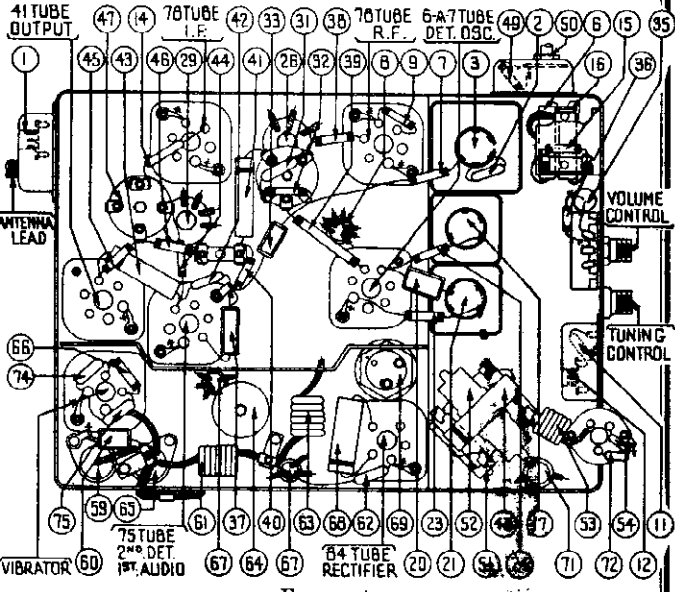
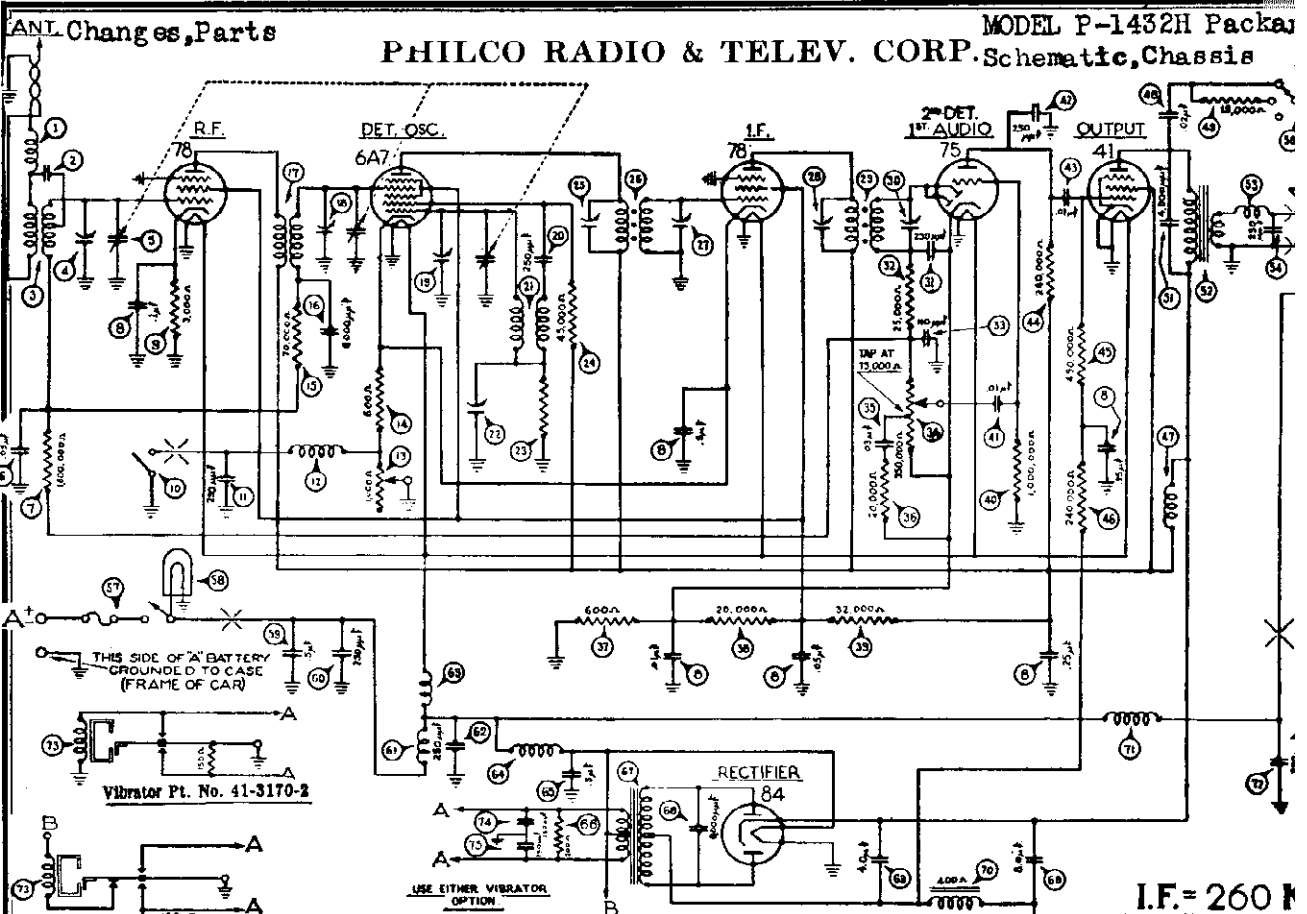


FIGURE 4

Description	Part No.	Description	Part No.
Distributor Resistor	4851	Stud (Speaker Mtg.)	28-6088
Interference Condenser	4522	Nut (Speaker mtg.)	W-55A
Interference Condenser	30-4007	Ground Strap	38-6606
Fuse	7227	Antenna Loom	38-8080
Fuse Insulator	27-7729	Ground Clamp	41-3194
Tea Bolt (Rec. mtg.)	28-8268	Receiver Housing	38-1707
Nut (Rec. mtg.)	W-518A		

The items marked with an asterisk are rarely required for service and in many cases will not be carried in stock by the local service station. In such cases it will be necessary to order these parts from Philco Transitone, Philadelphia or Chicago.



FOR ALIGNMENT PARTS LIST SEE INDEX

No.	Description	Part No.	Description	Part No.
1	Antenna Choke	32-2063	Condenser (.01 mfd.)	30-4478
2	Condenser (80 mmfd.)	30-1066	Resistor (240,000 ohms)	33-424344
3	Antenna Transformer	32-2236	Resistor (400,000 ohms)	33-449344
4	First Padder (on tun. cond.)		Resistor (240,000 ohms)	33-424344
5	Tuning Condenser	31-1312	"B" Choke	32-1281
6	Condenser (.05 mfd.)	30-4444	Condenser (.02 mfd.)	30-4405
7	Resistor (1,000,000 ohms)	33-510344	Resistor (15,000 ohms)	33-315344
8	Condenser (1.01 .05-1-25-25-.5 mfd.)	30-4478	Tone Control Switch	42-1139
9	Resistor (3,000 ohms)	33-230344	Condenser (4000 mmfd.)	30-4185
10	Sensitivity Switch	42-5608	Output Transformer	32-7495
11	Condenser (250 mmfd.)	30-1032	Choke	32-1374
12	Choke	32-2063	Condenser (250 mmfd.)	30-1032
13	Sensitivity Control	33-5129	Cone and Voice Coil	38-3526
14	Resistor (600 ohms)	33-1212	Field coil assembly	32-9236
15	Resistor (70,000 ohms)	33-370344	On & Off Switch	42-5606
16	Condenser (6,000 mmfd.)	30-4445	Pilot Lamp	34-2039
17	R. F. Transformer	32-2231	Condenser (.5 mfd.)	30-4474
18	Second Padder (on tun. cond.)		Condenser (250 mmfd.)	30-1032
19	Third Padder (on tun. cond.)		Filament Choke	32-1438
20	Condenser (250 mmfd.)	30-1032	Vibrator Choke	32-2537
21	Oscillator Transformer	32-2232	Condenser (.5 mfd.)	30-4474
22	Low Frequency Padder	31-6056	Resistor (200 ohms)	33-120344
23	Resistor (99,000 ohms)	33-399344	Power Transformer	32-7720
24	Resistor (45,000 ohms)	33-345344	Condenser (8000 mmfd.)	30-4420
25	Padder (Pri. 1st I.F. Trans.)		Filter Condenser (4-8 mfd.)	30-2170
26	First I. F. Transformer	32-2286	Filter Choke	32-7722
27	Padder (Sec. 1st I. F. Trans.)		Choke	32-2269
28	Second I. F. Transformer	32-2167	Condenser (250 mmfd.)	30-1032
29	Padder (Sec. 2nd I. F. Trans.)		Vibrator (Optional)	41-3170-2
30	Condenser (250 mmfd.)	30-1032	Condenser (250 mmfd.)	30-1032
31	Resistor (25,000 ohms)	33-325344	Condenser (250 mmfd.)	30-1032
32	Condenser (110 mmfd.)	30-1031	Tuning & Volume Shaft	28-8662
33	Volume Control (350,000 ohms)	33-5121	Sensitivity Shaft	28-6502
34	Condenser (.03 mfd.)	30-4449	Scale Assembly	42-5596
35	Resistor (20,000 ohms)	33-320344	Sensitivity Switch Knob	28-7203
36	Resistor (600 ohms)	33-1212	Tuning & Volume Knob	27-4313
37	Resistor (20,000 ohms)	33-220344	Knob Base	28-4184
38	Resistor (32,000 ohms)	33-332444	Antenna Loom Assembly	38-8030
39	Resistor (1,000,000 ohms)	33-510344	Tee Bolt (Rec. mtg.)	28-6268
40	Condenser (.01 mfd.)	30-4470	Switch and Lead Assembly	41-8217
41	Condenser (250 mmfd.)	30-1032	Speaker Cable	41-3235

CHANGES — "Run Numbers" are stamped on the chassis sub-base for identification. These "Run Numbers" are changed consecutively as major changes are made in the Receiver wiring and parts.

RUN No. 2 — Condenser ⑩ removed (.01 mfd.) — Part No. 30-4479 added (.01 mfd.).

RUN No. 3 — Remove Choke ⑨. Add Choke 32-1438. One side is connected to the filament of the type 41 Tube Socket. The other side connected to Choke ⑨.

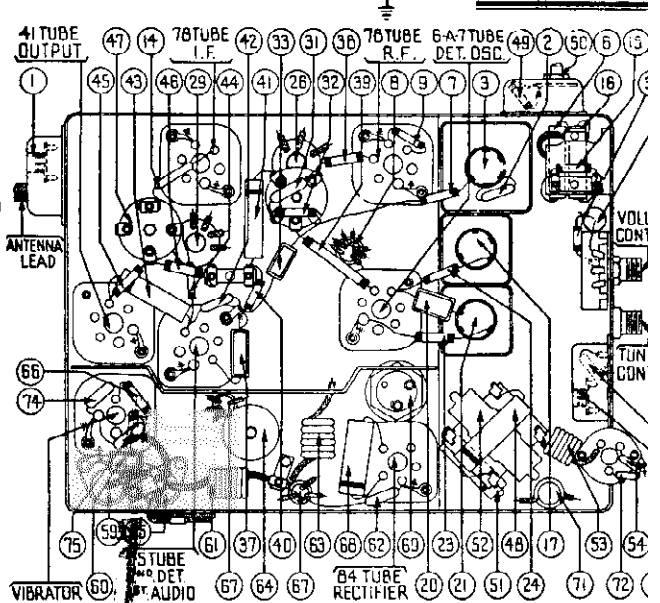


FIGURE 146

Connect a 250 mmfd. condenser Part No. 30-1032 across the filament of type 6A7 Tube Socket.

Connect one side of a 250 mmfd. condenser Part No. 30-1032 between 8 mfd. section of Condenser ⑩ and the "B" Choke ⑨ and the other to ground.

RUN No. 5 — Resistor ⑧ removed (51,000 ohms) Part No. 33-399344 a (99,000 ohms).

RUN No. 6 — A 10,000 ohms resistor Part No. 33-310344 has been added to the Receiver. This is connected in series between the B+ side Choke ⑦ and the 8 mfd. section of Condenser ⑩.

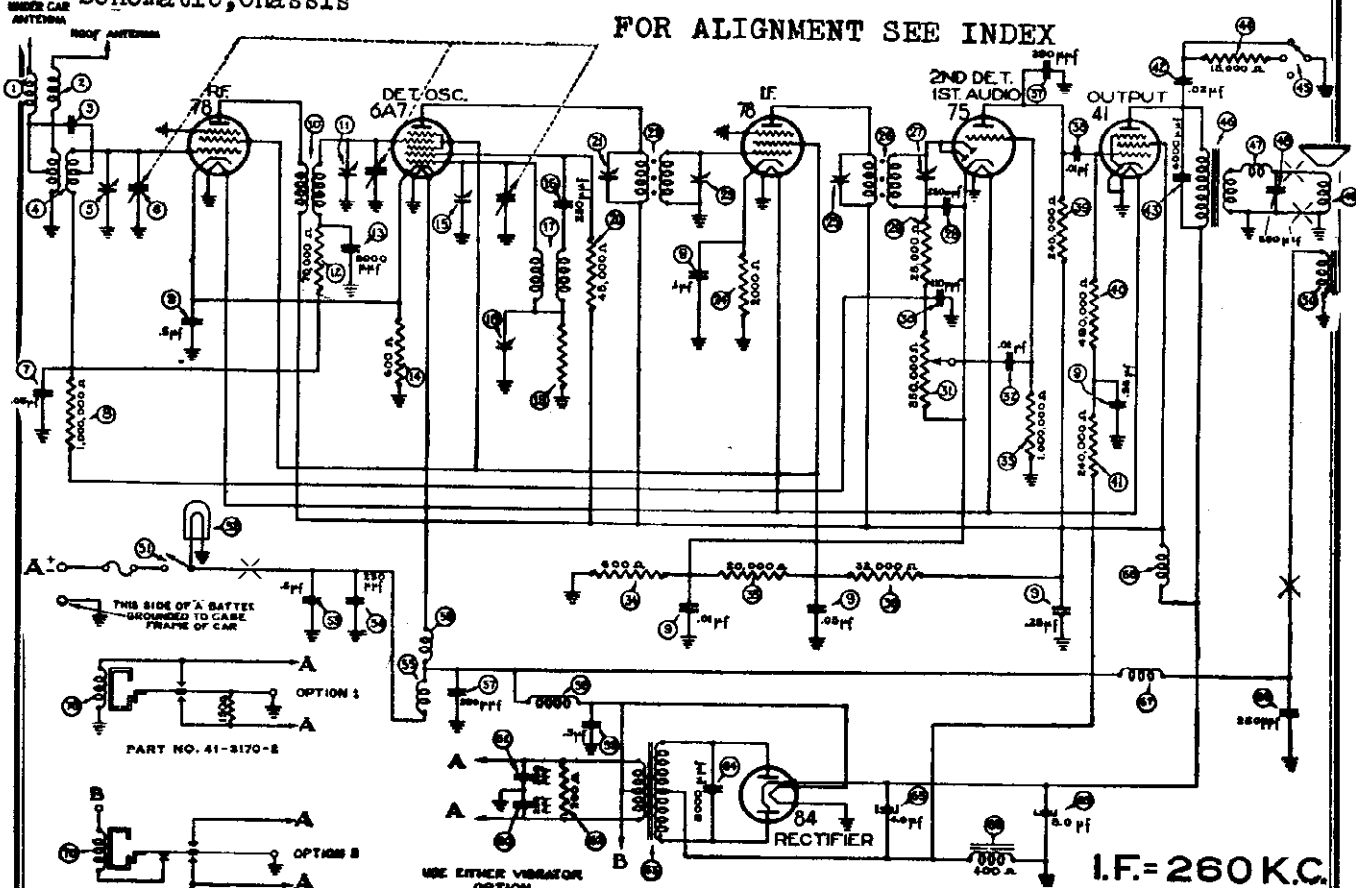
RUN No. 7 — Condenser ② removed (110 mmfd.) Part No. 30-1066 a (80 mmfd.).

MODEL N-1433H Nash
Schematic, Chassis

PHILCO RADIO & TELEV. CORP.

Changes, Parts

FOR ALIGNMENT SEE INDEX



PARTS LIST

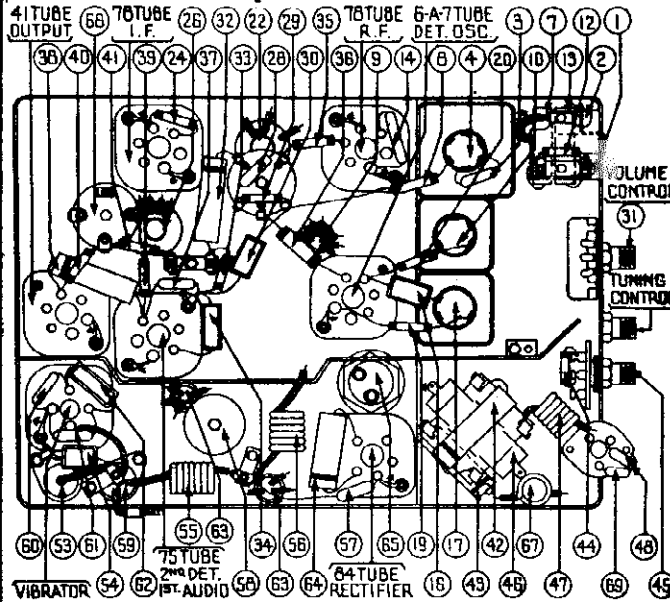


FIGURE 148

No.	Description	Part No.	Description	Part No.
1	Antenna choke	38-8108	Resistor (240,000 ohms)	33-424844
2	Antenna Choke	38-8108	Condenser (.02 mfd.)	30-4419
3	Condenser (70 mmfd.)	30-1068	Condenser (4,000 mmfd.)	30-4185
4	Antenna Transformer	32-2281	Resistor (15,000 ohms)	33-315344
5	First Padder (on tun. cond.)		Tone Control Switch	42-1273
6	Tuning Condenser	31-1912	Output Transformer	32-7495
7	Condenser (.05 mfd.)	30-4444	Choke	32-1374
8	Resistor (1,000,000 ohms)	33-510344	Condenser (250 mmfd.)	30-1032
9	Condenser (.01-.05-.1-.25-.25-.5 mfd.)	30-4478	Cone and Voice Coil	38-3526
10	R. F. Transformer	32-2231	Field Coil Assembly	32-9236
11	Second padder (on tun. cond.)		On and Off Switch Assembly	42-5617
12	Resistor (70,000 ohms)	33-370344	Pilot Lamp	34-2039
13	Condenser (6,000 mmfd.)	30-4445	Condenser (.5 mfd.)	30-4474
14	Resistor (800 ohms)	33-1212	Coarse Resistor (250 mmfd.)	30-1052
15	Third Padder (on tun. cond.)		"A" Choke	32-1374
16	Condenser (250 mmfd.)	30-1032	Filament Choke	32-1561
17	Oscillator Transformer	32-2232	Condenser (250 mmfd.)	30-1032
18	Low Frequency Padder	31-6056	Vibrator Choke	32-2249
19	Resistor (51,000 ohms)	33-351344	Condenser (.5 mfd.)	30-4474
20	Resistor (45,000 ohms)	33-345344	Coarse Resistor (250 mmfd.)	30-1032
21	Padder (Pri. 1st I. F. Trans.)		Condenser (250 mmfd.)	30-1032
22	First I. F. Transformer	32-2286	Resistor (200 ohms)	33-120344
23	Padder (Sec. 1st I. F. Trans.)		Power Transformer	32-7720
24	Resistor (2,000 ohms)	32-220334	Condenser (8,000 mmfd.)	30-4420
25	Padder (Pri. 2nd I. F. Trans.)		Filter Condenser (4-8 mfd.)	30-2188
26	Second I. F. Transformer	32-2187	Filter Choke	32-7722
27	Padder (Sec. 2nd I. F. Trans.)		Choke	32-2369
28	Condenser (250 mmfd.)	30-1032	"B" Choke	32-1281
29	Resistor (25,000 ohms)	33-325344	Condenser (250 mmfd.)	30-1032
30	Condenser (110 mmfd.)	30-1031	Vibrator (Optional)	41-3170-2
31	Volume Control (350,000 ohms)	33-5139	Inductive Suppressor	32-2250
32	Condenser (.01 mfd.)	30-4124	Tee Bolt (Rec. mtg.)	28-6161
33	Resistor (1,000,000 ohms)	33-510344	Nut (Rec. mtg.)	W518A
34	Resistor (800 ohms)	33-1212	Speaker Cable	41-3247
35	Resistor (30,000 ohms)	33-320334	Tuning and Volume Knob	28-7214
36	Resistor (32,000 ohms)	33-332444	Tone Control Knob	28-7215
37	Condenser (250 mmfd.)	30-1032	Knob Base	28-4184
38	Condenser (.01 mfd.)	30-4145	Tuning & Volume Shaft	28-8895
39	Resistor (240,000 ohms)	33-424344	Tone Control Shaft	28-8896
40	Resistor (490,000 ohms)	33-448344	Scale Assembly	42-5644
41	Resistor (240,000 ohms)	33-424344	Receiver Housing	38-1727
42	Resistor (99,000 ohms)			

CHANGES — "Run Numbers" are stamped on the chassis sub-base for identification. These "Run Numbers" are changed consecutively as major changes are made in the Receiver wiring and parts.

RUN No. 2 — Remove Tone Control Switch ⑩. Add Part No. 42-1273.

RUN No. 3 — Remove Tone Control Switch ⑩. Add Part No. 42-1273.

RUN No. 4 — Choke ⑩ removed, Part No. 32-1438 added. One side is connected to the filament of the type 41 Tube, and the other side is connected to Choke ⑩.

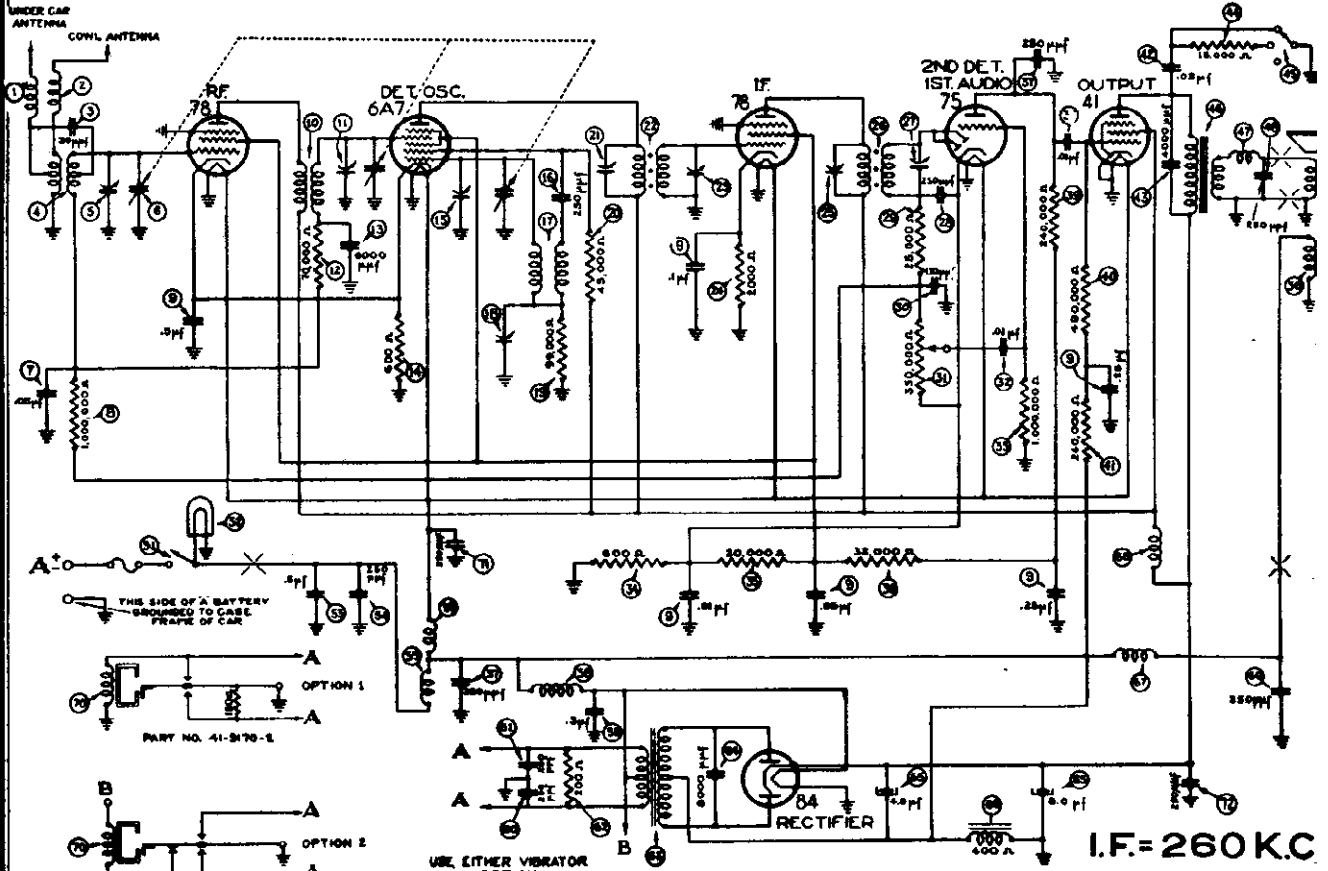
RUN No. 5 — The Antenna Transformer ④ is replaced with a new type having the same part number. It can be identified by the orange paint mark on the fibre.

RUN No. 6 — Resistor ⑩ removed (51,000 ohms) Part No. 33-399344 added (99,000 ohms).

Model N-1433H is a Special Custom-Built Receiver used exclusively by Nash Motor Company in 1937 Nash cars.

Schematic, Chassis Parts

PHILCO RADIO & TELEV. CORP.



USE EITHER VIBRATOR OPTION

FOR ALIGNMENT SEE INDEX

MARCH 5, 1937

I.F. = 260 KC

MODEL N-1434-H PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	38-8106	33	Resistor (240,000 ohms)	33-424344
2	Antenna Choke	38-8106	34	Condenser (.02 mfd.)	30-4495
3	Condenser (30 mmfd.)	30-1059	35	Condenser (4,000 mmfd.)	30-4185
4	Antenna Transformer	32-2461	36	Resistor (15,000 ohms)	33-315344
5	First Padder (on tun. cond.)		37	Tone Control Switch	42-1273
6	Tuning Condenser	31-1912	38	Output Transformer	32-7495
7	Condenser (.05 mfd.)	30-4444	39	Choke	32-1374
8	Resistor (1,000,000 ohms)	33-510344	40	Condenser (250 mmfd.)	30-1032
9	Condenser (.01-.05-.1-.25-.25-.5 mfd)	30-4478	41	Cone & Voice Coil	36-3526
10	R. F. Transformer	32-2231	42	Field Coil Assembly	32-9236
11	Second Padder (on tun. cond.)		43	On & Off Switch Assembly	42-5617
12	Resistor (70,000 ohms)	33-370344	44	Pilot Lamp	34-2039
13	Condenser (6,000 mmfd.)	30-4445	45	Condenser (.5 mfd.)	30-4474
14	Resistor (600 ohms)	33-1212	46	Condenser (250 mmfd.)	30-1032
15	Third Padder (on tun. cond.)		47	"A" Choke	32-1374
16	Condenser (250 mmfd.)	30-1032	48	Filament Choke	32-1438
17	Oscillator Transformer	32-2232	49	Condenser (250 mmfd.)	30-1032
18	Low Frequency Padder	31-6056	50	Vibrator Choke	32-2537
19	Resistor (99,000 ohms)	33-389344	51	Condenser (.5 mfd.)	30-4474
20	Resistor (45,000 ohms)	33-345344	52	Condenser (250 mmfd.)	30-1032
21	Padder (Pri. 1st I.F. Trans.)		53	Condenser (250 mmfd.)	30-1032
22	First I. F. Transformer	32-2286	54	Resistor (200 ohms)	33-120344
23	Padder (Sec. 1st I.F. Trans.)		55	Power Transformer	32-7720
24	Resistor (2,000 ohms)	32-220334	56	Condenser (8,000 mmfd.)	30-4420
25	Padder (Pri. 2nd I.F. Trans.)		57	Filter Condenser (4-8 mfd.)	30-2179
26	Second I. F. Transformer	32-2167	58	Filter Choke	32-7722
27	Padder (Sec. 2nd I.F. Trans.)		59	Choke	32-2289
28	Condenser (250 mmfd.)	30-1032	60	"B" Choke	32-1281
29	Resistor (25,000 ohms)	33-325344	61	Condenser (250 mmfd.)	30-1032
30	Condenser (110 mmfd.)	30-1031	62	Vibrator (OPTIONAL)	41-3170-2
31	Volume Control		63	Condenser (250 mmfd.)	30-1032
32	(350,000 ohms)	33-5139	64	Condenser (250 mmfd.)	30-1032
33	Condenser (.01 mfd.)	30-4479	65	Four-prong Socket	27-6044
34	Resistor (1,000,000 ohms)	33-510344	66	Five-prong Socket	27-6035
35	Resistor (600 ohms)	33-1212	67	Six-prong Socket	27-6036
36	Resistor (20,000 ohms)	33-320334	68	Seven-prong Socket	27-6037
37	Resistor (32,000 ohms)	33-332444	69	Inductive Suppressor	32-2250
38	Condenser (250 mmfd.)	30-1032	70	Interference Condenser	30-4007
39	Condenser (.01 mfd.)	30-4145	71	Fuse	7227
40	Resistor (240,000 ohms)	33-424344	72	Fuse Insulator	27-7729
41	Resistor (499,000 ohms)	33-449344	73	Tee Bolt (Rec. mtg.)	28-6161

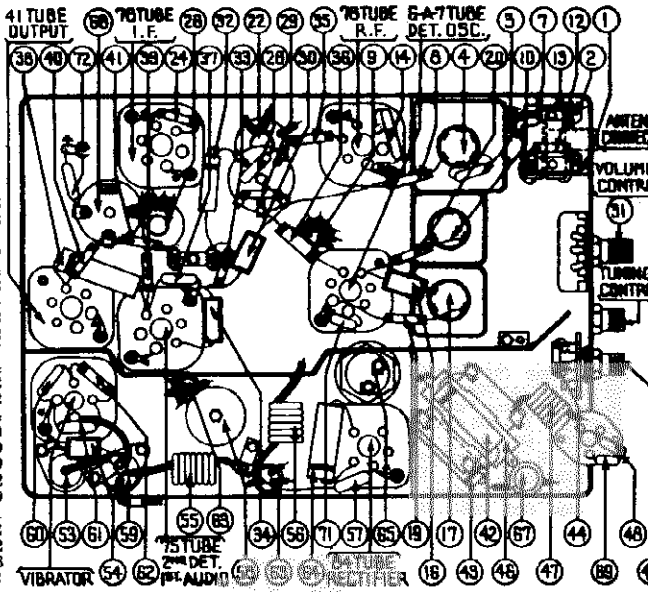


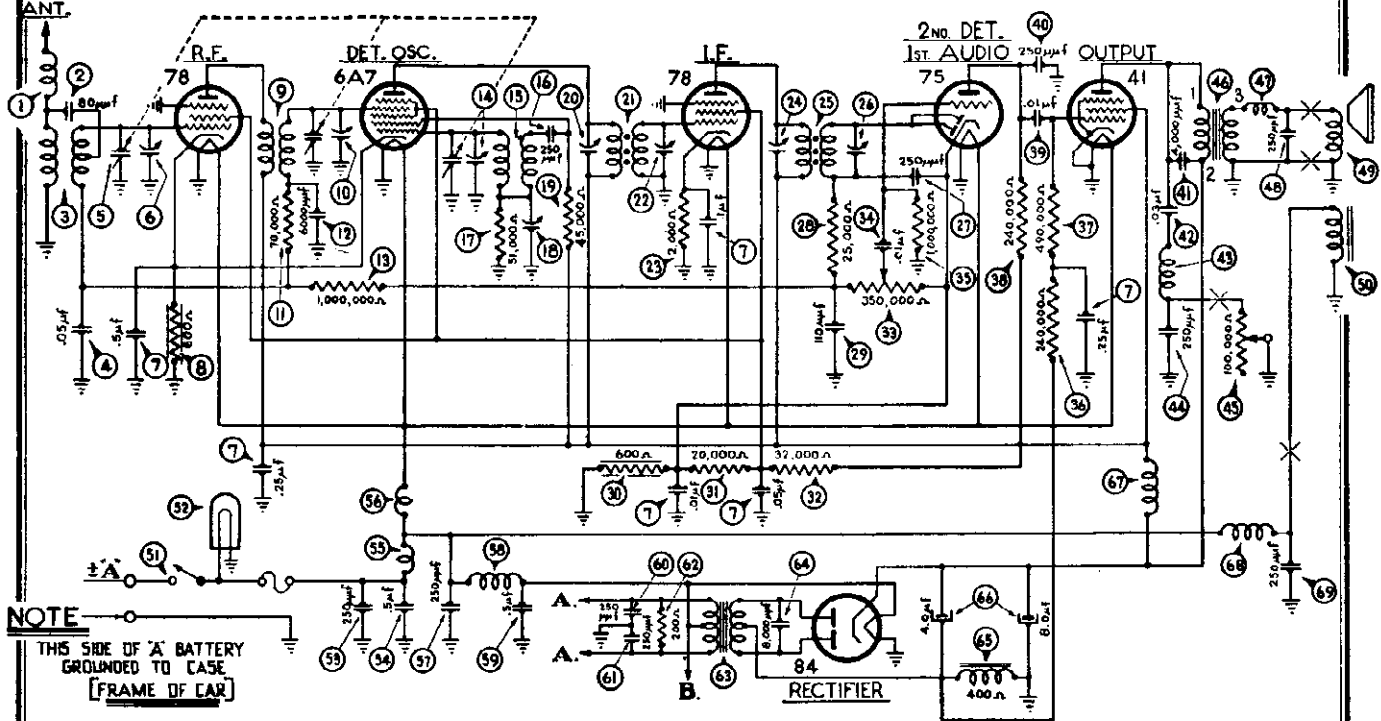
FIGURE 2

No.	Description	Part No.	No.	Description	Part
74	Nut (Rec. mtg.)	W518A	75	Tone Control Shaft	28-81
76	Speaker Cable	41-3247	76	Scale Assembly	42-51
77	Tuning & Volume Knob	28-7214	77	Control Mfg. Wrench	28-41
78	Tone Control Knob	28-7215	78	Receiver Housing	38-1
79	Knob Base	28-4184	79	Tow Strap	36-3
80	Tuning & Volume Shaft	28-8695			

NOTE: The items marked with an asterisk are rarely required for service and in many cases will not be carried in stock by the service station. In such cases it will be necessary to order these parts from Philco Transitone, Philadelphia or Chicago.

MODEL G-1436
Schematic, Chassis
Parts

PHILCO RADIO & TELEV. CORP.



NOTE
THIS SIDE OF 'A' BATTERY
GROUNDED TO CASE
[FRAME OF CAR]

**FOR ALIGNMENT
SEE INDEX**

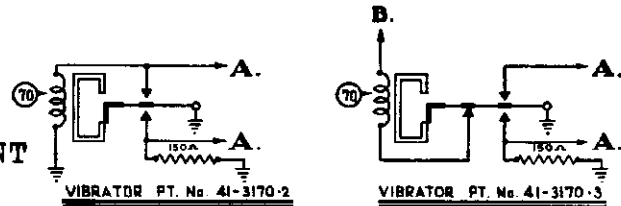


FIGURE 3

I.F. = 260 K.C.

OCTOBER 15, 1936

MODEL G-1436 PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	32-1956	30	Resistor (240,000 ohms)	33-42434
2	Condenser (80 mmfd.)	30-1066	31	Condenser (.01 mfd.)	30-4145
3	Antenna Transformer	32-2331	32	Condenser (250 mmfd.)	30-1032
4	Condenser (.05 mfd.)	30-4444	33	Condenser (4000 mmfd.)	30-4185
5	Tuning Condenser	31-2912	34	Condenser (.03 mfd.)	30-4380
6	First Padder (on tun. cond.)		35	Choke	32-1374
7	Condenser		36	Condenser (250 mmfd.)	30-1032
8	Resistor (600 ohms)	33-1212	37	Tone Control (100,000 ohms)	33-5192
9	R. F. Transformer	32-2231	38	Output Transformer	32-7495
10	Second Padder (on tun. cond.)		39	Choke	32-1374
11	Resistor (20,000 ohms)	33-370344	40	Condenser (250 mmfd.)	30-1032
12	Condenser (6000 mmfd.)	30-4445	41	Cone & Voice Coil	36-3822
13	Resistor (1,000,000 ohms)	33-510344	42	Field Coil Assembly	36-3823
14	Third Padder (on tun. cond.)		43	On & Off Switch Assembly	
15	Oscillator Transformer	32-2232	44	Pilot Lamp	34-2040
16	Condenser (250 mmfd.)	30-1032	45	Condenser (250 mmfd.)	30-1032
17	Resistor (51,000 ohms)	33-351344	46	Condenser (.5 mfd.)	30-4474
18	Low Frequency Padder	31-6056	47	"A" Choke	32-1374
19	Resistor (45,000 ohms)	33-345344	48	Filament Choke	32-1561
20	Padder (Pri. 1st I. F. Trans.)		49	Condenser (250 mmfd.)	30-1032
21	First I. F. Transformer	32-2286	50	Vibrator Choke	32-2249
22	Padder (Sec. 1st I. F. Trans.)		51	Condenser (.5 mfd.)	30-4474
23	Resistor (2000 ohms)	33-220344	52	Condenser (250 mmfd.)	30-1032
24	Padder (Pri. 2nd I. F. Trans.)		53	Condenser (250 mmfd.)	30-1032
25	Second I. F. Transformer	32-2167	54	Resistor (200 ohms)	33-120344
26	Padder (Sec. 2nd I. F. Trans.)		55	Power Transformer	32-7720
27	Condenser (250 mmfd.)	30-1032	56	Condenser (8000 mmfd.)	39-4320
28	Resistor (25,000 ohms)	33-325344	57	Filter Choke	32-7722
29	Condenser (110 mmfd.)	30-1031	58	Filter Condenser (4-8 mfd.)	30-2168
30	Resistor (600 ohms)	33-1212	59	"B" Choke	32-1281
31	Resistor (20,000 ohms)	33-320344	60	Choke	32-2259
32	Resistor (32,000 ohms)	33-332444	61	Condenser (250 mmfd.)	30-1032
33	Volume Control (350,000 ohms)	33-5139	62	Vibrator (Optional)	41-3170-2
34	Condenser (.01 mfd.)	30-4479	63	Four-prong Socket	27-6044
35	Resistor (1,000,000 ohms)	33-510344	64	Five-prong Socket	27-6035
36	Resistor (240,000 ohms)	33-424344	65	Six-prong Socket	27-6036
37	Resistor (490,000 ohms)	33-449344	66	Seven-prong Socket	27-6037
			67	Distributor Resistor	33-1196

NOTE: The items marked with an asterisk are rarely required for service and in many cases will not be carried in stock by the local service station. In such cases it will be necessary to order these parts from Philco Transitone, Philadelphia or Chicago.

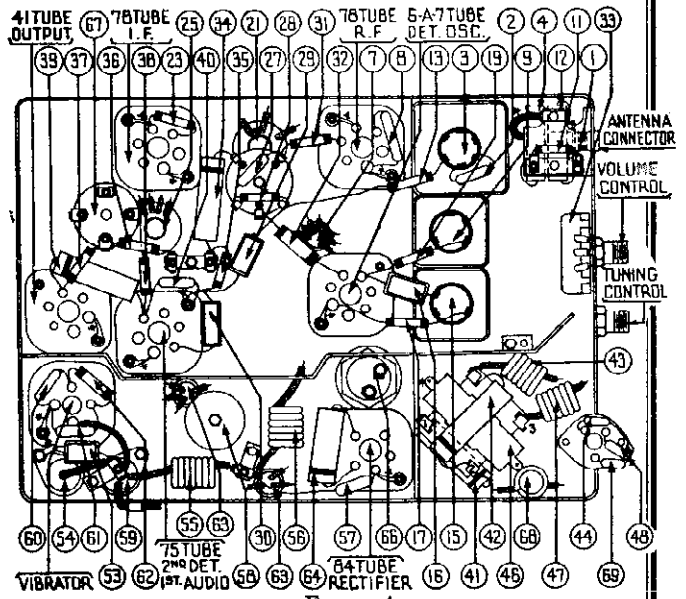
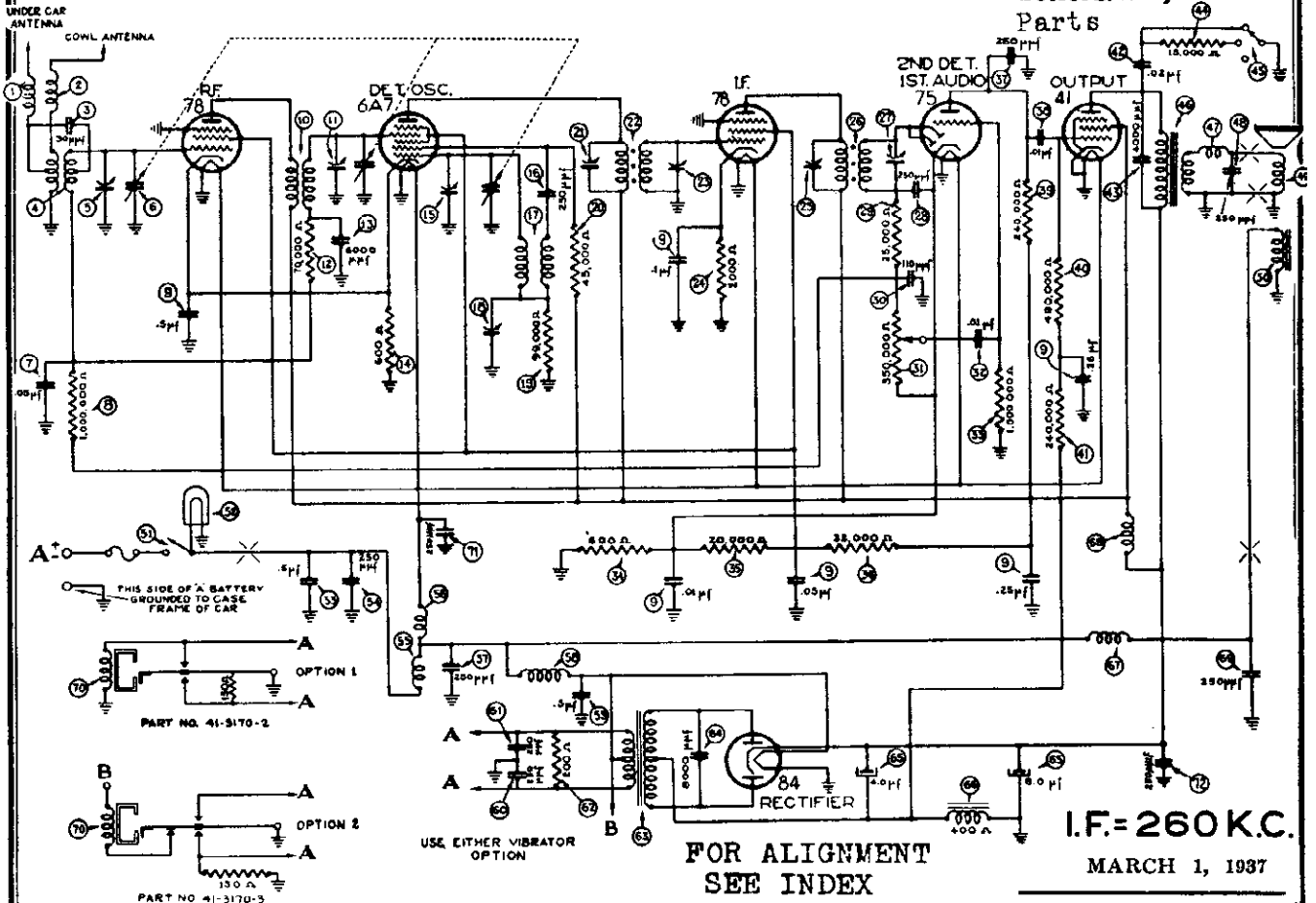


FIGURE 4

No.	Description	Part No.	No.	Description	Part No.
30	Interference Condenser	30-4007	28	Tee Bolt (Rec. mtg.)	28-6161
30	Interference Condenser	30-4486		Nut (Rec. mtg.)	W158A
	Fuse	7227		*Speaker Cable Assembly	41-3255
	Fuse Insulator	27-7729		*Shielded Loom Assembly	38-8230

PHILCO RADIO & TELEV. CORP.

MODEL S-1437 Studebaker
Two Unit Receiver
Schematic, Chassis
Parts



FOR ALIGNMENT
SEE INDEX

I.F. = 260 K.C.
MARCH 1, 1937

MODEL S-1437 PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
ⓐ	Antenna Choke	38-8106	ⓐ	Condenser (.02 mfd.)	30-4495
ⓑ	Antenna Choke	38-8106	ⓑ	Condenser (4,000 mmfd.)	30-4185
ⓒ	Condenser (30 mmfd.)	30-1059	ⓒ	Resistor (15,000 ohms)	33-315344
ⓓ	Antenna Transformer	32-2461	ⓓ	Tone Control Switch	42-1273
ⓔ	First Padder (on tun. cond.)	32-2461	ⓔ	Output Transformer	32-7495
ⓕ	Tuning Condenser	31-1912	ⓕ	Choke	32-1374
ⓖ	Condenser (.05 mfd.)	30-4478	ⓖ	Condenser (250 mmfd.)	30-1032
ⓗ	Resistor (1,000,000 ohms)	33-510341	ⓗ	Cone and Voice Coil	36-3526
ⓘ	Condenser (.01-.05-.1-.25-.35-.5 mfd)	30-4478	ⓘ	Field Coil Assembly	32-9236
ⓙ	R. F. Transformer	32-2231	ⓙ	On & Off Switch Assembly	42-5617
ⓚ	Second Padder (on tun. cond.)	32-2231	ⓚ	Pilot Lamp	34-2039
ⓛ	Resistor (70,000 ohms)	33-370344	ⓛ	Condenser (.5 mfd.)	30-4474
ⓜ	Condenser (6,000 mmfd.)	30-4445	ⓜ	Condenser (250 mmfd.)	30-1032
ⓝ	Resistor (600 ohms)	33-1212	ⓝ	"A" Choke	32-1374
ⓞ	Third Padder (on tun. cond.)	30-1032	ⓞ	Filament Choke	32-1438
ⓟ	Condenser (250 mmfd.)	30-1032	ⓟ	Condenser (250 mmfd.)	30-1032
ⓠ	Oscillator Transformer	32-2232	ⓠ	Vibrator Choke	32-2537
ⓡ	Low Frequency Padder	31-6056	ⓡ	Condenser (.5 mfd.)	30-4474
ⓢ	Resistor (99,000 ohms)	33-399344	ⓢ	Condenser (250 mmfd.)	30-1032
ⓣ	Resistor (45,000 ohms)	33-345344	ⓣ	Condenser (250 mmfd.)	30-1032
ⓤ	Padder (Pri. 1st I.F. Trans.)	32-2286	ⓤ	Resistor (200 ohms)	33-120344
ⓖ	First I. F. Transformer	32-2286	ⓖ	Power Transformer	32-7720
ⓗ	Padder (Sec. 1st I.F. Trans.)	33-220334	ⓗ	Condenser (8,000 mmfd.)	30-4420
ⓙ	Resistor (2,000 ohms)	33-220334	ⓙ	Filter Condenser (4-8 mfd.)	30-2179
ⓚ	Padder (Pri. 2nd I.F. Trans.)	32-2167	ⓚ	Filter Choke	32-7722
ⓛ	Second I. F. Transformer	32-2167	ⓛ	Choke	32-2269
ⓜ	Padder (Sec. 2nd I.F. Trans.)	30-1032	ⓜ	"B" Choke	32-1281
ⓝ	Condenser (250 mmfd.)	30-1032	ⓝ	Condenser (250 mmfd.)	30-1032
ⓞ	Resistor (25,000 ohms)	33-325344	ⓞ	Vibrator (OPTIONAL)	41-3170-2
ⓟ	Condenser (110 mmfd.)	30-1031	ⓟ	Condenser (250 mmfd.)	41-3170-3
ⓠ	Volume Control	33-5139	ⓠ	Condenser (250 mmfd.)	30-1032
ⓡ	Condenser (.01 mfd.)	30-4479	ⓡ	Condenser (250 mmfd.)	30-1032
ⓢ	Resistor (1,000,000 ohms)	33-510344	ⓢ	Four-prong Socket	27-6044
ⓣ	Resistor (600 ohms)	33-1212	ⓣ	Five-prong Socket	27-6035
ⓤ	Resistor (20,000 ohms)	33-320334	ⓤ	Six-prong Socket	27-6036
ⓖ	Resistor (32,000 ohms)	33-332444	ⓖ	Seven-prong Socket	27-6037
ⓗ	Condenser (250 mmfd.)	30-1032	ⓗ	Inductive Suppressor	32-2250
ⓙ	Condenser (.01 mfd.)	30-4145	ⓙ	Interference Condenser	30-4007
ⓚ	Resistor (240,000 ohms)	33-424344	ⓚ	Distributor Condenser	30-1087
ⓛ	Resistor (400,000 ohms)	33-430344	ⓛ	Fuse	7237
ⓜ	Resistor (240,000 ohms)	33-424344	ⓜ	Fuse Insulator	27-7729
ⓞ	Resistor (400,000 ohms)	33-430344	ⓞ	Static Collector (Pres.)	28-3584
ⓟ	Resistor (240,000 ohms)	33-424344	ⓟ	Static Collector (Dict.)	38-7405

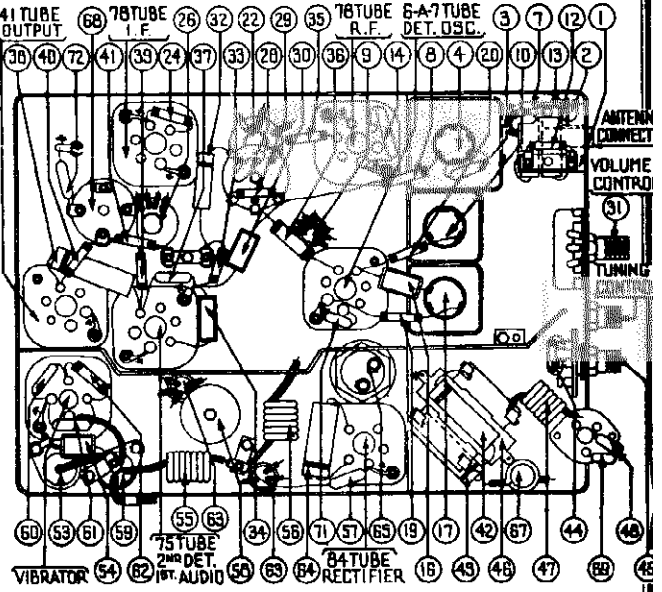


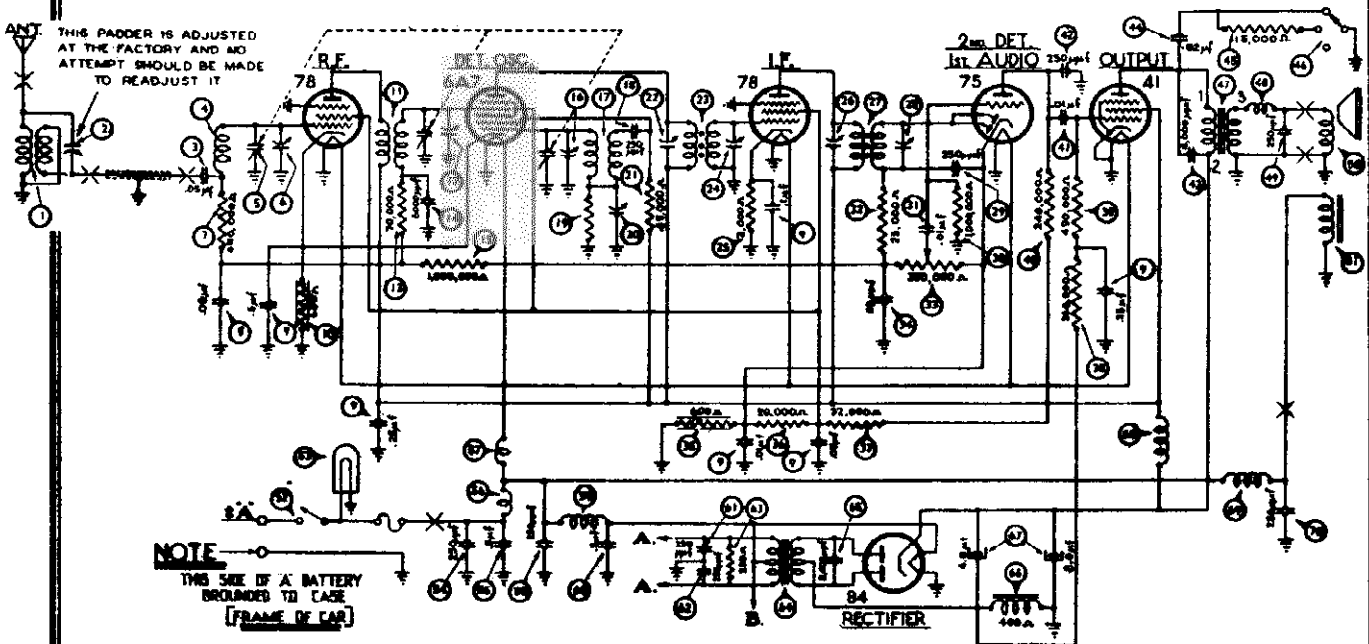
FIGURE 2

No.	Description	Part No.	No.	Description	Part No.
ⓐ	Tee Bolt (Rec. Mtg.)	28-6161	ⓐ	Tuning Shaft	28-86
ⓑ	Nut (Rec. Mtg.)	W-518A	ⓑ	Volume Shaft	28-86
ⓒ	Speaker Cable	41-3231	ⓒ	Tone Control Shaft	28-86
ⓓ	Ground Strap	38-7425	ⓓ	Scale Assembly	42-56
ⓔ	Tuning & Volume Knob	28-7211	ⓔ	Receiver Housing	38-17
ⓕ	Tone Control Knob	28-7212			

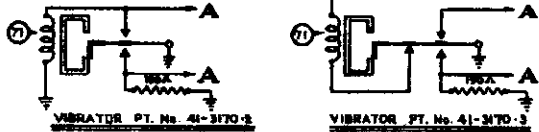
NOTE: The items marked with an asterisk are rarely required for service and in many cases will not be carried in stock by the service station. In such cases it will be necessary to order these parts from Philco Transitone, Philadelphia or Chicago.

MODEL F-1440 Ford
Schematic, Chassis
Changes, Parts

PHILCO RADIO & TELEV. CORP.



I.F. = 260 K.C.



FOR ALIGNMENT
SEE INDEX

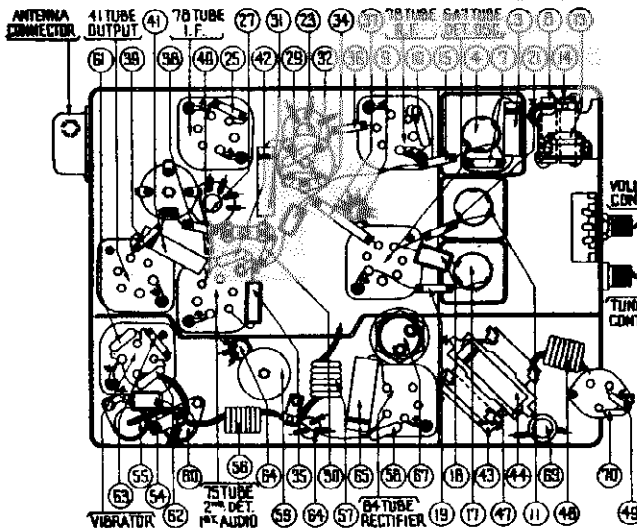


FIGURE 156

CHANGES — "Run Numbers" are stamped on the chassis sub-base for identification. These "Run Numbers" are changed consecutively as major changes are made in the Receiver wiring and parts.

RUN No. 2 — Tuning Condenser (C) removed Part No. 31-1985 added.

RUN No. 4 — Choke (B) removed Part No. 32-1436 added. One side is connected to the filament of the type 41 Tube and the other side is connected to Choke (C).

A 250 mmfd. Condenser Part No. 30-1032 has been added across the filament of the type 6A7 Tube Socket.

A 250 mmfd. Condenser Part No. 30-1032 has been added to the Receiver. One side is connected between the 8 mfd. section of Condenser (C) and the "B" Choke (B) and the other side grounded.

RUN No. 5 — Resistor (R) removed (51,000 ohms) Part No. 33-399344 added (99,000 ohms).

RUN No. 6 — Antenna Choke Part No. 32-2063 added to the Receiver. One side is connected to Condenser (C) and the other side connected to the Antenna Connector on the Receiver.

RUN No. 7 — The grid wire from the type 41 Tube was removed from its original location on the "B" Choke (B) and wired to the other side of "B" Choke (B).

No major change was involved in Run No. 3.

PARTS LIST

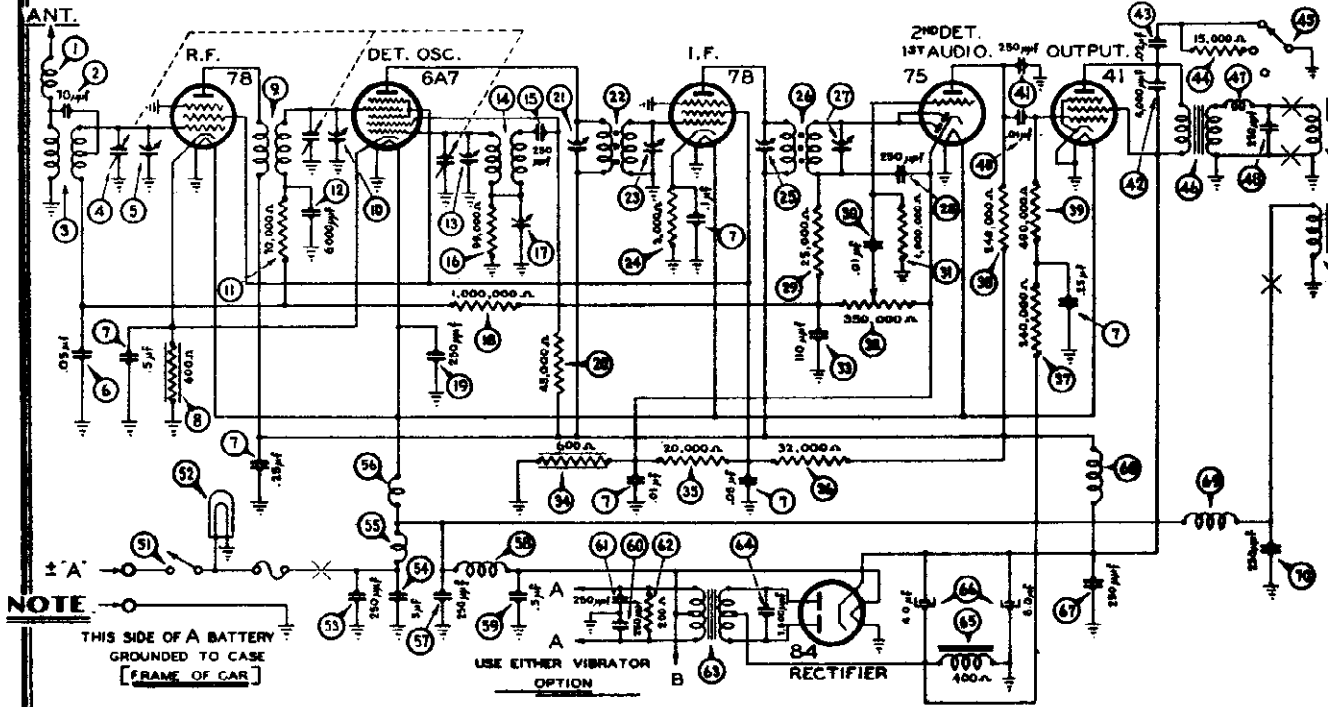
No.	Description	Part No.	Description	Part No.
1	Roof Antenna Transformer	32-2418	Resistor (15,000 ohms)	33-315344
2	Padder	31-8185	Tone Control Switch	42-1139
3	Condenser (.05 mfd.)	30-4444	Output Transformer	32-7495
4	Receiver Antenna Transformer	32-2422	Choke	32-1374
5	Tuning Condenser	31-1954	Condenser (250 mmfd.)	30-1032
6	First Padder (on Tun. Cond.)		Cone & Voice Coil	36-3588
7	Resistor (490,000 ohms)	33-449344	Field Coil Assembly	32-9236
8	Condenser (.05 mfd.)	30-4444	On & Off Switch	42-1277
9	Condenser (.01-.05-1 25-25-.5 mfd.)	30-4478	Pilot Lamp	34-2040
10	Resistor (600 ohms)	33-1212	Condenser (250 mmfd.)	30-1032
11	E. F. Transformer	32-2231	Condenser (.5 mfd.)	30-4474
12	Second Padder (on Tun. Cond.)		"A" Choke	32-1374
13	Resistor (70,000 ohms)	33-370344	Pilot Lamp	32-1561
14	Condenser (6,000 mmfd.)	30-4445	Condenser (250 mmfd.)	30-1032
15	Resistor (1,000,000 ohms)	33-510344	Vibrator Choke	32-2249
16	Third Padder (on Tun. Cond.)		Condenser (.5 mfd.)	30-4474
17	Oscillator Transformer	32-2232	Condenser (250 mmfd.)	30-1032
18	Condenser (250 mmfd.)	30-1032	Condenser (250 mmfd.)	30-1032
19	Resistor (89,000 ohms)	33-389344	Power Transformer	33-120344
20	Low Frequency Padder	31-6056	Condenser (8,000 mmfd.)	30-4420
21	Resistor (45,000 ohms)	33-345344	Filter Choke	32-7722
22	Padder (Pri. 1st I. F. Trans.)		Filter Condenser	30-2168
23	First I. F. Transformer	32-2286	"B" Choke	32-1281
24	Padder (Sec. 1st I. F. Trans.)		Choke	32-2269
25	Resistor (3,000 ohms)	33-230344	Condenser (250 mmfd.)	30-1032
26	Prvler (Pri. 2nd I. F. Trans.)		Vibrator (OPTIONAL)	41-3170-2
27	Second I. F. Transformer	32-2167	Four-prong Socket	27-6044
28	Padder (Sec. 2nd I. F. Trans.)		Pilot Lamp Socket	27-6035
29	Condenser (250 mmfd.)	30-1032	Six-prong Socket	27-6036
30	Resistor (1,000,000 ohms)	33-510344	Seven-prong Socket	27-6037
31	Condenser (.01 mfd.)	30-4124	Tuning Shaft	28-8699
32	Resistor (25,000 ohms)	33-325344	Volume Shaft	28-8714
33	Volume Control (350,000 ohms)	33-5139	Knob	27-4437
34	Condenser (110 mmfd.)	30-1031	Pilot Lamp Assembly	38-8285
35	Resistor (600 ohms)	33-1212	Dial	27-4456
36	Resistor (20,000 ohms)	33-320344	Glass	27-8656
37	Resistor (32,000 ohms)	33-332444	Pointer	27-4457
38	Resistor (240,000 ohms)	33-424344	Fuse	7927
39	Resistor (490,000 ohms)	33-449344	Fuse Insulator	27-7729
40	Resistor (240,000 ohms)	33-424344	Speaker Cable	41-3250
41	Condenser (.01 mfd.)	30-4145	"U" Clamp (Cont. Mfg.)	28-4680
42	Condenser (250 mmfd.)	30-1032	Transformer Lead (Shield)	L-2651
43	Condenser (4,000 mmfd.)	30-4185	Transformer Assembly	32-2424
44	Condenser (.02 mfd.)	30-4419		

The Model F-1440 Concealed Hender Bar Speaker with Ear Level Reception is a Special Custom-Built Receiver used exclusively by the Ford Motor Company for the 1937 Ford V-8 cars.

Changes, Parts

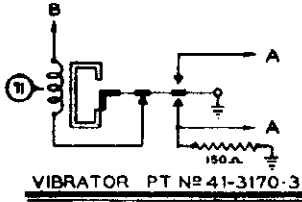
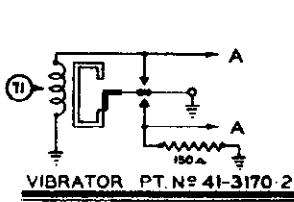
PHILCO RADIO & TELEV. CORP.

MODEL F-1442 Ford
Schematic, Chassis



NOTE
THIS SIDE OF A BATTERY
GROUNDED TO CASE
[FRAME OF CAR]

USE EITHER VIBRATOR
OPTION



FOR ALIGNMENT
SEE INDEX

I.F. = 260 KC.

PARTS LIST

No.	Description	Part No.	Description	Part No.
1	Antenna Choke	32-2063	Output Transformer	32-7495
2	Condenser (70 mmfd.)	30-1068	Choke	32-1374
3	Antenna Transformer	32-2524	Condenser (250 mmfd.)	30-1032
4	Tuning Condenser	31-1984	Cone & Voice Coil	36-3586
5	First Padder (on Tun. Cond.)	30-4444	Field Coil Assembly	32-9236
6	Condenser (.05 mfd.)	30-4444	On & Off Switch	42-1277
7	Condenser	30-4478	Pilot Lamp	34-2040
8	(.01-.05-1-25-25-.5 mfd.)	30-4478	Condenser (250 mmfd.)	30-1032
9	Resistor (600 ohms)	33-1212	Condenser (.5 mfd.)	30-4474
10	R. F. Transformer	32-2231	"A" Choke	32-1374
11	Second Padder (on Tun. Cond.)	33-2231	Fluorescent Choke	32-1438
12	Resistor (70,000 ohms)	33-370344	Condenser (250 mmfd.)	30-1032
13	Condenser (6,000 mmfd.)	30-4445	Vibrator Choke	32-2637
14	Third Padder (on Tun. Cond.)	30-4474	Condenser (.5 mfd.)	30-4474
15	Oscillator Transformer	32-2232	Condenser (250 mmfd.)	30-1032
16	Condenser (250 mmfd.)	30-1032	Condenser (250 mmfd.)	30-1032
17	Resistor (99,000 ohms)	33-309344	Resistor (200 ohms)	33-120344
18	Low Frequency Padder	31-8058	Power Transformer	32-7720
19	Resistor (1,000,000 ohms)	33-510344	Condenser (7.500 mmfd.)	30-4420
20	Condenser (250 mmfd.)	30-1032	Filter Choke	32-7722
21	Resistor (45,000 ohms)	33-345344	Filter Condenser (4-8 mfd.)	30-2168
22	Padder (Pri. 1st I. F. Trans.)	30-1032	Condenser (250 mmfd.)	30-1032
23	First I. F. Transformer	32-2286	"B" Choke	32-1281
24	Padder (Sec. 1st I. F. Trans.)	33-230344	Choke	32-2289
25	Resistor (3,000 ohms)	33-230344	Condenser (250 mmfd.)	30-1032
26	Padder (Pri. 2nd I. F. Trans.)	32-2167	Vibrator (OPTIONAL)	41-8170-2
27	Second I. F. Transformer	32-2167	Four-prong Socket	27-6044
28	Padder (Sec. 2nd I. F. Trans.)	30-1032	Five-prong Socket	27-6035
29	Condenser (250 mmfd.)	30-1032	Six-prong Socket	27-6036
30	Resistor (25,000 ohms)	33-325344	Seven-prong Socket	27-6037
31	Condenser (.01 mfd.)	30-4124	Tuning Shaft	28-8899
32	Resistor (1,000,000 ohms)	33-510344	Volume Shaft	28-8714
33	Volume Control	33-8139	Knob	27-4437
34	Condenser (110 mmfd.)	30-1031	Pilot Lamp Assembly	38-8285
35	Resistor (600 ohms)	33-1212	Dial	27-4458
36	Resistor (20,000 ohms)	33-320344	Glass	27-8658
37	Resistor (32,000 ohms)	33-332444	Pointer	27-4457
38	Resistor (240,000 ohms)	33-424344	Fuse	7227
39	Resistor (240,000 ohms)	33-424344	Fuse Insulator	27-7729
40	Resistor (490,000 ohms)	33-449344	Speaker Cable	41-3250
41	Condenser (.01 mfd.)	30-4145	Antenna Lead	L-2804
42	Condenser (250 mmfd.)	30-1032	"U" Clamp (Control Mtg.)	28-4680
43	Condenser (4,000 mmfd.)	30-4186	Gas Gauge Condenser	30-4663
44	Condenser (.02 mfd.)	30-4495	Oil Gauge Condenser	30-4307
45	Resistor (15,000 ohms)	33-315344	Interference Condenser	30-4500
46	Tone Control Switch	42-1139		

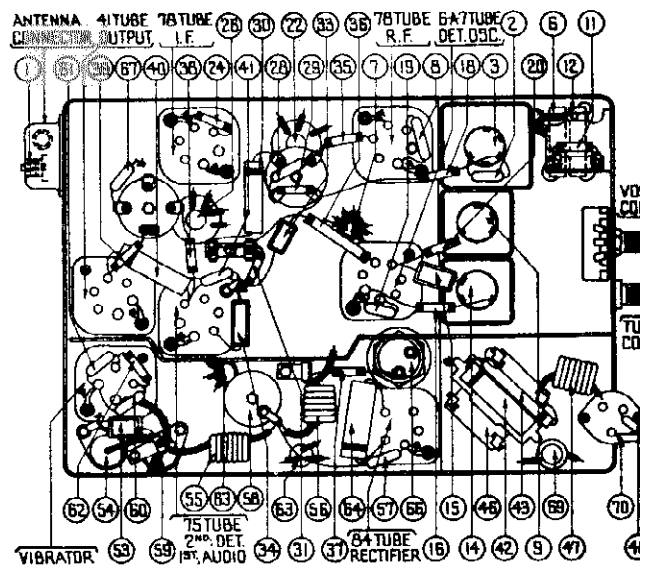


FIGURE 158

CHANGES — "Run Numbers" are stamped on the chassis sub-base for identification. These "Run Numbers" are changed consecutively as major changes are made in the Receiver wiring and parts.

RUN No. 2 — Resistor ② removed (300 ohms) Part No. 33-220344 a (2000 ohms).

RUN No. 3 — Resistor ③ removed (2000 ohms) Part No. 33-225344 a (2500 ohms).

RUN No. 4 — Reverse all lug connections on "B" Choke ④.

ADJUSTMENTS — The correct padding procedure for the Model F-144 given on Page 107.

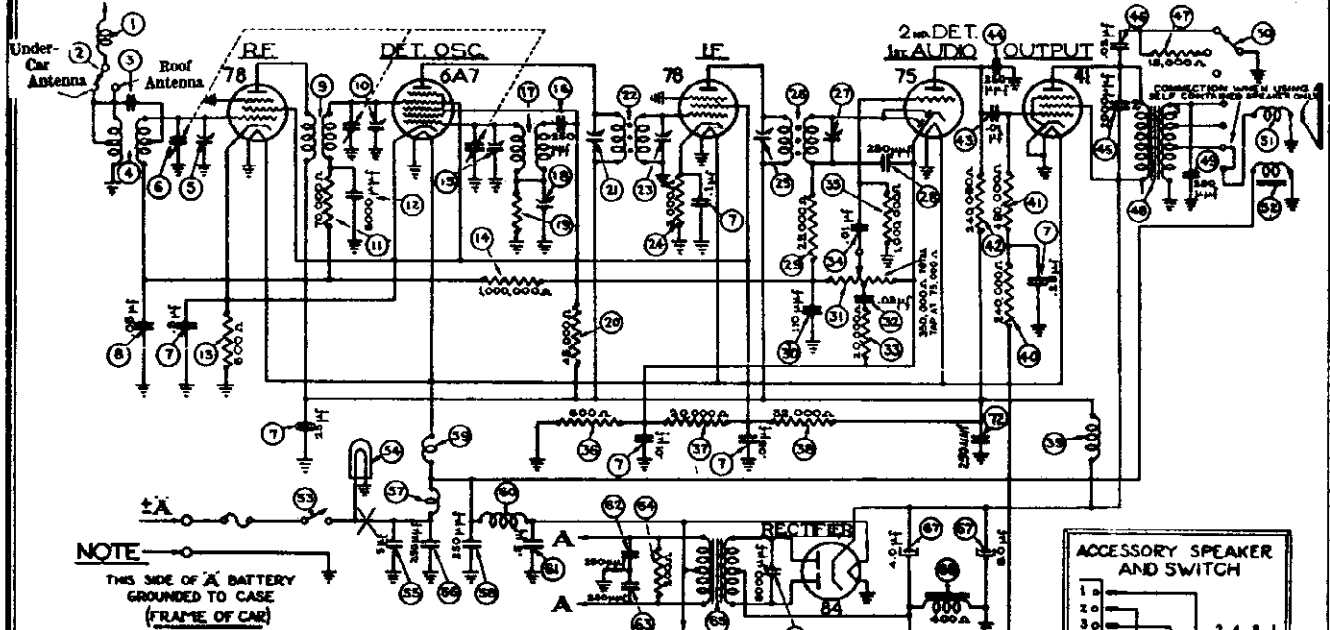
The Model F-1442 Concealed Header Bar Speaker with Ear Level Reception is a Special Custom-Built Receiver used exclusively by the Ford Motor Company for the 1937 Ford V-8 cars.

MODEL C-1540 Chrysler

Schematic, Chassis

PHILCO RADIO & TELEV. CORP.

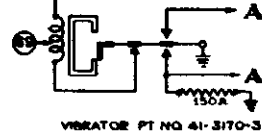
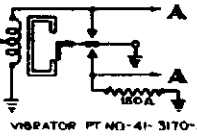
Parts



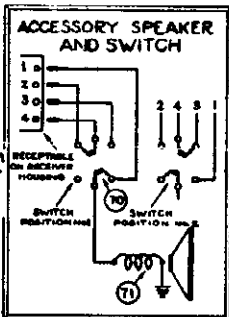
NOTE
THIS SIDE OF 'A' BATTERY
GROUNDED TO CASE
(FRAME OF CAR)

NOV. 20, 1936

LF=260KC.

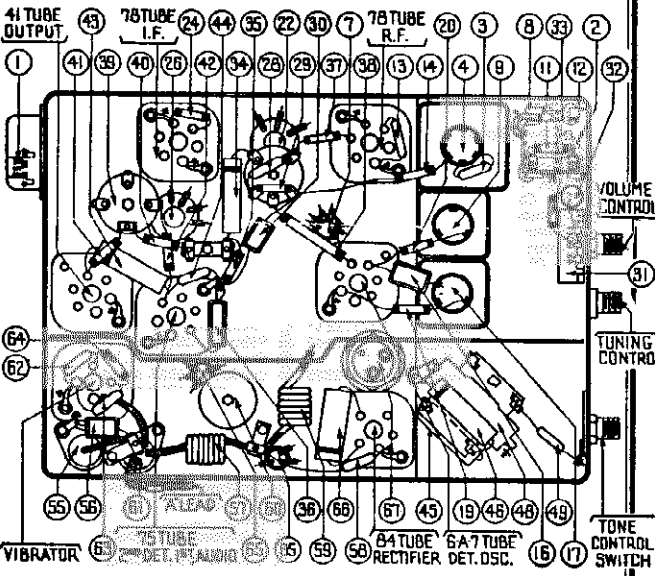


FOR ALIGNMENT
SEE INDEX



MODEL C-1450 PARTS LIST

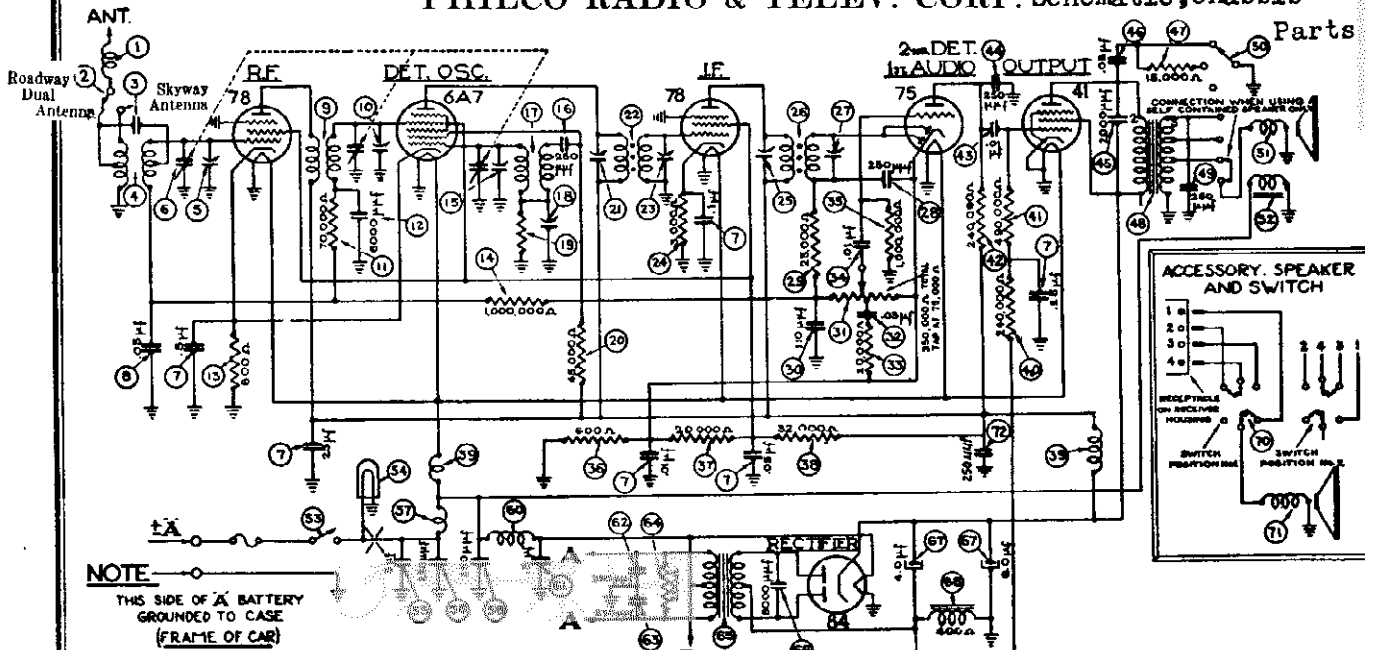
No.	Description	Part No.
1	Antenna Choke	32-2063
2	Antenna Switch	42-1259
3	Condenser (.70 mmfd.)	30-1088
4	Antenna Transformer	32-2350
5	First Padder (on Tun. Cond.)	31-1984
6	Tuning Condenser	31-1984
7	Condenser (.01-.05, 1.25-.25-.5 mfd.)	30-4478
8	Condenser (.05 mfd.)	30-4434
9	R. F. Transformer	32-2231
10	Second Padder (on Tun. Cond.)	30-4115
11	Resistor (70,000 ohms)	33-370344
12	Condenser (6,000 mmfd.)	30-4115
13	Resistor (600 ohms)	33-1212
14	Resistor (1,000,000 ohms)	33-510344
15	Third Padder (on Tun. Cond.)	30-1032
16	Condenser (250 mmfd.)	30-1032
17	Oscillator Transformer	32-2232
18	Low Frequency Padder	31-6056
19	Resistor (39,000 ohms)	33-339344
20	Resistor (45,000 ohms)	33-345344
21	Padder (Pri. 1st I. F. Trans.)	32-2288
22	First I. F. Transformer	32-2288
23	Padder (Sec. 1st I. F. Trans.)	33-230344
24	Resistor (3,000 ohms)	33-230344
25	Padder (Pri. 2nd I. F. Trans.)	32-2167
26	Second I. F. Transformer	32-2167
27	Padder (Sec. 2nd I. F. Trans.)	30-1032
28	Condenser (250 mmfd.)	33-325344
29	Resistor (25,000 ohms)	33-325344
30	Condenser (110 mmfd.)	30-1031
31	Volume Control (350,000 ohms)	33-5121
32	Condenser (.03 mfd.)	30-4449
33	Resistor (20,000 ohms)	33-320344
34	Condenser (.01 mfd.)	30-4124
35	Resistor (1,000,000 ohms)	33-510344
36	Resistor (600 ohms)	33-1212
37	Resistor (20,000 ohms)	33-320344
38	Resistor (32,000 ohms)	33-332444
39	'B' Choke	32-1281
40	Resistor (240,000 ohms)	33-424344
41	Resistor (490,000 ohms)	33-449344
42	Resistor (240,000 ohms)	33-424344
43	Condenser (.01 mfd.)	30-4145
44	Condenser (250 mmfd.)	30-1032
45	Condenser (2,000 mmfd.)	30-4177
46	Condenser (.02 mfd.)	30-4495
47	Resistor (15,000 ohms)	33-315344
48	Output Transformer	32-7765
49	Condenser (250 mmfd.)	30-1032
50	Tone Control Switch	42-1273
51	Tone and Voice Coil	36-3159
52	Field Coil Assembly	36-3513
53	On & Off Switch	42-5317
54	Pilot Lamp	34-2040
55	Condensers (.5 mfd.)	30-4474
56	Condenser (250 mmfd.)	30-1032
57	'A' Choke	32-1374
58	Condenser (250 mmfd.)	30-1032
59	Filament Choke	32-1438
60	Vibrator Choke	32-2249
61	Condenser (.5 mfd.)	30-4474
62	Condenser (250 mmfd.)	30-1032
63	Condenser (250 mmfd.)	30-1032
64	Resistor (200 ohms)	33-120344
65	Power Transformer	32-7720
66	Condenser (8,000 mmfd.)	30-4420
67	Filter Condenser (4-8 mfd.)	30-2179
68	Filter Choke	32-7722
69	Vibrator (Optional)	41-3170-2
70	Vibrator	41-3170-3
71	Accessory Speaker Switch	42-1257
72	Accessory Speaker Cone	36-3526
73	Condenser (250 mmfd.)	30-1032
74	Condenser (250 mmfd.)	30-1032
75	Accessory Speaker Cable	41-3237
76	Accessory Speaker Knob	03334
77	Complete Cable and Adapter	41-3234
78	Four-prong Socket	27-6044
79	Five-prong Socket	27-6035
80	Six-prong Socket	27-6036
81	Seven-prong Socket	27-6037
82	Accessory Speaker Socket	27-6025
83	Receiver Housing	38-1736
84	Distributor Resistor	33-1113
85	General Condenser	30-4490
86	Interference Condenser	30-4007
87	Fuse 7227	7227
88	Fuse Insulator	27-7729
89	Rec. Mtg. Plate (Plymouth)	28-3086
90	Rec. Mtg. Plate (Chrysler-Dodge-DeSoto)	28-4650
91	Tun. & Vol. Knob (Plymouth)	27-4363
92	Tun. & Vol. Knob (Dodge)	27-4365
93	Tun. & Vol. Knob (DeSoto)	27-4367
94	Tun. & Vol. Knob (Chrysler)	27-4377
95	Tun. & Vol. Knob (Motor Parts)	27-4401
96	Tone Control Knob (Plymouth)	27-4371
97	Tone Control Knob (Dodge)	27-4373
98	Tone Control Knob (DeSoto)	27-4375
99	Tone Control Knob (Chrysler)	27-4379
100	Tone Control Knob (Motor Parts)	27-4400
101	Tuning Control Shaft	28-8674
102	Volume Control Shaft	28-8675
103	Tone Control Shaft	28-8676
104	Bolt (Rec. Mtg.)	W825A
105	Scale Assembly	42-5637
106	Anti Back Lash Spring	28-8647
107	Pilot Lamp Assembly	38-7734
108	Wrench	28-4380



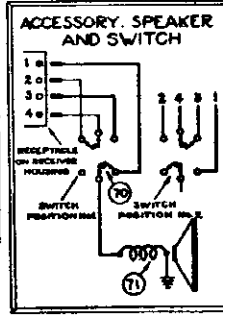
No.	Description	Part No.	No.	Description	Part No.
1	Tone Control Knob (Motor Parts)	27-4400	101	Tuning Control Shaft	28-8674
2	Tuning Control Shaft	28-8674	102	Volume Control Shaft	28-8675
3	Volume Control Shaft	28-8675	103	Tone Control Shaft	28-8676
4	Tone Control Shaft	28-8676	104	Bolt (Rec. Mtg.)	W825A
5	Bolt (Rec. Mtg.)	W825A	105	Scale Assembly	42-5637
6	Scale Assembly	42-5637	106	Anti Back Lash Spring	28-8647
7	Anti Back Lash Spring	28-8647	107	Pilot Lamp Assembly	38-7734
8	Pilot Lamp Assembly	38-7734	108	Wrench	28-4380
9	Wrench	28-4380			

A Condenser @ has been added to the Receiver. One side is connected to the filament of the type 6A7 tube and the other side to the ground. Note: The items marked with an asterisk are rarely required for service and in many cases will not be carried in stock by the local service station. In such cases it will be necessary to order these parts from Philco Transstone, Philadelphia or Chicago.

PHILCO RADIO & TELEV. CORP. Schematic, Chassis

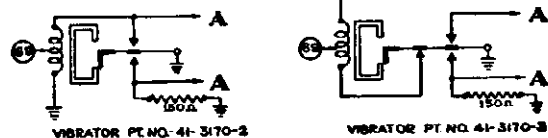


NOTE
THIS SIDE OF A BATTERY
GROUNDED TO CASE
(FRAME OF CAR)



NOV. 20, 1936

FIGURE 3



IF = 260 KC.

MODEL C-1452 PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	32-2063	49	Condenser (.02 mfd.)	30-4495
2	Antenna Switch	42-1259	50	Resistor (15,000 ohms)	33-315344
3	Condenser (30 mmfd.)	30-1059	51	Output Transformer	32-7765
4	Antenna Transformer	32-2433	52	Condenser (250 mmfd.)	30-1032
5	First Padder (on Tun. Cond.)	33-510344	53	Condenser (250 mmfd.)	30-1032
6	Tuning Condenser	31-1984	54	Condenser (250 mmfd.)	30-1032
7	Condenser (.01-.05-.1-.25-.5 mfd.)	30-4478	55	Condenser (250 mmfd.)	30-1032
8	Condenser (.05 mfd.)	30-4444	56	Condenser (250 mmfd.)	30-1032
9	R. F. Transformer	32-2231	57	Resistor (200 ohms)	33-120344
10	Second Padder (on Tun. Cond.)	33-510344	58	Power Transformer	32-7720
11	Resistor (70,000 ohms)	33-370344	59	Condenser (8,000 mmfd.)	30-4420
12	Condenser (6,000 mmfd.)	30-4445	60	Filter Condenser (4-8 mfd.)	30-2179
13	Resistor (600 ohms)	33-1212	61	Filter Choke	32-7722
14	Resistor (1,000,000 ohms)	33-510344	62	Vibrator (Optional)	41-3170-2
15	Third Padder (on Tun. Cond.)	33-510344	63	Vibrator	41-3170-3
16	Condenser (250 mmfd.)	30-1032	64	Accessory Speaker Switch	42-1257
17	Oscillator Transformer	32-2232	65	Accessory Speaker Cone	36-3526
18	Low Frequency Padder	31-6056	66	Condenser (250 mmfd.)	30-1032
19	Resistor (99,000 ohms)	33-399344	67	Condenser (250 mmfd.)	30-1032
20	Resistor (45,000 ohms)	33-345344	68	Resistor (200 ohms)	33-120344
21	Padder (Pri. 1st I. F. Trans.)	33-510344	69	*Accessory Speaker Cable	41-3237
22	First I. F. Transformer	32-2286	70	*Accessory Speaker Knob	08334
23	Padder (Sec. 1st I. F. Trans.)	33-230344	71	*Complete Cable and Adapter	41-3234
24	Resistor (3,000 ohms)	33-230344	72	Four-prong Socket	27-6044
25	Padder (Pri. 2nd I. F. Trans.)	33-510344	73	Five-prong Socket	27-6035
26	Second I. F. Transformer	32-2167	74	Six-prong Socket	27-6036
27	Padder (Sec. 2nd I. F. Trans.)	33-510344	75	Seven prong Socket	27-6037
28	Condenser (250 mmfd.)	30-1032	76	*Accessory Speaker Socket	27-6025
29	Resistor (25,000 ohms)	33-325344	77	*Receiver Housing	38-1736
30	Condenser (110 mmfd.)	30-1031	78	Distributor Resistor	33-1113
31	Volume Control (350,000 ohms)	33-5121	79	Generator Condenser	30-4490
32	Condenser (.03 mfd.)	30-4449	80	Interference Condenser	30-4007
33	Resistor (20,000 ohms)	33-320344	81	Fuse	7227
34	Condenser (.01 mfd.)	30-4124	82	Fuse Insulator	27-7729
35	Resistor (1,000,000 ohms)	33-510344	83	Rec. Mtg. Plate (Plymouth)	28-3086
36	Resistor (600 ohms)	33-1212	84	Rec. Mtg. Plate	28-4650
37	Resistor (20,000 ohms)	33-320344	85	(Chrysler-Dodge-DeSoto)	28-4650
38	Resistor (32,000 ohms)	33-332444	86	Tun. & Vol. Knob (Plymouth)	27-4371
39	"B" Choke	32-1281	87	Tone Control Knob (Dodge)	27-4373
40	Resistor (240,000 ohms)	33-424344	88	Tone Control Knob (DeSoto)	27-4375
41	Resistor (490,000 ohms)	33-449344	89	Tone Control Knob (Chrysler)	27-4377
42	Resistor (240,000 ohms)	33-524344	90	Tone Control Knob (Chrysler)	27-4379
43	Condenser (.01 mfd.)	30-4145			
44	Condenser (250 mmfd.)	30-1032			
45	Condenser (2,000 mmfd.)	30-4177			

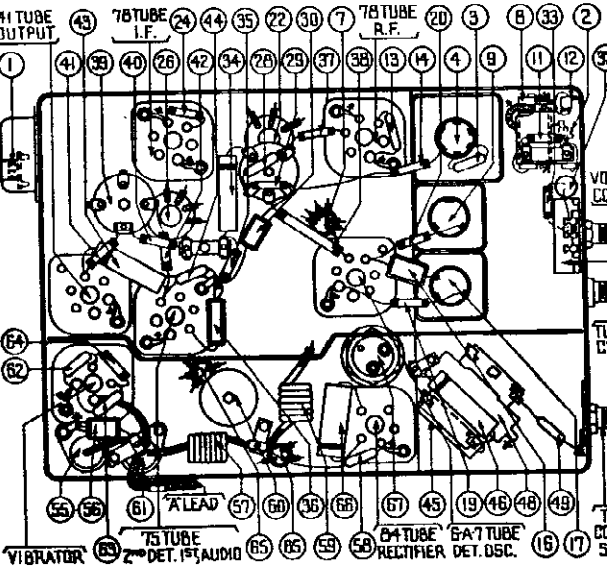


FIGURE 4

A Condenser 73 has been added to the Receiver. One side is connected to the filament of the type 6A7 tube and the side to the ground.
NOTE: The items marked with an asterisk are rarely required for service and in many cases will not be carried in stock local service station. In such cases it will be necessary to order these parts from Philco Transitone, Philadelphia or C

I. F. TRANSFORMERS AND PADDERS

The I. F. transformers are assembled complete with padding condensers.

Both the primary and secondary padders are placed side by side in the top of the transformer shield can. The adjusting screws are accessible thru the holes in the top of the shield. (See Figure 6).

The coil windings terminate in leads instead of terminals or lugs. The color scheme of the leads is given in Figure 5.

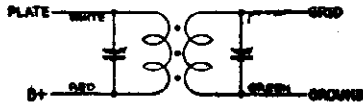


FIGURE 5

If replacements are ever necessary, replace the entire coil assembly, 82-2286 for the first I. F. stage and 82-2107 for the second I. F. stage. Neither the coil nor the padders will be furnished separately. Order only by the above numbers.

ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment

Fully charged heavy duty storage battery or 6-volt power pack, 046 Philco Set Tester, 3164 Padding wrench, 27-7159 Padding screw driver.

General

OUTPUT METER — The output meter must be connected by means of an adapter to the plate of the type 41 output tube and to the Receiver chassis.

SIGNAL GENERATOR — With the Receiver and signal generator set up for operation at the prescribed frequency, turn the Receiver volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the signal generator output lead must be connected to the Receiver housing.

Procedure

I. F. — Set the signal generator at exactly 200 K. C. Connect the generator lead to the grid cap of the 78 I. F. tube in series with a .1 mfd. condenser (without removing the grid cap).

Adjust the secondary screw padder (Ⓢ) on the second I. F. transformer for maximum reading on the output meter. Then adjust the primary screw padder (Ⓣ) for maximum reading. (See Figure 6 for location of padders).

Remove the generator lead from the 78 tube.

Connect the generator lead to the grid cap of the 6A7 tube in series with a .1 mfd. condenser (without removing the grid cap). Adjust the secondary screw padder (Ⓢ) on the first I. F. transformer for maximum reading on the output meter. Then adjust the primary screw padder (Ⓣ) for maximum reading. Readjust padders (Ⓢ) and (Ⓣ) with the generator lead connected to the type 6A7 tube. (See Figure 6 for location of padders).

HIGH FREQUENCY AND R. F. — After padding the first I. F. stage remove the generator lead from the 6A7 tube.

Set the signal generator at 1550 K. C. and then connect the generator lead to the grid cap of the 78 R. F. tube in series with a .1 mfd. condenser (without removing the grid cap).

Using a piece of paper approximately .006" thick as a gauge between the heel of the rotor plates and the stator plates, turn the rotor plates in mesh until they strike against the paper.

With the tuning condenser in this position, adjust the high frequency padder (Ⓢ) and the R. F. padder (Ⓣ) until the maximum reading is obtained on the output meter. This is the true setting for 1550 K. C., 155 on the dial scale.

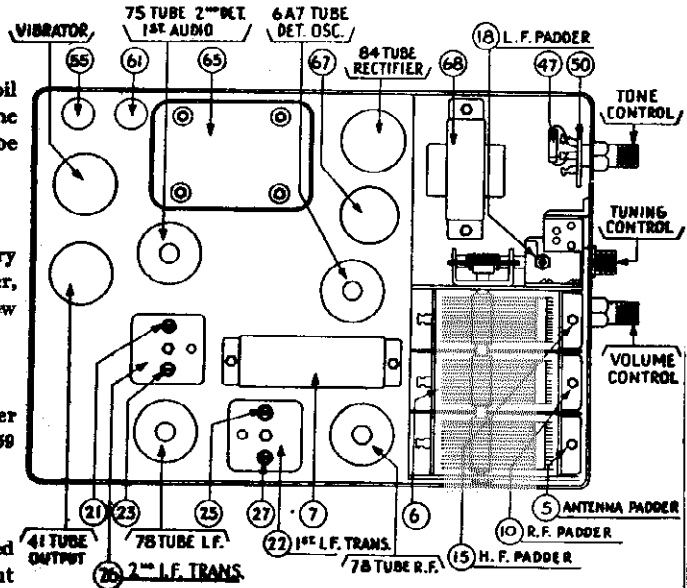


FIGURE 6

LOW FREQUENCY — Turn the tuning condenser plates in mesh to approximately 600 K. C., 60 on the dial scale and set the signal generator at 600 K. C. Roll the tuning condenser and adjust the low frequency padder screw (Ⓢ) for maximum reading on the output meter.

HIGH FREQUENCY READJUSTMENT — Turn the tuning condenser plates out of mesh to 1550 K. C. and set the signal generator at 1550 K. C. Then adjust the high frequency padder (Ⓢ) again for maximum reading on the output meter.

Remove the generator lead from the 78 R. F. tube.

ANTENNA — WHEN PADDING THE ANTENNA STAGE, IT IS EXTREMELY IMPORTANT THAT THE PROPER DUMMY ANTENNA BE CONSTRUCTED AND USED.

Connect the signal generator to the Antenna Cable Assembly (made up of the "Skyway Antenna" lead, Part No. L-2665 lead and a 22 mufd. condenser in series between the lead and the signal generator). Plug the cable into the antenna connector on the end of the Receiver.

Remove the snap button cover over the antenna selector and advance the selector switch to the Skyway antenna position.

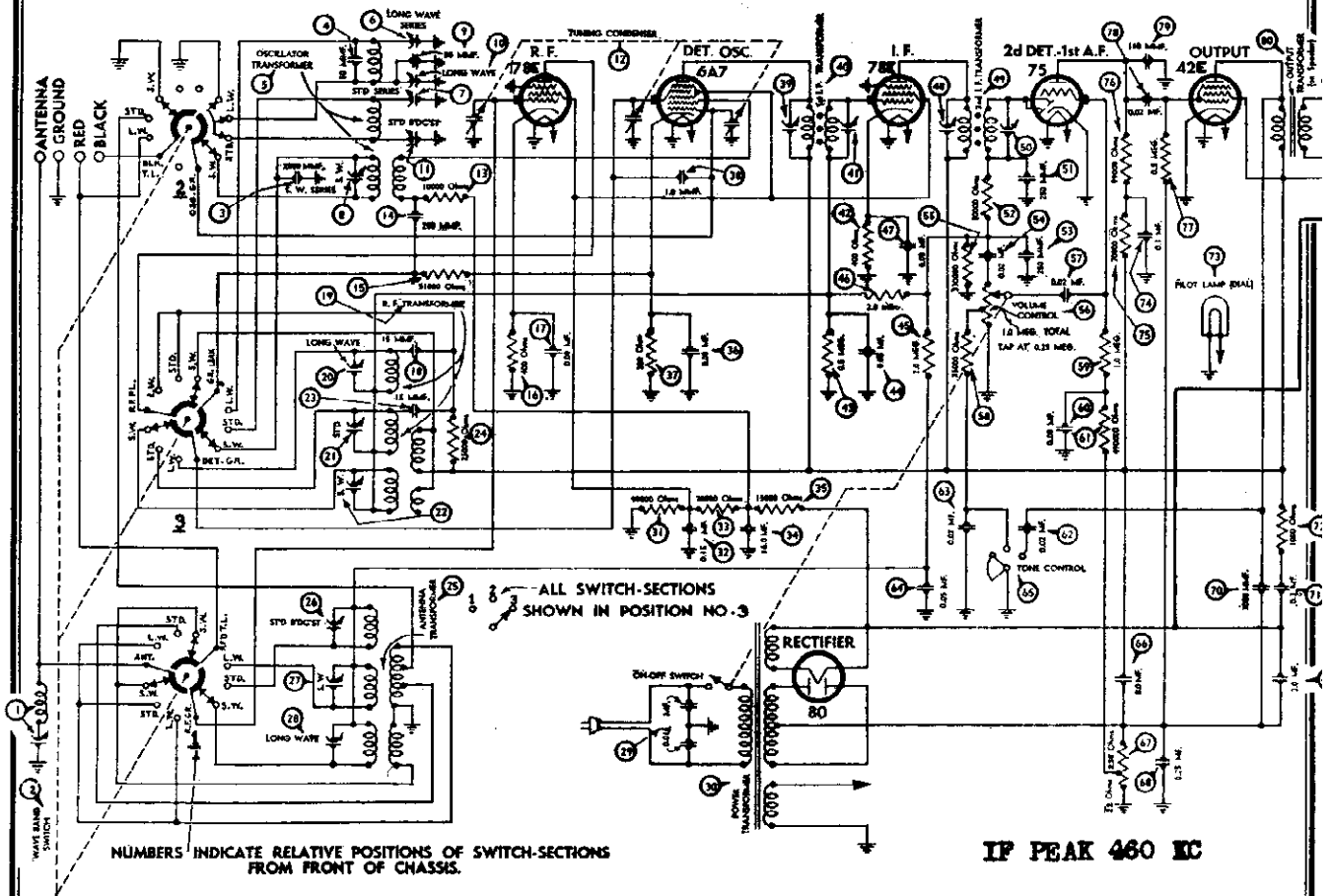
Follow this padding procedure regardless of whether the Receiver is used with the Roadway or with the Skyway antenna.

Turn the tuning condenser to 1400 K. C. and set the generator at 1400 K. C. Adjust the padders (Ⓢ) and (Ⓣ) for the maximum reading on the output meter.

When the antenna stage adjustment is made with the Receiver installed in the car, the antenna lead must be connected to the Receiver in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

PHILCO RADIO & TELEV. CORP.

MODEL 2620
Schematic, Parts



IF PEAK 460 KC

Schematic Number	Description	Part Number	List Price	Schematic Number	Description	Part Number
(1)	Wave Trap	38-6850		(48)	Padder	Part of (49)
(2)	Waveband Switch	42-1107		(49)	2nd I. F. Transformer	32-1647
(3)	Condenser (2900 mmf.)	30-1064		(50)	Padder	Part of (49)
(4)	Condenser (50 mmf.)	30-1029		(51)	Condenser (250 mmf.)	30-1032
(5)	Oscillator Coil	32-1665		(52)	Resistor (50,000 ohms)	6098
(6)	Padder (LONGWAVE LF.)	31-6044		(53)	Condenser (250 mmf.)	30-1032
(7)	Padder (STANDARD LF.)	Part of (6)		(54)	Condenser (0.02 mf.)	30-4215
(8)	Padder	Part of (5)		(55)	Resistor (330,000 ohms)	33-1200
(9)	Condenser (50 mmf.)	30-1029		(56)	Volume Control and Switch	33-5105-F
(10)	Padder	Part of (5)		(57)	Condenser (0.02 mf.)	30-4215
(11)	Padder	Part of (5)		(58)	Resistor (25,000 ohms)	33-1013
(12)	Tuning Condenser Assembly	31-1526		(59)	Resistor (1.0 meg.)	33-1096
(13)	Resistor (10,000 ohms)	4412		(60)	Condenser (0.09 mf.)	Part of (16)
(14)	Condenser (250 mmf.)	30-1032		(61)	Resistor (490,000 ohms)	6097
(15)	Resistor (51,000 ohms)	6098		(62)	Condenser (0.02 mf.)	Part of (65)
(16)	Condenser (0.09 mf.)	4989-DG		(63)	Condenser (0.02 mf.)	30-4215
(17)	Resistor (400 ohms)	33-3016		(64)	Condenser (0.05 mf.)	30-4020
(18)	Condenser (1.5 mmf.)			(65)	Tone Control	30-4332
(19)	R. F. Transformer	32-1666		(66)	Condenser (Electrolytic 8.0 mf.)	Part of (69)
(20)	Padder	Part of (19)		(67)	B.C. Resistor (257 ohms)	33-5418
(21)	Padder	Part of (19)		(68)	Condenser (0.25 mf.)	30-4146
(22)	Padder	Part of (19)		(69)	Condenser (Electrolytic 8.0-8.0 mf.)	30-2079
(23)	Condenser (1.5 mmf.)			(70)	Condenser (3,000 mmf.)	30-4042
(24)	Resistor (25,000 ohms)	33-1013		(71)	Condenser (0.3 mf.)	6287-DU
(25)	Antenna Transformer	32-1664		(72)	Resistor (1,000 ohms)	5837
(26)	Padder	Part of (25)		(73)	Pilot Lamp	34-2084
(27)	Padder	Part of (25)		(74)	Condenser (0.1 mf.)	30-4122
(28)	Padder	Part of (25)		(75)	Resistor (70,000 ohms)	5385
(29)	Condenser (0.015-0.015 mf.)	3793-DG		(76)	Resistor (39,000 ohms)	4411
(30)	Power Transformer (110 V., AC)	32-7381		(77)	Resistor (0.5 meg.)	6097
(31)	Resistor (99,000 ohms)	4411		(78)	Condenser (0.02 mf.)	30-4113
(32)	Condenser (0.15 mf.)	30-4191		(79)	Condenser (110 mmf.)	30-1031
(33)	Resistor (20,000 ohms)	6649		(80)	Output Transformer	32-7019
(34)	Condenser (Electrolytic 16.0 mf.)	30-2118		(81)	Replacement Speaker Cone	36-3157
(35)	Resistor (15,000 ohms)	5718		(82)	Field Coil Assembly	36-3579
(36)	Condenser (0.09 mf.)	30-4122			Dial	27-5128
(37)	Resistor (300 ohms)	30-3010			Spring and Clamp	28-2837
(38)	Condenser (1.0 mmf.)				Hub and Set Screw Assembly	31-1515
(39)	Padder	Part of (40)			Knob (Station Selector)	27-4206
(40)	1st I. F. Transformer	32-1646			Knob (Fine Tuning)	27-4207
(41)	Padder	Part of (40)			Knob (Volume and Tone)	27-4208
(42)	Resistor (400 ohms)	33-3016			Resel (Waveband)	27-4219
(43)	Resistor (0.5 meg.)	6097			Resel Gasket	28-8188
(44)	Condenser (0.05 mf.)	30-4020			Resel Frame Gasket	27-7980
(45)	Resistor (2.0 meg.)	33-1025			Resel Glass	27-7971
(46)	Resistor (2.0 meg.)	33-1025				37-8006
(47)	Condenser (0.09 mf.)	30-4122-S				

MODEL 2620
 Socket, Trimmers
 Chassis, Alignment

PHILCO RADIO & TELEV. CORP.

TYPE CIRCUIT: Superheterodyne, with preselector R.F. amplifier and pentode output (3 watts); built in connections for *Philco All-Wave Aerial*, aerial selector built into and operated by waveband switch.

POWER SUPPLY: Alternating current, voltage and frequency as specified on nameplate of chassis.

TUBES USED: 1 type 78E, R. F.; 1 type 6A7, 1st detector and oscillator; 1 type 78E, I. F.; 1 type 75, detector, AVC, and 1st audio; 1 type 42E, output; 1 type 80, rectifier.

WAVE BANDS: Three (1) long wave (weather); (2) standard, (with some police); (3) short wave.

COVERAGE OF EACH BAND: Band 1, 115 to 350 K.C. Band 2, 540 to 1720 K.C.; Band 3, 5.7 to 18.0 MC.

TUNING DRIVE: Two-speed gear drive, ball bearing, 50 to 1 ratio for slow tuning.

STONE CONTROLS: 3 position, with bass compensation effective in first position.

INTERMEDIATE FREQUENCY: 460 K.C.

POWER CONSUMPTION: 60 watts.

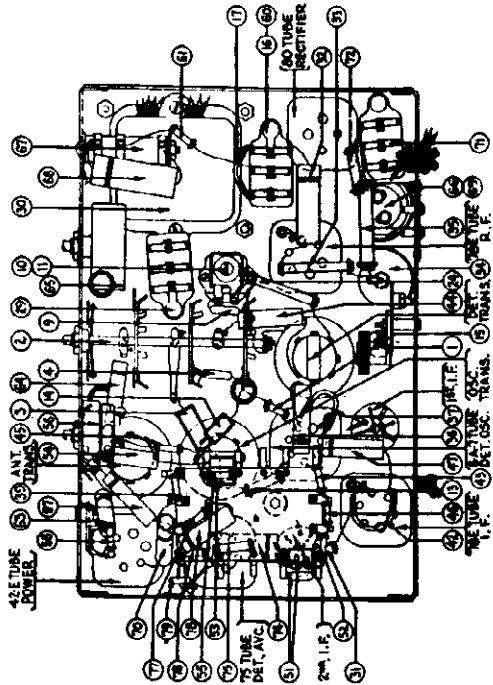


FIGURE 2

generator low at all times to insure proper peaking of the transformers.

WAVE TRAP—Connect the Signal Generator antenna and ground leads to the antenna and ground posts of the set. Replace the grid clip on the 6A7 tube cap. With the signal generator operating at 460 K.C. and the set controls adjusted as for I. F., adjust wavetrap (1) until a minimum reading is obtained in the output meter.

SHORT-WAVE: Turn wave band switch to extreme right (position 3) and set dial at 18.0 meg. Set Signal Generator at 18.0 meg. Connect a shunt condenser across the oscillator section of the gang and tune the shunt for maximum output. Adjust condensers (2) and (3) for maximum output. Remove shunt condenser and adjust condenser (4) for correct calibration. Check the alignment by tuning the set dial at approximately (1.5) meg. for the image frequency.

STANDARD: Turn wave switch to Standard (position 2) and set dial at 1500 K. C. Set Signal Generator at 1500 K. C., adjust condensers (5), (6) and (7) for maximum. Turn dial of set and signal generator to 660 K. C. and adjust condenser (8) for maximum output, retune (9) at 1500 K. C.

LONG WAVE: (Weather) — Turn waveband switch to position 1 (left) (longwave). Set dial at (85) and signal generator at 350 K. C. Adjust condensers (10), (11) and (12) (oscillator, R. F., and Antenna Longwave) for maximum reading.

Turn dial to 17, signal generator to 170 and adjust condenser (13) (longwave series) for maximum reading.

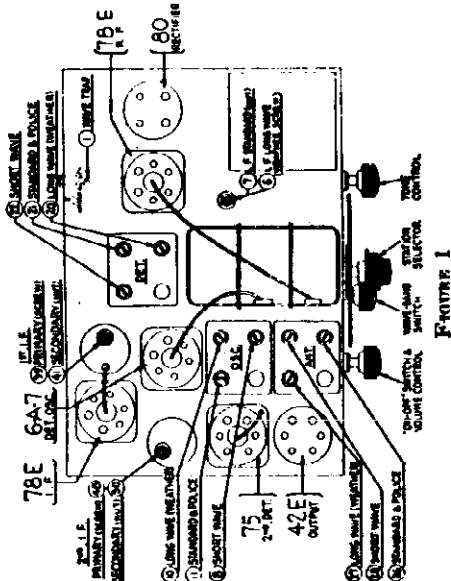


FIGURE 1

ADJUSTING COMPENSATING CONDENSERS

Adjustment of compensating condensers in Model 2620 requires an accurate signal generator covering long-wave, standard wave, police, and short-wave frequencies. The PHILCO Model 088 All-Wave Signal Generator, having a continuous range of from 100 to 20,000 K.C., is ideal for this purpose.

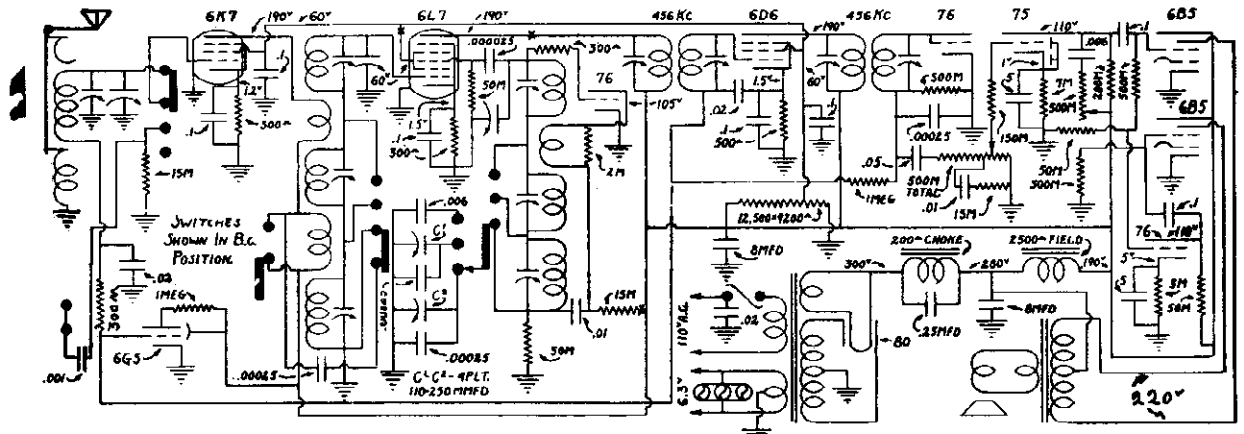
An output meter is also needed. PHILCO Model 025 Circuit Tester includes a high grade output meter.

Philco No. 3161 fibre wrench and No. 27-7069 fibre-handled screwdriver complete the equipment needed for making these adjustments. The location of the various compensating condensers is shown in Fig. 1. Connect the output meter to the plate and cathode contacts of the 42E output tube (using the adapters provided with the "025") and set it at the 6-30 volt range.

I. F. — Connect the antenna lead from the 088 Signal Generator to the grid cap of the 78E, I. F. amplifier (having removed the grid clip from the tube), and the ground lead to the ground post on the chassis. Set the Signal Generator (088) at 460 K.C., volume control of set full on, tone control counter-clockwise, wave band switch in No. 2 position, and condenser gang all the way in. Adjust the signal generator attenuator for approximately 1/4 scale reading on the output meter, now adjust condensers (2) and (3) for maximum reading of the output meter. Remove the signal generator antenna lead from the grid cap (replacing grid clip) and connect to the 6A7 grid cap. Repeat procedure, this time tuning condensers No. (5) and (6) for maximum output reading. Care should be taken to keep the signal input from the signal

PILGRIM ELECTRIC CORP.

MODELS NT, NTE
MODELS NTH, NTHE
Schematics, Voltage

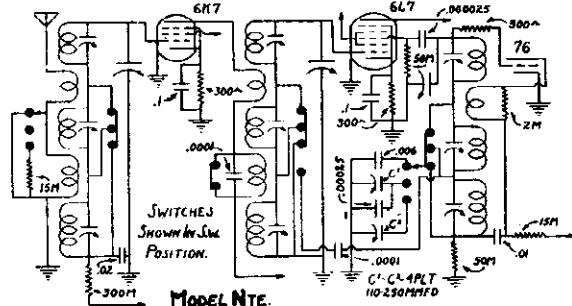


IF PEAK 456 KC

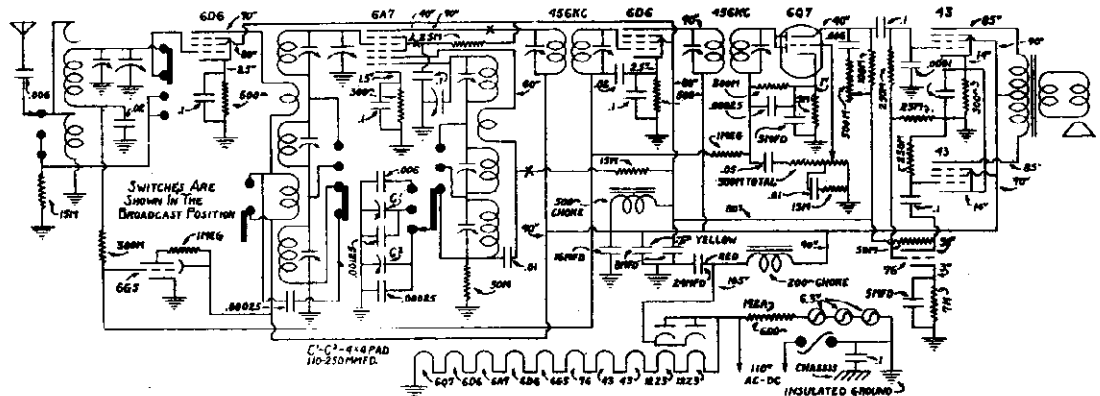
MODEL NT

902,001 AND UP. *Blum.*

ALL VOLTAGES MEASURED
WITH 1000- PER VOLT METER.
ALL OTHER CONSTANTS ON
MODEL NTE SAME AS MODEL NT.



MODEL NTE.

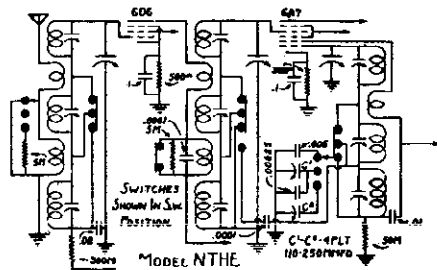


IF PEAK 456 KC

MODEL NTH

204,001 AND UP. *Blum.*

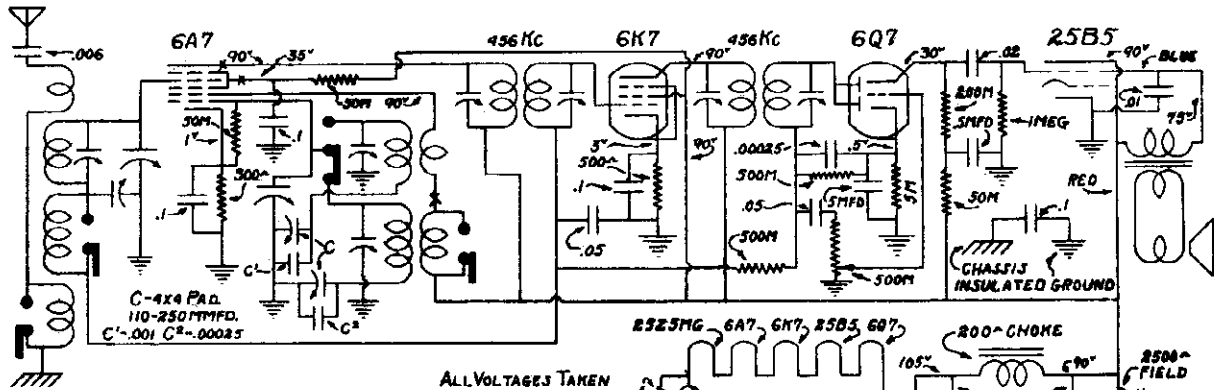
MODEL NTHE-ADDITIONAL PARTS-.00008 MIC. 6Q7 GRID TO GROUND.
.0005 MIC. 6Q7 PLATE TO GROUND. 150M. 1/2 WATT CHASSIS
RESISTOR IN SERIES WITH 6Q7 GRID LEAD. .517FD-150. INS. GND TO



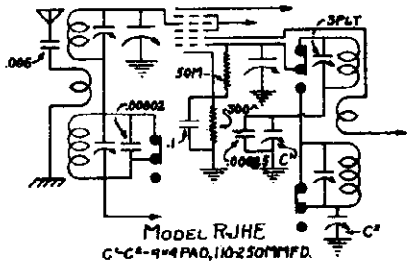
MODEL NTHE

MODELS RJ, RJE
 MODELS RJH, RJHE
 Schematics, Voltage

PILGRIM ELECTRIC CORP.

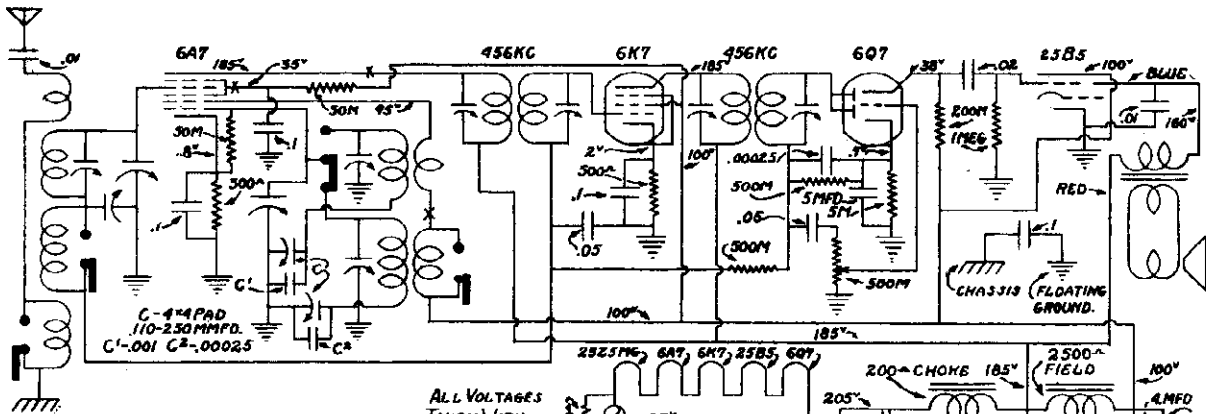


ALL VOLTAGES TAKEN WITH 1000 PER VOLT METER. ALL OTHER CONSTANTS ON MODEL RJHE SAME AS MODEL RJH.

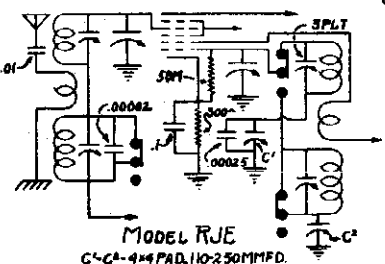


MODEL RJHE
 C-C4-4X4 PAD, 110-250M MFD.

MODEL RJH
 300,001 AND UP
 EUM.



ALL VOLTAGES TAKEN WITH 1000 PER VOLT METER. ALL OTHER CONSTANTS ON MODEL RJE SAME AS MODEL RJ.

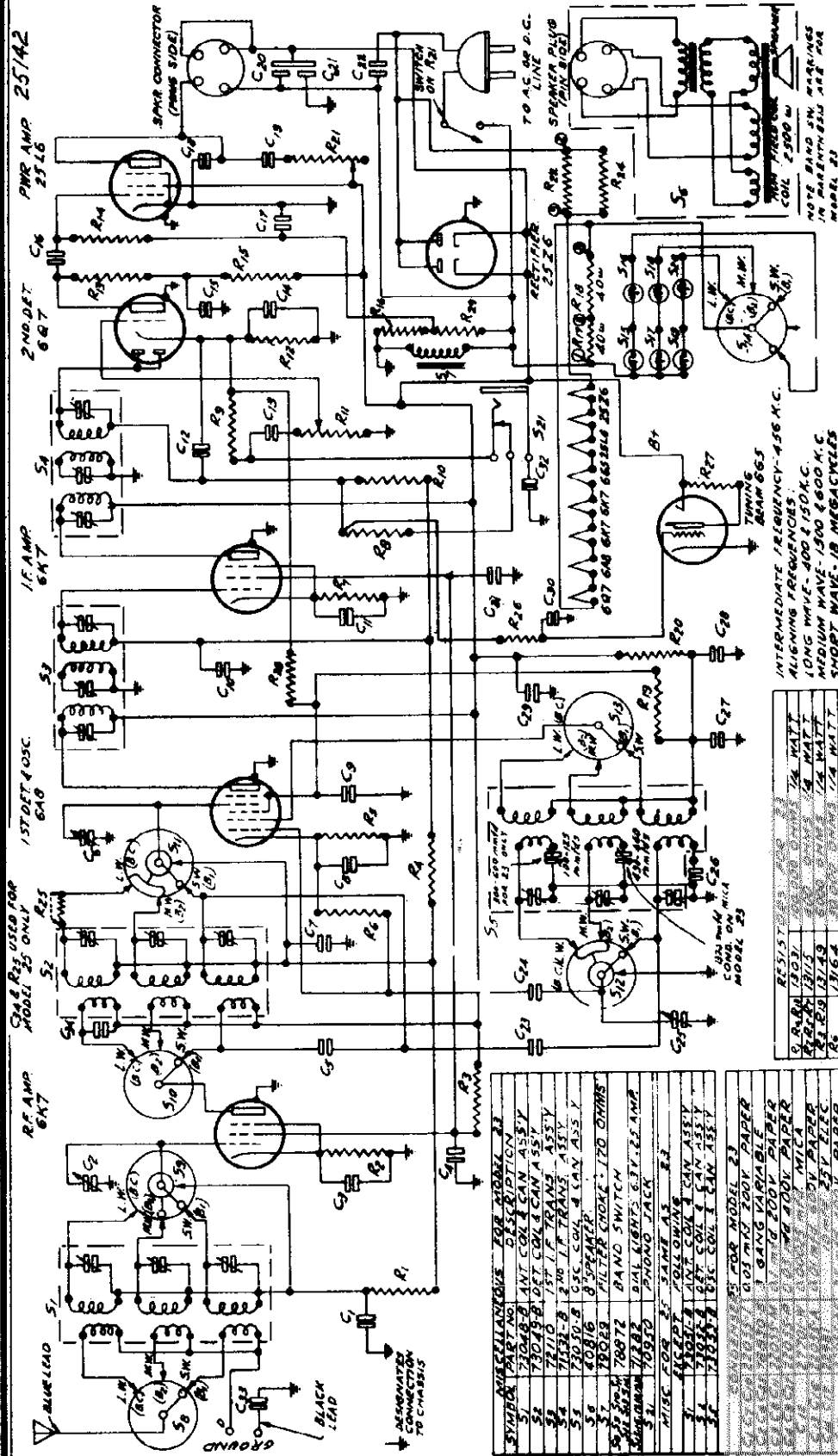


MODEL RJE
 C-C4-4X4 PAD, 110-250M MFD.

MODEL RJ
 300,001 AND UP
 EUM.

MODELS 23, P23, 25, P25
Schematic, Parts

PILOT RADIO CORP.



FOR ALIGNMENT, SEE INDEX

INTERMEDIATE FREQUENCY - 456 K.C.
ALIGNING FREQUENCIES:
LONG WAVE - 400 & 150 K.C.
MEDIUM WAVE - 1300 & 600 K.C.
SHORT WAVE - 18 MEGACYCLES



PARTS LIST (BOTTOM)
NOTE: FIGURES IN CIRCLES REFER TO PART NO.

SYMBOL	PART NO.	DESCRIPTION
	51	500 OHM 1/2 WATT RES
	52	100 OHM 1/2 WATT RES
	53	100 OHM 1/2 WATT RES
	54	100 OHM 1/2 WATT RES
	55	100 OHM 1/2 WATT RES
	56	100 OHM 1/2 WATT RES
	57	100 OHM 1/2 WATT RES
	58	100 OHM 1/2 WATT RES
	59	100 OHM 1/2 WATT RES
	60	100 OHM 1/2 WATT RES
	61	100 OHM 1/2 WATT RES
	62	100 OHM 1/2 WATT RES
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	67	100 OHM 1/2 WATT RES
	68	100 OHM 1/2 WATT RES
	69	100 OHM 1/2 WATT RES
	70	100 OHM 1/2 WATT RES
	71	100 OHM 1/2 WATT RES
	72	100 OHM 1/2 WATT RES
	73	100 OHM 1/2 WATT RES
	74	100 OHM 1/2 WATT RES
	75	100 OHM 1/2 WATT RES
	76	100 OHM 1/2 WATT RES
	77	100 OHM 1/2 WATT RES
	78	100 OHM 1/2 WATT RES
	79	100 OHM 1/2 WATT RES
	80	100 OHM 1/2 WATT RES
	81	100 OHM 1/2 WATT RES
	82	100 OHM 1/2 WATT RES
	83	100 OHM 1/2 WATT RES
	84	100 OHM 1/2 WATT RES
	85	100 OHM 1/2 WATT RES
	86	100 OHM 1/2 WATT RES
	87	100 OHM 1/2 WATT RES
	88	100 OHM 1/2 WATT RES
	89	100 OHM 1/2 WATT RES
	90	100 OHM 1/2 WATT RES
	91	100 OHM 1/2 WATT RES
	92	100 OHM 1/2 WATT RES
	93	100 OHM 1/2 WATT RES
	94	100 OHM 1/2 WATT RES
	95	100 OHM 1/2 WATT RES
	96	100 OHM 1/2 WATT RES
	97	100 OHM 1/2 WATT RES
	98	100 OHM 1/2 WATT RES
	99	100 OHM 1/2 WATT RES
	100	100 OHM 1/2 WATT RES

PILOT RADIO CORPORATION
1535 LEXINGTON CITY, N. Y. U. S. A.
Schematic, Parts
Model No. 25142
Checked by: [Signature]
Approved by: [Signature]

THIS PRINT SUPERSEDES ALL OTHERS
PRIOR TO [Redacted]

20 SERIES
FOR ALIGNMENT, SEE INDEX

MODEL S 23, P23, 25, P25
MODEL S G-44, G-45
Alignment

PILOT RADIO CORP.

Range, Model 23 and P-23
16 - 555 m. (18,800 - 5,400 kc.)

SERVICE INFORMATION FOR PILOT MODELS 23, 25, P-23, and P-25

REMOVAL OF CHASSIS FROM CABINET:
To remove the chassis from the cabinet proceed as follows:

Be certain that the line cord is removed from the power outlet socket.
Remove the "dip-on" knobs and felt washers from the controls and loosen the set screw on the tuning knob.
Remove the speaker plug from the socket at the rear of the chassis. Models P-23 and 25 have the socket mounted on the speaker.
Remove the four mounting screws, located underneath the chassis.

Remove the tuning beam plug from the socket at the front of the chassis.
When removing Models P-23 and P-25 from the cabinet remove the photo-radio switch from the motor board, and disconnect wires going to matching transformer. Also disconnect line and ground leads to phono motor.

REALIGNMENT: Should the receiver require re-alignment, the procedure outlined below should be followed. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.
Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the rear of the chassis.

The R. F. alignment trimmer condensers are mounted on the side of the coil shield.
I. F. ALIGNMENT: When aligning the Intermediate Frequency Amplifier, the external trimmer must be set at 476 kc. The Band Selector Switch should be in the "Broadcast" position, and the tuning condenser should be set at maximum capacity. Connect the "antenna" lead of the external oscillator to the control grid of the type 6K7 tube in the I. F. Amplifier stage through a 1 mfd. fixed condenser. Connect the "ground" lead of the external oscillator to the receiver ground lead. The I. F. alignment capacitors are located at the side of the shielded I. F. Transformers. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator lead from the type 6K7 I. F. amplifier tube and connect it in the same manner to the control grid at the top of the type 6A8 tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations use the least possible input to prevent broadening of the resonance peak.
In order to obtain the most accurate realignment of the I. F. amplifier, it is essential to repeat the alignment process in both I. F. Units.
BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads. Insert a 200 mfd. condenser in series with the antenna lead. Set the Band Selector Switch in the "Broadcast" position and place the tuning control pointer at the 1500 kc. mark. Adjust the broadcast band oscillator trimmer.

BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads. Insert a 200 mfd. condenser in series with the antenna lead. Set the Band Selector Switch in the "Broadcast" position and place the tuning control pointer at the 1500 kc. mark. Adjust the broadcast band oscillator trimmer.

Range, Model 25 and P-25
16 - 51 m. (18,800 - 5,880 kc.)
181 - 555 m. (1,650 - 540 kc.)
731 - 2140 m. (410 - 140 kc.)

Next adjust the interstage alignment trimmer for maximum response. Finally adjust the antenna section trimmer in the same manner.

Next adjust the 600 kc. padder condenser, located on the top of the oscillator coil. Set the external oscillator at 600 kc. Rotate the receiver tuning control until resonance is indicated. Then rock the tuning control back and forth about this resonance position, and at the same time adjust the padder condenser for the highest resonance peak.

Now repeat the 1500 kc. trimmer adjustment, following in every detail the procedure previously described.

ALIGNMENT OF THE SHORT WAVE BANDS:
The procedure in aligning the short wave bands is identical with that for the broadcast band, with the exception of the adjustment of the padder condenser. Insert a 400 ohm non-inductive resistor in series with the antenna lead. The alignment frequencies are as follows:
Band 2: 90 Meters—(6,000 kc.)
Band 1: 16.6 Meters—(18,000 kc.)

When aligning Band 2, set the Band Selector Switch in the position marked "Band 2". Set the tuning control pointer at 90 meters. Adjust the oscillator alignment capacitor on Band 2 for maximum output. Next adjust the interstage and antenna section alignment capacitors for maximum output.

To align Band 1, set the Band Selector Switch in the position marked "Band 1". Set the tuning control pointer at the 16.6 meter mark. Set the external oscillator at 18.6 meters. Adjust the oscillator section alignment capacitor on Band 1 for maximum output.

Proceed next to align the interstage section of Band 1. In doing this, it is essential to rock the tuning control back and forth about the resonance position and at the same time to adjust the trimmer for the highest resonance peak. Next align the antenna section for maximum sensitivity.

LONG WAVE MODEL 25

The above alignment positions refer to the Model 23 only, which is calibrated in frequency. The alignment points for the Model 25, which is calibrated in meters only, is as follows:

Long Wave Align at 750 meters
Pad at 2,000 meters.
Broadcast Pad at 200 meters.
Band 1 Align at 17 meters.

The Long Wave alignment procedure is similar to that for the Broadcast. A 200 mfd. condenser should be used in series with the antenna lead in aligning this band.

CAUTION: When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

Model G-44

16.4 - 51 m. (18,300 - 5,900 kc.)
48 - 146 m. (6,250 - 2,050 kc.)
187 - 555 m. (1,600 - 540 kc.)

REMOVAL OF CHASSIS FROM CABINET:

To remove the chassis from the cabinet proceed as follows:
Be certain that the battery cable is removed from the battery compartment.
Remove the "dip-on" knobs and felt washers from the controls and loosen the set screw on the tuning knob.
Remove the speaker plug from the socket at the rear of the speaker.
Remove the four mounting screws, located underneath the chassis.

REALIGNMENT: Should the receiver require re-alignment, the procedure outlined below should be followed. In the absence of an external oscillator, use the tuning control of the receiver. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.
Before connecting the chassis to the battery, reconnect the speaker cable in its socket at the rear of the chassis.

I. F. ALIGNMENT: When aligning the Intermediate Frequency Amplifier, the external trimmer must be set at 476 kc. The Band Selector Switch should be in the "Broadcast" position, and the tuning condenser should be set at maximum capacity. Connect the "antenna" lead of the external oscillator to the control grid of the type 1D7G tube in the I. F. Amplifier stage through a 1 mfd. fixed condenser. Connect the "ground" lead of the external oscillator to the receiver ground lead. The I. F. alignment capacitors are located at the top of the shielded I. F. Transformers. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator leads from the type 1D7G I. F. Amplifier tube and connect it in the same manner to the control grid at the top of the type 1C7G tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations use the least possible input to prevent broadening of the resonance peak.
In order to obtain the most accurate realignment of the I. F. Amplifier, it is essential to repeat the alignment process in both I. F. Units with the external oscillator leads connected across the control grid of the 1C7G tube.

WAVE TRAP ADJUSTMENT: With the oscillator still set at 16 kc., connect the oscillator to the antenna through a 200 mfd. condenser. Then adjust the wave trap condenser for maximum output on the output meter. The trimmer for the wave trap condenser is located underneath the gang condenser.

LOCATION OF TRIMMERS: The trimmers are mounted on the rear of the antenna and oscillator coil shield.
The antenna coil and trimmer assembly is mounted on the rear right corner of the chassis. The oscillator assembly is to the left of the antenna assembly.

In Model G-44 the Broadcast trimmers (oscillator and antenna) are the top trimmers.
The middle trimmer are for B1 and the bottom trimmers for B2.

The top trimmers in Model G-44 are for the long wave band. The middle trimmers are for the medium wave band and the bottom trimmers for the short wave band. The padding condenser adjusting screw for 600 kc. is accessible through the hole at the rear of the chassis of the G-44 Model. On the G-45 Model this screw is the padding adjustment for the long wave band and the hexagon adjusting through which this screw passes is the padding adjustment for medium wave band.

Model G-45

16.4 - 51 m. (18,900 - 5,900 kc.)
187 - 555 m. (1,600 - 540 kc.)
740 - 2,220 m. (405 - 135 kc.)

(MODEL G-45 IS SOLD OUTSIDE THE U. S. A. ONLY)

BROADCAST ALIGNMENT: After the I. F. Amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads, through a 200 mfd. condenser. Set the Band Switch in the "Broadcast" position and place the tuning control pointer at the 1500 kc. mark. Adjust the broadcast band oscillator trimmer in the same manner.

Next adjust the 600 kc. padder condenser. Set the external oscillator at 600 kc. Rotate the receiver tuning control until resonance is indicated. Then rock the tuning control back and forth about this resonance position, and at the same time adjust the padder condenser for the highest resonance peak.

Now repeat the 1500 kc. trimmer adjustment, following in every detail the procedure previously described.

ALIGNMENT OF THE SHORT-WAVE BANDS:
The procedure in aligning the short-wave bands is identical with that for the broadcast band with the exception of the adjustment of the padder condenser which is of fixed value and requires no adjustment. The alignment frequency is 16.6 Meters—(18,000 kc.)

Turn the Band Switch to the right. Tune the external oscillator to 16.6 meters. Tune the receiver so that the dial pointer is in a position coincidental with the 16.6 meter indication on the dial scale. Adjust the short wave oscillator trimmer for maximum response. Next adjust the signal circuit trimmer for maximum resonance. Repeat the adjustments to assure correct alignment, rocking the gang condenser to right or left for maximum gain.
Model G-44 is aligned in the same manner at 6,000 kc. with the switch in Band 2 position.

LONG WAVE ALIGNMENT: Procedure in the Model G-45 is similar to the Broadcast alignment of that receiver. Align at 375 kc. Adjust the ladder at 150 kc. Should it be necessary to remove the band switch assembly, it is advisable to realign the receiver after re-assembly.

LONG-WAVE BAND: Model G-45 (sold only outside the U. S. A.) has a third band covering 740 to 2,220 meters. Broadcast stations operating on long waves have a limited range, and are located chiefly in Europe. Hence, Model G-45 is not sold in the U. S. A. To tune the long wave stations, simply turn the Band Switch to the third position.

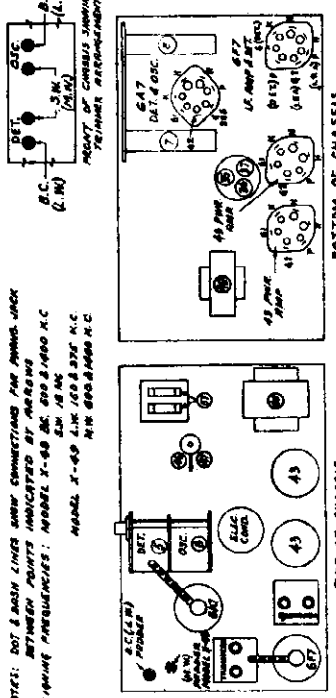
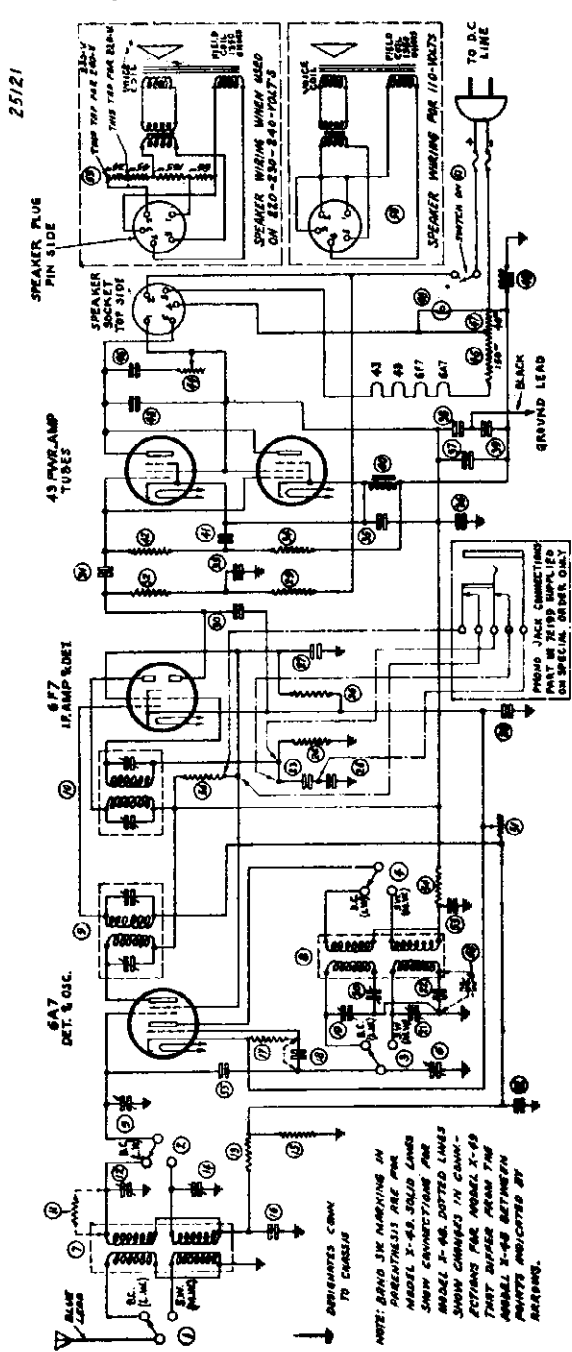
CAUTION: When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

ANTENNA: While this set will give you amazing results with a few feet of wire for an antenna, you will be well repaid for the slight expense of a good antenna by the improvement in broadcast quality, the increase of distance on foreign short waves, and the reduction of interference.

Pilot engineers recommend the doublet antenna. When using a doublet, connect one lead-in wire to terminal "A" at the rear of the set, and the other one to terminal "D". If you use an ordinary single-wire antenna, connect the antenna to the "A" terminal on the set. Then short the "D" and "G" terminals and connect to a good ground. If you are in doubt about the best antenna for your location, consult your Pilot dealer. He is best able to assist you. Do not depend upon self-applied "experts".

MODELS X-48, X-49
Schematic, Socket
Trimmers, Parts

PILOT RADIO CORP.



NOTES: DOT & DASH LINES SHOW CONNECTIONS FOR PHONO JACK BETWEEN POINTS INDICATED BY ARROWS.
ALTERNATE FREQUENCIES: MODEL X-48 20, 40, 80, 1600 K.C.
MODEL X-49 20, 40, 80, 1600 K.C.
MODEL X-48 16, 32, 64, 128, 256 K.C.
MODEL X-49 16, 32, 64, 128, 256 K.C.

MODEL X48 SUPERHETERODYNE
Range: 16-52 Meters (18,800-5,700 kc.)
178-550 Meters (1,680-545 kc.)

MODEL X49 SUPERHETERODYNE
Range: 178-550 Meters (1,680-545 kc.)
789-2,142 Meters (380-140 kc.)

(Sold in the European area only)

IF PEAK 456 KC

A good antenna is most essential for the reception of signals from stations located thousands of miles from the receiver. The flat top portion of the antenna should be placed as high above the ground and grounded objects as possible. Both lead-in wire and antenna should be located as far from sources of man-made static as possible. Automobile ignition systems, telephone communication lines, electric oil burner installations, motor and trolley power lines are some of the more common offenders of this nature. The installation of a good antenna requires a small amount of additional labor, but the extra effort is always rewarded with improved reception with a minimum of static interference. A properly installed antenna is almost as good as an extra stage of tuned radio frequency amplification.

It is advisable to place the radio receiver close to the incoming lead-in, as frequently an extension about the interior of the house picks up a considerable amount of static along with the desired signal. The illustration shows how to install a lightning arrester if one is desired.

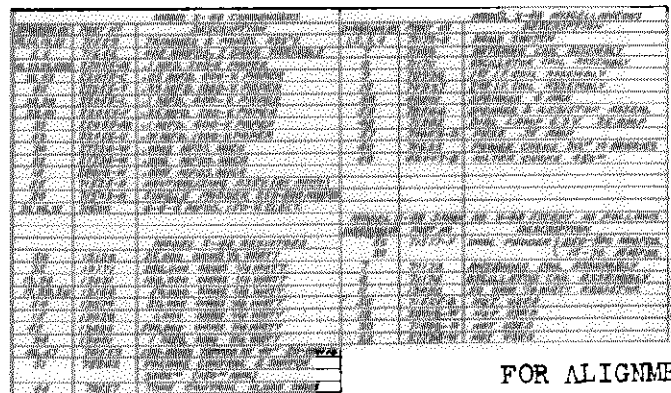
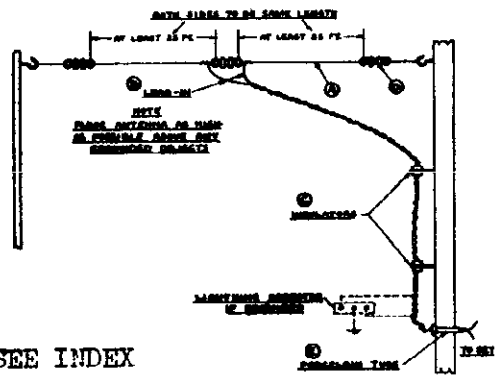
The kit contains two 75 ft. lengths of No. 14 wire. The illustration suggests the use of at least 25 ft. per section. Use as much of the wire up to 75 ft. per section as your location will permit. The letters at the right form a reference to the parts as arranged in the illustration.

Method No. 1: Join the ends of both leads together and connect to antenna terminal of set.
Method No. 2: Connect one wire to antenna lead of set; connect the other wire to the ground lead. Use the method on your set which gives the best performance.

CONTENTS OF PILOT KIT

- 2—75 ft. lengths of No. 14 enameled, copper wire.....A
- 100 ft. twisted pair lead-in wireB
- 2—Insulated stand-off insulatorsC
- 6—Porcelain insulatorsD
- 2—Porcelain tubesD
- 6—Insulated staples

ALL-WAVE ANTENNA SYSTEM

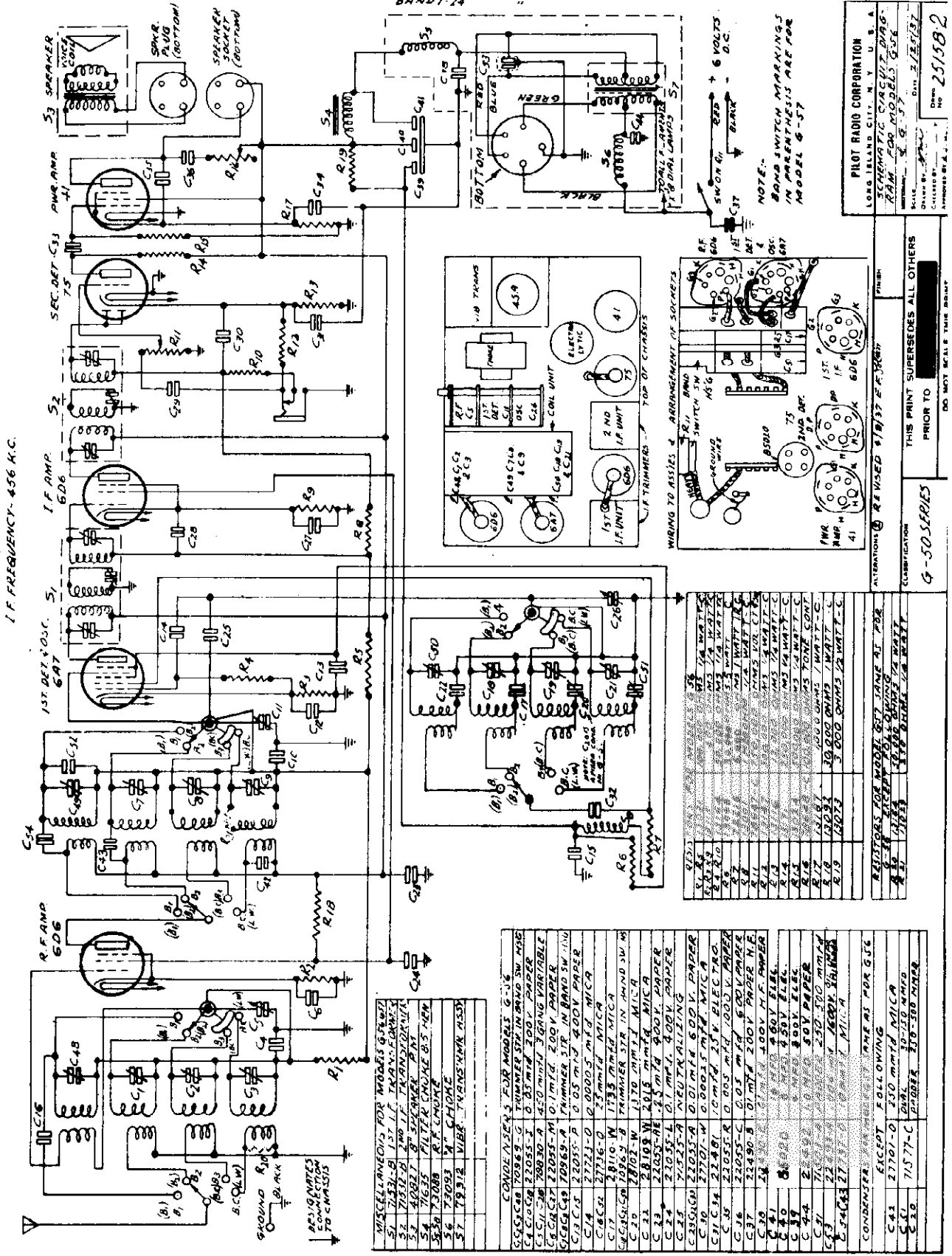


FOR ALIGNMENT, SEE INDEX

PILOT RADIO CORP.

25158-2

ALIGNING FREQUENCIES
BROAD CAST, 1500 & 600 KC
BAND 2 - 14 MEGACYCLES
BAND 3 - 6 " "
BAND 1 - 24 " "

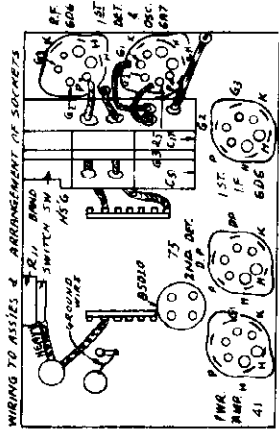
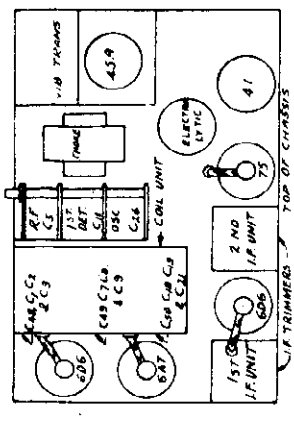


I.F. FREQUENCY - 456 K.C.

NOTE:
BAND SWITCH MARKINGS
IN PARENTHESES ARE FOR
MODEL G-57

SW ON 61
RED + 6 VOLTS
BLACK -

TOTAL 4 LAMPS S7



CONDENSERS FOR MODELS G-56 & G-57

C1	500 P.F.
C2	500 P.F.
C3	500 P.F.
C4	500 P.F.
C5	500 P.F.
C6	500 P.F.
C7	500 P.F.
C8	500 P.F.
C9	500 P.F.
C10	500 P.F.
C11	500 P.F.
C12	500 P.F.
C13	500 P.F.
C14	500 P.F.
C15	500 P.F.
C16	500 P.F.
C17	500 P.F.
C18	500 P.F.
C19	500 P.F.
C20	500 P.F.
C21	500 P.F.
C22	500 P.F.
C23	500 P.F.
C24	500 P.F.
C25	500 P.F.
C26	500 P.F.
C27	500 P.F.
C28	500 P.F.
C29	500 P.F.
C30	500 P.F.
C31	500 P.F.

MISCELLANEOUS PARTS FOR MODELS G-56 & G-57

S1	5Y4
S2	6X4
S3	6AR5
S4	6AV6
S5	6BE6
S6	6BD6
S7	6BE6

CONDENSERS FOR MODELS G-56 & G-57

C1	500 P.F.
C2	500 P.F.
C3	500 P.F.
C4	500 P.F.
C5	500 P.F.
C6	500 P.F.
C7	500 P.F.
C8	500 P.F.
C9	500 P.F.
C10	500 P.F.
C11	500 P.F.
C12	500 P.F.
C13	500 P.F.
C14	500 P.F.
C15	500 P.F.
C16	500 P.F.
C17	500 P.F.
C18	500 P.F.
C19	500 P.F.
C20	500 P.F.
C21	500 P.F.
C22	500 P.F.
C23	500 P.F.
C24	500 P.F.
C25	500 P.F.
C26	500 P.F.
C27	500 P.F.
C28	500 P.F.
C29	500 P.F.
C30	500 P.F.
C31	500 P.F.

PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y. U. S. A.
SCHEMATIC CIRCUIT DIAG.
FOR MODELS G-56
& G-57
DATE 2/2/37

PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y. U. S. A.
SCHEMATIC CIRCUIT DIAG.
FOR MODELS G-56
& G-57
DATE 2/2/37

PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y. U. S. A.
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& G-57
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LONG ISLAND CITY, N. Y. U. S. A.
SCHEMATIC CIRCUIT DIAG.
FOR MODELS G-56
& G-57
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PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y. U. S. A.
SCHEMATIC CIRCUIT DIAG.
FOR MODELS G-56
& G-57
DATE 2/2/37

MODELS X-48, X-49
Voltage, Alignment
MODELS G-56, G-57
Alignment

PILOT RADIO CORP.

Model G-56
Four Tuning Bands Cover 12.4-566 m. (24,200-530 kc.)
Model G-57

Four Tuning Bands: 12.4-32.5 meters (24,200-9,200 kc.)—20.5-61 meters (14,600-4,900 kc.)
182-566 meters (1,650-530 kc.)—755-2,300 meters (397-130 kc.)
REMOVAL OF CHASSIS FROM CABINET:

To remove the chassis from the cabinet proceed as follows:

Disconnect the battery from the receiver.
 Remove the "aligner" knobs and felt washers from the controls on the chassis.
 Remove the speaker plug from the socket at the rear of the chassis.

Remove the four mounting screws, located underneath the cabinet.

REALIGNMENT: Should the receiver require realignment, the procedure outlined below should be followed. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.

Before connecting the chassis to the battery, reconnect the speaker cable in its socket at the rear of the chassis.

The location of the R. F. alignment trimmer controls is on the side of the band switch. The trimmers in the lowest row are those for aligning Band 1. Those in the second row from bottom are for Band 2. The trimmer in the third row from bottom is for Band 3. The trimmer in the fourth row from bottom is for Band 4. The Broadcast and Long Wave trimmers for Model G-57, are located in the third and fourth rows respectively from the bottom.

The padding condenser is located under the rear section of the band switch. Access to the padding condenser is made through a hole provided in the rear of the chassis panel. Model G-57 has a Long Wave and a Broadcast padding condenser.

I. F. ALIGNMENT: When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 455 kc. The Band Selector Switch should be in the position marked "Broadcast", and the tuning condenser should be set at maximum capacity. Connect the antenna lead of the external oscillator to the control grid of the type 6X7 tube in the I. F. Amplifier. Connect the "ground" lead of the external oscillator to the receiver ground lead. The I. F. alignment capacitors are located at the side of the shielded I. F. Transformer. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator lead from the type 6X7 I. F. amplifier tube and connect it in the same manner to the control grid at the top of the type 6A8 tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.
 In order to obtain the most accurate realignment of the I. F. amplifier, it is essential to repeat the alignment process in both I. F. Units.

BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads. Insert a 200 mmf. condenser in series with the antenna lead. Set the Band Selector Switch in the "Broadcast" position and place the tuning control pointer at the 1500 kc. mark. Adjust the broadcast band oscillator trimmer.

Next adjust the 600 kc. padding condenser, located in the lower rear portion of the band switch, under the chassis. Set the external oscillator at 600 kc. Rotate

MODELS X-48 & X-49

I. F. ALIGNMENT: When aligning the intermediate Frequency Amplifier, the external oscillator must be set at 455 kc. The tuning condenser should be set at maximum capacity. Connect the antenna lead of the external oscillator to the control grid of the type 6X7 tube in the I. F. Amplifier stage through a 0.1 mfd. fixed condenser. Connect the ground lead of the external oscillator to the receiver ground dip. The I. F. alignment capacitors are located at the top of the shielded I. F. Transformer. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator leads from the type 6X7 I. F. Amplifier tube and connect it in the same manner to the control grid at the top of the type 6A7 tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. Amplifier, it is essential to repeat the alignment process in both I. F. units with the external oscillator leads connected across the control grid of the 6A7 tube.

BROADCAST ALIGNMENT: After the I. F. Amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads, this time with a .002 mfd. condenser in the antenna lead. Adjust the tuning control pointer at the 1400 kc. mark. Rotate the broadcast band oscillator trimmer to maximum response. Adjust the signal section trimmer in the same manner.

Next adjust the 600 kc. padding condenser. Set the external oscillator at 600 kc. Rotate the receiver tuning control until resonance is indicated. Then rock the tuning control back and forth about this resonance position, and at the same time adjust the padding condenser for the highest resonance peak.

Now repeat the 1400 kc. trimmer adjustment, following in every detail the procedure previously described.

SHORT-WAVE ALIGNMENT: The procedure in aligning the shortwave bands is identical with that for the broadcast with the exception of the adjustment of the padding condenser. A 400 ohm resistor should be inserted in the antenna lead. The alignment frequency is 16.8 Mcz.—(17,800 kc.).

Turn the Band Switch to the right. Tune the external oscillator to 15.8 meters. Tune the receiver tuning dial pointer in a position corresponding to the 16.8 meter indication on the external oscillator. Next adjust the signal circuit trimmer for maximum response. Repeat all adjustments to assure correct alignment, rocking the gang condenser to right or left for maximum gain.

HIGH BAND ALIGNMENT: Procedure in the Model 49 is similar to that for the Broadcast section of this receiver. Align at 375 kc. Adjust the padding at 180 kc.

CAUTION: When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLD-ERING PASTE OR ACID FLUXES OF ANY TYPE.

1. Examine the label on the rear of the chassis to make sure that the voltage is correct for the power supply you are using.
2. Connect the tube wire at the rear of the chassis to your antenna. For best results use an antenna of the type described in the PILOT antenna instruction sheet. If you are not experienced in erecting antennas, we strongly advise having this done by your radio service man. Good results can be obtained from a single wire about fifty feet long, and as high above surrounding objects as possible.
3. Connect the "back" lead at the rear of the chassis to the ground. This lead should be as short as possible. Wire the connection to the ground.
4. When the connections have been made, switch on the set, by turning the upper left-hand knob clockwise. This is the volume control knob as well as the compass dial, and at the lower right, the Band Switch.
5. When tuning in a station, be very careful to adjust the control set at the center of the response with the volume control volume. Unless that is done, the tone will be distorted.
6. If the tone from local stations is loud enough, to overcome the speaker, reducing the volume slightly will clear up the tone.
7. The tone control is at the lower left. Turning the knob to the left emphasizes the bass. Full musical response is obtained when this knob is turned all the way to the right.
8. If there is no sound in the speaker after the set has been turned on and the tubes have had time to become warm, reverse the position of the plug in the line socket.

NOTE: This PILOT set, in design, the quality of the materials, and the workmanship, is a fine musical instrument. It deserves careful and dry handling. We would like to have the tubes checked twice a year by your radio dealer, to assure the maintenance of its fine musical quality.

SERVICE INFORMATION

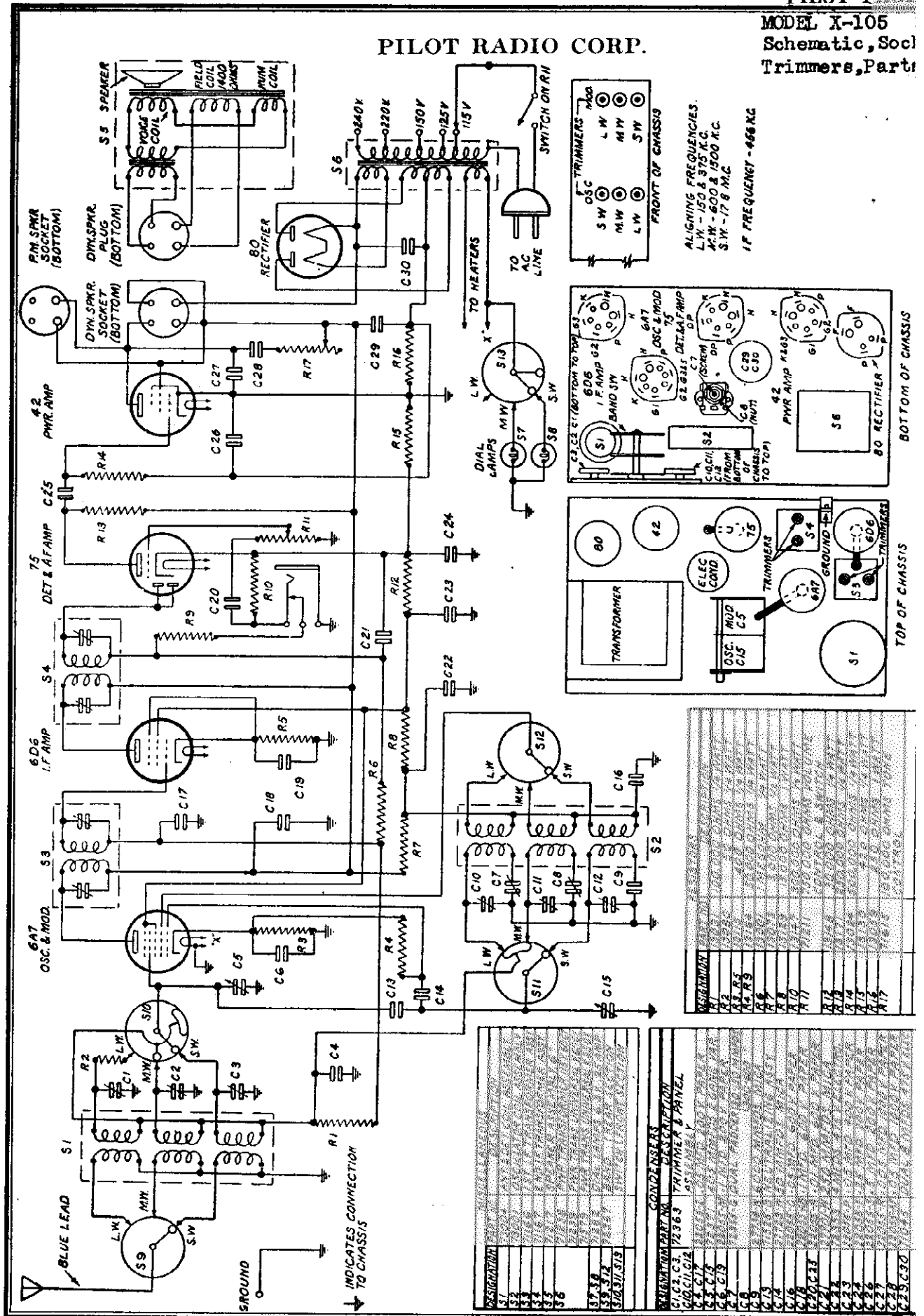
REMOVAL OF CHASSIS FROM CABINET:
 To remove the chassis from the cabinet proceed as follows:
 Be certain that the line cord is removed from the power outlet socket.
 Remove the aligner knobs and felt washers from the controls on the front panel.
 Remove the speaker plug from the socket at the rear of the chassis.
 Remove the four mounting screws, located underneath the chassis.
REALIGNMENT: Should the receiver require realignment, the procedure outlined below should be followed. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.
 Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the rear of the chassis.

VOLTAGES MEASURED AT TUBE SOCKETS

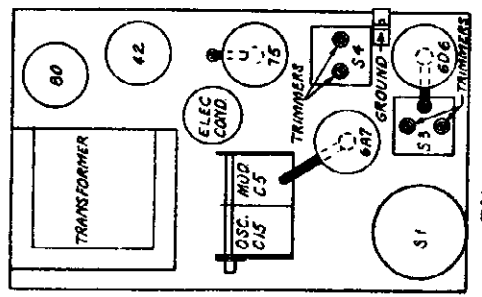
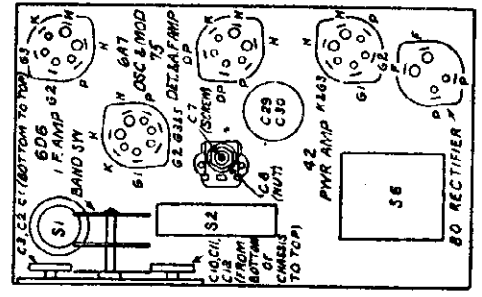
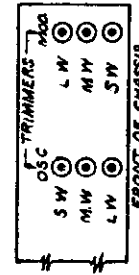
6A7 Det., Osc.	6X7 Amp., Det.
Plate 125 (110)	125 (110)
Screen 45 (45)	45 (45)
Cathode 10 (8)	10 (8)
Filament 6.3 (6.3)	6.3 (6.3)
Speaker field volts—105 (105) volts.	
Anode grid of 6A7—110 (80) volts.	
Trode plate of 6X7—99 (70) volts.	

Notes: Values are given for 220-volt line. For 110-volt line use values in parentheses.

PILOT RADIO CORP.



ALIGNING FREQUENCIES.
LW - 150 & 175 K.C.
MW - 600 & 1500 K.C.
SW - 17.8 MC
IF FREQUENCY - 466 KC



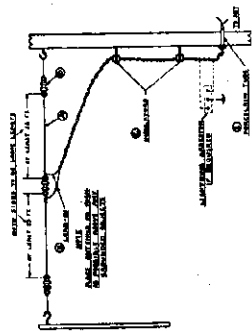
DESIGNATION	DESCRIPTION
S1	6A7 OSC & MOD
S2	6D6 I.F. AMP
S3	75 DET & AF AMP
S4	#2 PWR AMP
S5	55 SPEAKER
S6	60 RECTIFIER
S7	6A7 OSC & MOD
S8	6D6 I.F. AMP
S9	75 DET & AF AMP
S10	#2 PWR AMP
S11	55 SPEAKER
S12	60 RECTIFIER
S13	6A7 OSC & MOD
S14	6D6 I.F. AMP
S15	75 DET & AF AMP
S16	#2 PWR AMP
S17	55 SPEAKER
S18	60 RECTIFIER
S19	6A7 OSC & MOD
S20	6D6 I.F. AMP
S21	75 DET & AF AMP
S22	#2 PWR AMP
S23	55 SPEAKER
S24	60 RECTIFIER
S25	6A7 OSC & MOD
S26	6D6 I.F. AMP
S27	75 DET & AF AMP
S28	#2 PWR AMP
S29	55 SPEAKER
S30	60 RECTIFIER
S31	6A7 OSC & MOD
S32	6D6 I.F. AMP
S33	75 DET & AF AMP
S34	#2 PWR AMP
S35	55 SPEAKER
S36	60 RECTIFIER
S37	6A7 OSC & MOD
S38	6D6 I.F. AMP
S39	75 DET & AF AMP
S40	#2 PWR AMP
S41	55 SPEAKER
S42	60 RECTIFIER
S43	6A7 OSC & MOD
S44	6D6 I.F. AMP
S45	75 DET & AF AMP
S46	#2 PWR AMP
S47	55 SPEAKER
S48	60 RECTIFIER
S49	6A7 OSC & MOD
S50	6D6 I.F. AMP
S51	75 DET & AF AMP
S52	#2 PWR AMP
S53	55 SPEAKER
S54	60 RECTIFIER
S55	6A7 OSC & MOD
S56	6D6 I.F. AMP
S57	75 DET & AF AMP
S58	#2 PWR AMP
S59	55 SPEAKER
S60	60 RECTIFIER
S61	6A7 OSC & MOD
S62	6D6 I.F. AMP
S63	75 DET & AF AMP
S64	#2 PWR AMP
S65	55 SPEAKER
S66	60 RECTIFIER
S67	6A7 OSC & MOD
S68	6D6 I.F. AMP
S69	75 DET & AF AMP
S70	#2 PWR AMP
S71	55 SPEAKER
S72	60 RECTIFIER
S73	6A7 OSC & MOD
S74	6D6 I.F. AMP
S75	75 DET & AF AMP
S76	#2 PWR AMP
S77	55 SPEAKER
S78	60 RECTIFIER
S79	6A7 OSC & MOD
S80	6D6 I.F. AMP
S81	75 DET & AF AMP
S82	#2 PWR AMP
S83	55 SPEAKER
S84	60 RECTIFIER
S85	6A7 OSC & MOD
S86	6D6 I.F. AMP
S87	75 DET & AF AMP
S88	#2 PWR AMP
S89	55 SPEAKER
S90	60 RECTIFIER
S91	6A7 OSC & MOD
S92	6D6 I.F. AMP
S93	75 DET & AF AMP
S94	#2 PWR AMP
S95	55 SPEAKER
S96	60 RECTIFIER
S97	6A7 OSC & MOD
S98	6D6 I.F. AMP
S99	75 DET & AF AMP
S100	#2 PWR AMP

MODEL X-105
Voltage, Alignment
MODEL 223
Alignment

PILOT RADIO CORP.

MODEL 223

ALL-WAVE ANTENNA SYSTEM



In order to obtain the most accurate realignment of the I. F. Amplifier, it is essential to repeat the alignment process in both I. F. Units, with the external oscillator connected to the 6A7 tube.

BROADCAST ALIGNMENT: After the I. F. Amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and chassis, this time with a 200 mfd. condenser in the antenna lead. Set the Band Selector Switch in the "Broadcast" position and place the tuning control pointer at the 1500 kc. mark. Adjust the broadcast band oscillator trimmer to maximum response. Next adjust the interstage alignment trimmer for maximum response. Finally adjust the antenna section trimmer in the same manner.

Next adjust the 600 kc. padder condenser, located on the top of the oscillator coil. Set the external oscillator at 600 kc. Rotate the receiver tuning control back and forth about the resonance position, and at the same time adjust the padder condenser for the highest response. Now repeat the 1500 kc. trimmer adjustment, following in every detail the procedure previously described.

ALIGNMENT OF THE SHORT WAVE BANDS: The procedure in aligning the short wave bands is identical with that for the broadcast with the exception of the adjustment of the padder condenser. A 400 ohm resistor should be connected in the antenna lead. The tuning frequency of band 1 is 16.8 Meters—(17,800 kc.) and of Band 2, 9000 kc.

Turn the Band Switch to Band 1. Tune the external oscillator to 16.8 meters. Tune the receiver so that the dial pointer is in a position coincidental with the 16.8 meter indication on the dial scale. Adjust the short wave oscillator trimmer for maximum response. Next adjust the signal circuit trimmer for maximum resonance. Repeat all adjustments to assure correct alignment, rocking the gang condenser to right or left for maximum gain. Then align Band 2 in the same manner at 9000 kc.

NOTE: Should it be necessary to remove any part of the band switch assembly, it is advisable to realign the receiver after reassembly.

CAUTION: When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

A good antenna is most essential for the reception of signals from stations located thousands of miles from the receiver. The flat top portion of the antenna should be placed as high above the ground as possible. The antenna should be made of non-ferrous metal. As possible. Automobile ignition systems, telephone communication lines, and other electric lines are some of the more common offenders of this nature. The installation of a good antenna requires a small amount of skill and a few tools. The antenna should be installed in a position where it will receive the maximum amount of signal. A properly installed antenna is almost as good as an extra stage of tuned radio frequency amplification. To the incoming signal is frequently an extension about the latitude of the house pick up a considerable amount of static above with the desired signal. It is suggested that you install a lightning arrester in the antenna lead. The kit contains two 75 ft. lengths of No. 14 wire. The illustration suggests the use of at least 25 ft. per section. Use an amount of wire equal to the distance between the antenna and the ground. The battery at the right form a reference to the parts as arranged in the illustration.

Method No. 1: Join the ends of both leads together and connect to the antenna terminal of the lead to antenna of set; connect the other lead to the ground. Use the method on your set which gives the best performance.

CONTENTS OF PILOT KIT

- 2—75 ft. lengths of No. 14 enamel, copper wire.....A
- 100 ft. twisted pair lead-in wire.....B
- 2—Insulated stand-off insulators.....C
- 2—Porcelain insulators.....D
- 2—Porcelain tubes.....E
- 2—Insulated straps.....F

SERVICE INFORMATION
REMOVAL OF CHASSIS FROM CABINET:

To remove the chassis from the cabinet proceed as follows:
Be certain that the line cord is removed from the power outlet socket.
Remove the "dip-on" knobs and felt washers from the controls on the front panel.
Remove the speaker plug from the socket at the top of the chassis.
Remove the four mounting screws located underneath the cabinet.

REALIGNMENT: Should the receiver require realignment, the outlined procedure below should be followed. In the schematic wiring diagram the location and function of the various alignment capacitors are clearly illustrated. For best results an external modulated oscillator with adequate frequency range, and a visual output meter should be used.

Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the top of the chassis.

I. F. ALIGNMENT: When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The Band Selector Switch should be in the position marked "Broadcast", and the tuning condenser should be set at maximum capacity. Connect the "antenna" lead of the external oscillator to the control grid of the type 6D6 tube in the I. F. Amplifier stage through a .1 mfd. fixed condenser. Connect the "ground" lead of the external oscillator to the receiver chassis. The I. F. alignment capacitors are located at the side of the shielded I. F. Transformer. Using No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator lead from the type 6D6 I. F. Amplifier tube and connect it in the same manner to the control grid at the top of the type 6A7 tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peak.

MODEL X105 SUPERHETERODYNE SERVICE INFORMATION

Range: 16-52 Meters (16,800-5,700 kc.)

REMOVAL OF CHASSIS FROM CABINET:

To remove the chassis from the cabinet proceed as follows:
Be certain that the line cord is removed from the power outlet socket.
Use a small screw driver to loosen the set screw on the tuning knob.
Remove the "dip-on" knobs and felt washers from the controls on the front panel.
Remove the speaker plug from the socket at the rear of the chassis.
Remove the four mounting screws, located underneath the cabinet.

REALIGNMENT: Should the receiver require realignment, the outlined procedure below should be followed. In the schematic wiring diagram, the location and function of the various alignment capacitors are clearly illustrated. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.

Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the rear of the chassis.

I. F. ALIGNMENT: When aligning the Intermediate Frequency Amplifier, the external oscillator must be set

at 456 kc. The Band Switch should be in the position marked "Broadcast", and the tuning condenser should be set at maximum capacity. Connect the "antenna" lead of the external oscillator to the control grid of the type 6D6 tube in the I. F. Amplifier stage through a .1 mfd. fixed condenser. Connect the "ground" lead of the external oscillator to the receiver ground lead. The I. F. alignment capacitors are located at the top of the shielded I. F. Transformer. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator leads from the type 6D6 I. F. Amplifier tube and connect it in the same manner to the control grid at the top of the type 6A7 tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peak.

In order to obtain the most accurate realignment of the I. F. Amplifier, it is essential to repeat the alignment process in both I. F. Units with the external oscillator leads connected across the control grid of the 6A7 tube.

BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads, through a .0002 mfd. condenser. Set the Band Switch in the "Broadcast" position and place the tuning control pointer at the 1500 kc. mark. Adjust the broadcast band oscillator trimmer to maximum response. Adjust the signal section trimmer in the same manner.

Next adjust the 600 kc. padder condenser. Set the external oscillator at 600 kc. Rotate the receiver tuning

control until resonance is indicated. Then rock the tuning control back and forth about this resonance position, and at the same time adjust the padder condenser for the highest resonance peak.

Now repeat the 1500 kc. trimmer adjustment, following in every detail the procedure previously described.

ALIGNMENT OF THE SHORT-WAVE BANDS: The procedure in aligning the short wave bands is identical with that for the broadcast with the exception of the adjustment of the padder condenser which is of fixed value and requires no adjustment. The alignment frequency is 16.6 Meters—(18,000 kc.)

Turn the Band Switch to the right. Tune the external oscillator to 16.6 meters. Tune the receiver so that the dial pointer is in a position coincidental with the 16.6 meter indication on the dial scale. Adjust the short wave oscillator trimmer for maximum response. Next adjust the signal circuit trimmer for maximum resonance. Repeat all adjustments to assure correct alignment, rocking the gang condenser to right or left for maximum gain.

LONG WAVE ALIGNMENT: Procedure in the Model X105 is similar to the Broadcast section of that receiver. Align at 375 k.c. Adjust the padder at 160 k.c.

Should it be necessary to remove the band switch assembly, it is advisable to realign the receiver after reassembly.

CAUTION: When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

RECEIVER DESCRIPTION

- Operating Voltages—115, 125, 150, 220, 240 volts, Alternating Current.
- Frequency Rating—50 to 60 cycles.
- Power Consumption—50 Watts.
- Tubes—1 type 6A7, 1 type 6D6, 1 type 75, 1 type 42, 1 type 80.
- Wavelength Range—16 meters to 52.6 meters—178.5 meters to 350 meters—789 to 2142 meters.
- Undistorted power output—3 watts.
- Intermediate Frequency—456 kc.
- Tube Functions—Type 6A7: Electron emission control oscillator-detector.
Type 6D6: I. F. Amplifier.
Type 75: Duo-diode detector amplifier.
Type 42: Class "A" power pentode.
Type 80: Full-wave rectifier for power supply.

VOLTAGES

The D. C. Voltages measured at the tube sockets of the set should be read with a high resistance voltmeter of at least 1000 ohms per volt.

	OSC. DET. Type 6A7	I. F. Type 6D6	DIODE DET. Type 75	POWER PENTODE Type 42	RECTIFIER Type 80
Plate	230	230	105*	205	***
Cathode	4.	3.8	1.4	**	
Screen	85	85		230	
Filament	6.3	6.3	6.3	6.3	

*Voltages measured through 250,000 ohm plate resistor.

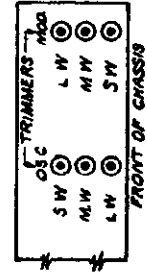
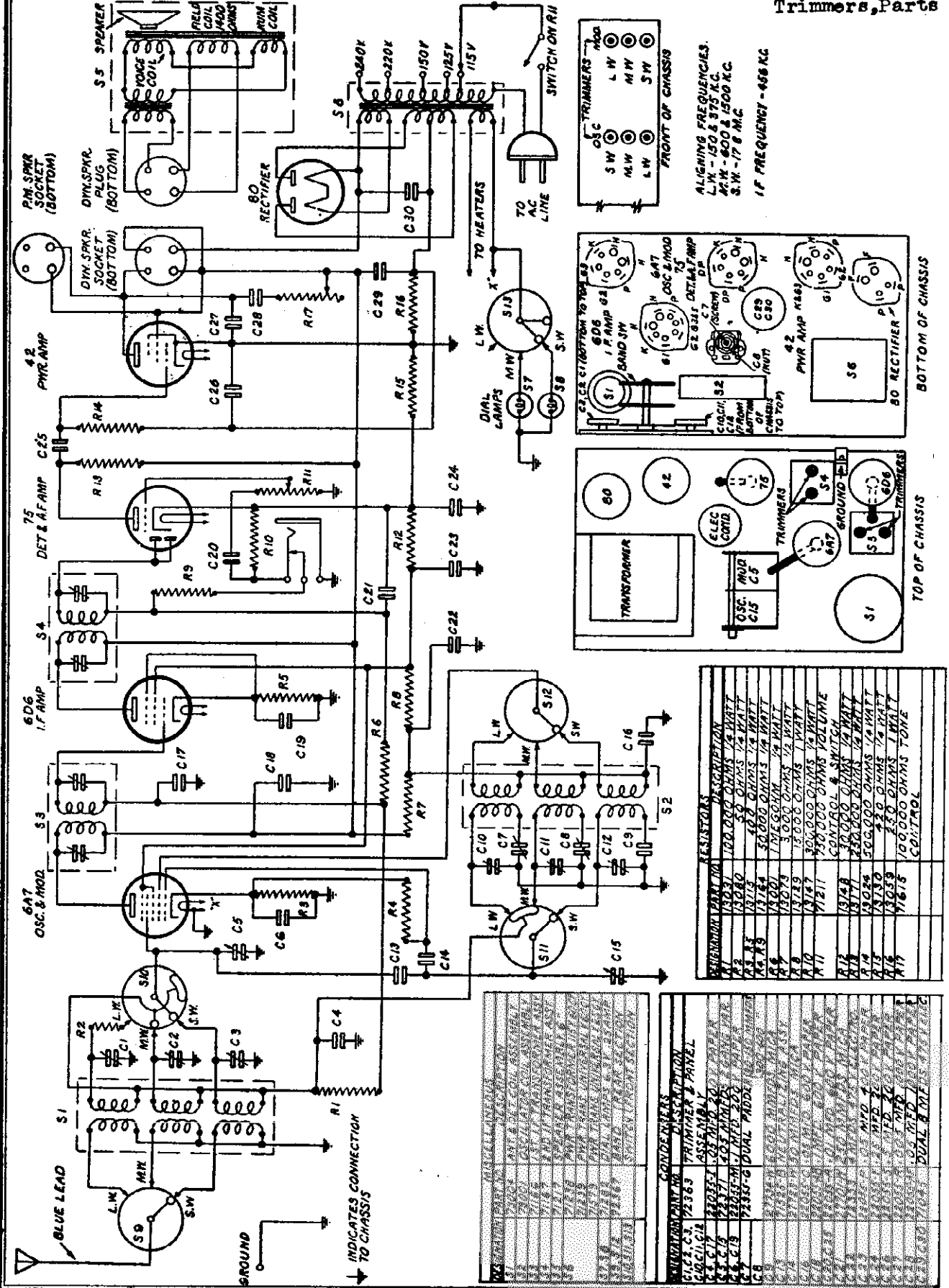
Speaker field voltage 90 volts. All plate voltages measured to cathode. All screen voltages measured to cathode. All cathode voltages measured to chassis frame.

**Grid bias voltage for No. 42 tube obtained across R-16 (250 ohms resistor).

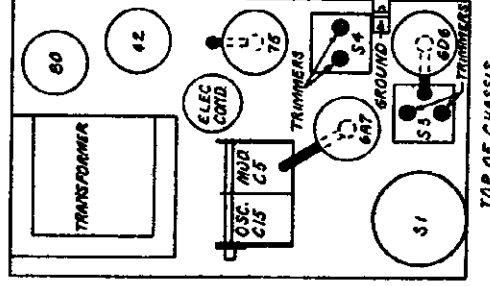
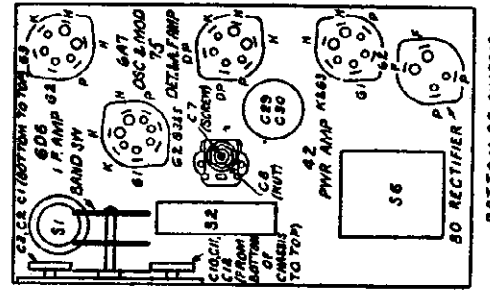
***Filament to chassis ground 315 volts D. C.

Anode grid of 6A7 to cathode—175 volts.

PILOT RADIO CORP.



ALIGNING FREQUENCIES.
L.W. - 150 & 375 KC.
M.W. - 600 & 1500 KC.
S.W. - 17 & MC.
IF FREQUENCY - 455 KC.



RESISTOR PART NO.	RESISTOR DESCRIPTION
R1	100,000 OHMS 1/4 WATT
R2	100,000 OHMS 1/4 WATT
R3	100,000 OHMS 1/4 WATT
R4	100,000 OHMS 1/4 WATT
R5	100,000 OHMS 1/4 WATT
R6	100,000 OHMS 1/4 WATT
R7	100,000 OHMS 1/4 WATT
R8	100,000 OHMS 1/4 WATT
R9	100,000 OHMS 1/4 WATT
R10	100,000 OHMS 1/4 WATT
R11	100,000 OHMS 1/4 WATT
R12	100,000 OHMS 1/4 WATT
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R99	100,000 OHMS 1/4 WATT
R100	100,000 OHMS 1/4 WATT

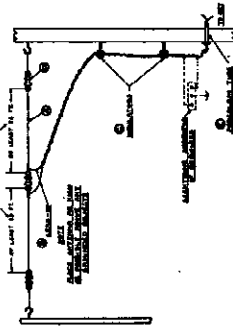
CONDENSER PART NO.	CONDENSER DESCRIPTION
C1	100,000 OHMS 1/4 WATT
C2	100,000 OHMS 1/4 WATT
C3	100,000 OHMS 1/4 WATT
C4	100,000 OHMS 1/4 WATT
C5	100,000 OHMS 1/4 WATT
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C95	100,000 OHMS 1/4 WATT
C96	100,000 OHMS 1/4 WATT
C97	100,000 OHMS 1/4 WATT
C98	100,000 OHMS 1/4 WATT
C99	100,000 OHMS 1/4 WATT
C100	100,000 OHMS 1/4 WATT

MODEL X-105
Voltage, Alignment
MODEL 223
Alignment

PILOT RADIO CORP.

M O D E L 2 2 3

ALL-WAVE ANTENNA SYSTEM



A good antenna is most essential for the reception of signals from stations located thousands of miles from the receiver. The antenna should be located as far from sources of man-made static and grounded objects as possible. Both lead-in wire and antenna wire should be spaced in 6-foot intervals. The antenna system consists of a horizontal wire supported by a central post and two side posts. The wire is connected to a transformer through a coil and a capacitor. The antenna system is designed to receive signals from stations located in any direction.

CONTENTS OF PILOT KIT

- 2-75 ft. lengths of No. 14 enamel-coated copper wire.....A
- 100 ft. twisted pair lead-in wire.....B
- 2-Insulated standard transformers.....C
- 2-Insulated capacitors.....D
- 2-Insulated tubes.....E
- 6-Insulated sockets.....F

SERVICE INFORMATION

REMOVAL OF CHASSIS FROM CABINET:

To remove the chassis from the cabinet proceed as follows:
Be certain that the line cord is removed from the power outlet socket.
Remove the "slip-on" knobs and felt washers from the controls on the front panel.
Remove the speaker plug from the socket at the top of the chassis.
Remove the four mounting screws located underneath the cabinet.

REALIGNMENT: Should the receiver require realignment, the outlined procedure below should be followed. In the schematic wiring diagram the location and function of the various alignment capacitors are clearly illustrated. For best results an external modulated oscillator with adequate frequency range, and a visual output meter should be used.
Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the top of the chassis.

I. F. ALIGNMENT: When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The Band Selector Switch should be in the position marked "Broadcast," and the tuning condenser should be set at maximum capacity. Connect the antenna lead of the 6D6 tube in the I. F. Amplifier stage through a 1 mfd. fixed condenser. Connect the "ground" lead of the external oscillator to the receiver chassis. The I. F. alignment capacitors are located at the side of the shielded I. F. Transformer. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator lead from the type 6D6 I. F. Amplifier tube and connect it in the same manner to the control grid at the top of the type 6A7 tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.

MODEL X105 SUPERHETERODYNE SERVICE INFORMATION **Range: 16-52 Meters (16,800-5,700 kc.)**

REMOVAL OF CHASSIS FROM CABINET:

- To remove the chassis from the cabinet proceed as follows:
Be certain that the line cord is removed from the power outlet socket.
Use a small screw driver to loosen the set screw on the tuning knob.
Remove the "slip-on" knobs and felt washers from the controls on the front panel.
Remove the speaker plug from the socket at the rear of the chassis.
Remove the four mounting screws, located underneath the cabinet.

at 456 kc. The Band Switch should be in the position marked "Broadcast," and the tuning condenser should be set at maximum capacity. Connect the "antenna" lead of the external oscillator to the control grid of the type 6D6 tube in the I. F. Amplifier stage through a .1 mfd. fixed condenser. Connect the "ground" lead of the external oscillator to the receiver ground lead. The I. F. alignment capacitors are located at the top of the shielded I. F. Transformer. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator leads from the type 6D6 I. F. Amplifier tube and connect it in the same manner to the control grid at the top of the type 6A7 tube.
Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.
In order to obtain the most accurate realignment of the I. F. Amplifier, it is essential to repeat the alignment process in both I. F. units with the external oscillator leads connected across the control grid of the 6A7 tube.
BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads, through a .0002 mfd. condenser. Set the Band Switch in the "Broadcast" position and place the tuning control pointer at the 1500 kc. mark. Adjust the broadcast band oscillator trimmer to maximum response. Adjust the signal section trimmer in the same manner.
Next adjust the 600 kc. padder condenser. Set the external oscillator at 600 kc. Rotate the receiver tuning control until resonance is indicated. Then rock the tuning control back and forth about this resonance position, and at the same time adjust the padder condenser for the highest response.
Now repeat the 1500 kc. trimmer adjustment, following in every detail the procedure previously described.
ALIGNMENT OF THE SHORT-WAVE BANDS:
The procedure in aligning the short wave-bands is identical with that for the broadcast with the exception of the adjustment of the padder condenser which is of fixed value and requires no adjustment. The alignment frequency is 16.6 Meters—(18,000 kc.)
Turn the Band Switch to the right. Tune the external oscillator to 16.6 meters. Tune the receiver so that the dial pointer is in a position coincidental with the 16.6 meter indication on the dial scale. Adjust the short wave oscillator trimmer for maximum response. Next adjust the signal circuit trimmer for maximum resonance. Repeat all adjustments to assure correct alignment, rocking the gang condenser to right or left for maximum gain.

LONG WAVE ALIGNMENT: Procedure in the Model X105 is similar to the Broadcast section of that receiver. Align at 375 kc. Adjust the padder at 160 kc.
Should it be necessary to remove the band switch assembly, it is advisable to realign the receiver after re-installing.
CAUTION: When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

REALIGNMENT: Should the receiver require realignment, the outlined procedure below should be followed. In the schematic wiring diagram, the location and function of the various alignment capacitors are clearly illustrated. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.
Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the rear of the chassis.
I. F. ALIGNMENT: When aligning the Intermediate Frequency Amplifier, the external oscillator must be set

RECEIVER DESCRIPTION

- Operating Voltages—115, 125, 150, 220, 240 volts, Alternating Current.
- Frequency Rating—50 to 60 cycles.
- Power Consumption—50 Watts.
- Tubes—1 type 6A7, 1 type 6D6, 1 type 75, 1 type 42, 1 type 80.
- Wavelength Range—16 meters to 32.6 meters—178.5 meters to 550 meters—789 to 2142 meters.
- Undistorted power output—3 watts.
- Intermediate Frequency—456 kc.
- Tube Functions—Type 6A7: Electron emission control oscillator-detector.
Type 6D6: I. F. Amplifier.
Type 75: Duo-diode detector amplifier.
Type 42: Class "A" power pentode.
Type 80: Full-wave rectifier for power supply.

VOLTAGES

The D. C. Voltages measured at the tube sockets of the set should be read with a high resistance voltmeter of at least 1000 ohms per volt.

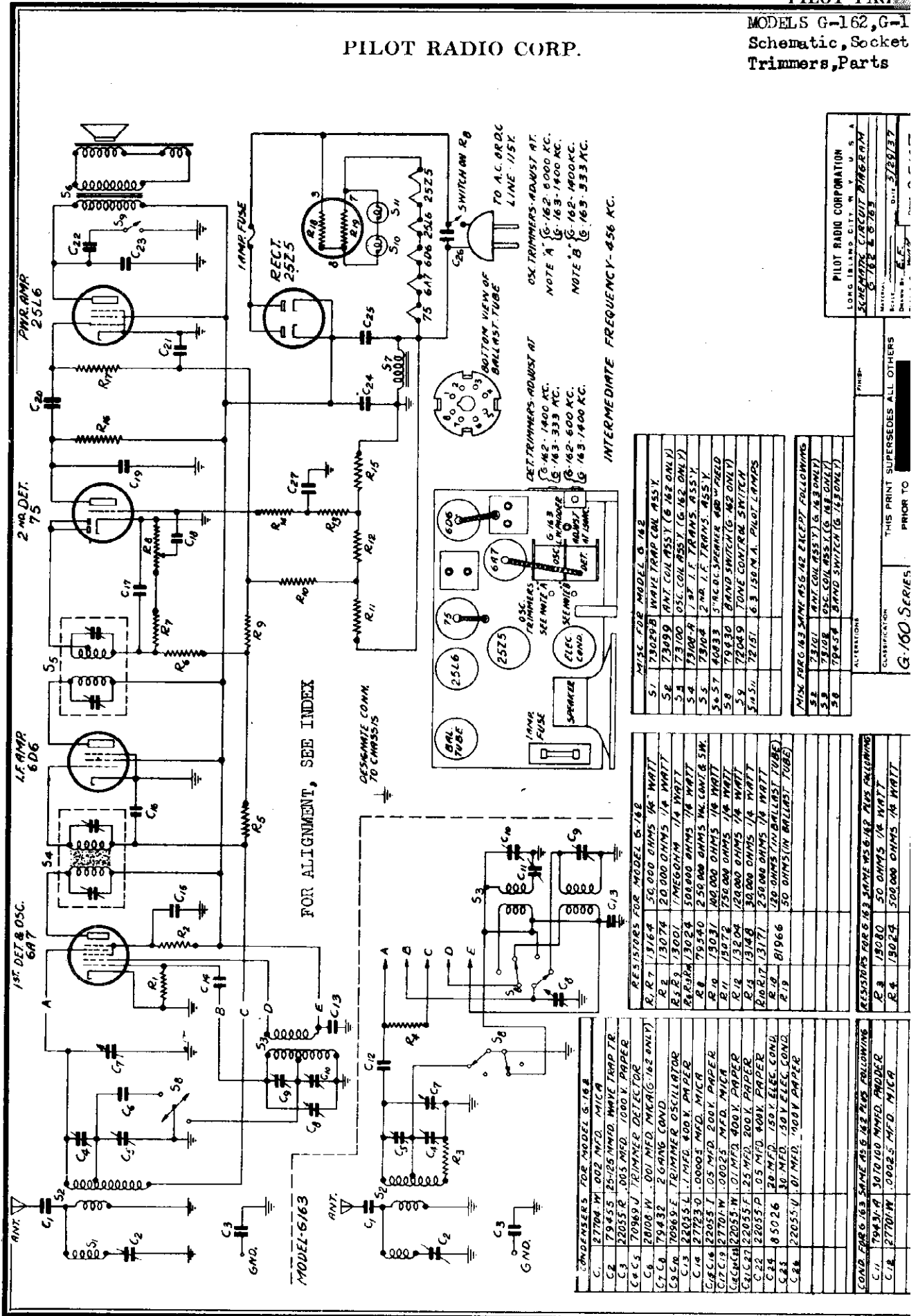
	OSC. DET. Type 6A7	I. F. Type 6D6	DIODE DET. Type 75	POWER PENTODE Type 42	RECTIFIER Type 80
Plate	230	230	105*	205	***
Cathode	4.	3.8	1.4	8*	***
Screen	85	85		230	
Filament	6.3	6.3	6.3	6.3	

*Voltages measured through 250,000 ohm plate resistor.

Speaker field voltage 90 volts. All plate voltages measured to cathode. All screen voltages measured to cathode. All cathode voltages measured to chassis frame.

**Grid bias voltage for No. 42 tube obtained across R-16 (250 ohms resistor).
***Filament to chassis ground 315 volts D. C.
Anode grid of 6A7 to cathode—175 volts.

PILOT RADIO CORP.



PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y. U. S. A.
SCHEMATIC CIRCUIT 21868-AM
REVISED 6-18-37
DATE 3/29/37

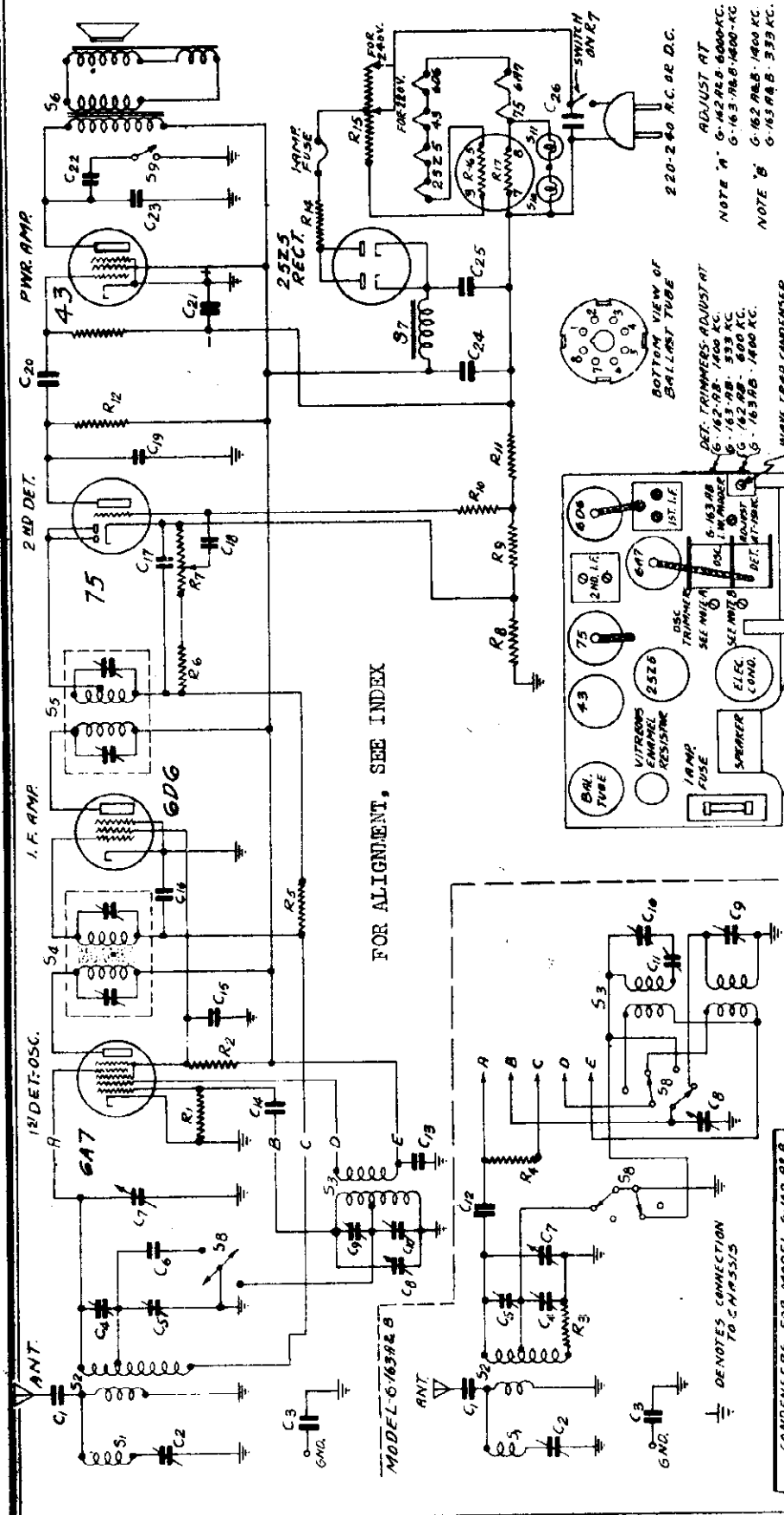
ALTERNATIONS	THIS PRINT SUPERSEDES ALL OTHERS	PRIOR TO
G-160 Series		
CLASSIFICATION		
PILOT		

MISC. FOR MODEL G-162	
S1	730209 WAVE TRAP CAN ASSY.
S2	734199 ANT. COIL ASSY (G-162 ONLY)
S3	73100 OSC. COIL ASSY (G-162 ONLY)
S4	73100 1st I.F. TRANS. ASSY
S5	73102 2nd I.F. TRANS. ASSY
S6	40833 5" A.C. SPINNER ADJUSTED
S7	73430 TONE SWITCH (G-162 ONLY)
S8	72049 TONE CONTR. SWITCH
S9	72151 6.3 150 M.A. PILOT LAMPS

CONDENSERS FOR MODEL G-162	
C1	27704 W. 002 MFD. MICA
C2	79455 25-125 MFD. WAXE TRAP TR.
C3	22055 R. .005 MFD. 1000 V. PAPER
C4	20989 V. TRIMMER DETECTOR
C5	28106 W. .001 MFD. MICA (G-162 ONLY)
C6	79432 2 GANG. COND.
C7	70869 E. TRIMMER OSCILLATOR
C8	22055 L. 1 MFD. 400 V. PAPER
C9	27723 O. 00004 MFD. MICA
C10	22055 T. .05 MFD. 200 V. PAPER
C11	22055 W. .01 MFD. 400 V. PAPER
C12	22055 F. .25 MFD. 200 V. PAPER
C13	22055 P. .05 MFD. 400 V. PAPER
C14	85026 30 MFD. 150 V. ELEC. COND.
C15	22055 V. .01 MFD. 1000 V. PAPER

MODELS G-162A, G-162B
G-163A, G-163B
Schematic, Socket
Trimmers, Parts

PILOT RADIO CORP.



FOR ALIGNMENT, SEE INDEX

NOTE A' G-162 RB-B-6000-KC
G-163 RB-B-593 KC
NOTE B' G-162 RB-B-1400 KC
G-163 RB-B-339 KC.

ADJUST AT
220-240 A.C. OR D.C.

INT. FREQ. 456 KC.

51	730298	MISC. FOR MODEL G-162 RB-B
52	73099	WAVE TRAP COIL ASSY.
53	73100	ANT. COIL ASSY. (G-162 RB-B ONLY)
54	73109	OSC. COIL ASSY. (G-162 RB-B ONLY)
55	73109-A	1ST I.F. TRANS. ASSY.
56	73109-B	2ND I.F. TRANS. ASSY.
57	40835	5 AC-D.C. SPRING-IND. UNIMFIED
58	72049	BAND SWITCH (G-162 RB-B ONLY)
59	72049	1000 OHMS 1/2 WATT CARBON

WAR TRAP CONDENSER ADJUST AT 456 KC.

DET. TRIMMERS-ADJUST AT
G-162 RB-B-1400 KC
G-163 RB-B-593 KC
ADJUST AT
G-162 RB-B-600 KC
G-163 RB-B-1400 KC.

SEE MICA
OSC. I.F. TRIMMER
DET. TRIMMER
ELEC. COND.
SWITCH
1 AMP. FUSE
VARIABLE RESISTOR
2526
75
43
6A7
6DG
12DET-OSC.
I.F. AMP.
PWR. AMP.
2ND DET.
ANT.

RESISTORS FOR MODEL G-162 RB-B

R-1	13164	50,000 OHMS 1/4 WATT CARBON
R-2	13164	15,000 OHMS 1/4 WATT CARBON
R-3	13007	2 MEG OHMS 1/4 WATT CARBON
R-4	13007	250,000 OHMS 1/4 WATT CARBON
R-5	13007	50 OHMS 1/4 WATT CARBON
R-6	13126	16 OHMS 1/4 WATT CARBON
R-7	13126	200 OHMS 1/4 WATT CARBON
R-8	13126	500,000 OHMS 1/4 WATT CARBON
R-9	13207	100 OHMS 1/4 WATT CARBON
R-10	83029	VARIABLE RESISTOR 500 OHMS TAPPED AT 250 OHMS
R-11	81907	210 OHMS (IN BALLAST TUBE)
R-12	81907	80 OHMS (IN BALLAST TUBE)

RESISTORS FOR MODEL G-163 RB-B

R-1	13164	50,000 OHMS 1/4 WATT CARBON
R-2	13164	15,000 OHMS 1/4 WATT CARBON
R-3	13007	2 MEG OHMS 1/4 WATT CARBON
R-4	13007	250,000 OHMS 1/4 WATT CARBON
R-5	13007	50 OHMS 1/4 WATT CARBON
R-6	13126	16 OHMS 1/4 WATT CARBON
R-7	13126	200 OHMS 1/4 WATT CARBON
R-8	13126	500,000 OHMS 1/4 WATT CARBON
R-9	13207	100 OHMS 1/4 WATT CARBON
R-10	83029	VARIABLE RESISTOR 500 OHMS TAPPED AT 250 OHMS
R-11	81907	210 OHMS (IN BALLAST TUBE)
R-12	81907	80 OHMS (IN BALLAST TUBE)

CONDENSERS FOR MODEL G-162 RB-B

C-1	27704W	0.02 MFD. MICA
C-2	27055-A	0.05 MFD. 100V. PAPER
C-3	27055-A	0.05 MFD. 100V. PAPER
C-4	27055-A	0.05 MFD. 100V. PAPER
C-5	27055-A	0.05 MFD. 100V. PAPER
C-6	27055-A	0.05 MFD. 100V. PAPER
C-7	27055-A	0.05 MFD. 100V. PAPER
C-8	27055-A	0.05 MFD. 100V. PAPER
C-9	27055-A	0.05 MFD. 100V. PAPER
C-10	27055-A	0.05 MFD. 100V. PAPER
C-11	27055-A	0.05 MFD. 100V. PAPER
C-12	27055-A	0.05 MFD. 100V. PAPER
C-13	27055-A	0.05 MFD. 100V. PAPER
C-14	27055-A	0.05 MFD. 100V. PAPER
C-15	27055-A	0.05 MFD. 100V. PAPER
C-16	27055-A	0.05 MFD. 100V. PAPER
C-17	27055-A	0.05 MFD. 100V. PAPER
C-18	27055-A	0.05 MFD. 100V. PAPER
C-19	27055-A	0.05 MFD. 100V. PAPER
C-20	27055-A	0.05 MFD. 100V. PAPER
C-21	27055-A	0.05 MFD. 100V. PAPER
C-22	27055-A	0.05 MFD. 100V. PAPER
C-23	27055-A	0.05 MFD. 100V. PAPER
C-24	27055-A	0.05 MFD. 100V. PAPER
C-25	27055-A	0.05 MFD. 100V. PAPER
C-26	27055-A	0.05 MFD. 100V. PAPER

COND. FOR G-163 RB-B SAME AS G-162 RB-B

C-1	27055-A	0.05 MFD. 100V. PAPER
C-2	27055-A	0.05 MFD. 100V. PAPER
C-3	27055-A	0.05 MFD. 100V. PAPER
C-4	27055-A	0.05 MFD. 100V. PAPER
C-5	27055-A	0.05 MFD. 100V. PAPER
C-6	27055-A	0.05 MFD. 100V. PAPER
C-7	27055-A	0.05 MFD. 100V. PAPER
C-8	27055-A	0.05 MFD. 100V. PAPER
C-9	27055-A	0.05 MFD. 100V. PAPER
C-10	27055-A	0.05 MFD. 100V. PAPER
C-11	27055-A	0.05 MFD. 100V. PAPER
C-12	27055-A	0.05 MFD. 100V. PAPER
C-13	27055-A	0.05 MFD. 100V. PAPER
C-14	27055-A	0.05 MFD. 100V. PAPER
C-15	27055-A	0.05 MFD. 100V. PAPER
C-16	27055-A	0.05 MFD. 100V. PAPER
C-17	27055-A	0.05 MFD. 100V. PAPER
C-18	27055-A	0.05 MFD. 100V. PAPER
C-19	27055-A	0.05 MFD. 100V. PAPER
C-20	27055-A	0.05 MFD. 100V. PAPER
C-21	27055-A	0.05 MFD. 100V. PAPER
C-22	27055-A	0.05 MFD. 100V. PAPER
C-23	27055-A	0.05 MFD. 100V. PAPER
C-24	27055-A	0.05 MFD. 100V. PAPER
C-25	27055-A	0.05 MFD. 100V. PAPER
C-26	27055-A	0.05 MFD. 100V. PAPER

PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y., U. S. A.
SCHEMATIC CIRCUIT DIAGRAM
FOR MODELS G-162 RB-B
G-163 RB-B

MATERIAL DATE: 5/17/37
CHECKED BY: E.F.
APPROVED BY: J.F.R.
AMOUNT: 25166-3

CLASSIFICATION: THIS PRINT SUPERSEDES ALL OTHERS
G-162 RB-B
G-163 RB-B

PRIOR TO: [REDACTED]

NO. NOT SCALE THIS PRINT

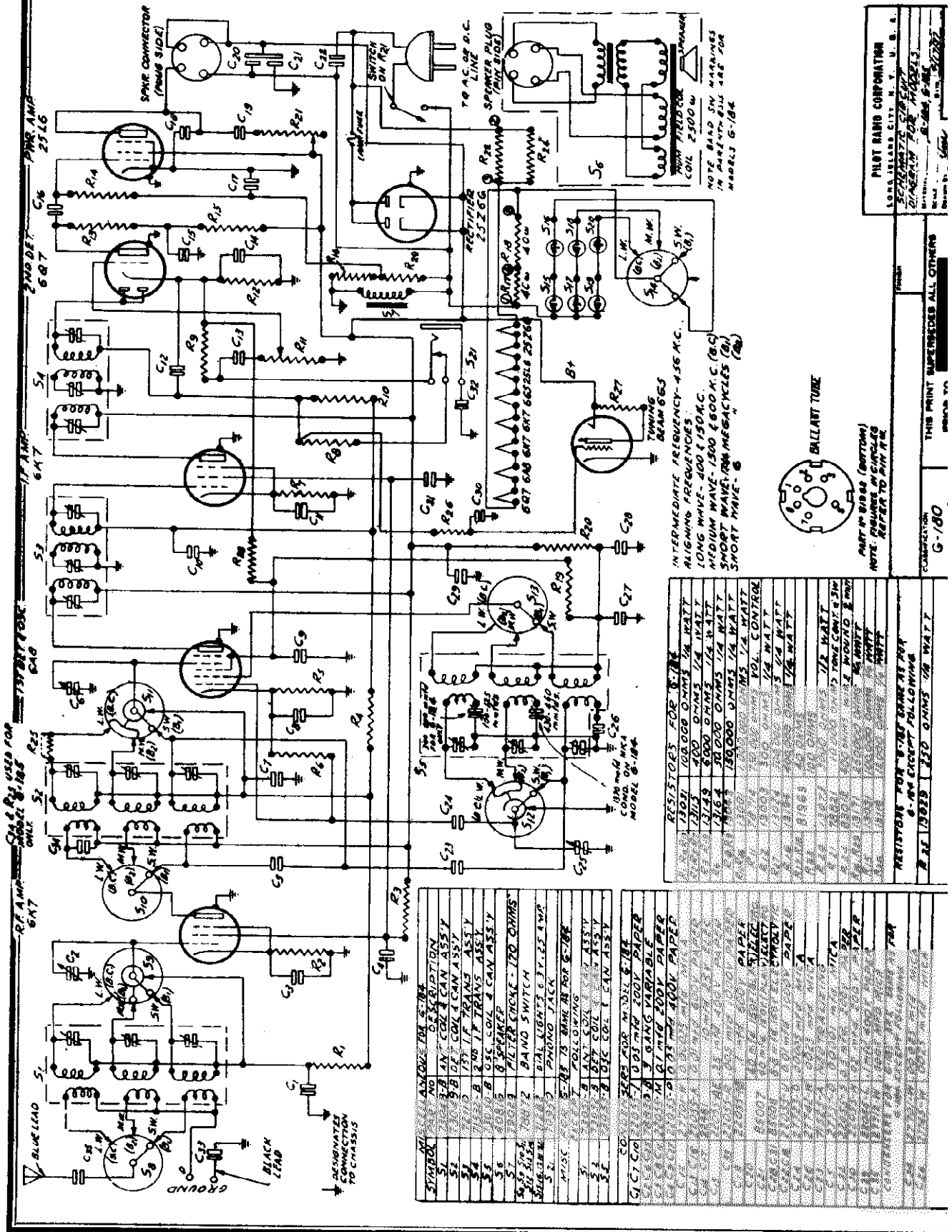
RESISTORS FOR MODEL G-162 RB-B

R-1	13164	50,000 OHMS 1/4 WATT CARBON
R-2	13164	15,000 OHMS 1/4 WATT CARBON
R-3	13007	2 MEG OHMS 1/4 WATT CARBON
R-4	13007	250,000 OHMS 1/4 WATT CARBON
R-5	13007	50 OHMS 1/4 WATT CARBON
R-6	13126	16 OHMS 1/4 WATT CARBON
R-7	13126	200 OHMS 1/4 WATT CARBON
R-8	13126	500,000 OHMS 1/4 WATT CARBON
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CONDENSERS FOR MODEL G-162 RB-B

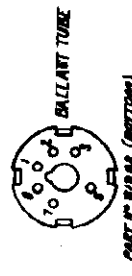
C-1	27704W	0.02 MFD. MICA
C-2	27055-A	0.05 MFD. 100V. PAPER
C-3	27055-A	0.05 MFD. 100V. PAPER
C-4	27055-A	0.05 MFD. 100V. PAPER
C-5	27055-A	0.05 MFD. 100V. PAPER
C-6	27055-A	0.05 MFD. 100V. PAPER
C-7	27055-A	0.05 MFD. 100V. PAPER
C-8	27055-A	0.05 MFD. 100V. PAPER
C-9	27055-A	0.05 MFD. 100V. PAPER
C-10	27055-A	0.05 MFD. 100V. PAPER
C-11	27055-A	0.05 MFD. 100V. PAPER
C-12	27055-A	0.05 MFD. 100V. PAPER
C-13	27055-A	0.05 MFD. 100V. PAPER
C-14	27055-A	0.05 MFD. 100V. PAPER
C-15	27055-A	0.05 MFD. 100V. PAPER
C-16	27055-A	0.05 MFD. 100V. PAPER
C-17	27055-A	0.05 MFD. 100V. PAPER
C-18	27055-A	0.05 MFD. 100V. PAPER
C-19	27055-A	0.05 MFD. 100V. PAPER
C-20	27055-A	0.05 MFD. 100V. PAPER
C-21	27055-A	0.05 MFD. 100V. PAPER
C-22	27055-A	0.05 MFD. 100V. PAPER
C-23	27055-A	0.05 MFD. 100V. PAPER
C-24	27055-A	0.05 MFD. 100V. PAPER
C-25	27055-A	0.05 MFD. 100V. PAPER
C-26	27055-A	0.05 MFD. 100V. PAPER

PILOT RADIO CORP.



REAR AMP: 6AT7
IF AMP: 6AG7
2ND DET: 6B7
PWR AMP: 25L6

INTERMEDIATE FREQUENCY 455 K.C.
ALIGNING FREQUENCIES
LONG WAVE - 400 & 150 K.C.
MEDIUM WAVE - 1500 & 600 K.C. (B.C.)
SHORT WAVE - 1000 & 500 K.C. (B.C.)
NOTE: PARTS IN CIRCLES IN SCHEMATIC ARE FOR MODEL G-184



RESISTORS FOR G-184	
120Ω	1000Ω OHMS 1/2 WATT
150Ω	1000Ω OHMS 1/2 WATT
180Ω	1000Ω OHMS 1/2 WATT
220Ω	1000Ω OHMS 1/2 WATT
270Ω	1000Ω OHMS 1/2 WATT
330Ω	1000Ω OHMS 1/2 WATT
390Ω	1000Ω OHMS 1/2 WATT
470Ω	1000Ω OHMS 1/2 WATT
560Ω	1000Ω OHMS 1/2 WATT
680Ω	1000Ω OHMS 1/2 WATT
820Ω	1000Ω OHMS 1/2 WATT
1K	1000Ω OHMS 1/2 WATT
1.2K	1000Ω OHMS 1/2 WATT
1.5K	1000Ω OHMS 1/2 WATT
1.8K	1000Ω OHMS 1/2 WATT
2.2K	1000Ω OHMS 1/2 WATT
2.7K	1000Ω OHMS 1/2 WATT
3.3K	1000Ω OHMS 1/2 WATT
3.9K	1000Ω OHMS 1/2 WATT
4.7K	1000Ω OHMS 1/2 WATT
5.6K	1000Ω OHMS 1/2 WATT
6.8K	1000Ω OHMS 1/2 WATT
8.2K	1000Ω OHMS 1/2 WATT
10K	1000Ω OHMS 1/2 WATT
12K	1000Ω OHMS 1/2 WATT
15K	1000Ω OHMS 1/2 WATT
18K	1000Ω OHMS 1/2 WATT
22K	1000Ω OHMS 1/2 WATT
27K	1000Ω OHMS 1/2 WATT
33K	1000Ω OHMS 1/2 WATT
39K	1000Ω OHMS 1/2 WATT
47K	1000Ω OHMS 1/2 WATT
56K	1000Ω OHMS 1/2 WATT
68K	1000Ω OHMS 1/2 WATT
82K	1000Ω OHMS 1/2 WATT
100K	1000Ω OHMS 1/2 WATT
120K	1000Ω OHMS 1/2 WATT
150K	1000Ω OHMS 1/2 WATT
180K	1000Ω OHMS 1/2 WATT
220K	1000Ω OHMS 1/2 WATT
270K	1000Ω OHMS 1/2 WATT
330K	1000Ω OHMS 1/2 WATT
390K	1000Ω OHMS 1/2 WATT
470K	1000Ω OHMS 1/2 WATT
560K	1000Ω OHMS 1/2 WATT
680K	1000Ω OHMS 1/2 WATT
820K	1000Ω OHMS 1/2 WATT
1M	1000Ω OHMS 1/2 WATT
1.2M	1000Ω OHMS 1/2 WATT
1.5M	1000Ω OHMS 1/2 WATT
1.8M	1000Ω OHMS 1/2 WATT
2.2M	1000Ω OHMS 1/2 WATT
2.7M	1000Ω OHMS 1/2 WATT
3.3M	1000Ω OHMS 1/2 WATT
3.9M	1000Ω OHMS 1/2 WATT
4.7M	1000Ω OHMS 1/2 WATT
5.6M	1000Ω OHMS 1/2 WATT
6.8M	1000Ω OHMS 1/2 WATT
8.2M	1000Ω OHMS 1/2 WATT
10M	1000Ω OHMS 1/2 WATT

PARTS LIST	
SYMBOL	DESCRIPTION
S1	500K POTENTIOMETER
S2	500K POTENTIOMETER
S3	500K POTENTIOMETER
S4	500K POTENTIOMETER
S5	500K POTENTIOMETER
S6	500K POTENTIOMETER
S7	500K POTENTIOMETER
S8	500K POTENTIOMETER
S9	500K POTENTIOMETER
S10	500K POTENTIOMETER
S11	500K POTENTIOMETER
S12	500K POTENTIOMETER
S13	500K POTENTIOMETER
S14	500K POTENTIOMETER
S15	500K POTENTIOMETER
S16	500K POTENTIOMETER
S17	500K POTENTIOMETER
S18	500K POTENTIOMETER
S19	500K POTENTIOMETER
S20	500K POTENTIOMETER
S21	500K POTENTIOMETER
S22	500K POTENTIOMETER
S23	500K POTENTIOMETER
S24	500K POTENTIOMETER
S25	500K POTENTIOMETER
S26	500K POTENTIOMETER
S27	500K POTENTIOMETER
S28	500K POTENTIOMETER
S29	500K POTENTIOMETER
S30	500K POTENTIOMETER
S31	500K POTENTIOMETER
S32	500K POTENTIOMETER
S33	500K POTENTIOMETER
S34	500K POTENTIOMETER
S35	500K POTENTIOMETER
S36	500K POTENTIOMETER
S37	500K POTENTIOMETER
S38	500K POTENTIOMETER
S39	500K POTENTIOMETER
S40	500K POTENTIOMETER
S41	500K POTENTIOMETER
S42	500K POTENTIOMETER
S43	500K POTENTIOMETER
S44	500K POTENTIOMETER
S45	500K POTENTIOMETER
S46	500K POTENTIOMETER
S47	500K POTENTIOMETER
S48	500K POTENTIOMETER
S49	500K POTENTIOMETER
S50	500K POTENTIOMETER
S51	500K POTENTIOMETER
S52	500K POTENTIOMETER
S53	500K POTENTIOMETER
S54	500K POTENTIOMETER
S55	500K POTENTIOMETER
S56	500K POTENTIOMETER
S57	500K POTENTIOMETER
S58	500K POTENTIOMETER
S59	500K POTENTIOMETER
S60	500K POTENTIOMETER
S61	500K POTENTIOMETER
S62	500K POTENTIOMETER
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S92	500K POTENTIOMETER
S93	500K POTENTIOMETER
S94	500K POTENTIOMETER
S95	500K POTENTIOMETER
S96	500K POTENTIOMETER
S97	500K POTENTIOMETER
S98	500K POTENTIOMETER
S99	500K POTENTIOMETER
S100	500K POTENTIOMETER

MODELS G-162, G-162A, G-162B
 G-163, G-163A, G-163B
 MODELS G-184, G-185
Alignment G-174, G-175

PILOT RADIO CORP.

Tranex AC-DC Model G-184—110-125 V. (50-60 Cycles)—Tranex AC-DC Model G-185
 16 - 555 m. (18,800 - 540 kc.)
 731 - 2140 m. (410 - 140 kc.)
MODEL G-174 (MODELS G-175 and G-185 ARE SOLD OUTSIDE THE U. S. A. ONLY)
 187-566 m. (1,600-530 kc.)
 800-2170 m. (375-138 kc.)

REMOVAL OF CHASSIS FROM CABINET:
 To remove the chassis from the cabinet proceed as follows:

Be certain that the line cord is removed from the power outlet socket.

Remove the "alignon" knobs and felt washers from the controls and loosen the set screw on the tuning knob.

Remove the speaker plug from the socket at the rear of the chassis.

Remove the four mounting screws, located underneath the cabinet.

Remove the tuning beam plug from the socket at the front of the chassis.

REALIGNMENT: Should the receiver require realignment, the procedure outlined below should be followed. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.

Before connecting the chassis to the power lines, reconnect the speaker cable in its socket at the rear of the chassis.

The R. F. alignment trimmer condensers are mounted on the side of the coil shields.

I. F. ALIGNMENT: When aligning the Intermediate-Frequency Amplifier, the external oscillator must be set at 416 kc. The Band Selector Switch should be in the position marked "Broadcast", and the tuning condenser should be set at maximum capacity. Connect the "antenna" lead of the external oscillator to the control grid of the type 6X7 tube in the I. F. Amplifier stage through a .1 mfd. fixed condenser. Connect the "ground" lead of the external oscillator to the receiver ground lead.

I. F. alignment capacitors are located at the side of the shielded I. F. Transformers. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator lead from the type 6X7 tube. Amplify the external oscillator lead from the type 6A7 tube. Connect the external oscillator lead to the control grid at the top of the type 6A8 tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. amplifier, it is essential to repeat the alignment process in both I. F. Units.

BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator lead to the receiver antenna and ground through a .0002 mfd. condenser. Leave the Band Switch in the "Broadcast" position and place the tuning control pointer at the 1500 kc. mark. Adjust the broadcast band oscillator trimmer to maximum output.

WAVE TRAP ADJUSTMENT: With the oscillator still set at 416 kc., connect the oscillator to the antenna through a 200 mfd. condenser. Then adjust the wave trap condenser for minimum deflection on the output meter.

BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator lead to the receiver antenna and ground through a .0002 mfd. condenser. Leave the Band Switch in the "Broadcast" position and place the tuning control pointer at the 1400 kc. mark. Tune the external oscillator to 1400 kc. Adjust the broadcast band oscillator trimmer to maximum output.

CAUTION: When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

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MODEL G-162 & G-163 (G-163 sold outside of U.S.)
 Model G-162A 220 Volt - AC DC 50-60 cycles Model G-163A
 Model G-162B 240 Volt - AC DC 50-60 cycles Model G-163B

44.5-126 m. (6,750-2380 kc.)
 187-566 m. (1,600-530 kc.)

REMOVAL OF CHASSIS FROM CABINET:

To remove the chassis from the cabinet proceed as follows:

Be certain that the line cord is removed from the power outlet socket.

Remove the knobs and felt washers from the controls on the front panel.

Remove the four mounting screws, located underneath the cabinet and pull chassis out.

REALIGNMENT: If the receiver requires alignment, the procedure outlined below should be followed. In the schematic diagram sheet, the location and function of the various alignment capacitors are clearly illustrated. For best results, an external modulated oscillator with adequate frequency range and a visual output meter, should be used.

I. F. ALIGNMENT: When aligning the Intermediate-Frequency Amplifier, the external oscillator must be set at 416 kc. The Band Switch should be in the position marked "Broadcast", and the tuning condenser should be set at maximum capacity. When aligning the receiver on all positions, the volume control should be turned to the maximum clockwise position. Connect the antenna lead of the external oscillator to the control grid of the 6D6 tube in the I. F. Amplifier through a .1 mfd. fixed condenser. Connect the ground lead of the external oscillator to the chassis. The I. F. alignment trimmers are located at the top of the shielded I. F. Transformers. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. Following this, connect the external oscillator leads to the control grid of the 6A7 tube. Adjust each trimmer on I. F. Unit No. 1 for maximum gain.

During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. amplifier, it is essential to repeat the alignment process in all I. F. Units, with the external oscillator leads connected to the control grid of the 6A7 tube.

WAVE TRAP ADJUSTMENT: With the oscillator still set at 416 kc., connect the oscillator to the antenna through a 200 mfd. condenser. Then adjust the wave trap condenser for minimum deflection on the output meter.

BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator lead to the receiver antenna and ground through a .0002 mfd. condenser. Leave the Band Switch in the "Broadcast" position and place the tuning control pointer at the 1400 kc. mark. Tune the external oscillator to 1400 kc. Adjust the broadcast band oscillator trimmer to maximum output.

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To remove the chassis from the cabinet proceed as follows:

Be certain that the line cord is removed from the power outlet socket.

Remove the "alignon" knobs and felt washers from the controls and loosen the set screw on the tuning knob.

Remove the speaker plug from the socket at the rear of the chassis.

Remove the four mounting screws, located underneath the cabinet.

Remove the tuning beam plug from the socket at the front of the chassis.

REALIGNMENT: Should the receiver require realignment, the procedure outlined below should be followed. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.

Before connecting the chassis to the power lines, reconnect the speaker cable in its socket at the rear of the chassis.

The R. F. alignment trimmer condensers are mounted on the side of the coil shields.

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Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. amplifier, it is essential to repeat the alignment process in all I. F. Units, with the external oscillator leads connected to the control grid of the 6A7 tube.

WAVE TRAP ADJUSTMENT: With the oscillator still set at 416 kc., connect the oscillator to the antenna through a 200 mfd. condenser. Then adjust the wave trap condenser for minimum deflection on the output meter.

BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator lead to the receiver antenna and ground through a .0002 mfd. condenser. Leave the Band Switch in the "Broadcast" position and place the tuning control pointer at the 1400 kc. mark. Tune the external oscillator to 1400 kc. Adjust the broadcast band oscillator trimmer to maximum output.

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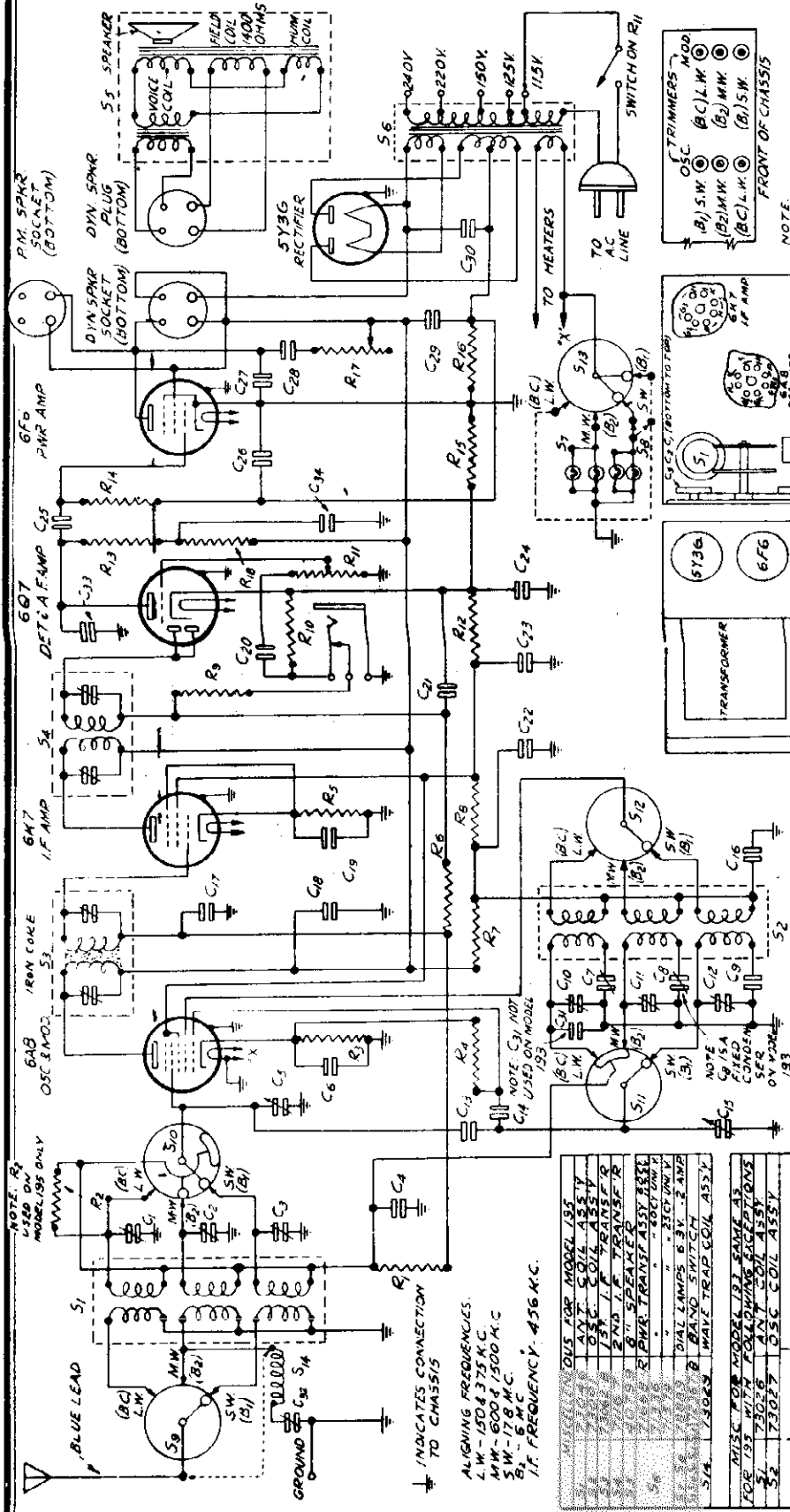
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PILOT RADIO CORP.

MODELS 193, 195 Revis
Schematic, Socket, Part
Trimmers, Alignment

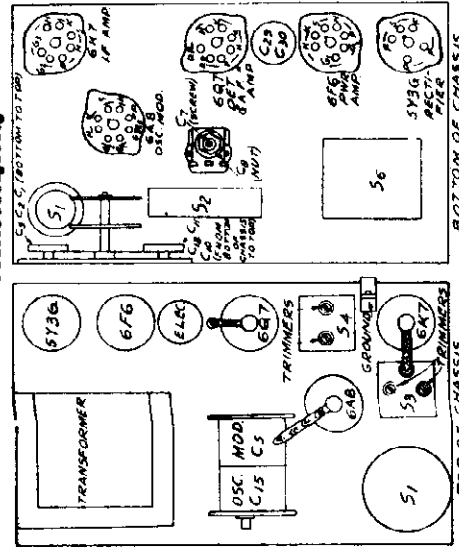


NOTE: BAND SW MARKINGS IN PARENTHESES FOR MODEL 193

Alignment same as Early 193 & 195

NOTE ON CIRCUIT FOR MODELS 193 & 195
DOTTED LINES SHOW CONNECTIONS FOR MODEL 193 WHICH DIFFER FROM MODEL 195 WHICH ARE INDICATED BY ARROWS ON BAND SWITCH

PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y., U. S. A.
SCHEMATIC CIRCUIT DIAGRAM
CHASSIS LAYOUT FOR MODELS 193 & 195
REVISED 1953
DATE: 1953
CHECKED BY: [Signature]
DRAWN BY: [Signature]
PART NO. 25131-6



RESISTOR VALUES FOR MODEL 193

R1	100K
R2	100K
R3	100K
R4	100K
R5	100K
R6	100K
R7	100K
R8	100K
R9	100K
R10	100K
R11	100K
R12	100K
R13	100K
R14	100K
R15	100K
R16	100K
R17	100K

RESISTOR VALUES FOR MODEL 195

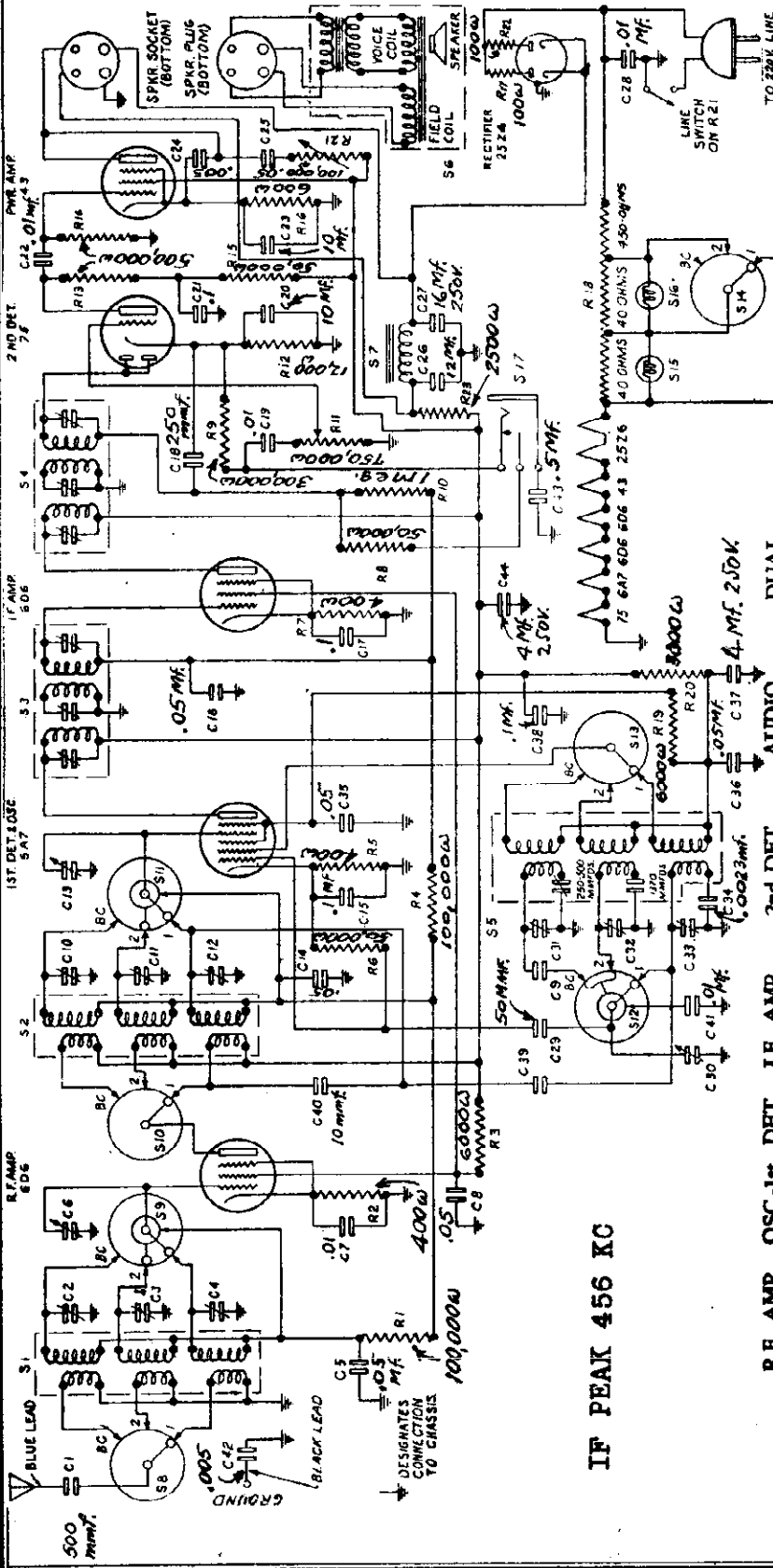
R1	100K
R2	100K
R3	100K
R4	100K
R5	100K
R6	100K
R7	100K
R8	100K
R9	100K
R10	100K
R11	100K
R12	100K
R13	100K
R14	100K
R15	100K
R16	100K
R17	100K

CONDENSER VALUES

C1	500PF
C2	500PF
C3	500PF
C4	500PF
C5	500PF
C6	500PF
C7	500PF
C8	500PF
C9	500PF
C10	500PF
C11	500PF
C12	500PF
C13	500PF
C14	500PF
C15	500PF
C16	500PF
C17	500PF
C18	500PF
C19	500PF
C20	500PF
C21	500PF
C22	500PF
C23	500PF
C24	500PF
C25	500PF
C26	500PF
C27	500PF
C28	500PF
C29	500PF
C30	500PF

MODEL 223
Schematic, Voltage

PILOT RADIO CORP.



IF PEAK 456 KC

	R.F. AMP.	OSC.-1st DET.	I.F. AMP.	2nd DET.	DIODE	AUDIO OUTPUT	DUAL RECTIFIER
PLATE	6D6	6A7	6D6	75	43	25Z6	
SCREEN	115	115	115	50*	175		
CATHODE	90	75	90		120		
FILAMENT	2.6	2.25	2.6	.5	15	215**	
	6.3	6.3	6.3	6.3	25	25	

NOTE: The D.C. voltages measured at the tube sockets of the set should be read with a high resistance voltmeter of at least 1,000 ohms per volt.

All voltages measured to chassis.

Speaker field voltage 215 volts.

Anode Grid of 6A7 100 volts.

* Measured through Plate Resistor.

** Cathode to chassis.

NOTE: These measurements should be made with the volume control turned to the right, and with the tuning adjusted at "No signal" position on dial.

REVERSING D.C. PLUG: When the Model 223 is operated on D.C., if the set seems dead, reverse the line plug in the socket. The set will work with the plug in one position, but not in the other.

Range: 16-555 Meters (18,800-545 kc.)
For Operation on 220 Volts—AC-DC

Power Consumption 100 Watts

Line Volts 220 volts A.C.-D.C.

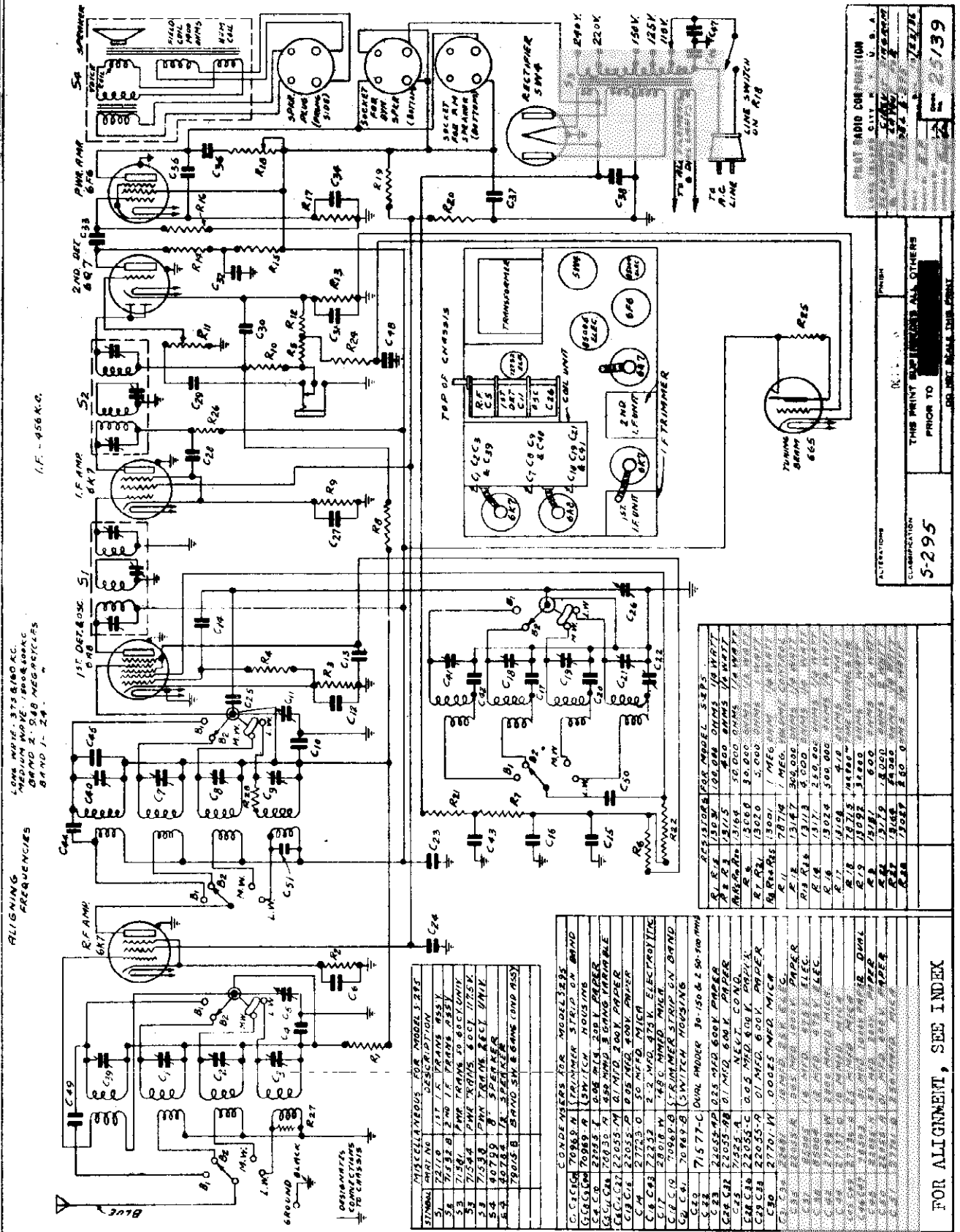
I. F. Frequency 456 Kc.

Power Output 2.3 Watts

FOR ALIGNMENT, SEE INDEX

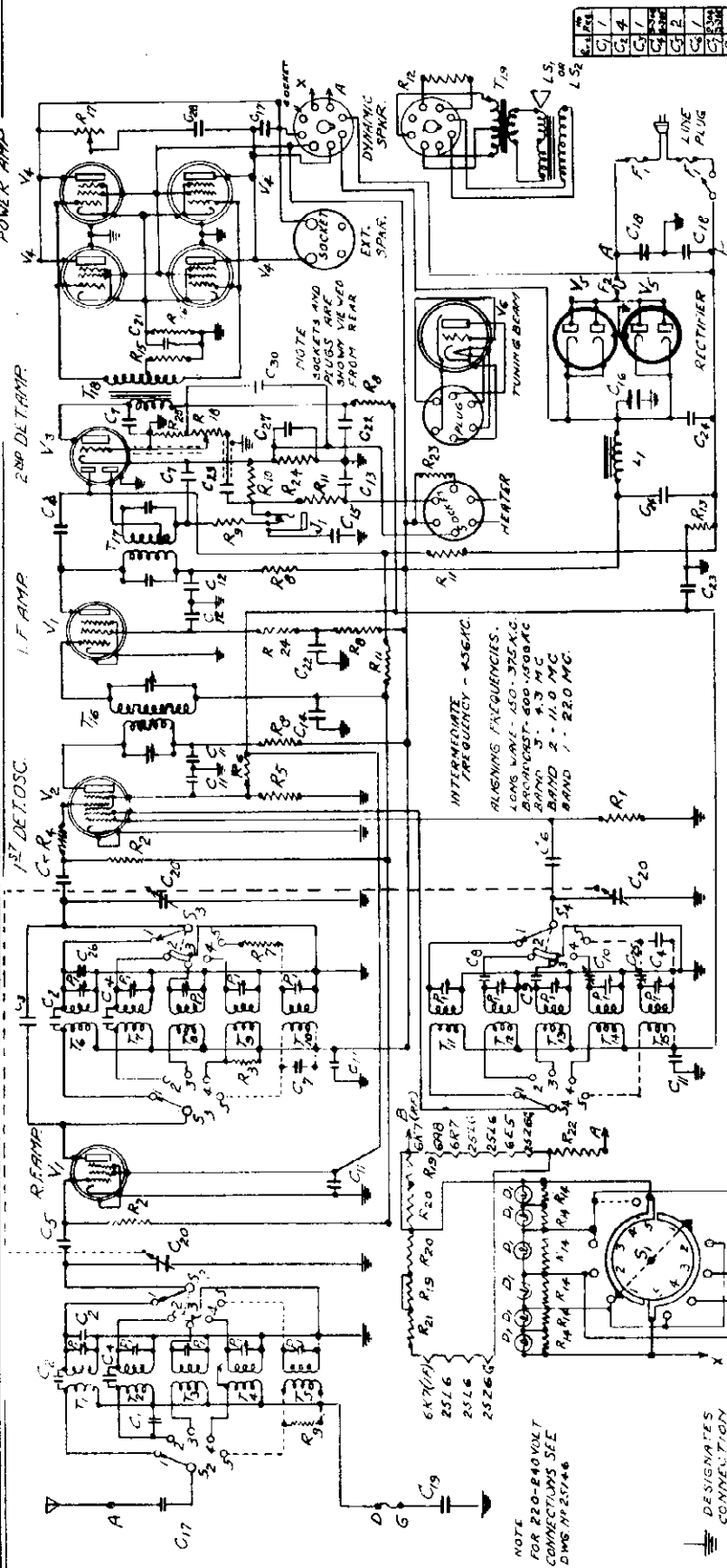
INTERMEDIATE FREQUENCY—456 KC
ALIGNING FREQUENCIES
BROADCAST—1500 & 600 KC
BAND 1—17.5 MEGACYCLES
BAND 2—

PILOT RADIO CORP.



MODELS X-304, X-305
Schematic, Parts

PILOT RADIO CORP.



INTERMEDIATE FREQUENCY - 456KC.
ALIGNING FREQUENCIES:
LONG WAVE - 450-375K.C.
MEDIUM WAVE - 400-1000K.C.
SHORT WAVE - 1.5-3 MC.
BAND 2 - 11.0 MC.
BAND 1 - 22.0 MC.

NOTE
FOR 220-240VOLT
CONNECTORS SEE
S.W. NO. 21446

DESIGNATES
CONNECTION
TO CHASSIS

REF.	QTY.	DESCRIPTION	MANUFACTURER	REMARKS
1	1	6X4	GE	50.000 OHMS WATT CARB
2	1	6AR5	GE	50.000 OHMS WATT CARB
3	1	6AV6	GE	50.000 OHMS WATT CARB
4	1	6X4	GE	50.000 OHMS WATT CARB
5	1	6AR5	GE	50.000 OHMS WATT CARB
6	1	6AV6	GE	50.000 OHMS WATT CARB
7	1	6X4	GE	50.000 OHMS WATT CARB
8	1	6AR5	GE	50.000 OHMS WATT CARB
9	1	6AV6	GE	50.000 OHMS WATT CARB
10	1	6X4	GE	50.000 OHMS WATT CARB
11	1	6AR5	GE	50.000 OHMS WATT CARB
12	1	6AV6	GE	50.000 OHMS WATT CARB
13	1	6X4	GE	50.000 OHMS WATT CARB
14	1	6AR5	GE	50.000 OHMS WATT CARB
15	1	6AV6	GE	50.000 OHMS WATT CARB
16	1	6X4	GE	50.000 OHMS WATT CARB
17	1	6AR5	GE	50.000 OHMS WATT CARB
18	1	6AV6	GE	50.000 OHMS WATT CARB
19	1	6X4	GE	50.000 OHMS WATT CARB
20	1	6AR5	GE	50.000 OHMS WATT CARB
21	1	6AV6	GE	50.000 OHMS WATT CARB
22	1	6X4	GE	50.000 OHMS WATT CARB
23	1	6AR5	GE	50.000 OHMS WATT CARB
24	1	6AV6	GE	50.000 OHMS WATT CARB
25	1	6X4	GE	50.000 OHMS WATT CARB
26	1	6AR5	GE	50.000 OHMS WATT CARB
27	1	6AV6	GE	50.000 OHMS WATT CARB
28	1	6X4	GE	50.000 OHMS WATT CARB
29	1	6AR5	GE	50.000 OHMS WATT CARB
30	1	6AV6	GE	50.000 OHMS WATT CARB
31	1	6X4	GE	50.000 OHMS WATT CARB
32	1	6AR5	GE	50.000 OHMS WATT CARB
33	1	6AV6	GE	50.000 OHMS WATT CARB
34	1	6X4	GE	50.000 OHMS WATT CARB
35	1	6AR5	GE	50.000 OHMS WATT CARB
36	1	6AV6	GE	50.000 OHMS WATT CARB
37	1	6X4	GE	50.000 OHMS WATT CARB
38	1	6AR5	GE	50.000 OHMS WATT CARB
39	1	6AV6	GE	50.000 OHMS WATT CARB
40	1	6X4	GE	50.000 OHMS WATT CARB
41	1	6AR5	GE	50.000 OHMS WATT CARB
42	1	6AV6	GE	50.000 OHMS WATT CARB
43	1	6X4	GE	50.000 OHMS WATT CARB
44	1	6AR5	GE	50.000 OHMS WATT CARB
45	1	6AV6	GE	50.000 OHMS WATT CARB
46	1	6X4	GE	50.000 OHMS WATT CARB
47	1	6AR5	GE	50.000 OHMS WATT CARB
48	1	6AV6	GE	50.000 OHMS WATT CARB
49	1	6X4	GE	50.000 OHMS WATT CARB
50	1	6AR5	GE	50.000 OHMS WATT CARB
51	1	6AV6	GE	50.000 OHMS WATT CARB
52	1	6X4	GE	50.000 OHMS WATT CARB
53	1	6AR5	GE	50.000 OHMS WATT CARB
54	1	6AV6	GE	50.000 OHMS WATT CARB
55	1	6X4	GE	50.000 OHMS WATT CARB
56	1	6AR5	GE	50.000 OHMS WATT CARB
57	1	6AV6	GE	50.000 OHMS WATT CARB
58	1	6X4	GE	50.000 OHMS WATT CARB
59	1	6AR5	GE	50.000 OHMS WATT CARB
60	1	6AV6	GE	50.000 OHMS WATT CARB
61	1	6X4	GE	50.000 OHMS WATT CARB
62	1	6AR5	GE	50.000 OHMS WATT CARB
63	1	6AV6	GE	50.000 OHMS WATT CARB
64	1	6X4	GE	50.000 OHMS WATT CARB
65	1	6AR5	GE	50.000 OHMS WATT CARB
66	1	6AV6	GE	50.000 OHMS WATT CARB
67	1	6X4	GE	50.000 OHMS WATT CARB
68	1	6AR5	GE	50.000 OHMS WATT CARB
69	1	6AV6	GE	50.000 OHMS WATT CARB
70	1	6X4	GE	50.000 OHMS WATT CARB
71	1	6AR5	GE	50.000 OHMS WATT CARB
72	1	6AV6	GE	50.000 OHMS WATT CARB
73	1	6X4	GE	50.000 OHMS WATT CARB
74	1	6AR5	GE	50.000 OHMS WATT CARB
75	1	6AV6	GE	50.000 OHMS WATT CARB
76	1	6X4	GE	50.000 OHMS WATT CARB
77	1	6AR5	GE	50.000 OHMS WATT CARB
78	1	6AV6	GE	50.000 OHMS WATT CARB
79	1	6X4	GE	50.000 OHMS WATT CARB
80	1	6AR5	GE	50.000 OHMS WATT CARB
81	1	6AV6	GE	50.000 OHMS WATT CARB
82	1	6X4	GE	50.000 OHMS WATT CARB
83	1	6AR5	GE	50.000 OHMS WATT CARB
84	1	6AV6	GE	50.000 OHMS WATT CARB
85	1	6X4	GE	50.000 OHMS WATT CARB
86	1	6AR5	GE	50.000 OHMS WATT CARB
87	1	6AV6	GE	50.000 OHMS WATT CARB
88	1	6X4	GE	50.000 OHMS WATT CARB
89	1	6AR5	GE	50.000 OHMS WATT CARB
90	1	6AV6	GE	50.000 OHMS WATT CARB
91	1	6X4	GE	50.000 OHMS WATT CARB
92	1	6AR5	GE	50.000 OHMS WATT CARB
93	1	6AV6	GE	50.000 OHMS WATT CARB
94	1	6X4	GE	50.000 OHMS WATT CARB
95	1	6AR5	GE	50.000 OHMS WATT CARB
96	1	6AV6	GE	50.000 OHMS WATT CARB
97	1	6X4	GE	50.000 OHMS WATT CARB
98	1	6AR5	GE	50.000 OHMS WATT CARB
99	1	6AV6	GE	50.000 OHMS WATT CARB
100	1	6X4	GE	50.000 OHMS WATT CARB

PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y., U. S. A.
SCHEMATIC FOR MODEL X-304
MATERIAL ANG. A-358
DATE 4-2-50
CHECKED BY: [Signature]
APPROVED BY: [Signature]

NOTE: ADDITIONAL WIRING FOR LONG WAVE BAND
ON MODEL X305 IS SHOWN IN DOTTED LINES

ALTERNATE CASE - CHASSIS WIRELESS 43 45192
CLASSIFICATION
X-300
THIS PRINT SUPERSEDES ALL OTHERS
PRIOR TO [Signature]
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T₁(P), T₂(P), T₃(P), T₄(P) - C.A.T. CT. P₁, P₂, P₃, C₂₅
TO BE OMITTED IN MODEL X304.

PILOT RADIO CORP.

MODEL S-295
Alignment
MODELS X-304, X
Voltage, Alignment

MODEL S-295, FOR ALTERNATING CURRENT

Four Tuning Bands: 12.4-32.8 meters (24,100-9,150 kc.) — 29.7-7.9 meters (10,100-3,800 kc.)
182-560 meters (1,650-537 kc.) — 755-2,300 meters (397-130 kc.)

Model X-304
12.7 - 570 m. (23,600 - 525 kc.)

Model X-305
12.7 - 570 m. (23,600 - 525 kc.)
740 - 2150 m. (405 - 136 kc.)

REMOVAL OF CHASSIS FROM CABINET

To remove the chassis from the cabinet proceed as follows:

- Be certain that the line cord is removed from the power outlet socket.
- Remove the knobs and felt washers from the controls and loosen the set screw on the tuning knob.
- Remove the speaker plug from the socket at the rear of the chassis.
- Remove the four mounting screws, located underneath the cabinet, from the socket at the rear of the chassis.

REALIGNMENT

Should the receiver require realignment, the procedure outlined below should be followed. In the alignment procedure, capacitors are clearly illustrated. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.

I. F. ALIGNMENT

When aligning Band 2, set the Band Switch in the position marked Band 2. Replace the 0.002 mfd. condenser with a 400 ohm non-inductive resistor. Rotate the tuning condenser on the dial scale. Adjust the Band 2 oscillator for maximum sensitivity. Next adjust the trimmer for maximum sensitivity. Check the overall sensitivity of the band at several points along the dial scale.

BROADCAST ALIGNMENT

When aligning Band 2, set the Band Switch in the position marked Band 2. Replace the 0.002 mfd. condenser with a 400 ohm non-inductive resistor. Rotate the tuning condenser on the dial scale. Adjust the Band 2 oscillator for maximum sensitivity. Next adjust the trimmer for maximum sensitivity. Check the overall sensitivity of the band at several points along the dial scale.

REMOVAL OF BAND SELECTOR SWITCH ASSEMBLY

Should it be necessary to remove the receiver after removal of the band selector switch assembly, it is advisable to realign the receiver after reassembly.

CAUTION

When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

PHONOGRAPH PICKUP

A back is provided at the rear of the chassis for plugging in an extra speaker, which can be used in the living room, in one of your up-stairs rooms, or in the garage.

Model X-304
12.7 - 570 m. (23,600 - 525 kc.)

REMOVAL OF CHASSIS FROM CABINET

To remove the chassis from the cabinet proceed as follows:

- Be certain that the line cord is removed from the power outlet socket.
- Remove the knobs and felt washers from the controls and loosen the set screw on the tuning knob.
- Remove the speaker plug from the socket at the rear of the chassis.
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Model X-304
12.7 - 570 m. (23,600 - 525 kc.)

REMOVAL OF CHASSIS FROM CABINET

To remove the chassis from the cabinet proceed as follows:

- Be certain that the line cord is removed from the power outlet socket.
- Remove the knobs and felt washers from the controls and loosen the set screw on the tuning knob.
- Remove the speaker plug from the socket at the rear of the chassis.
- Remove the four mounting screws, located underneath the cabinet, from the socket at the rear of the chassis.

REALIGNMENT

Should the receiver require realignment, the procedure outlined below should be followed. In the alignment procedure, capacitors are clearly illustrated. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.

I. F. ALIGNMENT

When aligning Band 2, set the Band Switch in the position marked Band 2. Replace the 0.002 mfd. condenser with a 400 ohm non-inductive resistor. Rotate the tuning condenser on the dial scale. Adjust the Band 2 oscillator for maximum sensitivity. Next adjust the trimmer for maximum sensitivity. Check the overall sensitivity of the band at several points along the dial scale.

BROADCAST ALIGNMENT

When aligning Band 2, set the Band Switch in the position marked Band 2. Replace the 0.002 mfd. condenser with a 400 ohm non-inductive resistor. Rotate the tuning condenser on the dial scale. Adjust the Band 2 oscillator for maximum sensitivity. Next adjust the trimmer for maximum sensitivity. Check the overall sensitivity of the band at several points along the dial scale.

REMOVAL OF BAND SELECTOR SWITCH ASSEMBLY

Should it be necessary to remove the receiver after removal of the band selector switch assembly, it is advisable to realign the receiver after reassembly.

CAUTION

When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

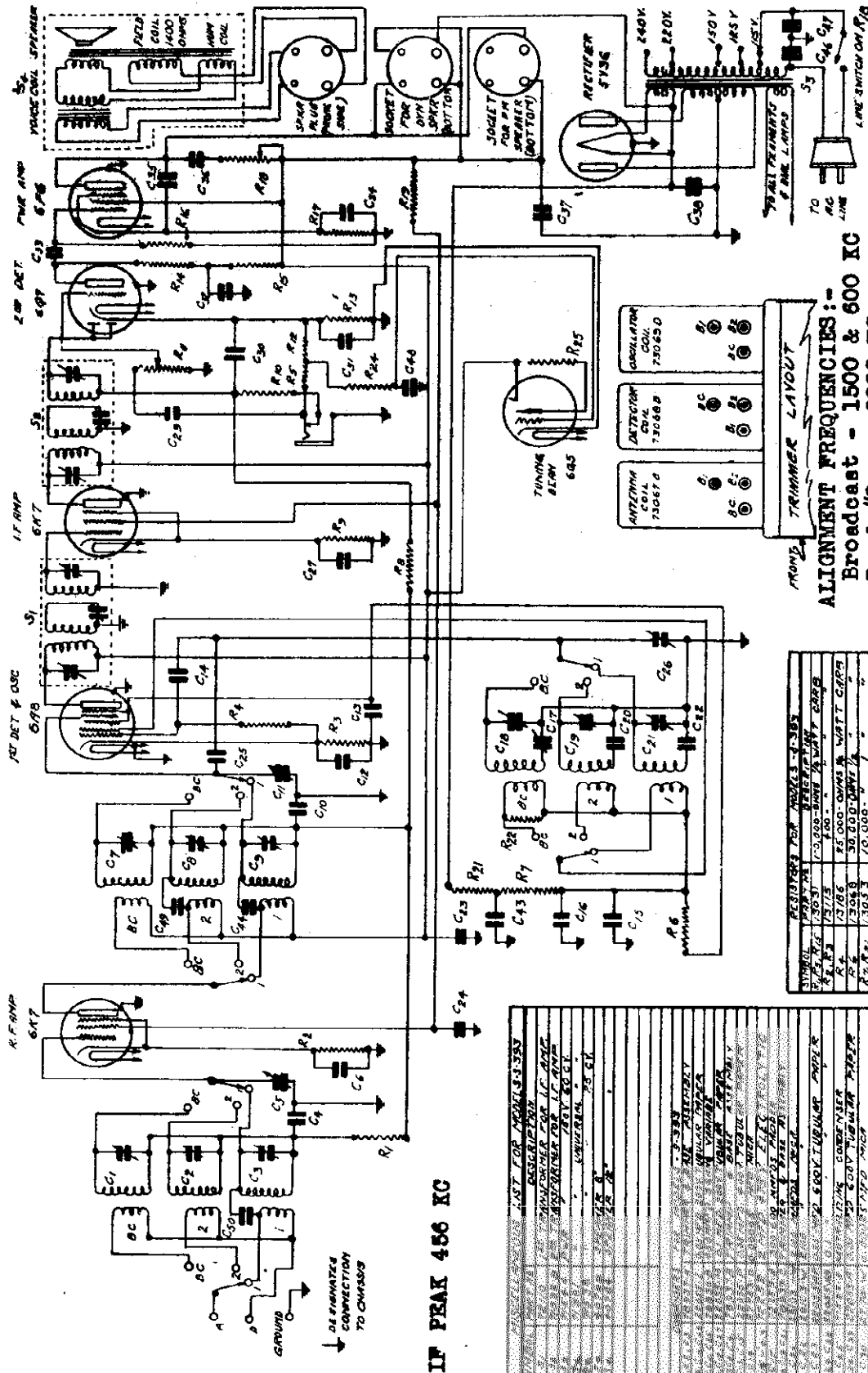
PHONOGRAPH PICKUP

A back is provided at the rear of the chassis for plugging in an extra speaker, which can be used in the living room, in one of your up-stairs rooms, or in the garage.

MODEL S-393

Schematic, Trimmers
Alignment, Parts

PILOT RADIO CORP.



RESISTORS FOR MODELS S-393

SYMBOL	RESISTANCE	WATTAGE	TYPE
R1	1500	1/2	RESISTOR
R2	1500	1/2	RESISTOR
R3	1500	1/2	RESISTOR
R4	1500	1/2	RESISTOR
R5	1500	1/2	RESISTOR
R6	1500	1/2	RESISTOR
R7	1500	1/2	RESISTOR
R8	1500	1/2	RESISTOR
R9	1500	1/2	RESISTOR
R10	1500	1/2	RESISTOR
R11	1500	1/2	RESISTOR
R12	1500	1/2	RESISTOR
R13	1500	1/2	RESISTOR
R14	1500	1/2	RESISTOR
R15	1500	1/2	RESISTOR
R16	1500	1/2	RESISTOR
R17	1500	1/2	RESISTOR
R18	1500	1/2	RESISTOR
R19	1500	1/2	RESISTOR
R20	1500	1/2	RESISTOR
R21	1500	1/2	RESISTOR
R22	1500	1/2	RESISTOR
R23	1500	1/2	RESISTOR
R24	1500	1/2	RESISTOR
R25	1500	1/2	RESISTOR

LIST FOR MODEL S-393

SYMBOL	DESCRIPTION	QUANTITY	TYPE
C1	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C2	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C3	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C4	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C5	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C6	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C7	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C8	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C9	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C10	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C11	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C12	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C13	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C14	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C15	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C16	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C17	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C18	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C19	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C20	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C21	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C22	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C23	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C24	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR
C25	50,000 OHMS 1/2 WATT CAP	1	CAPACITOR

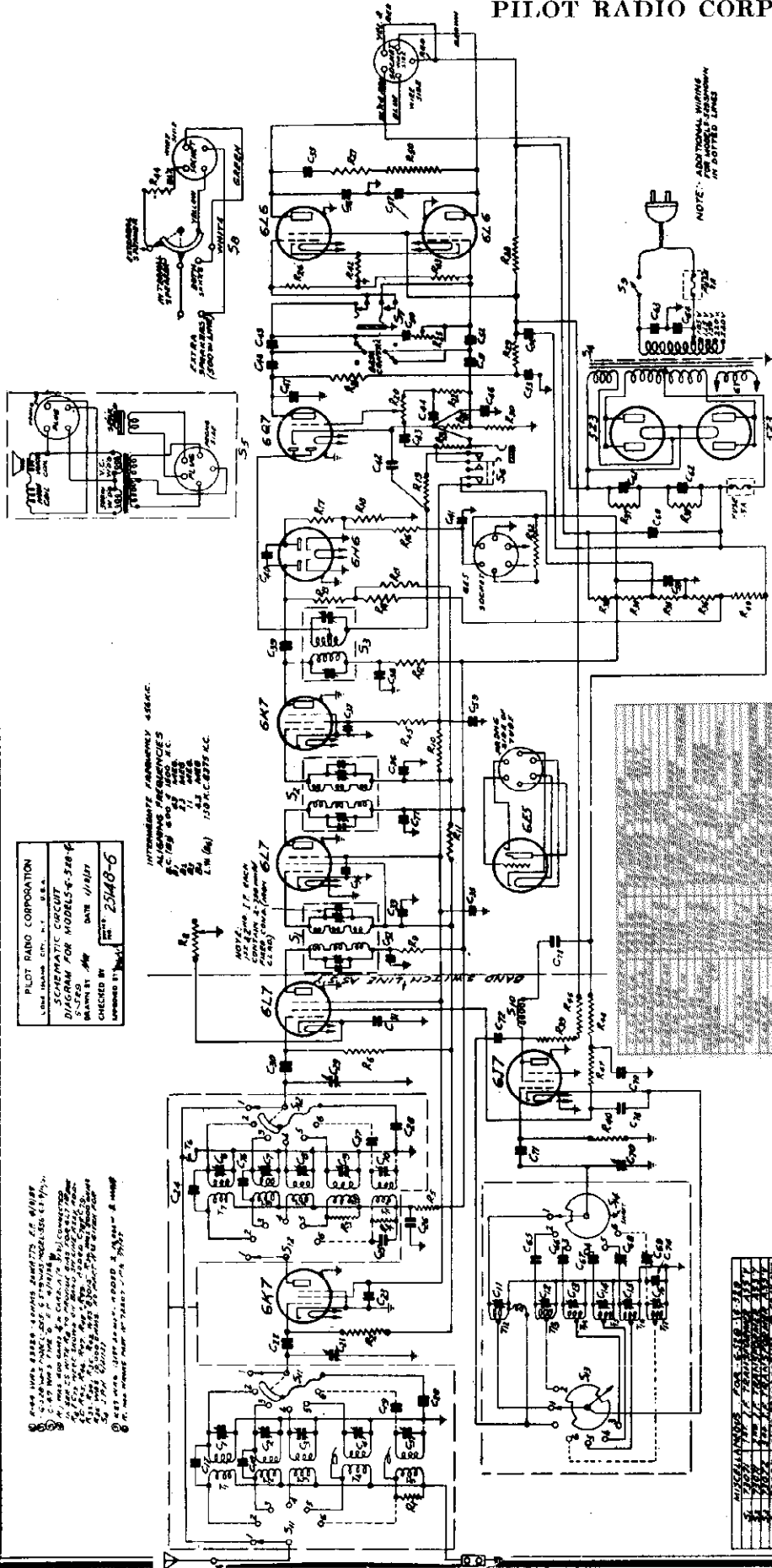
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 LONG ISLAND CITY, N. Y. U. S. A.
 SERVICE CENTER
 FOR MODEL S-393

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 PRIOR TO

MODEL S-393

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PILOT RADIO CORP.



NOTE: ADDITIONAL WIRING
AS SHOWN IN
PILOT PAGE

PILOT RADIO CORPORATION
LONG BEACH, CALIF., U.S.A.
SCHEMATIC CIRCUIT
DIAGRAM FOR MODEL'S G-525-G
DRAWN BY: J.M. DATE: 1/1/51
CHECKED BY: J.M.
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INTERMEDIATE FREQUENCY 455 KC.
ALIGNING FREQUENCIES
6L7 1625 KC.
6B7 2175 KC.
6G6 1625 KC.
6A7 1625 KC.
LW (M) 1500 KC. (275 KC.)

NOTE: FOR EACH
CONTROLS, REFER TO
PILOT PAGE FOR
6L7

FOR MORE DATA REFER TO PILOT PAGE 6-525-G
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Table with multiple columns and rows, likely a parts list or component specifications. The text is mostly illegible due to the image quality.

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FOR ALIGNMENT, SEE INDEX

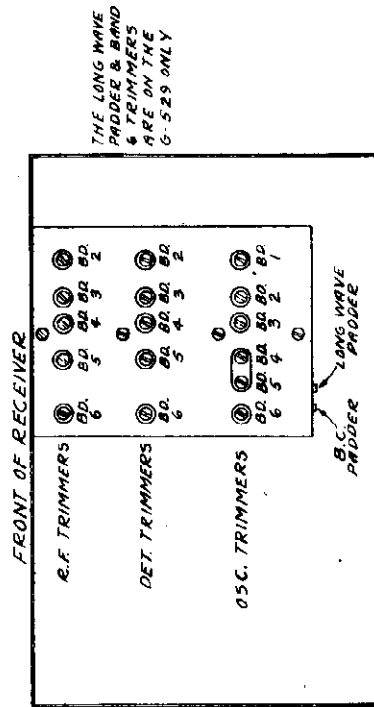
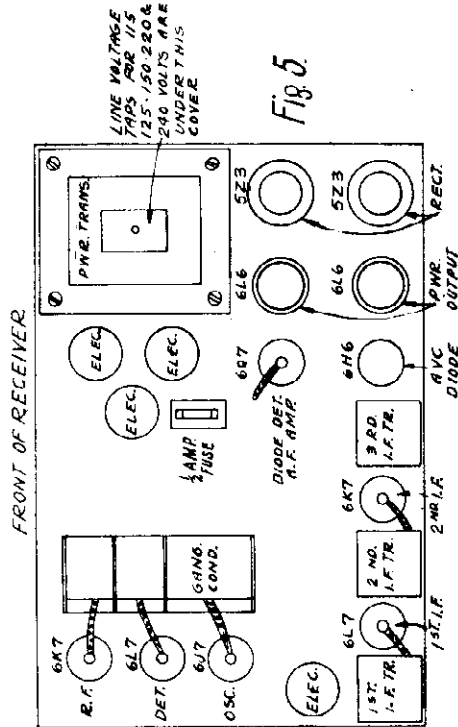
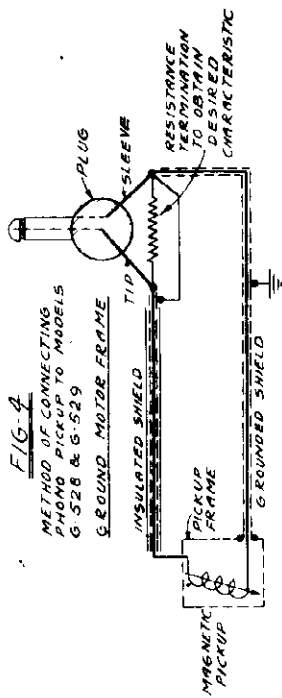
MODELS G-528, G-529

Socket, Trimmers
Phono. Data

PILOT RADIO CORP.

MODELS TG-528, TG-529

Speaker Connections



THE LONG WAVE PADDER & BAND & TRIMMERS ARE ON THE G-529 ONLY

Schematic Wiring Diagram

and special circuits for the
Models TG-528 and TG-529

EXTRA SPEAKER CONNECTIONS FOR MODELS G-528 & G-529

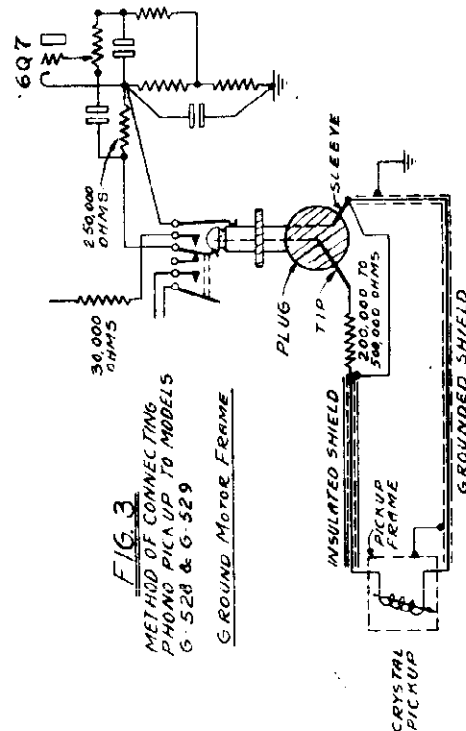
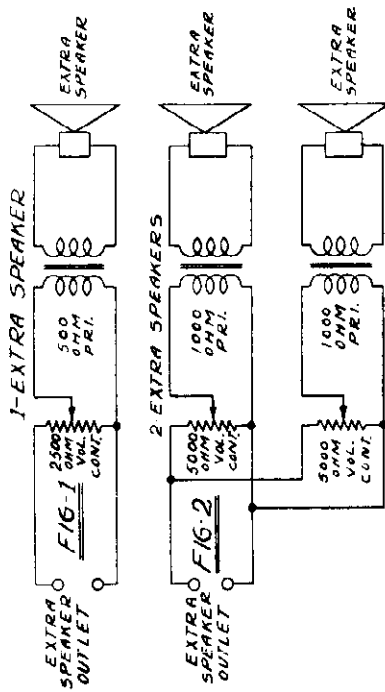


FIG. 3
METHOD OF CONNECTING
PHONO PICKUP TO MODELS
G-528 & G-529

MODELS G-528, G-529
Voltage, Alignment
MODELS G-584, G-585
Alignment

PILOT RADIO CORP.

MODELS G-528 & G-529

RECEIVER ALIGNMENT

EQUIPMENT REQUIRED:

- Signal Generator, having accurate frequency calibration.
- Output Meter
- Dummy Antenna; 900 ohm non-inductive resistor in mid. condenser
- .0002 mfd. condenser

CONNECTIONS: The posts marked D and G on the rear of the chassis should be connected to ground. The antenna lead from the signal generator is connected to the grid of the 6L7 intermediate frequency amplifier. The hot lead is transferred to the post marked A in series with a .0002 mfd. condenser when aligning Bands 4, 5, and 6. The .0002 mfd. condenser is connected to ground through a 400-ohm resistor when aligning Bands 1, 2, and 3 with a 400-ohm resistor when aligning Band 1, speaker terminals.

The output meter may be connected to the extra signal generator output. The signal generator should be set to 1500 kc. If this is not possible, the frequency a harmonic of a lower frequency may be used if the aligning signal is too strong.

The broadcast is due to the automatic volume control action. It is for this reason that the signal generator output must be kept low for accurate alignment.

ALIGNMENT PROCEDURE: All the control knobs should be turned to the extreme clockwise positions. The positions of the various trimmers are clearly shown in Figure 1. Connect the signal generator to the speaker for aligning the intermediate-frequency amplifier as described under "connections". Turn the loud speaker switch to the external receiver position. Set the signal generator at 456 kc. and increase its output until a reading is obtained on the output meter. Adjust the frequency trimmer in the order listed below under "I".

Next connect the signal generator for aligning Band 5. Set the signal generator and receiver dial at 1500 kc. Adjust the BY oscillator trimmer for maximum output. The detector and R.F. trimmers should next be adjusted for maximum output.

Band 5 should now be adjusted at the low frequency end of the dial. For this adjustment set the signal generator to 600 kc. and follow instructions under "rocking detector" at 600 kc. Repeat the 1500 kc. adjustment after aligning at 600 kc.

Model 529 has a long wave band (Band 6) which is adjusted in a manner similar to that for Band 5.

Bands 1, 2, 3 and 4 have no adjustment at the low frequency end of the band.

SOCKET VOLTAGES

6E7	6L7	6E7	6E7	6E7	6E7	6E7	6E7	6E7	6E7
RF Amp.	Mixer	IF Amp.	IF Amp.	IF Amp.	IF Amp.	IF Amp.	IF Amp.	IF Amp.	IF Amp.
0	30	0	30	0	30	0	30	0	30
0	90	0	90	0	90	0	90	0	90
0	120	0	120	0	120	0	120	0	120
0	150	0	150	0	150	0	150	0	150
0	220	0	220	0	220	0	220	0	220
0	300	0	300	0	300	0	300	0	300
0	400	0	400	0	400	0	400	0	400
0	500	0	500	0	500	0	500	0	500
0	600	0	600	0	600	0	600	0	600
0	700	0	700	0	700	0	700	0	700
0	800	0	800	0	800	0	800	0	800
0	900	0	900	0	900	0	900	0	900
0	1000	0	1000	0	1000	0	1000	0	1000

Grid bias voltage applied to L.F. and R.F. tubes—2.5 volts (Measure across R16)
 The above voltages were measured to chassis with a 1000 ohm per volt voltmeter and a 115 volt AC line.
 *Sensitivity control in maximum position. Cathode voltage measured with sensitivity control in maximum position, 9 volts.
 †Measured through high resistance.
 ‡Operating voltage through high resistance.
 ††† Frequency 50-60 cycles

IMAGE FREQUENCY: All bands except Band 1 are aligned with the oscillator slightly higher than the signal frequency. Band 1 has the oscillator adjusted to a frequency below the signal frequency. The possibility of aligning the receiver to the image frequency on Bands 2, 3 and 4 can be eliminated by adjusting the output of the oscillator to a level which will cause the receiver to receive two signals separated by twice the intermediate frequency. The signal which is received at a higher frequency on the receiver dial is the correct signal for alignment. The reverse is true on Band 1.

INTERMEDIATE FREQUENCY ALIGNMENT
 Set Signal Generator at 1500 kc.
 Adjust in Order Listed Below
 LEF-1
 LEF-2
 LEF-3

RADIO FREQUENCY ALIGNMENT

- Set Signal Generator and Receiver Dial at 375 kc.
- Band 6 150 kc.
- Band 5 1500 kc.
- Band 3 600 kc.
- Band 4 4300 kc.
- Band 2 11,000 kc.
- Band 1 60,000 kc.

*Rocking the gang is necessary to obtain correct alignment of the RF circuit. The signal generator should be set to the padding frequency and the gang rotated until the output meter reads maximum output.

The padding condenser for the band to be adjusted is turned a slight amount and the gang condenser turned to the next position. The padding condenser is then set to the padding frequency and the gang rotated until the output meter reads maximum output. The gang condenser in the same direction until a point is reached where the output decreases when the padding and gang are rotated further in the opposite direction. The padding condenser is then turned in the opposite direction where decreased output follows an adjustment of the padding.

ALIGNMENT OF BANDS 2 and 3: Center the indicator when aligning Bands 2 and 3. Center the frequencies covered. The signal generator and receiver indicator are set at the alignment frequency and the oscillator trimmer is adjusted for maximum output, care being taken to avoid adjustment to the image frequency. The intermediate frequency trimmer is now adjusted and the gang condenser is rotated until the output meter reads maximum output, until at some position of both trimmer and gang condenser, maximum output is obtained. The R.F. trimmer is adjusted in the same manner.

BAND 1 ALIGNMENT: The 60,000 kc. signal necessary for alignment may not be obtainable with most signal generators. The third harmonic of 20,000 kc. can be used for alignment. The signal generator should be adjusted to 60,000 kc. on the dial. The lower frequency trimmer should be adjusted to bring the lower frequency signal to the 60,000 kc. calibration on the dial.

6E7	6E7	6E7	6E7	6E7	6E7	6E7	6E7	6E7	6E7
RF Amp.	IF Amp.	IF Amp.	IF Amp.	IF Amp.	IF Amp.	IF Amp.	IF Amp.	IF Amp.	IF Amp.
0	30	0	30	0	30	0	30	0	30
0	90	0	90	0	90	0	90	0	90
0	120	0	120	0	120	0	120	0	120
0	150	0	150	0	150	0	150	0	150
0	220	0	220	0	220	0	220	0	220
0	300	0	300	0	300	0	300	0	300
0	400	0	400	0	400	0	400	0	400
0	500	0	500	0	500	0	500	0	500
0	600	0	600	0	600	0	600	0	600
0	700	0	700	0	700	0	700	0	700
0	800	0	800	0	800	0	800	0	800
0	900	0	900	0	900	0	900	0	900
0	1000	0	1000	0	1000	0	1000	0	1000

Power consumption 200 watts
 Undesired power output—30 watts

REMOVAL OF CHASSIS FROM CABINET:
 To remove the chassis from the cabinet proceed as follows:
 Be certain that the line cord is removed from the power outlet socket.
 Remove the "Upson" knobs and felt washers from the controls and loosen the set screw on the tuning knob.
 Remove the speaker plug from the socket at the rear of the speaker.
 Remove the four mounting screws, located underneath the cabinet.

REALIGNMENT: Should the receiver require realignment, the procedure outlined below should be followed. Refer to the schematic wiring diagram, the tension and function of the various trimmers and the procedure illustrated. For best results an external modulated oscillator with adequate frequency range, and a signal output meter, should be used.

Before connecting the chassis to the power line, reconnect the speaker cable.

I. F. ALIGNMENT: When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The Band Switch should be in the position marked "Broadcast," and the tuning condenser should be set at maximum capacity. Connect the "antenna" lead of the external oscillator to the control grid of the 6E7-G tube. Connect the "ground" lead of the external oscillator to the receiver ground lead. The I. F. alignment capacitors are located at the top of the shielded I. F. Transformers. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is obtained. On this step, the speaker terminals of the external oscillator leads from the type 6E7-G I. F. Amplifier tube and connect it in the same manner to the control grid at the top of the type 6A8-G tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During this process, the speaker terminals of the external oscillator should be connected to the control grid of the type 6A8-G tube. At least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. Amplifier, it is essential to check the alignment process in both I. F. units with the external oscillator leads connected across the control grid of the 6A8-G tube.

RECEIVER DESCRIPTION

Tube Functions	Type
6A8-G	Electron emission control oscillator-detector
6E7-G	I. F. amplifier
6D7-G	Detector, discriminator, amplifier
6V6-G (2)	Class "A" power amplifier
6Y2-G	Full-wave rectifier for power supply
6B5	Tuning beacon
6H6-G	AVC diode

Frequency Rating —50 to 60 cycles.
 Power Consumption—90 watts.
 Tubes —1 type 6A8-G, 1 type 6E7-G, 1 type 6D7-G, 2 type 6V6-G, 1 type 6Y2-G, 1 type 6B5, type 6H6-G
 Undesired power output—6 watts.
 Intermediate Frequency—456 kc.

Model G-585
 16 - 51 m. (18,800 - 5,860 kc.)
 190 - 571 m. (1,580 - 525 kc.)
 780 - 2,190 m. (385 - 140 kc.)
(MODEL G-585 IS SOLD OUTSIDE THE U.S.A. ONLY)

WAVE TRAP ADJUSTMENT: With the oscillator set at 456 kc., connect the oscillator to the antenna through a .0002 mfd. condenser. Then adjust the wave trap condenser for minimum deflection on the output meter.

BROADCAST ALIGNMENT: After the I. F. Amplifier is completely realigned, connect the external oscillator to the receiver antenna and ground leads, through a .0002 mfd. condenser. The oscillator should be in the "case" position and place the tuning control pointer at the 1500 kc. mark. Adjust the broadcast band oscillator trimmer to maximum response. Adjust the signal section trimmer in the same manner.

Next adjust the 600 kc. padding condenser. Set the external oscillator at 600 kc. Rotate the receiver tuning control until resonance is indicated. Then rock the tuning condenser until the output meter reads maximum response at the same time adjust the padding condenser for the highest resonance peak.

Now repeat the 1500 kc. trimmer adjustment, following in every detail the procedure previously described.

ALIGNMENT OF THE SHORT-WAVE BANDS: The procedure in aligning the short-wave bands is identical with that for the broadcast band with the exception of the adjustment of the padding condenser which is of fixed value and requires no adjustment. The alignment frequency is 17,480 kc.

Turn the Band Switch to the right. Tune the external oscillator to 17 megacycles. Tune the receiver so that the dial pointer is in a position coincidental with the 17 meter indication on the dial scale. Adjust the short wave oscillator trimmer for maximum response. Next adjust the signal circuit trimmer for maximum resonance. Repeat all adjustments to assure correct alignment, reading the frequency meter on the minimum gain.

Model G-584 is aligned in the same manner as 6,000 kc. with the switch in Band 2 position.

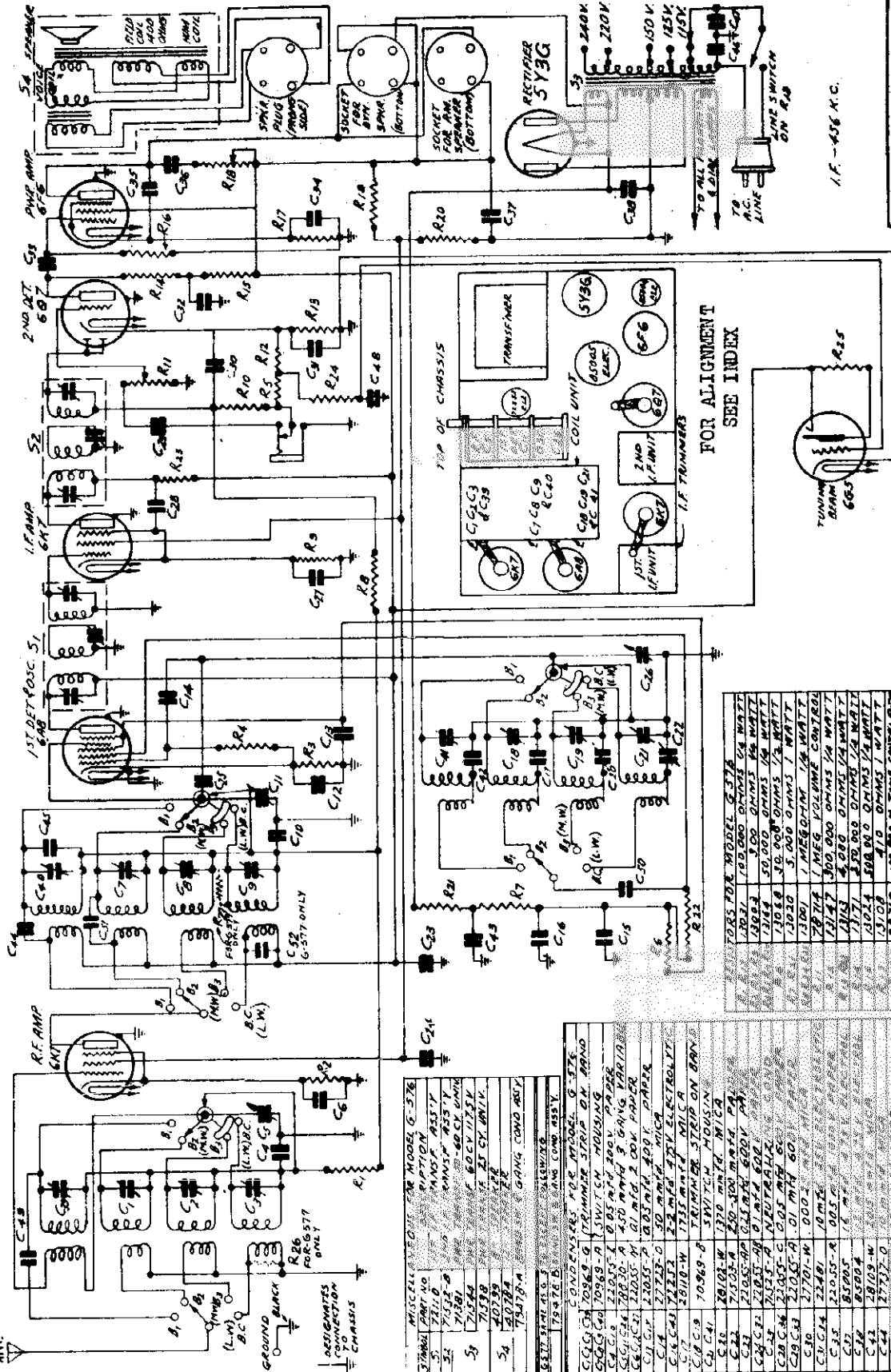
LONG WAVE ALIGNMENT: Proceedure in the Model G-585 is similar to the Broadcast section of 150 kc. Should it be necessary to remove the band switch assembly, it is advisable to realign the receiver after reassembly.

CAUTION: When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

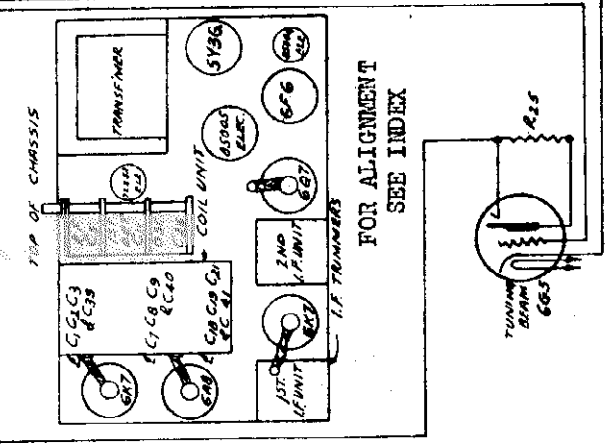
PILOT RADIO CORP.

MODELS G-576, G-577
Schematic, Socket
Trimmers, Parts

ALIGNING FREQUENCIES BROADCAST-1200 & 600 K.C. LONG WAVE 150 & 400 K.C.
BAND 2 - 6 MEGACYCLES
BAND 3 - 14 " "
BAND 1 - 24 " "



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LONG ISLAND CITY, N. Y. U. S. A.
SCHAFFNER ELECTRIC DIVISION
S. CHAMBERLAIN ST. NEW YORK 17, N. Y.
TELEPHONE: 68-3434
DATE: 1/2/57
DRAWN BY: [Signature]
CHECKED BY: [Signature]
APPROVED BY: [Signature]



TUNING DATA FOR MODEL G-576

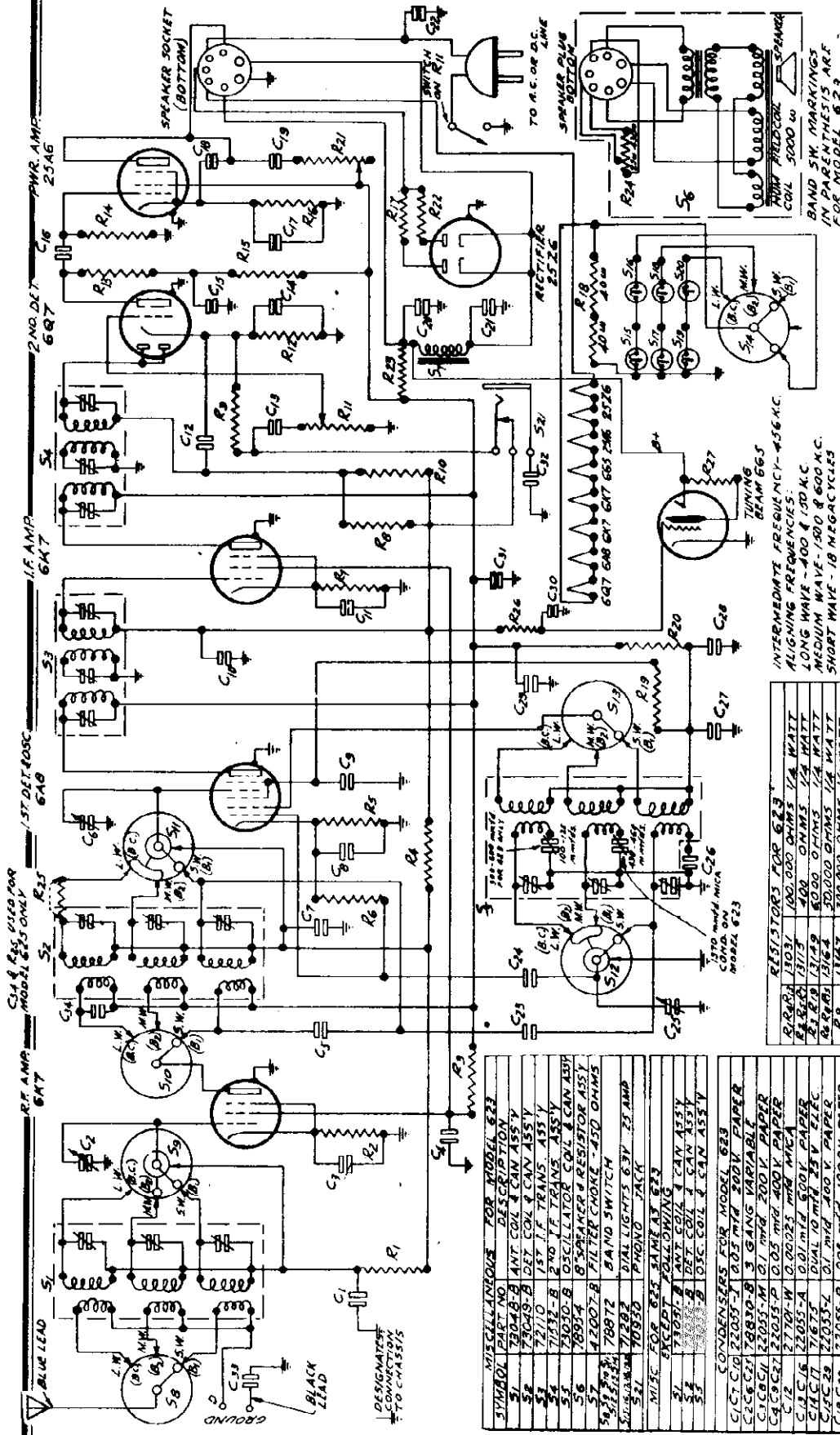
1000	1000 OHMS 1/2 WATT
1100	1000 OHMS 1/2 WATT
1200	1000 OHMS 1/2 WATT
1300	1000 OHMS 1/2 WATT
1400	1000 OHMS 1/2 WATT
1500	1000 OHMS 1/2 WATT
1600	1000 OHMS 1/2 WATT
1700	1000 OHMS 1/2 WATT
1800	1000 OHMS 1/2 WATT
1900	1000 OHMS 1/2 WATT
2000	1000 OHMS 1/2 WATT
2100	1000 OHMS 1/2 WATT
2200	1000 OHMS 1/2 WATT
2300	1000 OHMS 1/2 WATT
2400	1000 OHMS 1/2 WATT
2500	1000 OHMS 1/2 WATT
2600	1000 OHMS 1/2 WATT
2700	1000 OHMS 1/2 WATT
2800	1000 OHMS 1/2 WATT
2900	1000 OHMS 1/2 WATT
3000	1000 OHMS 1/2 WATT
3100	1000 OHMS 1/2 WATT
3200	1000 OHMS 1/2 WATT
3300	1000 OHMS 1/2 WATT
3400	1000 OHMS 1/2 WATT
3500	1000 OHMS 1/2 WATT
3600	1000 OHMS 1/2 WATT
3700	1000 OHMS 1/2 WATT
3800	1000 OHMS 1/2 WATT
3900	1000 OHMS 1/2 WATT
4000	1000 OHMS 1/2 WATT
4100	1000 OHMS 1/2 WATT
4200	1000 OHMS 1/2 WATT
4300	1000 OHMS 1/2 WATT
4400	1000 OHMS 1/2 WATT
4500	1000 OHMS 1/2 WATT
4600	1000 OHMS 1/2 WATT
4700	1000 OHMS 1/2 WATT
4800	1000 OHMS 1/2 WATT
4900	1000 OHMS 1/2 WATT
5000	1000 OHMS 1/2 WATT

MISCELLANEOUS

3	300K POTENTIOMETER
4	500K POTENTIOMETER
5	500K POTENTIOMETER
6	500K POTENTIOMETER
7	500K POTENTIOMETER
8	500K POTENTIOMETER
9	500K POTENTIOMETER
10	500K POTENTIOMETER
11	500K POTENTIOMETER
12	500K POTENTIOMETER
13	500K POTENTIOMETER
14	500K POTENTIOMETER
15	500K POTENTIOMETER
16	500K POTENTIOMETER
17	500K POTENTIOMETER
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37	500K POTENTIOMETER
38	500K POTENTIOMETER
39	500K POTENTIOMETER
40	500K POTENTIOMETER
41	500K POTENTIOMETER
42	500K POTENTIOMETER
43	500K POTENTIOMETER
44	500K POTENTIOMETER
45	500K POTENTIOMETER
46	500K POTENTIOMETER
47	500K POTENTIOMETER
48	500K POTENTIOMETER
49	500K POTENTIOMETER
50	500K POTENTIOMETER

MODELS 623, 625
Schematic, Parts

PILOT RADIO CORP.



FOR ALIGNMENT, SEE INDEX.

INTERMEDIATE FREQUENCY - 456 K.C.
ALIGNING FREQUENCIES:
LONG WAVE - 400 & 130 K.C.
MEDIUM WAVE - 750 & 600 K.C.
SHORT WAVE - 18 MEGACYCLES

RESISTORS FOR 623

R1	100K	100,000 OHMS 1/4 WATT
R2	100K	100,000 OHMS 1/4 WATT
R3	100K	100,000 OHMS 1/4 WATT
R4	100K	100,000 OHMS 1/4 WATT
R5	100K	100,000 OHMS 1/4 WATT
R6	100K	100,000 OHMS 1/4 WATT
R7	100K	100,000 OHMS 1/4 WATT
R8	100K	100,000 OHMS 1/4 WATT
R9	100K	100,000 OHMS 1/4 WATT
R10	100K	100,000 OHMS 1/4 WATT
R11	100K	100,000 OHMS 1/4 WATT
R12	100K	100,000 OHMS 1/4 WATT
R13	100K	100,000 OHMS 1/4 WATT
R14	100K	100,000 OHMS 1/4 WATT
R15	100K	100,000 OHMS 1/4 WATT
R16	100K	100,000 OHMS 1/4 WATT
R17	100K	100,000 OHMS 1/4 WATT
R18	100K	100,000 OHMS 1/4 WATT
R19	100K	100,000 OHMS 1/4 WATT
R20	100K	100,000 OHMS 1/4 WATT
R21	100K	100,000 OHMS 1/4 WATT
R22	100K	100,000 OHMS 1/4 WATT

RESISTORS FOR 625 SAME AS 623 EXCEPT FOLLOWING

R15	100K	100,000 OHMS 1/4 WATT
R22	100K	100,000 OHMS 1/4 WATT

CONDENSERS FOR MODEL 623

C1	500P	500 P.F. 50V. PAPER
C2	500P	500 P.F. 50V. PAPER
C3	500P	500 P.F. 50V. PAPER
C4	500P	500 P.F. 50V. PAPER
C5	500P	500 P.F. 50V. PAPER
C6	500P	500 P.F. 50V. PAPER
C7	500P	500 P.F. 50V. PAPER
C8	500P	500 P.F. 50V. PAPER
C9	500P	500 P.F. 50V. PAPER
C10	500P	500 P.F. 50V. PAPER
C11	500P	500 P.F. 50V. PAPER
C12	500P	500 P.F. 50V. PAPER
C13	500P	500 P.F. 50V. PAPER
C14	500P	500 P.F. 50V. PAPER
C15	500P	500 P.F. 50V. PAPER
C16	500P	500 P.F. 50V. PAPER
C17	500P	500 P.F. 50V. PAPER
C18	500P	500 P.F. 50V. PAPER
C19	500P	500 P.F. 50V. PAPER
C20	500P	500 P.F. 50V. PAPER
C21	500P	500 P.F. 50V. PAPER
C22	500P	500 P.F. 50V. PAPER
C23	500P	500 P.F. 50V. PAPER
C24	500P	500 P.F. 50V. PAPER
C25	500P	500 P.F. 50V. PAPER
C26	500P	500 P.F. 50V. PAPER
C27	500P	500 P.F. 50V. PAPER

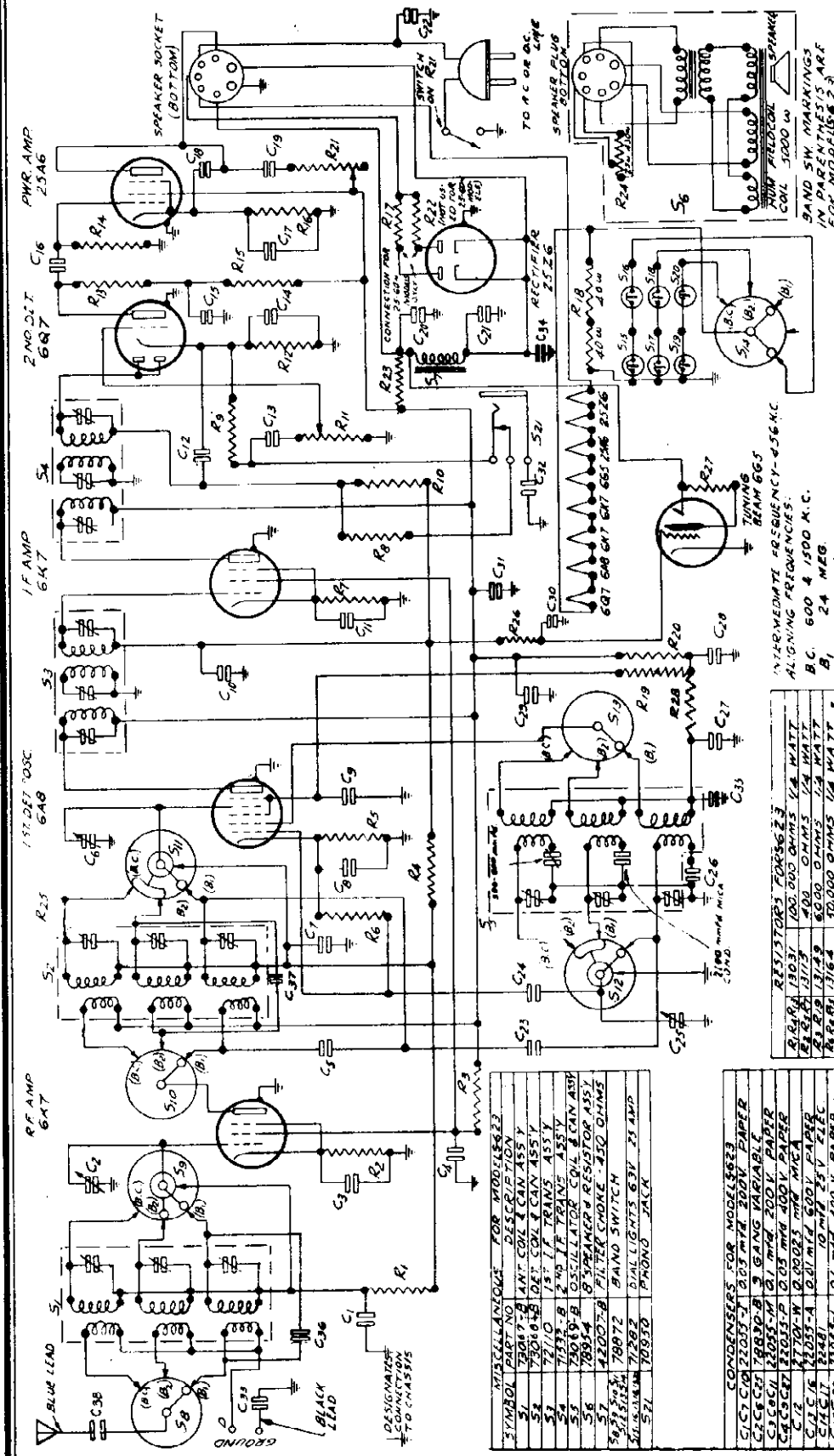
CONDENSERS FOR MODEL 625 SAME AS 623 EXCEPT FOLLOWING

C14	500P	500 P.F. 50V. PAPER
C24	500P	500 P.F. 50V. PAPER

PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y. U. S. A.
SCHEMATIC CIRCUIT
DIAGRAM FOR MODELS 623 & 625
MATERIAL
SCALE
DATE: 8-27-35
Drawn By: [Signature]
Checked by: [Signature]
Approved by: [Signature]

CLASSIFICATION
620 SERIES
THIS PRINT SUPERSEDES ALL OTHERS
PRIOR TO [Blank]
FOR NOT SCALE THIS PRINT

PILOT RADIO CORP.



CONDENSERS FOR MODELS S-623, S-623J

C1	0.001 MFD 50V ELECTRO
C2	0.001 MFD 50V ELECTRO
C3	0.001 MFD 50V ELECTRO
C4	0.001 MFD 50V ELECTRO
C5	0.001 MFD 50V ELECTRO
C6	0.001 MFD 50V ELECTRO
C7	0.001 MFD 50V ELECTRO
C8	0.001 MFD 50V ELECTRO
C9	0.001 MFD 50V ELECTRO
C10	0.001 MFD 50V ELECTRO
C11	0.001 MFD 50V ELECTRO
C12	0.001 MFD 50V ELECTRO
C13	0.001 MFD 50V ELECTRO
C14	0.001 MFD 50V ELECTRO
C15	0.001 MFD 50V ELECTRO
C16	0.001 MFD 50V ELECTRO
C17	0.001 MFD 50V ELECTRO
C18	0.001 MFD 50V ELECTRO
C19	0.001 MFD 50V ELECTRO
C20	0.001 MFD 50V ELECTRO
C21	0.001 MFD 50V ELECTRO
C22	0.001 MFD 50V ELECTRO
C23	0.001 MFD 50V ELECTRO
C24	0.001 MFD 50V ELECTRO
C25	0.001 MFD 50V ELECTRO
C26	0.001 MFD 50V ELECTRO
C27	0.001 MFD 50V ELECTRO
C28	0.001 MFD 50V ELECTRO
C29	0.001 MFD 50V ELECTRO
C30	0.001 MFD 50V ELECTRO
C31	0.001 MFD 50V ELECTRO
C32	0.001 MFD 50V ELECTRO
C33	0.001 MFD 50V ELECTRO

RESISTORS FOR MODELS S-623, S-623J

R1	100 OHMS 1/2 WATT
R2	100 OHMS 1/2 WATT
R3	100 OHMS 1/2 WATT
R4	100 OHMS 1/2 WATT
R5	100 OHMS 1/2 WATT
R6	100 OHMS 1/2 WATT
R7	100 OHMS 1/2 WATT
R8	100 OHMS 1/2 WATT
R9	100 OHMS 1/2 WATT
R10	100 OHMS 1/2 WATT
R11	100 OHMS 1/2 WATT
R12	100 OHMS 1/2 WATT
R13	100 OHMS 1/2 WATT
R14	100 OHMS 1/2 WATT
R15	100 OHMS 1/2 WATT
R16	100 OHMS 1/2 WATT
R17	100 OHMS 1/2 WATT
R18	100 OHMS 1/2 WATT
R19	100 OHMS 1/2 WATT
R20	100 OHMS 1/2 WATT
R21	100 OHMS 1/2 WATT
R22	100 OHMS 1/2 WATT
R23	100 OHMS 1/2 WATT
R24	100 OHMS 1/2 WATT
R25	100 OHMS 1/2 WATT
R26	100 OHMS 1/2 WATT
R27	100 OHMS 1/2 WATT

MISCELLANEOUS FOR MODELS S-623, S-623J

S1	ANT. COIL & CAN ASSY
S2	DET. COIL & CAN ASSY
S3	1ST I.F. TRANS. ASSY
S4	2ND I.F. TRANS. ASSY
S5	OSCILLATOR COIL & CAN ASSY
S6	SPREADER RESISTOR ASSY
S7	FILTER CHOKER - 250 OHMS
S8	250 OHM 250V ELECTRO
S9	250 OHM 250V ELECTRO
S10	250 OHM 250V ELECTRO
S11	250 OHM 250V ELECTRO
S12	250 OHM 250V ELECTRO
S13	250 OHM 250V ELECTRO
S14	250 OHM 250V ELECTRO
S15	250 OHM 250V ELECTRO
S16	250 OHM 250V ELECTRO
S17	250 OHM 250V ELECTRO
S18	250 OHM 250V ELECTRO
S19	250 OHM 250V ELECTRO
S20	250 OHM 250V ELECTRO
S21	250 OHM 250V ELECTRO
S22	250 OHM 250V ELECTRO
S23	250 OHM 250V ELECTRO
S24	250 OHM 250V ELECTRO
S25	250 OHM 250V ELECTRO
S26	250 OHM 250V ELECTRO
S27	250 OHM 250V ELECTRO
S28	250 OHM 250V ELECTRO
S29	250 OHM 250V ELECTRO
S30	250 OHM 250V ELECTRO
S31	250 OHM 250V ELECTRO
S32	250 OHM 250V ELECTRO
S33	250 OHM 250V ELECTRO
S34	250 OHM 250V ELECTRO
S35	250 OHM 250V ELECTRO
S36	250 OHM 250V ELECTRO
S37	250 OHM 250V ELECTRO
S38	250 OHM 250V ELECTRO
S39	250 OHM 250V ELECTRO
S40	250 OHM 250V ELECTRO
S41	250 OHM 250V ELECTRO
S42	250 OHM 250V ELECTRO
S43	250 OHM 250V ELECTRO
S44	250 OHM 250V ELECTRO
S45	250 OHM 250V ELECTRO
S46	250 OHM 250V ELECTRO
S47	250 OHM 250V ELECTRO
S48	250 OHM 250V ELECTRO
S49	250 OHM 250V ELECTRO
S50	250 OHM 250V ELECTRO

CONDENSERS FOR MODELS S-623, S-623J

C1	0.001 MFD 50V ELECTRO
C2	0.001 MFD 50V ELECTRO
C3	0.001 MFD 50V ELECTRO
C4	0.001 MFD 50V ELECTRO
C5	0.001 MFD 50V ELECTRO
C6	0.001 MFD 50V ELECTRO
C7	0.001 MFD 50V ELECTRO
C8	0.001 MFD 50V ELECTRO
C9	0.001 MFD 50V ELECTRO
C10	0.001 MFD 50V ELECTRO
C11	0.001 MFD 50V ELECTRO
C12	0.001 MFD 50V ELECTRO
C13	0.001 MFD 50V ELECTRO
C14	0.001 MFD 50V ELECTRO
C15	0.001 MFD 50V ELECTRO
C16	0.001 MFD 50V ELECTRO
C17	0.001 MFD 50V ELECTRO
C18	0.001 MFD 50V ELECTRO
C19	0.001 MFD 50V ELECTRO
C20	0.001 MFD 50V ELECTRO
C21	0.001 MFD 50V ELECTRO
C22	0.001 MFD 50V ELECTRO
C23	0.001 MFD 50V ELECTRO
C24	0.001 MFD 50V ELECTRO
C25	0.001 MFD 50V ELECTRO
C26	0.001 MFD 50V ELECTRO
C27	0.001 MFD 50V ELECTRO
C28	0.001 MFD 50V ELECTRO
C29	0.001 MFD 50V ELECTRO
C30	0.001 MFD 50V ELECTRO
C31	0.001 MFD 50V ELECTRO
C32	0.001 MFD 50V ELECTRO
C33	0.001 MFD 50V ELECTRO

FOR ALIGNMENT, SEE INDEX

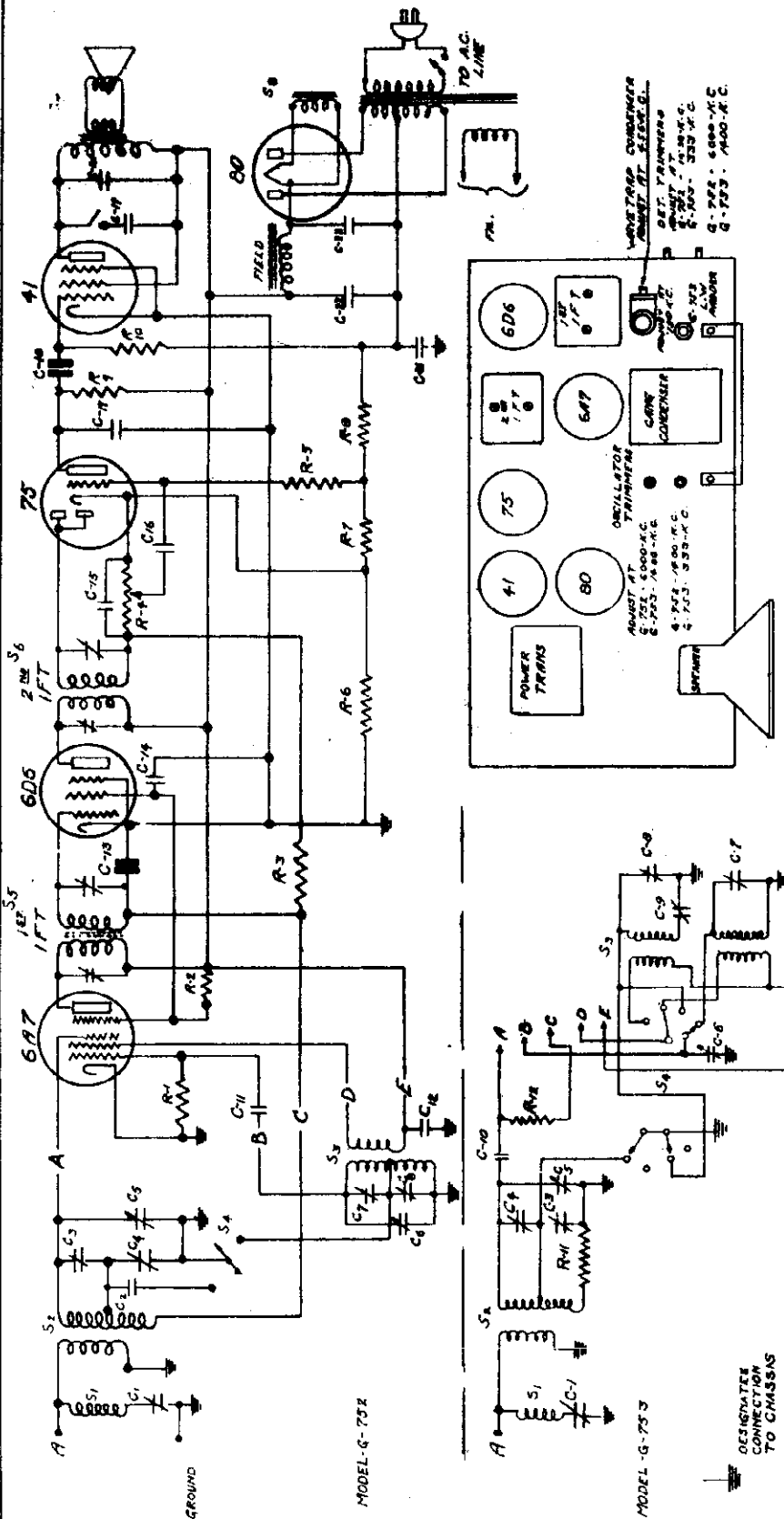
THIS PRINT SUPERSEDES ALL OTHERS

CLASSIFICATION
S-623 (S-623-60)

PILOT RADIO CORPORATION
SCHEMATIC CIRCUIT
DIAGRAM FOR MODELS S-623, S-623J
DRAWN BY: [Name]
CHECKED BY: [Name]
DATE: [Date]
JOB NO: 25144

MODEL S G-752, G-753
Schematic, Socket
Trimmers, Parts

PILOT RADIO CORP.



INTERMEDIATE FREQUENCY - 456 K.C.
ALIGNING FREQUENCIES:
BROADCAST MODEL G-752
SHORT WAVE - 1400 K.C.
MODEL G-753
LONG WAVE - 335-400 K.C. (200-7)
MEDIUM WAVE - 1400 K.C. (219-7)

MISCELLANEOUS FOR MODEL G-752

3-7	23029-B	WAVETRAP COIL
3-7	23029-B	ANTENNA COIL ASS'Y
3-7	23030	OSCILLATOR COIL ASS'Y
3-7	23030	BAND SWITCH
3-7	23030-A	17837 1/2 TRAPS ASS'Y
3-7	23030	SECOND I.F. TRANS ASS'Y
3-7	23030	POWER TRANSFORMER

MISCELLANEOUS FOR MODEL G-753

3-7	23029-B	WAVETRAP COIL
3-7	23029-B	ANTENNA COIL ASS'Y
3-7	23030	OSCILLATOR COIL ASS'Y
3-7	23030	BAND SWITCH
3-7	23030-A	17837 1/2 TRAPS ASS'Y
3-7	23030	SECOND I.F. TRANS ASS'Y
3-7	23030	POWER TRANSFORMER

MISCELLANEOUS FOR MODEL G-752

DESIGNATION	PART NO.	DESCRIPTION
R-1	13081	1000 OHM 1/2 WATT CARBON RES
R-2	13082	1000 OHM 1/2 WATT CARBON RES
R-3	13083	1000 OHM 1/2 WATT CARBON RES
R-4	13084	1000 OHM 1/2 WATT CARBON RES
R-5	13085	1000 OHM 1/2 WATT CARBON RES
R-6	13086	1000 OHM 1/2 WATT CARBON RES
R-7	13087	1000 OHM 1/2 WATT CARBON RES
R-8	13088	1000 OHM 1/2 WATT CARBON RES
R-9	13089	1000 OHM 1/2 WATT CARBON RES
R-10	13090	1000 OHM 1/2 WATT CARBON RES

MISCELLANEOUS FOR MODEL G-753

DESIGNATION	PART NO.	DESCRIPTION
R-1	13081	1000 OHM 1/2 WATT CARBON RES
R-2	13082	1000 OHM 1/2 WATT CARBON RES
R-3	13083	1000 OHM 1/2 WATT CARBON RES
R-4	13084	1000 OHM 1/2 WATT CARBON RES
R-5	13085	1000 OHM 1/2 WATT CARBON RES
R-6	13086	1000 OHM 1/2 WATT CARBON RES
R-7	13087	1000 OHM 1/2 WATT CARBON RES
R-8	13088	1000 OHM 1/2 WATT CARBON RES
R-9	13089	1000 OHM 1/2 WATT CARBON RES
R-10	13090	1000 OHM 1/2 WATT CARBON RES

PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y. U. S. A.
SERIAL NO. 17837-1/2-2-1937
MODEL G-752
DATE OF MANUFACTURE: 1-1-37

CLASSIFICATION: G-750
PRIOR TO: [REDACTED]
DO NOT SCALE THIS FORM

DESIGNATION: [REDACTED]
PART NO.: [REDACTED]
DESCRIPTION: [REDACTED]

DESIGNATION: [REDACTED]
PART NO.: [REDACTED]
DESCRIPTION: [REDACTED]

PILOT RADIO CORP.

MODELS 623, 625
 MODEL S-623, S-62
 MODELS G-752, G-75
 Alignment

Range, Model 623
 16 - 555 m. (18,800 - 540 kc.)

Range, Model 625
 16 - 555 m. (18,800 - 540 kc.)
 731 - 2140 m. (410 - 140 kc.)

Model G-753
 187-566 m. (1,600-530 kc.)
 800-2170 m. (375-138 kc.)

220:240 V. AC-DC

(MODEL 623 IS SOLD OUTSIDE THE U. S. A. ONLY)

AC-DC Model S-623, for 220-240 V. (50-60 Cycles)
 AC-DC Model S-623-J, for 220-240 V. (25-60 Cycles)

(MODEL G-753 IS SOLD OUTSIDE THE U. S. A. ONLY)

Three tuning bands covering 12.94 m. (25,000-3,200 kc.) and 187-565 m. (1,600-535 kc.)

I. F. ALIGNMENT: When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The Band Selector Switch should be in the position marked "Broadcast", and the tuning condenser should be set at maximum capacity. Connect the I. F. tube lead to the I. F. Amplifier through a 1 meg. fixed condenser. Connect the "ground" lead of the external oscillator to the receiver ground lead. The I. F. alignment capacitors are located at the side of the shielded I. F. Transformers. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator lead from the type 6K7 I. F. amplifier tube and connect it in the same manner to the control grid at the top of the type 6A9 tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. amplifier, it is essential to repeat the alignment process in both I. F. Units.

BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads. Insert a 200 mf. condenser in series with the antenna lead. Set the Band Selector Switch in the "Broadcast" position and place the tuning control pointer at the 1500 kc. mark. Adjust the broadcast band oscillator trimmer.

Next adjust the interstage alignment trimmer for maximum response. Finally adjust the antenna section trimmer in the same manner.

Next adjust the 600 kc. padder condenser, located on the top of the oscillator coil. Set the external oscillator at 600 kc. Rotate the receiver tuning control until resonance is indicated. Then rock the tuning control back and forth about the resonance position, and at the same time adjust the padder condenser for the highest resonance peak.

Now repeat the 1500 kc. trimmer adjustment, following the procedure previously described.

ALIGNMENT FOR SHORT WAVE BANDS (ALL EXCEPT S-623 & S-623J)

The procedure in aligning the short wave bands is identical with that for the broadcast with the exception of the adjustment of the padder condenser. Insert a 400 ohm non-inductive resistor in series with the antenna lead. The alignment frequencies are as follows:

Band 2: 50 Meters—(6,000 kc.)
 Band 1: 16.6 Meters—(18,000 kc.)

When aligning Band 2, set the Band Selector Switch in the position marked "Band 2". Set the tuning control pointer at 50 meters. Adjust the oscillator alignment capacitor on Band 2 for maximum output. Next adjust the interstage and antenna section alignment capacitors for maximum output.

Model G-752
 44.5-126 m. (6,750-2380 kc.)
 187-566 m. (1,600-530 kc.)

(MODEL G-753 IS SOLD OUTSIDE THE U. S. A. ONLY)

REMOVAL OF CHASSIS FROM CABINET:

To remove the chassis from the cabinet proceed as follows:

Be certain that the line cord is removed from the power outlet socket.

Remove the knobs and felt washers from the controls on the front panel.

Remove the four mounting screws, located underneath the cabinet and pull chassis out.

REALIGNMENT: If the receiver requires alignment, the procedure outlined below should be followed: In the schematic diagram sheet, the location and function of the various alignment capacitors are clearly illustrated. For best results, an external modulated oscillator with adequate frequency range and a visual output meter, should be used.

I. F. ALIGNMENT: When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The Band Switch should be in the position marked "Broadcast", and the tuning condenser should be set at maximum capacity. When aligning the receiver on all positions, the volume control should be turned to the maximum clockwise position. Connect the antenna lead of the external oscillator to the control grid of the 6D6 tube in the I. F. Amplifier through a .1 mf. fixed condenser. Connect the ground lead of the external oscillator to the chassis. The I. F. alignment trimmers are located at the top of the shielded I. F. Transformers. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. Following this, connect the external oscillator leads to the control grid of the 6A7 tube. Adjust each trimmer on I. F. Unit No. 1 for maximum gain.

During these operations, use the least possible input to prevent broadening of the resonance peak.

In order to obtain the most accurate realignment of the I. F. amplifier, it is essential to repeat the alignment process in all I. F. Units, with the external oscillator leads connected to the control grid of the 6A7 tube.

WAVE TRAP ADJUSTMENT: With the oscillator still set at 456 kc., connect the oscillator to the antenna through a 200 mf. condenser. Then adjust the wave trap condenser to minimum deflection on the output meter.

BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground through a .0002 mf. condenser. Leave the Band Switch in the "Broadcast" position and place the tuning control pointer at the 1400 kc. mark. Tune the external oscillator to 1400 kc. Adjust the broadcast band oscillator trimmer to maximum response.

Next adjust the antenna section trimmer for maximum output.

The alignment frequencies are as follows:

Longwave Band — 900 meters (333 kc.)
 Broadcast Band — 214 meters (1,400 kc.)
 Band 1 — 50 meters (6,000 kc.)

BAND 1: Align the Short-wave band in a similar manner using a 400-ohm non-inductive resistor in place of the .0002 mf. condenser. The alignment frequency is 6,000 kc. (50 meters).

THE LONG WAVE ALIGNMENT procedure in the Model G-753 is as follows: Turn the Band Switch to the Long Wave position. The alignment frequency is 333 kc. Adjust the padder condenser at 150 kc. and at the same time rock the gang until at some setting of both padder and gang condenser maximum output is obtained. Use a .0002 mf. condenser in the antenna lead from the external oscillator.

LONG WAVE BAND: Model G-753 (sold only outside the U. S. A.) has a tuning band covering 800 to 2170 meters. Broadcast stations operating on long waves have a limited range, and are located chiefly in Europe. Hence, Model G-753 is not sold in the U. S. A.

SHORT-WAVE BAND: This band covers 44.5 to 126 meters, and is calibrated in both meters and megacycles because some program time-tables show the dial settings in meters, while others use megacycles.

The receiving range on the 49-meter band is about 300 miles during the daytime, and 1,500 miles or more at night.

ANTENNA: Due to the high sensitivity of this receiver, it is recommended that an aerial not over fifty feet long be used.

If you use an ordinary single-wire antenna, connect the terminal to the blade marked "Antenna" on the chassis clip on the chassis to the ground.

TRIMMER CONTROL SWITCH: The trimmer control is at the rear of the chassis. In one position the treble response is increased and in the other position the bass frequencies are emphasized. When tuning in short waves the latter position will probably be found preferable.

BAND SWITCH: The center knob controls the band switch. When this knob is in the counterclockwise position the band switch is in the broadcast position on Model G-752 and in the longwave position on Model G-753. Turning the switch to the right or clockwise on Model G-752 permits reception of shortwave signals and medium wave signals on Model G-753.

CAUTION: When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

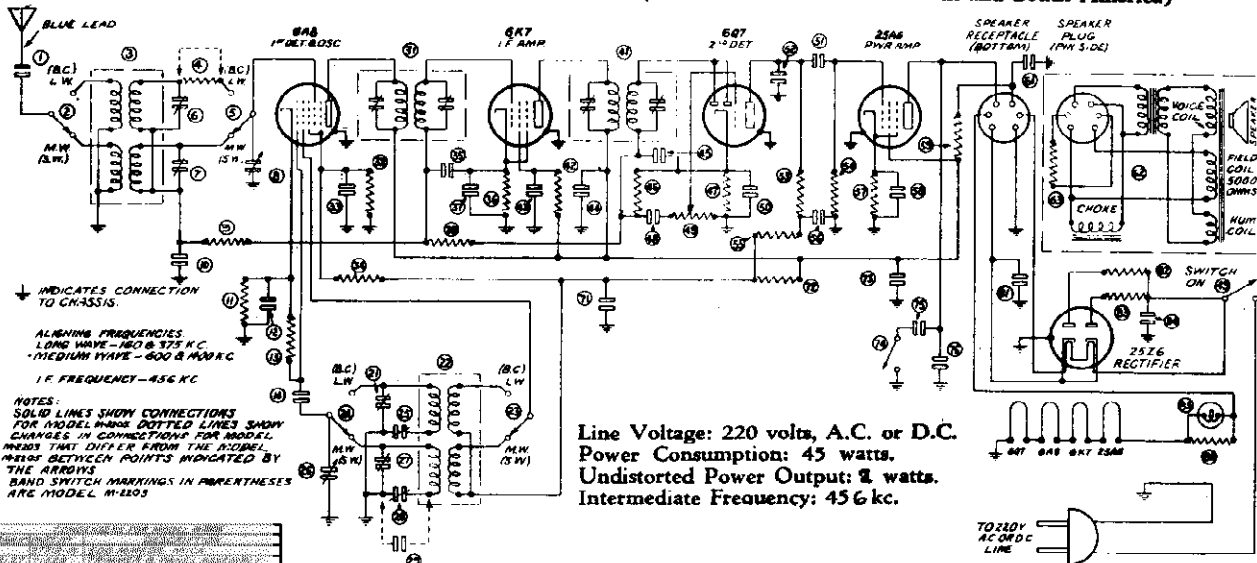
MODELS M-2203, M-2205

Schematic, Socket, Trimmers
Alignment, Parts, Voltage

PILOT RADIO CORP.

MODEL M-2203 SUPERHETERODYNE
Range: 16-52 Meters (18,800-5,700 kc.)
178-550 Meters (1,680-545 kc)

MODEL M-2205 SUPERHETERODYNE
Range: 178-550 Meters (1,680-545 kc.)
789-2,142 Meters (380-140 kc.)
(Not available for sale in North and South America)



INDICATES CONNECTION TO CHASSIS.
ALIGNING FREQUENCIES
LONG WAVE - 163 & 375 KC.
MEDIUM WAVE - 600 & 1400 KC
I.F. FREQUENCY - 456 KC

NOTES:
SOLID LINES SHOW CONNECTIONS FOR MODEL M-2203. DOTTED LINES SHOW CHANGES IN CONNECTIONS FOR MODEL M-2205 THAT DIFFER FROM THE DISCREPANCIES BETWEEN POINTS INDICATED BY THE ARROWS.
BAND SWITCH MARKINGS IN PARENTHESES ARE MODEL M-2205

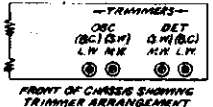
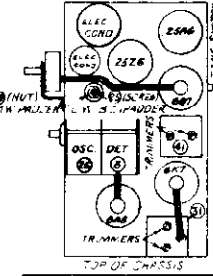
Line Voltage: 220 volts, A.C. or D.C.
Power Consumption: 45 watts.
Undistorted Power Output: 2 watts.
Intermediate Frequency: 456 kc.

RECOMMENDED PARTS LIST

1	ANTENNA COIL ASSEMBLY
2	ANTENNA COIL ASSEMBLY
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MISCELLANEOUS LIST OF COMPONENTS

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PILOT RADIO CORPORATION
LONG BEACH, CALIF. U.S.A.
SCHEMATIC CIRCUIT & CHASSIS ALIGNMENT FOR MODELS M-2203 & M-2205
SCALE: 1/8" = 1"
DATE: 1/25/40
DRAWN BY: J.F.R.
CHECKED BY: J.F.R.
25140

Voltages: Read tube socket voltages with meter having resistance of at least 1,000 ohms per volt. All voltages measured to chassis.

	Osc.-Det.	I.F.	Det. Amp.	Aud. Output	Rectifier
Tube	6A8	6K7	6Q7	25A6	25Z6
Plate	130	130	50*	180	—
Cathode	2.5	3.5	1	17.	210.
Screen	60	100	—	130	—
Filament	6.3	6.3	6.3	25.	25.

*Voltage measured through plate resistor.
Speaker field voltage, 210 volts.
Anode grid of 6A8, 100 volts.

REALIGNMENT: Should the receiver require realignment, the outlined procedure below should be followed. In the service information sheet, the location and function of the various alignment capacitors are clearly illustrated. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.

Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the rear of the speaker.

I. F. ALIGNMENT: When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The Band Switch should be in the position marked "Broadcast", and the tuning condenser should be set at maximum capacity. Connect the "antenna" lead of the external oscillator to the control grid of the type 6K7 tube in the I.F. Amplifier stage through a .1 mfd. fixed condenser. Connect the "ground" lead of the external oscillator to the receiver ground lead. The I.F. alignment capacitors are located at the top of the shielded I.F. Transformers. Rotate the adjusting screw of each capacitor on I.F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator leads from the type 6K7 I.F. Amplifier tube and connect it in the same

manner to the control grid at the top of the type 6A8 tube. Now rotate each adjustment screw on I.F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I.F. Amplifier, it is essential to repeat the alignment process in both I.F. units with the external oscillator leads connected across the control grid of the 6A8 tube.

BROADCAST ALIGNMENT: After the I.F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads with a .0002 mfd. condenser in the antenna lead. Set the Band Switch in the "Broadcast" position and place the tuning control pointer at the 1400 kc. mark. Adjust the broadcast band oscillator trimmer to maximum response. Adjust the signal section trimmer in the same manner. Next adjust the 600 kc. padder condenser. Set the external oscillator at 600 kc. Rotate the receiver tuning control until resonance is indicated. Then rock the tuning control back and forth about this resonance position, and at the same time adjust the padder condenser for the highest resonance peak.

Now repeat the 1400 kc. trimmer adjustment, following in every detail the procedure previously described.

SHORT-WAVE ALIGNMENT: The procedure in aligning the short-wave bands is identical with that for the broadcast with the exception of the adjustment of the padder condenser. The alignment frequency is 16.8 Meters—(17,800 kc.) Turn the Band Switch to the right. Tune the external oscillator to 16.8 meters. Tune the receiver so that the dial pointer is in a position coincidental with the 16.8 meter indication on the dial scale. Adjust the short wave oscillator trimmer for maximum response. Next adjust the signal circuit trimmer for maximum resonance. Repeat all adjustments to assure correct alignment, rocking the gang condenser to right or left for maximum gain.

THE LONG WAVE ALIGNMENT: Procedure in the Model 2205 is similar to the Broadcast section of that receiver. Align at 375 kc. Adjust the padder at 160 kc.

Should it be necessary to remove the band switch assembly, it is advisable to realign the receiver after reinstalling.

MODELS G-576, G-577
MODELS X-2253, X-2255
Alignment

PILOT RADIO CORP.

Model 2255

16 - 550 m. (16,800 - 545 kc.)
750 - 2000 m. (400 - 150 kc.)

FOR 32-VOLT BATTERY OPERATION

(MODEL 2255 IS SOLD OUTSIDE THE U. S. A. ONLY)

REMOVAL OF CHASSIS FROM CABINET:
To remove the chassis from the cabinet proceed as follows:

Be certain that the line cord is removed from the power outlet socket.
Remove the "slip-on" knobs and felt washers from the controls and loosen the set screw on the tuning knob.
Remove the speaker plug from the socket at the rear of the chassis.
Remove the four mounting screws, located underneath the cabinet.

Remove the tuning beam plug from the socket at the front of the chassis.

REALIGNMENT: Should the receiver require realignment, the procedure outlined below should be followed. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.

Before connecting the chassis to the power line, disconnect the speaker cable in its socket at the rear of the chassis.

The location of the R. F. alignment trimmer condensers is on the side of the band switch. The trimmers in the lower row are those for aligning Band 2. Those in the second row from the bottom are for Band 3. Those in the third row up are for the Broadcast. In the Model 2255 there is an additional row of trimmers located immediately above those for the Broadcast.

The padding condenser is located under the rear section of the chassis in its Model 2255 position. The antenna lead of the Broadcast paddler. Access to the paddler condenser is made through a hole provided in the rear of the chassis frame.

I. F. ALIGNMENT: When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 416 kc. The Band Selector Switch should be in the position marked "Broadcast", and the tuning condenser should be set at maximum capacity. Connect the "antenna" lead of the external oscillator to the control grid of the type 6D6 tube in the I. F. Amplifier stage through a 1/2 mfd. fixed condenser. Connect the "ground" lead of the external oscillator to the receiver ground lead. The I. F. alignment capacitors are located at the side of the chassis capacitor on I. F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator lead from the type 6K7 I. F. control tube and connect it in the same manner to the control grid at the top of the type 6A7 tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. amplifier, it is essential to repeat the alignment process in both I. F. Units.

BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads. Insert a 200 mmf. condenser in series with the antenna lead. Set the Band Selector Switch in the "Broadcast" position and place the tuning control pointer at the 1700 kc. mark. Adjust the broadcast band oscillator trimmer.

CAUTION: When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

PHONOGRAPH PICK-UP: A jack is provided at the rear of the chassis for plugging in the phonograph pick-up in the normal manner. The high-quality amplifier with which this set is equipped. The pick-up should be of the high-impedance type.

EXTRA SPEAKERS: At the rear of the chassis there is a socket for plugging in an extra speaker, which can be down cellar in the game room. This will give you the equivalent of an extra radio, at the small expense of the extra speaker. We recommend a permanent magnet dynamic speaker of 10,000 ohms. These speakers operate without any field exciting current.

Model 2253

16 - 550 m. (16,800 - 545 kc.)

FOR 32-VOLT BATTERY OPERATION

(MODEL 2253 IS SOLD OUTSIDE THE U. S. A. ONLY)

REMOVAL OF CHASSIS FROM CABINET:
To remove the chassis from the cabinet proceed as follows:

Be certain that the line cord is removed from the power outlet socket.
Remove the "slip-on" knobs and felt washers from the controls and loosen the set screw on the tuning knob.
Remove the speaker plug from the socket at the rear of the chassis.
Remove the four mounting screws, located underneath the cabinet.

Remove the tuning beam plug from the socket at the front of the chassis.

REALIGNMENT: Should the receiver require realignment, the procedure outlined below should be followed. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.

Before connecting the chassis to the power line, disconnect the speaker cable in its socket at the rear of the chassis.

The location of the R. F. alignment trimmer condensers is on the side of the band switch. The trimmers in the lower row are those for aligning Band 1. Those in the second row from the bottom are for Band 2. Those in the third row up are for the Broadcast. In the Model 2253 there is an additional row of trimmers located immediately above those for the Broadcast.

The padding condenser is located under the rear section of the chassis in its Model 2253 position. The antenna lead of the Broadcast paddler. Access to the paddler condenser is made through a hole provided in the rear of the chassis frame.

I. F. ALIGNMENT: When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 416 kc. The Band Selector Switch should be in the position marked "Broadcast", and the tuning condenser should be set at maximum capacity. Connect the "antenna" lead of the external oscillator to the control grid of the type 6D6 tube in the I. F. Amplifier stage through a 1/2 mfd. fixed condenser. Connect the "ground" lead of the external oscillator to the receiver ground lead. The I. F. alignment capacitors are located at the side of the chassis capacitor on I. F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator lead from the type 6K7 I. F. control tube and connect it in the same manner to the control grid at the top of the type 6A7 tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. amplifier, it is essential to repeat the alignment process in both I. F. Units.

BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads. Insert a 200 mmf. condenser in series with the antenna lead. Set the Band Selector Switch in the "Broadcast" position and place the tuning control pointer at the 1700 kc. mark. Adjust the broadcast band oscillator trimmer.

CAUTION: When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

PHONOGRAPH PICK-UP: A jack is provided at the rear of the chassis for plugging in the phonograph pick-up in the normal manner. The high-quality amplifier with which this set is equipped. The pick-up should be of the high-impedance type.

EXTRA SPEAKERS: At the rear of the chassis there is a socket for plugging in an extra speaker, which can be down cellar in the game room. This will give you the equivalent of an extra radio, at the small expense of the extra speaker. We recommend a permanent magnet dynamic speaker of 10,000 ohms. These speakers operate without any field exciting current.

Model G-576 G-577
Four Tuning Bands Cover 12.3-566 m. (24,200-330 kc.)

REMOVAL OF CHASSIS FROM CABINET:

To remove the chassis from the cabinet proceed as follows:
Be certain that the line cord is removed from the power outlet socket.

Remove the "slip-on" knobs and felt washers from the controls and loosen the set screw on the tuning knob.
Remove the speaker plug from the socket at the rear of the chassis.
Remove the four mounting screws, located underneath the cabinet.

Remove the tuning beam plug from the socket at the front of the chassis.

REALIGNMENT: Should the receiver require realignment, the procedure outlined below should be followed. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.

Before connecting the chassis to the power line, disconnect the speaker cable in its socket at the rear of the chassis.

The location of the R. F. alignment trimmer condensers is on the side of the band switch. The trimmers in the lower row are those for aligning Band 1. Those in the second row from the bottom are for Band 2. Those in the third row up are for Band 3. The trimmers in the top row are for the Broadcast band.

The padding condenser is located under the rear section of the band switch. Access to the paddler condenser is made through a hole provided in the rear of the chassis frame.

I. F. ALIGNMENT: When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 416 kc. The Band Selector Switch should be in the position marked "Broadcast", and the tuning condenser should be set at maximum capacity. Connect the "antenna" lead of the external oscillator to the control grid of the type 6K7 tube in the I. F. Amplifier stage through a 1/2 mfd. fixed condenser. Connect the "ground" lead of the external oscillator to the receiver ground lead. The I. F. alignment capacitors are located at the side of the chassis capacitor on I. F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator lead from the type 6K7 I. F. control tube and connect it in the same manner to the control grid at the top of the type 6A8 tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. amplifier, it is essential to repeat the alignment process in both I. F. Units.

BROADCAST ALIGNMENT: After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads. Insert a 200 mmf. condenser in series with the antenna lead. Set the Band Selector Switch in the "Broadcast" position and place the tuning control pointer at the 1700 kc. mark. Adjust the broadcast band oscillator trimmer.

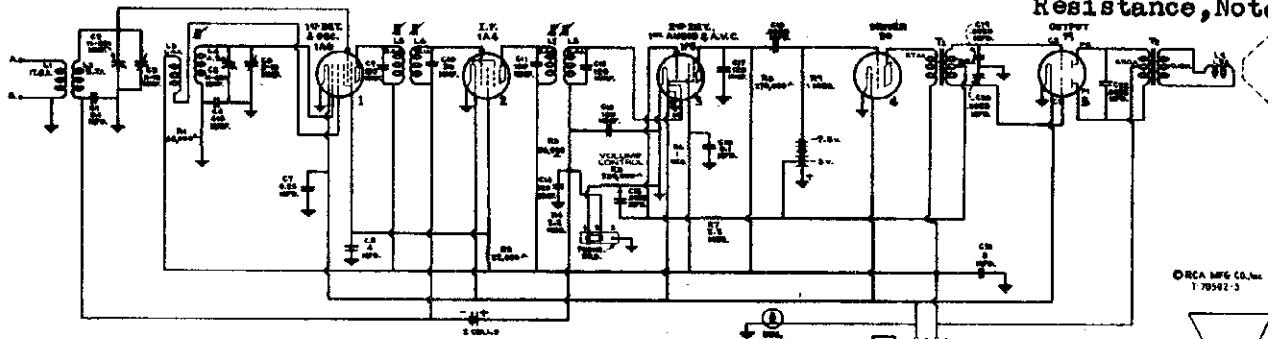
CAUTION: When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

PHONOGRAPH PICK-UP: A jack is provided at the rear of the chassis for plugging in the phonograph pick-up in the normal manner. The high-quality amplifier with which this set is equipped. The pick-up should be of the high-impedance type.

EXTRA SPEAKERS: At the rear of the chassis there is a socket for plugging in an extra speaker, which can be down cellar in the game room. This will give you the equivalent of an extra radio, at the small expense of the extra speaker. We recommend a permanent magnet dynamic speaker of 10,000 ohms. These speakers operate without any field exciting current.

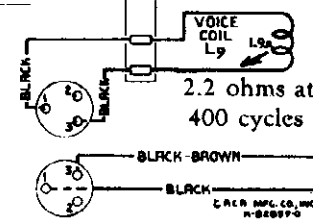
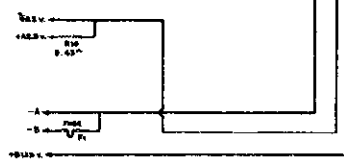
RCA MFG. CO., INC.

MODEL 5BT
Schematic, Sock,
Chassis Wiring
Resistance, Not

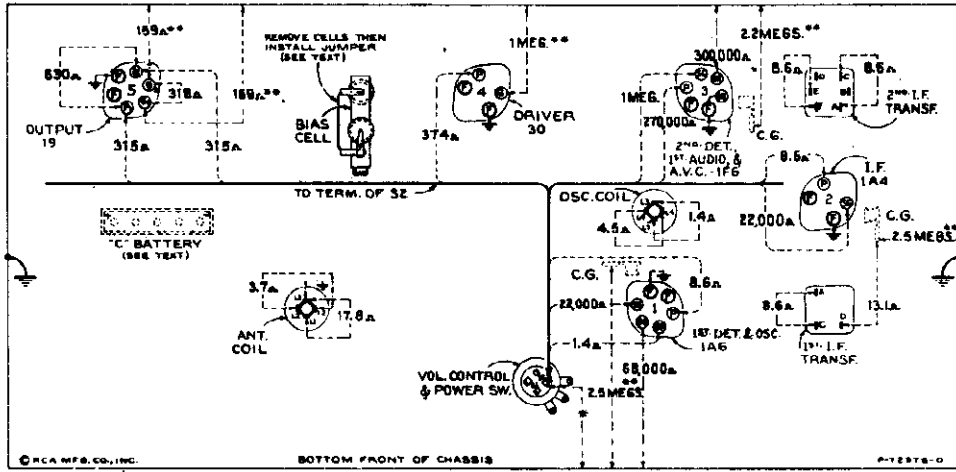


I.F. PEAK 460 KC.

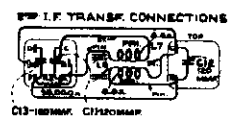
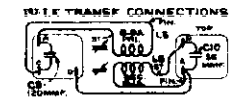
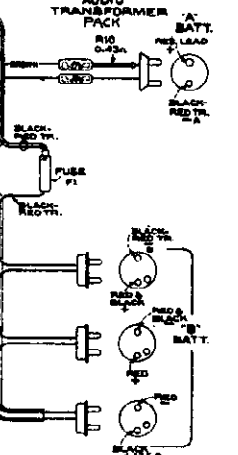
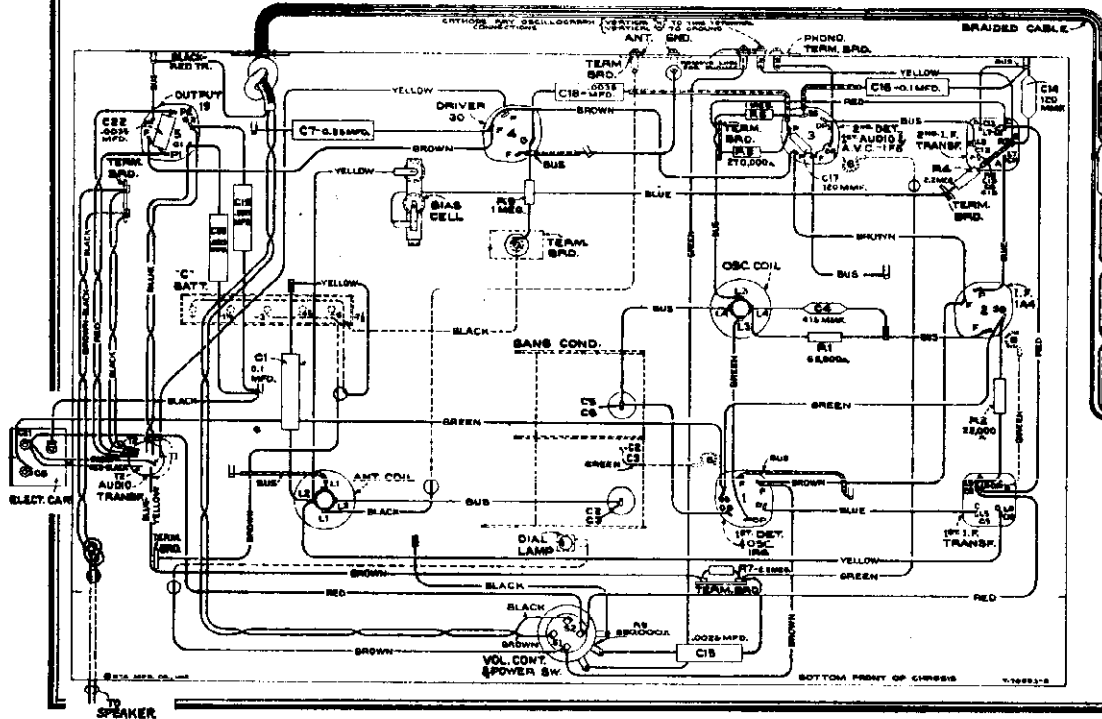
****Before making any resistance measurements, remove the two bias cells and connect jumpers on bias-cell board as shown. Also, remove the "C" battery and connect the two leads (-1 1/2 v. and -3 v.) to chassis ground. After measurements are completed, remove jumpers from bias-cell board and then carefully insert bias cells. Next, insert "C" battery and restore leads to their respective positions.**



Resistance Diagram
Battery cable dis-
connected -- Tube
removed -- Tuning
condenser in full
mesh -- Bias cell
and C battery re-
moved -- Volume
setting optional.



© RCA MFG. CO., INC. BOTTOM FRONT OF CHASSIS
* OPEN CIRCUIT - (LEAKAGE OF ELECTROLYTIC CAPACITORS ONLY)



MODEL 5BT
Trimmers, Voltage
Alignment

RCA MFG. CO., INC.

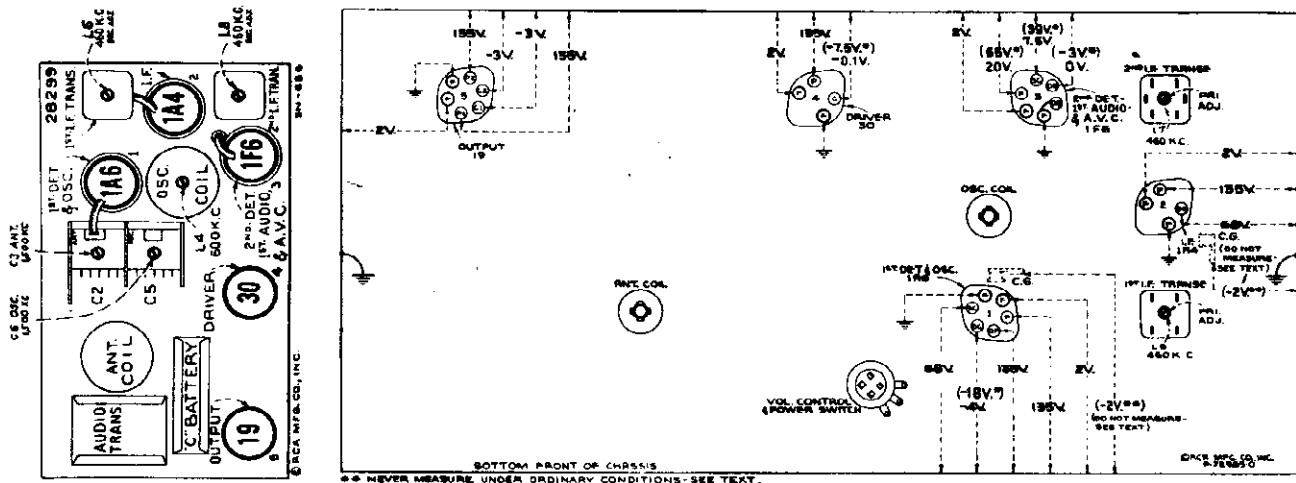


Figure 6—Radiotron Socket Voltages, Coil, and Trimmer Locations
Measured with all batteries at normal voltage—Tuned to approximately 1,000 kc—
No signal being received—Volume control optional

Radiotron Socket Voltages

CAUTION: Do not attempt to measure voltages on control grids of RCA-1A6 or RCA-1A4, with any conventional voltmeter, due to presence of bias cells. See "Caution" under "Service data" for method of measuring these cells.

Note: Two voltage values are shown for some readings. The higher value shown in parenthesis with asterisk (*) indicates operating conditions without voltmeter loading. The lower value is the actual measured voltage and differs from the higher value because of the additional loading of the voltmeter through the high series circuit resistance.

Radiotron Plate Current Readings
Measured with Milliammeter Connected at Tube Socket Plate Terminals under Conditions Similar to Those of Voltage Measurements

- (1) RCA-1A6—1st. Det. 2.26 ma.
—Osc. 1.86 ma.
 - (2) RCA-1A4—I.F. 3.6 ma.
 - (3) RCA-1F6—2nd Det.—A.F.—A.V.C. 0.3 ma.
 - (4) RCA-30—Driver 3.8 ma.
 - (5) RCA-49—Output 2.8 ma.**
- (** Total plate current.)

I-F Adjustments

The four adjustment screws (attached to molded magnetite cores) of the two i-f transformers (one on top and one on bottom of each i-f transformer) are located as shown by figures 3 and 6. Each circuit must be aligned to a basic frequency of 460 kc.

Connect the "Ant." output of the test-oscillator to the control grid of the RCA-1A6 through a .001 mfd. capacitor. Connect the test oscillator "Gnd." terminal to the ground terminal of the receiver chassis. Tune the test oscillator to 460 kc. Adjust the receiver tuning control to a point, within its range, where no interference is encountered either from broadcast stations or short stator of oscillator tuning condenser C5 to ground, eliminating local (heterodyne) oscillator signals.

Adjust the two magnetite core screws L8 and L7 of the second i-f transformer to produce maximum (peak) indicated receiver output. Then, adjust the two magnetite core screws L6 and L5 of the first i-f transformer for maximum (peak) receiver output as shown by the indicating device. It is advisable to repeat the adjustment of all i-f magnetite core screws to assure that the interaction between them has not disturbed the original adjustments. Remove temporary jumper, stator C5 to ground, if used.

R-F Adjustments

Calibrate the tuning dial by adjusting the dial pointer to the extreme low-frequency end calibration mark (530 kc) on dial scale while the gang tuning condenser plates are in their full-mesh position. Reduce output of test oscillator to minimum. Set receiver dial pointer to 600 kc. Tune the test oscillator to 600 kc and increase its output until an indication is obtained on the output indicator.

Adjust oscillator magnetite core screw L4 (top of oscillator coil) so that maximum (peak) indication is shown by the output indicator.

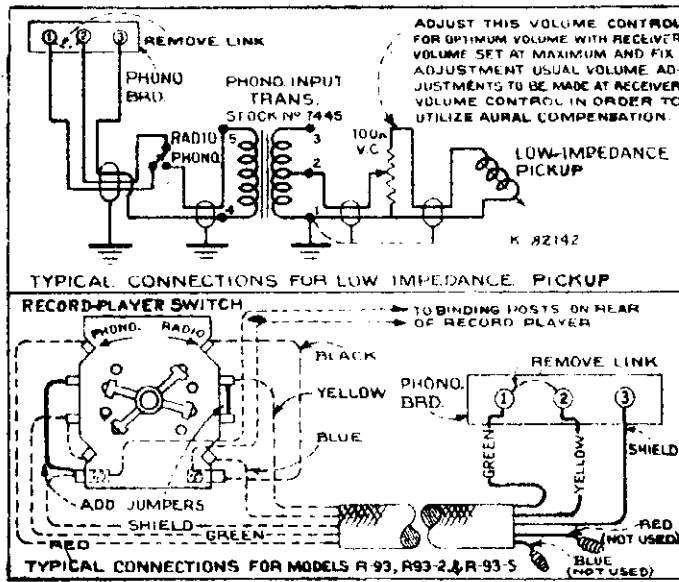
Set receiver dial pointer to 1,500 kc. Tune test oscillator to 1,500 kc. Adjust the oscillator and antenna trimmers C6 and C3 for maximum (peak) indicated output.

Tune test oscillator to 600 kc and adjust receiver to pick up this signal near 600 kc. Readjust the oscillator magnetite core screw L4 for maximum (peak) indicated output while rocking the receiver gang tuning condenser back and forth through this signal.

Repeat adjustments of C6 and C3 as above to correct for any changes in the oscillator tuning caused by the adjustment of L4.

RCA MFG. CO., INC.

MODEL 5BT
Phono Data
Notes, Parts



Caution: The two bias cells are used only for the purpose of supplying bias potential and should never be measured with an ordinary voltmeter or other device which draws any current. A simple check on these cells may be made by connecting a milliammeter in the plate circuit of the RCA-1A4 tube and noting the plate current reading. Then remove the two bias cells, being careful that the spring contact clips do not short-circuit them during removal. Connect a 2-volt battery between the + and - 2v. (- battery to grid side) terminals of the bias cell board, and again note the plate current reading. If the first reading obtained (with bias cells) is more than 40% from the latter reading (with 2-volt battery), the bias cells should be replaced. This 40% difference is equivalent to a change of approximately 25% battery voltage.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

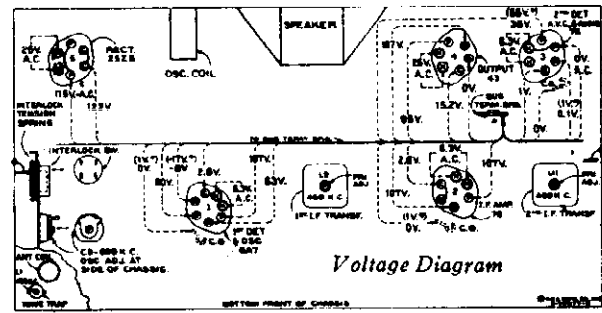
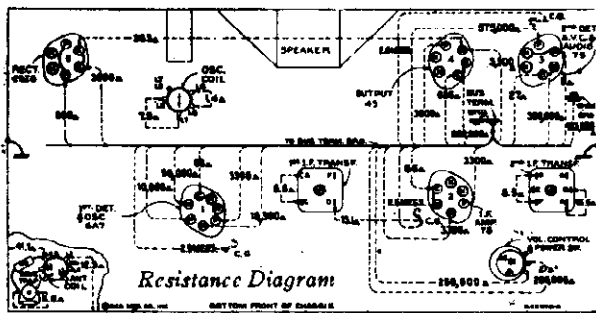
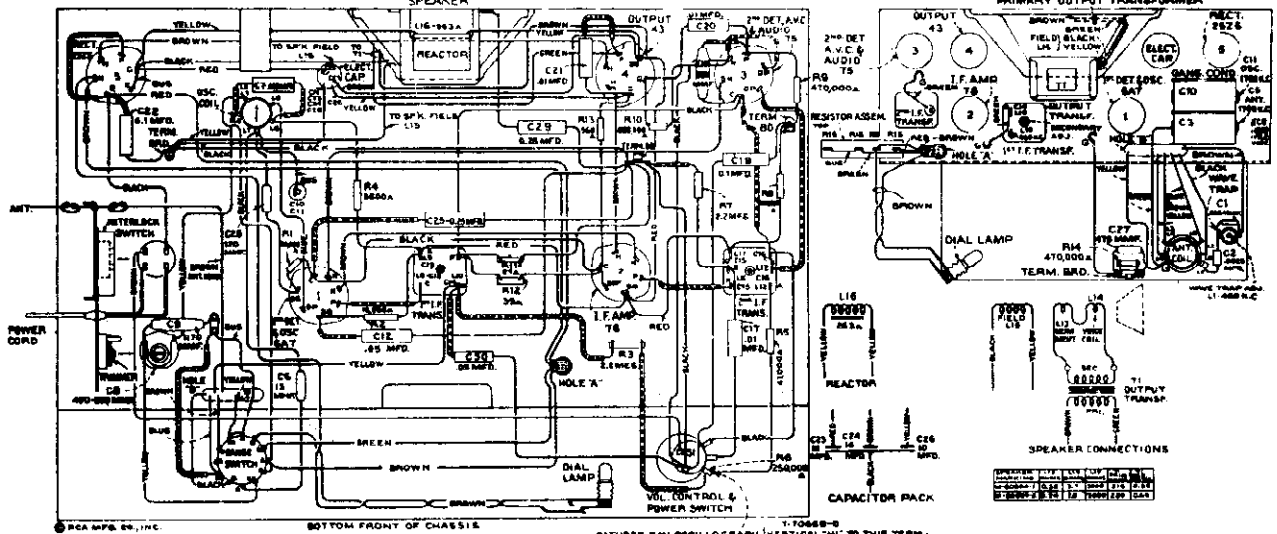
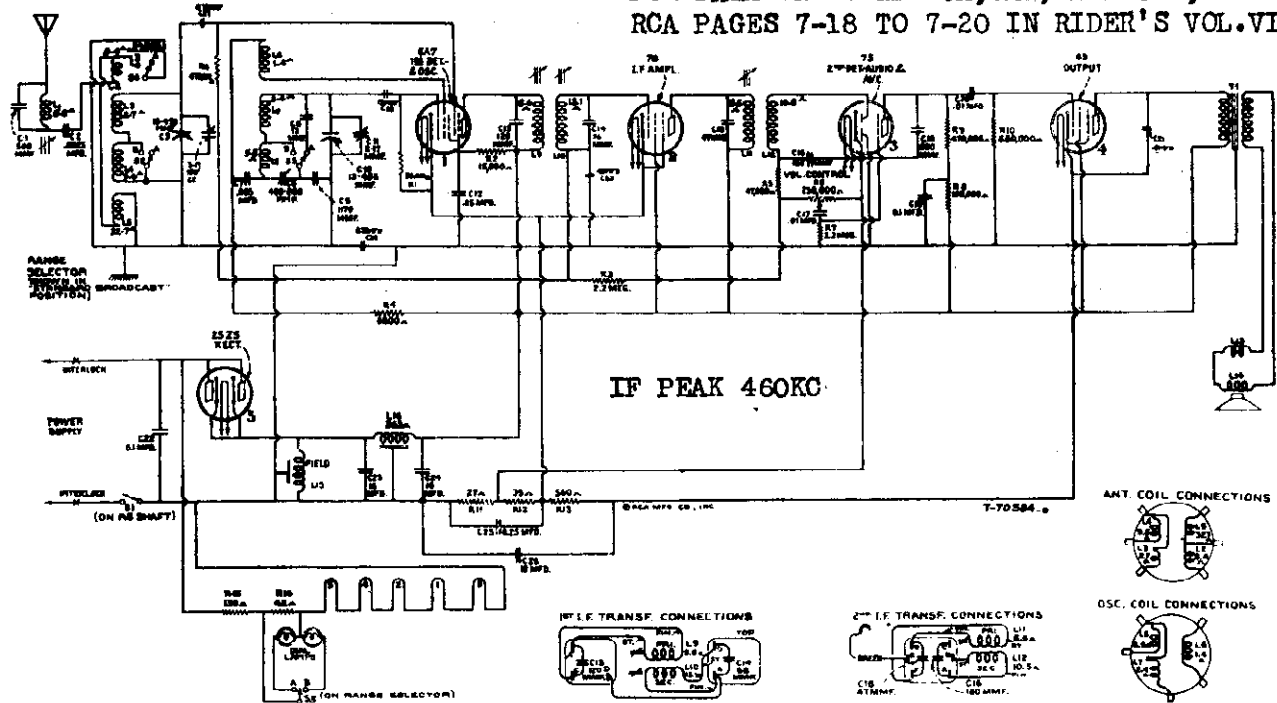
Stock No.	DESCRIPTION	List Price	Stock No.	DESCRIPTION	List Price
13216	RECEIVER ASSEMBLIES		11305	Resistor—22,000 ohms, carbon type, 1/4 watt—Package of 5 (R2)	1.00
12717	Board—Antenna and ground terminal board	\$0.25	11282	Resistor—56,000 ohms, carbon type, 1/10 watt—Package of 5 (R3)	.75
4289	Board—Phonograph terminal board	.22	12009	Resistor—68,000 ohms, carbon type, 1/4 watt—Package of 5 (R1)	\$1.00
4286	Body—Female section of fuse holder—Package of 10	.35	11323	Resistor—270,000 ohms, carbon type, 1/4 watt—Package of 5 (R8)	1.00
13217	Bushing—Bushing and ferrule assembly for fuse holder—Package of 10	.38	12200	Resistor—1 meg., insulated, 1/4 watt—Package of 5 (R6, R9)	1.00
4288	Cable—Battery cable complete with four 2-contact male connectors, fuse holder and fuse	3.05	11626	Resistor—2.2 meg., carbon type, 1/4 watt—Package of 5 (R4, R7)	1.00
12629	Cap—Male section of fuse holder—Package of 10	.36	13296	Shield—Coil shield for coil Stock Nos. 13293 and 13294	.30
12404	Capacitor—56 Mmfd. (C10)	.20	12008	Shield—First or second I. F. transformer shield	.28
12724	Capacitor—120 Mmfd. (C9, C11, C12)	.26	12607	Shield—First I. F. transformer shield top	.30
12406	Capacitor—120 Mmfd. (C14, C17)	.28	12581	Shield—Second I. F. transformer shield top	.36
13297	Capacitor—180 Mmfd. (C13)	.26	3682	Shield—1A4, 1A6, or 1F6 Radiotron shield	.22
5107	Capacitor—415 Mmfd. (C4)	.25	8098	Socket—Dial lamp socket	.10
5005	Capacitor—0025 Mfd. (C15, C19, C20)	.16	4794	Socket—4-contact 1A4 or 30 Radiotron socket	.15
4841	Capacitor—0035 Mfd. (C18, C22)	.16	4786	Socket—6-contact 1A5, 1F6 or 19 Radiotron socket	.15
4840	Capacitor—0.1 Mfd. (C1, C16)	.22	12007	Spring—Retaining spring for core, Stock No. 12006—Package of 10	.36
13295	Capacitor—0.25 Mfd. (C7)	.30	4284	Spring—Spring for female section fuse holder—Package of 10	.30
13293	Coil—Antenna coil with shield (L1, L2)	1.70	12803	Transformer—Audio transformer pack (T1, T2)	3.55
13294	Coil—Oscillator coil with shield (L3, L4)	1.00	12801	Transformer—First I. F. transformer (L5, L6, C9, C10)	1.70
13212	Condenset—2-gang variable tuning condenser (C2, C3, C5, C6)	3.40	12802	Transformer—Second I. F. transformer (L7, L8, C11, C12, C13, R3)	1.85
12828	Connector—2-contact male connector for cable, Stock No. 13217	20	13214	Volume control and power switch (R5, S1, S2)	1.50
12827	Connector—2-contact and guide pin male connector for cable Stock No. 13217	.30	4285	Washer—Insulating washer for female section of fuse holder—Package of 10	.22
5119	Connector—3-contact female connector for speaker cable	.25		REPRODUCER ASSEMBLIES	
12006	Core—Adjustable core and stud assembly for Stock Nos. 12801 and 12802	.22	12642	Cone—Reproducer cone and dust cap	.94
12681	Cell—Bias cell	.30	5118	Plug—3-contact male connector for reproducer—Complete	.25
13391	Dial—Station selector dial scale	.45	9712	Reproducer—Complete	6.60
3748	Fuse—1/4 ampere—Package of 5 (F1)	.40		MISCELLANEOUS ASSEMBLIES	
13215	Holder—Bias cell holder	.25	12638	Knob—Station selector control knob—Package of 5	.58
13213	Indicator—Station selector indicator pointer	.15			
4290	Insulator—Insulator for female section of fuse holders—Package of 10	.35			
4348	Lamp—Dial lamp	.38			
13298	Resistor—Flexible type, 0.43 ohm—Package of 5 (R10)	.90			

MODELS 5XA, 5XA3, 5XA4
Schematic, Socket, Voltage
Chassis Wiring, Resistance

RCA MFG. CO., INC.

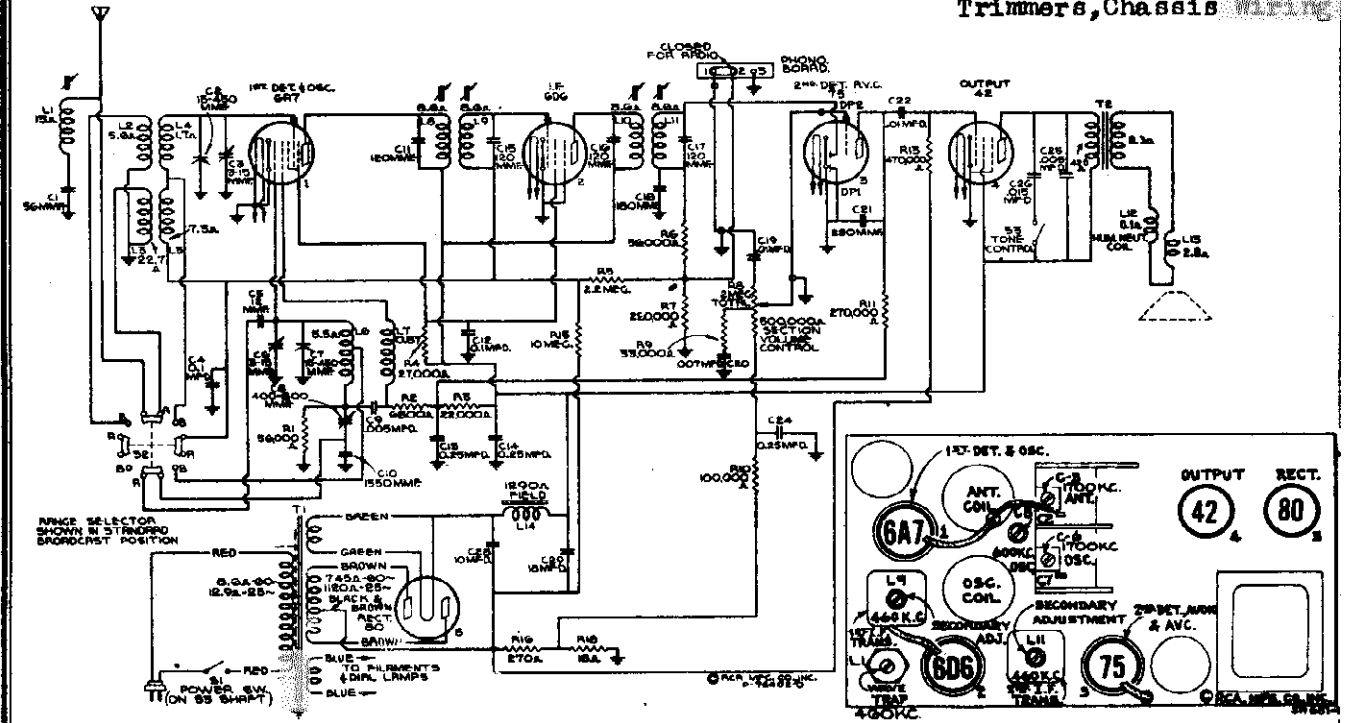
RCA Victor Models 5XA, 5XA3, and 5XA4 are similar to RCA Victor Models 5X, 5X3, and 5X4 respectively. Technical Information and Service Data for Models 5X, 5X3, and 5X4 is directly applicable except as contained herein.

FOR DATA ON MODELS 5X, 5X3, AND 5X4, SEE
RCA PAGES 7-18 TO 7-20 IN RIDER'S VOL. VII



RCA MFG. CO., INC.

MODEL 5T1
Schematic, Socket
Trimmers, Chassis Wiring



IF PEAK 460 KC

Figure 2—Schematic Circuit Diagram

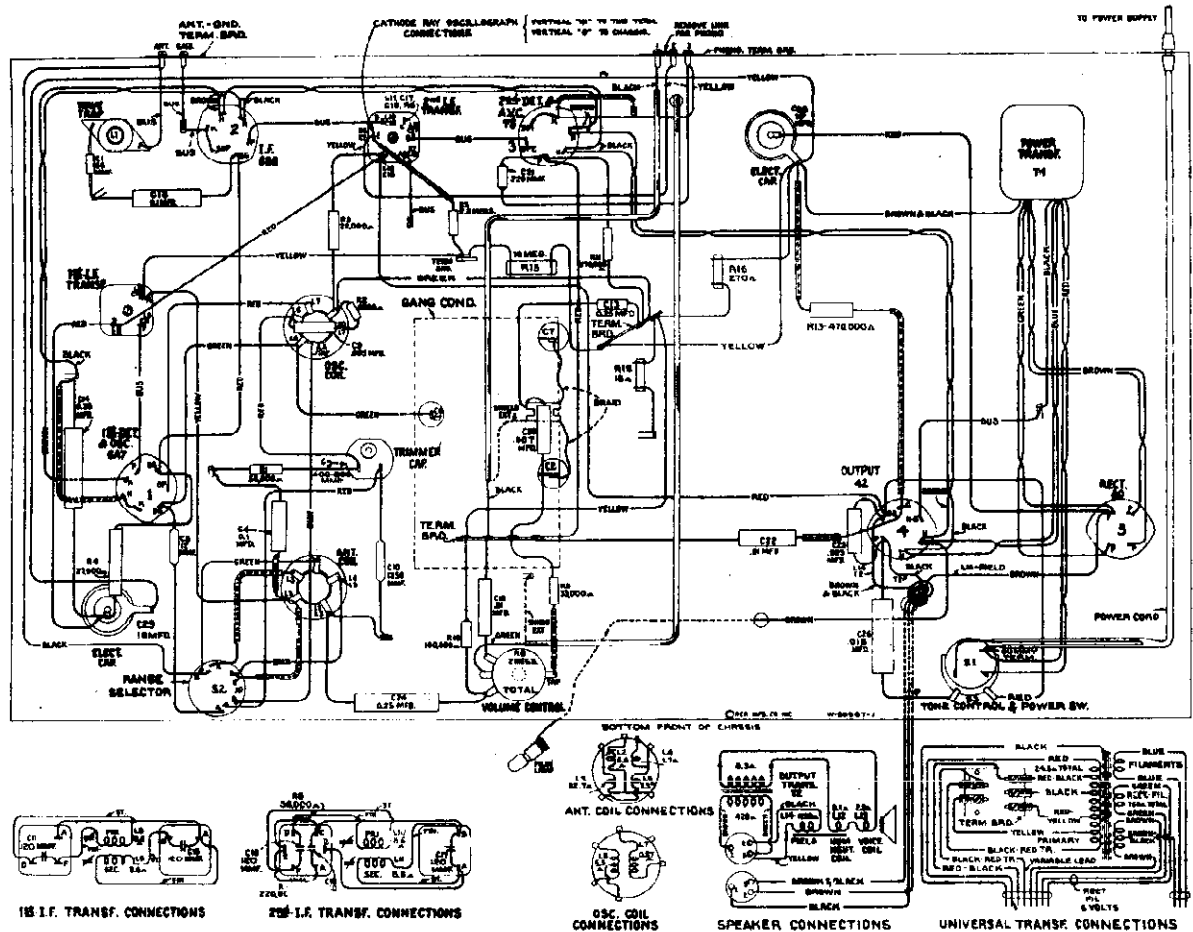


Figure 3—Chassis Wiring Diagram

MODEL 5T1
Voltage, Alignment

RCA MFG. CO., INC.

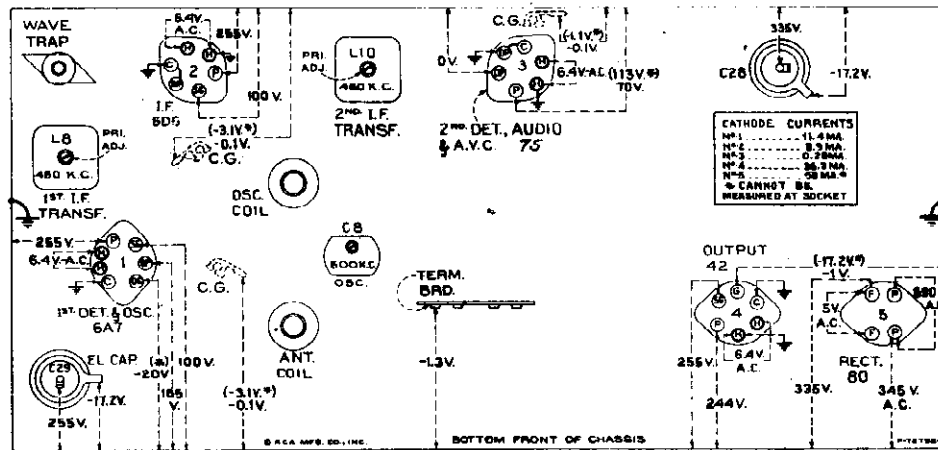


Figure 4—Radiotron Socket Voltages, Coil, and Trimmer Locations

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc ("Standard Broadcast")—
No signal being received—Volume control minimum

Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.

Voltage values as specified should hold within $\pm 20\%$ when the receiver is normally operative at its rated line voltage. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250, and 500 volts. Use the nearest range above the specified measured voltage. A-c voltages were measured with a corresponding a-c meter.

Alignment Procedure

Calibrate the tuning dial by adjusting dial pointer to the extreme low-frequency end calibration mark on the "Standard broadcast" dial scale with the two-gang tuning condenser in full-mesh position.

Perform alignment in proper order tabulated below, starting with No. 1 and following all operations across, then No. 2, etc.

Cathode-ray alignment is preferable; the connections to the chassis are shown on figure 3. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to

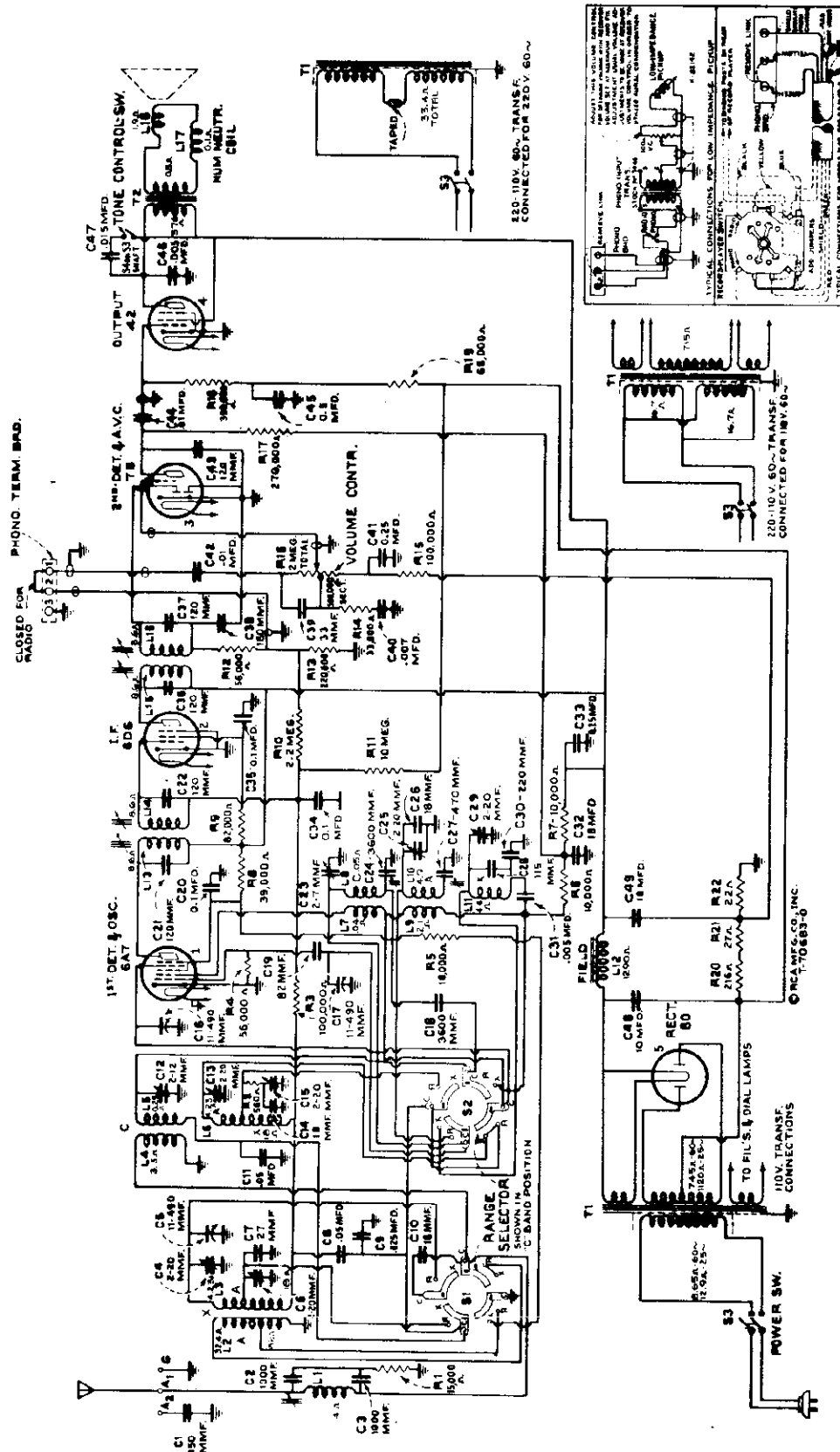
the receiver chassis for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal is received from a station or the local (heterodyne) oscillator.

For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

Order of Alignment	Test Oscillator			Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting				
1	6D6 i-f Grid Cap	.001 Mfd.	460 kc	No signal 550-750 kc	2nd i-f Trans.	L10 and L11	Max. (peak)
2	6A7 Det. Grid Cap	.001 Mfd.	460 kc	No signal 550-750 kc	1st i-f Trans.	L8 and L9	Max. (peak)
3	Ant. Post	200 Mmfd.	460 kc	No signal S. W. Band	Wave Trap	L1	Minimum Output
4	Ant. Post	200 Mmfd.	600 kc	600 kc	L-F Osc.	C8	Max. (peak)
5	Ant. Post	200 Mmfd.	1,700 kc	1,700 kc	H-F Osc.	C6	Max. (peak)
6	Ant. Post	200 Mmfd.	600 kc	Rock thru 600 kc	L-F Osc.	C8	Max. (peak)
7	Ant. Post	200 Mmfd.	1,700 kc	1,700 kc	H-F Osc.	C6	Max. (peak)
8	Ant. Post	200 Mmfd.	1,700 kc	1,700 kc	Ant.	C3	Max. (peak)

RCA MFG. CO., INC.

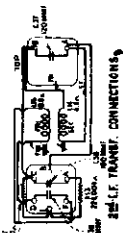
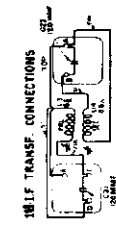
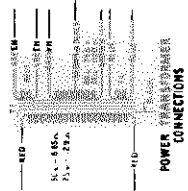
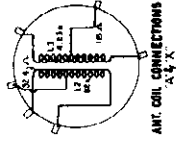
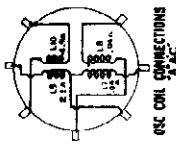
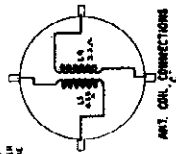
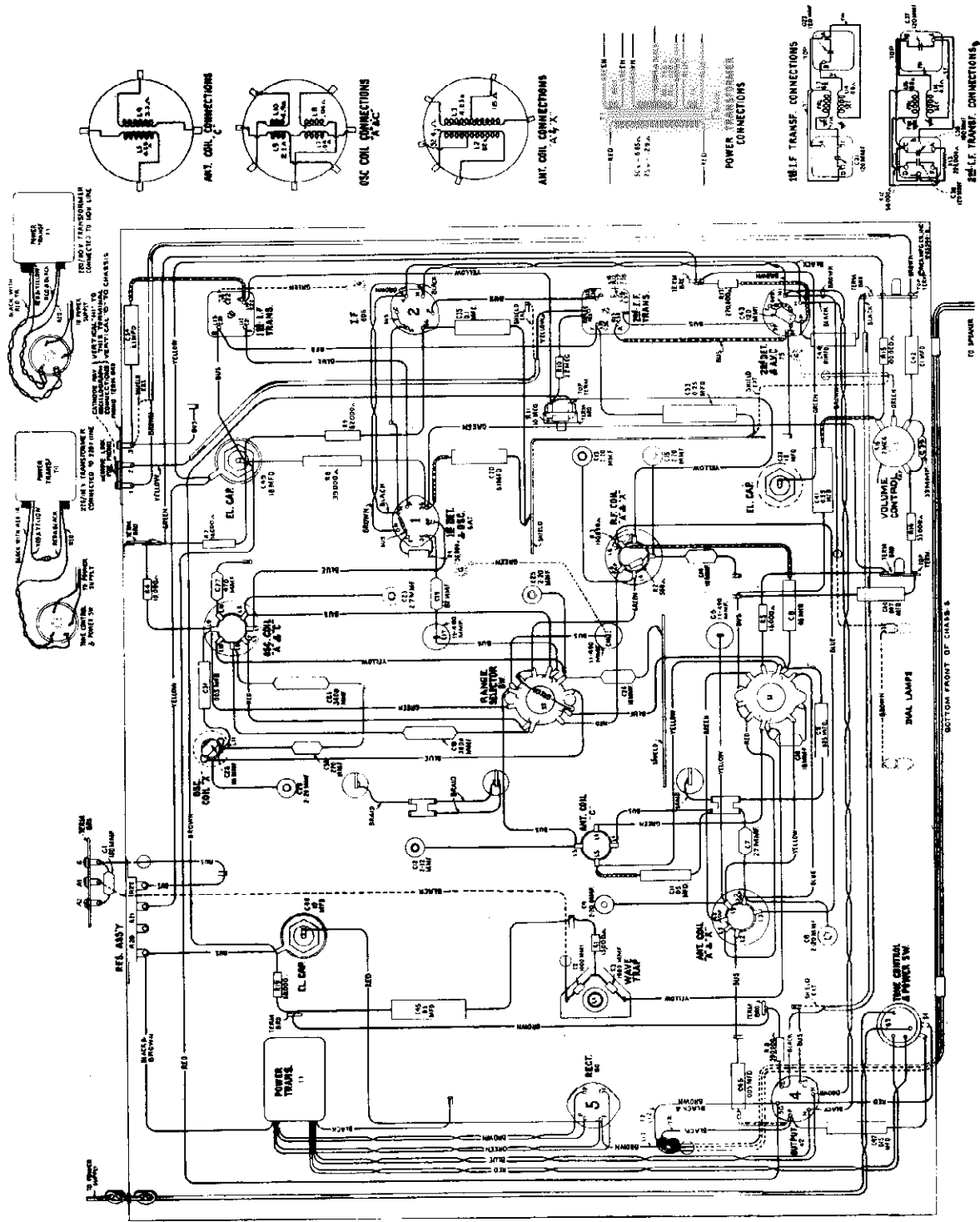


FREQUENCY OR WAVE-LENGTH RANGES	ALIGNMENT FREQUENCIES
Band "X" ... 145-350 kc (approx. 2,068-857 meters)	Band "X" ... 175 kc (osc.), 350 kc (osc., det., ant.)
Band "A" ... 525-1,550 kc (approx. 571-193 megacycles)	Band "A" ... 600 kc (osc.), 1,500 kc (osc., det., ant.)
Band "C" ... 5.8-22 megacycles	Band "C" ... 20,000 kc (osc., ant.)
Intermediate Frequency	460 kc

MODEL 5T4

Chassis Wiring

RCA MFG. CO., INC.



- Pilot Lamps (2) Mazda No. 46, 6.3 volts, 0.25 ampere
- POWER SUPPLY RATINGS**
- Rating A 105-125 volts, 50-60 cycles, 75 watts
- Rating B 105-125 volts, 25-50 cycles, 75 watts
- Rating C 100-125/200-250 volts, 50-60 cycles, 75 watts
- POWER OUTPUT RATING**
- Undistorted 2.0 watts
- Maximum 4.5 watts
- LOUDSPEAKER**
- Type Electrodynamic
- Voice Coil Impedance 2.2 ohms at 400 cycles

RCA MFG. CO., INC.

MODEL 5T4
 Socket, Trimmers
 Voltage, Resistance
 Loud Spkr. Wiring

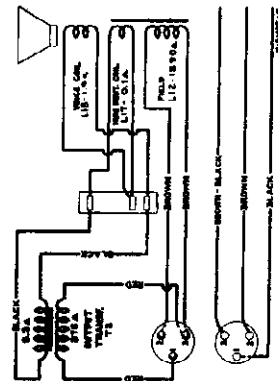
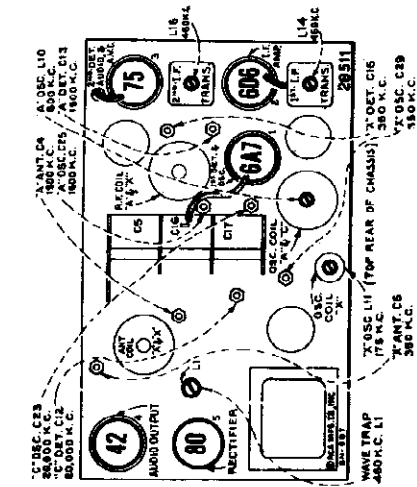


Figure 5—Loudspeaker Wiring

Radiotron Cathode Current Readings at Tube Measured with Milliammeter Connected at Tube Socket Cathode Terminal under Conditions Similar to Those of Voltage Measurements

- (1) RCA-6A7—1st Det.—Osc. 12.4 ma.
 - (2) RCA-6D6—I. F. Amp. 10.2 ma.
 - (3) RCA-75—2nd Det., A.V.C. and A. F. 0.23 ma.
 - (4) RCA-42—Power Amp. 39 ma.
 - (5) RCA-80—Rectifier 64 ma.*
- (* Cannot be measured at socket)

Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the series circuit resistance.

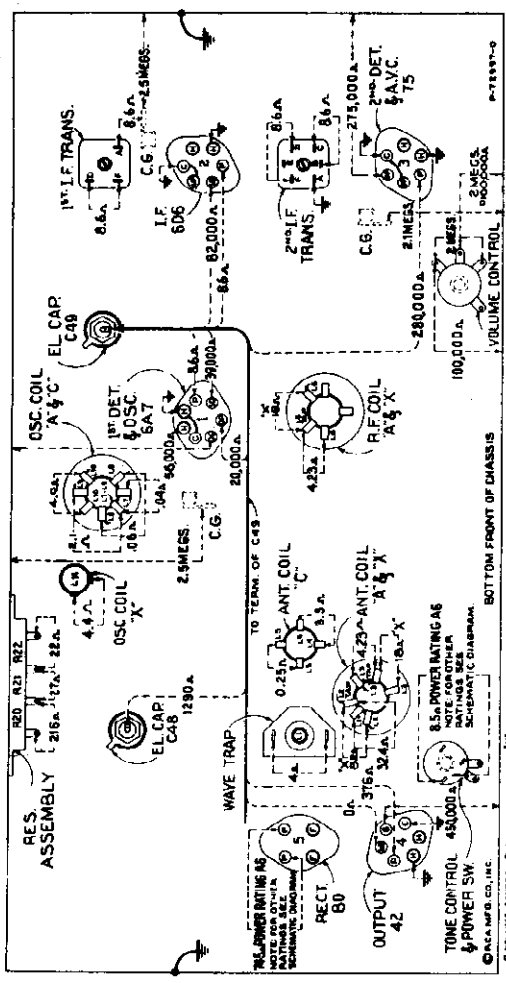


Figure 4—Resistance Diagram

Power supply disconnected—Radiotrons in sockets—Tuning condenser in full mesh—Volume control maximum—Range selector in "A" position

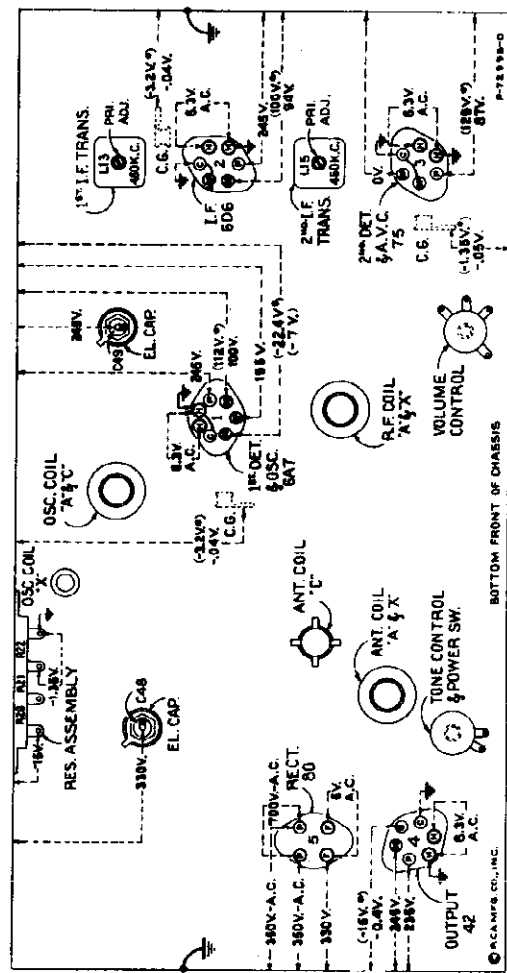


Figure 6—Radiotron Socket Voltages, Coil and Trimmer Locations

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc or 300 meters "A" band—No signal being received—Volume control minimum

MODEL 5T4
Alignment

RCA MFG. CO., INC.

Alignment Procedure

the test oscillator to 600 kc and set receiver dial pointer to 600 kc (500 meters). Adjust output of test oscillator until a slight indication of output is visible.

- (d) Adjust the oscillator magnetite core screw L10 (top of oscillator coil) so that maximum (peak) indicated output results.
- (e) Set receiver dial pointer to 1,500 kc (200 meters). Tune the test oscillator to 1,500 kc. Carefully adjust the oscillator, detector, and antenna trimmers C25, C13 and C4 respectively so that each brings about maximum (peak) indicated output.
- (f) Tune the test oscillator to 600 kc. Adjust the receiver to pick up this signal disregarding the dial reading at which it is best received. Adjust oscillator magnetite core screw L10 (top of oscillator coil), simultaneously rocking the tuning control of the receiver backward and forward through the signal, until maximum (peak) output results from the combined operations. After completing this adjustment, the trimmers C25, C13 and C4 should be re-adjusted as in (e) to correct for any change in the oscillator high-frequency tuning which has been caused by the preceding adjustment.

"X" Bend

- (g) Adjust receiver range selector to band "X" position and set receiver tuning control to a dial reading of 350 kc or 857.14 meters (19.75 on "C" scale). Tune test oscillator to 350 kc and adjust oscillator, detector, and antenna trimmers C29, C15 and C6, respectively, for maximum indicated receiver output.
- (h) Set receiver to 175 kc or 1,714.28 meters (7.4 on "C" scale) and tune test oscillator to 175 kc. Adjust screw L11 for maximum indicated output, simultaneously rocking tuning control of the receiver backward and forward through the signal.
- (i) The adjustment of C29, C15 and C6 should now be repeated at 350 kc as described in (g) to compensate for any changes caused by the low-frequency adjustment L11.

Loudspeaker

Centering of the loudspeaker voice coil is made in the usual manner with three narrow paper feelers after first removing the front paper dust cover. This may be removed by softening its cement with a very light application of acetone, using care not to allow the acetone to flow down into the air gap. The dust cover may be cemented back in place with ambroid upon completion of adjustment.

receiver output, as shown by the indicating device. During these adjustments, regulate the test oscillator output so that the indication is always as low as possible. By doing so, broadness of tuning due to a.v.c. action will be avoided. It is advisable to repeat the adjustment of all i-f magnetite core screws to assure that the interaction between them has not disturbed the original adjustment. Remove temporary jumper, stator C17 to chassis-ground if used.

R-F Adjustments

Calibrate the tuning dial by adjusting the scale pointer to the extreme right-hand end calibration mark, on any scale, while the three-gang tuning condenser plates are in full mesh.

Wave-Trap Adjustment

Attach the "Ant" output of the test oscillator to the receiver "A1" terminal through a 200 mmfd. (important) capacitor. The ground connections remain connected together. Leave the test oscillator adjusted to 460 kc. Adjust range selector to band "A" position. Then adjust the wave-trap screw to the point which causes maximum suppression (minimum output) of the 460 kc signal.

"C" Bend

- (a) Attach the "Ant" output of the test oscillator to the receiver "A1" terminal through a 300-ohm resistor, leaving the "Gnd" of the oscillator connected to the receiver chassis.
- Adjust range selector to band "C" position. Set receiver dial pointer to 20,000 kc (20 on scale).
- (b) Tune test oscillator to 20,000 kc. Set oscillator trimmer C23 to minimum capacity (plunger full out), and detector trimmer C12 to maximum capacity (plunger full in). Slowly push in oscillator trimmer C23 until maximum (peak) output is reached. Two peaks may be found. Adjust C23 to the peak with minimum capacity (plunger near out) for maximum indication. Tighten lock nut. Slowly pull out plunger of detector trimmer C12 until maximum (peak) indicated output is reached while slightly rocking the gang tuning condenser back and forth through the signal. Two peaks may be found with this circuit. The peak with maximum capacity (plunger near in) should be used. Tighten lock nut.

"A" Bend

- (c) Attach the "Ant" output of the test oscillator to the receiver "A1" terminal through a 200 mmfd. capacitor, leaving the "Gnd" of the oscillator connected to the receiver chassis. Adjust range selector to band "A" position. Reduce output of test oscillator to a minimum. Tune

There are ten alignment trimmers provided in the antenna transformer, detector, and oscillator coil tuned circuits. The i-f transformer, low-frequency oscillator, and wave-trap adjustments are made by means of screws attached to molded magnetite cores. All of these circuits have been accurately adjusted during manufacture and should remain properly aligned unless affected by abnormal conditions or altered during servicing. Loss of sensitivity, improper tone quality, and poor selectivity are the usual indications of improper alignment.

The correct performance of this receiver can only be obtained when the aligning has been done with adequate and reliable apparatus. The manufacturer of this receiver has available for sale, through its distributors and dealers, a complete assortment of such service equipment as may be needed for the alignment operation.

A test oscillator, such as the RCA Stock No. 9595, is required as a source of the specified alignment frequencies. Visual indication of receiver output during the adjustment is necessary and should be accomplished by the use of an indicator such as the RCA Stock No. 4317 Neon Output Indicator.

The procedure outlined below should be followed in adjusting the various trimmer capacitors and molded cores:

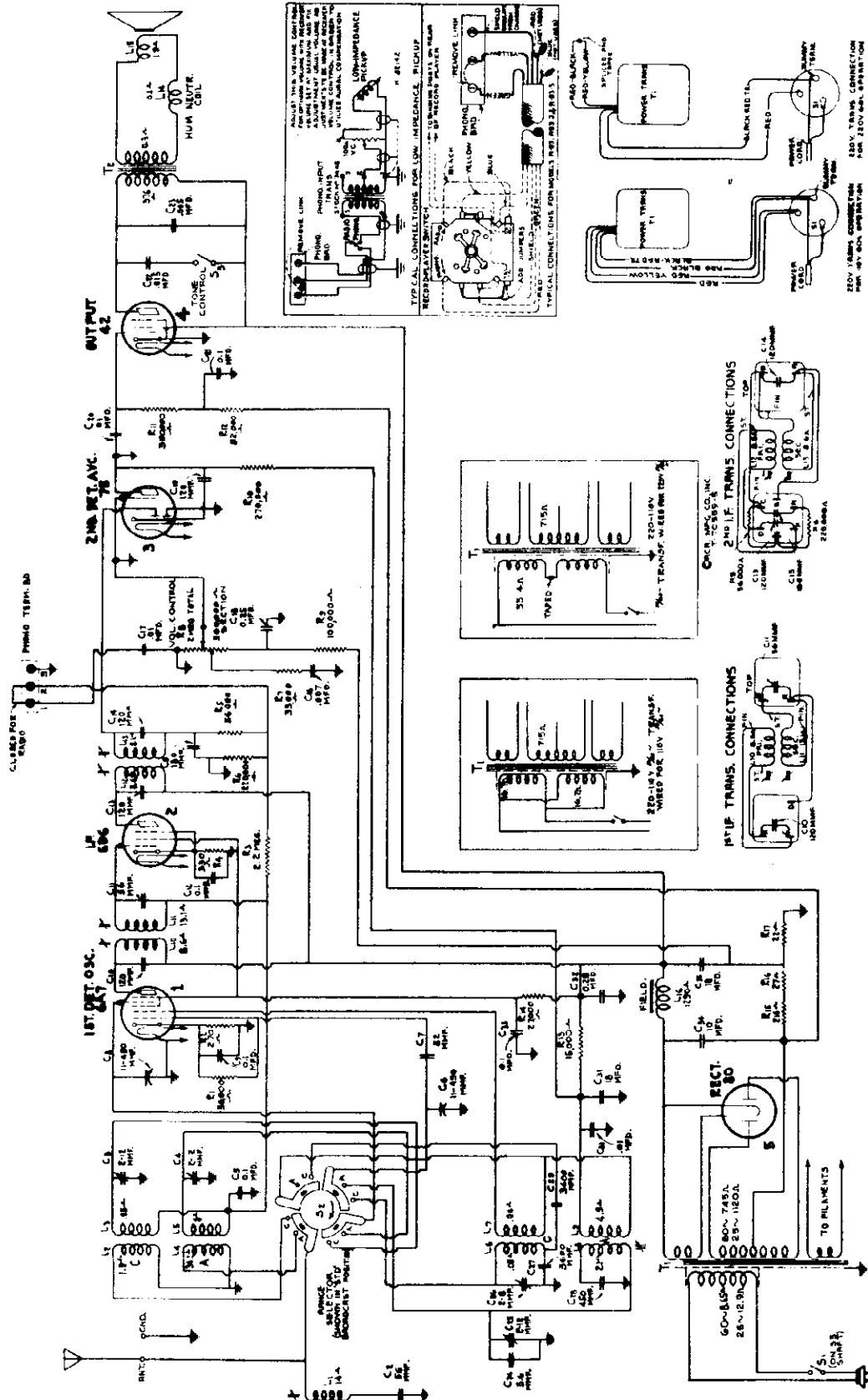
I-F Adjustments

The four adjustment screws (attached to molded magnetite cores) of the two i-f transformers (one on top and one on bottom of each i-f transformer) are located as shown by figures 3 and 6. Each circuit must be aligned to a basic frequency of 460 kc. To do this, attach the output indicator across the loudspeaker voice coil.

Connect the "Ant" output of the test oscillator to the control grid of the RCA-6A7 through a .001 mfd. capacitor. Connect the test oscillator "Gnd" terminal to the ground terminal of the receiver chassis. Tune the oscillator to 460 kc. Advance the receiver volume control to its full-on position and adjust the receiver tuning control to a point, within its range, where no interference is encountered from local broadcast stations or from the local (heterodyne) oscillator. To eliminate signals from the local oscillator short stator of C17 to chassis-ground. Increase the output of the test oscillator until a slight indication is present on the output indicator. Adjust the two magnetite core screws of the second i-f transformer L16 and L15 to produce maximum (peak) indicated receiver output. Then adjust the two magnetite core screws L14 and L13 of the first i-f transformer for maximum (peak)

RCA MFG. CO., INC.

MODEL 5T5
Schematic
Phono>Data



FREQUENCY RANGES

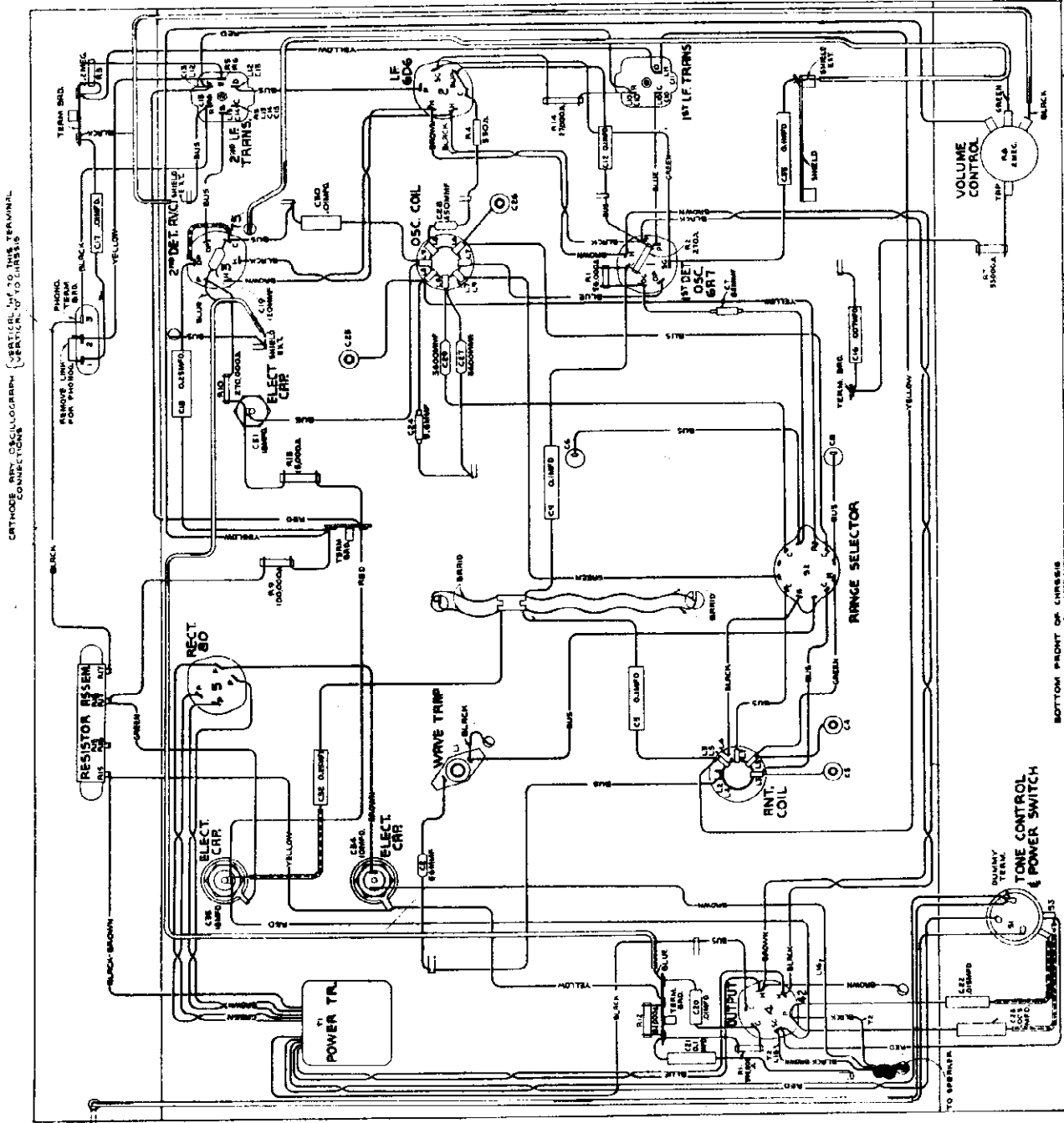
"Standard broadcast" (A) 530-1,900 kc
 "Short wave" (C) 5,800-21,600 kc
 Intermediate Frequency 460 kc

ALIGNMENT FREQUENCIES

"Standard broadcast" (A) 600 kc (osc.), 1,700 kc (osc., ant.)
 "Short wave" (C) 20,000 L.

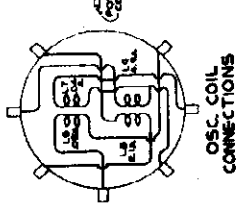
MODEL 5T5
Chassis Wiring
Trimmers, Socket

RCA MFG. CO., INC.

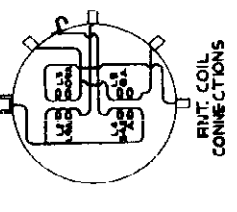


CATHODE RAY OSCILLOGRAPH (VERTICAL) OF THIS TERMINAL CONNECTIONS

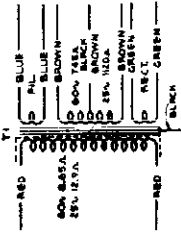
BOTTOM FRONT OF CHASSIS



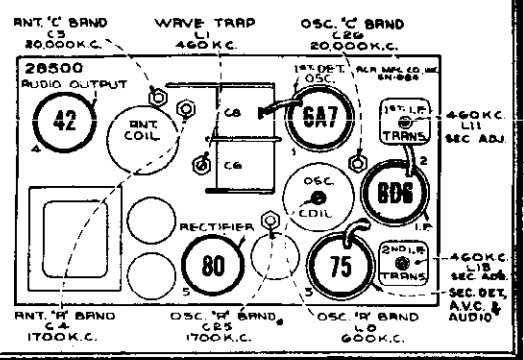
OSC. COIL CONNECTIONS



ANT. COIL CONNECTIONS

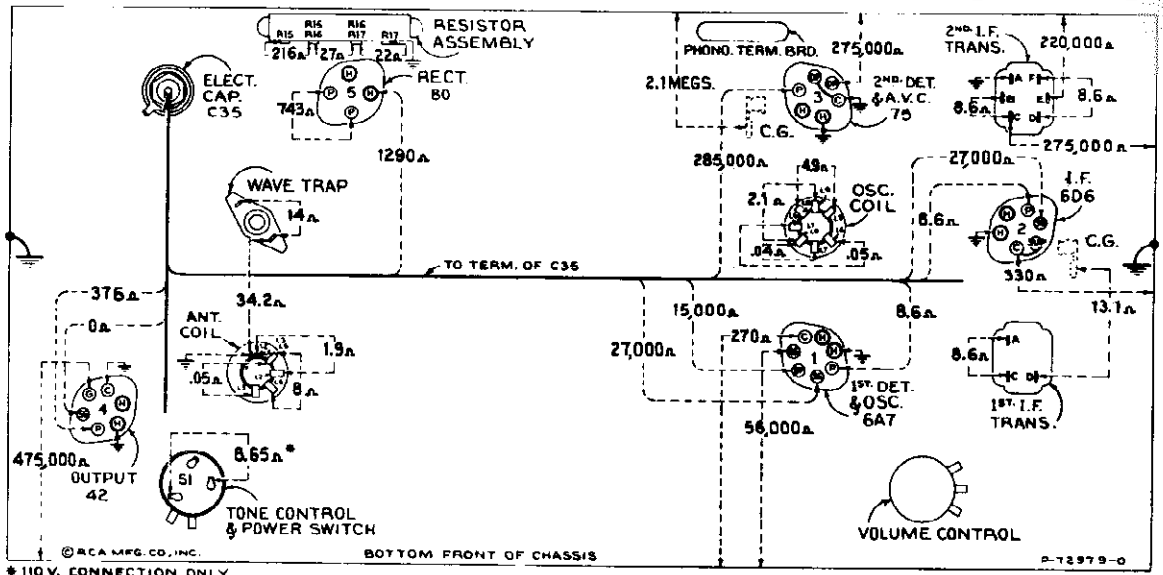


POWER TRNS.



RCA MFG. CO., INC.

MODEL 5T5
Voltage, Resistance
Spkr. Wiring



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BOTTOM FRONT OF CHASSIS

P-72979-0

Figure 4—Resistance Diagram

Power supply disconnected—Radiotrons in sockets—Tuning condenser in full mesh—
Volume control maximum

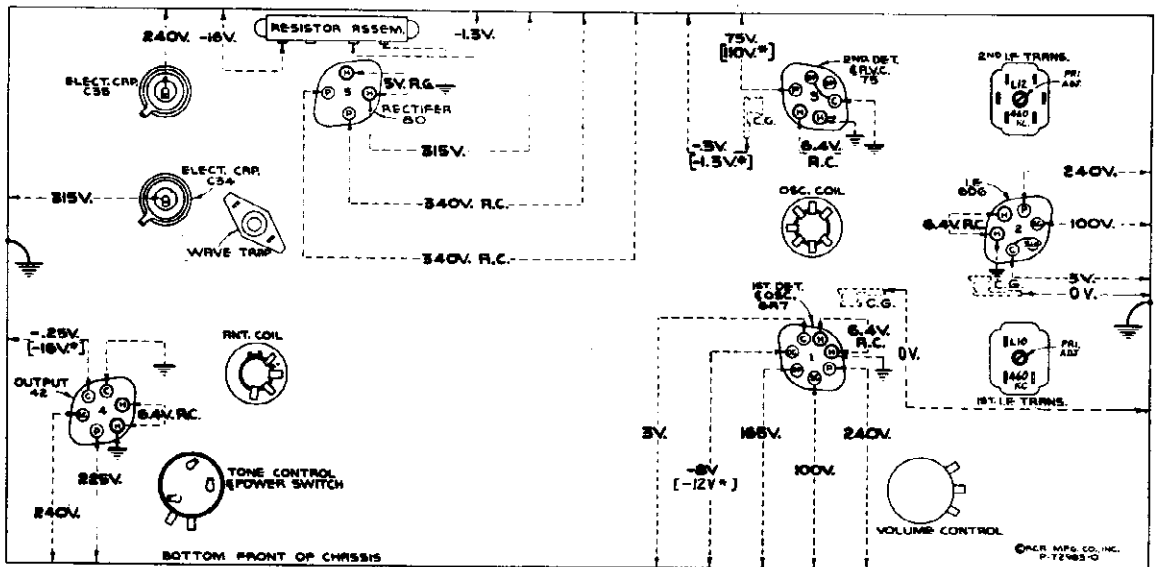


Figure 6—Radiotron Socket Voltages, Coil and Trimmer Locations.

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc ("Standard broadcast")—
No signal being received—Volume control minimum

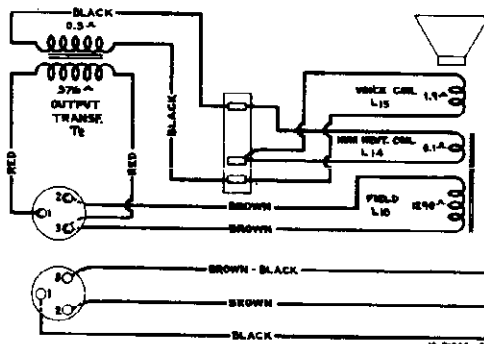


Figure 5—Loudspeaker Wiring

Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.

Radiotron Plate Current Readings

Measured with Milliammeter Connected at Tube Socket Plate Terminals Under Conditions Similar to Those of Voltage Measurements

- (1) RCA-6A7—1st Det.—Osc. 11.0 ma.
- (2) RCA-6D6—I. F. Amp. 10.0 ma.
- (3) RCA-75—2nd Det., A.V.C. and A. F. ... 0.22 ma.
- (4) RCA-42—Power Amp. 42.0 ma.
- (5) RCA-80—Rectifier

MODEL 5T5
Alignment
Parts

RCA MFG. CO., INC.

REPLACEMENT PARTS

Insist on genuine factory tested parts, which are readily identified and may be purchased from authorized dealers.

Stock No.	DESCRIPTION	List Price	Stock No.	DESCRIPTION	List Price
13216	Board—Antenna and ground terminal	\$0.25	11323	Resistor—270,000 ohms, carbon type, ¼ watt—Package of 5 (R10)	\$1.00
13217	Board—Variable condenser mounting bushing assembly—Package of 3	.22	11847	Resistor—390,000 ohms, carbon type, ¼ watt—Package of 5 (R11)	1.00
13218	Cap—Grid control cap—Package of 3	.43	11826	Resistor—2.2 meg, carbon type, ¼ watt—Package of 5 (R3)	1.00
13219	Cap—Adjustable trimmer (C3, C4, C23)	.15	12651	Shield—Chassis end shield and rubber mounting foot assembly—Package of 2	.28
12607	Capacitor—Adjustable trimmer (C26)	.38	13311	Shield—Chassis end shield and rubber mounting foot assembly—Package of 2	.30
12608	Capacitor—5.6 Mfd. (C24)	.20	12608	Shield—First I. F. transformer shield	.28
12609	Capacitor—5.6 Mfd. (C2)	.20	12799	Shield—Oscillator coil shield	.15
12610	Capacitor—5.6 Mfd. (C1)	.20	12799	Shield—Second I. F. transformer shield	.15
12611	Capacitor—42 Mfd. (C7)	.20	3482	Shield—6A7 or 75 Radiotron shield	.22
12612	Capacitor—120 Mfd. (C10, C13, C14)	.28	3482	Shield—6D6 Radiotron shield	.26
12613	Capacitor—180 Mfd. (C18)	.28	4794	Socket—4-contact 80 Radiotron socket	.15
12614	Capacitor—3.600 Mfd. (C27, C29)	.35	4794	Socket—6-contact 6D6, 42 or 75 Radiotron socket	.15
12615	Capacitor—3.600 Mfd. (C27, C29)	.35	4786	Socket—7-contact 6A7 Radiotron socket	.15
12616	Capacitor—0.05 Mfd. (C33)	.20	4787	Socket—Dial lamp socket	.14
12617	Capacitor—0.05 Mfd. (C18)	.20	11189	Spring—Tuning spring for Stock No. 12606 and 12607	.35
12618	Capacitor—0.15 Mfd. (C17, C20, C30)	.25	12607	Switch—Range switch (S2)	1.00
12619	Capacitor—0.15 Mfd. (C17, C20, C30)	.25	13309	Switch—Tone control and power switch (S1, S3)	.55
12620	Capacitor—0.1 Mfd. (C5, C8, C12, C21, C33)	.22	12801	Transformer—First I. F. transformer complete (L10, L11, C10, C11)	1.70
11240	Capacitor—10 Mfd. (C34)	1.08	12853	Transformer—Second I. F. transformer complete (L12, L13, C13, C14, C15, C16, C17, C18, C19, C20, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C35)	2.06
5212	Coil—Antenna coil and shield (L2, L3, L4, L5)	1.30	13332	Transformer—Power transformer, 105-125 volts, 50-60 cycles (T1)	4.85
12798	Coil—Oscillator coil and shield (L4, L7, L8, L9)	1.60	13584	Transformer—Power transformer, 105-125 volts, 25-60 cycles (T1)	4.80
12701	Coil—25-60 cycle variable tuning coil (L4, L7, L8, L9)	4.80	13393	Transformer—Power transformer, 110-125 volts, 50-60 cycles (T1)	4.85
3119	Connector—3-contact female connector for speaker cable	.25	12454	Tube—Wave-trap complete (L1)	.75
12004	Core—Adjustable core and stud for Stock No. 12453 and 12801	.22	13144	Volume control (R8)	1.00
12464	Core—Adjustable core and stud for Stock No. 12454	.22	REPRODUCER ASSEMBLIES		
13313	Dial—Station selector dial	.45	12641	Board—3-contact reproducer terminal board	.15
12702	Drive—Vernier drive for variable condenser	.68	12640	Bracket—Output transformer mounting bracket	.18
13314	Indicator—Station selector indicator pointer	.15	12012	Coil—Field coil (L16)	1.85
3226	Lamp—Dial lamp, 6.3 volts—Package of 3	.70	12842	Coil—Neutralizing coil (L14)	.20
13310	Resistor—Voltage divider comprising one 214-ohm, one 27-ohm and one 22-ohm sections (R15, R16, R17)	.35	5118	Connector—3-contact male speaker connector	.25
6135	Resistor—270 ohms, carbon type, ¼ watt—Package of 5 (R2)	1.00	9490	Reproducer—Complete	6.38
11296	Resistor—330 ohms, carbon type, ¼ watt—Package of 5 (R3)	1.00	11253	Transformer—Output transformer (T2)	1.54
12759	Resistor—390 ohms, carbon type, ¼ watt—Package of 5 (R4)	1.00	11886	Washer—Spring washer to hold field coil securely—Package of 5	.20
12011	Resistor—27,000 ohms, carbon type, ¼ watt—Package of 5 (R14)	1.10	MISCELLANEOUS ASSEMBLIES		
11364	Resistor—33,000 ohms, carbon type, ¼ watt—Package of 5 (R7)	1.00	12785	Crystal—Station selector etectochrom and crystal	1.00
5029	Resistor—50,000 ohms, carbon type, ¼ watt—Package of 5 (R1)	1.00	12699	Knob—Large station selector knob—Package of 5	.68
11282	Resistor—54,000 ohms, carbon type, ¼ watt—Package of 5 (R5)	1.00	12700	Knob—Small (vernier) station selector knob—Package of 5	.58
11365	Resistor—62,000 ohms, carbon type, ¼ watt—Package of 5 (R12)	1.00	11347	Knob—Control knob—Package of 5	.75
5145	Resistor—100,000 ohms, carbon type, ¼ watt—Package of 5 (R6)	1.00	11377	Screw—Chassis mounting screw and washer assembly—Package of 4	.12
11398	Resistor—220,000 ohms, carbon type, ¼ watt—Package of 5 (R8)	1.00	4982	Spring—Retaining spring for knob, Stock No. 12699—Package of 10	.50
			11349	Spring—Retaining spring for knob, Stock Nos. 11347 and 12700—Package of 5	.25

Prices quoted above are subject to change without notice.

Alignment Procedure

There are five alignment trimmers provided in the antenna transformer and oscillator coil tuned circuits. The i-f transformer and wave-trap adjustments are made by means of screws attached to molded magnetic cores. All of these circuits have been accurately adjusted during manufacture and should remain properly aligned unless affected by abnormal conditions or altered during servicing. Loss of sensitivity, improper tone quality, and poor selectivity are the usual indications of improper alignment.

The correct performance of this receiver can only be obtained when the aligning has been done with adequate and reliable apparatus. The manufacturer of this receiver has available for sale, through its distributors and dealers, a complete assortment of such service equipment as may be needed for the alignment operation.

A test oscillator, such as the RCA Stock No. 9955, is required as a source of the specified alignment frequencies. Visual indication of receiver output during the adjustment is necessary and should be accomplished by the use of an indicator such as the RCA Stock No. 4317 Neon Output Indicator.

The procedure outlined below should be followed in adjusting the various trimmer capacitors and molded cores:

I-F Adjustments

The four adjustment screws (attached to molded magnetic cores) of the two i-f transformers (one on top and one on bottom of each i-f transformer) are located as shown by figures 3 and 6. Each circuit must be aligned to a basic frequency of 460 kc. To do this, attach the output indicator across the loudspeaker voice coil.

Connect the output of the test oscillator to the control grid of the RCA 6A7 through a .001 mfd. capacitor. Connect the test oscillator "Grid" terminal to the ground terminal of the receiver chassis. Tune the oscillator to 460 kc. Advance the receiver volume control to its full-on position and adjust the receiver tuning control to a point, within its range, where no interference is encountered from local broadcast stations or from the local (heterodyne) oscillator. To eliminate signals from the local oscillator short stator of C6 to chassis-ground. Increase the output of the test oscillator until a slight indication is present on the output indicator. Adjust the two magnetic core screws of the second i-f transformer L13 and L12 to produce maximum (peak) indicated receiver output. Then adjust the two magnetic core screws L11 and L10 of the first i-f transformer for maximum (peak) receiver output as shown by the indicating device. During these adjustments, regulate the test oscillator output so that the indication is always as low as possible. By doing so, broadness of tuning due to a.v.c. action will be avoided. It is advisable to repeat the adjustment of all i-f magnetic core screws to assure that the interaction between them had not disturbed the original adjustment.

R-F Adjustments

Calibrate the tuning dial by adjusting the scale pointer to the extreme end calibration mark (beyond 55 on dial) while the two-gang tuning condenser plates are in full mesh.

Wave-Trap Adjustment

Attach the output of the test oscillator to the receiver "Antenna" terminal through a 200 mfd. (important) capacitor. The ground connections remain connected together. Leave the test oscillator tuned to 460 kc. Adjust range selector to "Short wave" (C) position. Then adjust the wave-trap screw to the point which causes maximum suppression (minimum received) of the 460 kc. signal.

"Standard Broadcast" Band

(a) Adjust range selector to "Standard broadcast" (A) position. Reduce output of test oscillator to a minimum. Tune the test oscillator to 600 kc and set receiver dial pointer to 460 kc. Adjust output of test oscillator until a slight indication of output is visible.

(b) Adjust the oscillator magnetic core screw L5 (top of oscillator coil) so that maximum (peak) indicated output results.

(c) Set receiver dial pointer to 1,700 kc. Tune the test oscillator to 1,700 kc. Carefully adjust the oscillator and antenna trimmers C25 and C4 respectively so that each brings about maximum (peak) indicated output.

(d) Tune the test oscillator to 600 kc. Adjust the dial reading at which it is best received. Adjust oscillator magnetic core screw L8 (top of oscillator coil) for maximum (peak) output while rocking gang tuning condenser. After completing this adjustment, the trimmers C25 and C4 should be readjusted as in (c) to correct for any change in the oscillator high-frequency tuning which has been caused by the preceding adjustment.

"Short Wave" Band

(e) Connect the "Ant." output of the test oscillator to the "Antenna" terminal through a 300-ohm resistor, leaving the "Grid" of the oscillator connected to the receiver chassis.

(f) Adjust range selector to its "Short wave" (C) position. Set receiver dial pointer to 20,000 kc. Tune test oscillator to 20,000 kc. Set oscillator trimmer C26 to minimum capacity (plunger full out), and antenna trimmer C3 to maximum capacity (plunger full in). Slowly push in oscillator trimmer C26 until maximum (peak) output is reached. Two peaks may be found. Adjust C26 to the peak with minimum capacity (plunger near out) for maximum indication. Tighten lock nut. Slowly pull out plunger of antenna trimmer C3 until maximum (peak) indicated output is reached while slightly rocking the gang tuning condenser back and forth through the signal. Two peaks may be found with this circuit. The peak with maximum capacity (plunger near in) should be used. Tighten lock nut.

Loudspeaker

Centering of the loudspeaker voice coil is made in the usual manner with three narrow paper feelers after first removing the front paper dust cover. This may be removed by softening its cement with a very light application of acetone, using care not to allow the acetone to flow down into the air gap. The dust cover may be cemented back in place with ambroid upon completion of adjustment.

RCA MFG. CO., INC.

MODELS 5T6, 5T7, 5T8
Schematic, Socket
Trimmers, Trans. Data

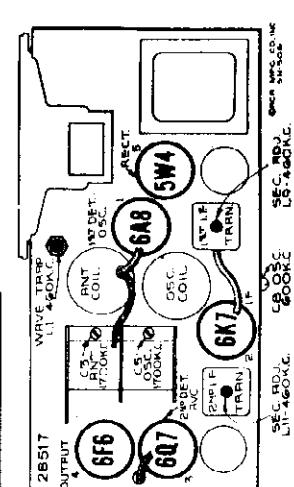
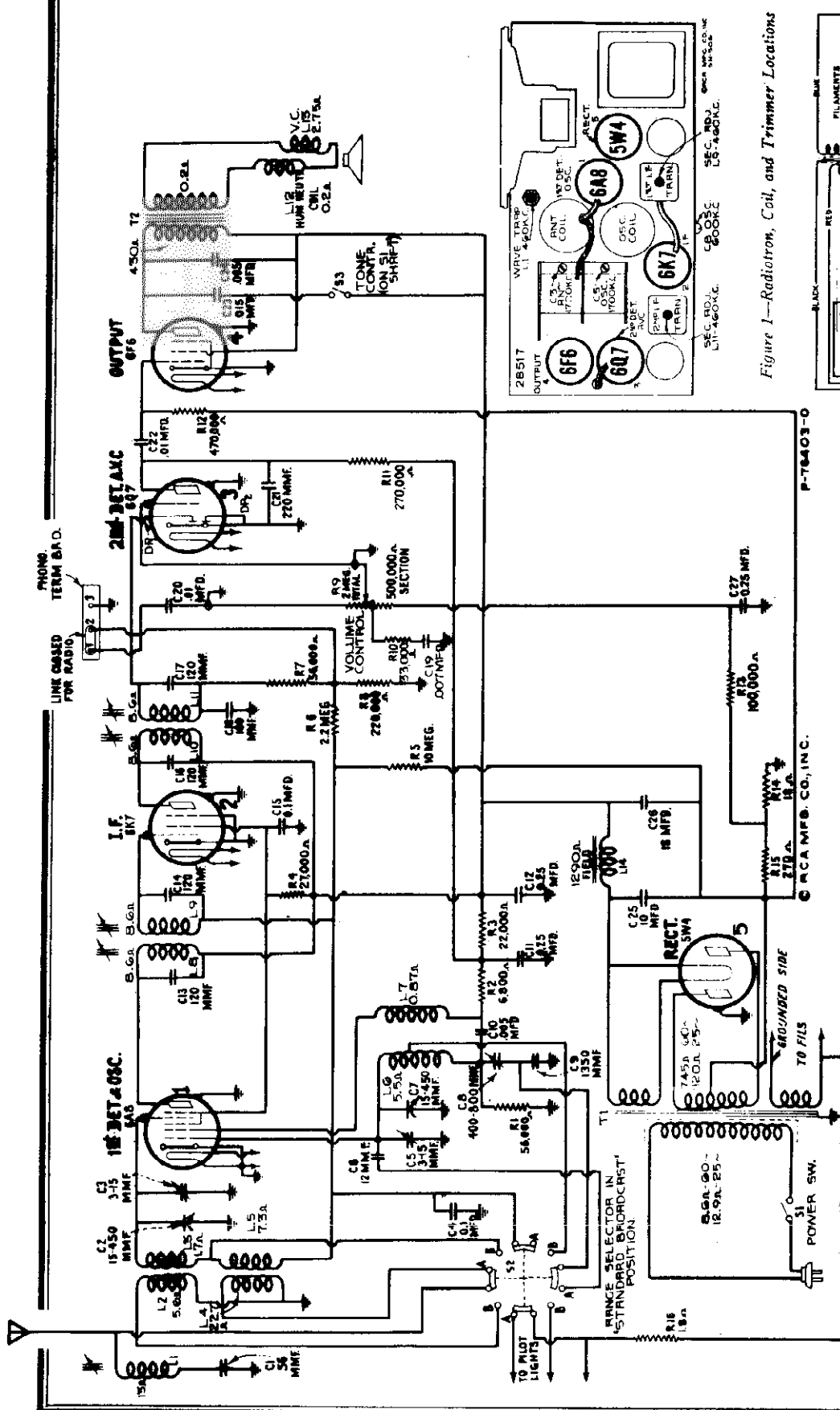
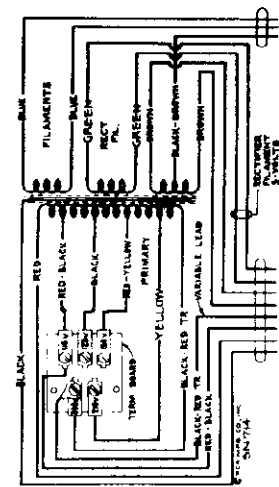


Figure 1—Radiotron, Coil, and Trimmer Locations



Primary resistance—21.6 ohms total
Secondary resistance—760 ohms total
Figure 5—Universal Transformer

ALIGNMENT FREQUENCIES

"Standard broadcast" (A) 600 kc (osc.), 1,700 kc (osc. ant.)
 "Short wave" (B) None required

Intermediate Frequency..... 460 kc

Pilot Lamps (3) Mazda No. 46, 6.3 volts, 0.25 amperes

POWER SUPPLY RATINGS

Rating A..... 105-125 volts, 50-60 cycles, 80 watts
 Rating B..... 105-125 volts, 25-60 cycles, 80 watts
 Rating C..... 100-130/140-160/195-250 volts, 40-60 cycles, 80 watts

POWER OUTPUT RATING

Undistorted..... 2.0 watts
 Maximum..... 4.5 watts

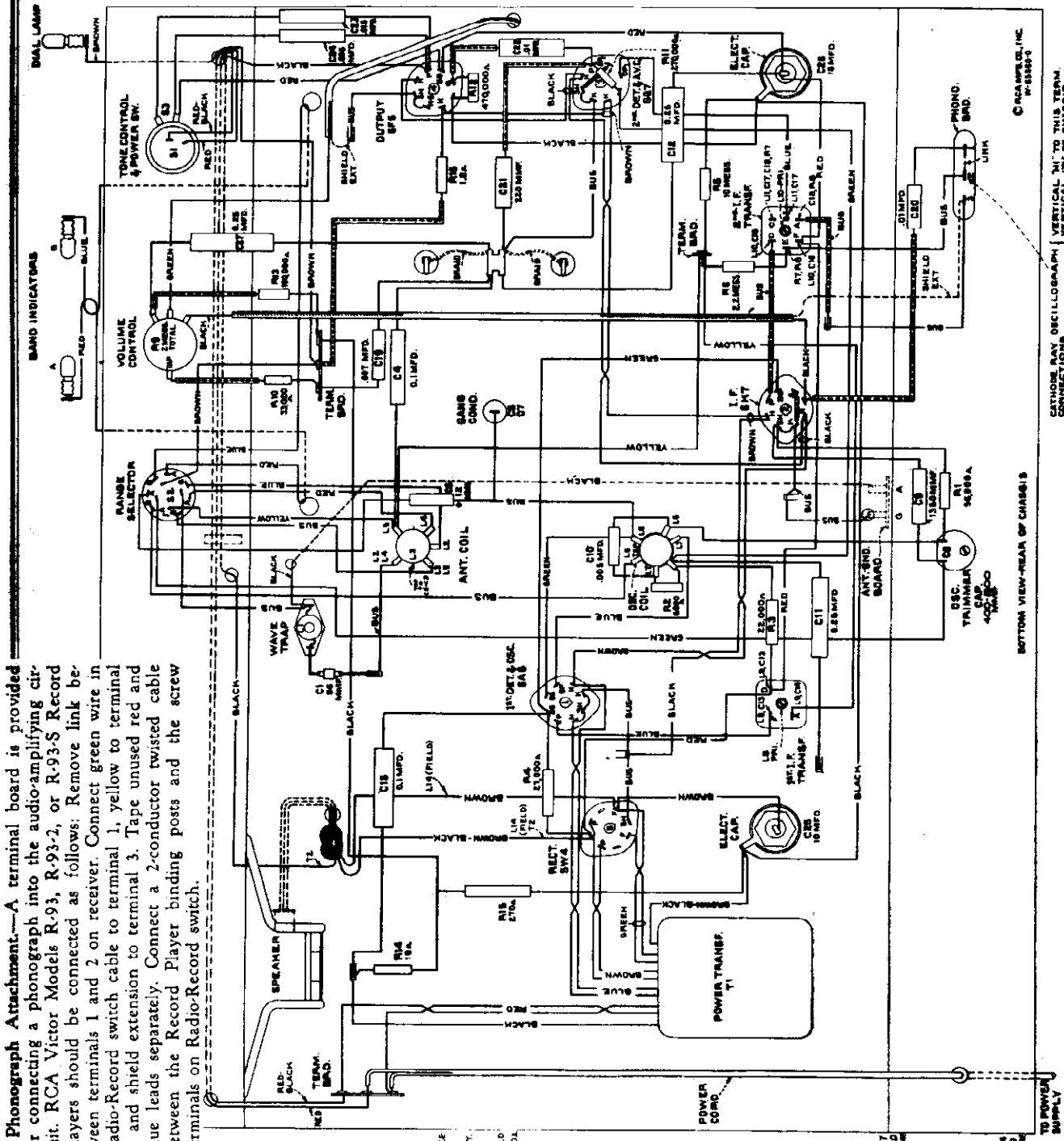
Loudspeaker

Type..... Electrodynamic
 Voice Coil Impedance..... 2 1/4 ohms at 400 cycles

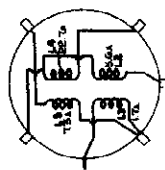
MODELS 5T6, 5T7, 5T8

Chassis Wiring
Phono.Data

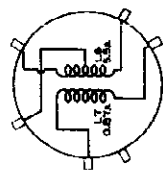
RCA MFG. CO., INC.



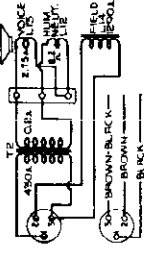
Phonograph Attachment.—A terminal board is provided for connecting a phonograph into the audio-amplifying circuit. RCA Victor Models R-93, R-93-2, or R-93-S Record Players should be connected as follows: Remove link between terminals 1 and 2 on receiver. Connect green wire in Radio-Record switch cable to terminal 1, yellow to terminal 2, and shield extension to terminal 3. Tape unused red and blue leads separately. Connect a 2-conductor twisted cable between the Record Player binding posts and the screw terminals on Radio-Record switch.



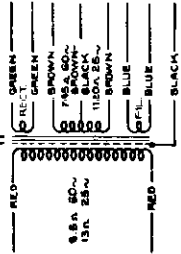
ANT. COIL CONNECTIONS



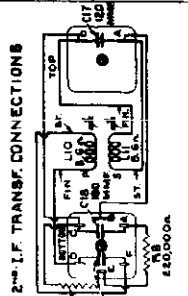
OSC. COIL CONNECTIONS



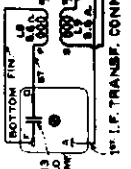
SPEAKER CONNECTIONS



POWER TRANSF. CONNECTIONS



2nd I.F. TRANSF. CONNECTIONS



1st I.F. TRANSF. CONNECTIONS

CATHODE RAY OSCILLOGRAPH VERTICAL TO THIS TERM. CONNECTIONS
 BOTTOM VIEW-REAR OF CHASSIS

RCA MFG. CO., INC.

Alignment Procedure

Calibrate the tuning dial by adjusting dial pointer to the horizontal center line (between the two dial scales) with the two-gang tuning condenser in full-mesh position. Two screws are provided on the dial hub for this adjustment.

Perform alignment in proper order tabulated below, starting with No. 1 and following all operations across, then No. 2, etc.

Cathode-ray alignment is preferable; the connections to the chassis are shown on figure 3. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to the receiver chassis for all alignment operations. Regulate

the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal is received from a station or the local (heterodyne) oscillator.

For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

Order of Alignment	Test Oscillator			Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain	Adjustment Location
	Connection to Receiver	Dummy Antenna	Frequency Setting					
1	6K7 i-f Grid Cap	.001 Mfd.	460 kc	No signal 550-750 kc	2nd i-f Trans.	L11 and L10	Max. (peak)	Figs. 1-4
2	6A8 Det. Grid Cap	.001 Mfd.	460 kc	No signal 550-750 kc	1st i-f Trans.	L9 and L8	Max. (peak)	Figs. 1-4
3	Ant. Post	200 Mmfd.	460 kc	No signal S. W. Band	Wave Trap	L1	Minimum Output	Fig. 1
4	Ant. Post	200 Mmfd.	600 kc	600 kc	L-F Osc.	C8	Max. (peak)	Fig. 1
5	Ant. Post	200 Mmfd.	1,700 kc	1,700 kc	H-F Osc.	C5	Max. (peak)	Fig. 1
6	Ant. Post	200 Mmfd.	1,700 kc	1,700 kc	Ant.	C3	Max. (peak)	Fig. 1
7	Ant. Post	200 Mmfd.	600 kc	Rock thru 600 kc	L-F Osc.	C8	Max. (peak)	Fig. 1
8	Ant. Post	200 Mmfd.	1,700 kc	1,700 kc	H-F Osc.	C5	Max. (peak)	Fig. 1
9	Ant. Post	200 Mmfd.	1,700 kc	1,700 kc	Ant.	C3	Max. (peak)	Fig. 1

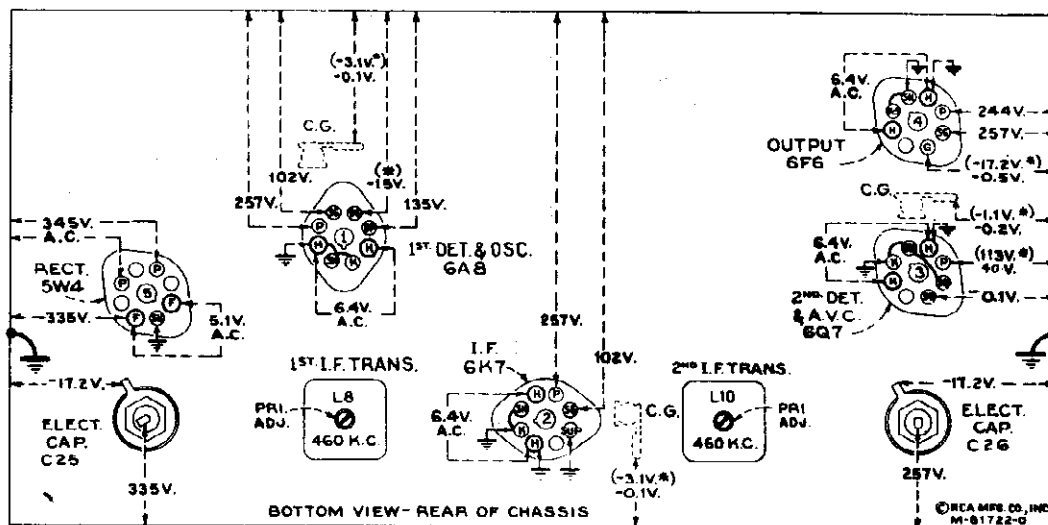


Figure 4—Radiotron Socket Voltages, Coil, and Trimmer Locations
Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc ("Standard broadcast")—
No signal being received—Volume control minimum

Radiotron Socket Voltages Radiotron Cathode Current Readings

Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.

Measured with Milliammeter Connected at Tube Socket Cathode Terminals Under Conditions Similar to Those of Voltage Measurements

- (1) RCA-6A8—1st Det.—Osc. 11.7 ma.
- (2) RCA-6K7—I. F. Amp. 9.4 ma.
- (3) RCA-6Q7—2nd Det., A.V.C. and A. F. 0.3 ma.
- (4) RCA-6F6—Power Amp. 39.6 ma.
- (5) RCA-5W4—Rectifier. 61.0 ma.*

* Cannot be measured at socket.

MODELS 5T6, 5T7, 5T8

MODEL 6T5

RCA MFG. CO., INC.

Parts Lists

REPLACEMENT PARTS FOR MODEL 5T6, 5T7, 5T8

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
13098	Board—Antenna and ground terminal board	11398	Resistor—220,000 ohm, carbon type, 1/10 watt (R8)
12717	Board—Phonograph terminal board	11333	Resistor—270,000 ohm, carbon type, 1/2 watt (R11)
5237	Bushing—Variable condenser mounting bushing assembly	11172	Resistor—470,000 ohm, carbon type, 1/2 watt (R12)
12511	Cap—Grid contact cap	11826	Resistor—2.2 megohm, carbon type, 1/2 watt (R6)
11465	Capacitor—Adjustable capacitor (C8)	13873	Resistor—10 megohm, carbon type, 1/2 watt (R5)
12659	Capacitor—12 Mmfd. (C6)	4869	Screw—No. 8-32x5/32 set screw for drive disc, Stock No. 13816
12661	Capacitor—56 Mmfd. (C1)	12650	Shield—Antenna coil shield
12404	Capacitor—120 Mmfd. (C13, C14, C16, C17)	12735	Shield—Dial lamp shield
12405	Capacitor—180 Mmfd. (C18)	12607	Shield—First I.F. transformer shield top
12618	Capacitor—220 Mmfd. (C21)	12008	Shield—First or second I.F. transformer shield
12660	Capacitor—1,350 Mmfd. (C9)	12651	Shield—Oscillator coil shield
4868	Capacitor—.005 Mfd. (C10, C24)	12581	Shield—Second I.F. transformer shield top
5148	Capacitor—.007 Mfd. (C19)	11195	Socket—6-contact 5W4 Radiotron socket
13138	Capacitor—.01 Mfd. (C20)	11198	Socket—8-contact 6A8, 6F6, 6K7 or 6Q7 Radiotron socket
4868	Capacitor—.01 Mfd. (C22)	11199	Socket—Dial lamp socket
11315	Capacitor—.015 Mfd. (C23)	12007	Spring—Retaining spring for core, Stock Nos. 12006 and 12664
4841	Capacitor—.01 Mfd. (C4, C15)	13813	Tone Control and Power Switch (S1, S3)
4840	Capacitor—0.25 Mfd. (C11, C27)	13106	Transformer—First I.F. transformer, complete (L8, L9, C13, C14)
5170	Capacitor—0.25 Mfd. (C12)	13107	Transformer—Second I.F. transformer, complete (L10, L11, C16, C17, C18, R7, R8)
11240	Capacitor—10 Mfd. (C25)	12644	Transformer—Power transformer, 115 volt, 60 cycle (T1)
5212	Capacitor—18 Mfd. (C26)	12645	Transformer—Power transformer, 115 volt, 25 cycle (T1)
12648	Coil—Antenna coil—less shield (L2, L3, L4, L5)	12646	Transformer—Power transformer, 240-210, 150-125-110 volts, 60 cycle (T1)
12649	Coil—Oscillator coil—less shield (L6, L7)	12654	Trap—Wave trap (L1)
13811	Condenser—2-gang variable tuning condenser (C2, C3, C5, C7)	13144	Volume Control (R9)
5119	Connector—3-contact female speaker cable connector		REPRODUCER ASSEMBLIES
12006	Core—Adjustable core and stud assembly for I.F. transformer, Stock Nos. 12652 and 12653	13822	Coil—Field coil (L14)
12664	Core—Adjustable core and stud assembly for wave trap, Stock No. 12654	13821	Cone—Reproducer cone and dust cap (L13)
13814	Dial—Station selector dial	5118	Connector—3-contact male speaker cable connector
13818	Disc—Station selector drive disc and lamp socket assembly	9776	Reproducer, complete
13815	Drive—Variable condenser drive shaft, spool and bearing	13823	Transformer—Output transformer (T2)
14301	Fuse—1/2 amp. resistor-fuse, 1.8 ohms (R18)		MISCELLANEOUS ASSEMBLIES
13817	Indicator—Station selector indicator	13824	Escutcheon—Station selector escutcheon
5226	Lamp—Dial lamp	12673	Knob—Station selector or volume control knob
13812	Range Switch (S2)	13825	Knob—Tone control or range switch knob
13674	Resistor—18 ohm, carbon type, 1/2 watt (R14)	11586	Screw—Chassis mounting screw No. 14x1 in.
13819	Resistor—270 ohm, wire wound, 1.1 watt (R15)	13885	Screw—No. 8-32x1/2 in. headless set screw for knob, Stock No. 13825
8070	Resistor—22,000 ohm, carbon type, 1/2 watt (R3)	4119	Screw—No. 8-32x1/2 in. headless set screw for knob, Stock No. 12673
12011	Resistor—27,000 ohm, carbon type, 1 watt (R4)		
11364	Resistor—33,000 ohm, carbon type, 1/2 watt (R10)		
11282	Resistor—56,000 ohm, carbon type, 1/10 watt (R7)		
5029	Resistor—56,000 ohm, carbon type, 1/2 watt (R1)		
11454	Resistor—6,800 ohm, carbon type, 1/2 watt (R2)		
5145	Resistor—100,000 ohm, carbon type, 1/2 watt (R13)		

REPLACEMENT PARTS FOR MODEL 6T5

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
	RECEIVER ASSEMBLIES		
13216	Board—Antenna and ground terminal board	13732	Resistor—10 meg., carbon type, 1/4 watt (R4)
12717	Board—Phonograph terminal board	12651	Shield—Antenna coil shield
5237	Bushing—Variable condenser mounting bushing assembly	13311	Shield—Chassis end shield and rubber mounting foot assembly
13870	Cable—Tuning tube cable and socket	12607	Shield—First I. F. transformer shield top
12118	Cap—Grid contact cap	12008	Shield—1. F. transformer shield
12714	Capacitor—Adjustable trimmer (C8)	12799	Shield—Oscillator coil shield
12807	Capacitor—Adjustable trimmer (C5)	12581	Shield—Second I. F. transformer shield top
12723	Capacitor—56 Mmfd. (C1)	3682	Shield—6A7 or 75 Radiotron shield
12629	Capacitor—56 Mmfd. (C16)	3950	Shield—6D6 Radiotron shield
13394	Capacitor—82 Mmfd. (C7)	13871	Socket—Tuning tube socket and cover
12724	Capacitor—120 Mmfd. (C24)	4794	Socket—4-contact 80 Radiotron socket
12404	Capacitor—120 Mmfd. (C15, C17, C18)	4766	Socket—6-contact 6D6, 42 or 75 Radiotron socket
12406	Capacitor—180 Mmfd. (C9)	4787	Socket—7-contact 6A7 Radiotron socket
12812	Capacitor—450 Mmfd. (C11)	11199	Socket—Dial lamp socket
12811	Capacitor—3,600 Mmfd. (C9)	12007	Spring—Retaining spring for Stock Nos. 12006 and 12664
4868	Capacitor—.005 Mfd. (C28)	12796	Switch—Range switch (S2)
5148	Capacitor—.007 Mfd. (C21)	13309	Switch—Tone control and power switch (S1, S3)
11315	Capacitor—.015 Mfd. (C27)	12801	Transformer—First I. F. transformer complete (L10, L11, C15, C16)
4858	Capacitor—.01 Mfd. (C10, C22, C25)	12653	Transformer—Second I. F. transformer complete (L12, L13, C17, C18, C19, R6, R8)
4841	Capacitor—0.1 Mfd. (C2, C14, C26)	12644	Transformer—Power transformer, 105-125 volts, 50-60 cycles (T1)
4840	Capacitor—0.25 Mfd. (C23)	12645	Transformer—Power transformer, 105-125 volts, 25-60 cycles (T1)
5170	Capacitor—0.25 Mfd. (C13)	13869	Transformer—Power transformer, 110 and 220 volts, 50-60 cycles (T1)
11240	Capacitor—10 Mfd. (C29)	12654	Trap—Wave-trap complete (L1)
5212	Capacitor—18 Mfd. (C12, C30)	13144	Volume control (R11)
12797	Coil—Antenna coil and shield (L2, L3, L4, L5)		REPRODUCER ASSEMBLIES
12798	Coil—Oscillator coil and shield (L6, L7, L8, L9)	12641	Board—3-contact reproducer terminal board
13679	Condenser—2-gang variable tuning condenser (C3, C4, C6)	12640	Bracket—Output transformer mounting bracket
5119	Connector—3-contact female connector for speaker cable	12812	Coil—Field coil (L16)
12006	Core—Adjustable core and stud for Stock Nos. 12653 and 12801	11469	Coil—Neutralizing coil (L14)
12664	Core—Adjustable core and stud for Stock No. 12654	12642	Cone—Reproducer cone and dust cap (L15)
13868	Dial—Station selector dial	5118	Connector—3-contact male speaker cable connector
13680	Drive—Vernier drive for variable condenser	9699	Reproducer—Complete
13314	Indicator—Station selector indicator pointer	11253	Transformer—Output transformer (T2)
5226	Lamp—Dial lamp, 6.3 volts	11886	Washer—Spring washer to hold field coil securely
13674	Resistor—18 ohms, carbon type, 1/2 watt (R17)		MISCELLANEOUS ASSEMBLIES
13819	Resistor—270 ohms, wire wound, 1.1 watts (R16)	12038	Band—Rubber band for tuning tube
12759	Resistor—15,000 ohms, carbon type, 1/2 watt (R2)	13615	Bracket—Tuning tube mounting bracket and clamp
12011	Resistor—27,000 ohms, carbon type, 1 watt (R3)	12785	Crystal—Station selector escutcheon and crystal
11364	Resistor—33,000 ohms, carbon type, 1/4 watt (R9)	12742	Escutcheon—Tuning tube escutcheon
5029	Resistor—56,000 ohms, carbon type, 1/4 watt (R1)	12699	Knob—Large station selector knob
11282	Resistor—56,000 ohms, carbon type, 1/10 watt (R8)	12700	Knob—Small (vernier) station selector knob
11365	Resistor—82,000 ohms, carbon type, 1/4 watt (R13)	11347	Knob—Volume control, tone control or range switch knob
5145	Resistor—100,000 ohms, carbon type, 1/4 watt (R10)	11377	Screw—Chassis mounting screw and washer assembly
11396	Resistor—220,000 ohms, carbon type, 1/10 watt (R6)	4982	Spring—Retaining spring for knob, Stock No. 12699
11323	Resistor—270,000 ohms, carbon type, 1/4 watt (R12)	11349	Spring—Retaining spring for knob, Stock Nos. 11347 and 12700
11847	Resistor—390,000 ohms, carbon type, 1/4 watt (R14)		
12013	Resistor—1 meg., carbon type, 1/10 watt (R15)		
11626	Resistor—2.2 meg., carbon type, 1/4 watt (R5, R7)		

Prices quoted above are subject to change without notice.

RCA MFG. CO., INC.

MODEL 6K2(2nd Prod)
Schematic
Chassis Wiring

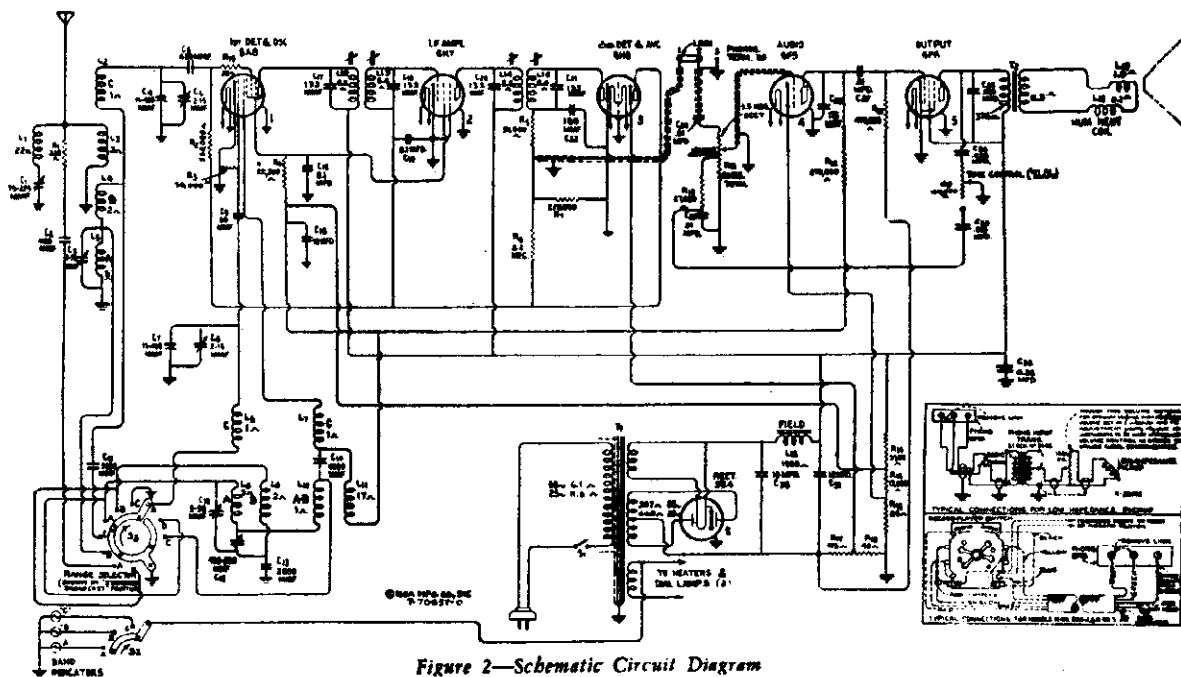


Figure 2—Schematic Circuit Diagram
(Model 6K2, Second Production)

IF PEAK 460KC

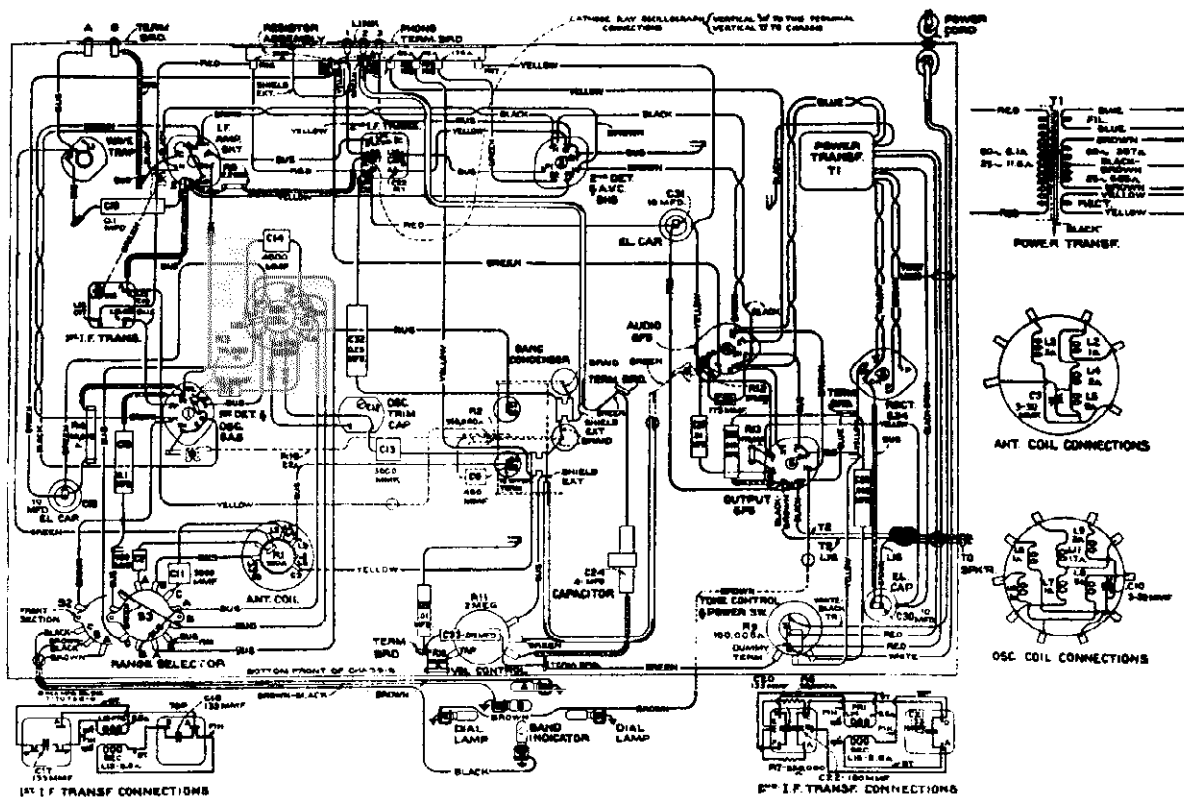


Figure 3—Chassis Wiring Diagram
(Model 6K2, Second Production)

MODEL 6K2 (2nd Prod.)

Socket, Trimmers
Parts

RCA MFG. CO., INC.

RCA VICTOR MODEL 6K2 (Second Production) WITH MAGNETITE CORE I-F TRANSFORMERS

FOR DATA ON MODEL 6K2 (1st Prod.), SEE
PAGES 7-41 TO 7-43 IN RIDER'S VOL. VII

These receivers are similar to Model 6K2 (first production) except for the i-f transformers, loudspeaker, and a few component parts. Visual inspection of the i-f transformers will readily identify these receivers. Service Data for Model 6K2 are directly applicable to these receivers except the information contained herein. The primary adjustments for the i-f transformers are located on the bottom of the transformers while the secondary adjustments are located on top.

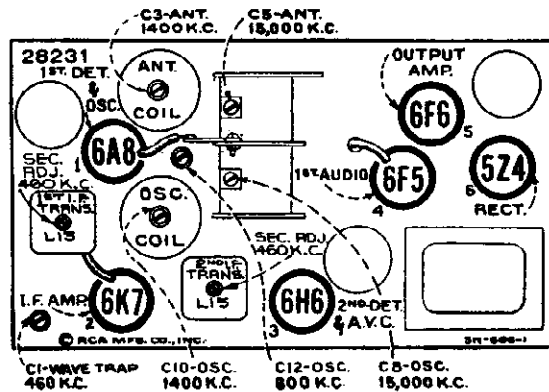


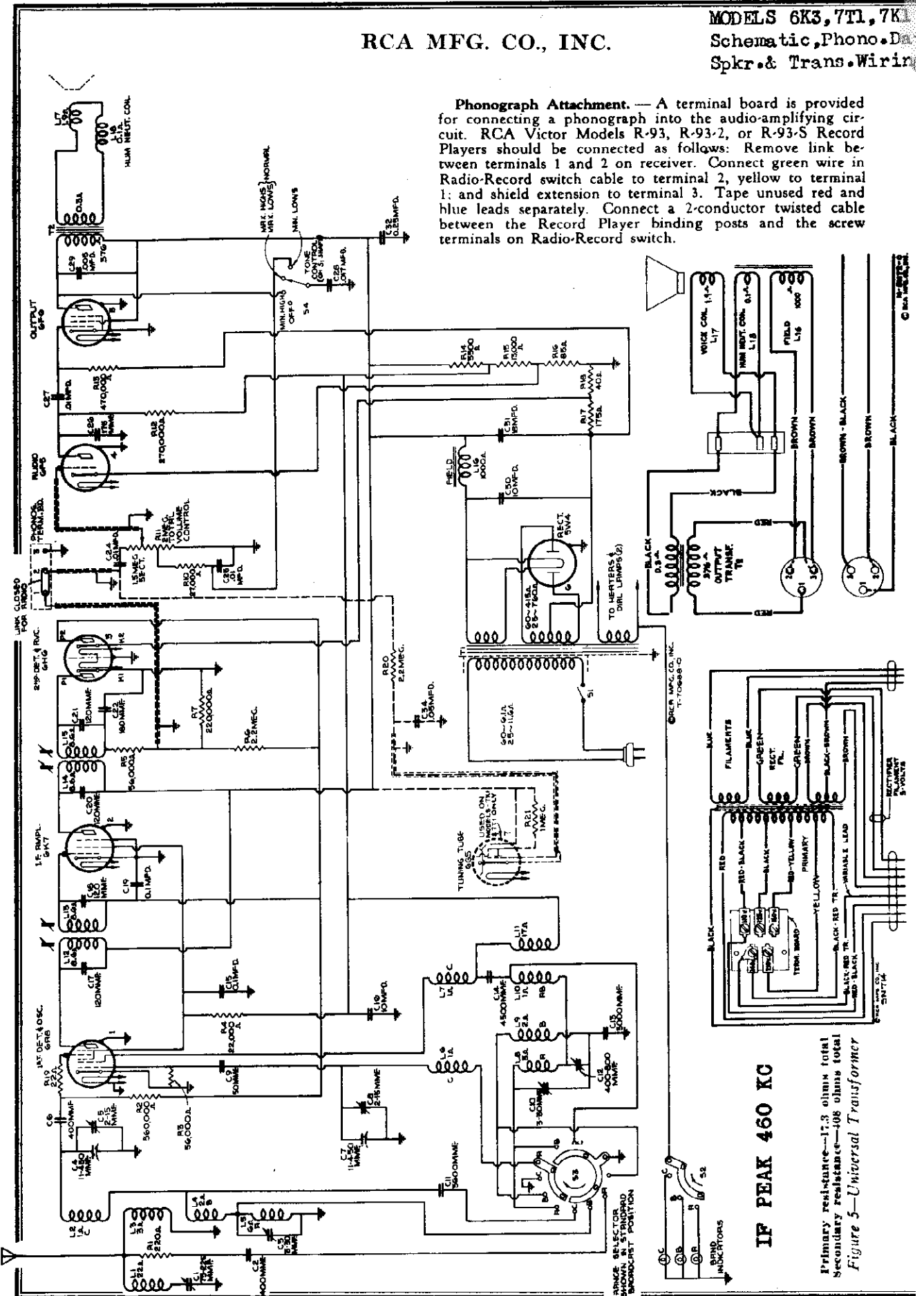
Figure 1—Radiotron, Coil, and Trimmer Locations
(Model 6K2, Second Production)

REPLACEMENT PARTS

Insist on genuine factory tested parts, which are readily identified and may be purchased from authorized dealers

Stock No.	DESCRIPTION	Stock No.	DESCRIPTION
RECEIVER ASSEMBLIES			
12930	Board—Antenna and ground terminal board.	11398	Resistor—220,000 ohms—Carbon type—1/10 watt—(R7).
12717	Board—Phonograph terminal board.	11453	Resistor—270,000 ohms—Carbon type—1/10 watt—(R12).
12772	Bracket—Top dial lamp socket bracket.	11452	Resistor—470,000 ohms—Carbon type—1/10 watt—(R13).
5237	Bushing—Variable tuning condenser mounting bushing assembly.	11597	Resistor—560,000 ohms—Carbon type—1/10 watt—(R2).
11350	Cap—Grid contact cap used on resistor—Stock No. 11624.	11626	Resistor—2.2 megohms—Carbon type—1/4 watt—(R6).
12511	Cap—Grid contact cap.	12008	Shield—i. f. transformer shield for Stock Nos. 13106 and 13107.
11256	Capacitor—Adjustable trimmer—(C1).	12607	Shield—First i. f. transformer shield top.
11465	Capacitor—Adjustable trimmer—(C12).	12581	Shield—Second i. f. transformer shield top.
11289	Capacitor—50 Mmfd.—(C9).	11603	Shield—Coil shield for Stock Nos. 11617 and 11618.
12946	Capacitor—133 Mmfd.—(C17, C18, C20, C21).	12735	Shield—Dial lamp shield.
11623	Capacitor—175 Mmfd.—(C26).	12771	Socket—Dial lamp socket—Located at top of dial scale.
12406	Capacitor—180 Mmfd.—(C22).	11199	Socket—Dial lamp socket.
11290	Capacitor—400 Mmfd.—(C2, C6).	11195	Socket—5-contact 5Z4 Radiotron socket.
11682	Capacitor—3000 Mmfd.—(C13).	11198	Socket—7-contact 6F5, 6H6 Radiotron socket.
11621	Capacitor—3600 Mmfd.—(C11).	11196	Socket—8-contact 6A8, 6F6 or 6K7 Radiotron socket.
11287	Capacitor—4500 Mmfd.—(C14).	12007	Spring—Retaining spring for core Stock No. 12006.
4866	Capacitor—005 Mfd.—(C29).	12769	Switch—Range switch—(S2, S3).
11395	Capacitor—.01 Mfd.—(C24).	12668	Tone Control—Control and power switch—(R9, S1).
4858	Capacitor—.01 Mfd.—(C25, C27).	13106	Transformer—First i. f. transformer—(L12, L13, C17, C18).
11315	Capacitor—.015 Mfd.—(C33).	13107	Transformer—Second i. f. transformer—(L14, L15, C20, C21, C22, R5, R7).
12670	Capacitor—.035 Mfd.—(C28).	11848	Transformer—Power transformer—105-125-volt, 50-60-cycle—(T1).
4841	Capacitor—0.1 Mfd.—(C19).	11849	Transformer—Power transformer—105-125-volt, 25-40-cycle—(T1).
11414	Capacitor—0.1 Mfd.—(C15).	11850	Transformer—Power transformer—105-250-volt, 40-60-cycle—(T1).
5179	Capacitor—0.25 Mfd.—(C32).	11391	Trap—Wave trap—(L1, C1).
11367	Capacitor—10 Mfd.—(C16).	13144	Volume control—(R11).
11240	Capacitor—10 Mfd.—(C30).	REPRODUCER ASSEMBLIES	
5212	Capacitor—18 Mfd.—(C31).	12641	Board—Reproducer terminal board.
11617	Coil—Antenna coil less shield—(L2, L3, L4, L5, C3, R1, L11, C10).	12640	Bracket—Output transformer mounting bracket and clamp.
11618	Coil—Oscillator coil less shield—(L6, L7, L8, L9, L10, L11, C10).	13600	Coil—Field coil—(L16).
13597	Condenser—2-gang variable tuning condenser—(C4, C5, C7, C8).	11469	Coil—Neutralizing coil—(L18).
5119	Connector—3-contact female connector for speaker cable.	12667	Cone—Reproducer cone complete—(L17).
12006	Core—Adjustable core and stud for Stock No. 13106 and 13107.	5118	Connector—3-contact male connector for speaker cable.
12792	Dial—Station selector dial.	9766	Reproducer complete.
13598	Drive—Variable tuning condenser vernier drive.	11253	Transformer—Output transformer—(T2).
13599	Foot—Chassis mounting foot and bracket.	11886	Washer—Spring washer to hold field coil securely.
12770	Holder—Dial scale holder and lamp bracket assembly less bracket for top dial lamp socket.	MISCELLANEOUS ASSEMBLIES	
12712	Indicator—Station selector indicator pointer.	12666	Cover—Reproducer cover assembly.
5226	Lamp—Dial lamp—6.3 volt.	12698	Crystal—Station selector crystal and escutcheon.
12718	Mask—Dial light diffuser complete with red, orange and green-colored screen.	11582	Knob—Range switch knob.
11466	Resistor—Voltage divider resistor—comprising one 3,500-ohm, one 15,000-ohm, one 85-ohm, one 40-ohm and one 175-ohm sections—(R14, R15, R16, R17, R18).	12699	Knob—Large station selector knob.
11624	Resistor—22 ohms—Flexible type complete with grid contact cap—(R19).	12700	Knob—Small (vernier) station selector knob.
11620	Resistor—220 ohms—Carbon type—1/10 watt—(R1).	11347	Knob—Tone control or volume control knob.
8070	Resistor—22,000 ohms—Carbon type—1/2 watt—(R4).	11210	Screw—Chassis mounting screw assembly.
11400	Resistor—27,000 ohms—Carbon type—1/4 watt—(R10).	11349	Spring—Retaining spring for knob—Stock No. 11347, No. 11582 and No. 12700.
11282	Resistor—56,000 ohms—Carbon type—1/10 watt—(R5).	4982	Spring—Retaining spring for knob—Stock No. 12699.
12286	Resistor—56,000 ohms—Insulated—1/4 watt—(R3).		

Phonograph Attachment. — A terminal board is provided for connecting a phonograph into the audio-amplifying circuit. RCA Victor Models R-93, R-93-2, or R-93-S Record Players should be connected as follows: Remove link between terminals 1 and 2 on receiver. Connect green wire in Radio-Record switch cable to terminal 2, yellow to terminal 1; and shield extension to terminal 3. Tape unused red and blue leads separately. Connect a 2-conductor twisted cable between the Record Player binding posts and the screw terminals on Radio-Record switch.



IF PEAK 460 KC

Primary resistance—17.3 ohms total
Secondary resistance—108 ohms total
Figure 5—Universal Transformer

MODELS 6K3, 7T1, 7K1
Chassis Wiring

RCA MFG. CO., INC.

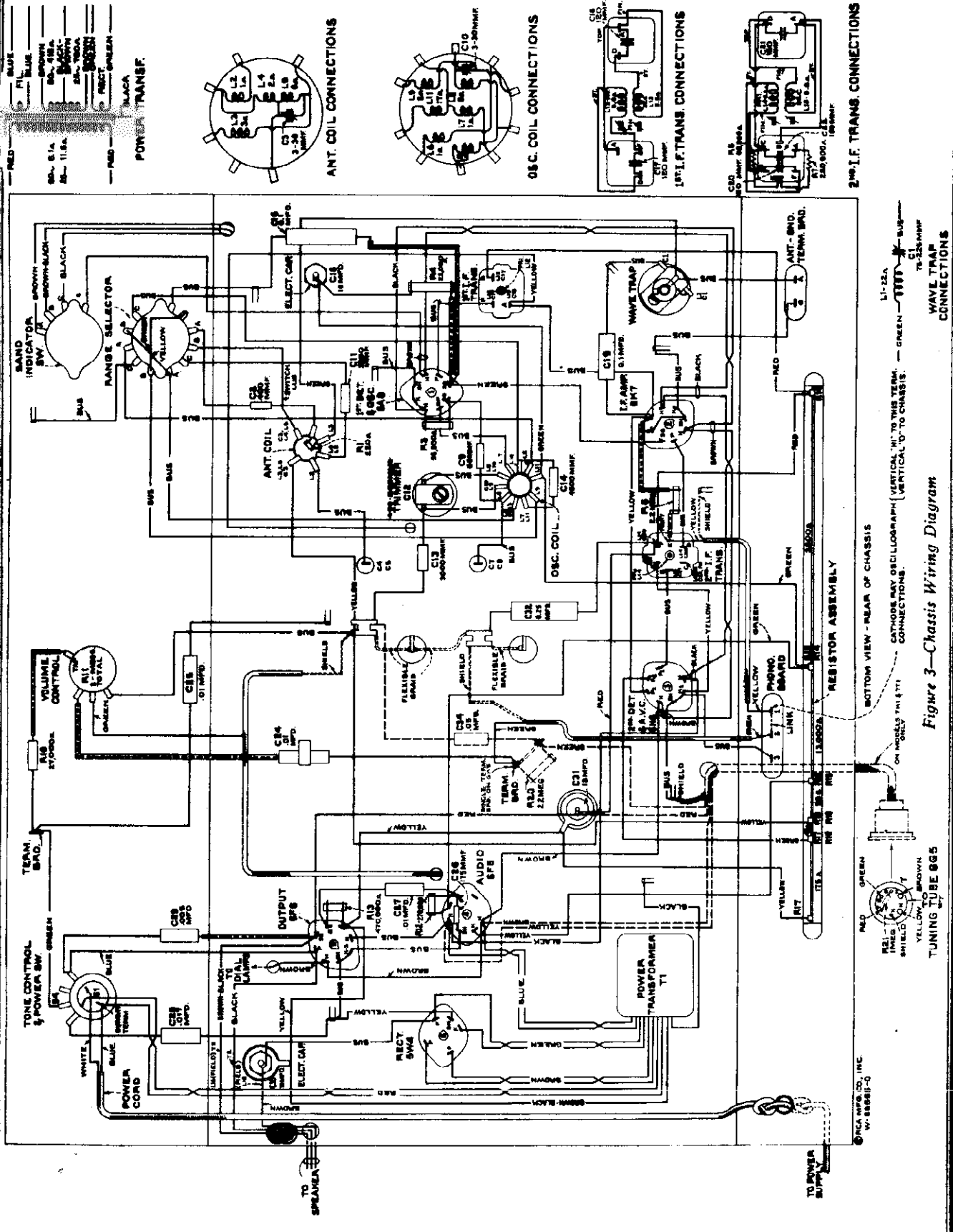


Figure 3—Chassis Wiring Diagram

RCA MFG. CO., INC.

MODELS 6K3, 7T1, 7K1
Socket, Trimmers
Voltage, Alignment

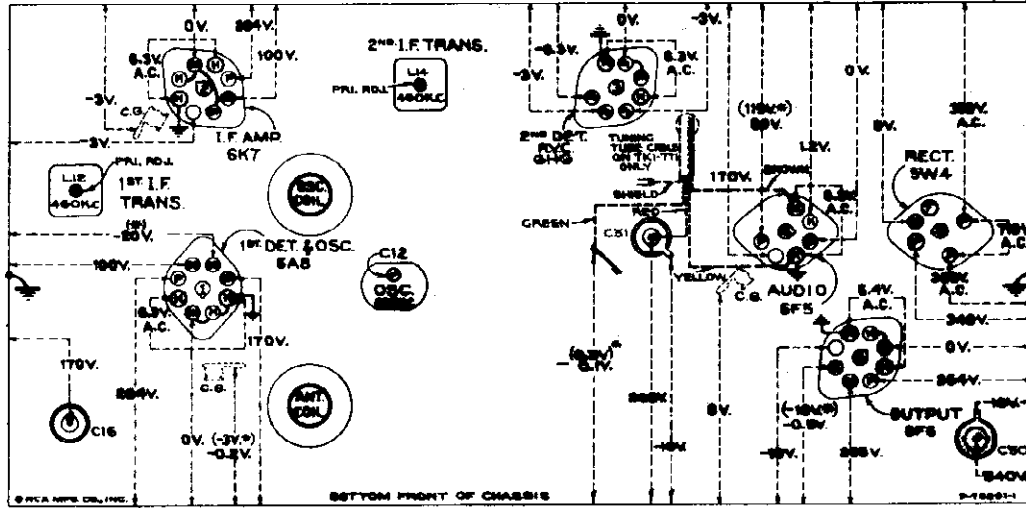


Figure 4—Radiotron Socket Voltages, Coil, and Trimmer Locations
Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc ("Standard broadcast")—
No signal being received—Volume control minimum

Loudspeaker.—Centering of the loudspeaker is made in the usual manner with three narrow paper feelers after first removing the front dust cover. This may be removed by softening its cement with a light application of acetone, using care not to allow the acetone to flow into the air gap. The dust cover should be cemented back in place with ambroid upon completion of adjustment.

Alignment Procedure

Calibrate the tuning dial by adjusting dial pointer to the low-frequency (end) calibration mark on "Standard broadcast" scale with the gang tuning condenser plates in full-mesh position. This is a fraction adjustment.

Perform alignment in proper order tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown by figures 1 and 4.

Cathode-ray alignment is preferable; the connections to the chassis are shown on figure 3. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to the receiver chassis for all alignment operations. Regulate

the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

Order of Alignment	Test Oscillator			Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting				
1	6K7 i-f Grid Cap	.001 Mfd.	460 kc	No signal 550-750 kc	2nd i-f Trans.	L14 and L15	Max. (peak)
2	6A8 Det. Grid Cap	.001 Mfd.	460 kc	No signal 550-750 kc	1st i-f Trans.	L12 and L13	Max. (peak)
3	Ant. Post	200 Mmfd.	460 kc	No signal 550-750 kc	Wave Trap	C1	Minimum Output
4	Ant. Post	300 Ohms	15,000 kc	15,000 kc	"C" Osc.	C8	Max (peak)*
5	Ant. Post	300 Ohms	15,000 kc	Rock thru 15,000 kc	"C" Ant.	C6	Max. (peak)
6	Ant. Post	200 Mmfd.	600 kc	600 kc	L-F Osc.	C18	Max. (peak)
7	Ant. Post	200 Mmfd.	1,400 kc	1,400 kc	H-F Osc.	C10	Max. (peak)
8	Ant. Post	200 Mmfd.	1,400 kc	1,400 kc	"A" Ant.	C3	Max. (peak)
9	Ant. Post	200 Mmfd.	600 kc	Rock thru 600 kc	L-F Osc.	C12	Max. (peak)
10	Ant. Post	200 Mmfd.	1,400 kc	1,400 kc	H-F Osc.	C10	Max. (peak)
11	Ant. Post	200 Mmfd.	1,400 kc	1,400 kc	"A" Ant.	C3	Max. (peak)

* Use maximum capacity peak if two peaks can be obtained.

Radiotron Cathode Current Readings
Measured with Milliammeter Connected at Tube Socket Cathode Terminals Under Conditions Similar to Those of Voltage Measurements

(1) RCA-6A8—1st Det.—Osc.	12.3 ma.
(2) RCA-6K7—1st Amp.	9.8 ma.
(3) RCA-6H6—2nd Det. and A.V.C.	0.2 ma.
(4) RCA-6F5—Audio Driver	34.0 ma.
(5) RCA-5W4—Power Amplifier	76.0 ma.*
(6) RCA-6G5—Tuning Tube	2.0 ma.

* Cannot be measured at socket.

Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.

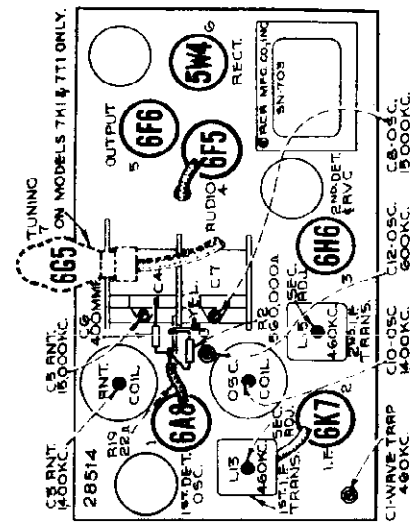


Figure 1—Radiotron, Coil, and Trimmer Locations

MODELS 6K3, 7T1, 7K1

Data, Parts

RCA MFG. CO., INC.

These receivers are of the superheterodyne type and have many distinctive features. Model 6K3 is a six-tube console model employing a 12-inch loudspeaker. Models 7T1 and 7K1 are table and console models respectively having similar

chassis to Model 6K3 except for the addition of a tuning tube "Magic Eye": the former has an 8-inch loudspeaker while the latter has a 12-inch loudspeaker.

FREQUENCY RANGES

- "Standard Broadcast" (A)..... 540—1,625 kc
- "Medium Wave" (B)..... 1,625—5,700 kc
- "Short Wave" (C)..... 5,700—18,000 kc

ALIGNMENT FREQUENCIES

- "Standard Broadcast" (A)..... 600 kc (osc.), 1,400 kc (osc. and ant.)
- "Medium Wave" (B)..... None required
- "Short Wave" (C)..... 15,000 kc (osc. and ant.)

Intermediate Frequency..... 460 kc

RADIOTRON COMPLEMENT

- (1) RCA-6A8..... First Detector—Oscillator
- (2) RCA-6K7..... Intermediate Amplifier
- (3) RCA-6H6..... Second Detector—A.V.C.

- (4) RCA-6F5..... Audio Voltage Amplifier
- (5) RCA-6F6..... Audio Power Amplifier
- (6) RCA-5W4..... Full-Wave Rectifier
- (7) RCA-6G5—(Models 7T1 and 7K1 only) Tuning Tube

Pilot Lamps (5)..... 7T1 and 7K1, Mazda No. 40, 6.3 volts, 0.15 amp.; 6K3, Mazda No. 46, 6.3 volts, 0.25 amp.

POWER SUPPLY RATINGS

- Rating A..... 105-125 volts, 50-60 cycles, 90 watts
- Rating B..... 105-125 volts, 25-60 cycles, 90 watts
- Rating C..... 100-130/140-160/195-250 volts, 40-60 cycles, 90 watts

POWER OUTPUT

- Undistorted..... 2.0 watts
- Maximum..... 4.5 watts

LOUDSPEAKER

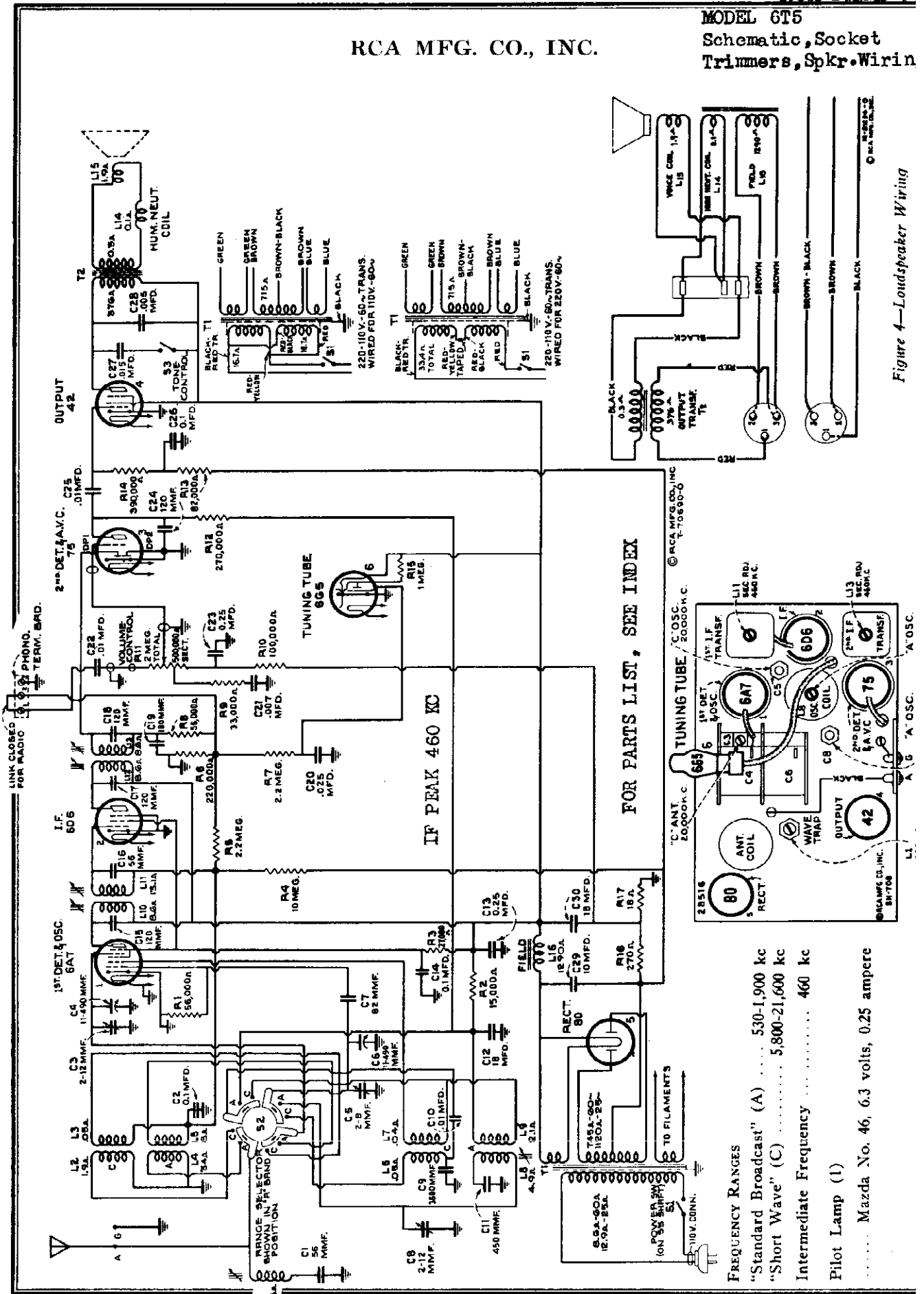
- Type..... Electrodynamic
- Impedance (v.c.)..... 2.2 ohms at 400 cycles

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
RECEIVER ASSEMBLIES			
12930	Board—Antenna and ground terminal board	12013	Resistor—1 megohm—Carbon type—1/10 watt (R21)—Models 7T1 and 7K1 only
12717	Board—Phonograph terminal board	11628	Resistor—2.2 megohms—Carbon type—1/2 watt (R6, R20)
12772	Bracket—Top dial lamp socket bracket	12008	Shield—I. F. transformer shield for Stock Nos. 13106 and 13107
5237	Bushing—Variable tuning condenser mounting bushing assembly	12607	Shield—First I. F. transformer shield top
11888	Cable—Tuning tube cable and socket—Models 7T1 and 7K1 only	12581	Shield—Second I. F. transformer shield top
12511	Cap—Grid contact cap	11603	Shield—Coil shield for Stock Nos. 11617 and 11618
11350	Cap—Grid contact cap used on resistor—Stock No. 11624	12735	Shield—Dial lamp shield
11465	Capacitor—Adjustable capacitor (C12)	12771	Socket—Dial lamp socket—Located at top of dial scale
11256	Capacitor—Adjustable trimmer (C1)	11199	Socket—Dial lamp socket
12404	Capacitor—120 Mmfd. (C17, C18, C20, C21)	11195	Socket—5-contact 5W4 Radiotron socket
11289	Capacitor—50 Mmfd. (C9)	11198	Socket—7-contact 6F5, 6H6 Radiotron socket
11623	Capacitor—175 Mmfd. (C26)	11196	Socket—8-contact 6A8, 6F6 or 6K7 Radiotron socket
12406	Capacitor—180 Mmfd. (C22)	11381	Socket—Tuning tube socket and cover—Models 7T1 and 7K1 only
11290	Capacitor—400 Mmfd. (C2, C6)	12007	Spring—Retaining spring for core, Stock No. 12008
11622	Capacitor—3000 Mmfd. (C13)	12769	Switch—Range switch (S2, S3)
11621	Capacitor—3600 Mmfd. (C11)	13681	Tone Control—Tone and power switch (S1, S4)
11287	Capacitor—4500 Mmfd. (C14)	13106	Transformer—First I. F. transformer (L12, L13, C17, C18)
4868	Capacitor—.005 Mfd. (C29)	19107	Transformer—Second I. F. transformer (L14, L15, C20, C21, C22, R5, R7)
11395	Capacitor—.01 Mfd. (C34)	11458	Transformer—Power transformer—105-125-volt, 50-60-cycle (T1)
4858	Capacitor—.01 Mfd. (C25, C27)	11885	Transformer—Power transformer—105-125-volt, 25-40-cycle (T1)
11315	Capacitor—.015 Mfd. (C33)	11884	Transformer—Power transformer—105-250-volt, 40-60-cycle (T1)
11451	Capacitor—.017 Mfd. (C28)	11391	Trap—Wave trap (L1, C1)
4836	Capacitor—.05 Mfd. (C34)—Models 7T1 and 7K1 only	13144	Volume Control (R11)
4841	Capacitor—.05 Mfd. (C19)	REPRODUCER ASSEMBLIES	
11414	Capacitor—.05 Mfd. (C15)	12641	Board—Reproducer terminal board
5170	Capacitor—.05 Mfd. (C32)	12640	Bracket—Output transformer mounting bracket and clamp
11387	Capacitor—.10 Mfd. (C16)	13600	Coil—Field coil (L16)
11240	Capacitor—.10 Mfd. (C30)	11469	Coil—Neutralizing coil (L18)
5212	Capacitor—.18 Mfd. (C31)	12642	Cone—Reproducer cone complete (L17)—Model 7T1
11617	Coil—Antenna coil less shield (L2, L3, L4, L5, C3, R1)	12667	Cone—Reproducer cone complete (L17)—Models 6K3 and 7K1
11618	Coil—Oscillator coil less shield (L6, L7, L8, L9, L10, L11, C10)	5118	Connector—3-contact male connector for speaker cable
13597	Condenser—2-gang variable tuning condenser (C4, C5, C7, C8)	9771	Reproducer complete—Model 7T1
5119	Connector—3-contact female connector for speaker cable	9766	Reproducer complete—Models 6K3 and 7K1
12006	Core—Adjustable core and stud for Stock Nos. 13106 and 13107	11253	Transformer—Output transformer (T2)
13682	Dial—Station selector dial	11886	Washer—Spring washer to hold field coil securely
13598	Drive—Variable tuning condenser vernier drive	MISCELLANEOUS ASSEMBLIES	
13599	Foot—Chassis mounting foot and bracket	12038	Band—Rubber band for tuning tube
12770	Holder—Dial scale holder and lamp bracket assembly less bracket for top dial lamp socket	13615	Bracket—Tuning tube mounting bracket and clamp
12712	Indicator—Station selector indicator pointer	12698	Crystal—Station selector crystal and escutcheon
4340	Lamp—Dial lamp—Models 7T1 and 7K1 only	12742	Escutcheon—Tuning tube escutcheon
5226	Lamp—Dial lamp—Model 6K3 only	12699	Knob—Large station selector knob
13683	Mask—Dial light diffuser complete with colored screen	12700	Knob—Small (vernier) station selector knob
11466	Resistor—Voltage divider resistor—comprising one 3,500-ohm, one 13,000-ohm, one 85-ohm, one 40-ohm and one 175-ohm sections (R14, R15, R16, R17, R18)	11347	Knob—Tone control, range switch or volume control knob
11624	Resistor—22 ohms—Flexible type complete with grid contact cap (R19)	11377	Screw—Chassis mounting screw assembly—Used on Model 7T1
11620	Resistor—220 ohms—Carbon type—1/10 watt (R1)	11210	Screw—Chassis mounting screw assembly—Used on Models 6K3 and 7K1
8070	Resistor—22,000 ohms—Carbon type—1/2 watt (R4)	11349	Spring—Retaining spring for knob—Stock Nos. 11347 and 12700
11400	Resistor—27,000 ohms—Carbon type—1/2 watt (R10)	4982	Spring—Retaining spring for knob—Stock No. 12699
12286	Resistor—56,000 ohms—Insulated—1/2 watt (R3)		
11282	Resistor—56,000 ohms—Carbon type—1/10 watt (R5)		
11398	Resistor—220,000 ohms—Carbon type—1/10 watt (R7)		
11453	Resistor—270,000 ohms—Carbon type—1/10 watt (R12)		
11452	Resistor—470,000 ohms—Carbon type—1/10 watt (R13)		
11397	Resistor—560,000 ohms—Carbon type—1/10 watt (R2)		

First Edition

RCA MFG. CO., INC.

MODEL 6T5
Schematic, Socket
Trimmers, Spkr. Wirin



FOR PARTS LIST, SEE INDEX

FREQUENCY RANGES
 "Standard Broadcast" (A) 530-1,900 kc
 "Short Wave" (C) 5,800-21,600 kc
 Intermediate Frequency 460 kc

Pilot Lamp (1)
 Mazda No. 46, 6.3 volts, 0.25 ampere

Figure 4—Loudspeaker Wiring

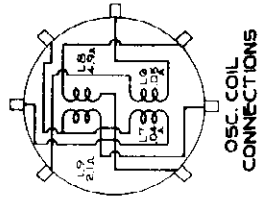
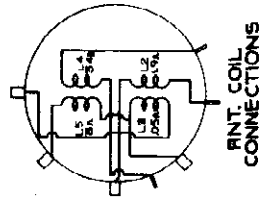
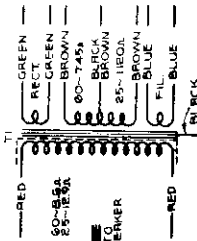
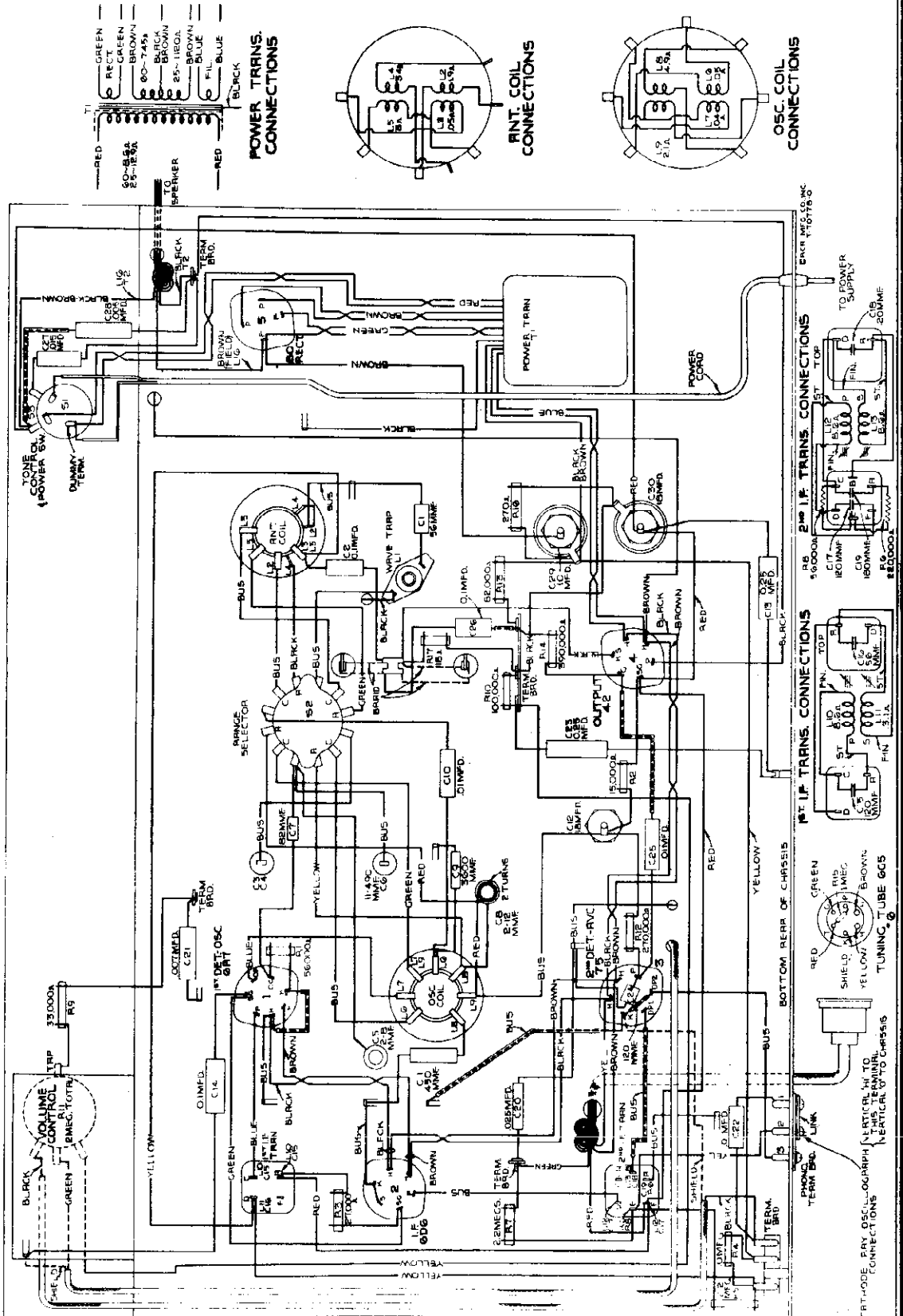
MODEL 6T5
Chassis Wiring

RCA MFG. CO., INC.

POWER SUPPLY RATINGS
 Rating A 105-125 volts, 50-60 cycles, 75 watts
 Rating B 105-125 volts, 25-60 cycles, 75 watts
 Rating C 100-125/200-250 volts, 50-60 cycles, 75 watts
LOUDSPEAKER
 Undistorted 2.0 watts
 Maximum 4.5 watts
POWER OUTPUT RATING
 Type Electrodynamic
 Voice Coil Impedance 2 1/4 ohms at 400 cycles

ALIGNMENT FREQUENCIES

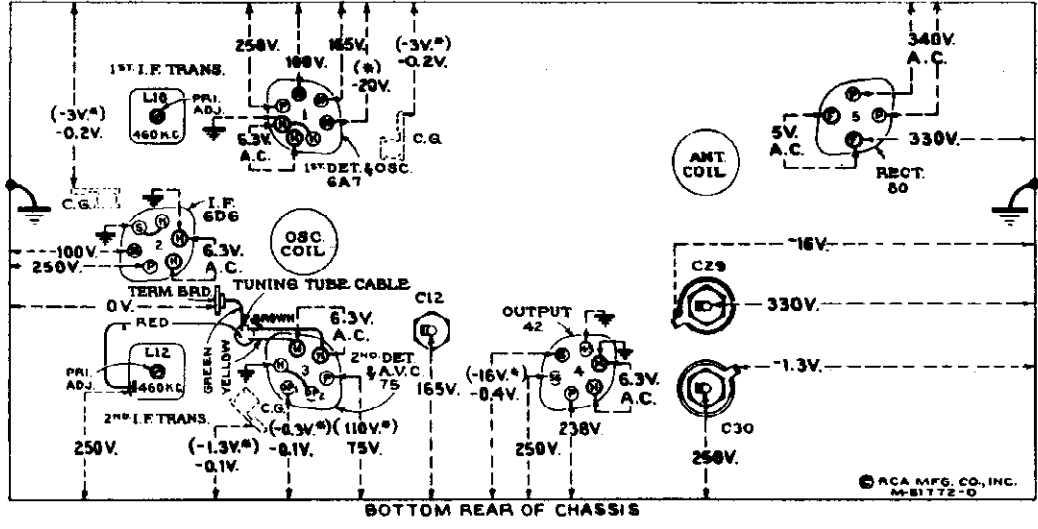
"Standard Broadcast" (A) 600 kc (osc.), 1,700 kc (osc., ant.)
 "Short Wave" (C) 20,000 kc (osc., ant.)



VERTICAL IN TO TERMINALS
 VERTICAL OUT TO CHASSIS

RCA MFG. CO., INC.

MODEL CT5
Voltage
Alignment



Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.

Figure 5—Radiotron Socket Voltages, Coil, and Trimmer Locations

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc ("Standard broadcast")—No signal being received—Volume control minimum

Radiotron Cathode Current Readings	
Measured with Milliammeter Connected at Tube Socket Cathode Terminals Under Conditions Similar to Those of Voltage Measurements	
(1) RCA-6A7—1st Det.—Osc.	11.0 ma.
(2) RCA-6D6—I-F Amp.	10.0 ma.
(3) RCA-75—2nd Det., A.V.C. and A.F.	0.22 ma.
(4) RCA-42—Power Amplifier	42.0 ma.
(5) RCA-80—Rectifier	66.0 ma.*
(6) RCA-6A5—Tuning Tube	2.0 ma.

(* Cannot be measured at socket.)

Phonograph Attachment.—A terminal board is provided for connecting a phonograph into the audio-amplifying circuit. RCA Victor Models R-93, R-93-2, or R-93-S Record Players should be connected as follows: Remove link between terminals 1 and 2 on receiver. Connect green wire in Radio-Record switch cable to terminal 1, yellow to terminal 2, and shield extension to terminal 3. Tape unused red and blue leads separately. Connect a 2-conductor twisted cable between the Record Player binding posts and the screw terminals on Radio-Record switch.

Alignment Procedure

Connect the "low" output terminal of the test oscillator to the receiver chassis for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action. The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator. For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

Order of Alignment	Test Oscillator		Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna				
1	6D6 I-F Grid Cap	.001 Mfd.	No Signal 550-750 kc	2nd I-F Trans.	L12 and L13	Max. (peak)
2	6A7 Det. Grid Cap	.001 Mfd.	No Signal 550-750 kc	1st I-F Trans.	L10 and L11	Max. (peak)
3	Ant. Post	200 Mmfd.	No Signal S-W Band	Wave Trap	L1	Minimum Output
4	Ant. Post	300 Ohms	20,000 kc	"C" Osc.	C5	Max. (peak)*
5	Ant. Post	300 Ohms	Rock Thru 20,000 kc	"C" Ant.	C3	Max. (peak)†
6	Ant. Post	200 Mmfd.	600 kc	"A" L-F Osc.	L8	Max. (peak)
7	Ant. Post	200 Mmfd.	1,700 kc	"A" H-F Osc.	C8	Max. (peak)
8	Ant. Post	200 Mmfd.	600 kc	"A" L-F Osc.	L8	Max. (peak)
9	Ant. Post	200 Mmfd.	1,700 kc	"A" H-F Osc.	C8	Max. (peak)

* Use minimum capacity peak.
† Use maximum capacity peak.

MODEL 7U2
Phono>Data
Notes

RCA MFG. CO., INC.

Pilot Lamps (5) Mazda No. 46, 6.3 volts, 0.25 amperes

POWER SUPPLY RATINGS

Rating	Voltage	Cycles	TOTAL RADIO AND PHONOGRAPH	
			RADIO	PHONOGRAPH
Rating A-6	105-125 volts	60 cycles	95 watts	120 watts
Rating A-5	105-125 volts	50 cycles	95 watts	120 watts
Rating B-2	105-125 volts	25 cycles	95 watts	120 watts
Rating C-6	105-130/140-160/200-250 volts	60 cycles	95 watts	120 watts
Rating C-5	105-130/140-160/200-250 volts	50 cycles	95 watts	120 watts

Alignment

The r-f and i-f adjustments on this instrument should be performed as outlined under "Alignment" in "Technical Information and Service Data" for Model 7U, substituting the magnetite-core symbols L15, L14, L13 and L12 for the trimming capacitor symbols C21, C20, C18 and C17 respectively in "I-F Adjustments." FOR DATA ON MODEL 7U, SEE RCA

Phonograph VOLUME VII.

The phonograph motor is of the governor induction type and is designed to be simple and foolproof. Occasionally, however, certain adjustments may be required. These adjustments are illustrated and explained in Figures 4 and 5. Application of oil to the felt pad which rubs against the governor disc will insure smooth operation.

Pickup adjustments are the same as outlined for Model 7U.

Resistance and Voltage Measurements

Voltage and resistance measurements for this receiver are the same as for Model 7U (Figures 4 and 7), with the following exception:

The resistance value shown on Figure 4, between the plate and capacitor C31 terminals of the RCA-6A8 first-detector and oscillator, and the RCA-6K7 i-f amplifier, should be 8.6 ohms instead of 13 ohms.

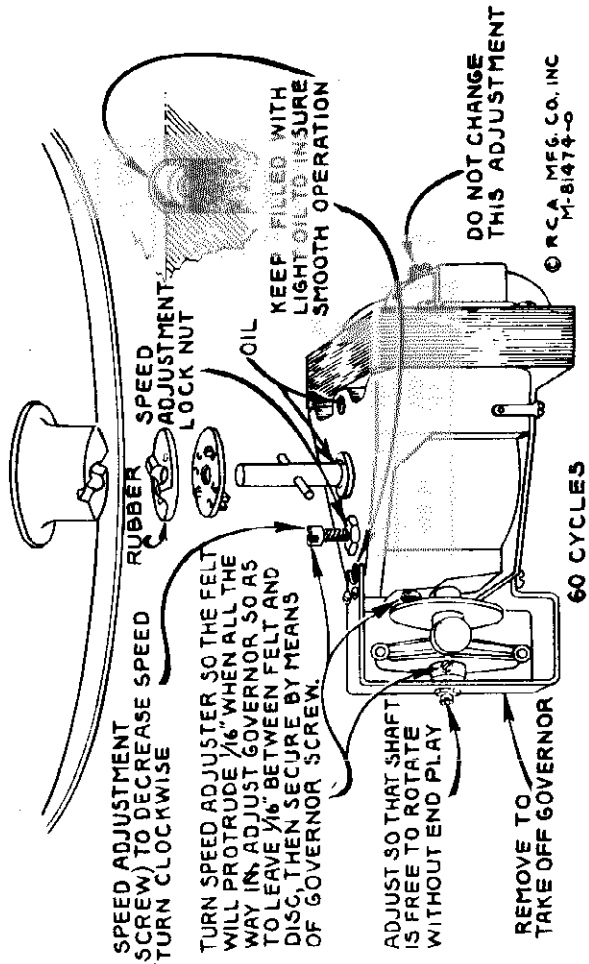


Figure 4—Details of 60-Cycle Motor

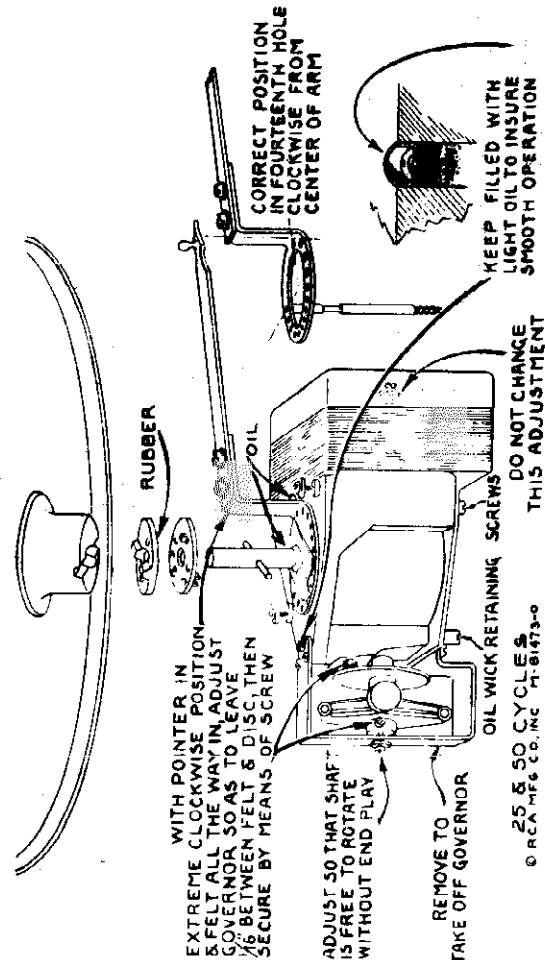
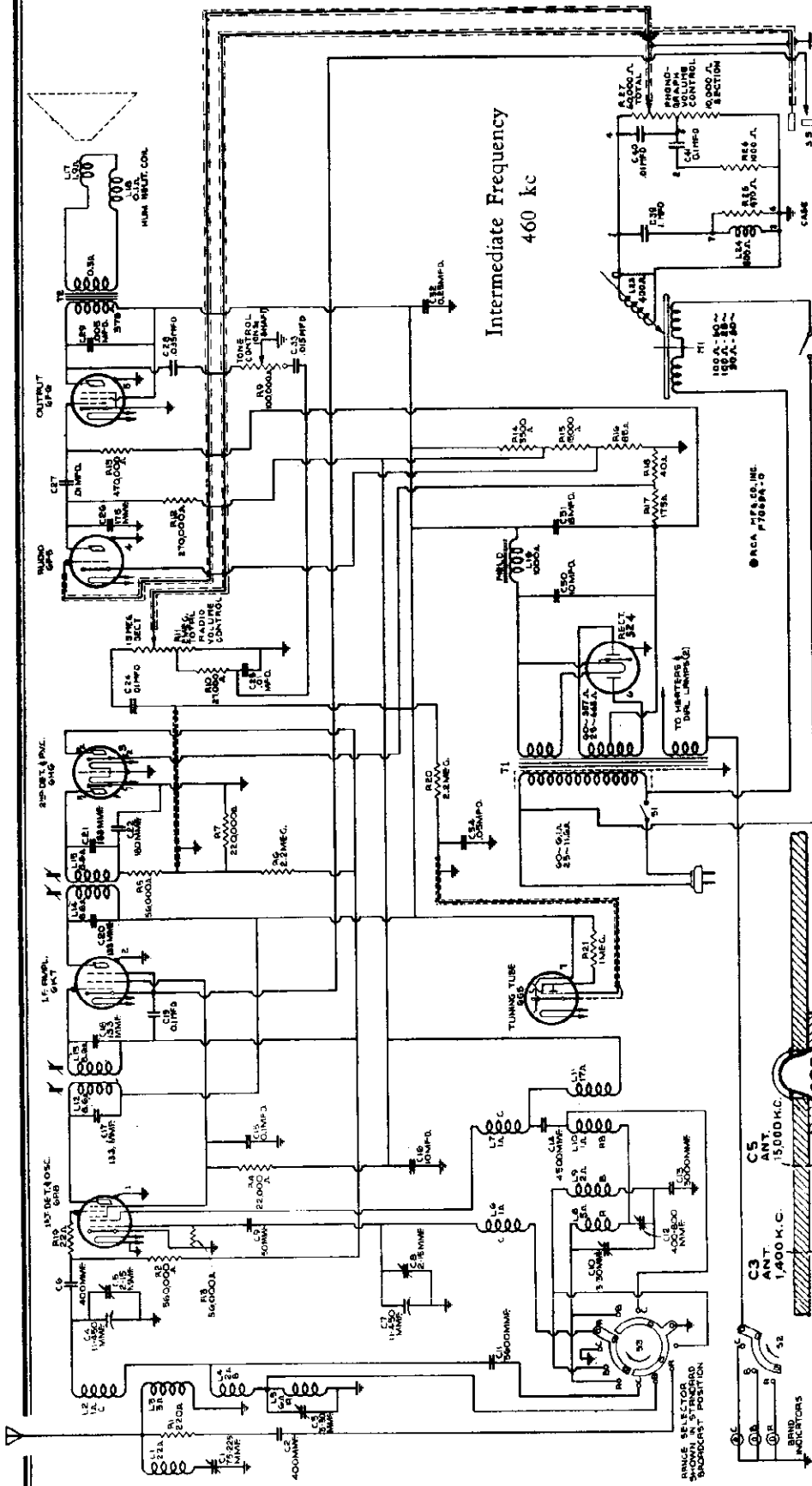


Figure 5—Details of 25- or 50-Cycle Motor

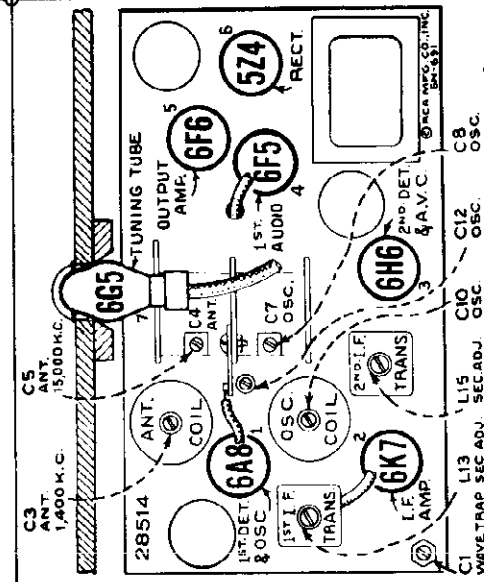
RCA MFG. CO., INC.

MODEL 7U
Schematic
Socket
Trimmers



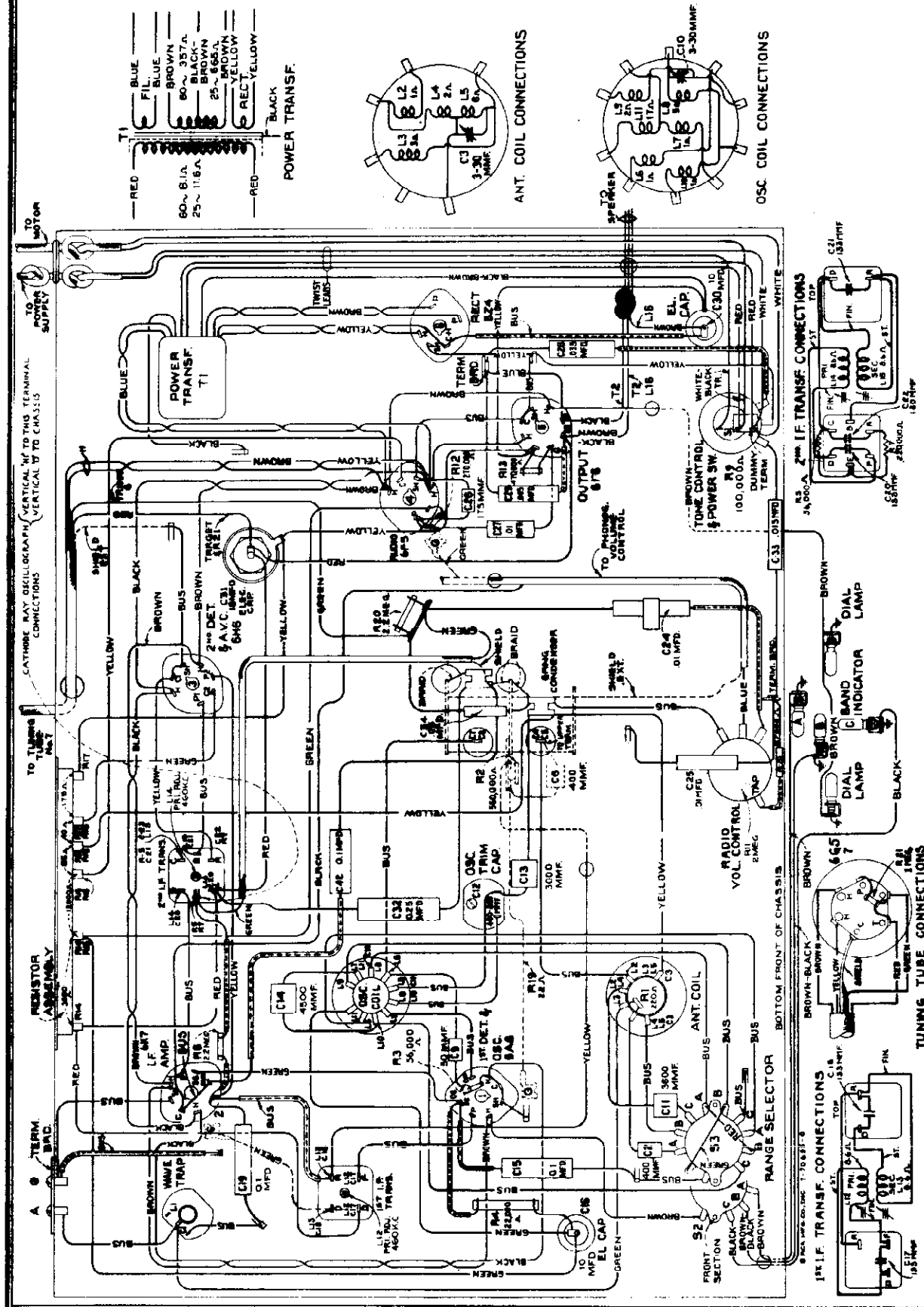
Intermediate Frequency
460 kc

- FREQUENCY RANGES
- "Standard broadcast" (A) 540- 1,625 kc
 - "Medium wave" (B) 1,625- 5,700 kc
 - "Short wave" (C) 5,700-18,000 kc
- ALIGNMENT FREQUENCIES
- "Standard broadcast" (A) ... 600 kc (osc.), 1,400 kc (osc. and ant.)
 - "Medium wave" (B) None required
 - "Short wave" (C) 15,000 kc (osc. and ant.)



MODEL 7U2
Chassis Wiring

RCA MFG. CO., INC.



POWER OUTPUT
Undistorted 2.0 watts
Maximum 4.5 watts

Loudspeaker
Type Electrodynamic
Impedance (v.c.) 2.2 ohms at 400 cycles
Type of Pickup High-impedance magnetic
Pickup Impedance 1,400 ohms at 1,000 cycles

RCA MFG. CO., INC.

Parts

Stock No.	DESCRIPTION	List Price	Stock No.	DESCRIPTION	List Price	Stock No.	DESCRIPTION	List Price
12030	RECEIVER ASSEMBLIES		11282	Resistor—50,000 ohms, carbon type, 1/10 watt—Package of 5 (R3)	.75	10174	Spring—Complete set of springs for station clock—Package of 2 sets	.50
5237	Board—Antenna and ground terminal	\$0.20	12286	Resistor—30,000 ohms, unglazed, 1/4 watt—Package of 5 (R2)	1.00	3322	Switch—Automatic brake switch (S4)	.75
11888	Bushing—Variable condenser mounting	.43	11398	Resistor—20,000 ohms, carbon type, 1/10 watt—Package of 5 (R7)	.75	11731	PICKUP AND ARM ASSEMBLIES	
12032	Cable—Tuning lamp cable and socket	1.06	11453	Resistor—20,000 ohms, carbon type, 1/10 watt—Package of 5 (R12)	.75	11732	Armature—Pickup armature	.64
11350	Cap—Grid contact cap—Package of 5	.90	11452	Resistor—470,000 ohms, carbon type, 1/10 watt—Package of 5 (R13)	.75	4543	Coil—Pickup coil (L23)	.60
11286	Cap—Grid contact cap—Package of 5	.15	11397	Resistor—500,000 ohms, carbon type, 1/10 watt—Package of 5 (R2)	.75	13579	Damper—Pickup damper block complete with damper plate	1.10
12046	Capacitor—30 Mmfd. (C9)	.26	12013	Resistor—1 megohm, carbon type, 1/10 watt—Package of 5 (R21)	.75	11951	Screw—Needle holding screw—Package of 40	7.85
11623	Capacitor—175 Mmfd. (C26)	.20	11626	Resistor—2.2 megohms, carbon type, 1/4 watt—Package of 5 (R6, R20)	\$1.00	12641	Board—Terminal board assembly	\$0.15
12406	Capacitor—180 Mmfd. (C22)	.26	12607	Shield—First I. F. transformer shield	.30	12640	Bracket—Output transformer mounting bracket	.18
11290	Capacitor—400 Mmfd. (Cz, C6)	.25	12581	Shield—Second I. F. transformer shield	.30	11660	Coil—Field coil (L16)	1.75
11622	Capacitor—3,000 Mmfd. (C13)	.36	11603	Shield—Coil shield for Stock Nos. 11617 and 11618	.36	11669	Coil—Neutralizing coil (L18)	1.75
11621	Capacitor—3,500 Mmfd. (C11)	.38	12735	Shield—Dial lamp shield—Package of 5	.25	12667	Coil—Reproducer cone (L17)	1.00
11287	Capacitor—4,500 Mmfd. (C14)	.30	12008	Shield—I. F. transformer shield for Stock Nos. 13106 and 13107	.25	5118	Connector—3-contact male connector for reproducer	.25
4668	Capacitor—.005 Mfd. (C29)	.20	11199	Socket—Dial lamp socket	.26	5119	Connector—3-contact female connector for reproducer cable	.25
11315	Capacitor—.015 Mfd. (C33)	.20	11381	Socket—Dial lamp socket, located at top	.14	9766	Reproducer complete	7.25
11395	Capacitor—.01 Mfd. (C24)	.18	11195	Socket—5-contact 5Z4 Radiotron socket	.45	11856	Transformer—Output transformer (T2) with primary winding used to hold field coil securely—Package of 5	1.56
4836	Capacitor—.05 Mfd. (C34)	.20	11198	Socket—7-contact 6E5 or 6H6 Radiotron socket	.15	13576	Motor—105-125 volts, 50-cycle motor complete (M1)	.20
11414	Capacitor—.01 Mfd. (C25, C27)	.25	11196	Socket—8-contact 6A8, 6F6 or 6K7 Radiotron socket	.15	13577	Motor—105-125 volts, 50-cycle motor complete	18.80
5170	Capacitor—.25 Mfd. (C32)	.22	12007	Spring—Retaining spring for core, Stock No. 12006—Package of 10	.36	13578	Motor—105-125 volts, 25-cycle motor complete	25.20
11240	Capacitor—10 Mfd. (C30)	1.08	12769	Switch—Range switch (S2, S3)	1.21	13583	Regulator—Motor speed regulator for motor only	25.20
5212	Capacitor—.18 Mfd. (C31)	1.16	11868	Transformer—Power transformer, 100-250 volts, 40-57 cycles (T1)	1.22	11762	Box—Used needle box	.25
11465	Capacitor—Adjustable trimmer (C12)	.44	13106	Transformer—First I. F. transformer (L12, L13, C17, C18)	1.22	11996	Bracket—Tuning lamp mounting bracket	.25
11256	Capacitor—Adjustable trimmer for wave trap, Stock No. 11391 (C1)	.44	13107	Transformer—Second I. F. transformer (L14, L15, C20, C21, C22, R3, R7)	1.40	12030	Cable—2-conductor shielded cable, approx. 18 inches long, connects phonograph volume control to compensator pack	.22
11617	Coil—Antenna coil less shield (L2, L3, L4, L5, C3, R1)	1.68	11848	Transformer—Power transformer, 100-125 volts, 50-60 cycles (T1)	2.06	12031	Cable—3-conductor shielded cable, approx. 19 inches long, complete with 4-contact female connector, contacts phonograph volume to receiver	.32
11818	Coil—Oscillator coil less shield (L6, L7, L8, L9, L10, L11, C10)	2.22	11849	Transformer—Power transformer, 100-250 volts, 40-57 cycles (T1)	4.40	11272	Clamp—Cable clamp for phonograph volume control cable, Stock No. 12030	1.04
13597	Condenser—2-gang variable tuning condenser (C4, C5, C7, C8)	4.55	11850	Transformer—Power transformer, 105-250 volts, 40-57 cycles (T1)	8.00	11760	Compensator—Phonograph compensator pack comprising one 470-ohm and one 1,000-ohm resistors, one .01 Mfd. and one .1 Mfd. and one 1 Mfd. capacitors and one 25 Henry reactor, L24, C39, C40, C41, R25, R26	.10
4573	Connector—2-contact female connector for motor cable, receiver section		13144	VOLUME MOTOR BOARD ASSEMBLIES	1.00	4153	Connector—4-contact female connector for cable, Stock No. 12031	3.85
5119	Connector—3-contact female connector for chassis reproducer cable		4577	Connector—2-contact male connector for motor leads	.30	12666	Cover—Reproducer cover	.45
6123	Connector—4-contact male connector for cable, Stock No. 12032		13575	Escutcheon—Motor speed regulator escutcheon for 25 or 50-cycle motors	.25	12698	Escutcheon—Station selector escutcheon	.65
12006	Core—Adjustable core and stud for Stock Nos. 13106 and No. 13107	\$0.30	13665	Lever—Brake mechanism actuating lever, fast to protruding pin on base of 5 screw—Motor mounting screw assembly for 60-cycle motor only—Package of 3	.85	12742	Escutcheon—Tuning tube escutcheon	1.02
13598	Drive—Variable tuning condenser vernier drive	.25	13574	Screw—Motor mounting screw assembly, for 25 or 50-cycle motors only—Package of 3	.85	11347	Knob—Phonograph volume control, receiver volume control, or range switch	.22
13599	Font—Chassis mounting foot and bracket assembly—Package of 2	.80	11750	Screw—No. 4-40 x 9/32, cone pointed, headless set screw for lever, Stock No. 13065—Package of 10	.22	12699	Knob—Large station selector knob—Package of 5	.75
12770	Holder—Dial scale holder and lamp bracket assembly	.55	13582	Brake—Automatic brake and switch complete	2.65	11210	Screw—Chassis mounting screw assembly, comprising one screw, one washer, and one lockwasher—Package of 4	.68
12712	Indicator—Station selector indicator pointer	.22	4577	Connector—2-contact male connector for brake switch power supply leads	.30	4982	Spring—Retaining spring for large knob in Stock No. 11349	.50
4540	Lamp—Dial lamp—Package of 5	.60	3994	Cover—Switch cover and screw	.26	11349	Screw—Retaining spring for small knob in Stock Nos. 12699, 11347 and 11582—Package of 5	.25
12718	Mask—Dial light diffuser complete with red, orange and green-colored screen	.40				11695	Turnable—Complete Phonograph volume control and switch (R27, S5)	2.48
11466	Resistor—220 ohms, carbon type, 1/10 watt—Package of 5 (R1)	.75						
11624	Resistor—22,000 ohms, carbon type, 1/4 watt—Package of 5 (R6)	1.00						
11620	Resistor—220 ohms, carbon type, 1/10 watt—Package of 5 (R1)	.75						
8070	Resistor—22,000 ohms, carbon type, 1/4 watt—Package of 5 (R6)	1.00						
11460	Resistor—27,000 ohms, carbon type, 1/4 watt—Package of 5 (R10)	1.00						

The prices quoted above are subject to change without notice.

MODEL 7X
Alignment
Parts

RCA MFG. CO., INC.

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price	Stock No.	DESCRIPTION	List Price
12716	RECEIVER ASSEMBLIES		11938	Resistor—20,000 ohms, carbon type, 1/10 watt—Package of 5 (R1)	0.75
12717	Board—Antenna and ground terminal board	\$0.20	11453	Resistor—170,000 ohms, carbon type, 1/10 watt—Package of 5 (R2)	.75
5237	Board—Phonograph terminal board	.43	13005	Resistor—300,000 ohms, carbon type, 1/10 watt—Package of 5 (R13)	.75
12511	Bushing—Turning bush—Package of 3	.15	11452	Resistor—470,000 ohms, carbon type, 1/10 watt—Package of 5 (R14)	.75
12714	Cap.—Grid control cap—Package of 5 (C16, C17)	.38	11811	Resistor—500,000 ohms, carbon type, 1/10 watt—Package of 5 (R10)	1.00
12607	Capacitor—Adjustable trimmer (C8, C14)	.20	4241	Resistor—1.5 meg, carbon type, 1/4 watt—Package of 5 (R11)	1.00
13001	Capacitor—22 Mmfd. (C18)	.20	12451	Shield—Coil shield for Stock No. 12708	.22
12608	Capacitor—33 Mmfd. (C19)	.20	12710	Shield—Coil shield for Stock No. 12709	.22
12609	Capacitor—33 Mmfd. (C20)	.20	12711	Shield—Coil shield for Stock No. 12710	.22
12629	Capacitor—16 Mmfd. (C26)	.20	12608	Shield—1 P. transformer shield for Stock No. 12801, 12553	.28
12604	Capacitor—120 Mmfd. (C23, C27, C28)	.26	12381	Shield—Top cap shield for 6J7 Radiotron	.14
12724	Capacitor—120 Mmfd. (C13)	.26	12110	Shutter—Dial scale holder and shutter	.48
12605	Capacitor—180 Mmfd. (C29)	.26	11198	Socket—7-contact 6J7, 6K7 or 6L7 Radiotron socket	.15
13003	Capacitor—180 Mmfd. (C11)	.26	11196	Socket—8-contact 25A6, 25Z6, 6H6 or 6I7 Radiotron socket	.15
12468	Capacitor—560 Mmfd. (C11, C21)	.40	3229	Socket—Dial lamp socket	.32
12237	Capacitor—555 Mmfd. (C20)	.40	12607	Socket—Dial lamp socket for Stock No. 12800, 12026 and 12654—Package of 10	.36
12237	Capacitor—555 Mmfd. (C20)	.40	12849	Spring—Tension spring for band indicator shutter link—Package of 5	.18
14001	Capacitor—1035 Mfd. (C37)	.16	12608	Tone control and power switch (R14, S5)	1.22
11313	Capacitor—.015 Mfd. (C5, C9, C39)	.20	12801	Transformer—Type 1, C5, C9, C39 transformer complete (L15, L16, C27, C28, C29, R6, R7)	1.70
4846	Capacitor—.01 Mfd. (C12, C30, C35)	.20	12653	Transformer—Second I. F. transformer complete (L15, L16, C27, C28, C29, R6, R7)	2.06
4858	Capacitor—.01 Mfd. (C7, C1, C31, C33, C35)	.22	12654	Trap—Wave trap complete (L1)	1.06
5170	Capacitor—.025 Mfd. (C32)	.25	13144	Volume control (R9)	1.06
4840	Capacitor—.025 Mfd. (C32)	.25			
5212	Capacitor—.18 Mfd. (C43)	.30	12914	Board—2-contact reproducer terminal board	.25
12998	Capacitor—Pack comprising one 24 Mfd., one 15 Mfd., and on 10 Mfd. sections (C1, C2, C3)	1.16	12640	Bracket—Output transformer mounting bracket	.18
12708	Coil—Antenna coil and shield (L2, L3, L4, L5)	3.70	12642	Cap.—Reproducer cone and dust cap (L1, L7)	.94
12943	Coil—Oscillator coil and shield (L6, L7, L8, L9, L10, L11, L12)	2.04	5118	Connector—3-contact male connector for speaker leads	.25
12701	Condenser—Variable tuning condenser—Standard	2.30	9717	Reproducer complete	.25
11979	Connector—2-contact male connector for power leads	4.00	11828	Transformer—Output transformer (T1)	1.46
5119	Connector—3-contact female connector for speaker leads	.25			
12800	Core—Adjustable core and stud for Stock No. 12706	20			
12006	Core—Adjustable core and stud for Stock No. 12801 and No. 12953	22			
12864	Core—Adjustable core and stud for Stock No. 12654	22			
12996	Dial—Station selector dial scale	.80			
12702	Dial—Station selector dial scale	.80			
12712	Indicator—Station selector indicator pointer	.22			
4340	Lamp—Dial lamp—Package of 5	.60			
12718	Mark—Dial light diffuser complete with 5 coarse lenses (S1, S2)	4.00			
12997	Resistor—100 ohms, carbon type, 1/4 watt—Package of 5 (R21)	2.05			
12999	Resistor—27 ohms, carbon type, 1/4 watt—Package of 5 (R21)	1.60			
11955	Resistor—27 ohms, carbon type, 1/4 watt—Package of 5 (R21)	1.00			
12453	Resistor—27 ohms, carbon type, 1/4 watt—Package of 5 (R23)	1.00			
13004	Resistor—27 ohms, carbon type, 1/4 watt—Package of 5 (R23)	1.00			
11647	Resistor—27,000 ohms, carbon type, 1/10 watt—Package of 5 (R3)	1.00			
11400	Resistor—27,000 ohms, carbon type, 1/10 watt—Package of 5 (R3)	1.00			
11282	Resistor—56,000 ohms, carbon type, 1/10 watt—Package of 5 (R6)	.75			
11281	Resistor—56,000 ohms, carbon type, 1/10 watt—Package of 5 (R6)	.75			
5145	Resistor—100,000 ohms, carbon type, 1/4 watt—Package of 5 (R2, R15)	1.00			

Prices quoted above are subject to change without notice.

maximum suppression (minimum indicated output) of the 460 kc. signal.

"Short Wave" Band

Connect the "Ant." output of the test oscillator to the receiver antenna terminal "A1" through a 100-ohm resistor, leaving the ground connections as before. Place the receiver range selector to its "Short wave" (C) position and set the dial pointer to 20,000 kc. Adjust test oscillator to 20,000 kc. Adjust the oscillator trimmer C14 to produce maximum (peak) output. Two positions of this trimmer may be found which produce maximum output. The position of minimum capacitance (plunger near out) should be used. Tighten lock nut. Adjust the antenna trimmer C7 to produce maximum (peak) output while slightly rocking the gang tuning condenser back and forth through the signal. Two positions may be found on this trimmer which produce maximum output. The position of maximum capacitance (plunger near in) should be used. Tighten lock nut. Check for image signal by changing the receiver dial setting to 19,080 kc. If the oscillator trimmer C14 has been correctly adjusted, the image signal will be received at this position. No adjustments should be made while checking for the image signal.

"Medium Wave" Band

Connections for test oscillator remain the same as for "Short Wave" (C) Band. Adjust the test oscillator to 6,000 kc. Place receiver range selector to "Medium Wave" (B) position and set receiver dial pointer to 6,000 kc. Then adjust the two trimmers C16 and C8 of the oscillator and antenna coils so that each produces maximum (peak) indicated receiver output. Tighten trimmer lock nuts.

"Standard Broadcast" Band

Change test oscillator connections by substituting 200 mmfd. condenser for the 300-ohm resistor. Adjust test oscillator and set receiver dial pointer to 1,500 kc. Place receiver range selector to "Standard Broadcast" (A) position.

Then adjust the two trimmers, C17 and C9, of the oscillator and antenna coils so that each produces maximum (peak) receiver output. Shift the test oscillator frequency to 600 kc. Tune the receiver to pick up this signal near 600 kc., disregarding the dial reading at which it is best received. Then adjust the oscillator magnetite core screw L11 simultaneously rocking the receiver tuning control backward and forward through the signal until maximum receiver output results from these combined operations. The adjustments at 1,500 kc. should then be repeated to correct for any change which may have been caused by the 600 kc. oscillator adjustment. Tighten lock nuts on C17 and C9.

Loudspeaker.—Centering of the loudspeaker voice coil is made in the usual manner with three narrow paper feelers after first removing the front paper dust cover. This may be removed by softening its cement with a very light application of acetone, using care not to allow the acetone to flow down into the air gap. The dust cover may be cemented back in place with ambroid upon completion of adjustment.

Alignment Procedure

The low-frequency oscillator tracking (600 kc.), wave-trap, and i-f transformer adjustments are made by means of six screws attached to molded magnetite cores. The remaining adjustments in the antenna and oscillator circuits are made with six plunger-type air-dielectric trimming capacitors and require the use of an RCA Stock No. 12636 Adjusting Tool. Before adjusting the plunger-type trimmers, they must be unlocked by loosening their hexagon lock nuts. The lock nuts should be tightened upon completion of adjustments. For location of these adjustments refer to figures 3 and 5.

A standard test oscillator, such as the RCA Stock No. 9955, will be required as a source of signal at the specified alignment frequencies. Means for indication of the receiver output during alignment; is also necessary to show when the correct point of adjustment is reached. The RCA Stock No. 4317 Neon Glow Indicator is designed for this purpose.

Attach the output indicator across the loudspeaker voice coil. Advance the receiver volume control to its maximum position, letting it remain in such position for all adjustments. For each adjusting operation, regulate the test-oscillator output control so that the signal level is as low as possible and still be observable at the receiver output. Use of such small signal will obviate broadness of tuning which would otherwise result from a v.c. action on a strong signal.

I-F Adjustments

Connect the "Ant." output of the test oscillator to the grid cap of the RCA-6L7 through a .001 mfd. capacitor. Connect the test oscillator "Gnd." terminal to the ground terminal of the receiver chassis. Place the receiver range selector in its "Standard Broadcast" (A) position and set receiver dial pointer to a position of no extraneous signals near 600 kc. Ground stator of local oscillator tuning condenser C23 to eliminate local oscillator signals. Adjust the test oscillator to 460 kc.

Adjust the two magnetite core screws L16 and L15 of the second i-f transformer to produce maximum (peak) indicated receiver output. Then adjust the two magnetite core screws L14 and L13 of the first i-f transformer for maximum (peak) receiver output as shown by the indicating device. It is advisable to repeat the adjustment of all i-f magnetite core screws to assure that the interaction between them has not disturbed the original adjustments. Remove temporary chassis ground from exciter stator C23.

R-F Adjustments

Calibrate the tuning dial by adjusting the scale pointer to the extreme low-frequency end calibration mark (530 kc.) on "Standard Broadcast" scale while the gang tuning condenser plates are in their full-mesh position. Alignment should be made in sequence of "Wave trap," "Short wave," "Medium wave," and "Standard Broadcast."

Wave-Trap Adjustment

Attach the "Ant." output of the test oscillator to the receiver antenna terminal "A1" through a 200-mmf. (impedance) capacitor. The ground connections remain connected together. Leave the test oscillator adjusted to 460 kc. and range selector in "Standard Broadcast" position as before. Then adjust the wave-trap screw L1 to the point which causes

RCA MFG. CO., INC.

MODEL 7X
Schematic, Voltage
Socket, Trimmers
Alignment, Resistance

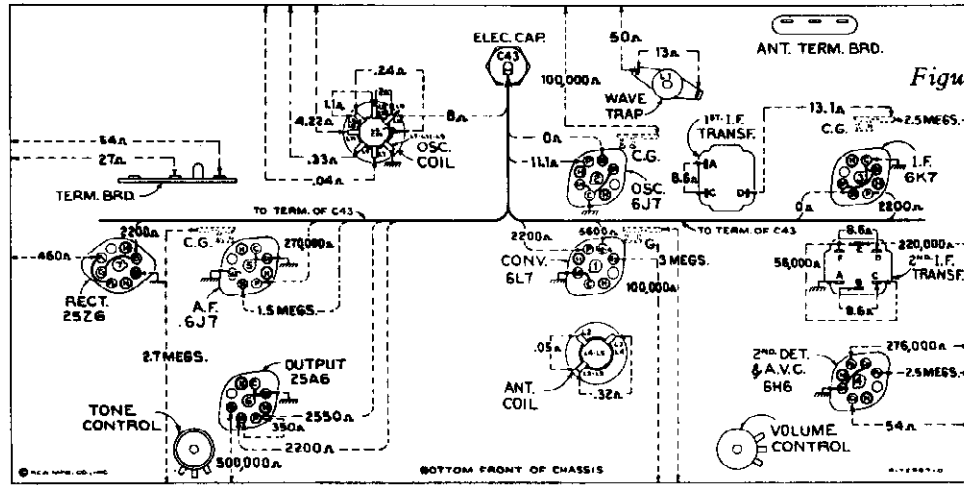
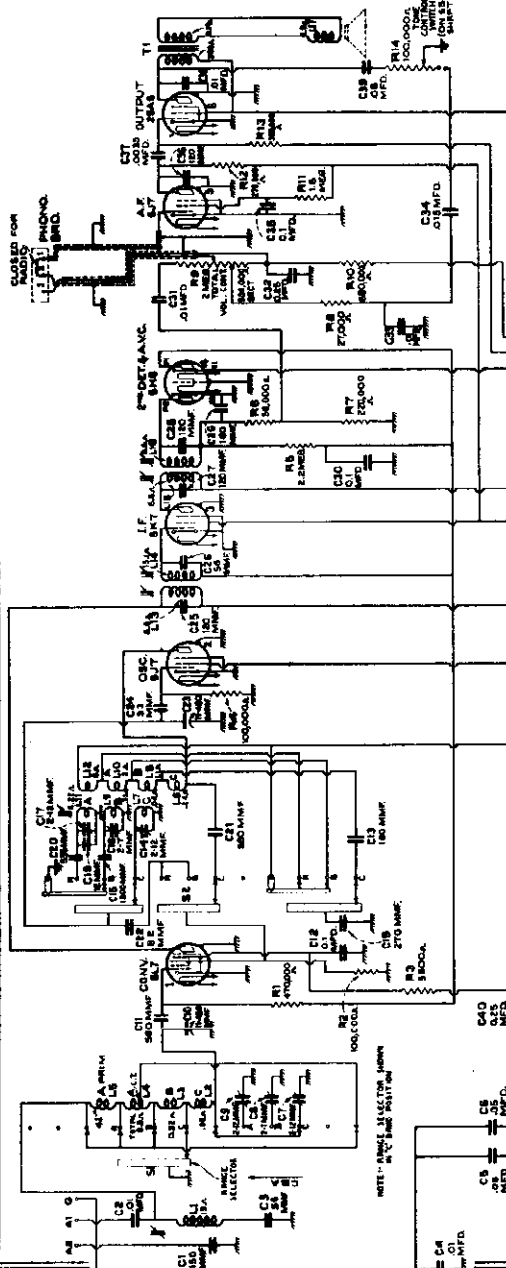


Figure 4—Resistance Diagram



Radiotron Cathode Current Readings

- (1) RCA-6L7—Converter 7.5 ma.
- (2) RCA-6J7—Osc. 3.5 ma.
- (3) RCA-6K7—I. F. Amp. 8.5 ma.
- (4) RCA-6H6—2nd Det.-A.V.C.
- (5) RCA-6J7—Audio 0.22 ma.
- (6) RCA-25A6—Power 27.0 ma.
- (7) RCA-25Z6—Rectifier 48.0 ma.

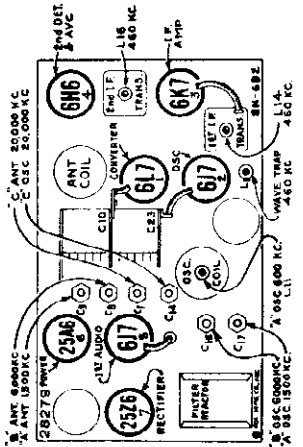
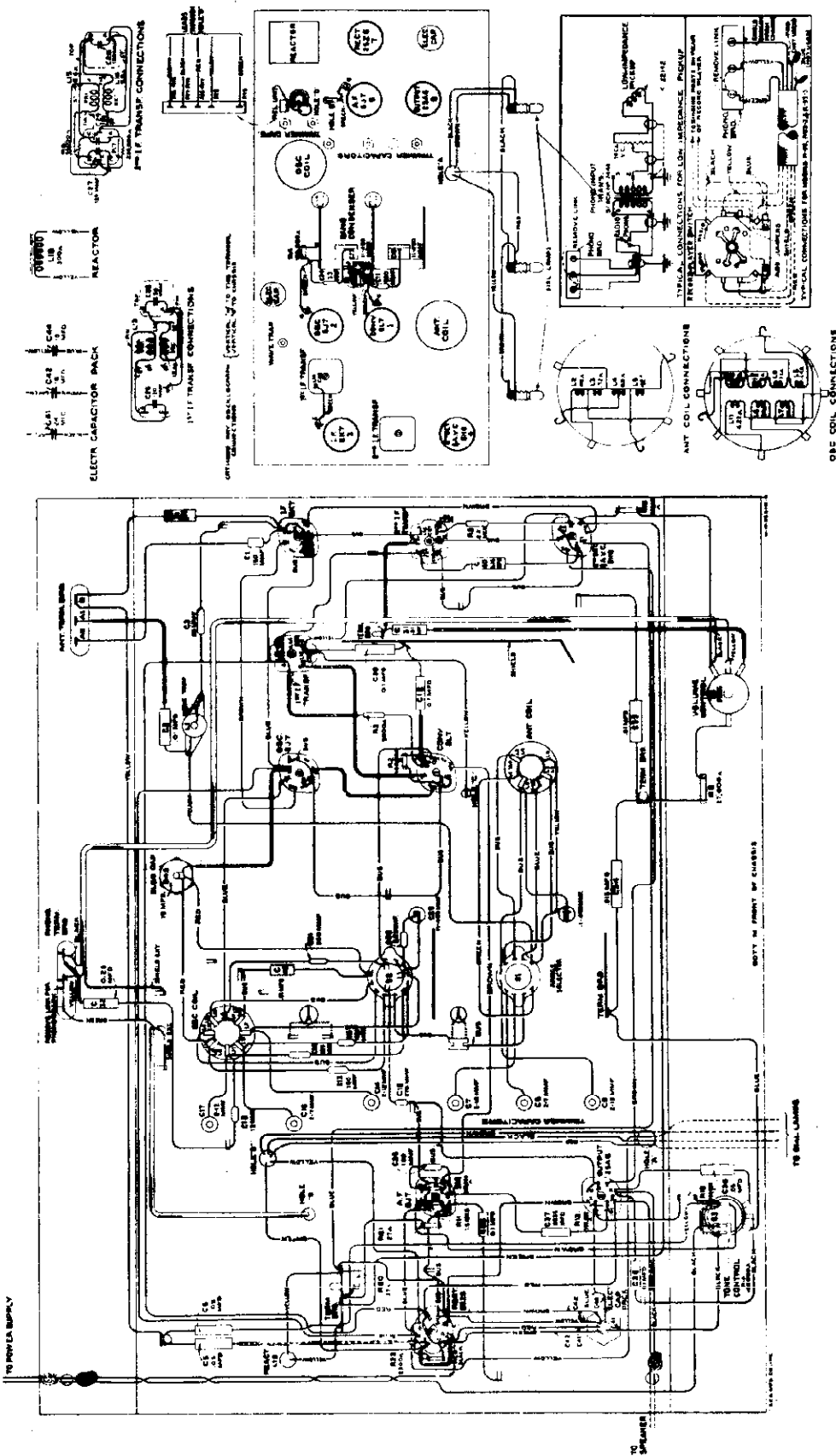


Figure 5—Radiotron Socket Voltages and Trimmer Locations
Measured at 115 volts, 60-cycle supply—For 115-volt d-c supply approximately 10% lower—
Tuned to approximately 1,000 kc—No signal being received—Tone control optional—

MODEL 7X
Chassis Wiring

RCA MFG. CO., INC.



FREQUENCY RANGES	ALIGNMENT FREQUENCIES
"Standard Broadcast" (A)	"Standard Broadcast" (A)
"Medium Wave" (B)	600 kc. (osc.), 1,500 kc. (osc., ant.)
"Short Wave" (C)	"Medium Wave" (B)
Intermediate Frequency	"Short Wave" (C)
	20,000 kc. (osc., ant.)

MODELS 8BT, 8BK, 8BTC, 8BK6
Schematic, Socket, Trimmers
Phono Data, Spkr. Wiring

RCA MFG. CO., INC.

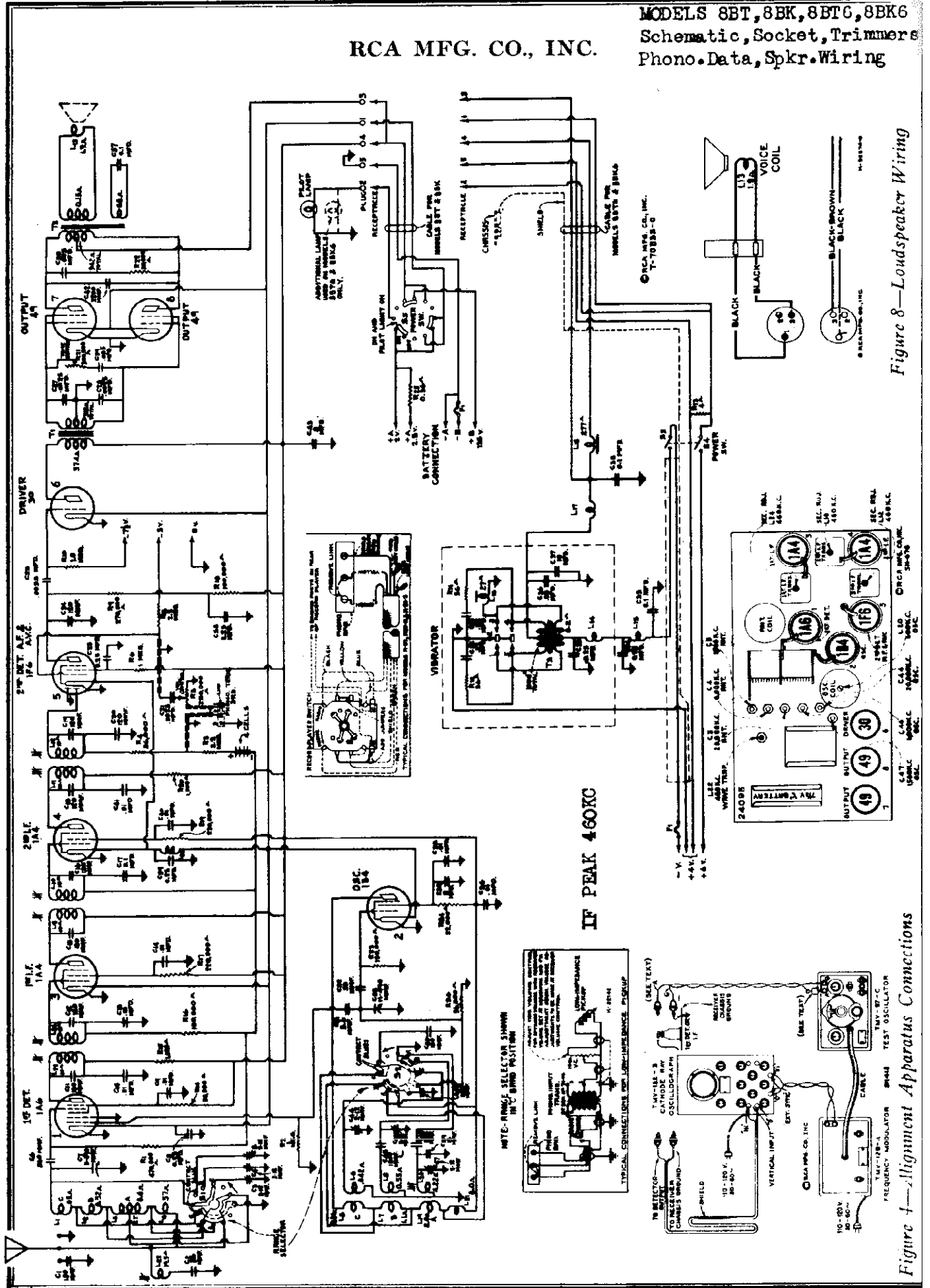


Figure 8—Loudspeaker Wiring

Figure 4—Alignment Apparatus Connections

MODELS 8BT6, 8BK6
Power Unit Wiring
Chassis Wiring

RCA MFG. CO., INC.

MODELS 8BT, 8BK
Batt. Cable, Chassis Wiring

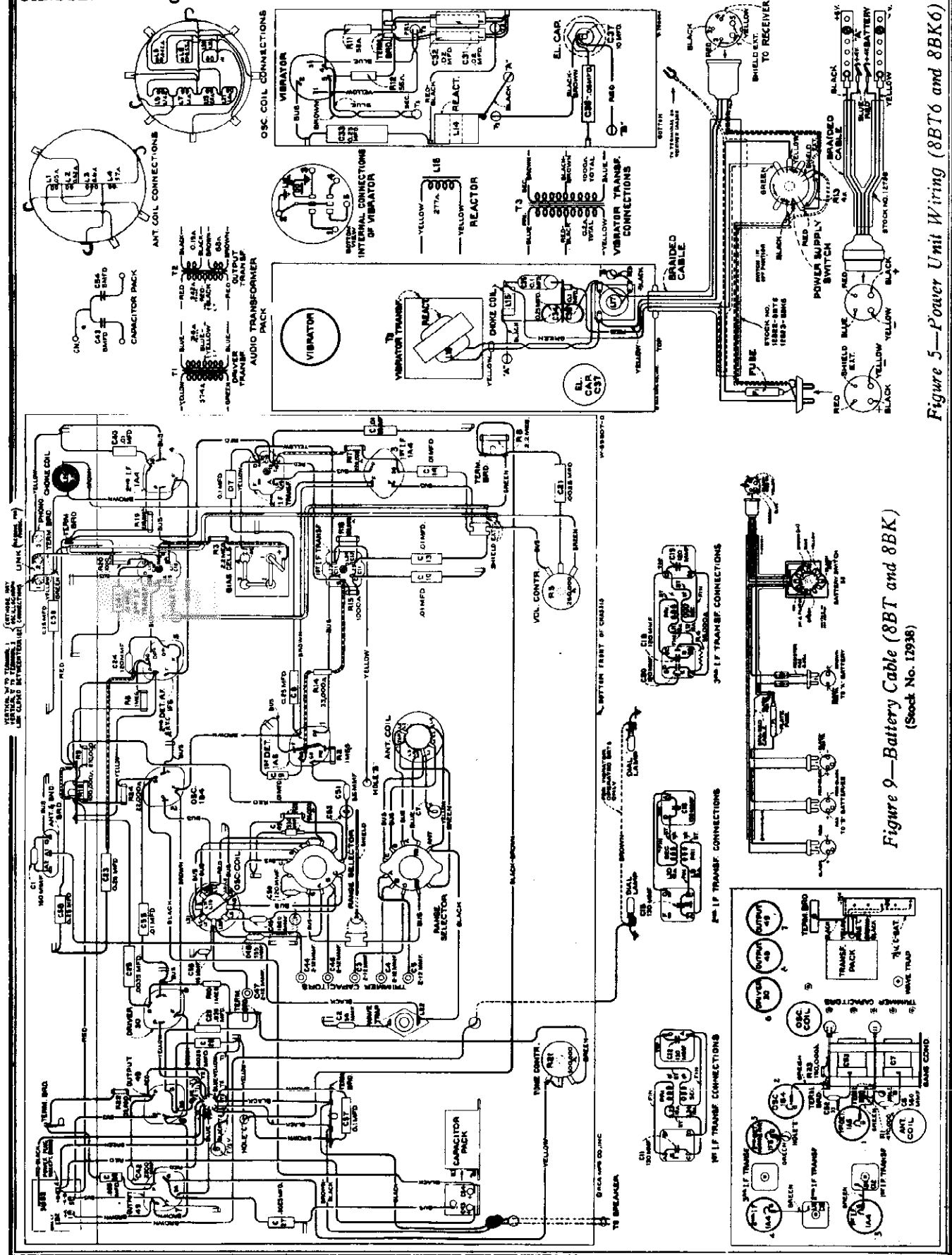


Figure 5—Power Unit Wiring (8BT6 and 8BK6)

Figure 9—Battery Cable (8BT and 8BK)
(Stock No. 12936)

RCA MFG. CO., INC.

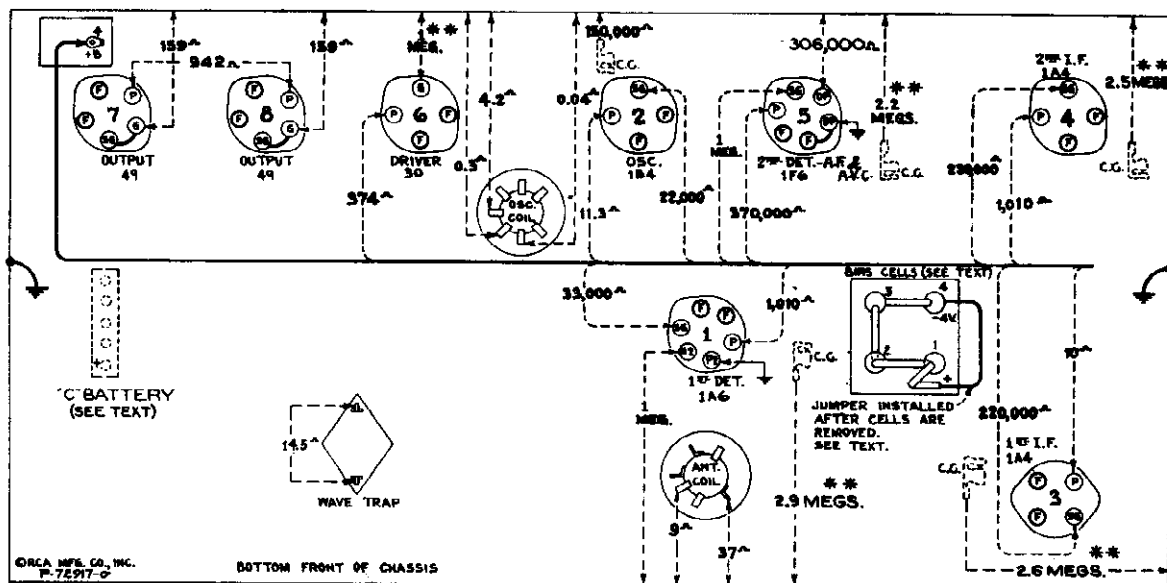


Figure 6—Resistance Diagram

Power-supply cable disconnected—Radiotrons in sockets—Tuning condenser in full-mesh—Bias cells and "C" battery removed—Volume setting optional

Resistance Measurements

****Before making any resistance measurements, remove the four bias cells and connect jumpers on bias-cell board as shown. Also, remove the "C" battery and connect the two leads (-7½ v. and -3 v.) to chassis ground. After measurements are completed, remove jumpers from bias-cell board and then carefully insert bias cells. Next, insert "C" battery and restore leads to their respective positions.**

Radiotron Plate Current Readings

Measured with Milliammeter Connected at Tube Socket Plate Terminals under Conditions Similar to Those of Voltage Measurements

(1) RCA-1A6—1st Det.	1.2 ma.
(2) RCA-1B4—Osc.	3.8 ma.
(3) RCA-1A4—1st I.F.	0.9 ma.
(4) RCA-1A4—2nd I.F.	0.9 ma.
(5) RCA-1F6—2nd Det.—A.F.—A.V.C.	0.25 ma.
(6) RCA-30—Driver	3.2 ma.
(7) RCA-49—Output	1.5 ma.
(8) RCA-49—Output	1.5 ma.

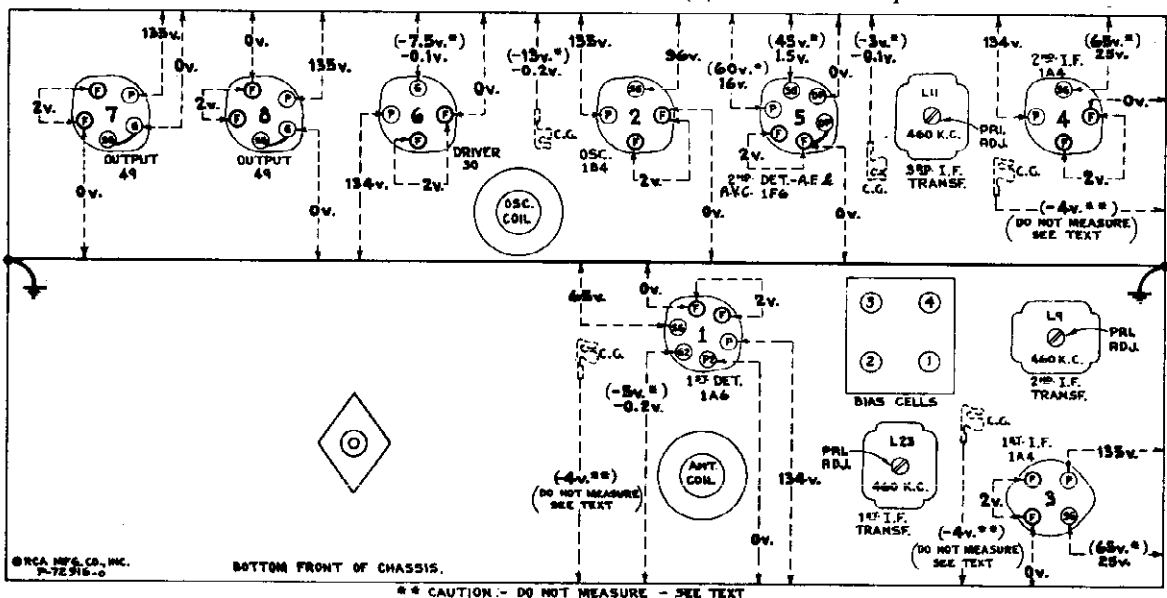


Figure 7—Radiotron Socket Voltages, Coil, and Trimmer Locations

Measured with all batteries at normal voltage—Tuned to approximately 1,000 kc ("Standard broadcast")—No signal being received—Volume control optional

back and forth through the signal. Two peaks may be found with this circuit. The peak with maximum capacity (plunger near in) should be used. Tighten lock nut. Check the image frequency by changing the receiver dial setting to 19,060 kc. The test oscillator signal should be faintly received at this position indicating that the adjustment of C44 has been correctly made. No adjustments should be made while checking for this image signal.

"Medium Wave" Band

(k) Place receiver range selector to its "Medium wave" position with the receiver dial pointer set to 6,000 kc. Tune the test oscillator to 6,000 kc. Adjust the oscillator air trimmer C46 for maximum (peak) amplitude of output as shown by the waves on the oscillograph screen. Two peaks may be found. The peak obtained with minimum capacity (plunger near out) should be used. Tighten lock nut. Adjust antenna air trimmer C4 for maximum (peak) output. Tighten lock nut.

"Wave-Trap" Adjustment

(l) Connect the output of the test oscillator to the antenna terminal "A1" through a 200-mmf. (important) capacitor. Place receiver range selector in "Standard broadcast" position. Set the receiver dial to a position of no extraneous signals near 600 kc. Tune the test oscillator to 460 kc. Adjust the wave-trap magnetic core screw to the point which causes minimum amplitude of output (maximum suppression of signal) as shown by the waves on the oscillograph.

"Standard Broadcast" Band

(m) Reduce output of test oscillator to minimum. Set receiver dial pointer to 600 kc. Tune the test oscillator to 600 kc and increase its output until a deflection is noticeable on the oscillograph screen.

(n) Adjust oscillator magnetic core screw L20 (top of oscillator coil) so that maximum (peak) amplitude of output is shown on the oscillograph screen.

(o) Set receiver dial pointer to 1,500 kc. Tune test oscillator to 1,500 kc. Adjust the oscillator and antenna air trimmers C47 and C5 for maximum (peak) output.

(p) Set test oscillator to 600 kc and tune receiver to pick up this signal near 600 kc. Re-adjust the oscillator magnetic core screw L20 for maximum (peak) output while rocking the receiver gang tuning condenser back and forth through this signal.

(q) Repeat adjustments in (p) above to correct for any changes in the oscillator tuning caused by the adjustment of L20. Tighten lock nuts on C47 and C5 after each is adjusted.

Antenna and Ground Terminals

These receivers are equipped with an antenna-ground terminal board having three terminals. These terminals are marked "A," "A1," and "G," the latter being the ground terminal.

(e) Increase the frequency of the test oscillator by slowly turning its tuning control until two separate, distinct, and similar waves appear on the screen. If only one wave appears, increase the "Freq." control on the oscillograph to obtain two waves. These waves will be identical in shape, totally disconnected, and appear in reversed positions. They will have a common base line, which is discontinuous. Adjust the "Freq." and "Sync." controls of the oscillograph to make them remain motionless on the screen. Continue increasing the test oscillator frequency until these forward and reverse curves move together and overlap, with their highest points exactly coincident. This condition will be obtained at a test oscillator setting of approximately 375 kc.

(f) With the images established as in (e), re-adjust the two magnetic core screws on the third $\frac{1}{2}$ transformer so that they cause the curves on the oscillograph screen to become exactly coincident throughout their lengths and have maximum amplitude.

(g) Without altering the adjustments of the apparatus, shift the "Ant." output of the test oscillator along with the .05-mfd. capacitor to the grid cap of the RCA-1A4 first $\frac{1}{2}$ tube (with grid lead in place). Adjust the two second $\frac{1}{2}$ transformer magnetic core screws L10 and L9 so that they cause the forward and reverse curves to become coincident throughout their lengths and have maximum amplitude.

(h) Shift the "Ant." output of the test oscillator along with the .05-mfd. capacitor to the grid cap of the RCA-1A6 first detector tube. Adjust the two magnetic core screws L24 and L23 of the first $\frac{1}{2}$ transformer so that they cause the forward and reverse curves to become coincident and have maximum amplitude. The composite wave, obtained in this manner represents the resonance characteristic of the total $\frac{1}{2}$ system. Lack of symmetry or irregularity of the resultant image will indicate the presence of a defect in the $\frac{1}{2}$ system.

R-F Adjustments

Calibrate the pointer of the tuning dial by adjusting it to the extreme low-frequency end of dial scale (330 kc) with the plates of the gang tuning condenser in full mesh. Alignment must be made in the sequence of "Short wave" band, "Medium wave" band, "Wave-trap," and "Standard broadcast" band.

"Short Wave" Band

(i) Connect the "Ant." output of the test oscillator to the antenna terminal "A1" through a 300-ohm resistor. Remove the plug of the frequency-modulator cable from test-oscillator jack. Turn test-oscillator modulation switch to "On." Shift the oscillograph "Timing" switch to "Int.".

(j) Set receiver range selector to its "Short wave" position and dial pointer to 20,000 kc. Adjust the test oscillator to 20,000 kc. Adjust oscillator air trimmer C44 until maximum (peak) amplitude of output is reached. Two peaks may be found. The peak with minimum capacity (plunger near out) should be used. Tighten lock nut. Adjust antenna air trimmer C3 until maximum (peak) amplitude of output is reached while slightly rocking the gang tuning condenser.

This type of alignment is possible through use of apparatus such as the RCA Stock No. 9536 Frequency Modulator and the RCA Stock No. 9545 Cathode-Ray Oscillograph. If this equipment is not available, an approximate alignment may be performed by the output-indicator method with an instrument such as the RCA Stock No. 4317 Neon Glow Indicator attached across the loudspeaker voice coil. Alignment by this method is similar to the cathode-ray method outlined below except that the receiver volume control should be at maximum, and the test oscillator sweeping operations omitted. The $\frac{1}{2}$ adjustments should be made so that the test-oscillator frequency can be shifted 2 kc above and below the 460 kc alignment frequency with little change in output. The $\frac{1}{2}$ adjustments should be peaked.

Cathode-Ray Alignment

Make alignment apparatus connections shown on figure 4. Remove the plug of the frequency modulator cable from the test oscillator jack. Connect the receiver chassis to a good external ground. Connect oscillograph "Vertical" input terminals as indicated on figure 2. Set oscillograph power switch to "On" and adjust "Intensity" and "Focus" controls to give a clearly defined spot, or line, on the screen. Set oscillograph "Ampl. A" switch to "On." "Vertical gain" control full-clockwise. "Ampl. B" switch to "Timing" switch to "Int." Place the "Sync." control, "Freq." control, and "Horizontal gain" control about their mid-positions. For each of the following adjustments, the test oscillator output must be regulated so that the image obtained on the oscillograph screen will be of the minimum size for accurate observation. The receiver volume control setting is optional.

I-F Adjustments

(a) Connect the "Ant." output of the test oscillator to the grid cap of RCA-1A4 second $\frac{1}{2}$ tube (with grid lead in place) through a .05-mfd. capacitor, with "Onid." to receiver chassis. Tune the test oscillator to 460 kc, place its modulation switch to "On" and its output switch to "Hi."

(b) Turn on the receiver and test oscillator. Increase the output of the test oscillator until a deflection is noticeable on the oscillograph screen. The figures obtained represent several waves of the detected signal, the amplitude of which may be observed as an indication of output. Cause the wave image formed (400-cycle waves) to be spread completely across the screen by adjusting the "Horizontal gain" control. The image should be synchronized and made to remain motionless by adjusting the "Sync." and "Freq." controls.

(c) Adjust the two magnetic core screws L12 and L11 (see figures 5 and 7) of the third $\frac{1}{2}$ transformer (one on top and one on bottom) to produce maximum vertical deflection of the oscillographic image. This adjustment places the transformer in exact resonance with the 460-kc signal. The sweeping operation should follow using the frequency modulator. Shift the oscillograph "Timing" switch to "Ext." Insert plug of frequency-modulator cable in test-oscillator jack. Turn the test-oscillator modulation switch to "Off." Turn on the frequency modulator and place its sweep-range switch to "Hi."

The signal entering the antenna circuit is coupled to control grid No. 1 of the RCA-1A6 through a tuned r-f transformer. This transformer is tapped to provide correct inductance for the band being used, and at the same time selecting the proper winding which serves as the primary and shorts out the unused coils to prevent any interaction which might otherwise occur. The locally generated oscillator signal is fed to control grid No. 2 of the RCA-1A6 through capacitor C51. Separate windings are employed in the oscillator stage for each band. The unused portion of the oscillator coil are shorted out when not in use. The output of the first-detector stage is fed through a two-stage i-f amplifier, consisting of two RCA-1A4's and three i-f transformers, to the diode portion of the RCA-1F6. Such an i-f amplifier arrangement provides excellent selectivity and gain, while its design gives increased fidelity due to its flat-top characteristic. The audio frequency secured by the detection process develops a voltage across resistors R4 and R5. The voltage developed across R5 is applied as a v.c. bias to the first detector and i-f tubes. The arm of the volume control R3 selects a portion of the audio voltage, which is applied to the control grid of the RCA-1F6 for voltage amplification. The output of this stage is resistance-capacitance coupled to the RCA-30 driver tube. The output of the driver stage is transformer coupled to the chassis of this push-pull output stage using RCA-49's. The output of this push-pull stage is transformer coupled to the permanent magnet dynamic loudspeaker. A tertiary winding on the output transformer shunted by C37 provides sharp cutoff of the high audio frequencies. A continuously variable high-frequency tone control R21 in series with C75 provides manual high-frequency tone control.

Models 8BT6 and 8BK6 obtain their plate supply from a vibrator-type power unit. The vibrator together with the power transformer T3 combine the functions of generating alternating current and rectification. Filter chokes and capacitors are built into this unit to eliminate interference (noise) which would otherwise be introduced into the receiver circuits.

Caution: The four bias cells are used only for the purpose of supplying bias potential and should never be measured with an ordinary voltmeter or other device which draws any current. A simple check on these cells may be made by connecting a milliammeter in the plate circuit of either RCA-1A4 tube and noting the plate current reading. Then remove the two bias cells (3 and 4), being careful that the spring contact clips do not short-circuit them during removal. Connect a 4-volt battery between the + and - 4v. terminals of the bias cell board, and again note the plate current reading. If the first reading obtained (with bias cells) is more than 40% from the latter reading (with 4-volt battery), all bias cells should be replaced. This 40% difference is equivalent to a change of approximately 2.5% battery voltage.

Alignment Procedure

There are seven alignment adjustments provided in the antenna and oscillator coil tuned circuits. Six of these adjustments are plunger type air trimmers and require use of an RCA Stock No. 12636 Adjusting Tool. The i-f transformer adjustments are made by means of screws attached to shielded magnetic cores. The cathode-ray method of alignment is preferred due to the flat-top i-f characteristics of these receivers.

MODELS 8T2, 8T11, 8K11

Parts

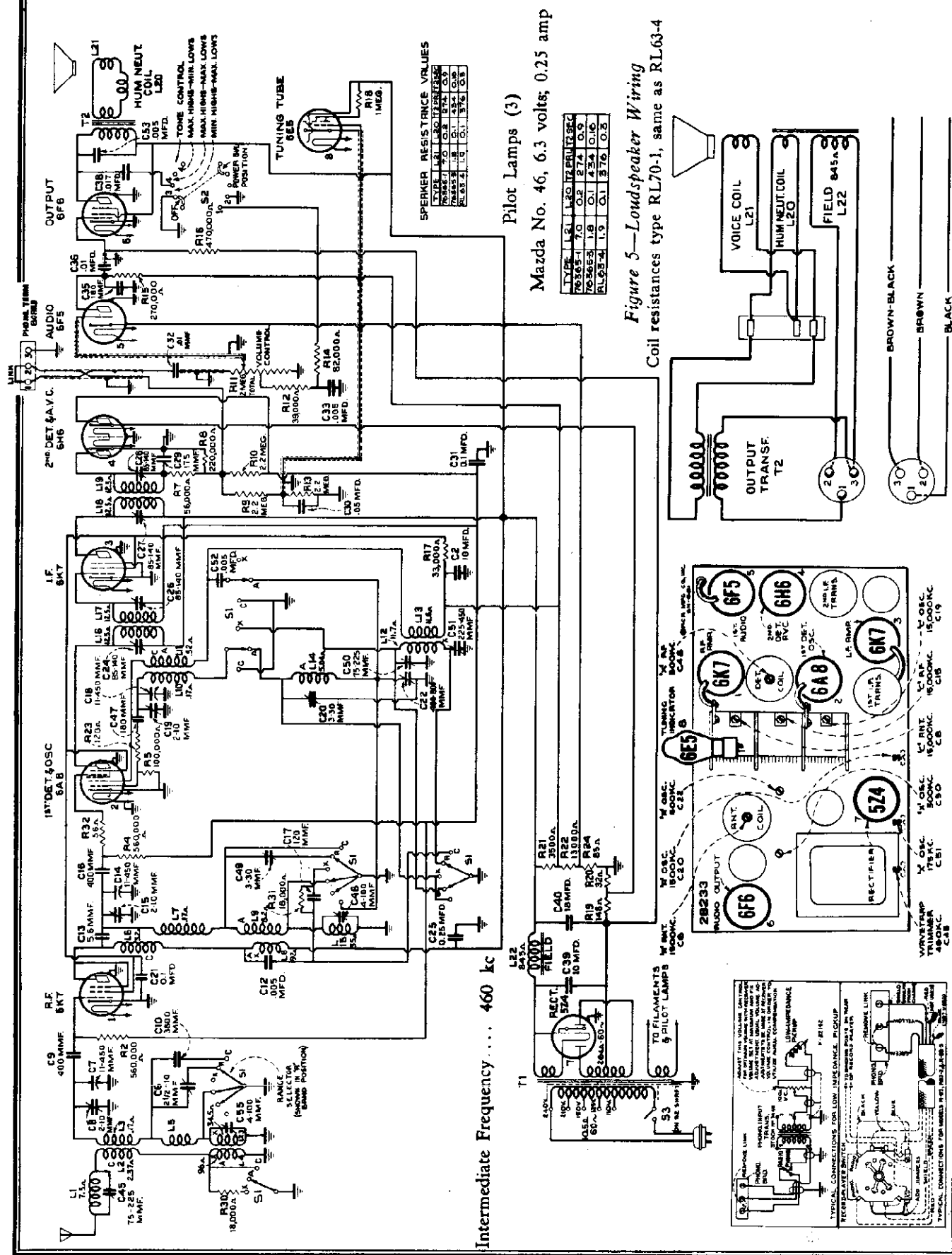
RCA MFG. CO., INC.

Stock No.	DESCRIPTION	List Price	Stock No.	DESCRIPTION	List Price
12706	RECEIVER ASSEMBLIES		11452	Resistor—170,000 ohms—Carbon type—1/10 watt—(R10)—Package of 5	.75
13058	Arm—Arm and hub assembly for operating shutter	\$0.22	11397	Resistor—500,000 ohms—Carbon type—1/10 watt—(R2, R4)—Package of 5	.75
12717	Board—Antenna and ground terminal board	.25	12013	Resistor—1 megohm—Carbon type—1/10 watt—(R18)—Package of 5	.75
5237	Board—Phonograph terminal board	.22	11626	Resistor—22 megohms—Carbon type—1/4 watt—(R5, R10, R13)—Package of 5	1.00
11625	Bushing—Variable tuning condenser mounting bushing assembly—Package of 3	.43	4669	Screw—No. 8-32 set screw for arm stk No. 12706—Package of 10	.25
12511	Cable—Radiotron tuning tube cable complete with socket	1.26	12064	Shield—Antenna or detector coil shield	.28
4955	Cap—Contact cap—Package of 5	.15	11604	Shield—Oscillator coil shield	\$0.24
11256	Capacitor—Adjustable trimmer (C45)	.48	11390	Shield—Intermediate frequency transformer shield	.25
12065	Capacitor—Adjustable trimmer (C22)	.48	12735	Shield—Dial lamp shield—Package of 5	.25
12814	Capacitor—Adjustable trimmer (C51)	.20	12971	Shutter—Dial scale holder and shutter assembly	.85
12974	Capacitor—5.6 Mfd.—(C15)	.20	11222	Socket—Dial lamp socket	.18
12903	Capacitor—120 Mfd.—(C17)	.20	11193	Socket—5-contact rectifier Radiotron socket	.15
11290	Capacitor—180 Mfd.—(C28)	.18	11198	Socket—7-contact 6K7—6X5—or 6H6 Radiotron socket	.15
14824	Capacitor—400 Mfd.—(C30)	.25	11196	Socket—8 contact 6A8 or 6F6 Radiotron socket	.13
4868	Capacitor—3,600 Mfd.—(C10)	.38	12966	Switch—Range switch—(S1)	1.75
11451	Capacitor—.017 Mfd.—(C38)	.20	11392	Switch—Tone control and power switch assembly—(S2, S3)	1.14
11395	Capacitor—.01 Mfd.—(C32)	.18	11388	Transformer—First intermediate frequency transformer—(L16, L17, C24, C26)	1.90
4858	Capacitor—.01 Mfd.—(C36)	.25	11389	Transformer—Second intermediate frequency transformer—(L18, L19, C27, C28, C29, R7, R8)	3.02
4839	Capacitor—.01 Mfd.—(C21)	.28	11804	Transformer—Power transformer—105-125 volts—75-50 cycles (T1)	6.02
4841	Capacitor—.01 Mfd.—(C31)	.22	11805	Transformer—Power transformer—105-130-140-160, 195-230 volts—40-60 cycles (T1)	7.95
5170	Capacitor—.025 Mfd.—(C25)	.25	11667	Trap—Wave trap—(L1, C48)	1.22
4836	Capacitor—.05 Mfd.—(C30)	.30	13344	Volume control—(R11)	1.00
11240	Capacitor—.10 Mfd.—(C39)	1.98		REPRODUCER ASSEMBLIES	
11387	Capacitor—.18 Mfd.—(C40)	.98	11232	Board—Terminal board with two lead wire clips	.18
5212	Capacitor—.18 Mfd.—(C40)	1.15	11231	Bolt—Yoke and core assembly bolt and nut	.16
12061	Coil—Antenna coil—Less shield—(L2, L3, L4, L5, L23, C5, C35) shield—(L2, L3, L4, L5, L23, C48, C49)	1.90	8060	Bracket—Output transformer mounting bracket	.14
12062	Coil—Antenna coil—Less shield—(L6, L7, L8, L9, L15, C48, C49)	1.94	11257	Clamp—Core center suspension clamping nut and screw assembly—Package of 5	.25
12063	Coil—Oscillator coil—Less shield—(L10, L11, L12, L13, L14, C20)	2.82	11254	Coil—Field coil—(L22)	2.00
12965	Condenser—Three-gang variable tuning condenser—(C7, C8, C14, C15, C18, C19)	6.15	11235	Core—Reproducer core—(L21) or 8T11	.30
13094	Dial—Station selector dial scale	\$1.05	11258	Core—Reproducer core—(L21) (Speaker No. RL70-1)—Model 8K11	1.00
11394	Foot—Chassis foot assembly—Package of 2	.70	5119	Connector—3-contact female connector for reproducer cable	.25
12712	Indicator—Station selector indicator lamp	.22	5118	Connector—3 contact male connector for reproducer	.21
5226	Lamp—Dial lamp—Package of 5	.70	9618	Reproducer—Complete (Speaker No. RL63-4)—Models 8T2 or 8T11	6.40
12718	Mask—Dial Light Diffuser with colored screen	.40	9619	Reproducer—Complete (Speaker No. RL70-1)—Model 8K11	6.05
11393	Resistor—Voltage divider resistor—comprising one 3,500 ohm and one 13,000 ohm sections—(R21, R22)	.74	11253	Transformer—Output transformer—(T2) 1/10 watt—(R15)—Package of 5	1.56
11329	Resistor—Voltage divider resistor—comprising one 148 ohm, one 32 ohm and one 85 ohm sections—(R19, R20, R24)	.52		MISCELLANEOUS ASSEMBLIES	
12075	Resistor—55 ohms—Flexible type complete with contact cap—(R32)	.28	11996	Bracket—Tuning tube mounting bracket and clamp	.22
12071	Resistor—120 ohms—Carbon type—1/4 watt—(R23)—Package of 5	1.00	12666	Cover—Reproducer cover—(Model 8K11)	.65
12070	Resistor—18,000 ohms—Carbon type—1/10 watt—(R30, R31)—Package of 5	.75	12698	Crystal—Station selector escutcheon and crystal—(Model 8T2)	1.02
5033	Resistor—33,000 ohms—Carbon type—1 watt—(R17)—Package of 5	1.10	13303	Crystal—Station selector escutcheon and crystal—(Model 8T11 or 8K11)	1.50
11322	Resistor—39,000 ohms—Carbon type—1/4 watt—(R12)—Package of 5	1.00	11276	Escutcheon—Tuning tube escutcheon—(Model 8T2)	.40
11365	Resistor—82,000 ohms—Carbon type—1/4 watt—(R14)—Package of 5	1.00	13275	Escutcheon—Tuning tube escutcheon (Model 8T11 or 8K11)	.25
3118	Resistor—100,000 ohms—Carbon type—1/4 watt—(R5)—Package of 5	1.00	11347	Knob—Range switch, tone control or volume control knob—Package of 5 (Model 8T2)	.75
11453	Resistor—270,000 ohms—Carbon type—1/10 watt—(R15)—Package of 5	.75	11610	Knob—Station selector knob—includes one large and one small knob—Package of 5—(Model 8T2)	1.00
			13304	Knob—Large station selector knob—Model 8T11 only—Package of 5	.75
			13393	Knob—Large station selector knob—Model 8K11 only—Package of 5	.80
			13305	Knob—Small (Vernier) Station selector knob—Model 8T11 only—Package of 5	.80
			13396	Knob—Small (Vernier) Station selector knob—Model 8K11 only—Package of 5	.75
			13396	Knob—Tone control, volume control or range switch knob—Model 8T11 only—Package of 5	.80
			13278	Knob—Tone control, volume control or range switch knob—Model 8K11 only—Package of 5	.80
			11210	Screw—Chassis mounting screw assembly for console model only—Package of 4	.28
			11377	Screw—Chassis mounting screw assembly for table model only—Package of 4	.12
			4982	Spring—Retaining spring for large knob Set No. 11610, 1304 and 13395—Package of 10	.50
			11349	Spring—Retaining spring for knob Set No. 11376, 1305, 1306, 1396 and small knob in Set No. 11610—Package of 5	.25

The prices quoted above are subject to change without notice.

MODELS 8T2, 8T11, 8K11
Schematic, Socket
Phono. Data

RCA MFG. CO., INC.

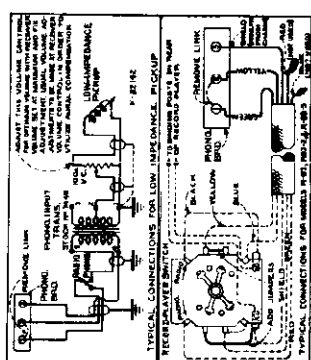


Intermediate Frequency ... 460 kc

Pilot Lamps (3)
Mazda No. 46, 6.3 volts; 0.25 amp

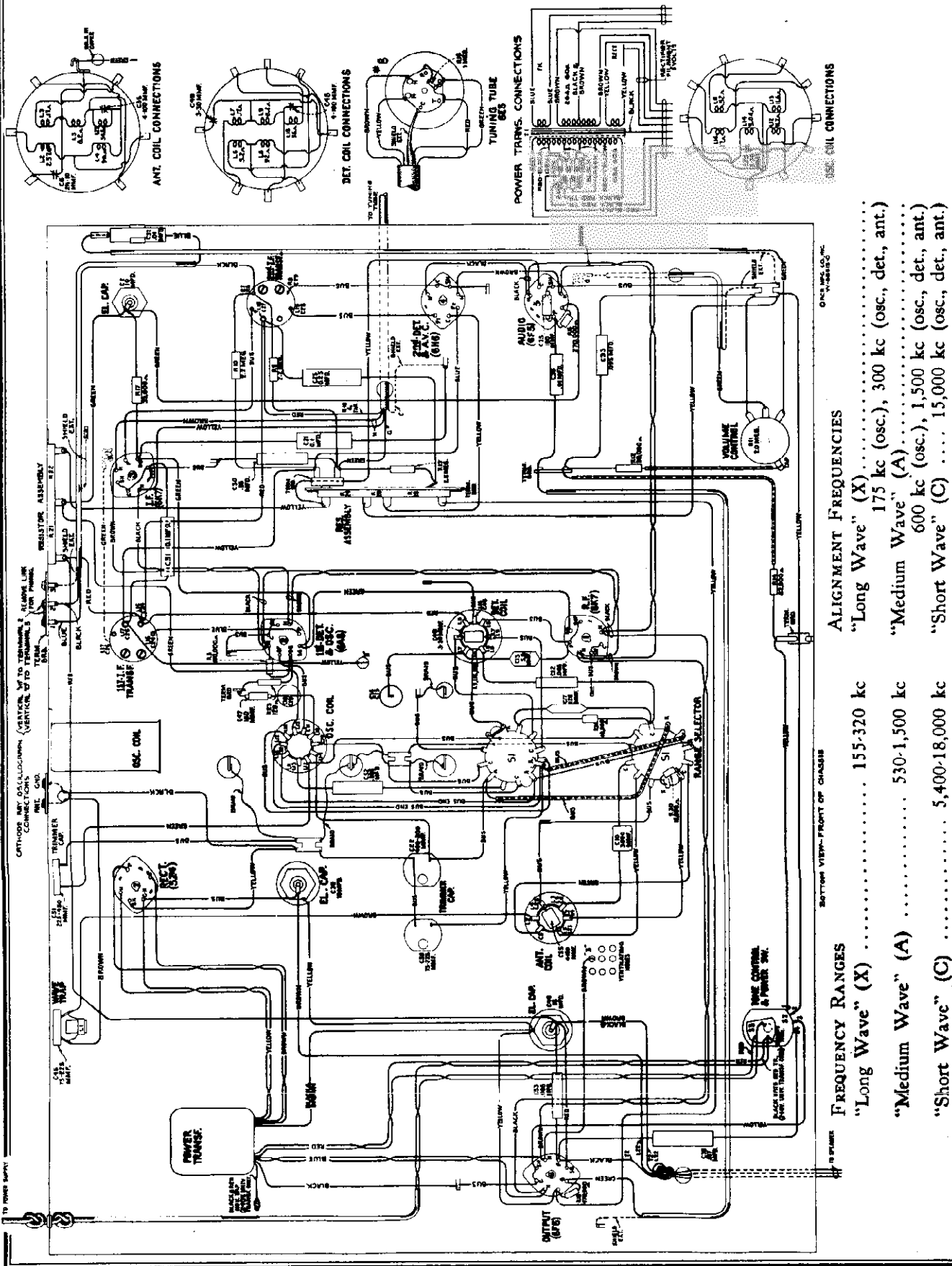
TYPE	L-1	L-2	L-3	L-4	L-5	L-6	L-7	L-8
70-50-1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
70-50-2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
70-50-3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
70-50-4	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Figure 5—Lowspeaker Wiring
Coil resistances type RL70-1, same as RL63-4



MODELS 8T2, 8T11, 8K11
Chassis Wiring

RCA MFG. CO., INC.



FREQUENCY RANGES	ALIGNMENT FREQUENCIES
"Long Wave" (X)	"Long Wave" (X)
155-320 kc	175 kc (osc.), 300 kc (osc., det., ant.)
"Medium Wave" (A)	"Medium Wave" (A)
530-1,500 kc	600 kc (osc.), 1,500 kc (osc., det., ant.)
"Short Wave" (C)	"Short Wave" (C)
5,400-18,000 kc	15,000 kc (osc., det., ant.)

RCA MFG. CO., INC.

MODEL S 8T2, 8T11, 8K
Voltage, Resistance
Trimmers

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycles, 100 watt
Rating B	105-125 volts, 25-60 cycles, 105 watt
Rating C	100-130/140-160/195-250 volts, 40-60 cycles, 100 watt

POWER OUTPUT RATING

Undistorted	2 1/4 watts
Maximum	5 watts

LOUDSPEAKER

Type	Electrodynami
Voice Coil Impedance	2.25 ohms at 400 cycle

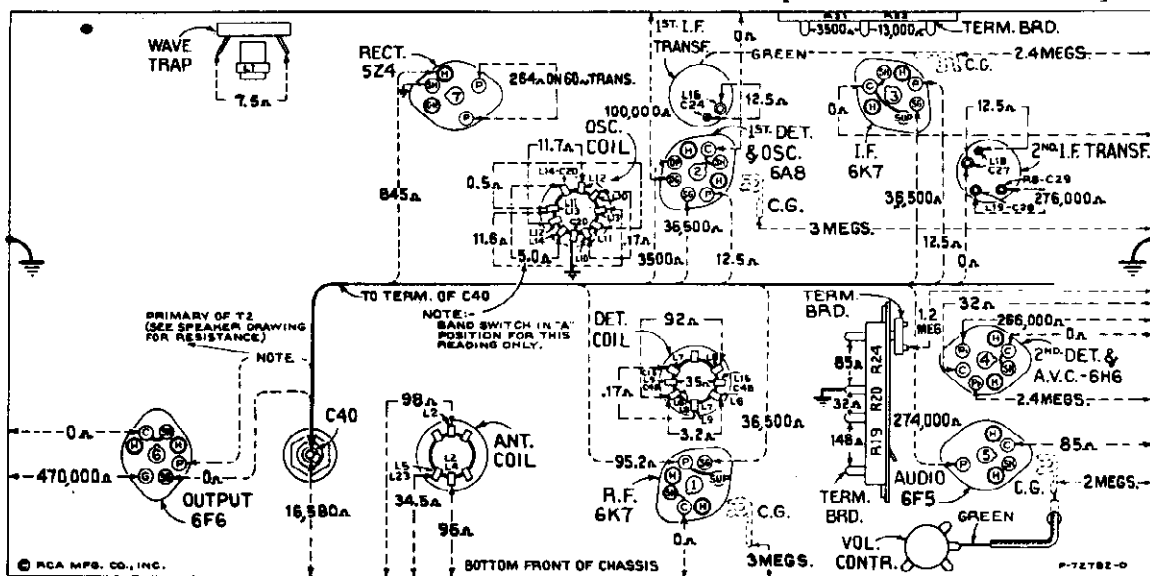


Figure 4—Resistance Diagram

Power supply disconnected—Radiotrons in sockets—Tuning condenser in full-mesh—Range selector in "Long wave" position—Volume control maximum—Power switch—Tone in "OFF" position

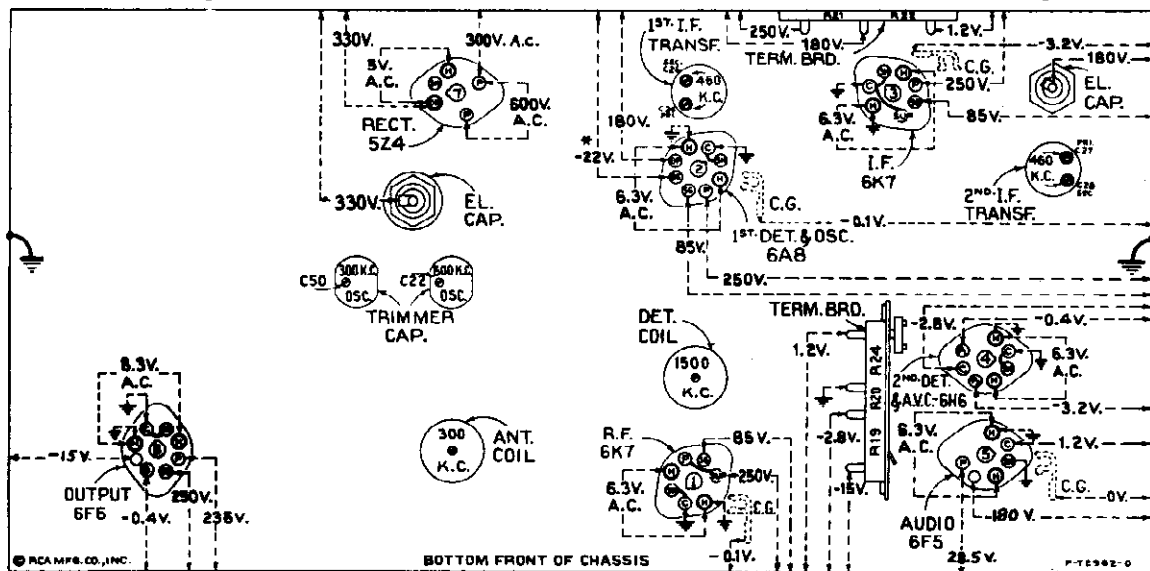


Figure 6—Radiotron Socket Voltages, Coil, and Trimmer Locations

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc—No signal being received—Volume control minimum—Power switch—Tone full clockwise

Radiotron Cathode Current Readings
Measured with Milliammeter Connected at Tube Socket Cathode Terminals under Conditions Similar to Those of Voltage Measurements

(1) RCA-6K7—R-F	12.5 ma.
(2) RCA-6A8—Det.-Osc.	13.8 ma.

(3) RCA-6K7—I.F.	9.0 ma.
(4) RCA-6H6—2nd Det.-A.V.C.	0.25
(5) RCA-6F5—Audio	0.25 ma.
(6) RCA-6F6—Power	40.0 ma.
(7) RCA-5Z4—Rect.	90.0 ma.*
(8) RCA-6E5—Eye	3.0 ma.

(* Cannot be measured at socket.)

MODEL S 8T2, 8T11, 8K11
Circuit Data, Alignment
Transformer Wiring

RCA MFG. CO., INC.

"Medium Wave" Band

(e) Change the receiver range selector to its "Medium wave." (A) band position and set the receiver tuning control to a dial reading of 1,500 kc. Turn the test oscillator to 1,500 kc and regulate its output to produce a slight indication on the receiver output indicating device.

(f) Adjust the high-frequency trimmers of the oscillator, detector, and antenna coils, C20, C49 and C6 respectively, to the points at which each produces maximum indicated receiver output.

(g) Shift the test-oscillator frequency to 600 kc and tune the receiver to pick up this signal, disregarding the dial reading at which it is best received.

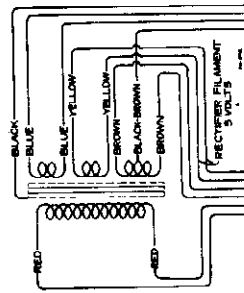
(h) Adjust the low-frequency trimmer C22 of the oscillator coil, simultaneously rocking the tuning control of the receiver backward and forward through the signal, until maximum indicated receiver output results from these combined operations. The adjustment of C19, C15 and C8 should be corrected at 15,000 kc as in (b), (c), and (d); also C20, C49 and C6 should be corrected at 1,500 kc, as in (f) to compensate for any changes caused by the adjustment of the low-frequency oscillator coil trimmer C22.

"Long Wave" Band

(i) Change receiver band selector to "Long wave" (X) band and set receiver tuning control to a dial reading of 300 kc. Tune test oscillator to 300 kc and adjust oscillator, detector, and antenna trimmers C30, C48 and C55, respectively, for maximum indicated receiver output.

(j) Set receiver to 175 kc and tune test oscillator to 175 kc. Adjust trimmer C31 for maximum indicated output, simultaneously rocking tuning control of the receiver backward and forward through the signal.

(k) The adjustment of C30, C48 and C55 should now be repeated at 300 kc as described in (i) to compensate for any changes caused by the adjustment of the low-frequency trimmer C31.



D. C. Resistance Values
110 volts, 50-60 cycles • 110 ohms, 25 cycles
Primary, 5.34 ohms
Secondary, 330 ohms
Secondary, 430 ohms

Figure 7—Standard Transformer

the output of the test oscillator until a slight indication is apparent on the output indicator. Adjust the two trimmers C28 and C27 of the second i-f transformer to produce maximum (peak) indicated receiver output. Then, adjust the two trimmers, C26 and C24, of the first i-f transformer for maximum (peak) receiver output as shown by the indicating device. During these adjustments, regulate the test oscillator output so that the receiver output indication is always as low as possible. By doing so, broadness of tuning, due to a v.c., action will be avoided. It is advisable to repeat the adjustment of all i-f trimmers a second time to assure that the inter-actment between them has not disturbed the original adjustment.

R-F Trimmer Adjustments

The eleven trimmers associated with the r.f. first detector, and oscillator tuned circuits have their locations shown by figures 3 and 5. The three trimmers which are at all times directly in shunt with the variable tuning condensers necessitate that the "Short wave" (C) band be aligned first. The range selector switch should, therefore, be turned to its "Short wave" position for the first adjustments. Leave the output indicator connected to the output system.

Calibrate the dial by rotating the tuning control until the variable condenser plates are in their full-mesh (maximum capacity) position and adjust the dial pointer so that its end points to the horizontal graduation (520 kc) at the low-frequency end of the "Medium wave" (A) dial scale.

Wave-Trap Adjustment

Connect the test oscillator to the antenna and ground terminals of the receiver, leaving it tuned to 460 kc. Adjust the wave-trap trimmer C45 for maximum suppression of the 460 kc signal. An increase in test-oscillator output may be necessary before the point of minimum output (maximum suppression of signal) is obtained.

"Short Wave" Band

(a) Adjust the test oscillator to 15,000 kc and set the receiver tuning control to a dial reading of 15,000 kc.

(b) Adjust trimmer C19 on the oscillator section of the variable condenser to the point at which it produces maximum indicated receiver output. Two points may be found, each of which produces such a maximum. The one of maximum trimmer capacitance is correct and should be used. The local (heterodyne) oscillator will be 460 kc below the signal frequency at this adjustment point.

(c) Adjust trimmer C15 of the detector section of the variable condenser, simultaneously rocking the receiver tuning control backward and forward through the 15,000 kc input signal, until maximum receiver output results from these combined operations.

(d) With the receiver tuning control set to 15,000 kc adjust trimmer C8 on the antenna section of the variable condenser to the point which produces maximum (peak) indicated receiver output.

accurately tuned to the incoming signal. This tube consists of an amplifier section and a cathode-ray section built in the same glass envelope. Correct tuning of the receiver to the incoming carrier is evidenced by the minimum width of the dark sector of the tuning tube.

Rectifier

The power required for operation of this receiver is supplied through transformer T1. This transformer has an efficient electrostatic shield between its primary and secondary windings. This shield prevents interference which is on the power-supply circuit from entering the receiver and conversely reduces the tendency of the receiver to re-radiate into the power circuit. An RCA-5Z4 furnishes the d.c. voltages necessary for plate, screen, cathode, and grid potentials. The field winding of the loudspeaker is used as a reactor in the filter circuit from which it simultaneously receives its magnetizing current.

Alignment Procedure

Precise alignment is vital to the proper functioning of this receiver. There are four trimming adjustments provided in the i-f system, five in the oscillator coil system, three in the detector coil system, and three in the antenna coil system. Each of these trimmers has been accurately adjusted during manufacture and should remain properly aligned unless affected by abnormal conditions of climate or have been altered for service purposes. Incorrect alignment is usually evidenced by a loss of sensitivity, improper tone quality, and poor selectivity. These indications will generally be present together.

The correct performance of these receivers can only be obtained when the alignment is performed with adequate and reliable test apparatus and in the sequence given. The manufacturer of these instruments has a complete assortment of such service equipment available for sale through its dealers and distributors.

A test oscillator (signal generator) is required as a source of the specified alignment frequencies. Visual indication of the receiver output during the adjustments is necessary to enable the serviceman to obtain an accuracy of alignment which is not possible by listening to the signal. The RCA Stock No. 9395 Full-Range Test Oscillator and the RCA Stock No. 4317 Neon Output Indicator are especially suitable and fulfill the above requirements.

The following procedure should be adhered to in adjusting the various trimmer capacitors.

I-F Trimmer Adjustments

The four trimmers of the two i-f transformers are located as shown by figure 6. Each must be aligned to a basic frequency of 460 kc. To do this, attach the output indicator across the voice-coil circuit. Attach the receiver chassis to a good external ground. Connect the output of the test oscillator between the control-grid of the RCA-6A8 first-detector tube and chassis-ground through a .001 mfd. capacitor. Tune the test oscillator to 460 kc. Advance the receiver volume control to its full-on position and adjust the receiver tuning control to a point where no interference is encountered from broadcast stations, or short stator of oscillator tuning capacitor C18 to chassis eliminating local oscillator signals. Increase

The conventional Superheterodyne type of circuit, consisting of an r-f stage, a combined first-detector-oscillator stage, a single i-f stage, a diode-detector-automatic-volume-control stage, an audio voltage-amplifier stage, an audio power-output stage, and a high-voltage rectifier power-supply stage is used.

Tuned Circuit

The antenna coil system and the detector coil system each consist of two series-connected primary and three series-connected secondary windings to provide three ranges of tuning. The oscillator coil system is wound on a single form. A range selector switch (S1) is used for connecting the various sections of these three coil systems into the circuit to provide operation on the band desired. The coils are tuned by a variable three-section gang condenser having trimmer capacitors in shunt with each section. There are additional trimmer capacitors across the section of each coil used for the "Medium wave" (A) band as well as the "Long wave" (X) band. A series trimmer is also associated with the "Medium wave" (A) and "Long wave" (X) band oscillator coils.

The intermediate-frequency amplifier system consists of an RCA-6K7 in a transformer-coupled circuit. This stage operates at a basic frequency of 460 kc. Each winding of both i-f transformers (input and output) is tuned by an adjustable trimmer.

Detector and A.V.C.

The modulated signal as obtained from the output of the i-f stage is detected by an RCA-6H6 twin-diode tube (No. 1 di de). The audio frequency secured by this process is transferred to the a-f system for amplification and final reproduction. The d.c. voltage which results from detection of the signal is used for automatic volume control. This voltage, which develops across resistor R8, is applied as automatic control-grid bias to the r-f, first-detector, and i-f tubes through a suitable resistance filter circuit. The No. 2 diode of the RCA-6H6 is used to supply residual bias for the controlled tubes under conditions of little or no signal. This diode, under such conditions, draws current which flows through resistors R10 and R8, thereby maintaining the desired minimum operating bias on such tubes. On application of signal energy above a certain level, however, the auxiliary bias-diode ceases to draw current and the a.v.c. diode takes over the biasing function.

Audio System

The manual volume control consists of an acoustically tapered potentiometer in the audio circuit between the output of the detector diode and the input grid of the audio-voltage-amplifier tube. This control has a tone compensating filter connected to it so that the correct aural balance will be obtained at different volume settings.

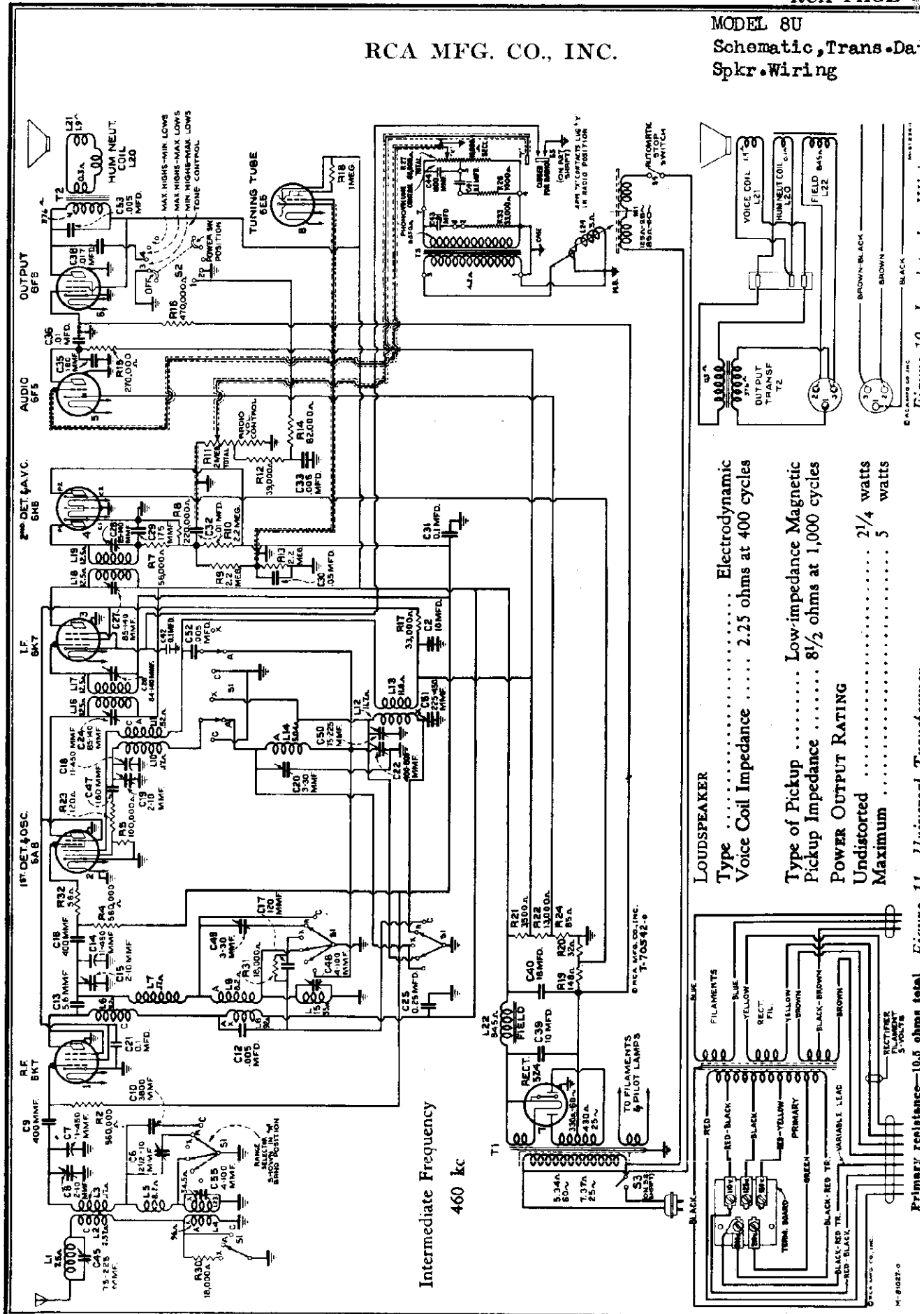
Resistance-capacitance coupling is used between the first-audio stage and the power-output stage. The output of the power amplifier is transformer-coupled into the dynamic loudspeaker. High-frequency tone control is effected by a capacitor across the plate circuit of the output tube. Speech-music control is effected by a resistor connected to the compensated volume control circuit. Control of tone is obtained by means of the switch (S').

"Magic Eye"

An RCA-6E5 cathode-ray tuning tube is used as a means of visually indicating when the receiver is

RCA MFG. CO., INC.

MODEL 8U
Schematic, Trans. Da.
Spkr. Wiring



Intermediate Frequency
460 kc

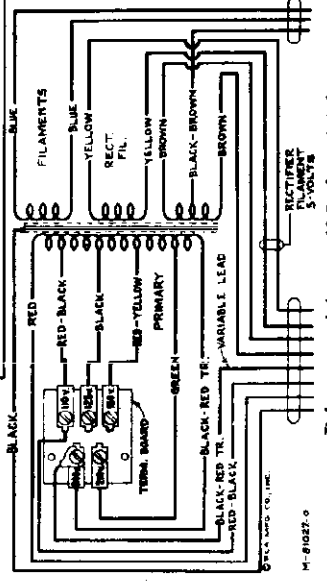
LOUDSPEAKER

Type Electrodynamic
Voice Coil Impedance 2.25 ohms at 400 cycles

Type of Pickup Low-impedance Magnetic
Pickup Impedance 8 1/2 ohms at 1,000 cycles

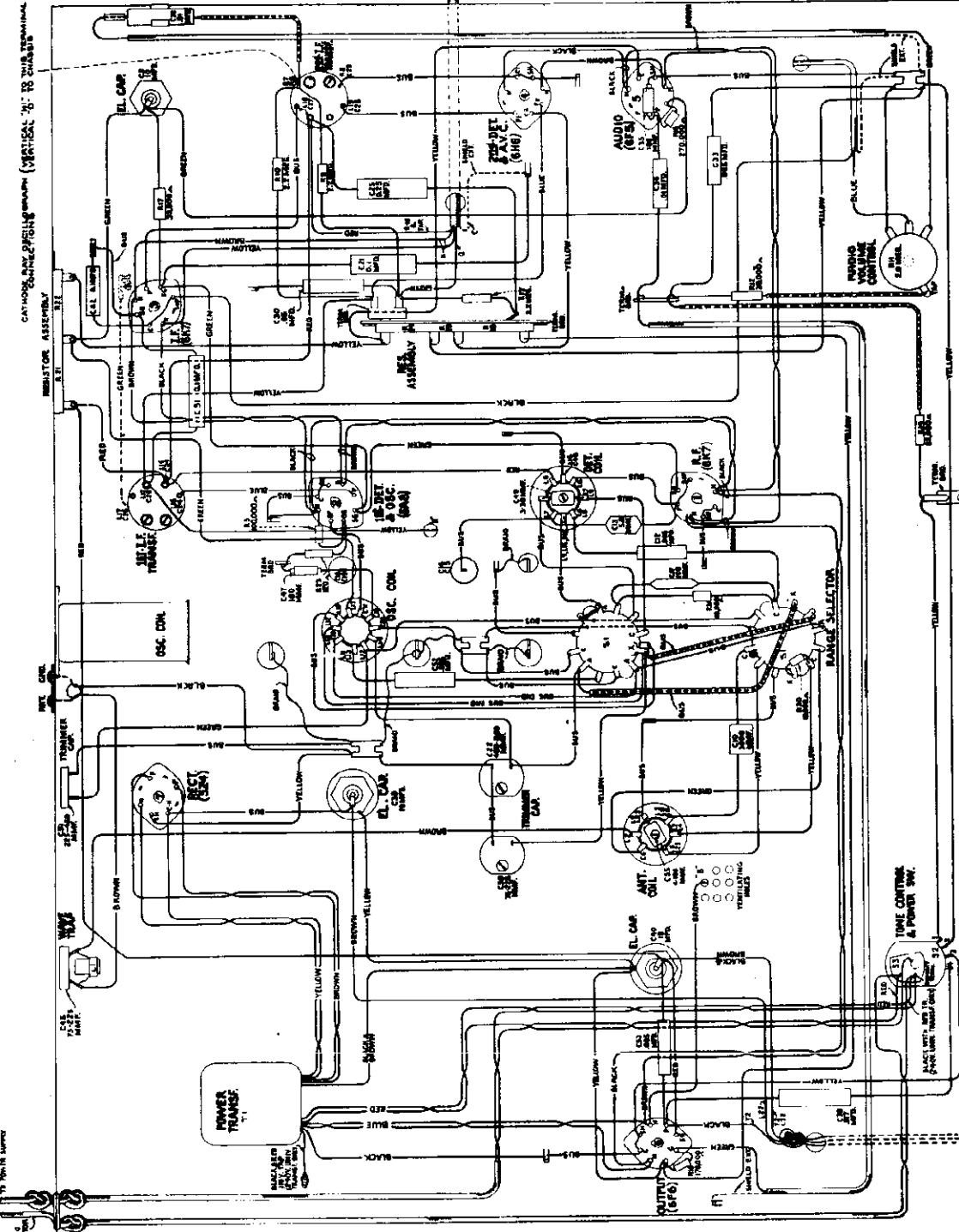
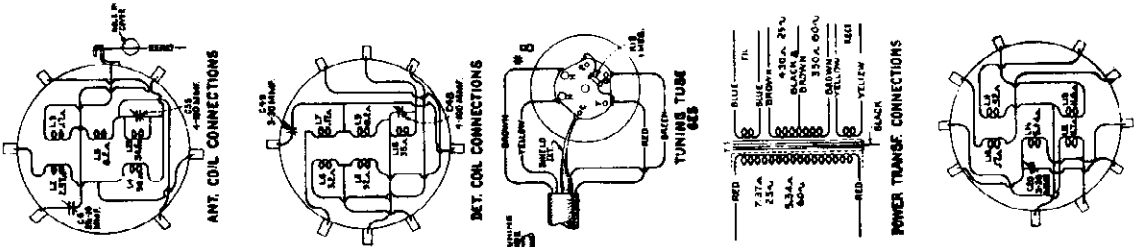
POWER OUTPUT RATING

Undistorted 2 1/4 watts
Maximum 5 watts



MODEL 8U
Chassis Wiring

RCA MFG. CO., INC.



CATHODE AND SPRING WIRING (VERTICAL 'W' IS CONTINUING)

TO POWER SUPPLY

OPTIONAL LINE PORT OF CARRIER

TO TUNING TUBE #6S

TO TUNING TUBE #6S

TO TUNING TUBE #6S

TO TUNING TUBE #6S

TO TUNING TUBE #6S

FREQUENCY RANGES	ALIGNMENT FREQUENCIES
"Long Wave" (X)	"Long Wave" (X)
"Medium Wave" (A)	"Medium Wave" (A)
"Short Wave" (C)	"Short Wave" (C)

155-320 kc	175 kc (osc.), 300 kc (osc., det., ant.)
530-1,500 kc	600 kc (osc.), 1,500 kc (osc., det., ant.)
5,400-18,000 kc	15,000 kc (osc., det., ant.)

RCA MFG. CO., INC.

MODEL 8U
Voltage, Resistance
Socket, Trimmers

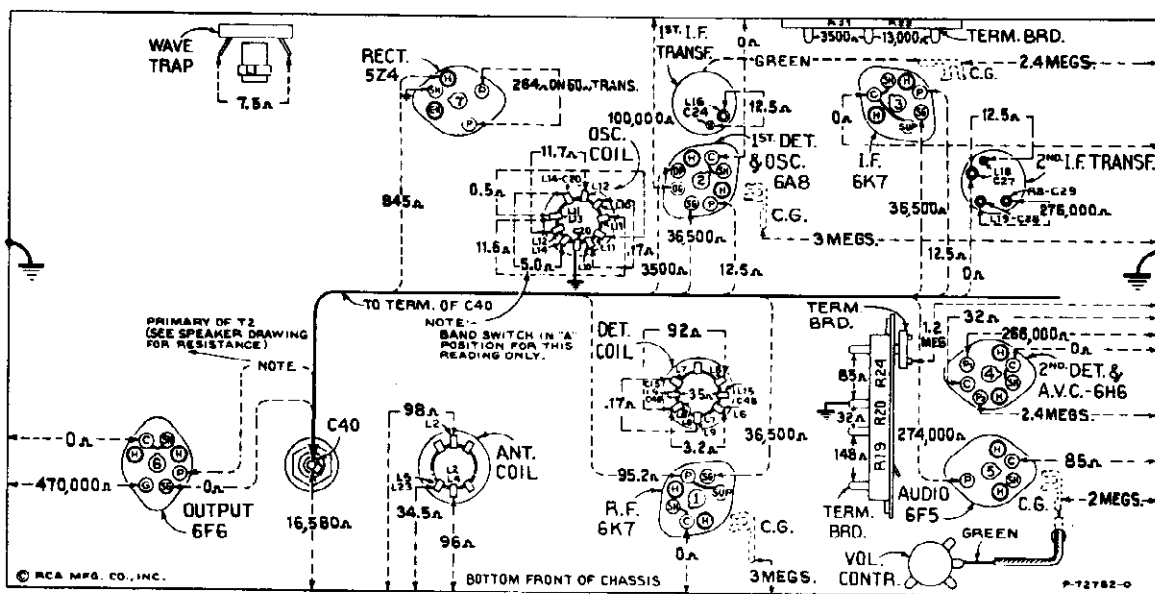
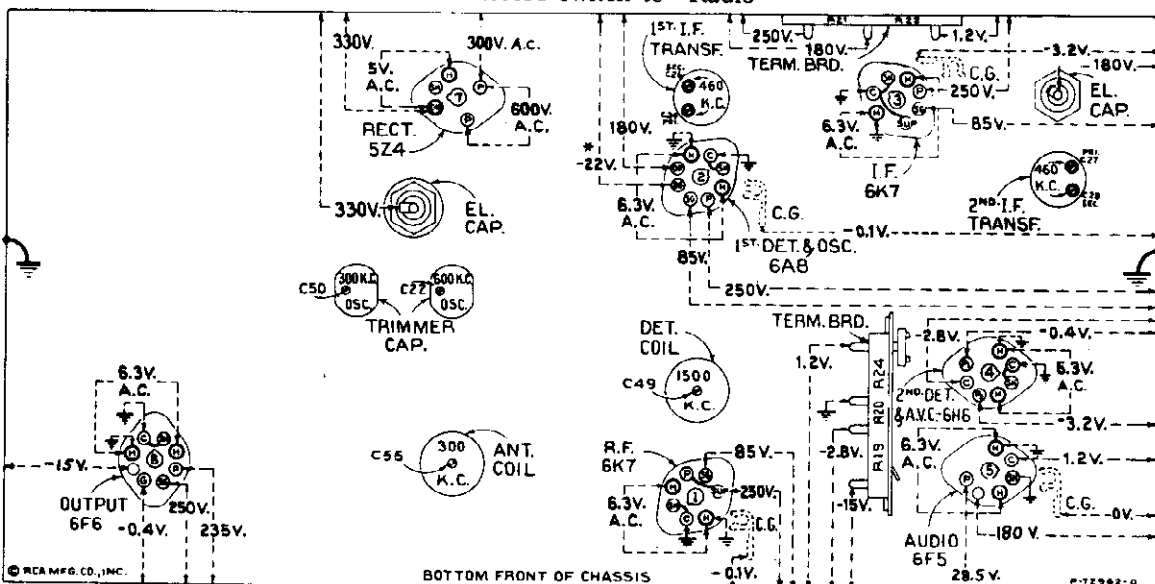


Figure 4—Resistance Diagram

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc—No signal being received—Volume control minimum—Power switch—Tone full clockwise—Radio—Record switch to "Radio"

Power supply disconnected—Radiotrons in sockets—Tuning condenser in full-mesh—Range selector "Long wave" position—Volume control maximum—Power switch—Tone in "OFF" position—Radio—Record switch to "Radio"



Radiotron Cathode Current Readings
 Measured with Milliammeter Connected at Tub Socket Cathode Terminals under Conditions Similar to Those of Voltage Measurements

(1)	RCA-6K7—R-F	12.5 ma.
(2)	RCA-6A8—Det.-Osc.	13.8 ma.
(3)	RCA-6K7—I.F.	9.0 ma.
(4)	RCA-6H6—2nd Det.-A.V.C.	—
(5)	RCA-6F5—Audio	0.25 ma.
(6)	RCA-6F6—Power	40.0 ma.
(7)	RCA-5Z4—Rect.	90.0 ma.*
(8)	RCA-6E5—Eye	3.0 ma.

(* Cannot be measured at socket.)

Diagram showing the locations of the radiotrons and their current measurement points:

- 1: 6K7 (R-F)
- 2: 6A8 (Det.-Osc.)
- 3: 6K7 (I.F.)
- 4: 6H6 (2nd Det.-A.V.C.)
- 5: 6F5 (Audio)
- 6: 6F6 (Power)
- 7: 5Z4 (Rect.)
- 8: 6E5 (Eye)

 Notes include: "© RCA MFG. CO., INC. P-72782-0".

MODEL 8U
Phono.Wiring
Motor Details

RCA MFG. CO., INC.

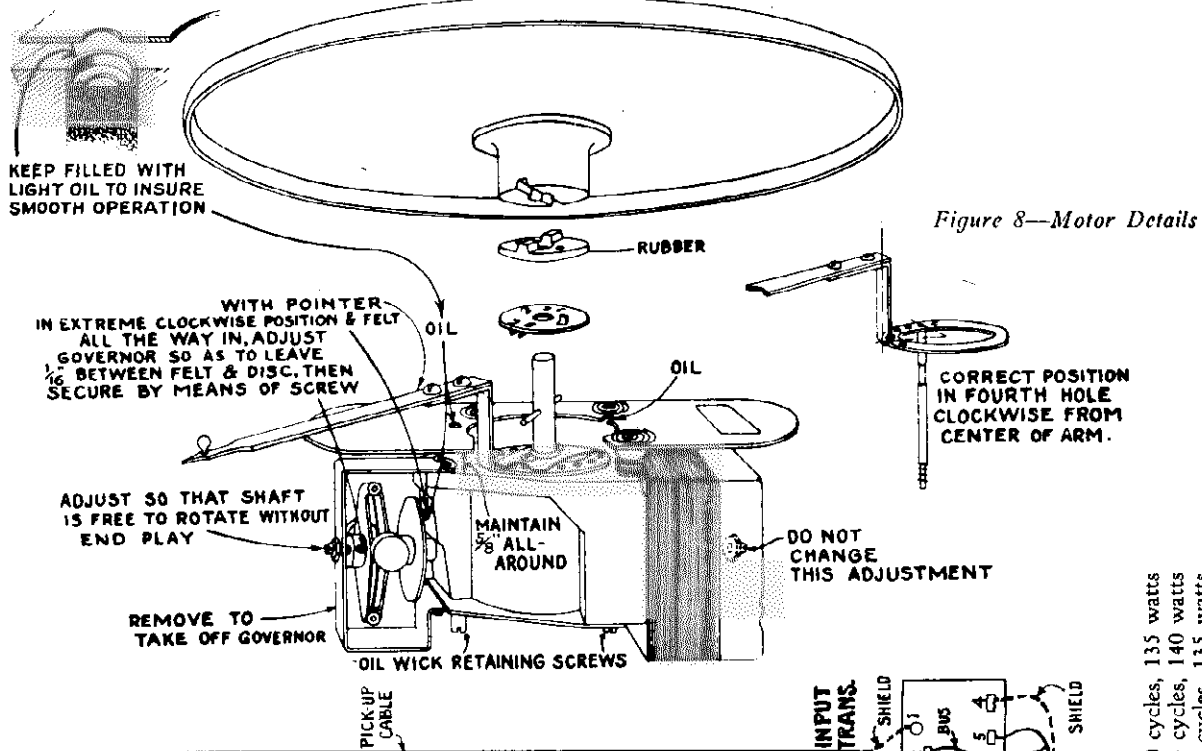


Figure 8—Motor Details

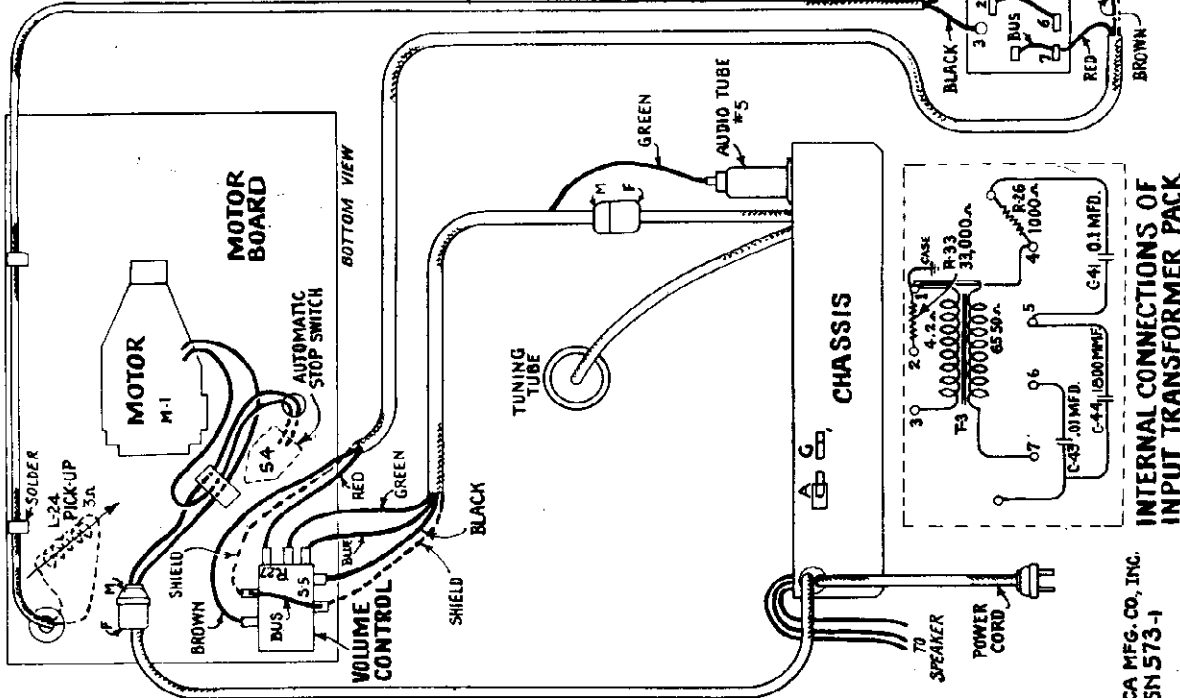
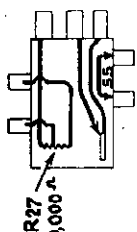


Figure 6—Assembly Wiring



INTERNAL CONNECTIONS OF PHONOGRAPH VOLUME CONTROL

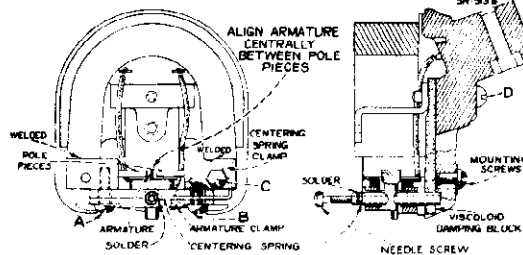


Figure 7—Details of Pickup

RCA MFG. CO., INC.
SN 573-1

INTERNAL CONNECTIONS OF INPUT TRANSFORMER PACK

POWER SUPPLY RATING	105-125 volts, 50-60 cycles, 135 watts
Rating A	105-125 volts, 25 cycles, 140 watts
Rating B	100-130/140-160/195-250 volts, 50-60 cycles, 135 watts
Rating C	

RCA MFG. CO., INC.

which are at all times directly in shunt with the variable tuning condensers necessitate that the "Short wave" (C) band be aligned first. The range selector switch should, therefore, be turned to its "Short wave" position for the first adjustments. Leave the output indicator connected to the output system.

Calibrate the dial by rotating the tuning control until the variable condenser plates are in their full mesh (maximum capacity) position and adjust the dial pointer so that its end points to the horizontal graduation (520 kc) at the low-frequency end of the "Medium wave" (A) dial scale.

"Wave-Trap" Adjustment

Connect the test oscillator to the antenna and ground terminals of the receiver, leaving it tuned to 460 kc. Adjust the wave-trap trimmer C45 for maximum suppression of the 460 kc signal. An increase in test-oscillator output may be necessary before the point of minimum output (maximum suppression of signal) is obtained.

"Short Wave" Band

- (a) Adjust the test oscillator to 15,000 kc and set the receiver tuning control to a dial reading of 15,000 kc.
- (b) Adjust trimmer C19 on the oscillator section of the variable condenser to the point at which it produces maximum indicated receiver output. Two points may be found, each of which produces such a maximum. The one of maximum trimmer capacitance is correct and should be used. The local (heterodyne) oscillator will be 460 kc below the signal frequency at this adjustment point.
- (c) Adjust trimmer C15 of the detector section of the variable condenser, simultaneously rocking the receiver tuning control backward and forward through the 15,000 kc input signal, until maximum receiver output results from these combined operations.
- (d) With the receiver tuning control set to 15,000 kc adjust trimmer C8 on the antenna section of the variable condenser to the point which produces maximum (peak) indicated receiver output.

"Medium Wave" Band

- (e) Change the receiver range selector to its "Medium wave" (A) band position and set the receiver tuning control to a dial reading of 1,500 kc. Tune the test oscillator to 1,500 kc and regulate its output to produce a slight indication on the receiver output indicating device.
- (f) Adjust the high-frequency trimmers of the oscillator, detector, and antenna coils, C20, C49, and C5 respectively, to the points at which each produces maximum indicated receiver output.
- (g) Shift the test-oscillator frequency to 600 kc and tune the receiver to pick up this signal, disregarding the dial reading at which it is best received.
- (h) Adjust the low-frequency trimmer C22 of the oscillator coil, simultaneously rocking the tuning control of the receiver backward and forward through the signal, until maximum indicated receiver output results from these combined operations. The adjustment of C19,

quence given. The manufacturer of this instrument has a complete assortment of such service equipment available for sale through its dealers and distributors. Two methods of alignment are applicable. One method requires the cathode-ray oscilloscope, while the other requires a voltmeter or glow-type indicator. The oscilloscope method is advantageous in that the indication is in the form of a wave-image which represents the resonance characteristic of the tuned circuits. Alignment by this method should be performed with equipment such as an RCA Stock No. 9545 Cathode-Ray Oscilloscope and an RCA Stock No. 9558 Frequency Modulator. For the output indicator method an instrument such as an RCA Stock No. 4317 should be used. Either of the above methods requires a reliable test oscillator for the source of alignment frequencies such as the RCA Stock No. 9595 Test Oscillator. Cathode-ray alignment is similar to the output indicator alignment outlined below, except as follows: The frequency modulator should be used to sweep the test oscillator signal when aligning the i-f amplifier and the low-frequency oscillator series trimmers. It will only be necessary to first adjust the trimmers to peak response, as outlined below, without the frequency modulator connected. Then, interconnect the test oscillator with the frequency modulator and re-tune the test oscillator (increase frequency) until the forward and reverse curves coincide at their highest points. Next, adjust the trimmers until the curves coincide through-out their length and have maximum amplitude. The proper place for connection of the oscilloscope input to the receiver is indicated on the Chassis Wiring Diagram (figure 3). The high-frequency trimmer on all three bands should be adjusted for maximum (peak) amplitude of the image.

I-F Trimmer Adjustments

The four trimmers of the two i-f transformers are located as shown by figure 5. Each must be aligned to the basic frequency of 460 kc. To do this, attach the output indicator across the voice-coil circuit. Attach the receiver chassis to a good external ground. Connect the output of the test oscillator between the control-grid of the RCA-6A8 first-detector tube and chassis-ground through a .001 mfd. capacitor. Tune the test oscillator to 460 kc. Advance the receiver volume control to its full-on position and adjust the receiver tuning control to a point where no interference is encountered from broadcast stations or short station of oscillator tuning capacitor C18 to chassis eliminating local oscillator signals. Increase the output of the test oscillator until a slight indication is apparent on the output indicator. Adjust the two trimmers, C28 and C27 of the second i-f transformer to produce maximum (peak) indicated receiver output. Then, adjust the two trimmers, C25 and C24, of the first i-f transformer for maximum (peak) receiver output as shown by the indicating device. During these adjustments, regulate the test-oscillator output so that the receiver output indication is always as low as possible. By doing so, broadcast tuning, due to a.v.c., action will be avoided. It is advisable to repeat the adjustment of all i-f trimmers a second time to assure that the inter-connection between them has not disturbed the original adjustment.

R-F Trimmer Adjustments

The eleven trimmers associated with the r-f, first detector, and oscillator tuned circuits, have their locations shown by figures 1 and 5. The three trimmers

they are applied to the grid of the RCA-6E5 audio amplifier stage through the compensated phonograph volume control R27. This phonograph volume control also incorporates switches for transferring from mono to record reproduction. In the radio position, arm "X" of the phonograph volume control contacts radio volume control R11 to the grid of the RCA-6E5 audio amplifier; also, switch S5 closes which completes the cathode circuit of the RCA-6K7 i-f amplifier stage. In the phonograph position, switch S5 opens and arm "X" of the phonograph volume control disconnects from lug "1" and moves onto the phonograph volume control resistance as shown by figure 2.

"Magic Eye"

An RCA-6E5 cathode-ray tuning tube is used as a means of visually indicating when the receiver is accurately tuned to the incoming signal. This tube consists of an amplifier section and a cathode-ray section built in the same glass envelope. Correct tuning of the receiver to the incoming carrier is evidenced by the minimum width of the dark sector of the tuning tube.

Rectifier

The power required for operation of this receiver is supplied through transformer T1. This transformer has an efficient electrostatic shield between its primary and secondary windings. This shield prevents interference which is on the power-supply circuit from entering the receiver and conversely reduces the tendency of the receiver to re-radiate into the power circuit. An RCA-5Z4 furnishes the d-c voltages necessary for plate, screen, cathode, and grid potentials. The field winding of the loudspeaker is used as a reactor in the filter circuit from which it simultaneously receives its magnetizing current.

Phonograph Mechanism

An improved manually-operated phonograph mechanism is used in this model. The 12-inch turntable will accommodate either the 10-inch or the 12-inch phonograph records. The turntable rotates at a speed of 78 r.p.m. A speed regulator is provided for accurate adjustment of this speed. It is important that a machine of any particular rating be operated at the frequency and voltage for which it is rated. Attempts to operate at ratings other than specified for the particular instrument may result in damage to both the phonograph motor and the radio receiver. An automatic switch is provided to turn "off" the phonograph motor at the completion of record play when the eccentric-type inside groove record is used.

Alignment Procedure

Precise alignment is vital to the proper functioning of this receiver. There are four trimming adjustments provided in the i-f system, five in the oscillator coil system, three in the detector coil system, and three in the antenna coil system. Each of these trimmers has been accurately adjusted during manufacture and should remain properly aligned unless affected by abnormal conditions of climate or have been altered for service purposes. Incorrect alignment is usually evidenced by loss of sensitivity, improper tone quality, and poor selectivity. These indications will generally be present together.

The correct performance of this receiver can only be obtained when the alignment is performed with adequate and reliable test apparatus and in the se-

The conventional superheterodyne type of circuit consisting of an r-f stage, a combined first-detector-oscillator stage, a single i-f stage, a diode-detector-amplifier-volume-control stage, an audio voltage-reducer stage, an audio power-output stage, and a tuning indicator "Magic Eye" stage, is used.

Tuned Circuits

The antenna coil system and the detector coil system each consist of two series-connected primary and three series-connected secondary windings to provide the three ranges of tuning. The oscillator coil system is wound on a single form. A range selector switch (S1) is used for connecting the various sections of these three coil systems into the circuit to provide operation on the band desired. The coils are tuned by a variable three-section gang condenser having trimmer capacitors in shunt with each section. There are additional trimmer capacitors across the section of each coil used for the "Medium wave" (A) band as well as the "Long wave" (X) band. A series trimmer is also associated with the "Medium wave" (A) and "Long wave" (X) band oscillator coils.

The intermediate-frequency amplifier system consists of an RCA-6K7 in a transformer-coupled circuit. This stage operates at a basic frequency of 460 kc. Each winding of both i-f transformers (input and output) is tuned by an adjustable trimmer.

Detector and A.V.C.

The modulated signal as obtained from the output of the i-f stage is detected by an RCA-6H6 twin-diode tube (No. 1 diode). The audio frequency secured by this process is transferred to the a-f system for amplification and final reproduction. The d-c voltage which results from detection of the signal is used for automatic volume control. This voltage, which develops across resistor R8, is applied as automatic control bias to the r-f, first-detector, and i-f tubes through a suitable resistance filter circuit. The No. 2 diode of the RCA-6H6 is used to supply residual bias for the controlled tubes under conditions of little or no signal. This diode, under such conditions, draws current which flows through resistors R10 and R8, thereby maintaining the desired minimum operating bias on such tubes. On application of signal energy above a certain level, however, the auxiliary bias-diode ceases to draw current and the a.v.c. diode takes over the biasing function.

Audio System

The manual volume control consists of an acoustically tapered potentiometer in the audio circuit between the output of the detector diode and the input grid of the audio-voltage-amplifier tube. This control has a tone compensating filter connected to it so that the correct aural balance will be obtained at different volume settings.

Resistance-capacitance coupling is used between the first-audio stage and the power-output stage. The output of the power amplifier is transformer-coupled into the dynamic loudspeaker. High-frequency tone control is effected by a capacitor across the plate circuit of the output tube. Speech-music control is effected by a resistor connected to the compensated volume control circuit. Control of tone is obtained by means of the switch (S2).

Phonograph Circuit

The electrical impulses generated in the pickup L24 are boosted in the step-up transformer T3, after which

MODEL 8U

Alignment, Page 2
Phono Data, Parts

RCA MFG. CO., INC.

Stock No.	DESCRIPTION	List Price
11394	Foot—Chassis foot assembly—Package of 2	\$0.70
12712	Indicator—Station selector indicator pointer	.22
5228	Lamp—Dial lamp—Package of 5	.70
12718	Mark—Dial Light Diffuser with colored screen	.40
11393	Resistor—Voltage divider resistor—containing one 350 ohm and one 13,000 ohm sections—(R21, R22)	.74
11329	Resistor—Voltage divider resistor—containing one 148 ohm, one 32 ohm and one 85 ohm sections—(R19, R20, R24)	.52
12075	Resistor—50 ohms—Fixed type component—(R23)	.28
12071	Resistor—120 ohms—Carbon type—(R23)	1.00
12070	Resistor—18,000 ohms—Carbon type—1/10 watt—(R30, R31)—Package of 5	.75
5033	Resistor—30,000 ohms—Carbon type—1/10 watt—(R12)	1.10
11322	Resistor—30,000 ohms—Carbon type—1/10 watt—(R12)	1.00
11365	Resistor—82,000 ohms—Carbon type—1/4 watt—(R14)—Package of 5	1.00
3118	Resistor—100,000 ohms—Carbon type—1/4 watt—(R15)—Package of 5	1.00
11453	Resistor—100,000 ohms—Carbon type—1/10 watt—(R15)—Package of 5	.75
11452	Resistor—470,000 ohms—Carbon type—1/10 watt—(R15)—Package of 5	.75
11397	Resistor—560,000 ohms—Carbon type—1/10 watt—(R2, R4)—Package of 5	.75
12013	Resistor—1 megohm—Carbon type—1/10 watt—(R3)	.75
11826	Resistor—2 megohm—Carbon type—1/4 watt—(R9, R10, R13)—Package of 5	1.00
4669	Screw—No. 8-32 set screw for arm Silt	.25
12064	Screw—No. 8-32 set screw for arm Silt	.22
11604	Shield—Antenna or detector coil shield	.24
11390	Shield—Antenna or detector coil shield	.25
12315	Shield—Intermediate frequency transformer shield	.25
12971	Shield—Lamp shield—Package of 5	.25
11222	Shield—Lamp socket shield	.18
11195	Shield—Rectifier shield—(L2, L3, C5, C55)	.15
4839	Shield—Rectifier shield—(L2, L3, C5, C55)	.28
4841	Shield—Rectifier shield—(L2, L3, C5, C55)	.22
11414	Shield—Rectifier shield—(L2, L3, C5, C55)	.20
5170	Shield—Rectifier shield—(L2, L3, C5, C55)	.25
4836	Shield—Rectifier shield—(L2, L3, C5, C55)	.30
11240	Shield—Rectifier shield—(L2, L3, C5, C55)	1.08
11377	Shield—Rectifier shield—(L2, L3, C5, C55)	1.16
12041	Shield—Rectifier shield—(L2, L3, C5, C55)	1.90
12062	Shield—Rectifier shield—(L2, L3, C5, C55)	1.94
12063	Shield—Rectifier shield—(L2, L3, C5, C55)	2.62
12965	Shield—Rectifier shield—(L2, L3, C5, C55)	6.15
4153	Shield—Rectifier shield—(L2, L3, C5, C55)	.48
4573	Shield—Rectifier shield—(L2, L3, C5, C55)	.30
13094	Shield—Rectifier shield—(L2, L3, C5, C55)	1.05
11196	Shield—Rectifier shield—(L2, L3, C5, C55)	.15
11394	Shield—Rectifier shield—(L2, L3, C5, C55)	.15
12849	Shield—Rectifier shield—(L2, L3, C5, C55)	.18
12066	Shield—Rectifier shield—(L2, L3, C5, C55)	.175
11392	Shield—Rectifier shield—(L2, L3, C5, C55)	1.14

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

the pickup has received normal care because the magnet and pole pieces are one unit and the magnetic circuit remains practically closed at all times. When the pickup has been mishandled, subjected to a strong a.c. field, jolted, or dropped, there may be an appreciable loss of magnetic strength, in which case it will be necessary to re-magnetize the entire structure. To do this, it will be necessary to first remove the pickup mechanism from the tone arm, and then remove the magnet assembly. Place the magnet assembly on the poles of a standard pickup magnetizer such as the RCA Stock No. 9549 Pickup Magnetizer and charge the magnet in accordance with the instructions accompanying the magnetizer. It is preferable to check the polarity of the pickup magnet and to re-magnetize it so that the same polarity is maintained.

Loudspeaker

Centering of the loudspeaker voice coil is made in the usual manner with three narrow paper feelers after first removing the front paper dust cover. This may be removed by softening its cement with a very light application of acetone, using care not to allow the acetone to flow down into the air gap. The dust cover should be cemented back in place with ambroid upon completion of adjustment.

Universal Transformer

The transformer used on some models of this receiver is adaptable to several ranges of voltages as given under Rating C of Electrical Specifications. Its schematic and wiring are shown by figure 11. Terminals are provided at the top of the transformer case for changing the primary connections to suit the voltage being used. Note that a 110-volt tap is brought out separately for supplying a phonograph motor.

Stock No.	REPLACEMENT PARTS	List Price
12706	Arm—Arm and hub assembly for operating shunter	\$0.22
13098	Board—Antenna and ground terminal board	.25
5237	Board—Variable tuning condenser mounting tubing assembly—Package of 3	.43
11625	Cable—Radiotron tuning tube cable complete with socket	1.26
11759	Cable—2-conductor shielded volume control cable—complete with 4-contact fitting	.82
12511	Cap—Contact cap—Package of 5	.48
11465	Capacitor—Adjustable trimmer (C22)	.48
11256	Capacitor—Adjustable trimmer (C50)	.48
4953	Capacitor—Adjustable trimmer (C45)	.55
12065	Capacitor—Adjustable trimmer (C51)	.20
12814	Capacitor—50 Mmfd.—(C17)	.20
5116	Capacitor—125 Mmfd.—(C20)	.18
13003	Capacitor—180 Mmfd.—(C33, C47)	.20
11290	Capacitor—400 Mmfd.—(C9, C16)	.25
11621	Capacitor—3,600 Mmfd.—(C10)	.38
4858	Capacitor—005 Mfd.—(C12, C33, C52, C53)	.20
11451	Capacitor—.017 Mfd.—(C38)	.18
11305	Capacitor—.01 Mfd.—(C30)	.18
4858	Capacitor—.01 Mfd.—(C30)	.25

the centering spring-clamp by means of the screw C, allowing the centering spring to remain in the position at which the armature is exactly centered between the pole pieces. With a little practice, the correct adjustment of the armature may be readily obtained. The air gap between the pole pieces and the armature should be kept free from dust, filings, and other such foreign materials which would obstruct the movement of the pickup armature.

Damping Block

The viscoloid block which is attached to the back end of the armature shank serves as a mechanical filter to eliminate undesirable resonances and to cause the frequency response to be uniform. Should it be necessary to replace this damping block, it may be done by removing screw D and the cover support bracket from the mechanism and taking off the old viscoloid block. The surface of the armature which is in contact with the viscoloid should be thoroughly

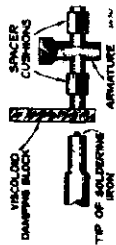


Figure 9—Special Soldering-Iron Tip

cleaned with fine emery cloth. Then insert the new block so that it occupies the same position as it did originally. Make certain that the block is in correct vertical alignment with the armature. The hole in the new viscoloid block is somewhat smaller than the diameter of the armature in order to permit a snug fit. With the viscoloid aligned on the armature, screw D and the cover support bracket should then be replaced. Heat should be applied to the armature (viscoloid side) so that the viscoloid block will fuse at the point of contact and become rigidly attached to the armature. A special-tip soldering iron constructed as shown in figure 9 will be found very useful in performing this operation. The iron should be applied only long enough to slightly melt the block and cause a small bulge on both sides.

Replacing Coil

Whenever there is defective operation due to an open or shorted pickup coil, this coil should be replaced. The method of replacement will be obvious upon inspection of the pickup assembly and by study of the cut-away illustrations. Make sure that the new coil is properly centered with the hole in the support strip and glued securely in that position. It is important to re-adjust the armature as previously explained after re-assembly of the mechanism. Only rosin core solder should be used for soldering the coil leads in the pickup. This same type of solder should be used when necessary for soldering the centering spring to the armature.

Magnetizing

Loss of magnetization will not usually occur when

C13, and C8 should be corrected at 15,000 kc as in (b), (c), and (d); also C20, C49, and C6 should be corrected at 1,500 kc as in (f) to compensate for any changes caused by the adjustment of the low-frequency oscillator coil trimmer C22.

Long Wave Band

- (e) Change receiver hand selector to "Long wave" (X) band and set receiver tuning control to a dial reading of 300 kc. Tune test oscillator to 300 kc and adjust oscillator, detector, and antenna trimmers C50, C48, and C55, respectively, for maximum indicated receiver output.
- (f) Set receiver to 175 kc and tune test oscillator to 175 kc. Adjust trimmer C51 for maximum indicated output, simultaneously rocking tuning control of the receiver backward and forward through the signal.
- (g) The adjustments of C50, C48, and C55 should now be repeated at 300 kc as described in (f) to compensate for any changes caused by the adjustment of the low-frequency trimmer C51.

Phonograph Mechanism

The phonograph motor is of the governor induction type and designed to be simple and foolproof. Under normal operating conditions, service difficulties should be negligible. Occasionally, however, certain adjustments may be required. These adjustments are illustrated and explained in figure 8. Application of oil to the felt pad which rubs against the governor disc will insure smooth operation.

Magnetic Pickup

The pickup used in the phonograph unit is of an improved design. The horseshoe magnet is rigidly welded to the pole pieces and is irremovable. There is a centering spring attached to the armature to maintain proper adjustment and to provide a limiting effect on the movement of the armature. The frequency response is substantially uniform over a wide range. Service operations which may be necessary on the pickup are as follows:

Centering Armature

Refer to figure 7 showing the pickup inner structure. The armature is shown in its proper relation to the magnet pole pieces, i. e., exactly centered. Whenever this centering adjustment has been disturbed, the screws A, B, and C should be loosened and the armature clamp adjusted to the point where the vertical axis of the armature is at right angles to the horizontal axis of the pole pieces, and centered between them. This centering operation may be facilitated by inserting a small rod or nail into the armature needle hole, using it as a lever to test the angular movement of the armature. The limitations of the movement in each direction will be caused by the armature striking when there is equal angular displacement of the armature and adjustment rod or nail to each side of the vertical axis of the magnet and coil assembly. The screws A and B should then be secured, observing care not to disturb the adjustment of the armature clamp. Then place the pickup in a vise and secure

RCA MFG. CO., INC.

Stock No.	DESCRIPTION	List Price	Stock No.	DESCRIPTION	List Price
11388	Transformer—First intermediate frequency transformer—(L16, L17, C24, C26)	1.90	11549	one lockwasher and one nut—Package of 10	.50
11389	Transformer—Second intermediate frequency transformer—(L18, L19, C27, C28, C29, R7, R8)	3.02	11547	Screw—Pickup front cover screw—Package of 10	.42
11803	Transformer—Power transformer—105-125 volts—50-60 cycles—(T1)	4.38		Screw—Pickup needle holding screw—Package of 10	.42
11805	Transformer—Power transformer—105-130, 140-160, 195-250 volts—40-60 cycles (T1)	7.95		REPRODUCER ASSEMBLIES	
11667	Trap—Wave trap—(L1, C45)	1.22	11232	Board—Terminal board with two lead wire clips	.18
13144	Volume control—(R11)	1.00	11231	Bolt—Yoke and core assembly bolt and nut	.16
	MOTOR ASSEMBLIES		8060	Bracket—Output transformer mounting bracket	.14
11703	Governor—Governor complete for phonograph motor—Stock No. 11701 or No. 11702	3.05	11257	Clamp—Cone center suspension clamping nut and screw assembly—Package of 5	.25
11701	Motor—Phonograph turntable motor—110 volts—50 to 60 cycles—(M1)	21.20	11254	Coil—Field coil—(L22)	2.00
	MOTOR BOARD ASSEMBLIES		11233	Coil—Neutralizing coil (L20)	.30
4594	Box—Used needle box (cup)	.30	11258	Cone—Reproducer cone—(L21)	1.00
4577	Connector—2-contact male connector for motor cable	.30	5118	Connector—3 contact male connector for reproducer	.25
7084	Cover—Turntable cover	.40	5119	Connector—3-contact female connector for reproducer cable	.25
11704	Damper—Turntable rubber damper and damper plate	.24	9619	Reproducer—Complete	6.05
4596	Escutcheon—Speed regulator escutcheon plate	.36	11253	Transformer—Output transformer—(T2)	1.56
4597	Screw—Motor mounting screw assembly—comprising four screws, four lockwashers, four spacers, and four nuts	.22	11886	Washer—Spring washer used to hold field coil securely—Package of 5	.20
11696	Turntable—Complete	2.48		MISCELLANEOUS ASSEMBLIES	
11695	Volume control—Phonograph volume control—(R27, S5)	1.60	11996	Bracket—Tuning tube mounting bracket and clamp	.22
	ECCENTRIC AUTOMATIC BRAKE SWITCH ASSEMBLIES		11947	Cable—2-conductor shielded cable, approximately 35 inches long—connects volume control to input transformer	.85
3994	Cover—Eccentric automatic switch cover and screw	.26	11948	Cable—3-conductor shielded volume control cable (control end)—complete with 4-contact male connector	1.50
10174	Springs—Automatic brake springs—comprising one each of four springs—Package of 2 sets	.50	6123	Connector—4-contact male connector for volume control cable	.30
6896	Switch—Eccentric automatic brake and switch assembly—less switch cover	2.50	12698	Crystal—Station selector escutcheon and crystal	1.02
3322	Switch—Eccentric automatic switch only—less cover—(S13)	.75	11276	Escutcheon—Tuning tube escutcheon	.40
	PICKUP AND ARM ASSEMBLIES		11347	Knob—Phonograph volume control, radio volume control, range switch, or tone control and power switch knob—Package of 5	.75
11944	Arm—Pickup arm complete—less pickup unit	6.00	11610	Knob—Station selector knob assembly, comprising one large and one small knob—Package of 5	1.00
13404	Armature—Pickup armature	.95	12556	Receptacle—Needle holder	.40
11548	Back—Pickup housing back	.52	11210	Screw—Chassis mounting screw assembly—Package of 4	.28
11946	Coil—Pickup coil—(L24)	.65	11349	Spring—Retaining spring for knob Stk. No. 11347, and small knob in Stk. No. 11610—Package of 5	.25
3521	Cover—Pickup back cover	.18	4982	Spring—Retaining spring for large knob in Stk. No. 11610—Package of 10	.50
11708	Cover—Pickup front cover	.15	3391	Spring—Suspension spring and washer assembly for mounting motor board, comprising 1 bolt, 1 top spring, 1 bottom spring, 2 cup washers, 1 C washer and 1 cap nut	.50
12354	Damper—Pickup damper	.16		Transformer—Phonograph input transformer pack, comprising one input transformer, one 1,800 Mmfd., one .01 Mfd. and one 0.1 Mfd. capacitors and one 1,000-ohm, one 33,000-ohm resistors (T3, C41, C43, C44, R26, R33)	7.05
3516	Damper—Pickup arm damper—comprising one upper and one lower damper, one upper bushing and one lower bearing	.14			
3390	Escutcheon—Pickup arm escutcheon	.46			
11945	Pickup unit—Complete—(L24)	5.50	11949		
3389	Rod—Eccentric automatic brake trip rod—Package of 5	\$0.40			
3387	Screw assembly—Pickup mounting screw assembly—comprising one screw,				

The prices quoted above are subject to change without notice.

MODEL CV-8 "Pak-O-Powr"
Schematic, Chassis Wiring
Parts

RCA MFG. CO., INC.

MODEL CV-8 PAK-O-POWR

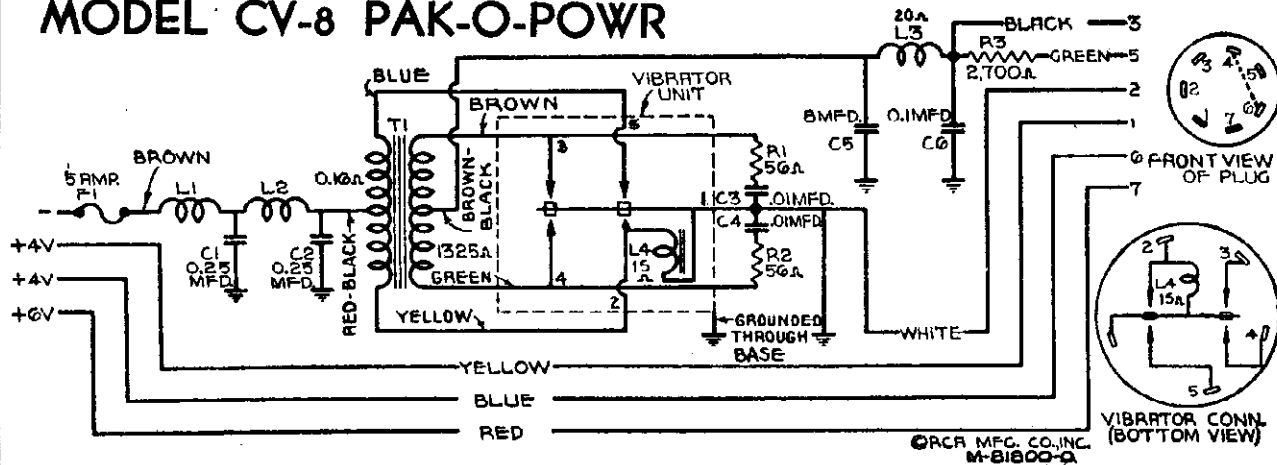


Figure 1. - Schematic Circuit Diagram

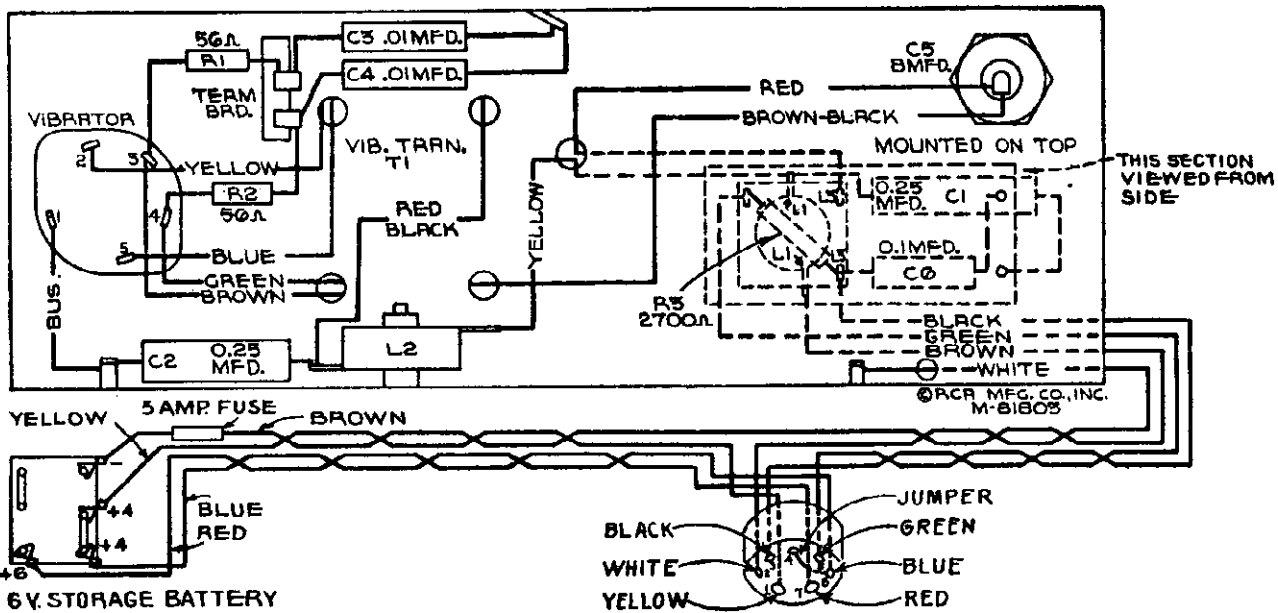


Figure 2. - Chassis Wiring Diagram

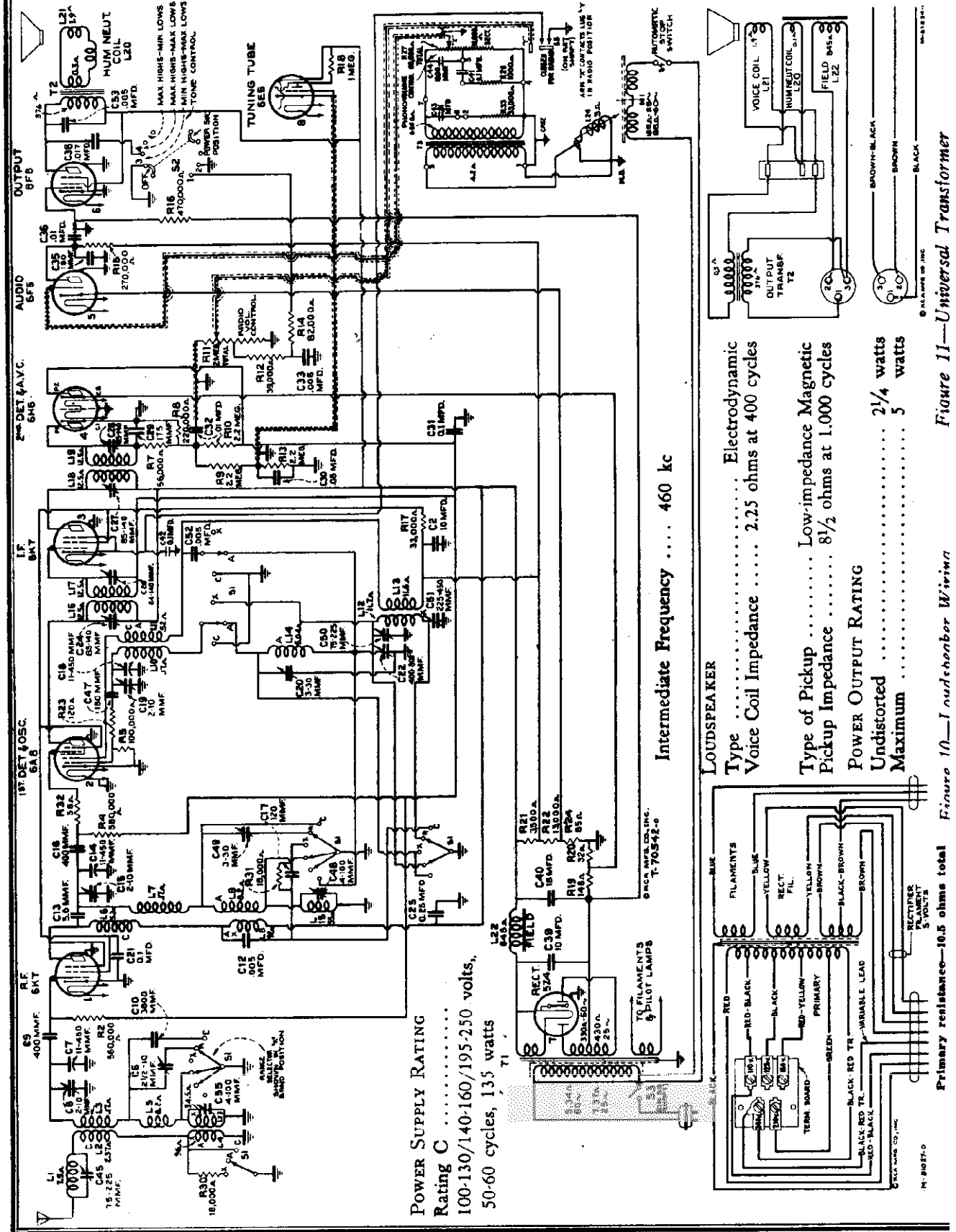
Stock No.

Description

- 13046 Capacitor--8 mfd. (C5)
- 14289 Clip--Two battery clips, one marked "+" and one unmarked
- 12819 Coil--Choke coil and terminal board assembly (L3)
- 12179 Coil--Choke coil. (L1, L2)
- 5140 Fuse--5 ampere (F1)
- 4290 Insulator--Fuse holder insulating sleeve
- 14419 Mounting--Rubber mounting for vibrator chassis
- 14409 Plug--7-contact female plug for battery cable
- 13220 Resistor--56 ohms, carbon type, 1/4 watt (R1, R2)
- 14421 Resistor--2700 ohms, insulated, 1 watt (R3)
- 4284 Spring--Fuse holder tension spring
- 14420 Transformer--Vibrator transformer (T1)
- 14422 Vibrator--Plug-in vibrator unit (L4)
- 4285 Washer--Fuse holder insulating washer

RCA MFG. CO., INC.

MODEL 802
Schematic, Trans. Dat



POWER SUPPLY RATING
Rating C
100-150/140-160/195-250 volts,
50-60 cycles, 135 watts

Intermediate Frequency 460 kc

LOUDSPEAKER
Type Electrodynamic
Voice Coil Impedance 2.25 ohms at 400 cycles
Type of Pickup Low-impedance Magnetic
Pickup Impedance 8 1/2 ohms at 1,000 cycles
POWER OUTPUT RATING
Undistorted 2 1/4 watts
Maximum 5 watts

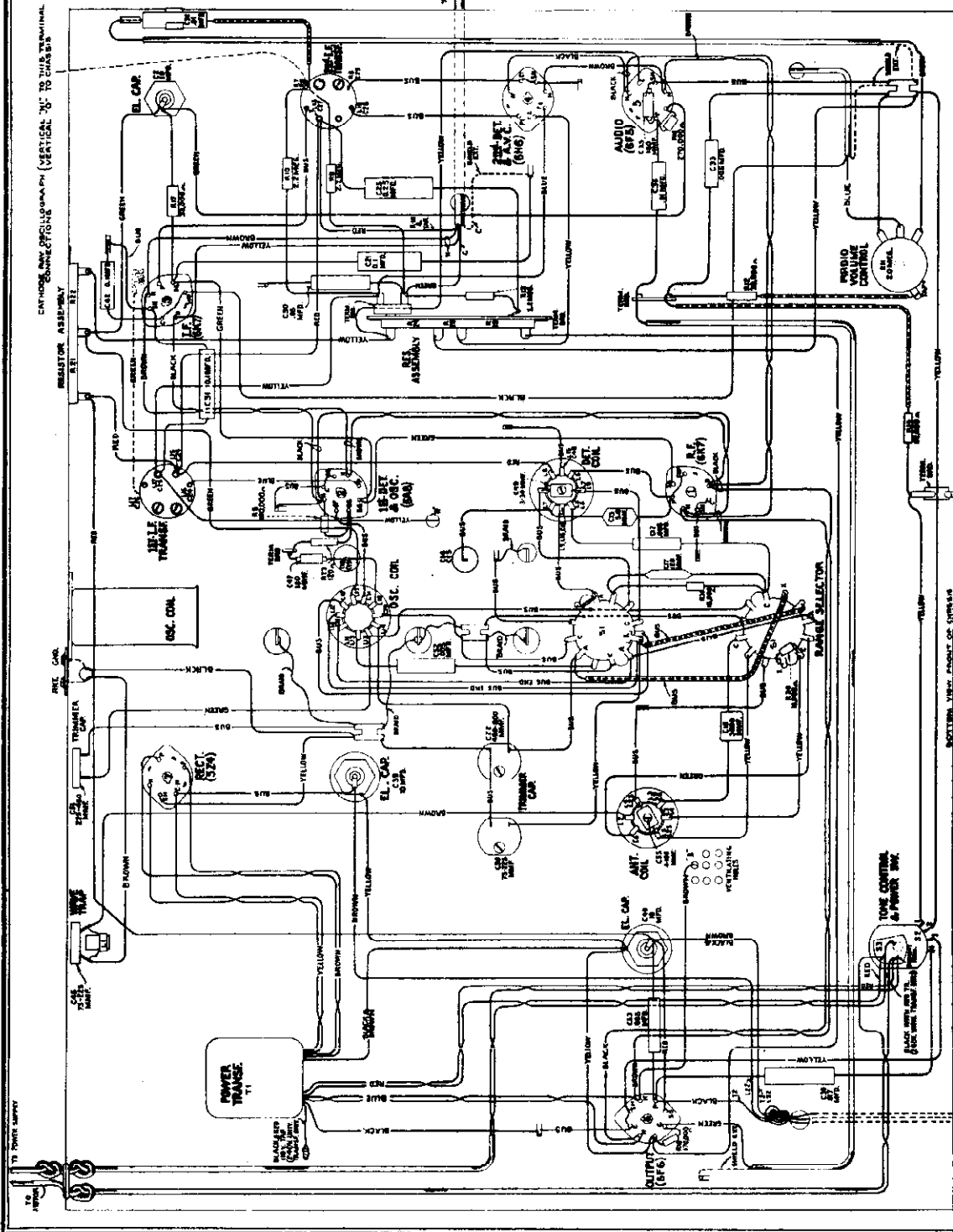
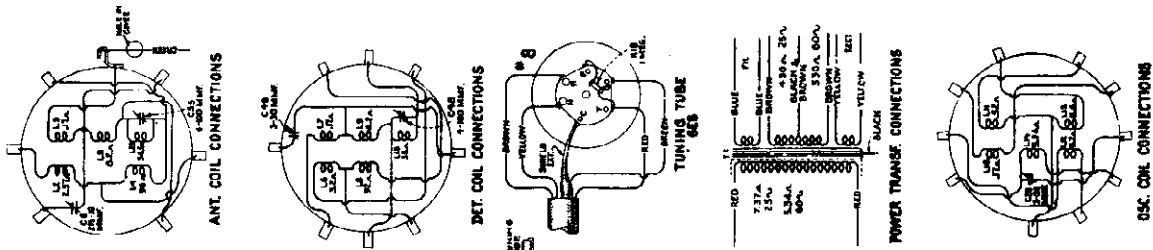
Figure 10—1 out of 2 Wires

Figure 11—Universal Transformer

MODEL 8U2

Chassis Wiring

RCA MFG. CO., INC.



FREQUENCY RANGES	ALIGNMENT FREQUENCIES
"Long Wave" (X)	"Long Wave" (X)
"Medium Wave" (A)	"Medium Wave" (A)
"Short Wave" (C)	"Short Wave" (C)

RCA MFG. CO., INC.

MODEL 8U2
Voltage, Resistance
Socket, Trimmers

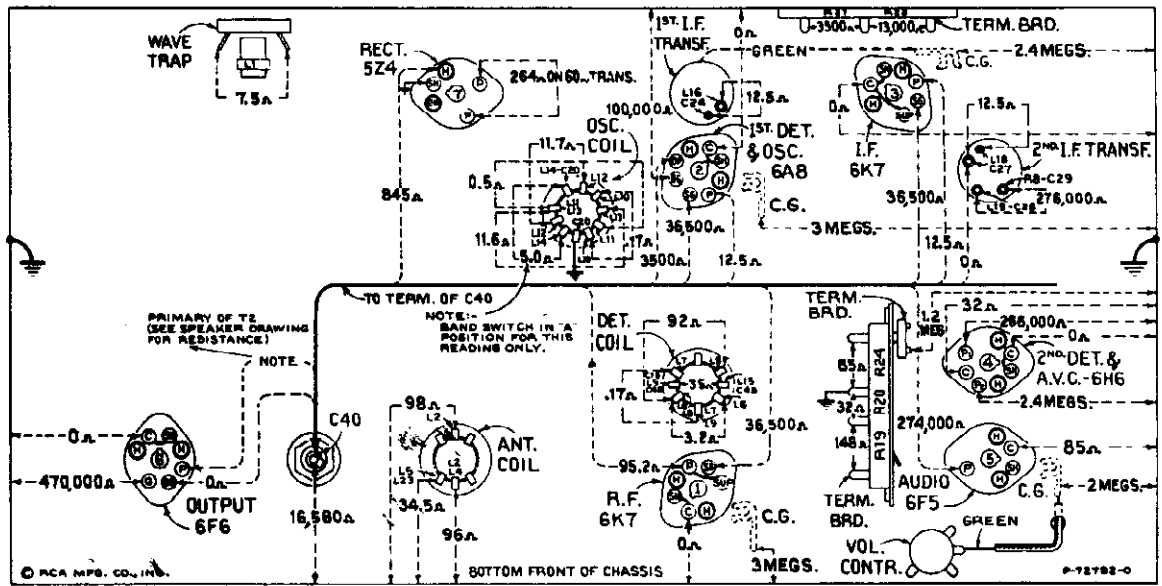
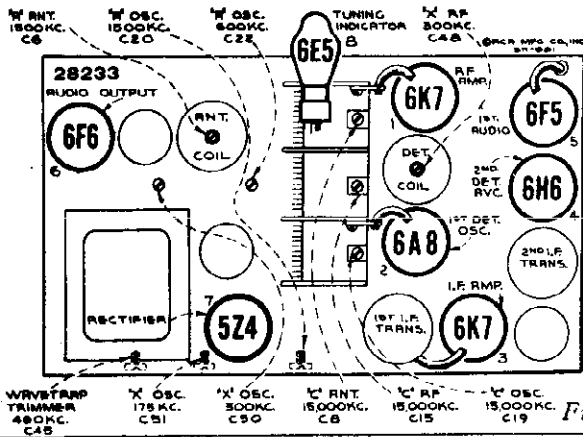
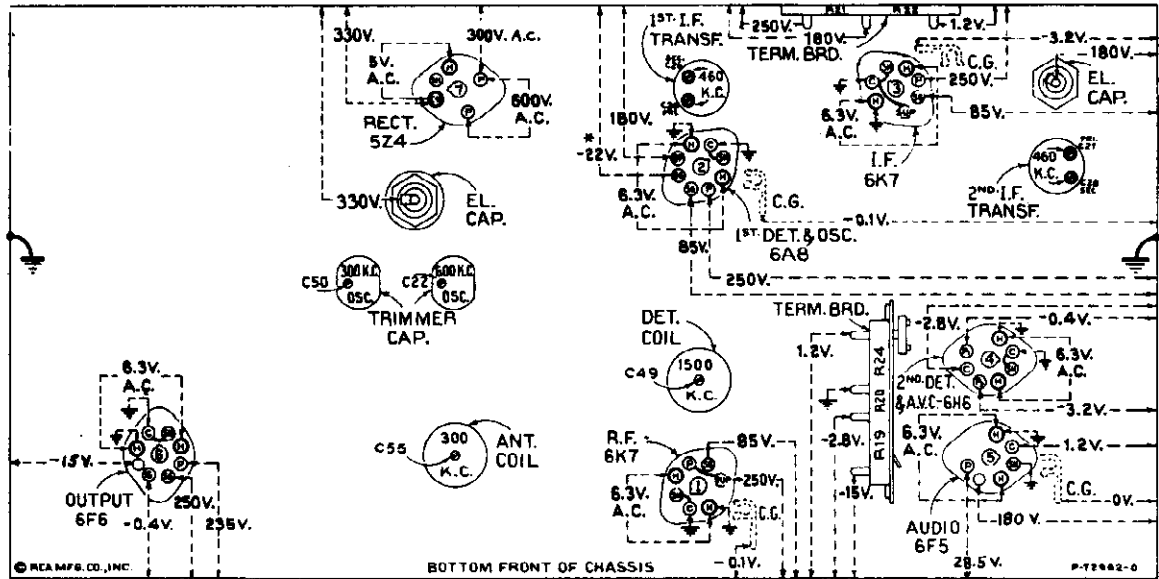


Figure 4—Resistance Diagram

Power supply disconnected—Radiotrons in sockets—Tuning condenser in full-mesh—Range selector "Long wave" position—Volume control maximum—Power switch—Tone in "OFF" position—Radio-Record switch to "Radio"

Figure 5—Radiotron Socket Voltages, Coil, and Trimmer Locations

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc—No signal being received—Volume control minimum—Power switch—Tone full clockwise—Radio-Record switch to "Radio"



Radiotron Cathode Current Readings

Measured with Milliammeter Connected at Tube Socket Cathode Terminals under Conditions Similar to Those of Voltage Measurements

- (1) RCA-6K7—R-F 12.5 ma.
- (2) RCA-6A8—Det. Osc. 13.8 ma.
- (3) RCA-6K7—I.F. 9.0 ma.
- (4) RCA-6H6—2nd Det.-A.V.C.
- (5) RCA-6F5—Audio 0.25 ma.
- (6) RCA-6F6—Power 40.0 ma.
- (7) RCA-5Z4—Rect. 90.0 ma.*
- (8) RCA-6E5—Eye 3.0 ma.

(* Cannot be measured at socket.)

Figure 1—Radiotron, Coil, and Trimmer Locations

MODEL 8U2
 Assembly Wiring
 Phono. Details, Pick-up

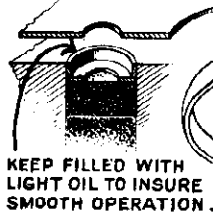


Figure 8—Motor Details

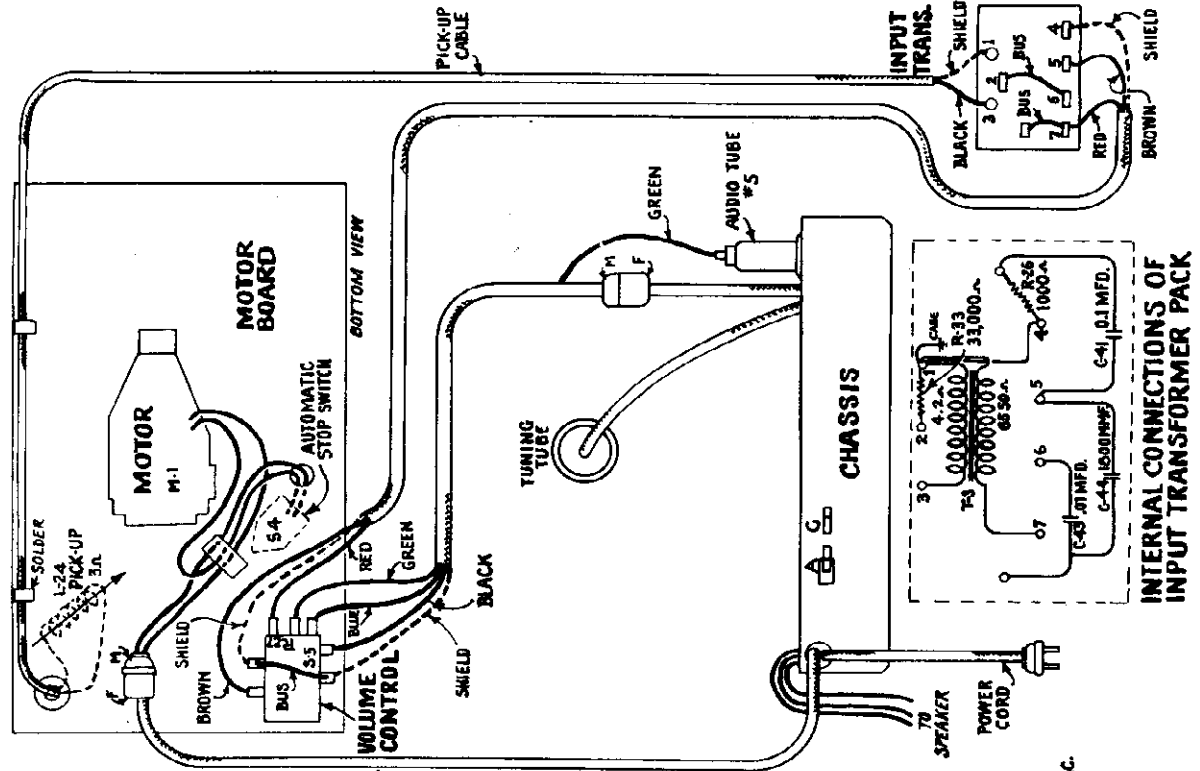
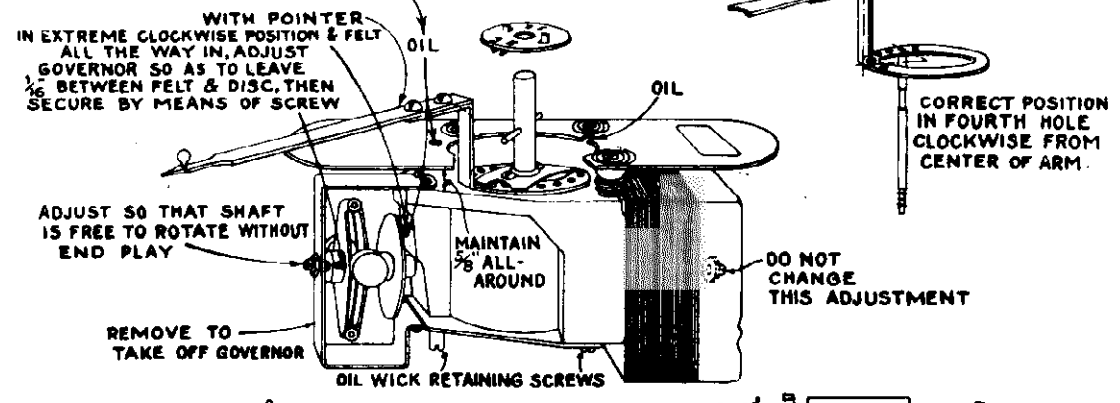


Figure 6—Assembly Wiring

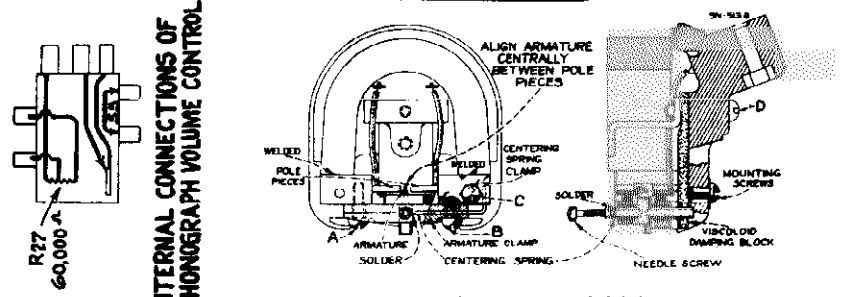


Figure 7—Details of Pickup

RCA MFG. CO., INC.
 SN 1573-1

RCA MFG. CO., INC.

Table with columns: Stock No., DESCRIPTION, List Price. Contains parts like capacitors, resistors, coils, and connectors.

Adjust the high-frequency trimmers of the oscillator, detector, and antenna coils, C26, C49, and C5 respectively, to the points at which each produces maximum indicated receiver output.

- (f) Adjust the low-frequency trimmer C22 of the oscillator coil, simultaneously rocking the tuning control of the receiver backward and forward through the signal, until maximum indicated receiver output results from these combined operations. The adjustment of C19, C15, and C8 should be corrected at 15,000 kc as in (b), (c), and (d); also C20, C49, and C6 should be corrected at 1,500 kc, as in (i) to compensate for any changes caused by the adjustment of the low-frequency oscillator coil trimmer C22.

Long Wave Band

- (i) Set receiver to 175 kc and tune test oscillator to 175 kc. Adjust trimmer C51 for maximum indicated output, simultaneously rocking tuning control of the receiver backward and forward through the signal. The adjustment of C50, C48, and C55 should now be repeated at 300 kc, as described in (i) to compensate for any changes caused by the adjustment of the low-frequency trimmer C21.

two trimmers, C26 and C27 of the second i-f transformer to produce maximum (peak) indicated receiver output. Then, adjust the two trimmers, C26 and C24, of the first i-f transformer for maximum (peak) receiver output as shown by the indicating device. During these adjustments, regulate the test-oscillator output so that the receiver output indication is always as low as possible. By doing so, broadness of tuning, due to a.v.c. action will be avoided. It is advisable to repeat the adjustment of all i-f trimmers a second time to assure that the interaction between them has not disturbed the original adjustment.

R-F Trimmer Adjustments

The eleven trimmers associated with the r-f, first detector, and oscillator tuned circuits have their locations shown by figures 1 and 3. The three trimmers which are at all times directly in alignment with the variable tuning condensers necessitate that the "Short wave" (C) band be aligned first. The range selector switch should, therefore, be turned to its "Short wave" position for the first adjustments. Leave the output indicator connected to the output system. Calibrate the dial by rotating the tuning control until the variable condenser plates are in their full-mesh (maximum capacity) position and adjust the dial pointer so that its end points to the horizontal graduation (520 kc) at the low-frequency end of the "Medium wave" (A) dial scale.

Wave-Trap Adjustment

Connect the test oscillator to the antenna and ground terminals of the receiver, leaving it tuned to 460 kc. Adjust the wave-trap trimmer C45 for maximum suppression of the 460 kc signal. An increase in test-oscillator output may be necessary before the point of minimum output (maximum suppression of signal) is obtained.

"Short Wave" Band

- (a) Adjust the test-oscillator to 15,000 kc, and set the receiver tuning control to a dial reading of 15,000 kc.
(b) Adjust trimmer C19 on the oscillator section of the variable condenser to the point at which it produces maximum indicated receiver output. Two points may be found, each of which produces such a maximum. The one of maximum trimmer capacitance is correct and should be used. The local (heterodyne) oscillator will be 460 kc below the signal frequency at this adjustment point.
(c) Adjust trimmer C15 of the detector section of the variable condenser, simultaneously rocking the receiver tuning control backward and forward through the 15,000 kc input signal until maximum receiver output results from these combined operations.
(d) With the receiver tuning control set to 15,000 kc adjust trimmer C8 on the antenna section of the variable condenser to the point which produces maximum (peak) indicated receiver output.

"Medium Wave" Band

- (e) Change the receiver range selector to its "Medium wave" (A) band position and set the receiver tuning control to a dial reading of 1,500 kc. Tune the test oscillator to 1,500 kc and regulate its output to produce a slight indication on the receiver output indicator.

Alignment Procedure

Precise alignment is vital to the proper functioning of this receiver. There are four trimming adjustments provided in the i-f system, five in the oscillator coil system, three in the detector coil system, and three in the antenna coil system. Each of these trimmers has been accurately adjusted during manufacture and should remain properly aligned unless affected by abnormal conditions of climate or have been altered for service purposes. Incorrect alignment is usually evidenced by loss of sensitivity, improper tone quality, and poor selectivity. These indications will generally be present together. The correct performance of this receiver can only be obtained when the alignment is performed with adequate and reliable test apparatus and in the sequence given. The manufacturer of this instrument has a complete assortment of such service equipment available for sale through its dealers and distributors. Two methods of alignment are applicable. One method requires the cathode-ray oscillograph, while the other requires a voltmeter or glow-type indicator. The oscillographic method is advantageous in that the indication is in the form of a wave-image which represents the resonance characteristic of the tuned circuits. Alignment by this method should be performed with equipment such as an RCA Stock No. 9545 Cathode-Ray Oscillograph and an RCA Stock No. 9558 Frequency Modulator. For the output indicator method an instrument such as an RCA Stock No. 4317 should be used. Either of the above methods requires a reliable test oscillator for the source of alignment frequencies such as the RCA Stock No. 9595 Test Oscillator. Cathode-ray alignment is similar to the output indicator alignment outlined below, except as follows: The frequency modulator should be used to sweep the test oscillator signal when aligning the i-f amplifier and the low-frequency oscillator series trimmers. It will only be necessary to first adjust the trimmers to peak response, as outlined below, without the frequency modulator connected. Then, interconnect the test oscillator with the frequency modulator and re-tune the test oscillator (increase frequency) until the forward and reverse curves coincide at their highest points. Next, adjust the trimmers until the curves coincide through-out their length and have maximum amplitude. The proper place for connection of the oscillograph input to the receiver is indicated on the Chassis Wiring Diagram (figure 3). The high-frequency trimmers on all three bands should be adjusted for maximum (peak) amplitude of the images.

I-F Trimmer Adjustments

The four trimmers of the two i-f transformers are located as shown by figure 5. Each must be aligned to a basic frequency of 460 kc. To do this, attach the output indicator across the voice-coil circuit. Connect the test oscillator to the antenna section of the control grid of the RCA-6A8 first-detector tube and chassis ground through a .001 mfd. capacitor. Tune the test oscillator to 460 kc. Advance the receiver volume control to its full-on position and adjust the receiver tuning control to a point where no interference is encountered from broadcast stations, or short station of oscillator tuning capacitor C18 to chassis eliminating local oscillator signals. Increase the output of the test oscillator until a slight indication is apparent on the output indicator. Adjust the

REPLACEMENT PARTS

Table with columns: Stock No., DESCRIPTION, List Price. Lists various components like trimmers, capacitors, and coils.

The prices quoted above are subject to change without notice.

MODEL 8U2

Parts, Page 2

RCA MFG. CO., INC.

Stock No.	DESCRIPTION	List Price	Stock No.	DESCRIPTION	List Price
11389	Transformer—Second intermediate frequency transformer—(L18, L19, C27, C28, C29, R7, R8)	3.02	3389	Rod—Eccentric automatic brake trip rod—Package of 5	\$0.40
11803	Transformer—Power transformer—105-125 volts—50-60 cycles—(T1)	4.38	3387	Screw assembly—Pickup mounting screw assembly—comprising one screw, one lockwasher and one nut—Package of 10	.50
11805	Transformer—Power transformer—105-130, 140-160, 195-250 volts—40-60 cycles (T1)	7.95	11549	Screw—Pickup front cover screw—Package of 10	.42
11667	Trap—Wave trap—(L1, C45)	1.22	11547	Screw—Pickup needle holding screw—Package of 10	.42
13144	Volume control—(R11)	1.00			
	MOTOR ASSEMBLIES			REPRODUCER ASSEMBLIES	
11703	Governor—Governor complete for phonograph motor—Stock No. 11701 or No. 11702	3.05	11232	Board—Terminal board with two lead wire clips	.18
11701	Motor—Phonograph turntable motor—110 volts—50 to 60 cycles—(M1)	21.20	11231	Bolt—Yoke and core assembly bolt and nut	.16
	MOTOR BOARD ASSEMBLIES		8060	Bracket—Output transformer mounting bracket	.14
4594	Box—Used needle box (cup)	.30	11257	Clamp—Cone center suspension clamping nut and screw assembly—Package of 5	.25
4577	Connector—2-contact male connector for motor cable	.30	11254	Coil—Field coil—(L22)	2.00
7084	Cover—Turntable cover	.40	11233	Coil—Neutralizing coil (L20)	.30
11704	Damper—Turntable rubber damper and damper plate	.24	11258	Cone—Reproducer cone—(L21)	1.00
4596	Escutcheon—Speed regulator escutcheon plate	.36	5118	Connector—3 contact male connector for reproducer	.25
4597	Screw—Motor mounting screw assembly—comprising four screws, four lockwashers, four spacers, and four nuts	.22	5119	Connector—3-contact female connector for reproducer cable	.25
11696	Turntable—Complete	2.48	9619	Reproducer—Complete	6.05
11695	Volume control—Phonograph volume control—(R27, S5)	1.60	11253	Transformer—Output transformer—(T2)	1.56
	ECCENTRIC AUTOMATIC BRAKE SWITCH ASSEMBLIES		11886	Washer—Spring washer used to hold field coil securely—Package of 5	.20
3994	Cover—Eccentric automatic switch cover and screw	.26			
10174	Springs—Automatic brake springs—comprising one each of four springs—Package of 2 sets	.50		MISCELLANEOUS ASSEMBLIES	
6896	Switch—Eccentric automatic brake and switch assembly—less switch cover	2.50	11996	Bracket—Tuning tube mounting bracket and clamp	.22
3322	Switch—Eccentric automatic switch only—less cover—(S13)	.75	11947	Cable—2-conductor shielded cable, approximately 35 inches long—connects volume control to input transformer	.85
	PICKUP AND ARM ASSEMBLIES		11948	Cable—3-conductor shielded volume control cable (control end)—complete with 4-contact male connector	1.50
11944	Arm—Pickup arm complete—less pickup unit	6.00	6123	Connector—4-contact male connector for volume control cable	.30
13404	Armature—Pickup armature	.95	12698	Crystal—Station selector escutcheon and crystal	1.02
11548	Back—Pickup housing back	.52	11276	Escutcheon—Tuning tube escutcheon	.40
11946	Coil—Pickup coil—(L24)	.65	11347	Knob—Phonograph volume control, radio volume control, range switch, or tone control and power switch knob—Package of 5	.75
3521	Cover—Pickup back cover	.18	11610	Knob—Station selector knob assembly, comprising one large and one small knob—Package of 5	1.00
11708	Cover—Pickup front cover	.15	12556	Receptacle—Needle holder	.40
12354	Damper—Pickup damper	.16	11210	Screw—Chassis mounting screw assembly—Package of 4	.28
3516	Damper—Pickup arm damper—comprising one upper and one lower damper, one upper bushing and one lower bearing	.14	11349	Spring—Retaining spring for knob Stk. No. 11347, and small knob in Stk. No. 11610—Package of 5	.25
3390	Escutcheon—Pickup arm escutcheon	.46	4982	Spring—Retaining spring for large knob in Stk. No. 11610—Package of 10	.50
11945	Pickup unit—Complete—(L24)	5.50	3391	Spring—Suspension spring and washer assembly for mounting motor board, comprising 1 bolt, 1 top spring, 1 bottom spring, 2 cup washers, 1 C washer and 1 cap nut	.50
11949	Transformer—Phonograph input transformer pack, comprising one input transformer, one 1,800 Mmfd., one .01 Mfd. and one 0.1 Mfd. capacitors and one 1,000-ohm, one 33,000-ohm resistors (T3, C41, C43, C44, R26, R33)	7.05			

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

RCA MFG. CO., INC.

MODEL 9K1
Schematic, Socket
Trimmers

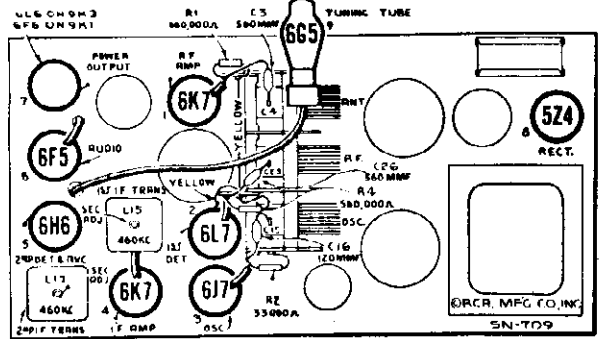
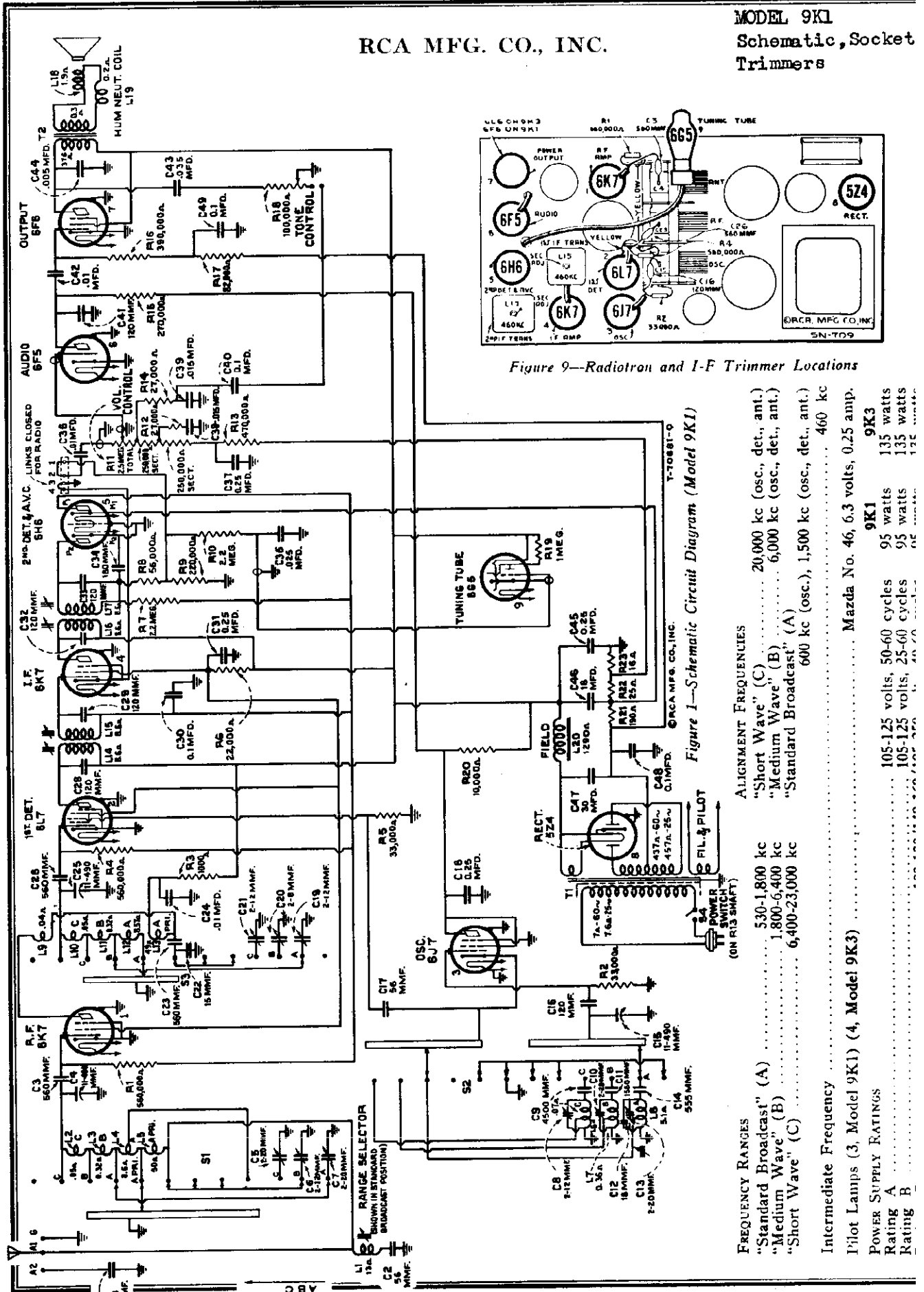


Figure 9—Radiotron and I-F Trimmer Locations

Figure 1—Schematic Circuit Diagram (Model 9K1)

ALIGNMENT FREQUENCIES	20,000 kc (osc., det., ant.)	9K3
"Short Wave" (C)	6,000 kc (osc., det., ant.)	9K1
"Medium Wave" (B)	600 kc (osc.), 1,500 kc (osc., det., ant.)	95 watts
"Standard Broadcast" (A)	460 kc	135 watts
Intermediate Frequency	Mazda No. 46, 6.3 volts, 0.25 amp.	95 watts
Pilot Lamps (3, Model 9K1) (4, Model 9K3)		105-125 volts, 50-60 cycles
Power Supply Ratings		105-125 volts, 25-60 cycles
Rating A		95 watts
Rating B		135 watts

MODEL 9K1
Chassis Wiring

RCA MFG. CO., INC.

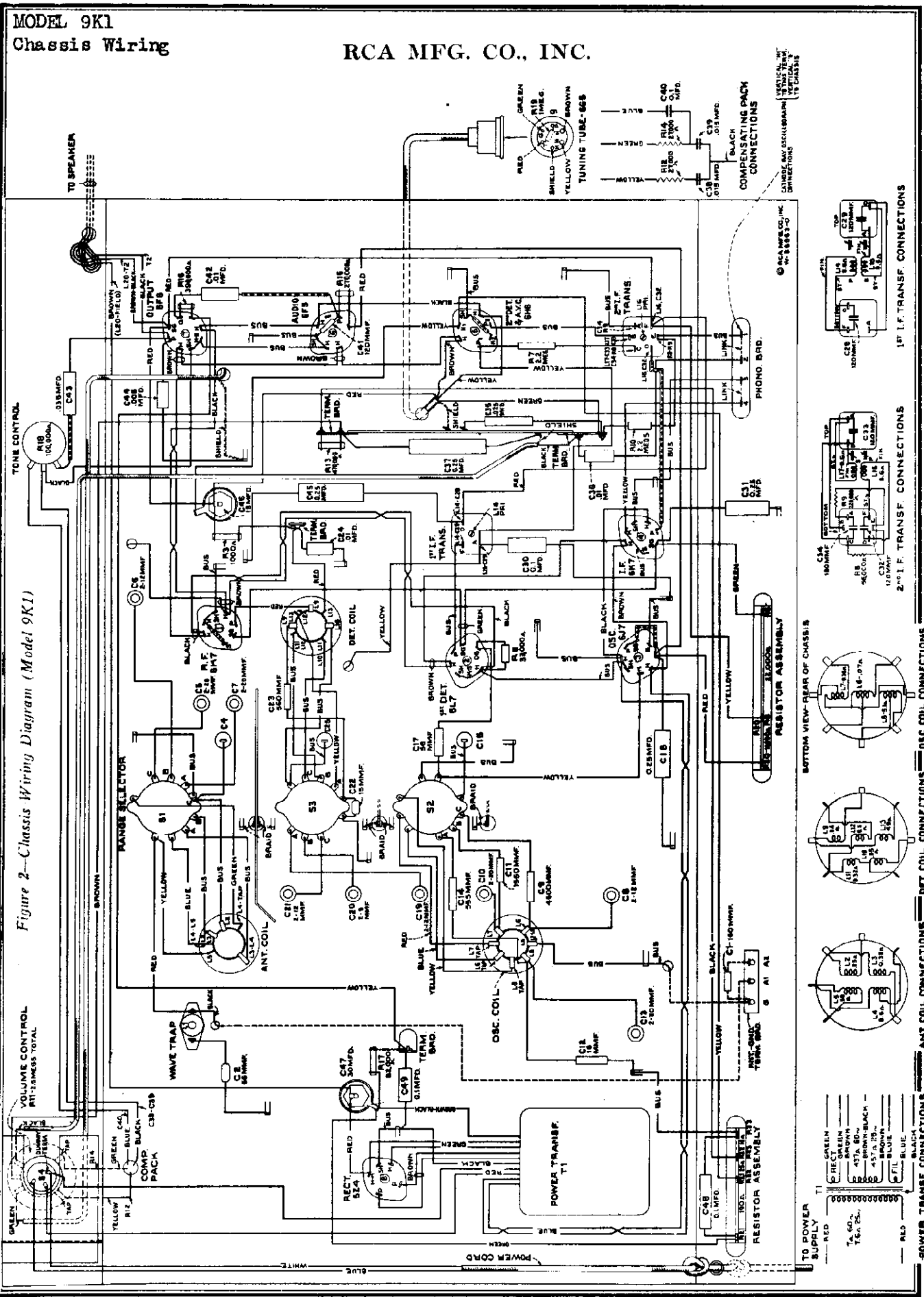


Figure 2—Chassis Wiring Diagram (Model 9K1)

RCA MFG. CO., INC.

MODEL 9K3
Schematic, Trans. Data
Spkr. Wiring

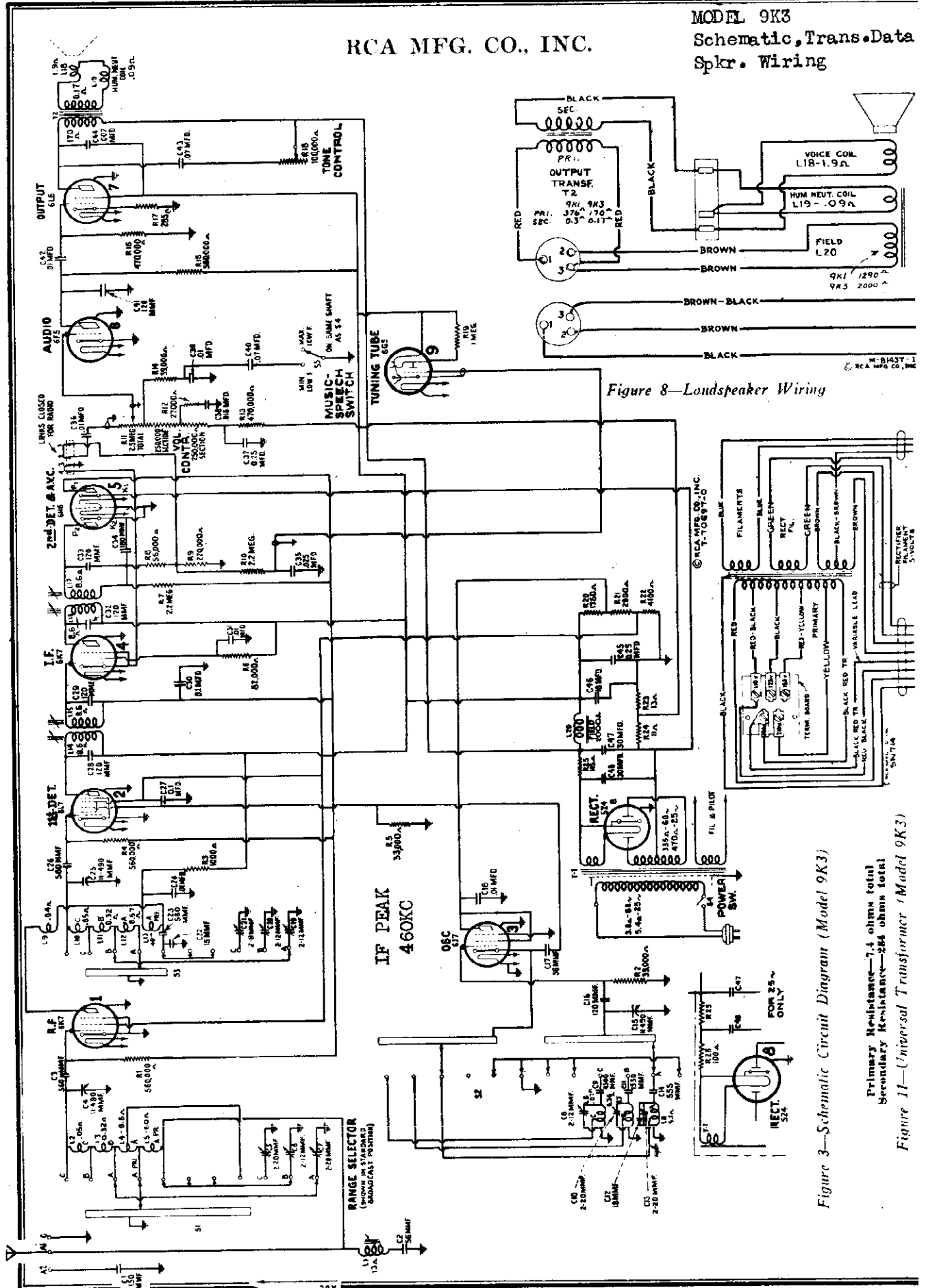


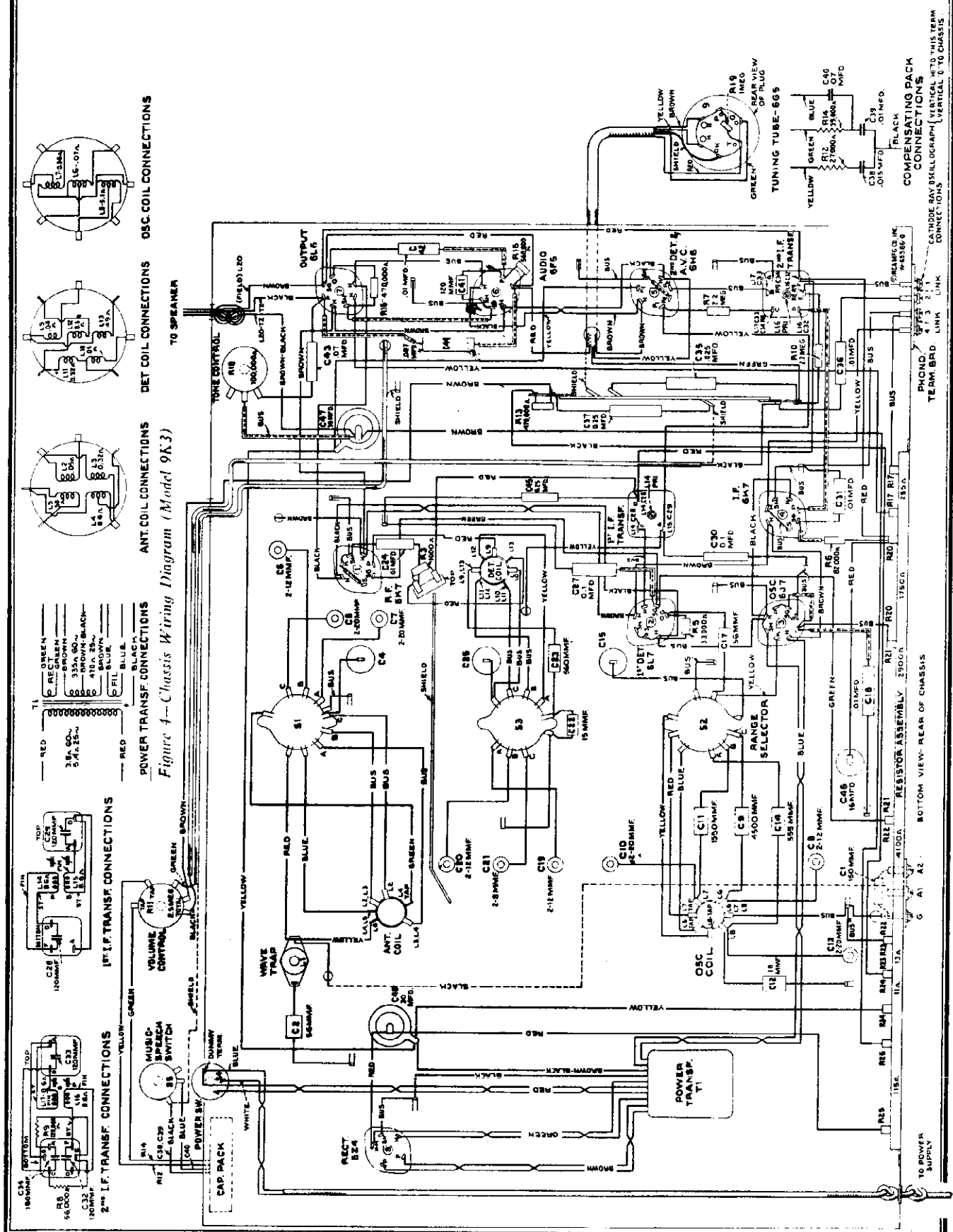
Figure 8—Loudspeaker Wiring

Figure 3—Schematic Circuit Diagram (Model 9K3)

Primary Resistance—7.4 ohms total
Secondary Resistance—244 ohms total
Figure 11—Universal Transformer (Model 9K3)

MODEL 9K3
Chassis Wiring

RCA MFG. CO., INC.



POWER TRANSFORMER CONNECTIONS
 ANT. COIL CONNECTIONS
 DET COIL CONNECTIONS
 OSC. COIL CONNECTIONS

Figure 4—Chassis Wiring Diagram (Model 9K3)

COMPENSATING PACK
 CONNECTIONS
 VERTICAL TO THIS TERM
 CATHODE RAY BULLDOGGERS
 VERTICAL TO CHASSIS

PHONO
 TERM. BRD. LINK
 4 1 3 2 1 1

RESISTOR ASSEMBLY 2900A
 1750A
 1550A

REAR VIEW: REAR OF CHASSIS
 G A1 A2

RCA MFG. CO., INC.

MODELS 9K1, 9K3
Voltage, Socket
Trimmers

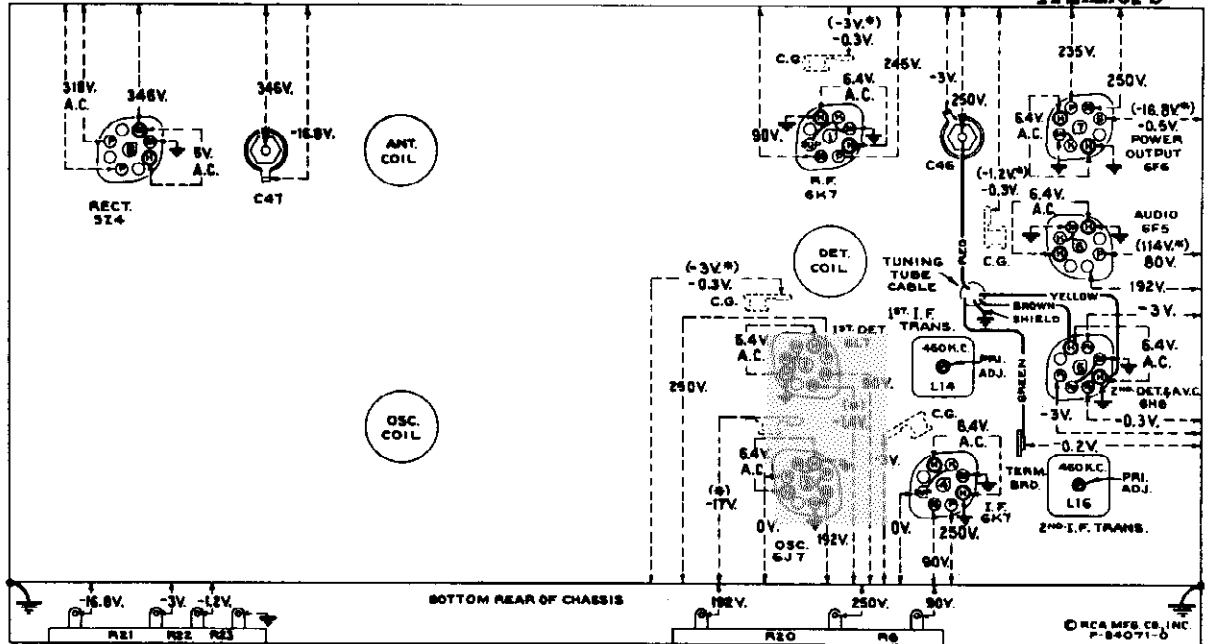
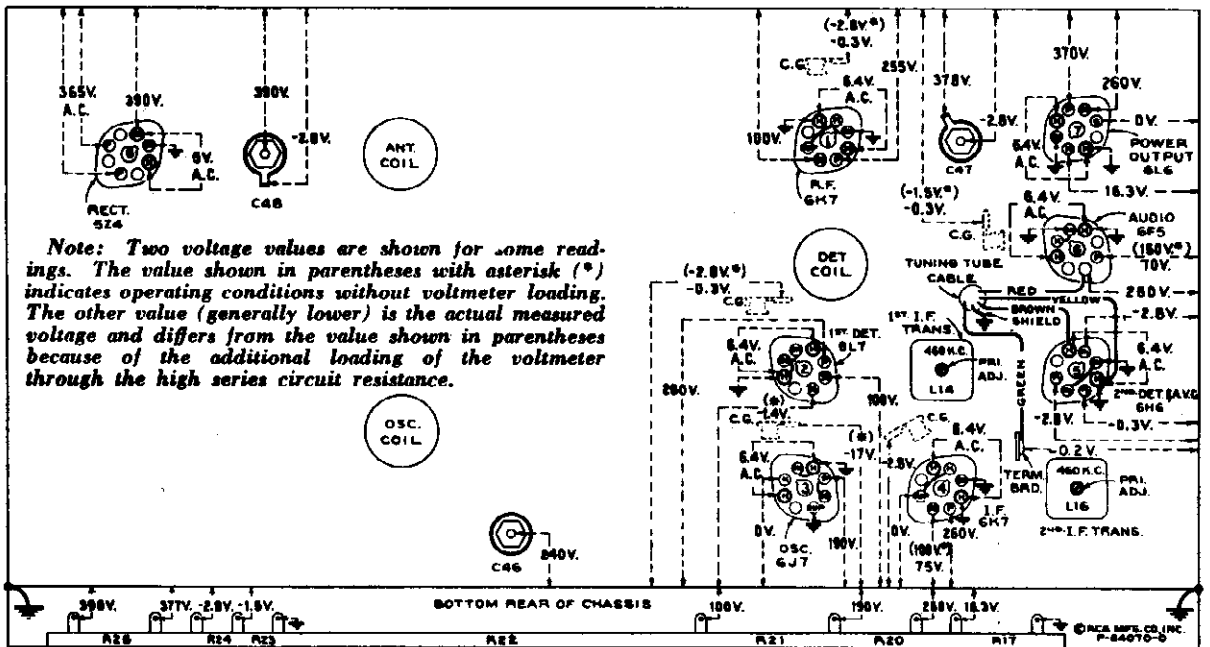


Figure 6—Radiotron Socket Voltages and I-F Trimmer Locations (Model 9K1)



Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.

Figure 7—Radiotron Socket Voltages and I-F Trimmer Locations (Model 9K3)

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc ("Standard broadcast")—
No signal being received—Volume control minimum

Radiotron Cathode Current Readings

Measured with Milliammeter Connected at Tube
Socket Cathode Terminals Under Conditions
Similar to Those of Voltage Measurements

	9K1	9K3		9K1	9K3
(1) RCA-6K7—R-F Amp.	7.5	7.5 ma.	(6) RCA-6F5—1st Audio	0.3	0.2 ma.
(2) RCA-6L7—1st Det.	6.4	7.2 ma.	(7) RCA-6F6—Output	41	— ma.
(3) RCA-6J7—Osc.	5.4	6.3 ma.	(7) RCA-6L6—Output	—	60 ma.
(4) RCA-6K7—I-F Amp.	7.5	7.5 ma.	(8) RCA-5Z4—Rectifier	72*	118 ma.*
(5) RCA-6H6—2nd Det. & A.V.C.	—	—	(9) RCA-6G5—Tuning Tube	2.0	2.0 ma.

(*Cannot be measured at socket.)

MODELS 9K1, 9K3
Alignment, Trimmers

RCA MFG. CO., INC.

Alignment Procedure

Calibrate the tuning dial by adjusting dial pointer to the low-frequency (end) calibration mark on "Standard broadcast" scale with the gang tuning-condenser plates in full-mesh position. This is a friction adjustment.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on Figures 5, 6, 7, and 9.

Cathode-ray alignment is preferable; the connections to the chassis are shown in Figures 2 and 4. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to the receiver chassis for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

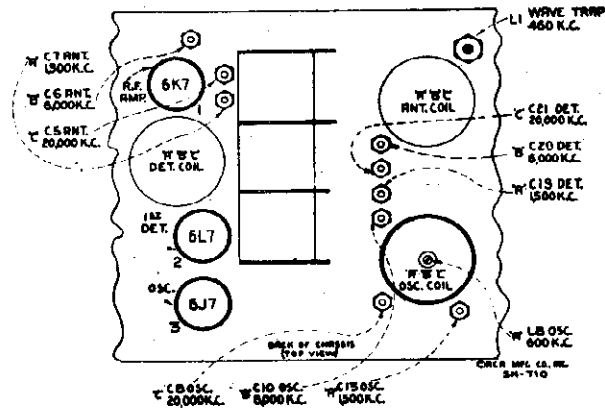


Figure 5—R-F Trimmer Locations

Note.—The locations of C20 and C21 are interchanged on some chassis of Model 9K1.

Order of Alignment	Test Oscillator			Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting				
1	6K7 I-F Grid Cap	.001 Mfd.	460 kc	No Signal 550-750 kc	2nd I-F Trans.	L16 and L17	Max. (peak)
2	6L7 Det. Grid Cap	.001 Mfd.	460 kc	No Signal 550-750 kc	1st I-F Trans.	L14 and L15	Max. (peak)
3	"A1" Ant. Term.	200 Mmfd.	460 kc	No Signal 550-750 kc	Wave Trap	L1	Minimum Output
4	"A1" Ant. Term.	300 Ohms	20,000 kc	20,000 kc	"C" Osc.	C8	Max. (peak)*
5	"A1" Ant. Term.	300 Ohms	20,000 kc	Rock thru 20,000 kc	"C" Det.	C21	Max. (peak)†
6	"A1" Ant. Term.	300 Ohms	20,000 kc	20,000 kc	"C" Ant.	C5	Max. (peak)‡
7	"A1" Ant. Term.	300 Ohms	6,000 kc	6,000 kc	"B" Osc.	C10	Max. (peak)
8	"A1" Ant. Term.	300 Ohms	6,000 kc	6,000 kc	"B" Det.	C20	Max. (peak)
9	"A1" Ant. Term.	300 Ohms	6,000 kc	6,000 kc	"B" Ant.	C6	Max. (peak)
10	"A1" Ant. Term.	200 Mmfd.	600 kc	600 kc	"A" L-F Osc.	L8	Max. (peak)
11	"A1" Ant. Term.	200 Mmfd.	1,500 kc	1,500 kc	"A" H-F Osc.	C13	Max. (peak)
12	"A1" Ant. Term.	200 Mmfd.	600 kc	Rock thru 600 kc	"A" L-F Osc.	L8	Max. (peak)
13	"A1" Ant. Term.	200 Mmfd.	1,500 kc	1,500 kc	"A" H-F Osc.	C13	Max. (peak)
14	"A1" Ant. Term.	200 Mmfd.	1,500 kc	1,500 kc	"A" Det.	C19	Max. (peak)
15	"A1" Ant. Term.	200 Mmfd.	1,500 kc	1,500 kc	"A" Ant.	C7	Max. (peak)

* Use minimum capacity peak if two peaks can be obtained.

† Use maximum capacity peak if two peaks can be obtained.

‡ After this adjustment, check for image signal by shifting receiver dial to 19,080 kc.

RCA MFG. CO., INC.

General Description

These receivers each employ a nine-tube, three-band superheterodyne circuit. Model 9K1 uses an RCA-6F6 power-output tube, delivering a maximum output of 4.5 watts, while Model 9K3 uses an RCA-6L6 beam-power-output tube, delivering a maximum output of 12.5 watts. The tuning range for each model is continuous from 530 to 23,000 kc, which includes the standard broadcast band and the important short-wave bands at 49, 31, 25, 19, 16, and 13 meters, along with channels assigned for police, aviation, and amateur communication.

Features of design include an r-f amplifier stage; magnetite-core adjusted i-f transformers, wave-trap, and low-frequency oscillator tracking; full automatic volume control; phonograph terminal board; "Magic Eye" tuning tube; 12-inch electrodynamic loudspeaker; new plunger-type, air-dielectric trimming capacitors; aural-compensated audio volume control; continuous high-frequency tone control; and a two-point low-frequency tone control. In addition, Model 9K3 has a cabinet incorporating the "Magic Voice."

Service Data

The various diagrams of this booklet contain such information as will be needed to isolate causes for defective operation if such develops. The ratings of the resistors, capacitors, coils, etc., are indicated adjacent to the symbols signifying these parts on the diagrams. Identification titles such as R1, L1, C1, etc., provide reference between the illustrations and Replacement Parts List. The coils, transformer windings, and reactors are rated in terms of d-c resistance to permit continuity checks.

Phonograph Attachment.—A terminal board is provided for connecting a phonograph into the audio-amplifying circuit. RCA Victor Models R-93, R-93-2, R-93-A, or R-94 Record Players should be connected as follows: Remove the two links from the phonograph terminal board. Connect green wire in Radio-Record switch cable to terminal 2; yellow to terminal 1; red to terminal 4; and both the blue lead and shield to terminal 3. Connect a 2-conductor twisted cable between the Record Player binding posts and the screw terminals on Radio-Record switch.

Loudspeaker.—Centering of the loudspeaker is made in the usual manner with three narrow paper feelers

after first removing the front dust cover. This may be removed by softening its cement with a light application of acetone, using care not to allow the acetone to flow into the air gap. The dust cover should be cemented back in place with ambroid upon completion of adjustment.

Selector Dial (Model 9K3).—Figure 10 illustrates the relation of the various parts of the dial mechanism when in its "Standard broadcast" position with the range switch likewise turned to its "Standard broadcast" position. In re-assembling the dial after repairs, see that the gears are meshed in accordance with the diagram, at the same time noting that the range switch is in its "Standard broadcast" position and the lever attached to the range-switch shaft placed in the position shown.

To adjust the dial mechanism, set the range switch to its "Standard broadcast" position. Place a straight-edge across the center of the dial so that its edge is even with the lower (end) marking at both the low-frequency and high-frequency ends of the dial. Under such conditions the straight-edge should be parallel with the top of the chassis base. If the straight-edge is not parallel with the top of the chassis base, loosen the nut on the rear of the roller link pivot stud and move the stud up or down until the link roller moves the dial to the desired position so that the end calibration marks obtain the position mentioned above. Tighten the nut on the roller link pivot stud.

Set the gang tuning condenser to its maximum capacity position. Adjust the dial pointer to the low-frequency (end) mark on "Standard broadcast" scale. This is a friction adjustment.

With the gang tuning condenser plates still in full mesh, loosen the two set screws on the vernier-dial hub. Rotate the vernier dial until the "0" marking is in a vertical plane above the center of the shaft. Tighten set screws.

Antenna and Ground Terminals.—These receivers are equipped with an antenna-ground terminal board having three terminals. These terminals are marked "A2," "A1," and "G," the latter being the ground terminal and should always be connected to a good external ground. The transmission-line leads of the RCA RK-40A antenna system should be connected to terminals "A2" and "A1." The receiver coupling units of the RCA RK-40 and the RCA Spider-Web antenna systems should be connected to terminals "A1" and "G." Connect a single-wire antenna to terminal "A1."

POWER OUTPUT	9K1	9K3
Undistorted	2.0 watts	7.0 watts
Maximum	4.5 watts	12.5 watts

LOUDSPEAKER	
Type	12-inch Electrodynamic
Impedance (v. c.)	2.2 ohms at 400 cycles

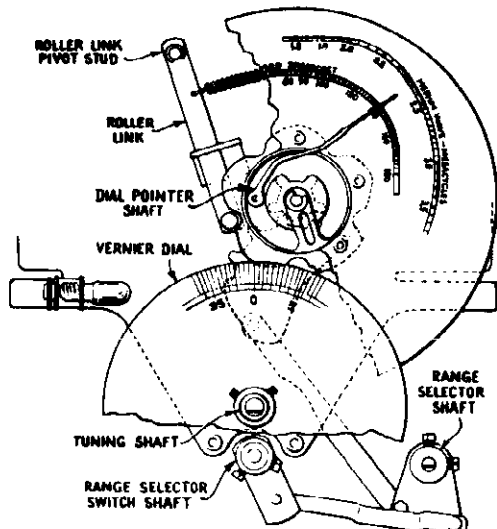


Figure 10—Selector Dial Mechanism (Model 9K3)

STOCK No.	PARTS
REPRODUCER ASSEMBLIES (Model 9K1 Only)	
12641	Board—3-contact reproducer terminal board
12640	Bracket—Output transformer mounting bracket and clamp
12012	Coil—Field coil (L20)
11469	Coil—Neutralizing coil (L19)
12667	Cone—Reproducer cone and dust cap (L18)
5118	Connector—3-contact male speaker cable connector
9696	Reproducer—Complete
11253	Transformer—Output transformer (T2)
11886	Washer—Spring washer to hold field coil securely
REPRODUCER ASSEMBLIES (Model 9K3 Only)	
12914	Board—Reproducer terminal board
13842	Bracket—Output transformer mounting bracket and clamp
13660	Coil—Field coil (L20)
11469	Coil—Neutralizing coil (L19)
12667	Cone—Reproducer cone and dust cap (L18)
5118	Connector—3-contact male speaker cable connector
9778	Reproducer—Complete
12913	Transformer—Output transformer (T2)
11886	Washer—Spring washer to hold field coil securely

Prices quoted above are subject to change without notice.

MODEL S 9K1, 9K3
Parts, Page 2

RCA MFG. CO., INC.

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
13834	Resistor—100 ohms, wire wound, 4 watts, for 25-cycle model only (R26) (Model 9K3 only)	12406	Capacitor—180 Mmfd. (C34)
5112	Resistor—1,000 ohms, carbon type, 1/4 watt (R3)	12727	Capacitor—555 Mmfd. (C14)
11300	Resistor—33,000 ohms, carbon type, 1/10 watt (R2, R5)	12537	Capacitor—560 Mmfd. (C3, C23, C26)
11282	Resistor—56,000 ohms, carbon type, 1/10 watt (R8)	12729	Capacitor—1,550 Mmfd. (C11)
11365	Resistor—82,000 ohms, carbon type, 1/4 watt (Model 9K1, R17) (Model 9K3, R6)	12728	Capacitor—4,500 Mmfd. (C9)
11398	Resistor—220,000 ohms, carbon type, 1/10 watt (R9)	4838	Capacitor—.005 Mfd. (C44) (Model 9K1 only)
11453	Resistor—270,000 ohms, carbon type, 1/10 watt (R15) (Model 9K1 only)	13033	Capacitor—.007 Mfd. (C44) (Model 9K3 only)
13005	Resistor—390,000 ohms, carbon type, 1/10 watt (R16) (Model 9K1 only)	4858	Capacitor—.01 Mfd. (Model 9K1, C24, C36, C42) (Model 9K3, C18, C24, C31, C36, C42)
11172	Resistor—470,000 ohms, carbon type, 1/4 watt (R13)	4870	Capacitor—.025 Mfd. (C35)
11452	Resistor—470,000 ohms, carbon type, 1/10 watt (R16) (Model 9K3 only)	12670	Capacitor—.035 Mfd. (C43) (Model 9K1 only)
11397	Resistor—560,000 ohms, carbon type, 1/10 watt (R1, R4)	13841	Capacitor—.07 Mfd. (C43) (Model 9K3 only)
5035	Resistor—560,000 ohms, carbon type, 1/4 watt (R15) (Model 9K3 only)	4841	Capacitor—.01 Mfd. (Model 9K1, C30, C48, C49) (Model 9K3, C27, C30)
12013	Resistor—1 megohm, carbon type, 1/10 watt (R19)	4840	Capacitor—.025 Mfd. (Model 9K1, C31, C37) (Model 9K3, C37)
11626	Resistor—2.2 megohms, carbon type, 1/4 watt (Model 9K1, R10) (Model 9K3, R7, R10)	5170	Capacitor—.025 Mfd. (Model 9K1, C18, C45) (Model 9K3, C45)
12679	Resistor—2.2 megohms, insulated, 1/4 watt (R7) (Model 9K1 only)	5212	Capacitor—.16 Mfd. (C46)
12927	Resistor—Voltage divider, comprising one 16-ohm, one 25-ohm, and one 190-ohm sections (R21, R22, R23) (Model 9K1 only)	12467	Capacitor—.30 Mfd. (Model 9K1, C47) (Model 9K3, C47, C48)
12715	Resistor—Voltage divider, comprising one 10,000-ohm, and one 22,000-ohm sections (R6, R20) (Model 9K1 only)	13655	Capacitor pack—Comprising two sections each .015 Mfd., one section 0.1 Mfd., and two 27,000-ohm resistors (C38, C39, C40, R12, R14) (Model 9K1 only)
13840	Resistor—Voltage divider, comprising one 115-ohm, one 11-ohm, one 13-ohm, one 4,100-ohm, one 2,900-ohm, one 1,750-ohm, and one 285-ohm sections (R17, R20, R21, R22, R23, R24, R25) (Model 9K3 only)	12708	Coil—Antenna coil and shield (L2, L3, L4, L5)
4669	Screw—No. 8-32 x 5/32 set screw for link, Stock No. 12868 (Model 9K3 only)	13654	Coil—Detector coil and shield (L9, L10, L11, L12, L13)
3903	Screw—No. 8-32 x 3/16 headless, cup-point set screw for dial, Stock No. 12870 (Model 9K3 only)	12709	Coil—Oscillator coil and shield (L6, L7, L8)
12925	Shaft—Range switch and band indicator operating shaft and hub assembly (Model 9K3 only)	13657	Compensator pack—Comprising one .015 Mfd., one .01 Mfd., one .07 Mfd. capacitors and one 27,000-ohm and one 39,000-ohm resistors (C38, C39, C40, R12, R14) (Model 9K3 only)
12710	Shield—Coil shield for Stock No. 12709	13650	Condenser—3-gang variable tuning condenser (C4, C15, C25) (Model 9K1 only)
12799	Shield—Coil shield for Stock Nos. 12708 and 13654	12922	Condenser—3-gang variable tuning condenser (C4, C15, C25) (Model 9K3 only)
12926	Shield—Chassis end shield and mounting foot assembly	5119	Connector—3-contact female connector for reproducer cable
12733	Shield—Dial lamp shield (Model 9K1 only)	12006	Core—Adjustable core and stud for Stock Nos. 12652 and 12653
12008	Shield—I. F. transformer shield for Stock Nos. 12652 and 12653	12664	Core—Adjustable core and stud for Stock No. 12654
12607	Shield—Top shield for I. F. transformer, Stock No. 12652	12800	Core—Adjustable core and stud for Stock No. 12709
12581	Shield—Top shield for I. F. transformer, Stock No. 12653	13653	Dial—Station selector dial scale (Model 9K1 only)
13652	Shutter—Dial scale holder and shutter assembly complete with link (Model 9K1 only)	12870	Dial—Vernier dial and disc assembly (Model 9K3 only)
11195	Socket—5-contact 5Z4 Radiotron socket	13651	Drive—Variable tuning condenser vernier drive with pinion gear (Model 9K1 only)
11198	Socket—7-contact 6F5, 6H6, 6K7, or 6L7 Radiotron socket	12712	Indicator—Station selector indicator pointer (Model 9K1 only)
11196	Socket—8-contact 6F6, 6J7, or 6L6 Radiotron socket	5226	Lamp—Dial lamp, 6.3 volts
11222	Socket—Dial lamp socket (Model 9K1, all sockets) (Model 9K3, upper right or lower left socket)	12868	Link—Range switch and band indicator operating link, complete with set screws (Model 9K3 only)
13095	Socket—Upper left or lower right dial lamp socket (Model 9K3 only)	13683	Mask—Dial scale mask, complete with colored screens (Model 9K1 only)
11381	Socket—Tuning tube socket and cover	DRIVE ASSEMBLIES (Model 9K3 Only)	
12007	Spring—Retaining spring for core, Stock Nos. 12006, 12664, or 12800	10705	Ball—5/32-inch diameter steel ball for planetary drive
12849	Spring—Tension spring for dial shutter link (Model 9K1 only)	10941	Ball—1/8-inch diameter steel ball for planetary drive bearing
13648	Switch—Range switch (S1, S2, S3) (Model 9K1 only)	12904	Bushing—Plate and bushing assembly for planetary drive mounting
13839	Switch—Range switch (S1, S2, S3) (Model 9K3 only)	12905	Coupling—Flexible coupling and shaft assembly, complete
13649	Tone control (R18) (Model 9K1 only)	12899	Dial—Band indicating dial and cam assembly
12921	Tone control—High-frequency tone control (R18) (Model 9K3 only)	12909	Drive—Variable tuning condenser drive, complete—including mounting bracket, drive, dial scale and indicator, less vernier dial, Stock No. 12870, and link, Stock No. 12868
12860	Tone control—Low-frequency tone control switch and power switch (S4, S5) (Model 9K3 only)	12906	Gear—Anti-lash drive gear, complete
12652	Transformer—First I. F. transformer, complete (L14, L15, C28, C29)	12910	Gear—Sector gear and link assembly for band selector
12653	Transformer—Second I. F. transformer, complete (L16, L17, C32, C33, C34, R8, R9)	12908	Indicator—Station selector indicator pointer
12918	Transformer—Power transformer, 105-125 volts, 50-60 cycles (T1) (Model 9K1 only)	8051	Link—Link and roller assembly, complete with spring
12857	Transformer—Power transformer, 105-125 volts, 25-60 cycles (T1) (Model 9K1 only)	12911	Screen—Dial lamp screen and light diffuser
11211	Transformer—Power transformer, 105-125 volts, 50-60 cycles (T1) (Model 9K3 only)	4669	Screw—Set screw for flexible coupling or gear, Stock Nos. 12905 and 12906
11212	Transformer—Power transformer, 105-125 volts, 25-60 cycles (T1) (Model 9K3 only)	12901	Shaft—Direct drive shaft and pinion gear for planetary drive
11213	Transformer—Power transformer, 100-250 volts, 40-60 cycles (T1) (Model 9K3 only)	12900	Shaft—Vernier drive shaft for planetary drive
12654	Trap—Wave trap, complete (L1)	12903	Spring—Tension spring for planetary drive bearing
13647	Volume control and power switch (R11, S4) (Model 9K1 only)	12907	Spring—Tension spring for gear, Stock No. 12906
12861	Volume control (R11) (Model 9K3 only)	8052	Spring—Tension spring for link, Stock No. 8051
RECEIVER ASSEMBLIES		MISCELLANEOUS ASSEMBLIES (Model 9K1 Only)	
12706	Arm—Hub and arm assembly complete with set screws for operating shutter link (located on range-switch shaft) (Model 9K1 only)	11996	Bracket—Tuning tube mounting bracket and clamp
12806	Board—3-contact antenna and ground terminal board	12666	Cover—Reproducer field coil and yoke cover
12863	Board—4-contact and 2-link phonograph terminal board	12698	Crystal—Station selector escutcheon and crystal
12929	Bracket—Mounting bracket for L. F. tone control or volume control (Model 9K3 only)	12742	Escutcheon—Tuning tube escutcheon
5237	Bushing—Variable condenser mounting bushing assembly	12699	Knob—Large station selector knob
13656	Button—Plug button for top of detector coil shield, Stock No. 12799	12700	Knob—Small (vernier) station selector knob
11625	Cable—Tuning tube cable and socket	11347	Knob—Range switch, tone control, or volume control knob
12511	Cap—Grid contact cap	11210	Screw—Chassis mounting screw, washer, and lockwasher assembly
12884	Capacitor—Adjustable trimmer (long) (C5, C7, C10, C13)	4982	Spring—Retaining spring for knob, Stock No. 12699
12714	Capacitor—Adjustable trimmer (medium) (C6, C8, C19, C21)	11349	Spring—Retaining spring for knob, Stock Nos. 11347 or 12700
12807	Capacitor—Adjustable trimmer (short) (C20)	MISCELLANEOUS ASSEMBLIES (Model 9K3 Only)	
12896	Capacitor—.15 Mmfd. (C22)	13615	Bracket—Tuning tube mounting bracket and clamp
12722	Capacitor—.18 Mmfd. (C12)	12915	Crystal—Station selector escutcheon and crystal
12723	Capacitor—.56 Mmfd. (C2, C17)	12742	Escutcheon—Tuning tube escutcheon
12404	Capacitor—.120 Mmfd. (C28, C29, C32, C33)	12699	Knob—Large station selector knob
12724	Capacitor—.120 Mmfd. (C16, C41)	12700	Knob—Small (vernier) station selector knob
12725	Capacitor—.150 Mmfd. (C1)	11347	Knob—Low-frequency tone control and power switch, volume control, range switch or high-frequency tone control knob

The prices quoted above are subject to change without notice.

RCA MFG. CO., INC

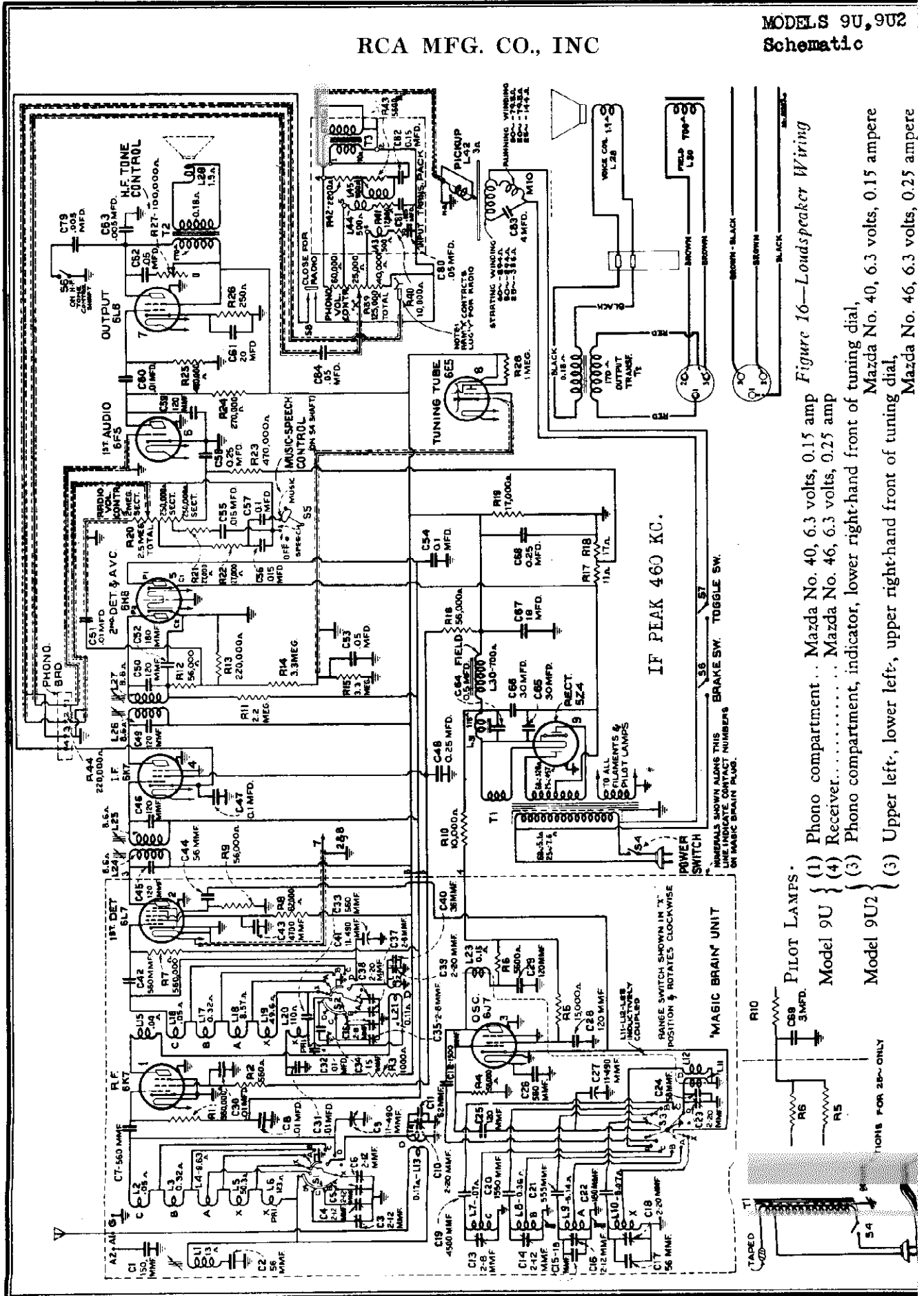


Figure 16—Loudspeaker Wiring

- (1) Phono compartment... Mazda No. 40, 6.3 volts, 0.15 amp
- (4) Receiver..... Mazda No. 46, 6.3 volts, 0.25 amp
- (3) Phono compartment, indicator, lower right-hand front of tuning dial, Mazda No. 40, 6.3 volts, 0.15 ampere
- (3) Upper left, lower left, upper right-hand front of tuning dial, Mazda No. 46, 6.3 volts, 0.25 ampere

MODEL 9U
Chassis Wiring

RCA MFG. CO., INC.

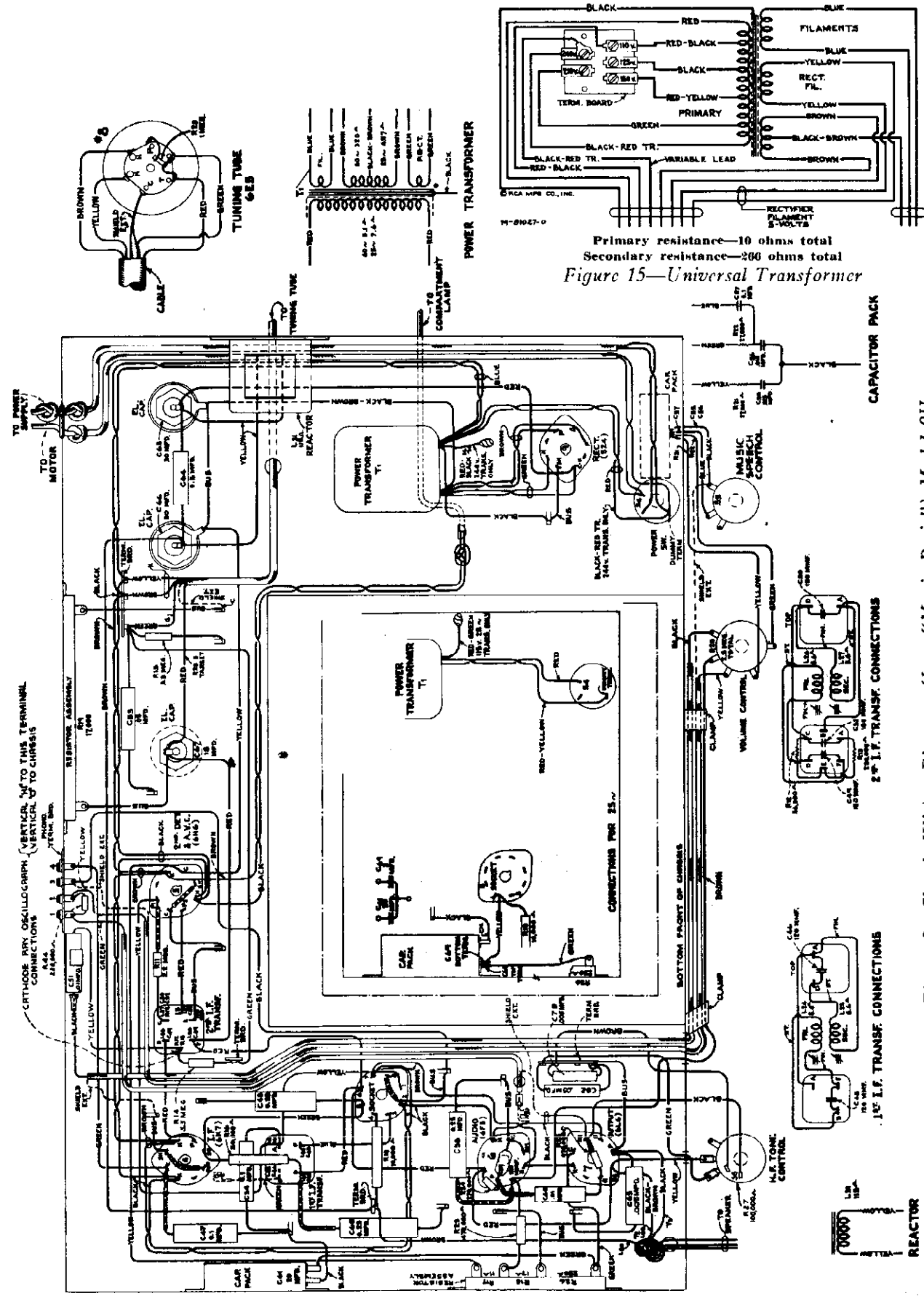


Figure 2—Chassis Wiring Diagram (Less "Magic Brain") Model 9U

Primary resistance—10 ohms total
 Secondary resistance—200 ohms total
 Figure 15—Universal Transformer

RCA MFG. CO., INC.

MODELS 9U, 9U2
"Magic Brain" Wiring

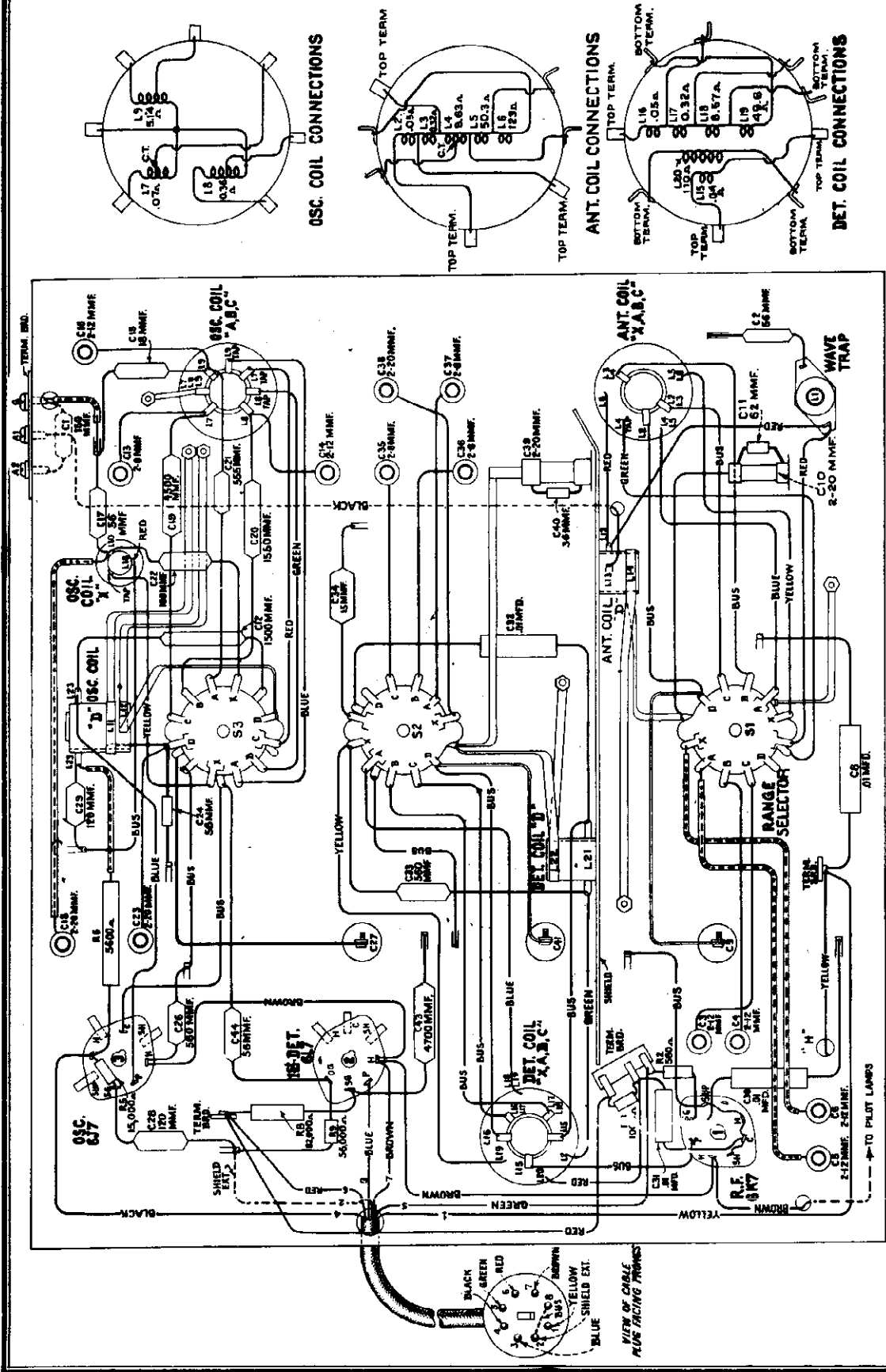


Figure 5—"Magic Brain" Wiring Diagram

POWER OUTPUT RATINGS

- Undistorted..... 5 watts
 - Maximum..... 9 watts
- LOUDSPEAKER
- Type..... 12-inch Electrodynamic
 - Impedance (V.C.)..... 2.2 ohms at 400 cycles

PHOTOGRAPH

- Type..... Automatic Record Ejector
- Record Capacity..... Seven 10-inch or Six 12-inch
- Turntable Speed..... 78 R.P.M.
- Type of Pickup..... Low-Impedance Magnetic
- Pickup Impedance..... 8.5 ohms at 1,000 cycles

MODEL 9U2
Chassis Wiring

RCA MFG. CO., INC.

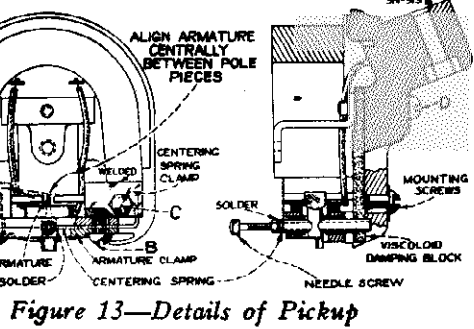
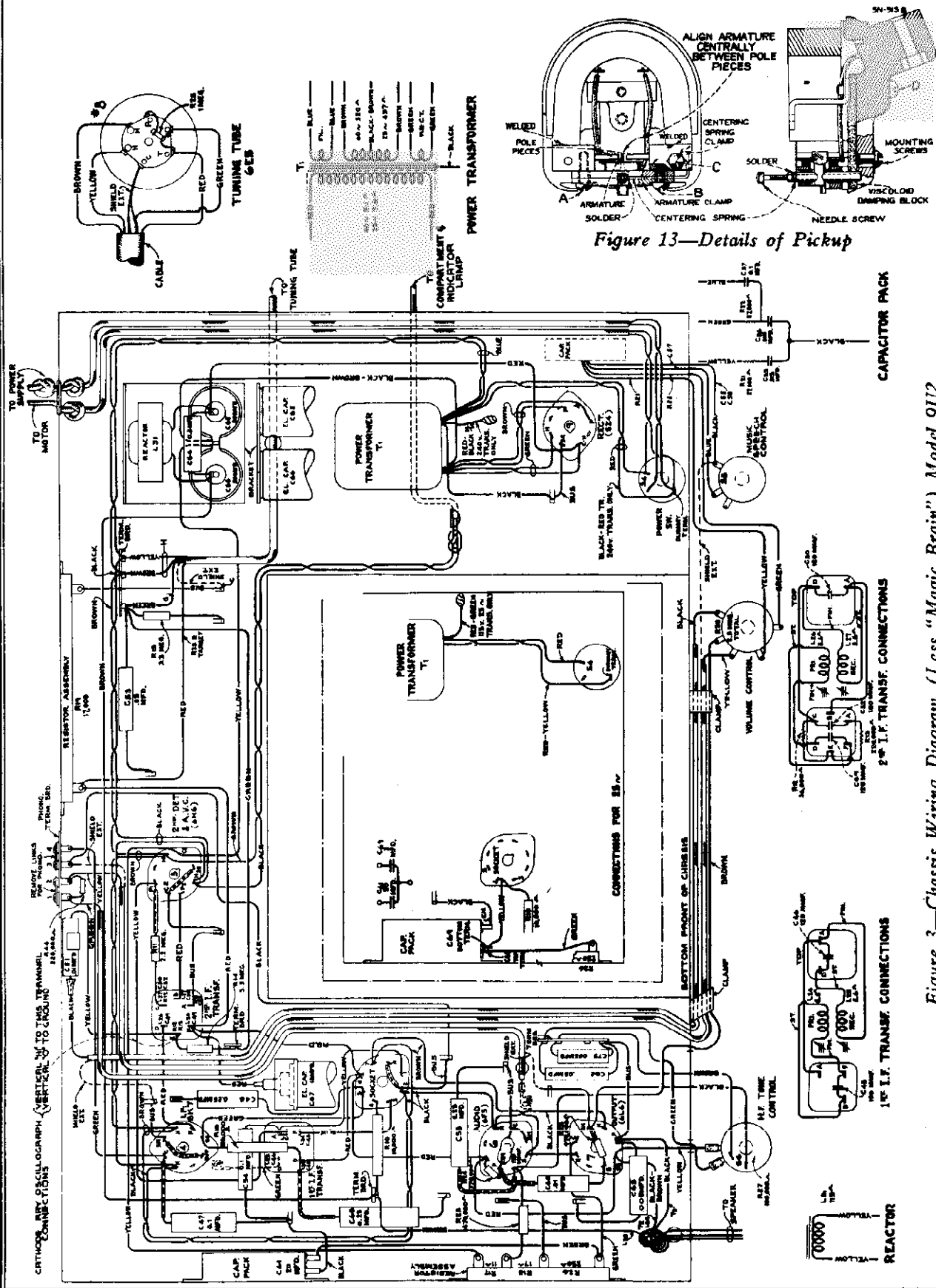
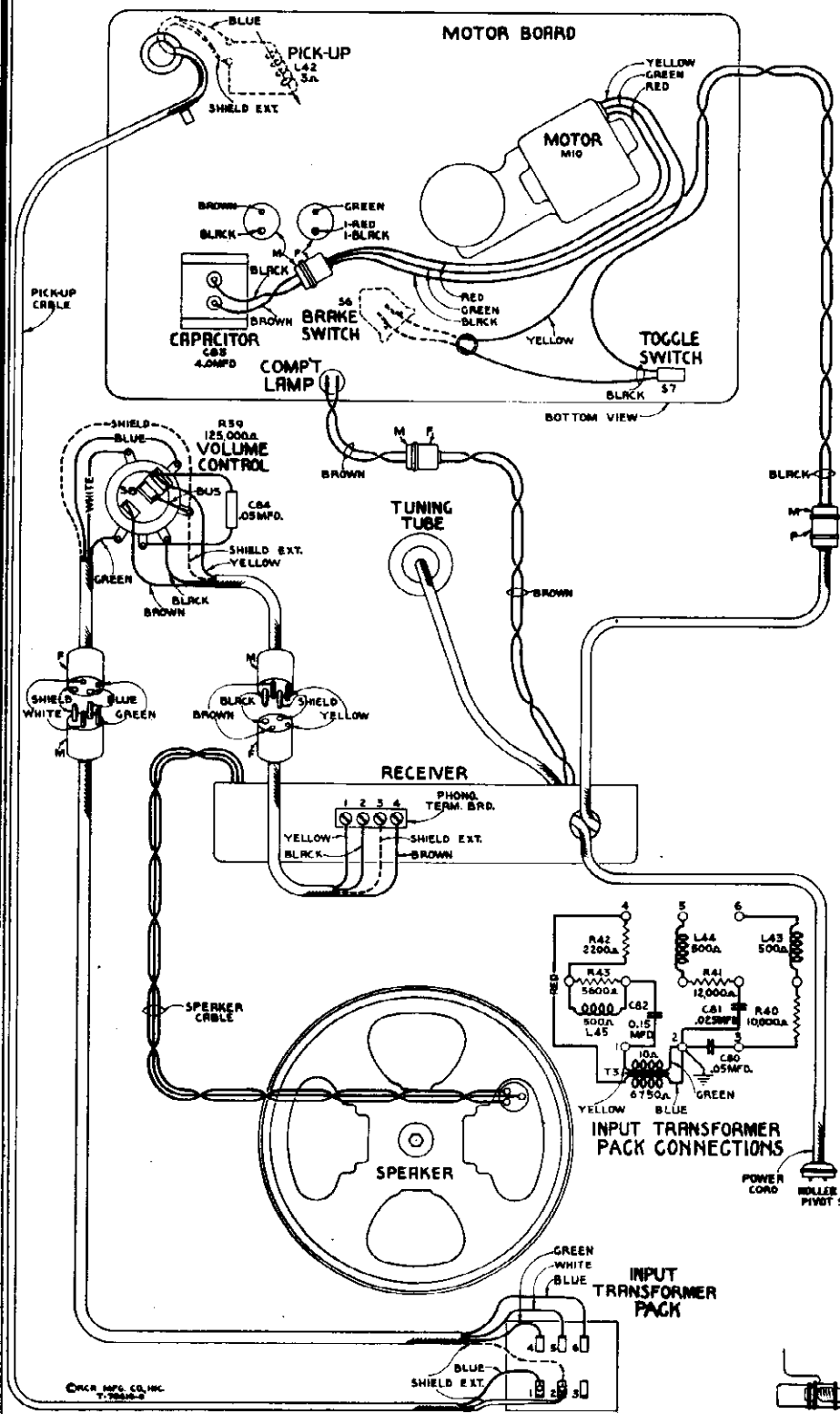


Figure 3—Chassis Wiring Diagram (Less "Magic Brain") Model 9U2

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MODELS 9U, 9U2
Assembly Wiring
Dial Data



Electrical Specifications

ALIGNMENT FREQUENCIES	
"Long Wave" (X)	175 kc (osc.), 350 kc (osc, det., ant.)
"Standard Broadcast" (A)	600 kc (osc.), 1,500 kc (osc, det., ant.)
"Medium Wave" (B)	6,000 kc (osc, det., ant.)
"Short Wave" (C)	20,000 kc (osc, det., ant.)
"Ultra Short Wave" (D)	57,000 kc (osc, det., ant.)
Intermediate Frequency	460 kc

FREQUENCY RANGES	
"Long Wave" (X)	150-410 kc
"Standard Broadcast" (A)	530-1,800 kc
"Medium Wave" (B)	1,800-6,400 kc
"Short Wave" (C)	6,400-23,000 kc
"Ultra Short Wave" (D)	23,000-60,000 kc

Figure 8—Assembly Wiring

POWER SUPPLY RATINGS

Rating A-6 (Model 9U only)	105-125 volts, 60 cycles, 150 watts
Rating A-5 (Model 9U only)	105-125 volts, 50 cycles, 155 watts
Rating B-2	105-125 volts, 25 cycles, 150 watts
Rating C-6	105-130/140-160/200-250 volts, 60 cycles, 150 watts
Rating C-5	105-130/140-160/200-250 volts, 50 cycles, 155 watts

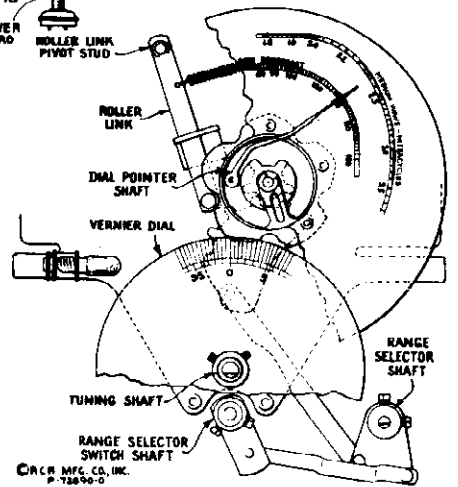


Figure 12—Selector Dial Change Mechanism

MODELS 90, 902
Socket, Trimmers
Voltage, Resistance

RCA MFG. CO., INC.

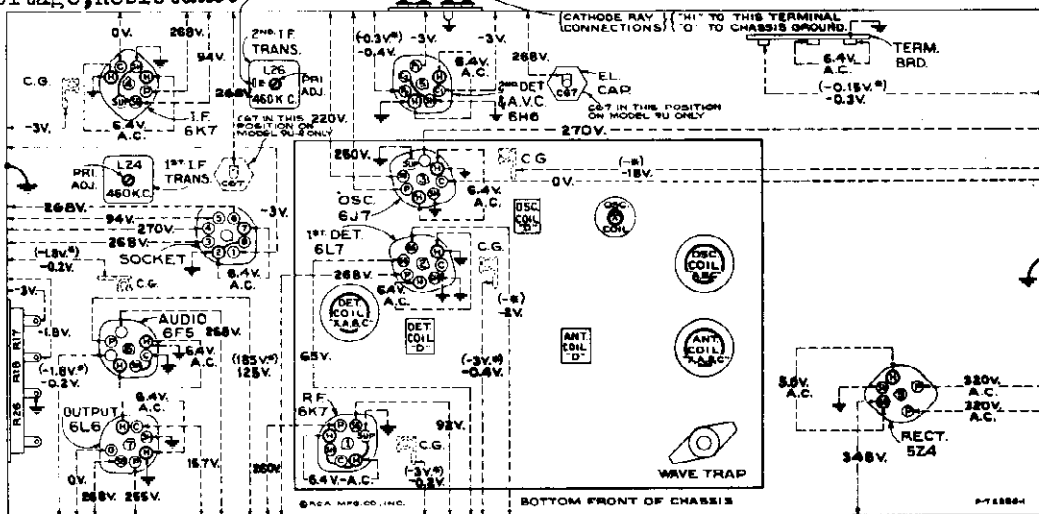


Figure 11—Radiotron Socket Voltages, Coil, and I-F Trimmer Locations

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc—No signal being received—Radio volume control counter-clockwise—Phono volume control extreme counter-clockwise—Other controls optional

Note: Two voltage values are shown for some readings. The value shown in parenthesis with asterisk (*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parenthesis because of the additional loading of the voltmeter through the high series circuit resistance.

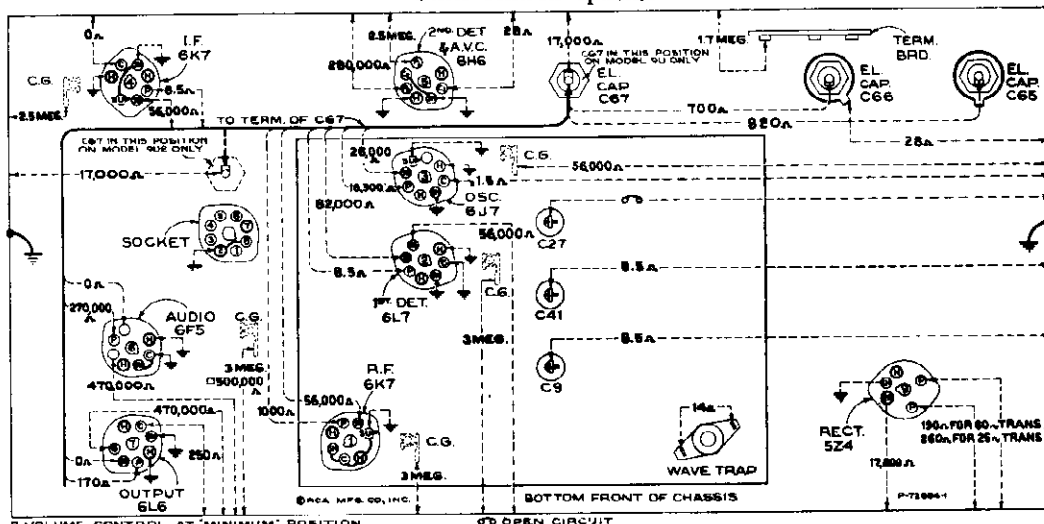


Figure 10—Resistance Diagram

Power supply disconnected—Radiotrons in sockets—Tuning condenser in full-mesh—Range selector in "Standard broadcast" position—Radio volume control clockwise—Phono volume control extreme counter-clockwise—Other controls optional

Radiotron Cathode Current Readings
Measured with Milliammeter Connected at Tube Socket
Cathode Terminal under Conditions Similar to Those of Voltage Measurements

- (6) RCA-6F5—A.F. 0.3 ma.
 - (7) RCA-6L6—Power 63 ma.
 - (8) RCA-6E5—Eye 3.0 ma.
 - (9) RCA-5Z4—Rect. 110 ma.*
- (*Cannot be measured at socket)

- (1) RCA-6K7—R.F. 8.0 ma.
- (2) RCA-6L7—1st Det. 4.4 ma.
- (3) RCA-6J7—Osc. 6.7 ma.
- (4) RCA-6K7—I-F 8.0 ma.
- (5) RCA-6H6—2nd Det.-A.V.C.

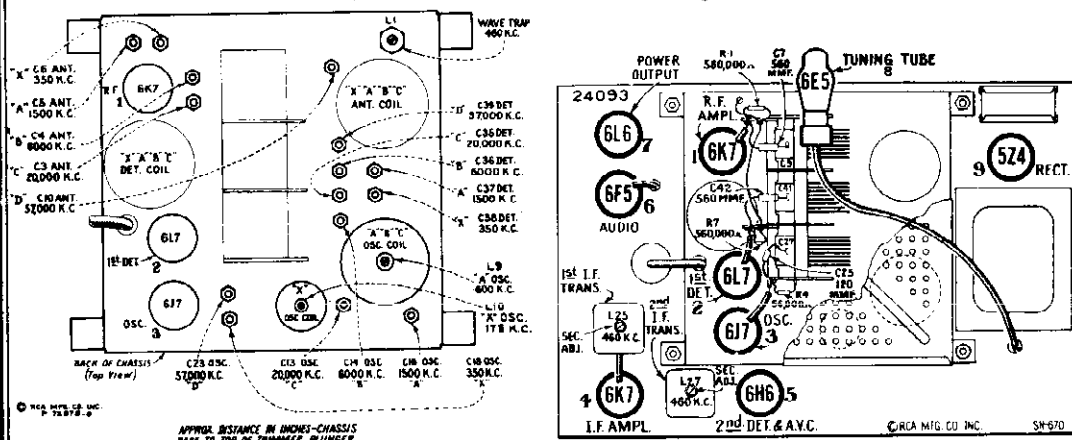


Figure 4—Radiotron and I-F Trimmer Locations

Figure 7—"Magic Draw" Trimmer Locations

RCA MFG. CO., INC.

MODELS 9U, 9U2
Automatic Record Change
Details, Notes

ADJUST AND TIGHTEN NUT SO AS TO PROVIDE APPROXIMATELY $\frac{1}{32}$ " BETWEEN SLOT IN LINK AND SCREW. WHEN BUMPER IS IN CONTACT WITH STOP BRACKET.

TO ADJUST RISE AND SWING OF TONE ARM — WITH MANUAL INDEX LEVER IN 12" POSITION AND ROLLER ON MAIN LEVER A ENGAGED IN CAM AT HALF CYCLE POSITION AS SHOWN, AND SWITCH STOP SCREW C, ADJUST EYEBOLT D SO NEEDLE POINT (ORANGE SPARK) IS $1\frac{1}{16}" + 1/32"$ — .000 ABOVE TURNABLE FELT. AT THE SAME TIME ADJUST SCREW C SO THAT NEEDLE LANDS AT A RADIUS OF $5\frac{13}{16}" + 1/16"$ — .000 FROM CENTER OF TURNABLE SPINDLE. THIS ADJUSTMENT CAN BE FACILITATED BY USING 7 TWELVE-INCH RECORDS (NOT WARPED) WHICH MEASURES $1\frac{1}{16}"$ TOTAL. ANY ADJUSTING RISE TO $3/8"$ TO $3/4"$ ABOVE RIM OF TOP RECORD. LANDING RADIUS $5\frac{13}{16}" + 1/16"$ — .000.

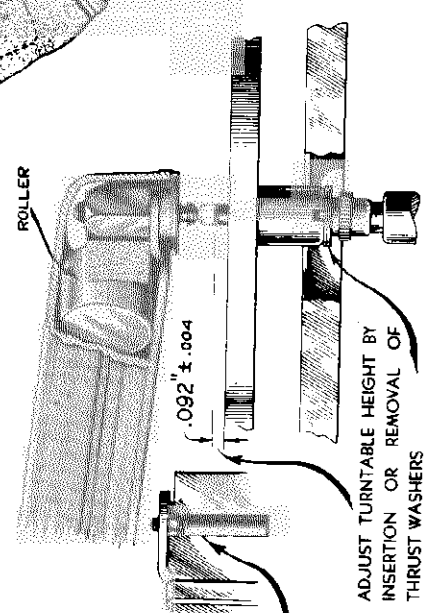
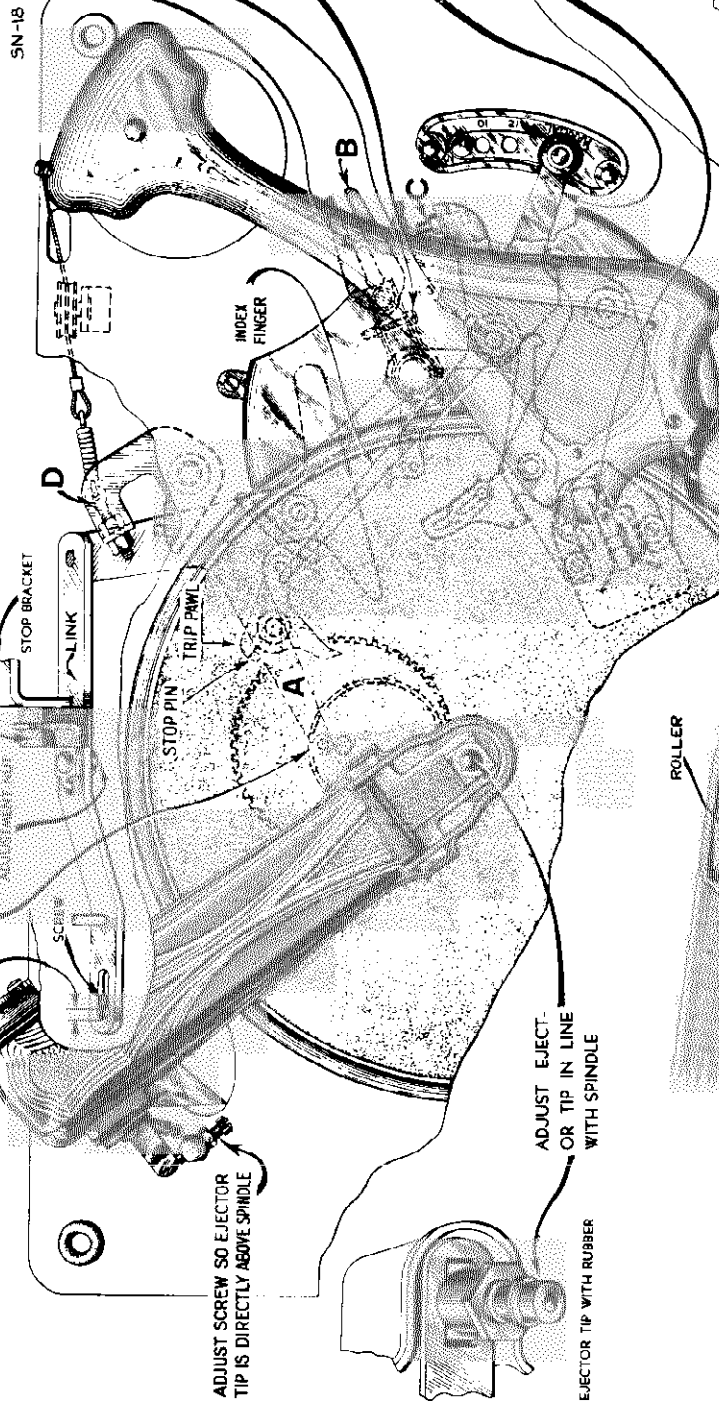
ADJUST NEEDLE HEIGHT BY MEANS OF TRIP ROD UNTIL NEEDLE POINT OF AN "ORANGE SHANK" NEEDLE IS $1/16" + .010$ BELOW TOP SURFACE OF THE RUBBER PICKUP REST.

ADJUST SCREW UNTIL FRICTION WILL JUST FORCE FINGER TO MOVE TRIP PAWL (WITH COVER REMOVED)

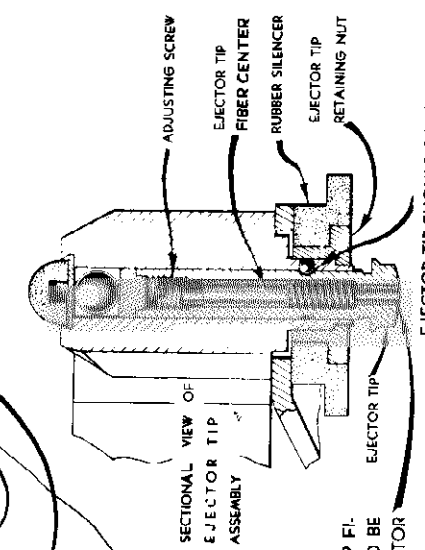
TO ADJUST MANUAL INDEX FINGER. PLACE MANUAL INDEX LEVER IN THE POSITION SHOWN. SET MANUAL INDEX FINGER TO FORCE TRIP PAWL AGAINST STOP PIN. TIGHTEN SET SCREW.

ADJUST AUTOMATIC SWITCH AS FOLLOWS. PLACE MANUAL INDEX LEVER IN POSITION SHOWN AND WITH SWITCH IN TRIPPED POSITION, ADJUST IT UNTIL THE CONTACT POINTS ARE OPENED $.020" \pm .001$ AS INDICATED (TURNABLE REMOVED)

ADJUST SCREW SO EJECTOR TIP IS DIRECTLY ABOVE SPINDLE



IF ROLLER FAILS TO ROLL BACK DURING AUTOMATIC CYCLE, ADJUST SCREW UPWARD TO PROVIDE A GREATER INCLINE DURING THE CYCLE. DO NOT ADJUST SO HIGH AS TO CAUSE EJECTOR TIP TO FAIL TO TOUCH TOP OF TURNABLE FELT AT HIGHEST POINT.



END OF EJECTOR TIP FIBER CENTER SHOULD BE FLUSH WITH EJECTOR TIP.

EJECTOR TIP SHOULD ROTATE FREELY

Figure 9—Automatic Record Changer Adjustments

to the input of the i-f system, i.e., to the RCA 6L7 first-detector grid cap, through a .001-mfd. capacitor (with grid lead in place). Regulate the test-oscillator output so that the amplitude of the oscillographic image is approximately the same as used for adjustment (f) above.

(h) The two first i-f transformer magnetite core screws L25 and L26 (one on top and one on bottom) should then be adjusted so that they cause the forward and reverse curves to become coincident throughout their lengths and have maximum amplitude. The composite wave obtained in this manner represents the lack of characteristic of the total i-f system. Lack of symmetry or irregularity of the resultant image will indicate the presence of a defect in the i-f system.

R-F Adjustments

Make receiver dial adjustments as outlined by "Selector dial," figure 12. Alignment must be made in sequence of "Wave-trap," "Ultra short wave" band, "Short wave" band, "Medium wave" band, "Standard broadcast" band, and "Long wave" band.

"Wave-Trap" Adjustment

(a) Connect the output of the test oscillator to the antenna terminal "A1" through a 200-mmf. (important) capacitor. Remove the plug of the frequency-modulator cable from the test-oscillator jack. Turn test-oscillator modulation switch to "On." Shift the oscillograph "Timing" switch to "Int." Place receiver range selector in "Standard broadcast" position. Set the receiver dial to a position of no extraneous signals near 600 kc. Tune the test oscillator to 460 kc. Adjust the wave-trap magnetite core screw to the point which causes minimum amplitude of output (maximum suppression of signal) as shown by the waves on the oscillograph. An increase of the test-oscillator output may be necessary before this point of minimum amplitude, obtained by correct adjustment of wave-trap screw, becomes apparent on oscillograph screen.

"Ultra Short Wave" Band

(b) Connect the "Ant." output of the test oscillator to the antenna terminal "A1" of the receiver through a 300-ohm resistor. Set the receiver range selector to its "Ultra short wave" position and its dial pointer to 37,000 kc. Adjust the test oscillator to 19,000 kc. The third harmonic of 19,000 kc is used for this adjustment. If the modulation on the oscillograph screen is not sufficient for the following adjustments at 37,000 kc, the vertical-input terminals of the cathode-ray oscillograph may be connected thus: "Hi" to the plate contact of the RCA-6L6 power-output tube socket with the "V" terminal to chassis-ground. The receiver should be turned off while making this connection since the plate potential is impressed across the oscillograph input and a severe shock will result if contact is made between these two points. If this connection is made, advance the receiver volume control to its maximum position. Adjust oscillator air-trimmer C23 for maximum (peak) output. Two positions, each producing maximum output, may be found. The position of minimum capacitance (plunger near out) should be used. This places the receiver

a clearly defined spot, or line, on the screen. Set oscillograph "Ampl. A" switch to "On." "Vertical gain" control full-clockwise, "Ampl. B" switch to "Tuning." "Range" switch to No. 2 position, and aligned, so as to cause the circuit to resonate within the range of the trimmer. An increase in the capacity-to-ground of the trimmer will be required if the iron output when the air-trimmer plunger is fully-in, while a decrease in the capacity-to-ground will be required if the brass end of the tuning wand causes an increase in signal output when the air-trimmer plunger is fully-out.

I-F Adjustments

(a) Turn range selector to its "Standard broadcast" (A) position and tune receiver to a position of no extraneous signals near 600 kc. Connect the "Ant." output of the test oscillator to the grid cap of RCA-6K7 i-f tube (with grid lead in place) through a .001-mfd. capacitor, with "Grid" to receiver chassis. Tune the test oscillator to 460 kc and place its modulation switch to "On" and its output switch to "Hi."

(b) Turn on the receiver and test oscillator. Increase the output of the test oscillator until a deflection is noticeable on the oscillograph screen. The figures obtained represent several waves of the detected signal, the amplitude of which may be observed as an indication of output. Cause the wave-image formed (400-cycle waves) to be spread completely across the screen by adjusting the "Horizontal gain" control. The image should be synchronized and made to remain motionless by adjusting the "Sync." and "Freq." controls.

(c) Adjust the two magnetic core screws L27 and L26 (see figures 4 and 11) of the second i-f transformer (one on top and one on bottom) to produce maximum vertical deflection of the oscillographic image. This adjustment places the transformer in exact resonance with the 460-kc signal. The sweeping operation should follow using the frequency modulator. Shift the oscillograph "Timing" switch to "Ext." Insert plug of frequency-modulator cable in test-oscillator jack.

(d) Turn the test-oscillator modulation switch to "Off." Turn on the frequency modulator and place its sweep-range switch to "Hi." Increase the frequency of the test oscillator by slowly turning its tuning control until two separate, distinct, and similar waves appear on the screen. If only one wave appears, increase the "Freq." control on the oscillograph to obtain two waves. These waves will be identical in shape, totally disconnected, and appear in reversed positions. They will have a common base line, which is discontinuous. Adjust the "Freq." and "Sync." controls of the oscillograph to make them remain motionless on the screen. Continue increasing the test-oscillator frequency until these forward and reverse curves move together and overlap, with their highest points exactly coincident. This condition will be obtained at a test-oscillator setting of approximately 37.5 kc.

(e) With the images established as in (d), re-adjust the two magnetic core screws L27 and L26 on the second i-f transformer so that they cause the curves on the oscillograph screen to become exactly coincident throughout their lengths and have maximum amplitude.

(f) Without altering the adjustments of the apparatus, shift the "Ant." output of the test oscillator

specive air-trimmer capacitance should be increased (plunger pushed in). If the range of the air trimmer is not sufficient to give the desired results, the lead-dress may be changed in the particular circuit being aligned, so as to cause the circuit to resonate within the range of the trimmer. An increase in the capacity-to-ground of the trimmer will be required if the iron output when the air-trimmer plunger is fully-in, while a decrease in the capacity-to-ground will be required if the brass end of the tuning wand causes an increase in signal output when the air-trimmer plunger is fully-out.

Precautionary Dressing of Leads for "Magic Beam" Alignment
(Refer to Figure 3)

1. Keep blue lead A of S1 to antenna coil L25 dressed away from chassis, coil shield, coil, and other leads.
2. Blue lead from C10 to S1 should be as short as possible.
3. Keep blue lead A of S2 to detector coil L18-19 clear of chassis, coil shield, coil, and other leads.
4. Keep spaghetti lead C6 to X of S1 apart from spaghetti lead C5 to A of S1, and from chassis.

Lead "A"

1. Keep green lead terminal S1 to antenna coil tap L4 away from chassis, coil shield, and coil.
2. Lead C8 to X of S1 and from chassis.

Lead "C"

Lead from C19 to oscillator coil L7 should be maintained as short and straight as possible.

Two methods of alignment are applicable—one requires use of the cathode-ray oscillograph, and the other requires a voltmeter or glow-type indicator. The cathode-ray alignment method is advantageous in that the indication provided is in the form of a wave-image which represents the resonance characteristics of the circuit being tuned. This method is preferred because of the i-f characteristics of these receivers. This type of alignment is possible through use of apparatus such as the RCA Stock No. 9458 Frequency Modulator and the RCA Stock No. 9443 Cathode-Ray Oscillograph. If this equipment is not available, an approximate alignment may be performed by the output-indicator method with an instrument such as the RCA Stock No. 4317 Neon Glow Indicator attached across the loudspeaker voice coil. Alignment by this method is similar to the cathode-ray method outlined below except that the receiver volume control should be at maximum, the trimmers adjusted to peak response (with the exception of the wave-trap) and the test-oscillator sweeping operations omitted. Either of these methods require the use of a reliable test oscillator such as the RCA Stock No. 9593.

Cathode-Ray Alignment

Make alignment apparatus connections shown on figure 6. Remove the plug of the frequency-modulator cable from the test-oscillator jack. Connect the receiver chassis to a good external ground. Connect oscillograph "Vertical" input terminals as indicated on figure 11. Set oscillograph power switch to "On" and adjust "Intensity" and "Focus" controls to give

There are seventeen adjustments required for the alignment of the oscillator, first-detector, and antenna-tuned circuits; one adjustment for the wave-trap; and four adjustments for the i-f system. Fifteen of these adjustments are made with plunger-type air trimming capacitors and require the use of an RCA Stock No. 12636 Adjusting Tool. Each of these capacitors has a lock nut for securing the plunger in place after adjustment. The remaining seven adjustments are made by means of screws attached to molded magnetite cores. These cores change the inductance of the particular coils in which they are inserted to provide exact alignment. All of these adjustments are accurately made during manufacture and should remain in proper alignment unless affected by abnormal conditions of climate or purposed alterations for servicing, or unless altered by other means. Loss of sensitivity, improper tone quality, and poor selectivity are the usual indications of improper alignment. Such conditions will usually exist simultaneously. Correct performance of this receiver can only be obtained when these adjustments have been made by a skilled service engineer with the use of adequate and reliable test equipment. The manufacturer of this receiver has such test equipment available for sale through its distributors and dealers.

The extensive frequency range of this receiver necessitates a more or less involved method of alignment. However, if the following directions are carefully applied in the sequence given, normal performance of the instrument will be obtained.

The plunger-type air trimming capacitors have their approximate plunger settings tabulated on figure 7. If the plungers have been disturbed from their original adjustments, they may be roughly set to the specified dimensions prior to alignment.

For alignment, the test-oscillator frequency should be quite accurate. A convenient and reliable means of accurately checking the frequency of test oscillators, receivers, etc., is the RCA Stock No. 9572 Crystal Calibrator.

If the test-oscillator signal cannot be heard as the receiver (heterodyne) oscillator air-trimmer plunger is changed from its minimum-capacity to maximum-capacity position (receiver dial and test oscillator set to the specified frequencies), and the correct oscillator air-trimmer used, it may be an indication that the test-oscillator frequency is outside the range covered by the air-trimmer. Under such conditions, when a more accurate setting of the test oscillator cannot be determined, set the oscillator air-trimmer plungers to the approximate settings given on figure 7. Tune the test oscillator until the signal is heard in the speaker. Each of two test-oscillator settings (the fundamentals or the harmonics of which are 920 kc apart) produce a signal. The low-frequency test-oscillator setting should be used as this places the test-oscillator (signal) frequency 460 kc below the frequency of the receiver heterodyne oscillator.

Holes are provided in the top of the r-f and antenna coil cans on some models to enable a tuning check with the RCA Stock No. 6679 Tuning Wand. The hole in the top of the detector coil can has a catch button which must be removed before insertion of the tuning wand. When the brass end of the wand is inserted in the coil, the inductance of the coil is decreased. If this results in an increase of output, the respective air-trimmer capacitance should be decreased (plunger pulled out). If inserting the iron end of the tuning wand causes an increase in output, resulting from an increase of inductance of the coil, the re-

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C6, again, to produce maximum amplitude of the images and best coincidence throughout their lengths.
(k) Re-tune the receiver to approximately 175 kc so that the forward and reverse waves appear on the oscillograph screen. Adjust the oscillator magnetic core screw L10 to produce maximum (peak) amplitude of the waves, disregarding the fact that the two images may or may not come together.
(l) Shift the receiver dial setting to 350 kc without altering any other adjustments (frequency modulator still in operation). Adjust air-trimmers C18, C38, and C6, respectively, to produce maximum amplitude and best coincidence for any waves. These adjustments compensate for any changes caused by the adjustment of the magnetic core screw L10. Tighten lock nuts on C18, C38, and C6, respectively, after each is adjusted.

Selector Dial

Figure 12 illustrates the relation of the various parts of the dial mechanism when in its "Standard broadcast" position with the range switch likewise turned to its "Standard broadcast" position. In re-assembling the dial after repairs, see that the gears are meshed in accordance with the diagram at the same time noting that the range switch in its "Standard broadcast" position and the lever attached to the range-switch shaft placed in the position shown.

To adjust the dial mechanism, set the range switch to its "Standard broadcast" position. Place a straight-edge across the center of the dial so that its edge is even with the lower (end) marking at both the low-frequency and high-frequency ends of the dial. Under such conditions the straight-edge should be parallel with the top of the chassis base. If the straight-edge is not parallel with the top of the chassis base, loosen the nut on the rear of the roller link pivot stud and move the stud up or down until the link roller moves the dial to the desired position so that the end calibration marks obtain the position mentioned above. Tighten the nut on the roller link pivot stud.

Set the gang tuning condensers to its maximum capacity position. Adjust the dial pointer to the low-frequency (end) mark on "Standard broadcast" scale. This is a friction adjustment.

With the gang tuning condenser plates still in full mesh, loosen the two set screws on the vernier-dial hub. Rotate the vernier dial until the "0" marking is in a vertical plane above the center of the shaft. Tighten set screws.

Antenna and Ground Terminals

These receivers are equipped with an antenna-ground terminal board having three terminals. These terminals are marked "A1," "A1," and "G," the latter being the ground terminal and should always be connected to a good external ground. The transmission line leads of the RCA RK40A antenna system should be connected to terminals "A1" and "A1." The receiver coupling units of the RCA RK40 and the RCA Spider-Web antenna systems should be connected to terminals "A1" and "G." Connect a single-wire antenna to terminal "A1."

Magnetic Pickup

The pickup used in the phonograph unit is of an improved design. The horseshoe magnet is rigidly

tion and insert plug of the frequency-modulator cable in test-oscillator jack. Turn test-oscillator modulation switch to "Off." Re-tune the test oscillator (increase frequency) until the forward and reverse waves appear on the oscillograph screen and become coincident at their highest points. This will occur at a test-oscillator setting of approximately 600 kc. Adjust trimmer C16, C37, and C3, again, setting each to the point which produces the best coincidence and maximum amplitude of the images.

(h) Remove the plug of the frequency-modulator cable from the test-oscillator jack. Turn test-oscillator modulation switch to "On." Set oscillograph "Timing" switch to "Int." Tune test oscillator to 200 kc (200-400-kc range). Tune receiver for maximum response to this signal at a dial reading of approximately 600 kc. The third harmonic of the 200-kc signal is used for this adjustment. Shift oscillograph "Timing" switch to "Ext." Insert the plug of the frequency-modulator cable in test-oscillator jack. Turn test-oscillator modulation switch to "Off." Re-tune the test oscillator (increase frequency) until the forward and reverse waves show on the oscillograph screen. This will occur at a test-oscillator setting of approximately 250 kc. Disregarding the fact that the two images may or may not come together, adjust the oscillator magnetic core screw L9 (top of large oscillator coil can) to produce maximum (peak) amplitude of the images. Shift the oscillograph "Timing" switch to "Int." Re-move the plug of the frequency-modulator cable from the test-oscillator jack. Turn the test-oscillator modulation switch to "On." Repeat adjustments in (g) above to compensate for any changes caused by the adjustment of L9 core, tightening lock nuts on C16, C37, and C3, respectively, after each is adjusted.

"Long Wave" Band

(i) Shift the oscillograph "Timing" switch to "Int." Remove the plug of the frequency-modulator cable from the test-oscillator jack. Turn the test-oscillator modulation switch to "On." Place receiver range selector to its "Long wave" position. Set the receiver dial pointer to 175 kc. Tune the test oscillator to 175 kc and increase its output until a deflection is noticeable on the oscillograph screen. Adjust oscillator magnetic core screw L10 (located on top of small oscillator coil can) so that maximum (peak) amplitude of output is shown on the oscillograph screen.

(j) Set receiver dial pointer to 350 kc. Tune test oscillator to 350 kc. Adjust the oscillograph, detector, and antenna air-trimmers C18, C38, and C6 to produce maximum (peak) output as shown by the waves on the oscillograph screen. With out disturbing the connections, shift the oscillograph "Timing" switch to "Ext." Place the frequency-modulator sweep-range switch to its "Hi" position and insert plug of frequency-modulator cable in test-oscillator jack. Turn test-oscillator modulation switch to "Off." Re-tune the test oscillator (decrease frequency) until the forward and reverse waves show on the oscillograph screen and become coincident at their highest points. This will occur at a test-oscillator setting of approximately 198 kc. This setting places the test-oscillator frequency to 175 kc. The second harmonic is now used for the 350 kc adjustment. Adjust air-trimmers C18, C38, and

wave" band.

"Short Wave" Band

(d) Set the receiver range selector to its "Short wave" position and its dial pointer to 20,000 kc. Adjust the test oscillator to 20,000 kc. If the vertical input cathode-ray connections were changed for adjustment (b) above, they should be restored to their original position as shown on figure 11. Adjust oscillator air-trimmer C13 until maximum (peak) output is reached. Two peaks may be found with this circuit. The peak with minimum capacitance (plunger near out) should be used. Tighten lock nut. Adjust detector air-trimmer C35 until maximum (peak) output is reached, while slightly rocking the gang tuning condenser back and forth through the signal. Two peaks may be found with this circuit. The peak with maximum capacitance (plunger near in) should be used. Tighten lock nut. Adjust antenna air-trimmer C3 until maximum (peak) output is reached while slightly rocking the gang tuning condenser back and forth through the signal. The peak with minimum capacitance (plunger near in) should be used. Tighten lock nut. Adjust antenna air-trimmer C3 until maximum (peak) output is reached while slightly rocking the gang tuning condenser back and forth through the signal. Two peaks may be found with this circuit. The peak with maximum capacitance (plunger near in) should be used. Tighten lock nut. Check the image frequency by changing the receiver dial setting to 19,000 kc. The image signal should be received at this position indicating that the adjustment of C13 has been correctly made. No adjustments should be made while checking for the image signal.

Medium Wave" Band

(e) Place receiver range selector to its "Medium wave" position with its dial pointer set to 6,000 kc. Tune the test oscillator to 6,000 kc. Adjust oscillator air-trimmer C14 to produce maximum (peak) output as shown by the waves on this oscillograph. Two peaks may be found with this circuit. The peak with minimum capacitance (plunger near out) should be used. Tighten lock nut. Adjust the detector air-trimmer C36 for maximum (peak) output while slightly rocking the gang tuning condenser back and forth through the signal. Two peaks may be found with this circuit. The peak with maximum capacitance (plunger near in) should be used. Tighten lock nut. Adjust antenna air-trimmer C4 to produce maximum (peak) output. Tighten lock nut.

"Standard Broadcast" Band

(f) Remove the 300-ohm resistor from between the test-oscillator "Ant" post and receiver antenna terminal "A1" and insert a 200-mmd. capacitor in its place. Place receiver range selector to "Standard broadcast" position with receiver dial pointer set to 600 kc. Tune the test oscillator to 600 kc. Adjust oscillator magnetic core screw L9 (top of large oscillator coil can) for maximum (peak) output as shown by the waves on the oscillograph screen.

(g) Set receiver dial pointer to 1,500 kc. Tune test oscillator to 1,500 kc (1,500-3,100-kc range) and increase its output to produce a registration on the oscillograph screen. Carefully adjust the oscillator, detector, and antenna air-trimmers C16, C37 and C5, respectively, to produce maximum (peak) output as shown by the waves on the oscillograph screen. Shift the oscillograph "Timing" switch to "Ext." Place the frequency-modulator sweep-range switch to its "Lo" position

heterodyne oscillator 460 kc higher in frequency than the incoming signal. Tighten lock nut. Adjust the detector air-trimmer C39, while slightly rocking the gang tuning condenser back and forth through the signal, for maximum (peak) output. Two peaks may be found on this trimmer. The peak of maximum capacitance (plunger near in) should be used. Tighten lock nut. Adjust the antenna air-trimmer C10 for maximum (peak) output while slightly rocking the gang tuning condenser back and forth through the signal. Two peaks may be found on this trimmer which produce maximum output. The peak with maximum capacitance (plunger near in) should be used. Tighten lock nut. Check the image frequency by changing the receiver dial setting to 56,000 kc. If the image signal is received at this position, the adjustment of the oscillator air-trimmer C23 has been correctly made. No adjustments should be made while checking for the image signal.

(c) Re-tune receiver for maximum response to 57,000 kc (not image response) without disturbing test-oscillator adjustments. Change test oscillator to 6,800-14,000 kc range. Tune test oscillator until signal is heard in speaker; should occur at approximately 14,240 kc, fourth harmonic of test oscillator used. Two test-oscillator settings (250 kc apart) will produce a signal at this point. The lower frequency test-oscillator setting should be used, as this places the test oscillator harmonic 460 kc below the frequency of the receiver heterodyne oscillator. Tune receiver for maximum response at a dial setting of approximately 28,500 kc (image should tune in at a dial setting approximately 27,580 kc) without altering test-oscillator adjustment. Test-oscillator second harmonic of 14,290 kc is used for the following check. Check calibration of receiver dial. A receiver-dial reading of less than 28,500 kc indicates that the inductance of the oscillator secondary coil L11 is too low and should be increased. If the receiver dial reading is greater than 28,500 kc, the inductance of L11 is too high and should be decreased. If it is necessary to change the inductance of L11, first remove bottom cover of "Magic Brain" and then set receiver dial pointer to 28,500 kc. To decrease inductance, move the grounded ends (straps) of L11 and L12 (see figure 5) nearer chassis. Do not allow straps to touch chassis except where connected. To increase inductance, move the straps farther away from chassis. Adjust position of straps till maximum (peak) output results. The alignment of the detector tuned circuit should next be checked at 28,500 kc without changing either the receiver or test oscillator adjustments. An increase of output when the brass end of a tuning wand is brought near L22 indicates that L22 is too high in inductance, while an increase when the iron end is brought near the coil indicates that the inductance is too low. The inductance of L22 may be varied by changing the spacing between the grounded end (strap) of L22 and the strap connected from C41 to connect on S2 (figure 3). An increase of spacing will increase the inductance, while a decrease of spacing will decrease the inductance. Adjust the spacing until maximum (peak) output results. Replace "Magic Brain" bottom cover and repeat adjustments in (b) prior to those of "Short

Stock No.	Description	Last Price
11488	Connector—3-contact female connector for motor lead.....	.14
11542	Cover—Turntable cover.....	.88
11553	Escutcheon—Index, escutcheon engraved "Manual—12"—16.....	.44
4340	Lamp—Fluorescent lamp—component—imp.—comprising base, ballast, and guide.....	.60
3764	Non—Cap nut for motor board suspension assembly—Package of 4.....	.40
3672	Pin—Manual index pin.....	.42
11551	Reg—Pickup rest.....	.14
3654	Roller—Pickup arm, cap guide roller.....	.34
11711	Shade—Photograph compartment lamp shade.....	.16
3763	Suspension Spring—Suspension spring, washer and bolt assembly for two cup washers, two springs, two "C" washers and one cap nut.....	.41
4671	Switch—Operating switch—toggle type (S7).....	.72
11599	Turntable—Complete.....	2.90
MISCELLANEOUS CABLE ASSEMBLIES		
13126	Cable—3-conductor shielded compensator cable (transducer end), approximately 8 inches long, complete with one 4-conductor female connector, Stock No. 11494.....	2.20
13127	Cable—3-conductor shielded compensator cable (transducer end), approximately 13 inches long, complete with one 4-conductor female connector, Stock No. 12365 and three pin type terminals—For Model 9U2 only.....	1.45
13132	Cable—3-conductor shielded compensator cable (transducer end), approximately 27 inches long, complete with one 4-conductor female connector, Stock No. 12365 and three pin type terminals—For Model 9U only.....	2.00
13125	Cable—3-conductor shielded volume control cable (chassis end), approximately 13 inches long, complete with one 4-conductor female connector, Stock No. 12494.....	1.75
13128	Cable—3-conductor shielded volume control cable (control end), approximately 9 1/4 inches long, complete with one 4-conductor female connector, Stock No. 12563.....	1.55
13131	Cable—3-conductor shielded volume control cable (chassis end), approximately 24 inches long, complete with one 4-conductor female connector, Stock No. 12494—For Model 9U only.....	2.00
12494	Connector—4-contact female for cable, Stock Nos. 13125, 13126 or 13131.....	.18
12565	Connector—4-contact male for cable, Stock Nos. 13127, 13128 or 13131.....	.20
REPRODUCER ASSEMBLIES		
12914	Board—3-contact reproducer terminal board.....	.35
12640	Bracket—Oscillator mounting bracket and clamp assembly.....	.18
12667	Coil—Field coil (L30).....	1.70
3118	Plug—3-contact male reproducer plug.....	1.00
12915	Reproducer—Output transformer (T2).....	8.70
12913	Washer—Spring washer to hold field coil security—Package of 5.....	1.45
11886	Washer—Spring washer to hold field coil security—Package of 5.....	.20
MISCELLANEOUS ASSEMBLIES		
4191	Box—Used needle box.....	.70
11996	Bracket—Tuning lamp mounting bracket and clamp.....	.32

Stock No.	Description	Last Price
11723	Escutcheon—Pickup arm, escutcheon.....	.65
11721	Pickup—Pickup unit, complete.....	5.50
11549	Screw—Pickup front cover screw—Package of 10.....	.42
3387	Screw—Pickup top washer for mounting pickup to arm—Package of 10.....	.50
11547	Screw—Pickup needle screw—Package of 10.....	.42
OPERATING MECHANISM		
6802	Cam and gear assembly.....	1.38
11558	Cover—Metal cover for trip lever and friction finger assembly.....	.30
6809	Finger—Manual index lever finger assembly.....	.35
3670	Finger—Friction finger assembly.....	.25
11556	Lever—Main lever and link assembly.....	.62
11557	Lever—Main spring lever.....	2.10
3677	Lever—Pickup arm cable lever assembly—comprising lever with cable screw, spring and nut.....	.40
11553	Lever—Trip lever and friction clutch assembly.....	.94
6303	Plate—Trip pawl assembly.....	.40
4124	Screw—Eject arm actuating plate assembly.....	.50
4163	Screw—Cable lever actuating and nut—Package of 10.....	.20
4164	Screw—Manual index lever finger set.....	.60
4059	Screw—Trip lever clutch tension adjustment screw—Package of 10.....	.22
4166	Screw—Special screw used to fasten main lever and link assembly bushing—Package of 10.....	.30
11559	Spring—Actuating spring—Package of 10.....	.28
4127	Spring—Cable lever tension spring—Package of 10.....	.44
4165	Spring—Manual index lever finger tension spring—Package of 10.....	.30
4061	Spring—Trip lever latch plate tension—Package of 10.....	.38
7917	Washer—Spring washer—"U" type—Package of 10.....	.30
9735	Motor—105-121 volts—25 cycles (M1).....	49.50
9651	Motor—105-121 volts—50 cycles (M1).....	35.35
12050	Suspension Spring—Motor mounting spring, washer, and nut assembly—complete with three springs, washers and three nuts.....	35.35
MOTOR ASSEMBLIES		
3994	Cover—Motor switch cover.....	.26
10174	Plate—Automatic brake latch plate—Spring—Automatic brake spring—Package of 2 sets.....	.40
6803	Switch Assembly—Automatic switch, complete.....	.50
3321	Switch—Motor switch (36).....	.75
11881	Base—Photograph compartment lamp socket—7 Mid.....	.55
12051	Contact male connector for use with motor, Stock No. 9650 or No. 9651 only (S83).....	4.18
11101	Capacitor—4 MFD., complete with motor, Stock No. 9715 (S83).....	5.05
4674	Connector—2-contact male connector for compartment lamp heads.....	.35
4577	Connector—2-contact male connector motor cable.....	.30

Prices quoted above are subject to change without notice.

welded to the pole pieces and is irremovable. There is a centering spring attached to the armature to maintain proper adjustment and to provide a limiting effect on the movement of the armature. The frequency response is substantially uniform over a wide range. Service operations which may be necessary on the pickup are as follows:

Centering Armature

Refer to figure 13 showing the pickup inner structure. The armature is shown in its proper relation to the magnet pole pieces, i.e., exactly centered. Whenever this centering adjustment has been disturbed, when screws A, B, and C should be loosened and the armature clamp adjusted to the point where the vertical axis of the pole pieces, and centered between them. This centering operation may be facilitated by inserting a small rod or nail into the armature needle hole, using it as a lever to test the angular movement of the armature. The limitations of the movement in each direction will be caused by the armature striking the pole pieces. The proper adjustment is obtained when there is equal angular displacement of the armature and adjustment rod or nail to each side of the vertical axis of the magnet and coil assembly. The screws A and B should then be secured, observing care not to disturb the adjustment of the armature clamp. Then place the pickup in a vise and secure the centering spring-clamp by means of the screw C, allowing the centering spring to remain in the position at which the armature is exactly centered between the pole pieces. With a little practice, the correct adjustment of the armature may be readily obtained. The air gap between the pole pieces and the armature should be kept free from dust, filings, and other such foreign materials which would obstruct the movement of the pickup armature.

Damping Block

The viscoloid block which is attached to the back end of the armature shank serves as a mechanical filter to eliminate undesirable resonances and to cause the frequency response to be uniform. Should it be necessary to replace this damping block, it may be done by removing screw D and the cover support bracket from the mechanism and taking off the old viscoloid block. The surface of the armature which is in contact with the viscoloid should be thoroughly cleaned with fine emery cloth. Then insert the new block so that it occupies the same position as it did originally. Make certain that the block is in correct vertical alignment with the armature. The hole in the new viscoloid block is somewhat smaller than the diameter of the armature in order to permit a snug fit. With the viscoloid aligned on the armature, screw D and the cover support bracket should then be replaced. Heat should be applied to the armature (viscoloid side) so that the viscoloid block will fuse at the point of contact and become rigidly attached to the armature. A special soldering iron constructed as shown in figure 14 will be found very useful in performing this operation. The iron should be applied only long enough to slightly melt the block and cause a small bulge on both sides.

Replacing Coil

Whenever there is defective operation due to an open or shorted pickup coil, this coil should be replaced. The method of replacement will be obvious upon inspection of the pickup assembly and by study of the cut-away illustrations. Make sure that the new

coil is properly centered with the hole in the support strip and glued securely in that position. It is important to re-adjust the armature as previously explained after re-assembly of the mechanism. Only loose core solder should be used for soldering the coil leads to the pickup. This same type of solder should be used when necessary for soldering the centering spring to the armature.

Magnetizing

Loss of magnetization will not usually occur when the pickup has received normal care because the magnet and pole pieces are one unit and the magnetic circuit remains practically closed at all times. When the pickup has been mishandled, subjected to a strong ac field, jolted, or dropped, there may be an appreciable loss of magnetic strength, in which case it will be necessary to re-magnetize the entire structure. To do this, it will be necessary to first remove the pickup mechanism from the tone arm, and then remove the magnet assembly. Place the magnet assembly on the poles of a standard pickup magnetizer such as the RCA Stock No. 9549 Pickup Magnetizer and charge the magnet in accordance with the instructions accompanying the magnetizer. It is preferable to check the polarity of the pickup magnet and to re-magnetize it so that the same polarity is maintained.

Automatic Record Ejector

The record changing mechanism is designed to be simple and fool-proof. Under normal operating conditions, service difficulties should be negligible. Occasionally, however, certain adjustments may be required. These adjustments are illustrated and explained in figure 9.

It is important when servicing the automatic mechanism, to have it placed on a level support. It is also important to refrain from forcing the mechanism if there is a tendency to bind or jam, since bent levers and possibly broken parts may result.

The tip of the record ejector is adjustable in relation to the turntable spindle, the two being exactly coaxial when properly adjusted. To align the tip, remove the rubber spacer of the ejector assembly, loosen the ejector tip retaining nut and slide the tip assembly to the position where it is in true-line with the axis of the turntable spindle. This adjustment may be simplified by placing several records on the turntable, depressing the spindle through the top record hole and lining up the ejector tip in the spindle hole of the record.

To insure that the ejector tip rotates freely, apply a slight amount of oil to the shank of the tip at the point where it is in contact with the ball bearing.

Loudspeaker

Centering of the loudspeaker voice coil is made in the usual manner with three narrow paper feelers after first removing the front paper dust cover. This may be removed by softening its cement with a very light application of acetone using care not to allow the acetone to flow down into the air gap. The dust cover may be cemented back in place with ambroid upon completion of adjustment.

Refer to figure 13 showing the pickup inner structure. The armature is shown in its proper relation to the magnet pole pieces, i.e., exactly centered. Whenever this centering adjustment has been disturbed, when screws A, B, and C should be loosened and the armature clamp adjusted to the point where the vertical axis of the pole pieces, and centered between them. This centering operation may be facilitated by inserting a small rod or nail into the armature needle hole, using it as a lever to test the angular movement of the armature. The limitations of the movement in each direction will be caused by the armature striking the pole pieces. The proper adjustment is obtained when there is equal angular displacement of the armature and adjustment rod or nail to each side of the vertical axis of the magnet and coil assembly. The screws A and B should then be secured, observing care not to disturb the adjustment of the armature clamp. Then place the pickup in a vise and secure the centering spring-clamp by means of the screw C, allowing the centering spring to remain in the position at which the armature is exactly centered between the pole pieces. With a little practice, the correct adjustment of the armature may be readily obtained. The air gap between the pole pieces and the armature should be kept free from dust, filings, and other such foreign materials which would obstruct the movement of the pickup armature.

The viscoloid block which is attached to the back end of the armature shank serves as a mechanical filter to eliminate undesirable resonances and to cause the frequency response to be uniform. Should it be necessary to replace this damping block, it may be done by removing screw D and the cover support bracket from the mechanism and taking off the old viscoloid block. The surface of the armature which is in contact with the viscoloid should be thoroughly cleaned with fine emery cloth. Then insert the new block so that it occupies the same position as it did originally. Make certain that the block is in correct vertical alignment with the armature. The hole in the new viscoloid block is somewhat smaller than the diameter of the armature in order to permit a snug fit. With the viscoloid aligned on the armature, screw D and the cover support bracket should then be replaced. Heat should be applied to the armature (viscoloid side) so that the viscoloid block will fuse at the point of contact and become rigidly attached to the armature. A special soldering iron constructed as shown in figure 14 will be found very useful in performing this operation. The iron should be applied only long enough to slightly melt the block and cause a small bulge on both sides.

Whenever there is defective operation due to an open or shorted pickup coil, this coil should be replaced. The method of replacement will be obvious upon inspection of the pickup assembly and by study of the cut-away illustrations. Make sure that the new

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Table with columns: Stock No., Description, List Price, Stock No., Description, List Price, Stock No., Description, List Price, Stock No., Description, List Price. The table lists various electronic components and assemblies such as capacitors, resistors, sockets, and transformers, organized into sections like RECEIVER ASSEMBLIES, DRIVE ASSEMBLIES, and MAGIC BRAIN UNIT ASSEMBLIES.

Prices quoted above are subject to change without notice.

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Circuit Data

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mary L18. In the "Short wave" (C) band, L16 is the secondary. The ground of the coil system is now between L16 and L17. L17 is used as the primary and is resonated to the proper frequency by capacitor C34. In addition, L15 acts as a high-frequency primary which resonates above 20 mc and improves the gain at the high-frequency end of the "Short wave" band. Coils L19 and L18 are shorted by the range selector. L21 is effectively r-f bypassed in this position by capacitor C32. In the "Ultra short wave" (D) band, L22 is the secondary, or grid coil, and consists of approximately a single turn of silver plated strap around a 7/8-inch coil form. The primary coils, L21 and L15 are in series on this band, with L21 acting as a low-frequency primary and L15 as a high-frequency primary. L16 is shunted by L22 instead of being shorted directly by the range selector. Any inductive effect of L16 is thus eliminated. L19, L18, and L17 are shorted directly by the range selector. Separate windings, with the exception of L23, are employed in the oscillator stage for each position of the range selector. L23 (inductively coupled to L11 and L12) is placed in the oscillator plate circuit to provide additional feed-back when operating receiver on the "Ultra short wave" (D) band. This coil is effectively r-f bypassed by capacitor C12, when range selector is in the "Short wave" (C) position, to prevent undesirable reactions. Its effect on the remaining bands is negligible. The inherent stability of the oscillator circuit provides minimum frequency drift which is especially advantageous for high-frequency reception. The locally generated signal is capacitance coupled to grid No. 3 of the RCA-6L7 first detector.

A single-wire antenna, or a doublet antenna, when connected to the proper input terminals of the receiver, is coupled to the control grid of the RCA-6K7 r-f amplifier tube through the tuned r-f transformer consisting of L6, L5, L4, L3, and L2 (except when range selector is in "Ultra short wave" position). The primary coil L13 of the "Ultra short wave" (D) band tuned r-f transformer remains in the antenna circuit at all times. A unique method of switching is used. In the "Long wave" (X) band, L6 becomes the primary with L5, L4, L3, and L2 as secondary. In the "Standard broadcast" (A) band, L5 becomes the primary with L4, L3, and L2 as secondary (L6 shorted out). In the "Medium wave" (B) band, L4 becomes the primary with L3 and L2 as secondary (L6 and L5 shorted out). In the "Short wave" (C) band, L3 becomes the primary with L2 as secondary (L6, L5, L4, and tap on L4 shorted out). The tap on L4 is provided to prevent interaction with L3 and L2 when operating receiver in "Short wave" band. In the "Ultra short wave" (D) band, L6, L5, L4, and L3 are shorted out and grounded, and secondary L14 is placed in shunt with L2. The latter connection prevents undesirable interaction of L2 with L14. This method of switching reduces the total number of coils and leads, and results in having a low-loss primary and secondary winding for each band with high efficiency of operation.

The band switching of the detector circuits is similar to that of the antenna circuits. Coils L15, L21, and L20 are always connected in series with the plate circuit of the RCA-6K7 r-f amplifier tube. In the "Long wave" (X) band, L19, L18, L17, and L16 are connected in series as the secondary circuit. The ground of the coil system is at the low end of L19. L20 acts as the primary which transfers energy to the secondary L19. Capacitor C33 resonates primary L20 at the proper frequency. In the "Standard broadcast" (A) band, L18, L17, and L16 are connected in series as the secondary circuit. The ground of the coil system is now between L18 and L19. L19 is used as the primary and is resonated at the proper frequency by capacitors C34 and C35 which are in shunt with this coil. Capacitor C33 is connected to transfer energy to the primary coil L19. In the "Medium wave" (B) band, L17 and L16 are connected in series as the secondary. The ground of the coil system is now between L17 and L18. L18 is used as the primary and is resonated at the proper frequency by capacitor C34 which is in shunt with this coil. L19 is shorted by the range selector. Capacitor C33 transfers the r-f energy from the plate circuit to the pri-

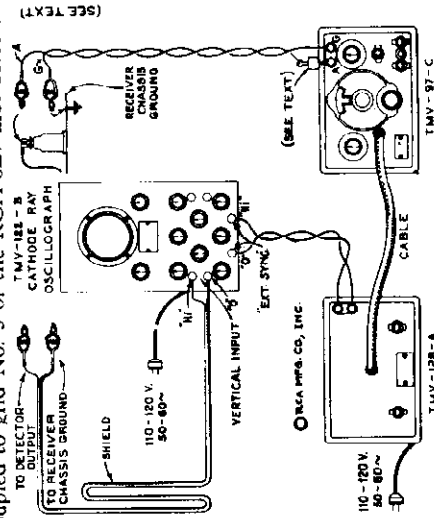


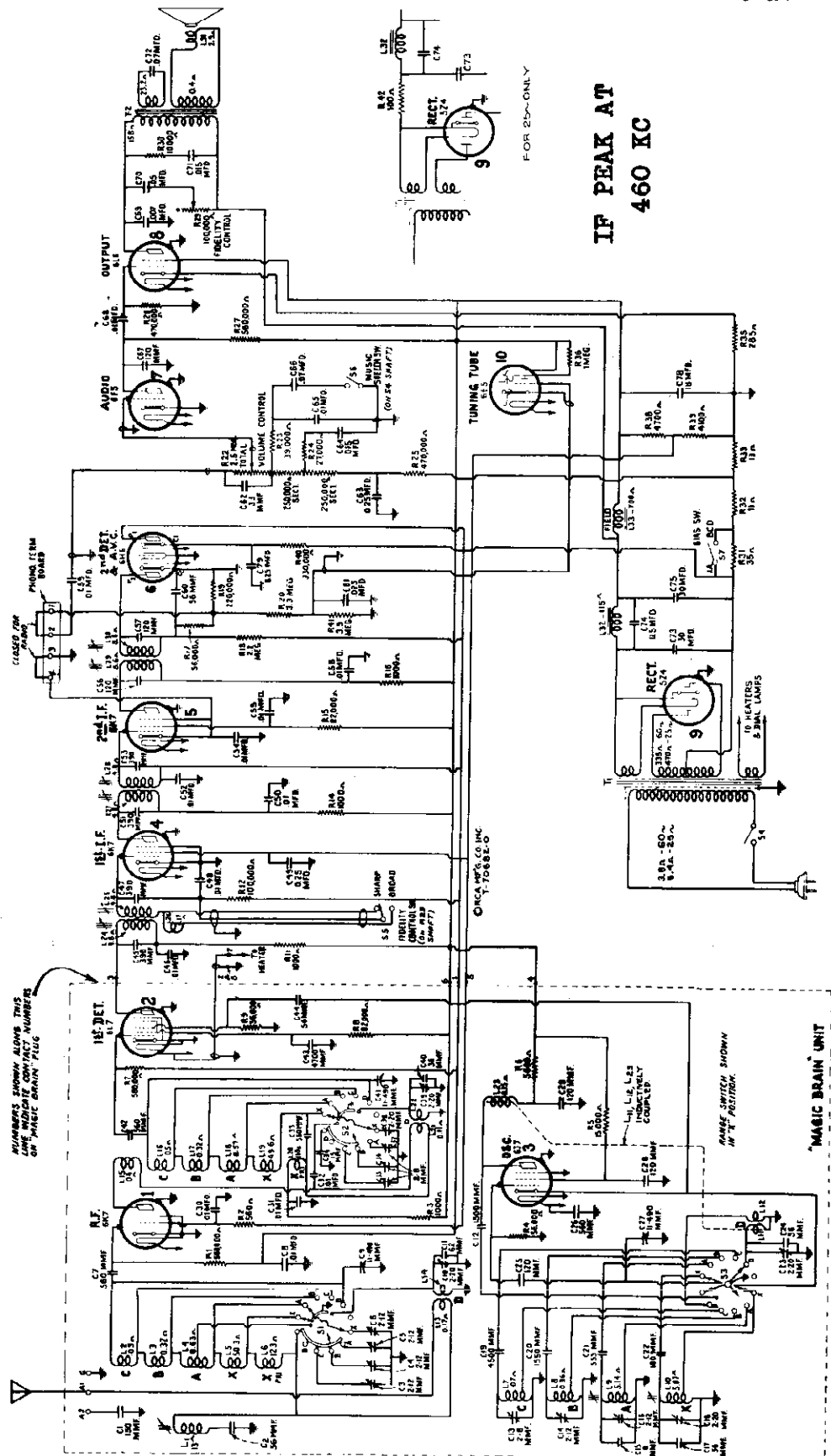
Figure 6—Alignment Apparatus Connections

Stock No.	REPLACEMENT PARTS	List Price
3737	Damper—Pickup damper—Package of 5.	.65
3516	Damper—Damper assembly for pickup arm base—Comprising one upper and one lower damper, one upper bushing and one lower bearing.	.14
13103	Cap—Pilot lamp cap—Package of 5—Model 9U2 only.	.65
4836	Capacitor—.05 Mfd. (for phonograph volume control) (C84).	.30
12915	Crystal—Station selector escutcheon and crystal.	1.30
11580	Cover—Pilot lamp cover—Model 9U2 only.	.12
12742	Escutcheon—Tuning lamp escutcheon.	.22
4340	Lamp—Pilot lamp—6.3 volts—Package of 5—Model 9U2 only.	.60
12699	Knob—Large station selector knob—Package of 5.	.68
11347	Knob—Low frequency tone control and power switch phonograph or radio volume control, range switch, or high frequency tone control knob—Package of 5.	.75
12700	Knob—Small (vernier) station selector knob—Package of 5.	.58
11607	Receptacle—Needle card holder.	.38
11210	Screw—Chassis mounting screw assembly for Model 9U only—Package of 4.	.28
4560	Screw—Chassis mounting screw assembly (front)—Comprising one screw, one washer and one lockwasher—Package of 10—Model 9U2 only.	.30
13102	Screw—Chassis mounting screw assembly (bottom)—Comprising one screw, two cushions, one spacer, one washer and one lockwasher—Package of 2—for Model 9U2 only.	.30
12916	Shield—Complete R.F. unit shield.	.90
11573	Socket—Pilot lamp socket—Model 9U2 only.	.28
11349	Spring—Retaining spring for knob, Stock Nos. 11347 and 12700—Package of 5.	.25
4982	Spring—Retaining spring for knob, Stock No. 12699—Package of 10.	.50
13415	Tube—Magic voice tube—7 inches long.	.35
13416	Tube—Magic voice tube—8 inches long.	.35
13417	Tube—Magic voice tube—9 inches long.	.35
13127	Transformer—Phonograph input transformer—Comprising one transformer, three choke coils, three capacitors and four resistors (T3, L43, L44, L45, C80, C81, C82, R40, R41, R42, R43).	6.40
13126	Volume Control—Phonograph volume control and switch (R39, S8).	1.50

"Magic Brain"
 The new "Magic Brain" is constructed as a separate, self-contained, completely shielded, five-band, oscillator-detector antenna-tuning unit which plugs into the main chassis.

RCA MFG. CO., INC.

MODEL S 10K1
10T(2nd Prod.)
Schematic



IF PEAK AT
460 KC

FOR 250-ONLY

NUMBERS SHOWN ALONG THIS LINE INDICATE CONTACT NUMBERS ON MAGIC BRAIN PLUG

WAVE SWITCH SHOWN IN 'A' POSITION.

'MAGIC BRAIN' UNIT

MODELS 10K1, 10T (2nd Prod.)
Chassis Wiring

RCA MFG. CO., INC.

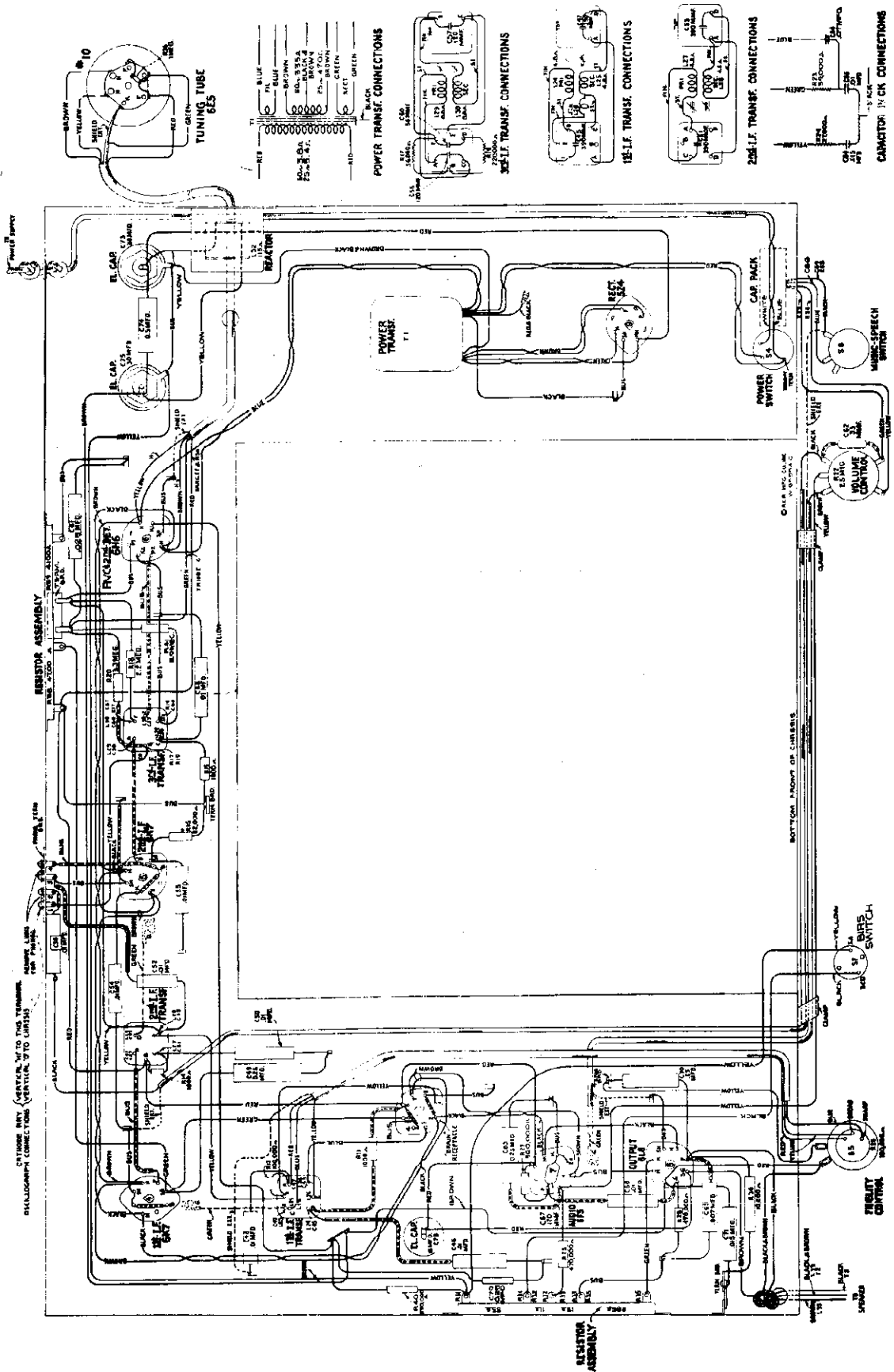


Figure 3—Chassis Wiring Diagram (Less "Magic Brain")
[Model 10K1 and Model 10T (Second Production)]

RCA MFG. CO., INC.

MODELS 10K1, 10T (2nd Prod.)
Socket, Voltage, Trimmers
Notes

RCA VICTOR MODEL 10K1 and MODEL 10T (Second Production)

TECHNICAL INFORMATION AND SERVICE DATA

These receivers are similar to Models 10T (first production) and 10K except for slight changes in the filter and bleeder circuits, loudspeakers, power transformers, and a few component parts. The loudspeakers, for the Model 10T second and first productions may be identified by the stampings RL63E1 and RL63D2 respectively. Model 10T (second production) chassis may be identified by visual inspection of the resistor assembly at the rear bottom of chassis. In the second production the assembly is comprised of one 4,700-ohm and one 4,100-ohm section (R38, R39), while the assembly in the first production consists of a single 17,000-ohm section R34. Model 10T (second production)

has the 20 mfd. capacitor C76 at the bottom left rear of chassis omitted. Service data for Models 10T and 10K is directly applicable to these receivers except for the data contained herein. Power Supply Ratings (A, B and C)—135 watts. Undistorted and Maximum Power Outputs—7 and 10 watts. Cabinet Dimensions (height, width, and depth) Model 10K1—41, 29, and 14 3/4 inches. Weights (net and shipping) Model 10K1—91 and 135 pounds. Resistance Diagram and Cathode Current Readings to be disregarded. Universal Power Transformer resistances (pri. and sec.)—7.4 and 240 ohms total.

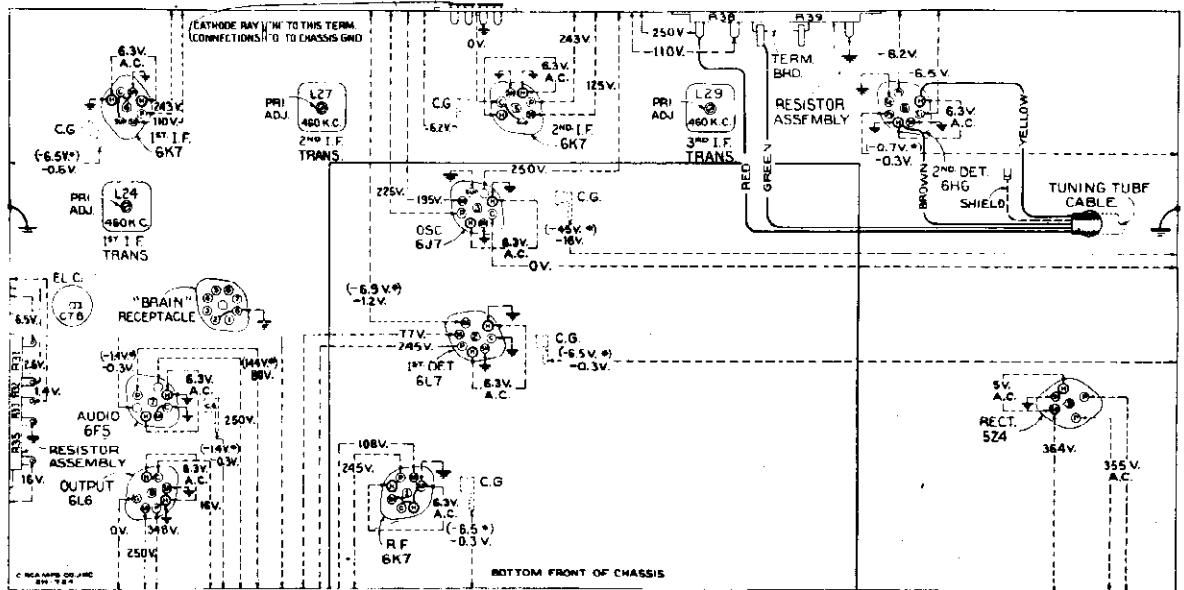


Figure 1—Radiotron Socket Voltages, Coil, and I-F Trimmer Locations
[Model 10K1 and Model 10T (Second Production)]

REPLACEMENT PARTS

Insist on genuine factory tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
RECEIVER ASSEMBLIES			
12863	Board—Phonograph input terminal board	4886	Capacitor—.05 Mfd. (C70)
4427	Bracket—Volume control mounting bracket	4870	Capacitor—.025 Mfd. (C61)
12987	Bracket—Band changeover switch bracket	4840	Capacitor—.025 Mfd. (C49, C63, C79)
12985	Cable—Tuning lamp cable and socket	12741	Capacitor—.05 Mfd. (C74)
12991	Cable—3-conductor shielded fidelity control cable, approximately 7 1/4 inches long	5212	Capacitor—.18 Mfd. (C78)
12511	Cap—Grid contact cap	12487	Capacitor—.30 Mfd. (C73, C75)
12948	Capacitor—.33 Mfd. (C62)	13657	Compensator Pack—Comprising one .015-Mfd., one .01-Mfd., one .07-Mfd. capacitors, one 27,000-ohm and one 39,000-ohm resistors (C64, C65, C66, R23, R24)
12629	Capacitor—.56 Mfd. (C60)	12006	Core—Core and stud assembly for intermediate frequency transformer
12404	Capacitor—.120 Mfd. (C56, C57)	12866	Foot—Chassis foot assembly
12724	Capacitor—.120 Mfd. (C87)	5226	Lamp—Pilot lamp
13022	Capacitor—.390 Mfd. (C45, C47, C51, C53)	12868	Link—Link mechanism on band indicator operating arm
13033	Capacitor—.007 Mfd. (C69)	12871	Reactor—Filter reactor (L32)
4858	Capacitor—.01 Mfd. (C46, C48, C50, C52, C54, C55, C58, C68)	13656	Resistor—Voltage divider—Comprising one 4,700-ohm and one 4,100-ohm sections (R38, R39)
4624	Capacitor—.01 Mfd. (C59)		
11315	Capacitor—.015 Mfd. (C71)		

MODELS 10K1, 10T (2nd Prod.)

Parts

RCA MFG. CO., INC.

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
13659	Resistor—Voltage divider—Comprising one 285-ohm, one 13-ohm, one 11-ohm and one 35-ohm sections (R31, R32, R33, R35)	12881	Coil—Oscillator coil and shield, X band only (L10)
13834	Resistor—100 ohms—wire wound, 4 watt—For 25-cycle model only (R42)	12890	Coil—Oscillator coil, "D" band (L11, L12, L23)
12311	Resistor—1,000 ohms—insulated, 1/2 watt (R11, R16)	12889	Coil—R-F coil, "D" band (L21, L22)
13030	Resistor—1,000 ohms—carbon type, 1/10 watt (R14)	12877	Condenser—3-gang variable tuning condenser (C9, C27, C41)
13097	Resistor—10,000 ohms—insulated, 1 watt (R30)	12887	Connector—8-contact male connector and cover for power cable, Stock No. 12886
11282	Resistor—56,000 ohms—carbon type, 1/10 watt (R17)	12664	Core—Adjustable core and stud for Stock No. 12654
11365	Resistor—82,000 ohms—carbon type, 1/2 watt (R15)	12800	Core—Adjustable core and stud for Stock No. 12709
11281	Resistor—100,000 ohms—carbon type, 1/10 watt (R12)	12882	Core—Adjustable core and stud for Stock No. 12881
11398	Resistor—220,000 ohms—carbon type, 1/10 watt (R19)	11324	Resistor—560 ohms—carbon type, 1/2 watt (R2)
5108	Resistor—330,000 ohms—carbon type, 1/2 watt (R40)	5112	Resistor—1,000 ohms—carbon type, 1/2 watt (R3)
11172	Resistor—470,000 ohms—carbon type, 1/2 watt (R25, R28)	11238	Resistor—5,600 ohms—carbon type, 1 watt (R6)
5035	Resistor—560,000 ohms—carbon type, 1/2 watt (R27)	3998	Resistor—15,000 ohms—carbon type, 1/2 watt (R5)
12013	Resistor—1.0 megohm—carbon type, 1/10 watt—Located in tuning tube socket (R36)	11282	Resistor—56,000 ohms—carbon type, 1/10 watt (R4, R9)
11626	Resistor—2.2 megohm—carbon type, 1/2 watt (R18)	8064	Resistor—82,000 ohms—carbon type, 1/2 watt (R8)
12874	Resistor—3.3 megohm—carbon type, 1/2 watt (R20)	11397	Resistor—560,000 ohms—carbon type, 1/10 watt (R1, R7)
13167	Resistor—3.9 megohm—carbon type, 1/2 watt (R41)	12651	Shield—Coil shield for Stock Nos. 12879, 12880
12870	Scale—Vernier dial scale	12710	Shield—Coil shield for Stock No. 12709
12008	Shield—Intermediate frequency transformer shield	12883	Shield—Coil shield for Stock No. 12881
12607	Shield—1st or 2nd I.F. transformer shield top	11198	Socket—7-contact 6K7 Radiotron socket
12581	Shield—3rd I.F. transformer shield top	11279	Socket—7-contact 6L7 Radiotron socket
11195	Socket—5-contact 5Z4 Radiotron socket	12885	Socket—8-contact 6J7 Radiotron socket
11198	Socket—7-contact 6K7 or 6H6 Radiotron socket	12007	Spring—Retaining spring for core, Stock Nos. 12664, 12800, 12882
11196	Socket—8-contact 6F5, 6L6 Radiotron or Magic Brain power supply socket	12878	Switch—Range switch and mounting nut (S1, S2, S3)
13095	Socket—Upper left or lower right hand dial lamp socket	12654	Trap—Wave-trap, complete (L1)
11222	Socket—Upper right or lower left hand dial lamp socket		DRIVE ASSEMBLIES
11381	Socket—Tuning tube socket and cover	10705	Ball—5/32-inch diameter steel ball for planetary drive
12007	Spring—Retaining spring for core in I.F. transformer	10841	Ball—1/4-inch diameter steel ball for planetary drive bearing
12986	Stud—Band indicator operating arm stud	12904	Bushing—Plate and bushing assembly for planetary drive mounting
12860	Switch—Low frequency tone and power switch (S4, S6)	12905	Coupling—Flexible coupling and shaft assembly, complete
12988	Switch—Bias switch (S7)	12909	Dial—Band indicating dial and cam assembly
12979	Tone Control—High frequency tone and fidelity control (R29, S5)	12899	Drive—Variable tuning condenser drive, complete, including mounting bracket drive, dial scale and indicator, less vernier dial, Stock No. 12870 and link, Stock No. 12868
12981	Transformer—First intermediate frequency transformer (L24, L25, L26, C45, C47)	12906	Gear—Anti-lash drive gear, complete
12990	Transformer—Second intermediate frequency transformer (L27, L28, C51, C53)	12910	Gear—Sector gear and link assembly for band selector
12982	Transformer—Third intermediate frequency transformer (L29, L30, C56, C57, C80, R17, R19)	12908	Indicator—Station selector indicator pointer
11211	Transformer—Power transformer, 105-125 volts, 50-60 cycles (T1)	8051	Link—Link and roller assembly, complete with spring
11212	Transformer—Power transformer, 105-125 volts, 25-60 cycles (T1)	12911	Screen—Dial lamp screen and light diffuser
11213	Transformer—Power transformer, 110-125-150-210-240 volts, 40-60 cycles (T1)	4869	Screw—Set screw for flexible coupling or gear, Stock Nos. 12905 and 12906
12861	Volume Control (R22)	12901	Shaft—Direct drive shaft and pinion gear for planetary drive
	MAGIC BRAIN UNIT ASSEMBLIES	12900	Shaft—Vernier drive shaft for planetary drive
12806	Board—3-contact antenna and ground terminal board	12903	Spring—Tension spring for planetary drive bearing
5237	Bushing—Variable condenser mounting bushing assembly	12907	Spring—Tension spring for gear, Stock No. 12906
12886	Cable—Shielded power cable, approximately 4 inches long, complete with 8-contact male plug	8052	Spring—Tension spring for link, Stock No. 8051
12511	Cap—Grid contact cap		REPRODUCER ASSEMBLIES
12714	Capacitor—Adjustable trimmer capacitor (C3, C4, C5, C6, C14, C16)	12914	Board—Reproducer terminal board
12884	Capacitor—Adjustable trimmer capacitor (C10, C18, C23, C38, C39)	12640	Bracket—Output transformer mounting bracket and clamp (Model 10T, 2nd Production)
12807	Capacitor—Adjustable trimmer capacitor (C13, C35, C36, C37)	13842	Bracket—Output transformer mounting bracket and clamp (Model 10K1)
12896	Capacitor—15 Mmfd. (C34)	13660	Coil—Reproducer field coil (L33)
12722	Capacitor—18 Mmfd. (C15)	12842	Cone—Reproducer cone and dust cap (L31) (Model 10T, 2nd Production)
12891	Capacitor—36 Mmfd. (C40)	12667	Cone—Reproducer cone and dust cap (L31) (Model 10K1)
12629	Capacitor—56 Mmfd. (C24)	5118	Connector—3-contact male connector for speaker leads
12895	Capacitor—56 Mmfd. (C17)	9768	Reproducer, complete (Model 10T, 2nd Production)
12723	Capacitor—56 Mmfd. (C2, C44)	9780	Reproducer, complete (Model 10K1)
13307	Capacitor—62 Mmfd. (C11)	13661	Transformer—Output transformer (T2, C72)
12724	Capacitor—120 Mmfd. (C25, C28, C29)	11886	Washer—Spring washer to hold field coil securely
12725	Capacitor—150 Mmfd. (C1)		MISCELLANEOUS ASSEMBLIES
12894	Capacitor—180 Mmfd. (C22)	12038	Band—Rubber band for tuning tube
12727	Capacitor—555 Mmfd. (C21)	11996	Bracket—Tuning lamp bracket and clamp
12537	Capacitor—560 Mmfd. (C7, C26, C33, C42)	12915	Escutcheon—Station selector escutcheon and crystal
12898	Capacitor—1,500 Mmfd. (C12)	12742	Escutcheon—Tuning lamp escutcheon
12729	Capacitor—1,550 Mmfd. (C20)	12698	Knob—Large station selector knob
12728	Capacitor—4,500 Mmfd. (C19)	12700	Knob—Small (vernier) station selector knob
12897	Capacitor—4,700 Mmfd. (C43)	11347	Knob—Music-speech and power switch—volume control—range selector or fidelity control knob
4858	Capacitor—.01 Mfd. (C8, C30, C31, C32)	11377	Screw—Chassis mounting screw assembly (Model 10T)
12879	Coil—Antenna coil and shield, XABC bands (L2, L3, L4, L5, L6)	11210	Screw—Chassis mounting screw assembly (Model 10K1)
12888	Coil—Antenna coil, "D" band (L13, L14)	12918	Shield—Complete r-f unit top shield
12880	Coil—Detector coil and shield, XABC bands (L15, L16, L17, L18, L19, L20)	4982	Spring—Holding spring for station selector or volume control knob, Stock No. 12699
12709	Coil—Oscillator coil and shield, ABC bands (L7, L8, L9)	11349	Spring—Retaining spring for knob, Stock Nos. 12700 and 11347

RCA MFG. CO., INC.

MODEL 13K
Schematic, Spkr. Wirin
Transformer Wiring

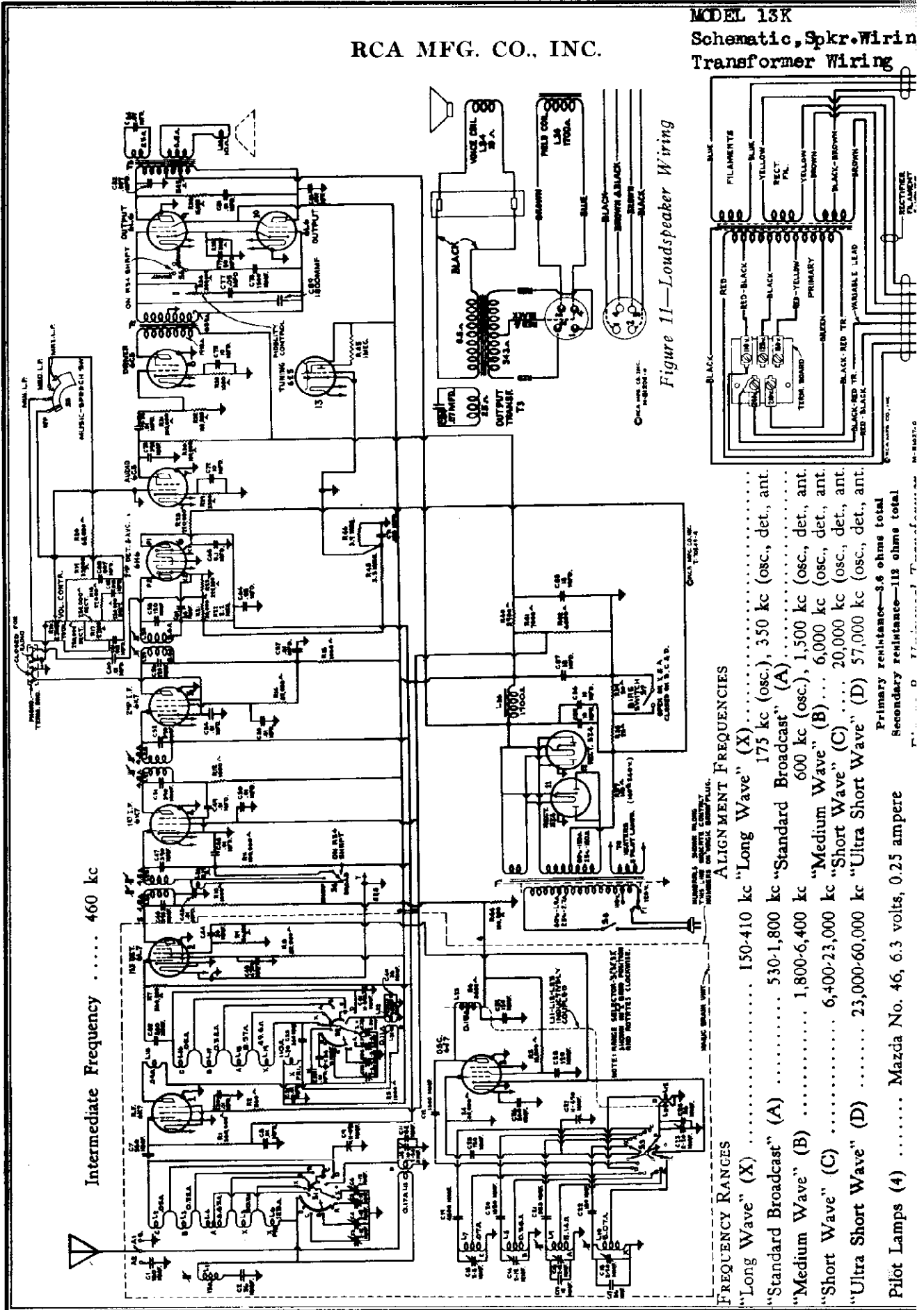


Figure 11—Loudspeaker Wiring

Intermediate Frequency 460 kc

ALIGNMENT FREQUENCIES

- "Long Wave" (X) 150-410 kc "Long Wave" (X) 175 kc (osc.), 350 kc (osc, det., ant.
- "Standard Broadcast" (A) 530-1,800 kc "Standard Broadcast" (A) 600 kc (osc.), 1,500 kc (osc, det., ant.
- "Medium Wave" (B) 1,800-6,400 kc "Medium Wave" (B) 6,000 kc (osc, det., ant.
- "Short Wave" (C) 6,400-23,000 kc "Short Wave" (C) 20,000 kc (osc, det., ant.
- "Ultra Short Wave" (D) 23,000-60,000 kc "Ultra Short Wave" (D) 57,000 kc (osc, det., ant.

Primary resistance—3.6 ohms total
Secondary resistance—113 ohms total

FREQUENCY RANGES

Pilot Lamps (4) Mazda No. 46, 6.3 volts, 0.25 ampere

MODEL 13K
Chassis Wiring

RCA MFG. CO., INC.

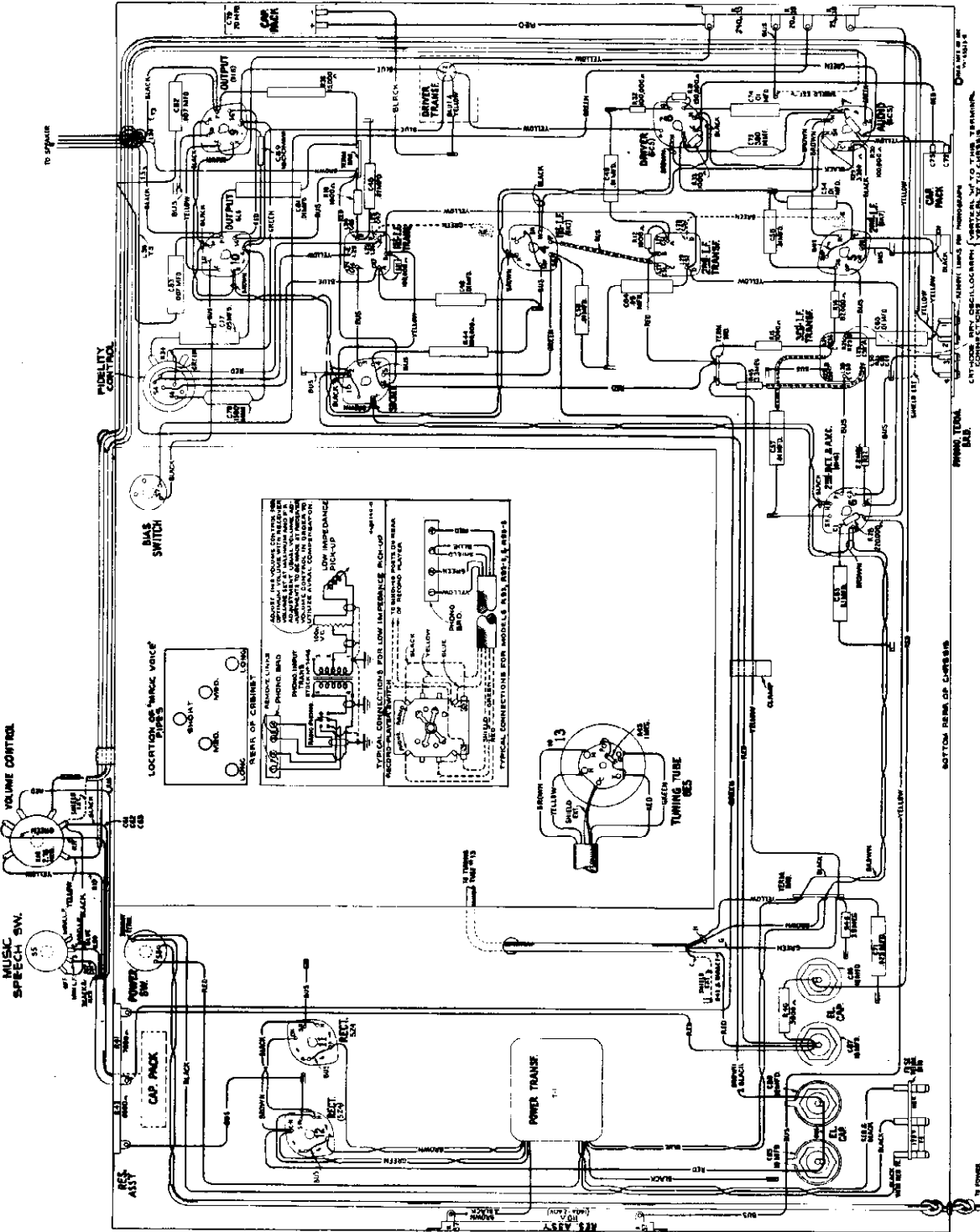
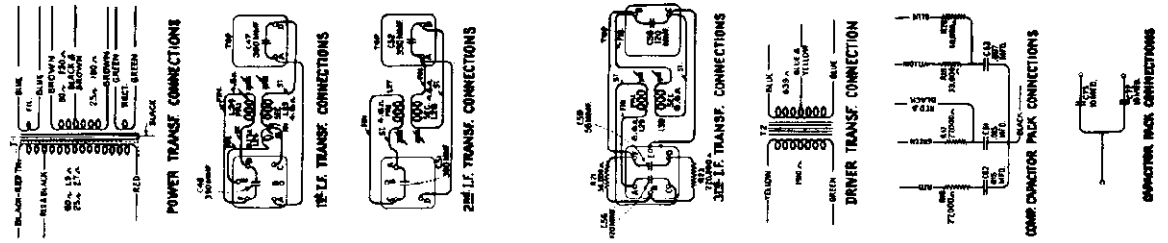


Figure 3—Chassis Wiring Diagram (Less "Magic Brain")

RCA MFG. CO., INC.

MODEL 13K
"Magic Brain"
Chassis Wiring

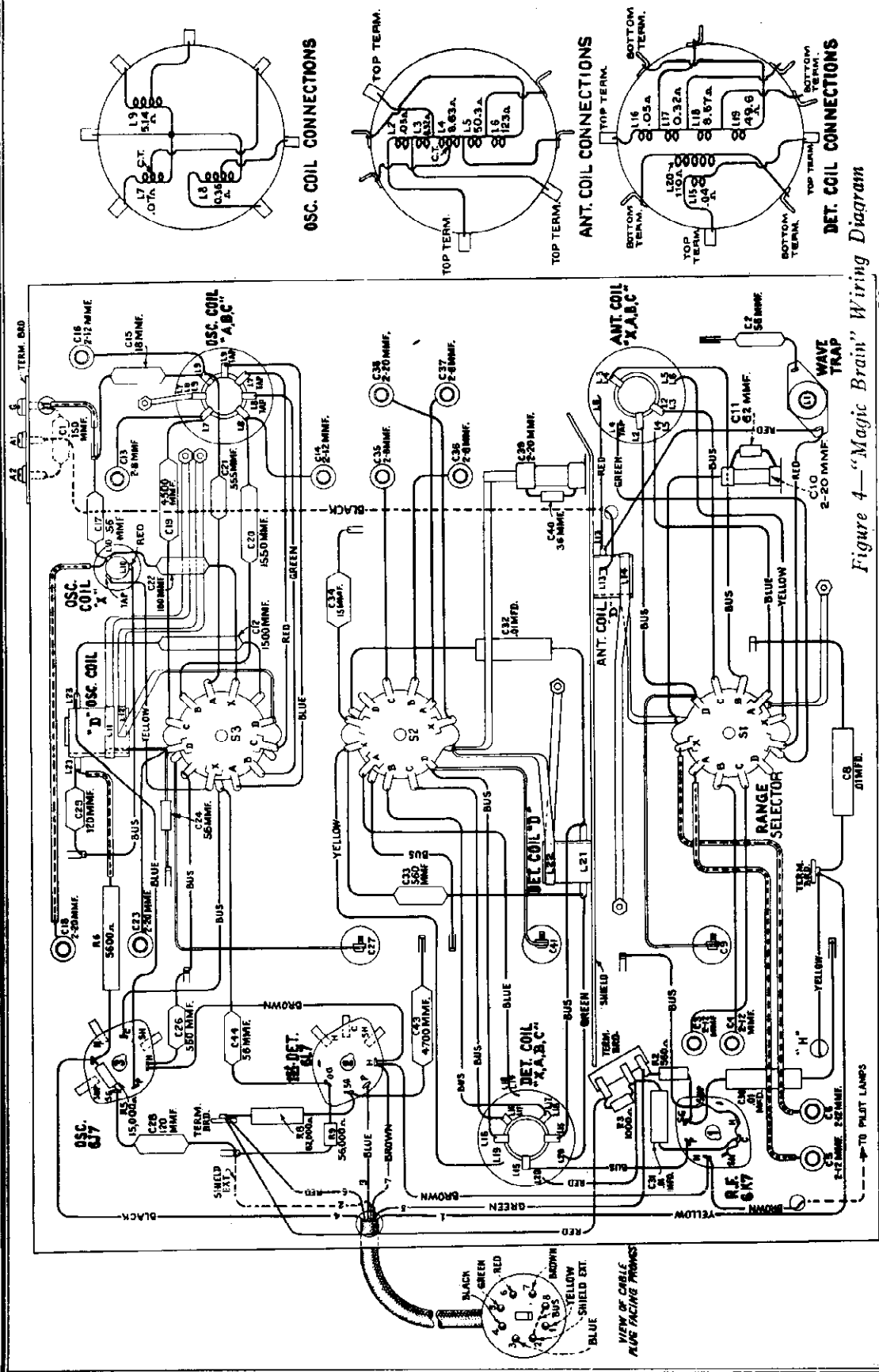


Figure 4—"Magic Brain" Wiring Diagram

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POWER SUPPLY RATINGS

- Rating A 105-125 volts, 50-60 cycles, 165 watts
- Rating B 105-125 volts, 25-60 cycles, 165 watts
- Rating C 100-130/140-160/195-250 volts, 40-60 cycles, 165 watts

POWER OUTPUT
Undistorted 20 watts

LOUDSPEAKER Type Electrodynamic

MODEL 13K
Resistance, Voltage
Socket, Trimmers

RCA MFG. CO., INC.

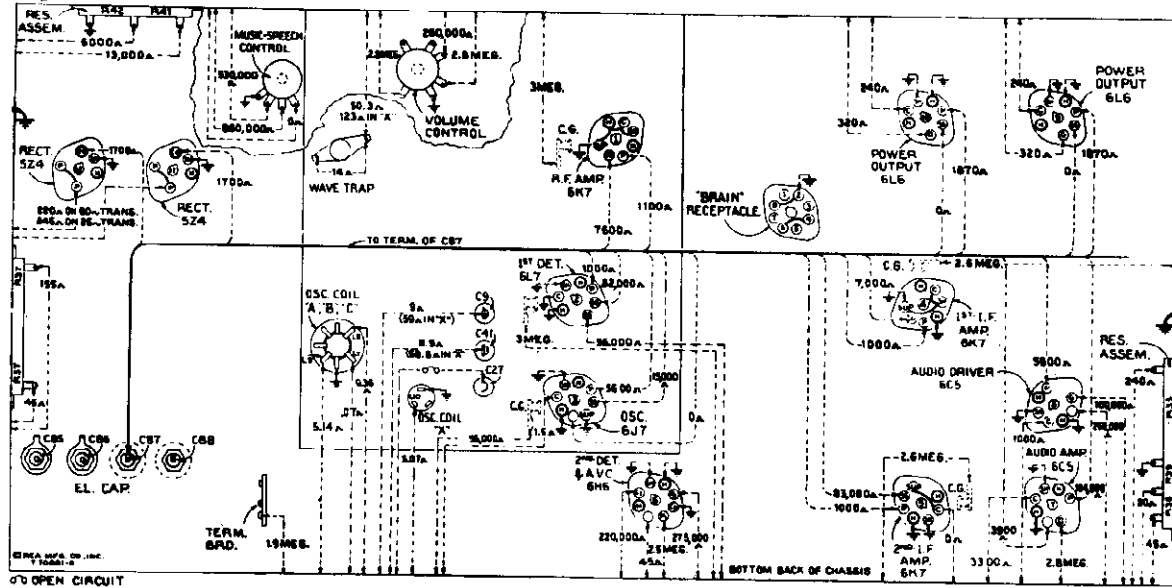


Figure 9—Resistance Diagram

Power supply disconnected—Radiotrons in sockets—Tuning condenser in full-mesh—Range selector in "Standard broadcast" position—Volume control maximum—Fidelity control optional—Music-speech Control Clockwise

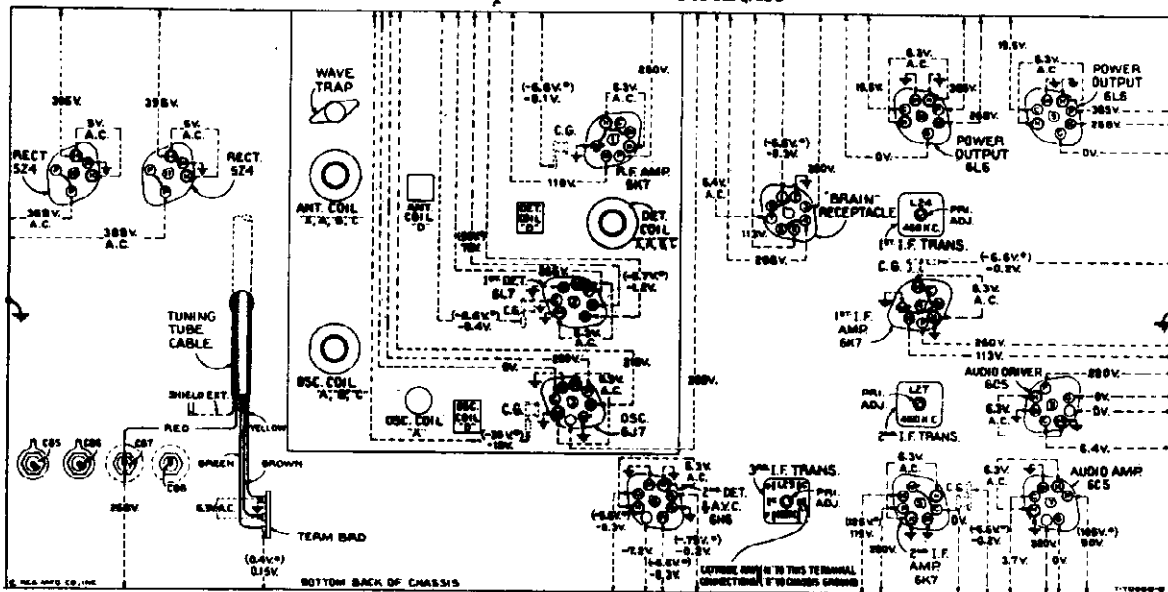


Figure 10—Radiotron Socket Voltages, Coil, and I-F Trimmer Locations

Measured at 115 volts, 60-cycle supply—Tuned to a approximately 1,000 kc—No signal being received—Volume control minimum—Fidelity control optional

Radiotron Cathode Current Readings

Measured with Milliammeter Connected at Tube Socket Cathode Terminals under Conditions Similar to Those of Voltage Measurements

- | | | | |
|-------------------------------------|----------|------------------------------------|---------|
| (1) RCA-6K7—R-F Amp. | 6.2 ma. | (8) RCA-6C5—Audio Driver Amp. | 6.4 ma. |
| (2) RCA-6L7—1st Det. | 4.0 ma. | (9) RCA-6L6—Power Output | 43 ma. |
| (3) RCA-6J7—Osc. | 6.6 ma. | (10) RCA-6L6—Power Output | 43 ma. |
| (4) RCA-6K7—1st I-F Amp. | 6.2 ma. | (11) RCA-5Z4—Rectifier | 80 ma.* |
| (5) RCA-6K7—2nd I-F Amp. | 7.5 ma. | (12) RCA-5Z4—Rectifier | 80 ma.* |
| (6) RCA-6H6—2nd Det.—A.V.C. | — | (13) RCA-6E5—Tuning Tube | 3.0 ma. |
| (7) RCA-6C5—Audio Voltage Amp. | 1.25 ma. | | |

(*Cannot be measured at socket)

RCA MFG. CO., INC.

MODEL 13K
Dial Change Mechanism
Notes, Socket, Trimmers

Phonograph Terminal Board

A terminal board is provided for connecting a phonograph into the audio amplifying circuit. Typical methods of connecting a low-impedance pickup, or the RCA Victor Models R-93, R-93-2, and R-93-S Record Players are shown on the Schematic Diagram (figure 2).

Selector Dial

Figure 12 illustrates the relation of the various parts of the dial mechanism when in its "Standard broadcast" position with the range switch likewise turned to its "Standard broadcast" position. In re-assembling the dial after repairs, see that the gears are meshed in accordance with the diagram, at the same time noting that the range switch is in its "Standard broadcast" position and the lever attached to the range-switch shaft placed in the position shown.

To adjust the dial mechanism, set the range switch to its "Standard broadcast" position. Place a straight-edge across the center of the dial so that its edge is even with the lower (end) marking at both the low-frequency and high-frequency ends of the dial. Under such conditions the straight-edge should be parallel with the top of the chassis base. If the straight-edge is not parallel with the top of the chassis base, loosen the nut on the rear of the roller link pivot stud and move the stud up or down until the link roller moves the dial to the desired position so that the end calibration marks obtain the position mentioned above. Tighten the nut on the roller link pivot stud.

Set the gang tuning condenser to its maximum capacity position. Adjust the dial pointer to the low-frequency (end) mark on "Standard broadcast" scale. This is a friction adjustment.

With the gang tuning condenser plates still in full mesh, loosen the two set screws on the vernier-dial hub. Rotate the vernier dial until the "0" marking is in a vertical plane above the center of the shaft. Tighten set screws.

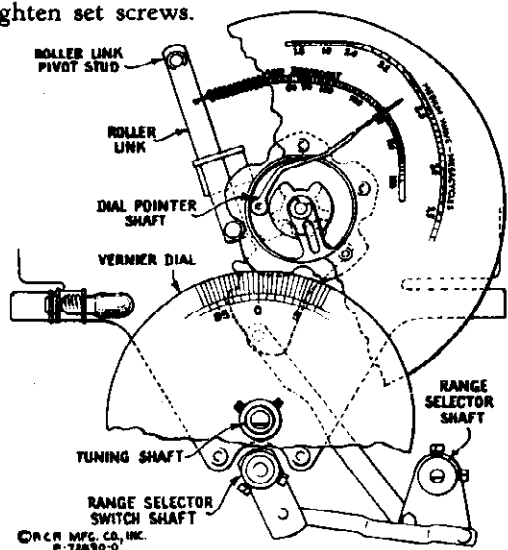


Figure 12—Selector Dial Change Mechanism

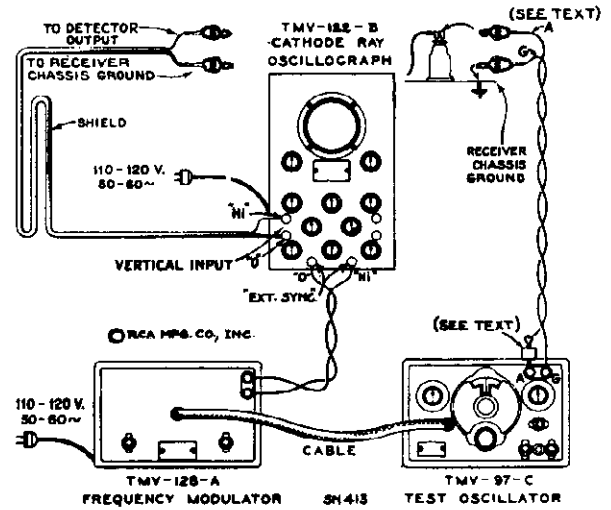


Figure 5—Alignment Apparatus Connections

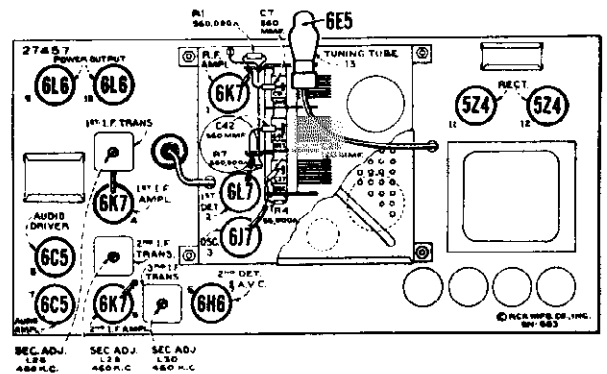


Figure 1—Radiotron and I-F Trimmer Locations

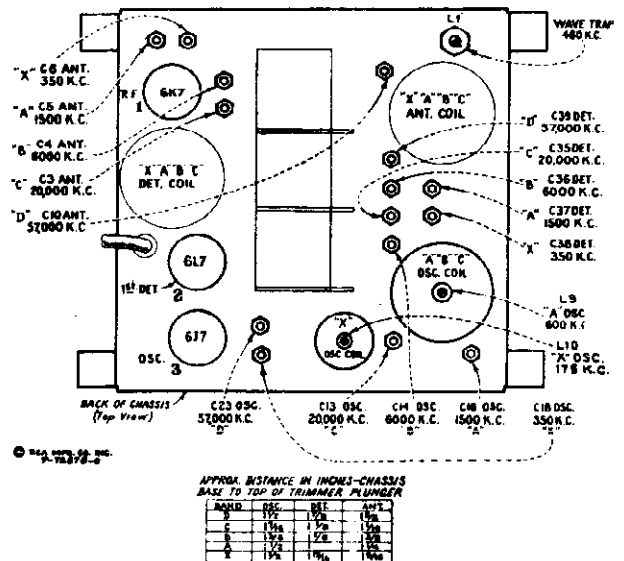


Figure 7—"Magic Brain" Trimmer Locations

MODEL 13K
Alignment, Page 1
Oscillograms

RCA MFG. CO., INC.

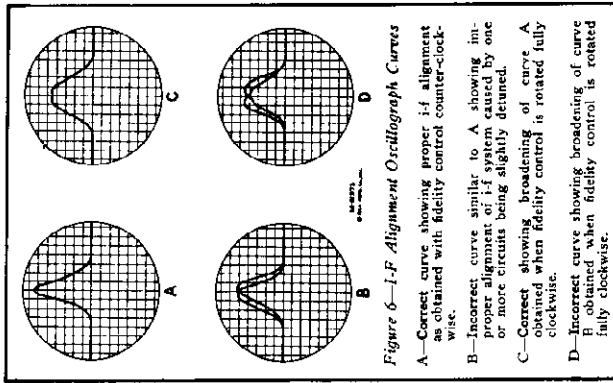


Figure 6-1-F Alignment Oscillograph Curves
A—Correct curve showing proper i-f alignment as obtained with fidelity control counter-clockwise.
B—Incorrect curve similar to A showing improper alignment of i-f system caused by one or more circuits being slightly detuned.
C—Correct showing broadening of curve A obtained when fidelity control is rotated fully clockwise.
D—Incorrect curve showing broadening of curve B obtained when fidelity control is rotated fully clockwise.

Cathode-Ray Alignment

Make alignment apparatus connections shown on figure 5. Remove the plug of the frequency-modulator cable from the test-oscillator jack. Connect the receiver chassis to a good external ground. Connect oscillograph "Vertical" input terminals as indicated on figure 3. Set oscillograph power switch to "On" and adjust "Intensity" and "Focus" controls to give a clearly defined spot, or line, on the screen. Set oscillograph "Ampl. A" switch to "On," "Vertical gain" control full-clockwise. "Ampl. B" switch to "Timing," "Range" switch to No. 2 position, and "Timing" switch to "Int." Place the "Sync" control "Freq." control, and "Horizontal gain" control to about their mid-positions. For each of the following adjustments, the test-oscillator output must be regulated so that the image obtained on the oscillograph screen will be of the minimum size for accurate observation. The receiver volume-control setting is optional.

I-F Adjustments

- (a) Turn range selector to its "Standard broadcast" (A) position and tune receiver to a position of no extraneous signals near 600 kc. Set fidelity control to counter-clockwise position. Connect the "Ant." output of the test oscillator to the grid cap of RCA-6K7 second i-f tube (with grid lead in place) through a .001-mfd. capacitor, with "Grid" to receiver chassis modulation switch to "On" and its output switch to "Hi."
- (b) Turn on the receiver and test oscillator. Increase the output of the test oscillator until a deflection is noticeable on the oscillograph screen. The figures obtained represent several waves of the detected signal, the amplitude of which may be observed as an indication of output. Cause the wave-image formed (400-cycle waves) to be spread completely across the screen by adjusting the "Horizontal gain" control. The image should be synchronized and made to remain motionless by adjusting the "Sync." and "Freq." controls.
- (c) Adjust the two magnetic core screws L30 and L29 (see figures 1 and 10) of the third i-f transformer (one on top and one on bottom) to produce maximum vertical deflection of the oscillographic image. This adjustment places the transformer in exact resonance with the 460 kc signal.
- (d) The sweeping operation should follow using the frequency modulator. Shift the oscillograph "Timing" switch to "Ext." Insert plug of frequency-modulator cable in test-oscillator jack. Turn the test-oscillator modulation switch to "Off." Turn on the frequency modulator and place its sweep-frequency switch to "Hi."
- (e) Increase the frequency of the test oscillator by slowly turning its tuning control until two separate, distinct, and similar waves appear on the screen. If only one wave appears, increase the "Freq." control on the oscillograph to obtain two waves. These waves will be identical in shape, totally disconnected, and appear in reversed positions. They will have a common

lators, receivers, etc., is the RCA Stock No. 9572 Crystal Calibrator.

If the test-oscillator signal cannot be heard as the receiver (heterodyne) oscillator air-trimmer plunger is changed from its minimum-capacity to maximum-capacity position (frequency dial and test oscillator set to the specified frequency), and the correct oscillator air-trimmer used) it may be an indication that the test-oscillator frequency is outside the range covered by the air-trimmer. Under such conditions, when a more accurate setting of the test oscillator cannot be determined, set the oscillator air-trimmer plungers to the approximate settings given on figure 7. Tune the test oscillator until the signal is heard in the speaker. Each of two test-oscillator settings (the fundamentals or the harmonics of which are 920 kc apart) produce a signal. The lower-frequency test-oscillator setting should be used as this places the test-oscillator (air-trimmer) frequency 460 kc below the frequency of the receiver heterodyne oscillator.

Holes are provided in the top of the r-f and antenna-coil cans on some models to enable a tuning check with the RCA Stock No. 6679 Tuning Wand. The hole in the top of the detector coil can has a catch button which must be removed before insertion of the tuning wand. When the brass end of the wand is inserted in the coil, the inductance of the coil is decreased. If this results in an increase of output, the respective air-trimmer capacitance should be decreased (plunger pulled out). If inserting the iron end of the tuning wand causes an increase in output, resulting from an increase of inductance of the coil, the respective air-trimmer capacitance should be increased (plunger pushed in). If the range of the air-trimmer is not sufficient to give the desired results, the lead-dress may be changed in the particular circuit being aligned, so as to cause the circuit to resonate within the range of the trimmer. An increase in the capacity-to-ground of the circuit will be required if the iron end of the tuning wand causes an increase of signal output when the air-trimmer plunger is full-out, while a decrease in the capacity-to-ground will be required if the brass end of the tuning wand causes an increase in signal output when the air-trimmer plunger is full-out.

Two methods of alignment are applicable—one requires use of the cathode-ray oscillograph, and the other requires a voltmeter or glow-type indicator. The cathode-ray alignment method is advantageous in that the indication provided is in the form of a wave-image which represents the resonance characteristics of the circuit being tuned. This method is preferred because of the i-f characteristics of this receiver. This type of alignment is possible through use of apparatus such as the RCA Stock No. 9545 Cathode-Ray Oscillograph. If this equipment is not available, an approximate alignment may be performed by the output-indicator method with an instrument such as the RCA Stock No. 4517 Neon Glow Indicator attached across the loud-speaker voice coil. Alignment by this method is similar to the cathode-ray method outlined below except that the receiver volume control should be at maximum, the trimmers adjusted to peak response (with the exception of the wave-trap) and the test-oscillator sweeping operations omitted. Either of these methods require the use of a reliable test oscillator such as the RCA Stock No. 9595.

Alignment Procedure

There are seventeen adjustments required for the alignment of the oscillator, first-detector, and antenna-circuits; one adjustment for the wave-trap; and six adjustments for the i-f system. Fifteen of these adjustments are made with plunger-type air-trimming capacitors and require the use of an RCA Stock No. 12636 Adjusting Tool. Each of these capacitors has a lock nut for securing the plunger in place after adjustment. The remaining nine adjustments are made by means of screws attached to molded magnetic cores. These cores change the inductance of the particular coils in which they are inserted to provide exact alignment. All of these adjustments are accurately made during manufacture and should remain in proper alignment unless affected by abnormal conditions of climate or purported alterations for servicing, or unless altered by other means. Loss of sensitivity, improper tone quality, and poor selectivity are the usual indications of improper alignment. Such conditions will usually exist simultaneously. Correct performance of this receiver can only be obtained when these adjustments have been made by a skilled service engineer with the use of adequate and reliable test equipment. The manufacturer of this receiver has such test equipment available for sale through its distributors and dealers.

The extensive frequency range of this receiver necessitates a more or less involved method of alignment. However, if the following directions are carefully applied in the sequence given, normal performance of the instrument will be obtained.

The plunger-type air-trimming capacitors have their approximate plunger settings tabulated on figure 7. If the plungers have been disturbed from their original adjustments, they may be roughly set to the specified dimensions prior to alignment.

In performing services on the "Magic Brain", the leads should be restored to their original positions, and the lead-dress is important for proper operation and dial calibration.

Precautionary Dressing of Leads for "Magic Brain" Alignment

(Refer to Figure 4)

Band "X"

1. Keep blue lead A of S1 to antenna coil L4-5, dressed away from chassis and from yellow lead X of S1 to antenna coil L4-6.
2. Bus lead from C10 to S1 should be as short as possible.
3. The green lead A of S2 to detector coil L18-19 clear of chassis coil shield, to any other leads.
4. Keep spaghetti lead C6 to X of S1, apart from spaghetti lead of C5 to A of S1, and from chassis.

Band "A"

1. Keep green lead terminal S1 to antenna coil tap L4 chassis, coil shield, and coil.
2. Keep spaghetti lead C5 to A of S1 apart from spaghetti lead C6 to X of S1 and from chassis.

Band "C"

Lead from C10 to oscillator coil L7 should be maintained as short and straight as possible. For alignment, the test-oscillator frequency should be quite accurate. A convenient and reliable means of accurately checking the frequency of test oscil-

oscillator, detector, and antenna air-trimmers C16, C37, and C3, respectively to produce maximum (peak) output as shown by the waves on the oscillograph screen. Shift the oscillograph "Timing" switch to "Ext." Place the frequency-modulator sweep-range switch to its "Le" position and insert plug of the frequency-modulator cable in test-oscillator jack. Turn test-oscillator modulation switch to "Off." Re-tune the test oscillator (increase frequency) until the forward and reverse waves show on the oscillograph screen and become coincident at their highest points. This will occur at a test-oscillator setting of approximately 1,680 kc. Adjust air-trimmers C16, C37, and C3 again, setting each to the point which produces the best coincidence and maximum amplitude of the images.

(h) Remove the plug of the frequency-modulator cable from the test-oscillator jack. Turn test-oscillator modulation switch to "On." Set oscillograph "Timing" switch to "Int." Tune test oscillator to 200 kc (200-400-kc range). Tune receiver for maximum response to this signal at a dial reading of approximately 600 kc. The third harmonic of the 200-ke signal is used for this adjustment. Shift oscillograph "Timing" switch to "Ext." Insert the plug of the frequency-modulator cable in test-oscillator jack. Turn test-oscillator modulation switch to "Off." Re-tune the test oscillator (increase frequency) until the forward and reverse waves show on the oscillograph screen. This will occur at a test-oscillator setting of approximately 230 kc. Disregarding the fact that the two images may or may not come together, adjust the oscillator magnetite core screw L9 (top of large oscillator coil can) to produce maximum (peak) amplitude of the images. Shift the oscillograph "Timing" switch to "Int." Remove the plug of the frequency-modulator cable from the test-oscillator jack. Turn the test-oscillator modulation switch to "On." Repeat adjustments in (g) above to compensate for any changes caused by the adjustment of L9 core, tightening lock nuts on C16, C37, and C3, respectively, after each is adjusted.

"Long Wave" Band

(i) Shift the oscillograph "Timing" switch to "Int." Remove the plug of the frequency-modulator cable from the test-oscillator jack. Turn the test-oscillator modulation switch to "On." Place receiver range selector to its "Long wave" position. Set the receiver dial pointer to 175 kc. Tune the test oscillator to 175 kc and increase its output until a deflection is noticeable on the oscillograph screen. Adjust oscillator magnetite core screw L10 (located on top of small oscillator coil can) so that maximum (peak) amplitude of output is shown on the oscillograph screen.

(j) Set receiver dial pointer to 350 kc. Tune test oscillator to 350 kc. Adjust the oscillator, detector, and antenna air-trimmers C18, C38, and C6 to produce maximum (peak) output as shown by the waves on the oscillograph screen. Without disturbing the connections, shift the oscillograph "Timing" switch to "Ext." Place the frequency-modulator sweep-range switch to its "Hi" position and insert plug of frequency-modulator cable in test-oscillator jack. Turn test-oscillator modulation switch to "Off." Re-tune the test oscillator (decrease frequency) until the

spacing between the grounded end (strap) of L22 and the strap connected from C41 to control on S2 (figure 4). An increase of spacing will increase the inductance, while a decrease of spacing will decrease the inductance. Adjust the spacing until maximum (peak) output results. Replace "Magic Brain" bottom cover and repeat adjustments in (b) prior to those of "Short wave" band.

"Short Wave" Band

(k) Set the receiver range selector to its "Short wave" position and its dial pointer to 20,000 kc. Adjust the test oscillator to 20,000 kc. Adjust oscillator air-trimmer C13 until maximum (peak) output is reached. Two peaks may be found with this circuit. The peak with maximum capacitance (plunger near out) should be used. Tighten lock nut. Adjust detector air-trimmer C35 until maximum (peak) output is reached, while slightly rocking the gang tuning condenser back and forth through the signal. Two peaks may be found with this circuit. The peak with maximum capacitance (plunger near in) should be used. Tighten lock nut. Adjust antenna air-trimmer C3 until maximum (peak) output is reached while slightly rocking the gang tuning condenser back and forth through the signal. Two peaks may be found with this circuit. The peak with maximum capacitance (plunger near in) should be used. Tighten lock nut and forth through the signal. Two peaks may be found with this circuit. The peak with maximum capacitance (plunger near in) should be used. Tighten lock nut. Two peaks may be found with this circuit. The peak with maximum capacitance (plunger near in) should be used. Tighten lock nut. Check the image frequency by changing the receiver dial setting to 19,080 kc. The image signal should be adjusted at this position indicating that the adjustment of C3 has been correctly made. No adjustments should be made while checking for the image signal.

"Medium Wave Band"

(l) Place receiver range selector to its "Medium wave" position with its dial pointer set to 6,000 kc. Tune the test oscillator to 6,000 kc. Adjust oscillator air-trimmer C14 to produce maximum (peak) output as shown by the waves on the oscillograph. Two peaks may be found with this circuit. The peak with minimum capacitance (plunger near out) should be used. Tighten lock nut. Adjust the detector air-trimmer C36 for maximum (peak) output while slightly rocking the gang tuning condenser back and forth through the signal. Two peaks may be found with this circuit. The peak with maximum capacitance (plunger near in) should be used. Tighten lock nut. Adjust antenna air-trimmer C4 to produce maximum (peak) output. Tighten lock nut.

"Standard Broadcast" Band

(m) Remove the 300-ohm resistor from between the test-oscillator "Ant" post and receiver antenna terminal "A1" and insert a 300-mfd capacitor in its place. Place receiver range selector to "Standard broadcast" position with receiver dial pointer set to 600 kc. Tune the test oscillator to 600 kc. Adjust oscillator coil can for maximum (peak) output as shown by the waves on the oscillograph screen.

(n) Set receiver dial pointer to 1,500 kc. Tune test oscillator to 1,500 kc (1,500-3,100-ke range) and increase its output to produce a registration on the oscillograph screen. Carefully adjust the

Adjust oscillator air-trimmer C23 for maximum (peak) output. Two positions, each producing maximum output, may be found. The position of minimum capacitance (plunger near out) should be used. This places the receiver heterodyne oscillator 460 kc higher in frequency than the incoming signal. Tighten lock nut. Adjust the detector air-trimmer C39, while slightly rocking the gang tuning condenser back and forth through the signal, for maximum (peak) output. Two peaks may be found on this trimmer. The peak of maximum capacitance (plunger near in) should be used. Tighten lock nut. Check the image frequency by changing the receiver dial setting to 56,080 kc. If the image signal is received at this position, the adjustment of the oscillator air-trimmer C23 has been correctly made. No adjustments should be made while checking for the image signal.

(c) Re-tune receiver for maximum response to the 37,000 kc input signal (not image response) without disturbing test-oscillator adjustments. Change test oscillator to 6,800-14,000 kc range. Tune test oscillator until signal is heard in speaker (should occur at approximately 14,250 kc, fourth harmonic of test oscillator used). Two test-oscillator settings (230 kc apart) will produce a signal at this point. The lower frequency test-oscillator setting should be used as this places the test-oscillator harmonic 460 kc below the frequency of the receiver heterodyne oscillator. Tune receiver for maximum response at a dial setting of approximately 28,500 kc (image should tune in at a dial setting approximately 27,580 kc) without altering test-oscillator adjustment. Test oscillator second harmonic of 14,250 kc is used for the following check. Check calibration of receiver dial. A receiver-dial reading of less than 28,500 kc indicates that the inductance of the oscillator secondary coil L11 is too low and should be increased. If the receiver dial reading is greater than 28,500 kc, the inductance of L11 is too high and should be decreased. If it is necessary to change the inductance of L11, first remove bottom cover of "Magic Brain" and then set receiver dial pointer to 28,500 kc. To decrease inductance, move the grounded ends (straps) of L11 and L12 (see figure 4) nearer chassis. Do not allow straps to touch chassis except where connected. To increase inductance, move the straps farther away from chassis. Adjust position of straps until maximum (peak) output results. The alignment of the detector tuned circuit should not be checked at 28,500 kc without changing either the receiver or test-oscillator adjustments. An increase of output when the brass end of a tuning wand is brought near L22 indicates that L22 is too high in inductance, while an increase when the iron end is brought near the coil indicates that the inductance is too low. The inductance of L22 may be varied by changing the

tus, shift the "Ant" output of the test oscillator to the input of the *f* system, i.e., to the grid cap of the RCA-9L7 first-detector, (with grid lead in place) through a .001-mfd. capacitor. Regulate the test-oscillator output so the amplitude of the oscillographic image is approximately the same as used for adjustment (h) above.

(g) The two first *f*-transformer magnetite core screws L25 and L24 (one on top and one on bottom) should then be adjusted so that they cause the forward and reverse waves to coincide throughout their lengths and have maximum amplitude.

(k) Note width of oscillographic image at a point which is 50% of maximum amplitude. Turn receiver fidelity control to extreme clockwise position. Note width of oscillographic image at a point which is 50% of maximum amplitude. Under normal conditions the latter measurement should be approximately 60% greater in width than the former measurement. The image should also appear slightly double humped. These conditions indicate proper broadening of the band width of the *f* amplifier. Turn range selector to "Medium wave" (B) band and note increase of amplitude. The amplitude should increase several times. It may be necessary to decrease output of test oscillator to keep image on screen. Turn receiver fidelity control to extreme counter-clockwise position and proceed to "R-F Adjustments."

R-F Adjustments

Make receiver dial adjustments as outlined by "Selector dial," figure 12. Alignment must be made in sequence of "Wave trap," "Ultra short wave" band, "Short wave" band, "Medium wave" band, "Standard broadcast" band, and "Long wave" band.

"Wave Trap" Adjustment

(a) Connect the "Ant" output of the test oscillator to the antenna terminal "A1" through a 200-mfd. (important) capacitor. Remove the plug of the frequency-modulator cable from the test-oscillator jack. Turn test-oscillator modulation switch to "On." Shift the oscillograph "Timing" switch to "Int." Place receiver range selector in "Standard broadcast" position. Set the receiver dial to a position of no extraneous signals near 600 kc. Tune the test oscillator to 460 kc. Adjust the wave-trap magnetite core screw L1 to the point which causes minimum amplitude of output (maximum suppression of signal) as shown by the waves on the oscillograph. An increase of the test-oscillator output may be necessary before this point of minimum amplitude, obtained by correct adjustment of wave-trap screw, becomes apparent on oscillograph screen.

"Ultra Short Wave" Band

(b) Connect the "Ant" output of the test oscillator to the antenna terminal "A1" of the receiver through a 300-ohm resistor. Set the receiver range selector to its "Ultra short wave" position and its dial pointer to 57,000 kc. Adjust the test oscillator to 19,000 kc. The third harmonic of 19,000 kc is used for this adjustment.

MODEL 13K

Alignment Page 3
Notes, Parts

RCA MFG. CO., INC.

Stock No.	DESCRIPTION	List Price	Stock No.	DESCRIPTION	List Price
12467	Shield—Transformer shield top for first or second I. F. transformer	.30	12681	Coil—Oscillator coil and shield X band only (L10)	.80
12481	Shield—Transformer shield top for third I. F. transformer	.36	12890	Coil—Oscillator coil "D" band (L11, L12, L23)	.70
11194	Socket—5-contact 24 Radiotron socket	.15	12877	Condensers—Variable tuning condensers (C9, C17, C41)	.85
11196	Socket—5-contact 24 Radiotron socket	.15	12887	Connector—8 contact male connector and cover for power cable Slt. No. 12888	.40
11381	Socket—5-contact 24 Radiotron socket and Magt Brain power supply socket	.15	12664	Core—Adjustable core and stud for Slt. No. 12664	.22
13095	Socket—Upper left or lower right hand dial lamp socket	.45	12920	Core—Adjustable core and stud for Slt. No. 12920	.20
11222	Socket—Upper left or lower left hand dial lamp socket	.18	12882	Core—Adjustable core and stud for Slt. No. 12882	.20
12007	Spring—Retaining spring for core, Stock No. 12006—Package of 10	.36	11324	Resistor—560 ohms—Carbon type—1/4 watt (R2)—Package of 5	1.00
12986	Stud—Stud nut and washer for connecting link assembly, Stock No. 12985, to use with link, Stock No. 12910	1.00	5112	Resistor—1,000 ohms—Carbon type—1/4 watt (R3)—Package of 5	1.00
12988	Switch—Bias switch (S7)	.65	11298	Resistor—15,000 ohms—Carbon type—1/4 watt (R4)—Package of 5	.22
13015	Tone control—Music-speech and power switch (S5, S9)	1.00	11282	Resistor—15,000 ohms—Carbon type—1/4 watt (R5)—Package of 5	.75
13013	Tone control—Music-speech and power switch (S5, S9)	1.15	8064	Resistor—56,000 ohms—Carbon type—1/4 watt (R6)—Package of 5	1.00
12981	Transformer—Second I. F. transformer complete (L24, L25, L26, C46, C47)	2.15	11397	Resistor—15,000 ohms—Carbon type—1/4 watt (R7)—Package of 5	.75
12982	Transformer—Third I. F. transformer complete (L27, L28, C51, C52)	1.85	12651	Shield—Coil shield for Slt. No. 12879 and 12880	.22
13023	Transformer—Driver transformer (T2)	2.25	12710	Shield—Coil shield for Slt. No. 12710	.22
13008	Transformer—Power transformer, 100-120 volts, 50-60 cycles (T1)	2.25	11178	Socket—7 contact 6K7 Radiotron socket	.15
13009	Transformer—Power transformer, 100-120 volts, 50-60 cycles (T1)	7.55	11279	Socket—7 contact 6K7 Radiotron socket	.15
13010	Transformer—Power transformer, 100-120 volts, 50-60 cycles (T1)	11.20	12885	Socket—8 contact 6J7 Radiotron socket	.20
13011	Transformer—Power transformer, 100-120 volts, 50-60 cycles (T1)	12.65	12007	Spring—Retaining spring for core Slt. No. 12006, 12900 and 12882—Package of 5	.36
13012	Volume control—(R16)	1.00	12674	Switch—Range switch and mounting nut (S1, S2, S3)	3.60
MAGIC BRAIN					
UNIT ASSEMBLIES					
12806	Board—5-contact antenna and ground terminal board	.25	12654	Trap—Wave trap complete (L1)	.75
5237	Board—Variable tuning condenser mounting board	.43	10705	Ball—3/32 in. diameter steel ball for planetary drive—Package of 20	\$0.21
12886	Cable—Shielded power cable, approx. 4 inches long, complete with 8-contact male plug	1.50	10941	Ball—1/8 in. diameter steel ball for planetary drive bearing—Package of 20	.25
12511	Cap—Grid contact cap—Package of 5 (C13, C35, C36, C37)	.15	12904	Bushing—Plate and bushing assembly for planetary drive mounting and shaft assembly complete	.50
12714	Capacitor—Adjustable trimmer capacitor (C3, C4, C5, C6, C14, C16)	\$0.38	12905	Dial—Band indicating dial and cam assembly	1.03
12884	Capacitor—Adjustable trimmer capacitor (C13, C35, C36, C37)	.35	12899	Drive—Variable tuning condenser drive complete including mounting bracket, drive shaft and dial Slt. No. 12870 and link Slt. No. 12868	4.40
12895	Capacitor—15 Mmfd. (C34)	.20	12908	Gear—Anti-lash drive gear complete for planetary drive	.75
12722	Capacitor—18 Mmfd. (C15)	.20	12908	Gear—Sector gear and link assembly for band selector	.20
12891	Capacitor—36 Mmfd. (C40)	.20	12908	Indicator—Station selector indicator	.20
12899	Capacitor—56 Mmfd. (C24)	.20	8151	Link—Link and roller assembly complete with springs	.30
12995	Capacitor—56 Mmfd. (C24)	.20	12911	Screws—Dial lamp screen and light diffuser	.20
13507	Capacitor—62 Mmfd. (C11)	.20	4669	Screw—Set screw for flexible coupling or gear stock Nos. 12903 and 12906—Package of 10	.25
12724	Capacitor—120 Mmfd. (C25, C28, C29)	.28	12901	Shaft—Direct drive shaft and pinion gear for planetary drive	.75
12725	Capacitor—150 Mmfd. (C1)	.28	12900	Shaft—Yernier drive shaft for planetary drive	.25
12894	Capacitor—180 Mmfd. (C22)	.20	12903	Spring—Tension spring for planetary drive bearing—Package of 10	.20
12727	Capacitor—355 Mmfd. (C21)	.20	12907	Spring—Tension spring for link stock No. 12906—Package of 10	.20
12537	Capacitor—560 Mmfd. (C7, C26, C33, C42)	.20	8052	Spring—Tension spring for link stock No. 12906—Package of 10	.20
12808	Capacitor—1500 Mmfd. (C12)	.20	12907	Spring—Tension spring for link stock No. 12906—Package of 10	.20
12729	Capacitor—1550 Mmfd. (C20)	.20	2.05	2.02	
12728	Capacitor—4500 Mmfd. (C19)	.36			
12897	Capacitor—4700 Mmfd. (C43)	.40			
4858	Capacitor—30 Mfd. (C8, C30, C31, C32)	.190			
12879	Coil—Antenna coil "D" band (L13, L14, L15, L16, L17, L18)	1.90			
12880	Coil—Detector coil "D" band (L13, L14, L15, L16, L17, L18, L19, L20)	1.90			
12709	Coil—Oscillator coil and shield ABC bands (L7, L8, L9)	2.02			

The prices quoted above are subject to change without notice.

forward and reverse waves show on the oscillograph screen and become coincident at their highest points. This will occur at a test-oscillator setting of approximately 198 kc. This setting places the test-oscillator frequency to 175 kc. The second harmonic is now used for the 350 kc. adjustment. Adjust air trimmers C18, C36, and C6, again, to produce maximum amplitude of the images where they best coincide throughout their lengths.

(k) Re-tune the receiver to approximately 175 kc so that the forward and reverse waves appear on the oscillograph screen. Adjust the oscillator magnetron core screw L10 to produce maximum (peak) amplitude of the waves, disregarding the fact that the two images may or may not come together.

(l) Shift the receiver dial setting to 350 kc without altering any other adjustments (frequency modulator still in operation). Adjust air-trimmers C18, C36, and C6, respectively, to produce maximum amplitude and best coincidence for any waves. These adjustments compensate for any changes caused by the adjustment of the magnetron core screw L10. Tighten lock nuts on C18, C36, and C6, respectively, after each is adjusted.

Loudspeaker

Centering of the loudspeaker voice coil is made in the usual manner with three narrow paper feelers after first removing the front paper dust cover. This may be removed by softening its cement with a very light application of acetone using care not to allow the acetone to flow down into the air gap. The dust cover may be cemented back in place with ambroid upon completion of adjustment.

Antenna and Ground Terminals

These receivers are equipped with an antenna-ground terminal board having three terminals. These terminals are marked "A2," "A1," and "G," the latter being the ground terminal and should always be connected to a good external ground. The transmission-line leads of the RCA RK-40A antenna system should be connected to terminals "A2" and "A1." The receiver coupling units of the RCA RK-40 and the RCA SpiderWeb antenna systems should be connected to terminals "A1" and "G." Connect a single-wire antenna to terminal "A1."

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
12863	RECEIVER ASSEMBLIES	
12967	Board—Phonograph terminal board	\$0.25
4427	Bracket—Mounting bracket for bias switch	.15
12904	Bracket—Volume control and L. F. tone control mounting bracket	\$0.18
12904	Cable—Tuning loop cable and socket	1.35
12609	Cap—Grid contact cap—Package of 5	.15
12904	Capacitor—56 Mmfd. (C59)	\$0.20
13008	Capacitor—150 Mmfd. (C56, C58)	.26
13008	Capacitor—390 Mmfd. (C73)	.25
13008	Capacitor—390 Mmfd. (C46, C47, C51, C52)	.25
12908	Capacitor—1,500 Mmfd. (C78)	.20

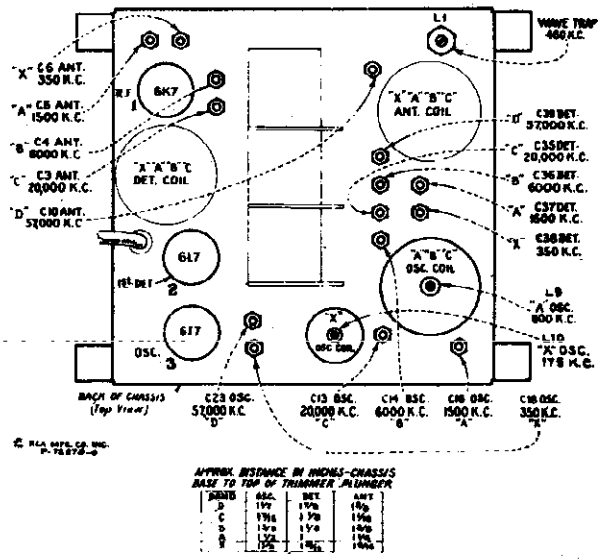
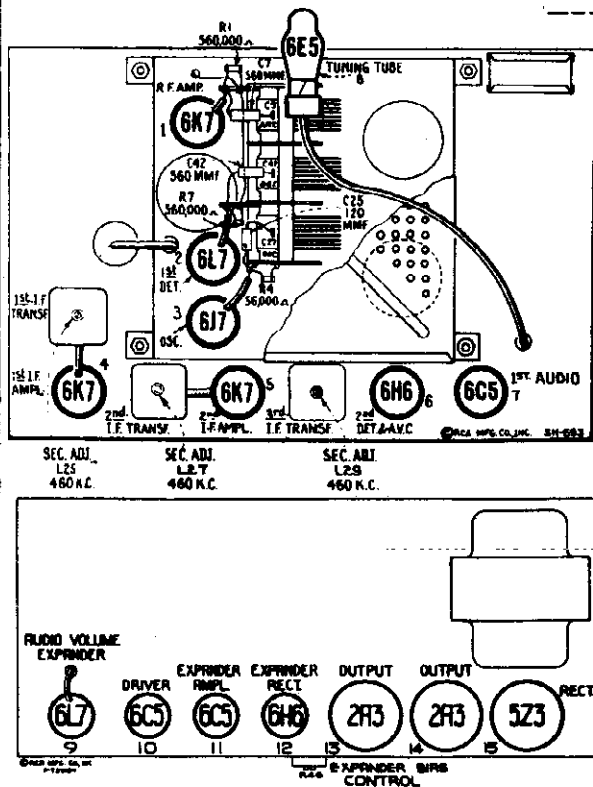
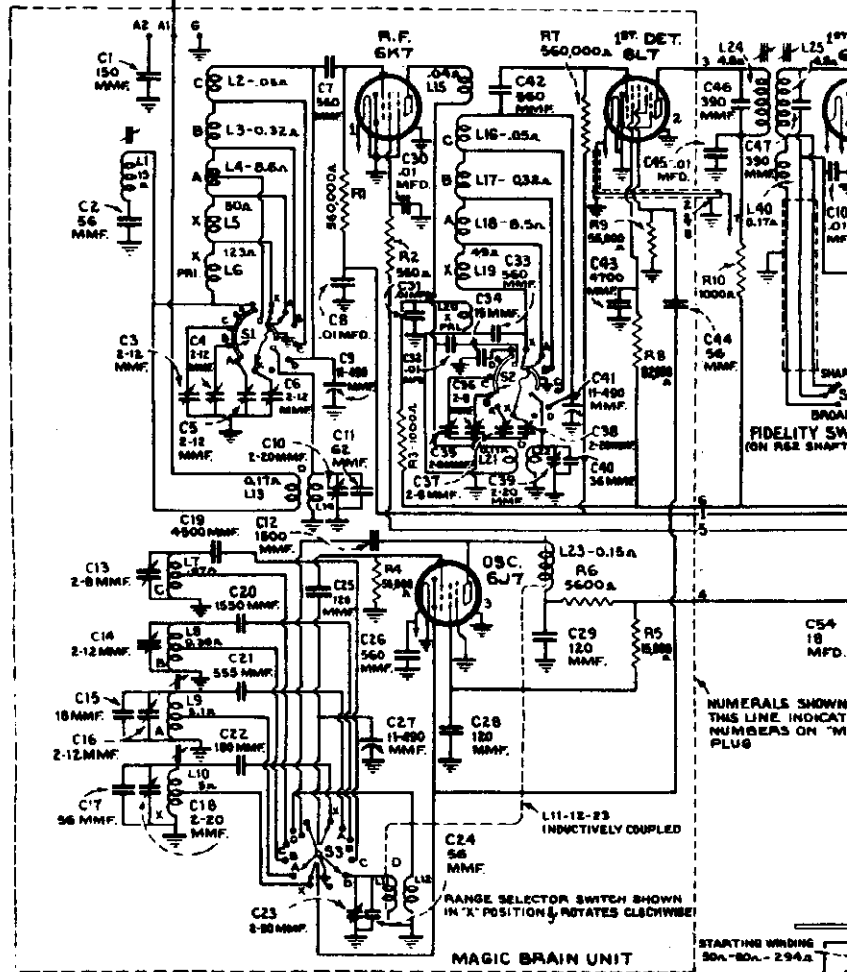
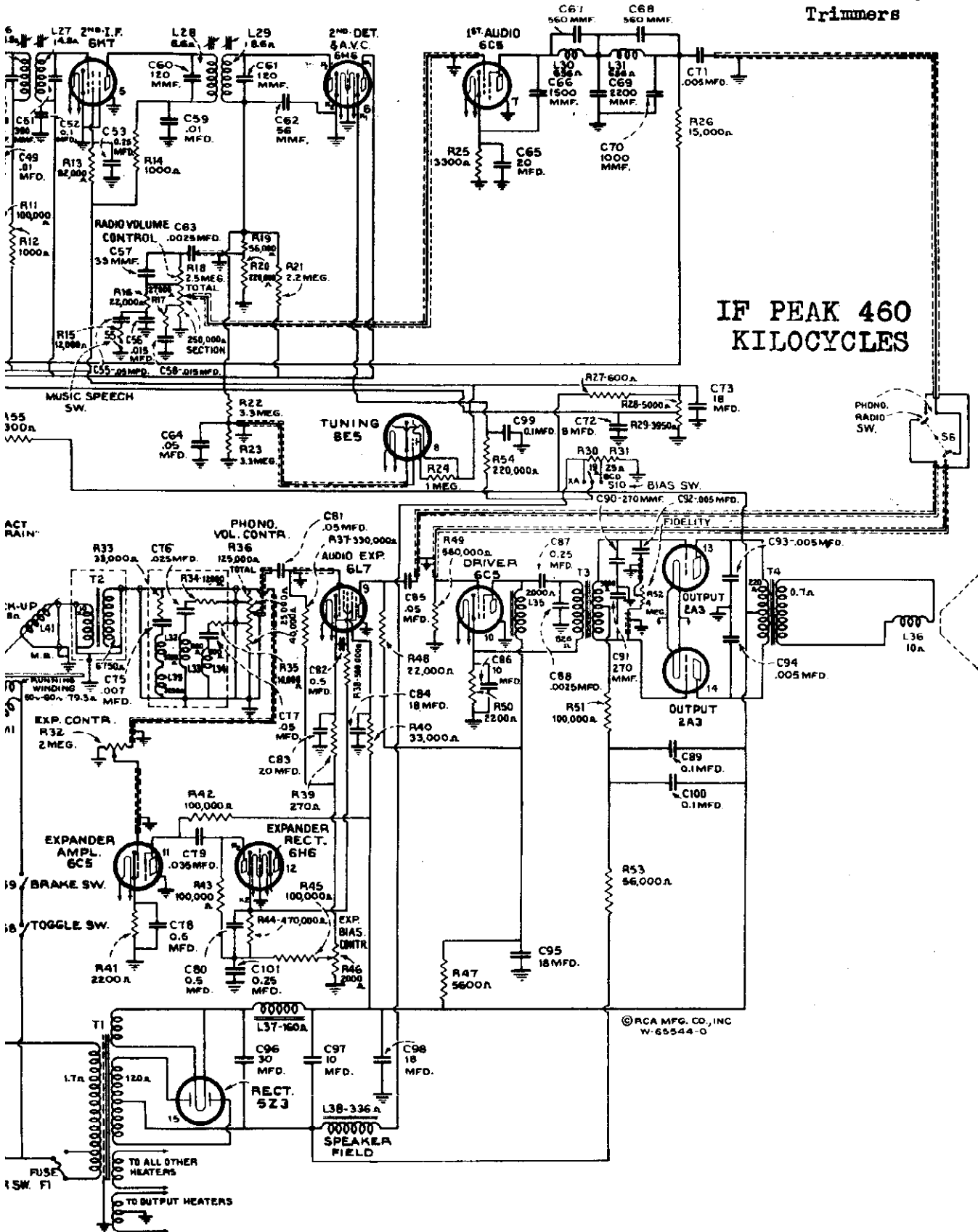


Figure 3—Radiotron and I-F Trimmer Locations

Figure 8—"Magic Brain" Trimmer Locations

CO., INC.

MODEL 15U
Schematic, Socket
Trimmers



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W-65544-0

e 1—Schematic Circuit Diagram

RCA MFG. CO., INC.

MODEL 15U Receiver Chassis Wiring

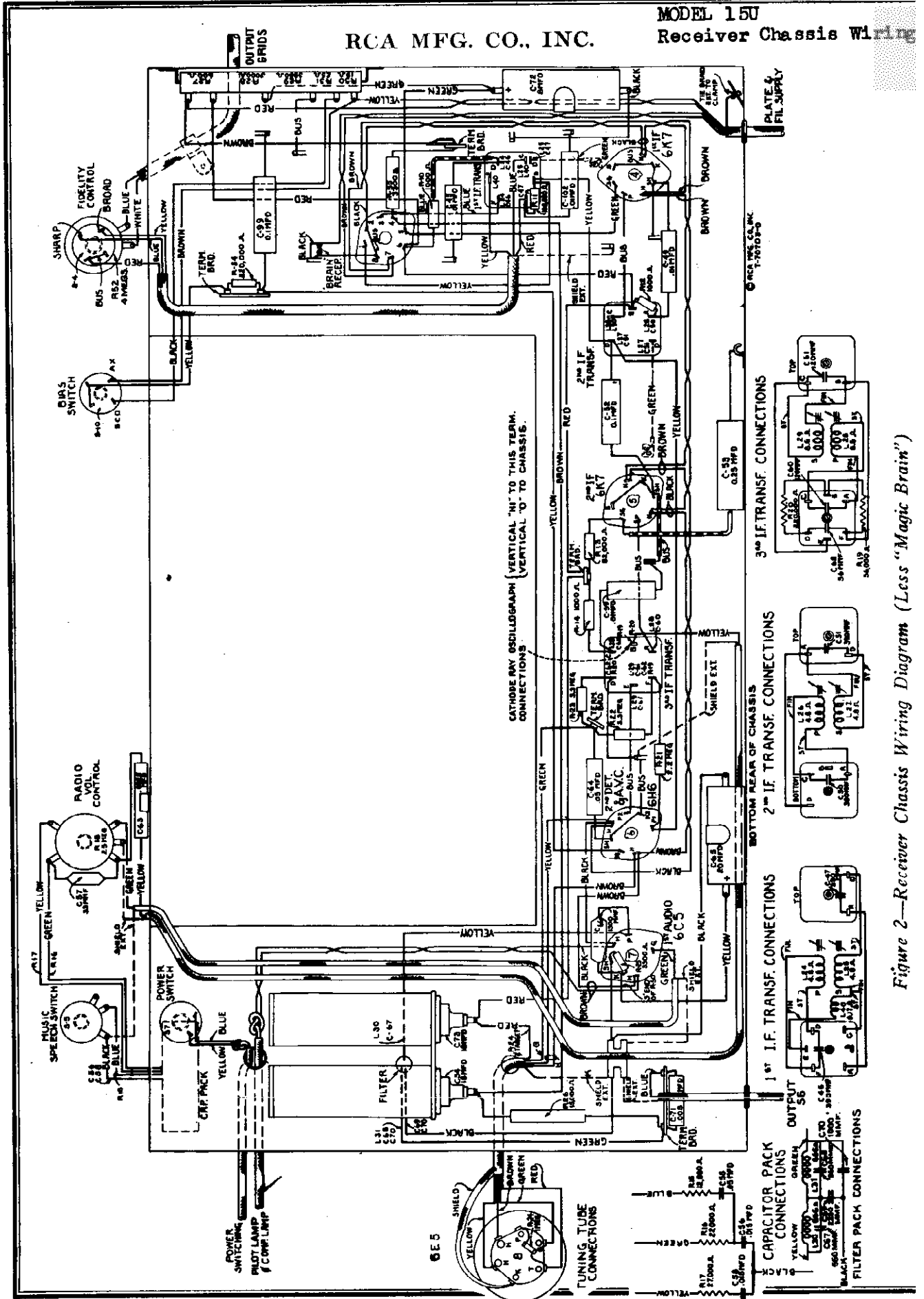


Figure 2—Receiver Chassis Wiring Diagram (Less "Magic Brain")

MODEL 15U
"Magic Brain"
Chassis Wiring

RCA MFG. CO., INC.

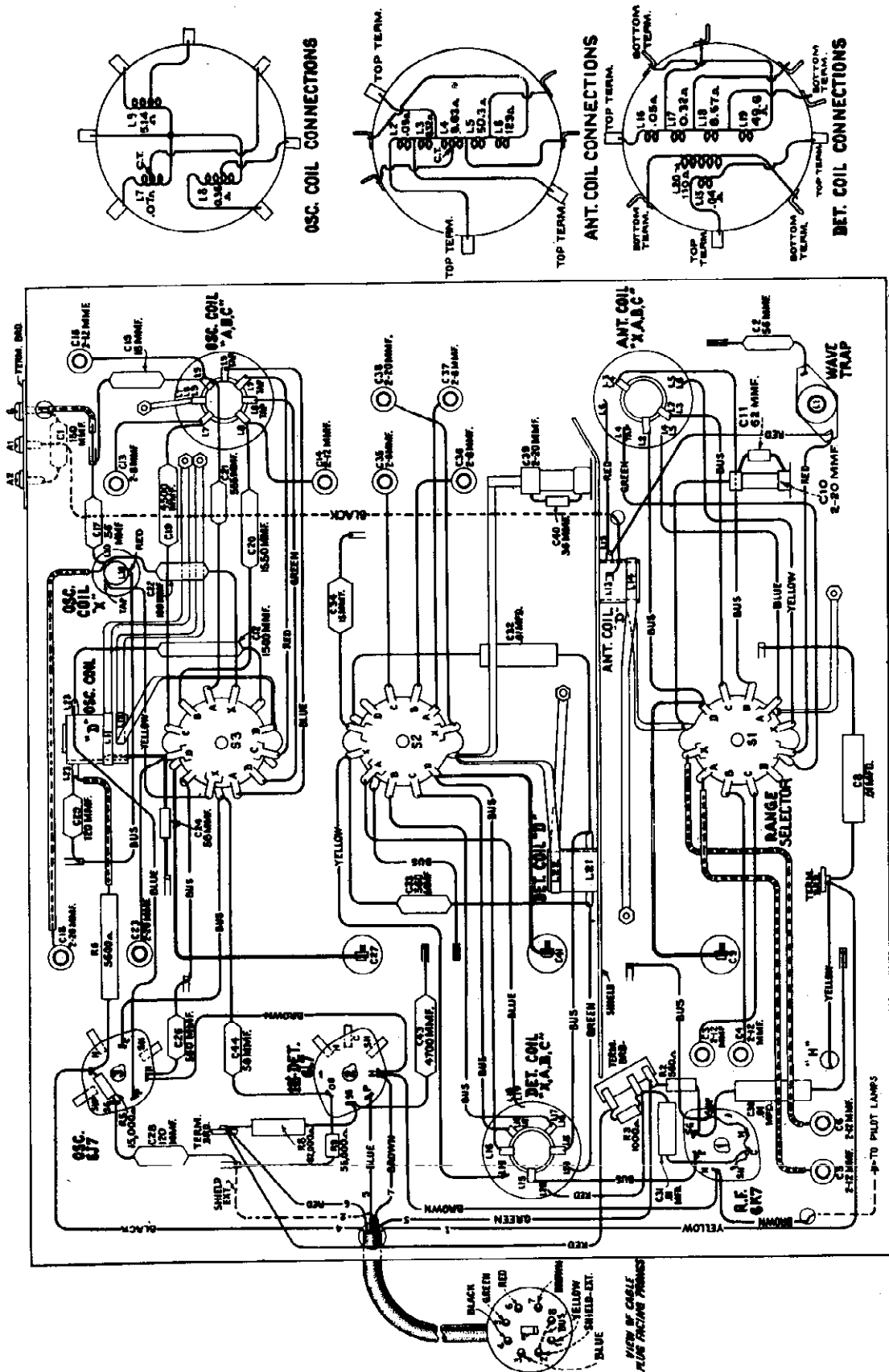


Figure 4—"Magic Brain" Wiring Diagram.

RCA MFG. CO., INC.

MODEL 15U
Power Amplifier
Chassis Wiring
Spkr. Wiring, Pick-up

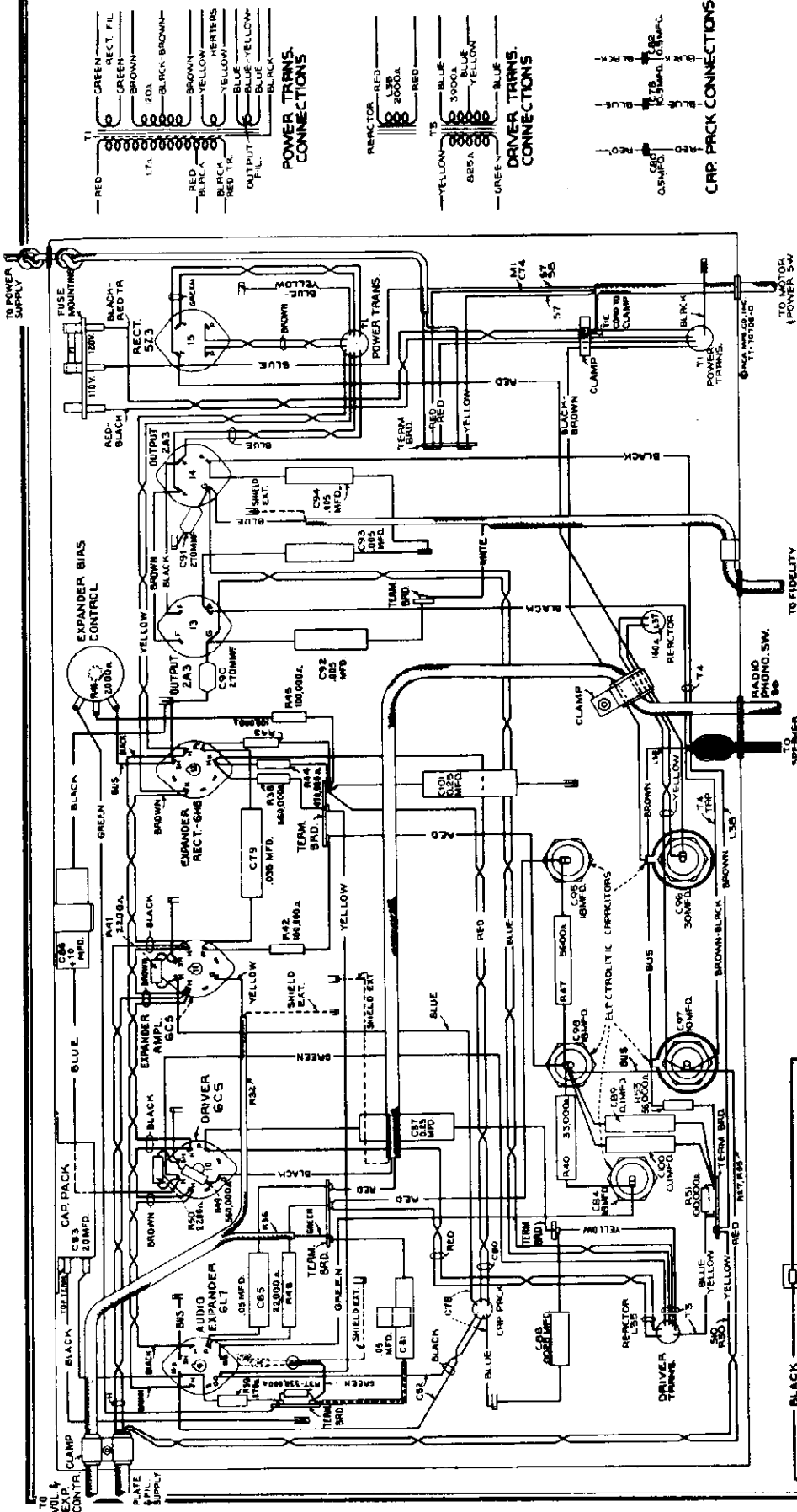


Figure 5—Power Amplifier Wiring Diagram

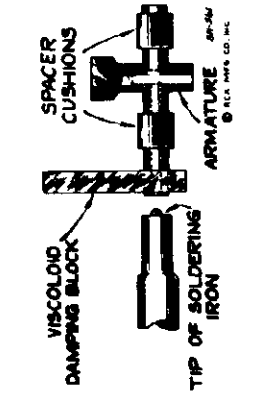


Figure 16—Special Soldering-Iron Tip

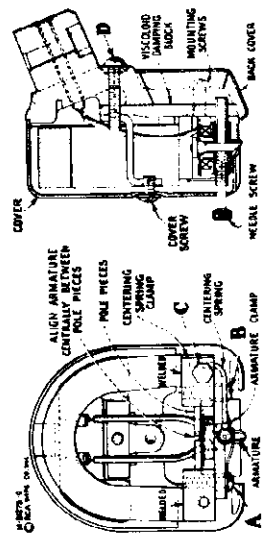


Figure 15—Details of Pickup

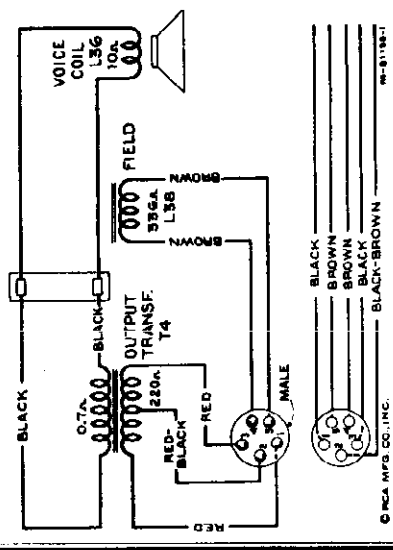


Figure 9—Loudspeaker Wiring

MODEL 15U

Specifications

Notes

RCA MFG. CO., INC.

Electrical Specifications

FREQUENCY RANGES

"Long Wave" (X)..... 150-410 kc
 "Standard Broadcast" (A)..... 530-1,800 kc
 "Medium Wave" (B)..... 1,800-6,400 kc
 "Short Wave" (C)..... 6,400-23,000 kc
 "Ultra Short Wave" (D)..... 23,000-60,000 kc

ALIGNMENT FREQUENCIES

"Long Wave" (X).....
 175 kc (osc.), 350 kc (osc., det., ant.)
 "Standard Broadcast" (A).....
 600 kc (osc.), 1,500 kc (osc., det., ant.)
 "Medium Wave" (B)..... 6,000 kc (osc., det., ant.)
 "Short Wave" (C)..... 20,000 kc (osc., det., ant.)
 "Ultra Short Wave" (D)..... 57,000 kc (osc., det., ant.)

Intermediate Frequency..... 460 kc

RADIOTRON COMPLEMENT

- | | |
|---|---|
| (1) RCA-6K7..... R-F Amplifier | (8) RCA-6E5..... "Magic Eye" Tuning Indicator |
| (2) RCA-6L7..... First Detector | (9) RCA-6L7..... Audio Volume Expander |
| (3) RCA-6J7..... Heterodyne Oscillator | (10) RCA-6C5..... Audio Driver Amplifier |
| (4) RCA-6K7..... First I-F Amplifier | (11) RCA-6C5..... Expander Amplifier |
| (5) RCA-6K7..... Second I-F Amplifier | (12) RCA-6H6..... Expander Rectifier |
| (6) RCA-6H6..... Second Detector and A.V.C. | (13) RCA-2A3..... Power Output |
| (7) RCA-6C5..... Audio Voltage Amplifier | (14) RCA-2A3..... Power Output |
| | (15) RCA-5Z3..... Full-Wave Rectifier |

Pilot Lamps (6)..... Mazda No. 40, 6.3 volts, 0.15 ampere

POWER-SUPPLY RATINGS

		RADIO ONLY	TOTAL
Rating A-6.....	105-125 volts, 60 cycles.....	180 watts.....	205 watts
Rating A-5.....	105-125 volts, 50 cycles.....	180 watts.....	210 watts

For 220-volt operation, a step-down transformer (Stock No. 7217) must be used.

Fuse Rating..... 3 amperes

PHONOGRAPH

Type..... Automatic Record Ejector
 Record Capacity..... Seven 10-inch or Six 12-inch
 Turntable Speed..... 78 R.P.M.
 Type of Pickup..... Low-Impedance Magnetic
 Pickup Impedance..... 100 ohms at 1,000 cycles

POWER-OUTPUT RATINGS

Undistorted..... 12 watts
 Maximum..... 15 watts

LOUDSPEAKER

Type..... Super 12-inch Electrodynamic
 Impedance (V.C.)..... 11¼ ohms at 400 cycles

Mechanical Specifications

CABINET DIMENSIONS

Height..... 34 inches
 Width..... 48⁷/₈ inches
 Depth..... 18¹/₁₆ inches

WEIGHTS

Net..... 222 pounds
 Shipping..... 311 pounds
 Chassis Base Dimensions..... 15 inches x 9³/₄ inches x 3 inches
 Over-all Height of Chassis..... 9¹/₄ inches
 Amplifier Base Dimensions..... 16¹/₄ inches x 7¹/₂ inches x 2³/₄ inches
 Over-all Height of Amplifier..... 7⁵/₈ inches

OPERATING CONTROLS

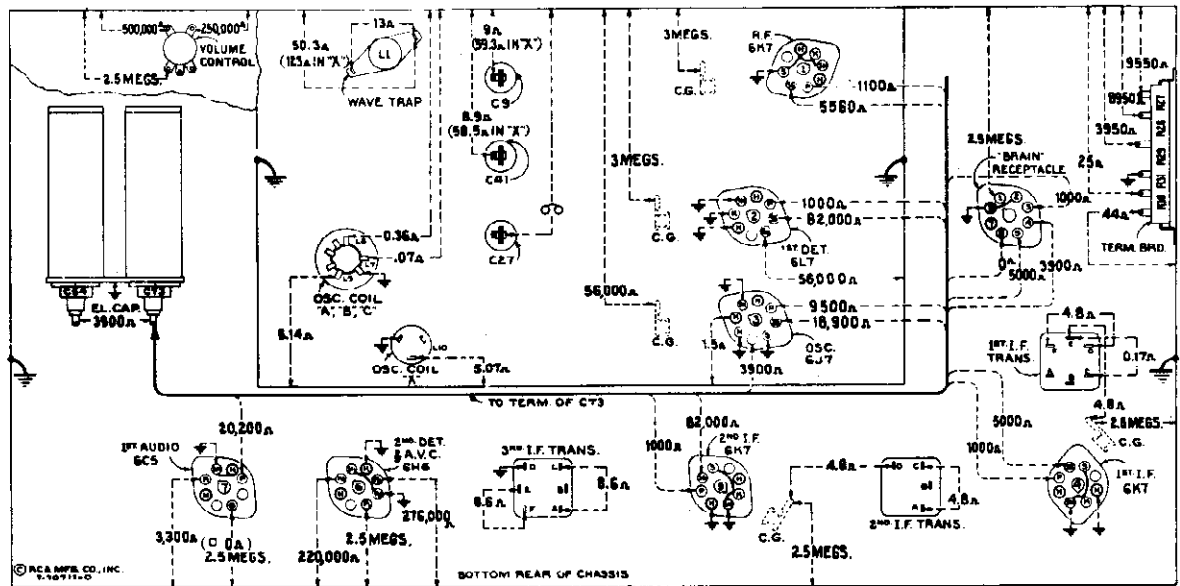
Radio..... (1) Music-Speech—Power Switch, (2) Volume, (3) Tuning, (4) Range Selector
 (5) Fidelity
 Phonograph..... (1) Turntable Switch, (2) Radio-Phono Transfer Switch, (3) Index, (4) Dynamic
 Amplifier, (5) Phonograph Volume
 Tuning Drive Ratios..... 20 to 1 and 100 to 1

General Description

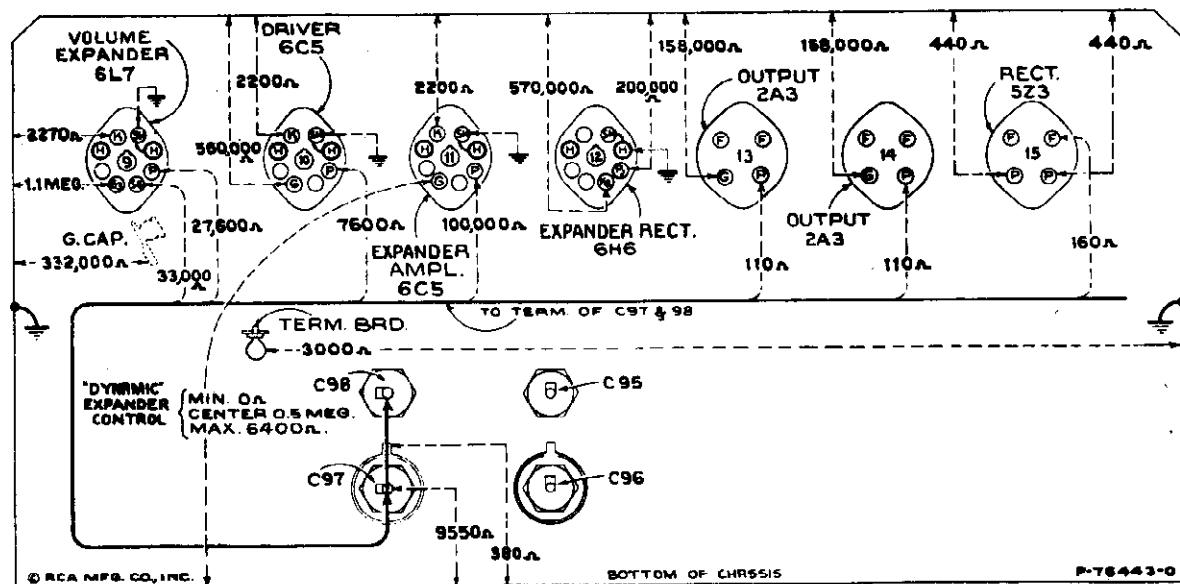
The Model 15U Phonograph-Radio Combination employs all of the latest developments in the art of record and radio reproduction. A few of the design features include higher-fidelity reproduction from both records and radio; the revolutionary dynamic expander; "Magic Brain"; improved automatic record

changer; selector dial; "Magic Voice"; magnetite-core i-f transformers, wave-trap, and low-frequency oscillator tracking adjustments; new plunger-type air trimmers; and a super 12-inch electrodynamic loudspeaker with aluminum voice coil and high-frequency tone diffuser.

RCA MFG. CO., INC.



Receiver



Power Amplifier

Figure 10—Resistance Diagram

Power supply disconnected—Radiotrons in sockets—All cables connected—Tuning condenser in full-mesh
—Range selector in "Standard broadcast" position—Both volume controls maximum—Radio-Phono
switch either position

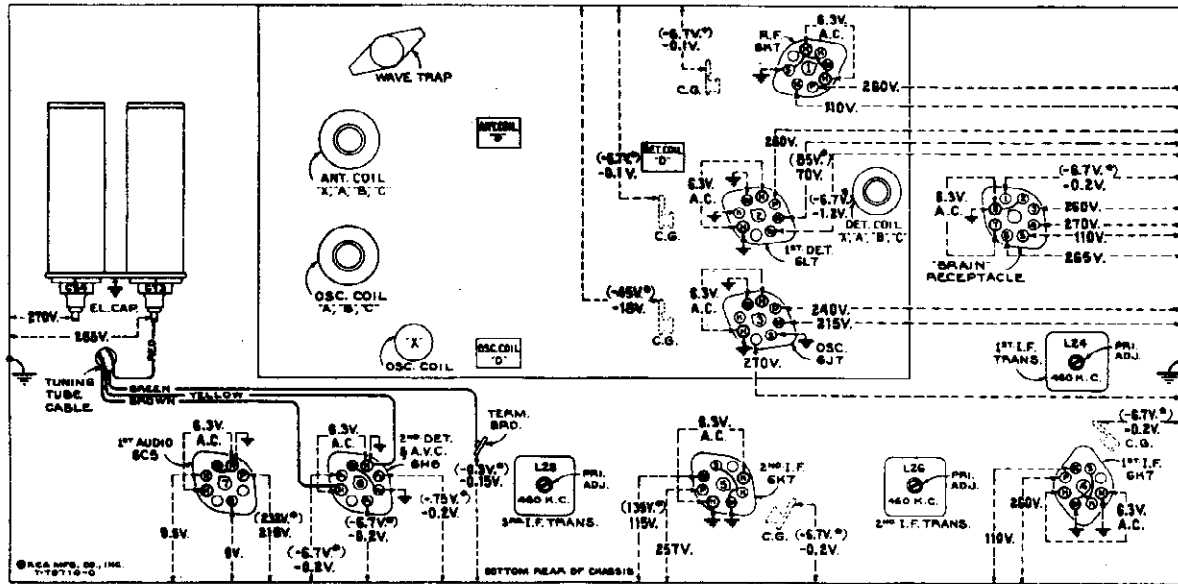
Resistance Measurements

The resistance values shown between Radiotron socket contacts, grid caps, resistors, and terminals to chassis ground or other pertinent point on figure 10, permit a rapid continuity check of the circuits. The use of this diagram in conjunction with the Schematic Circuit Diagram, figure 1, and Wiring Diagrams, figures 2, 4, and 5, will permit the location of certain troubles which might otherwise be difficult to ascertain. Each value as specified should hold within $\pm 20\%$. Variations in excess

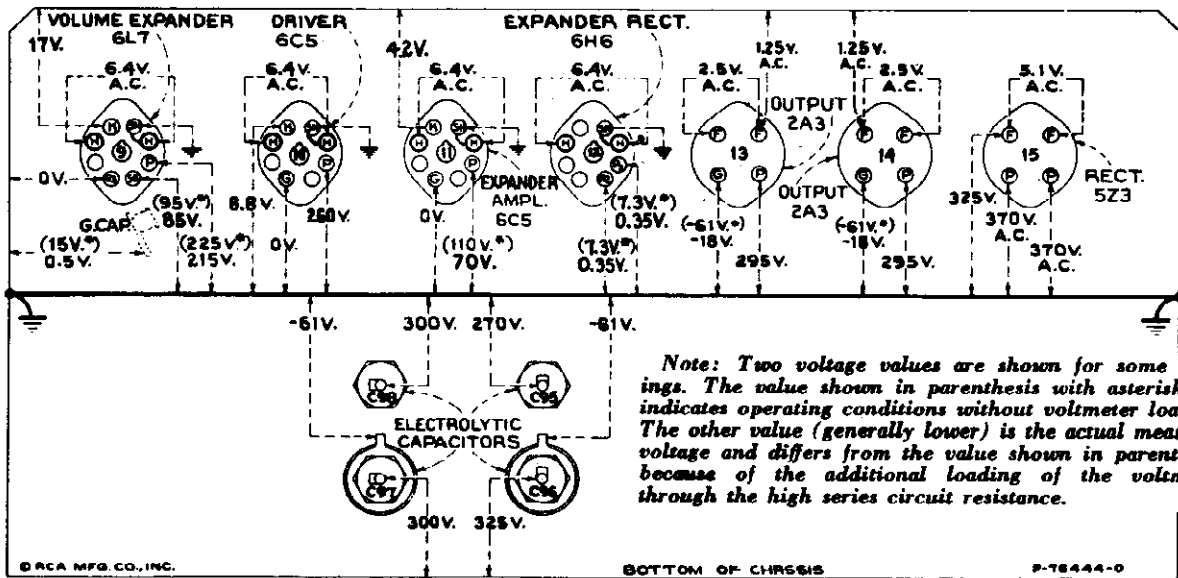
of this limit will usually be indicative of trouble in circuit under test. When measuring the resistance between points of the circuit and ground, it will be necessary to connect the negative terminal of the resistance meter to chassis-ground. If the polarity of the resistance meter is not known, it may be readily ascertained by connecting a d-c voltmeter of indicated polarity across the terminals of the device.

MODEL 15U
Voltage, Socket
Trimmers

RCA MFG. CO., INC.



Receiver



Power Amplifier

Figure 11—Radiotron Socket Voltages, Coil, and I-F Trimmer Locations

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc—No signal being received—
Both volume controls minimum—Radio-Phono switch either position

Radiotron Cathode Current Readings

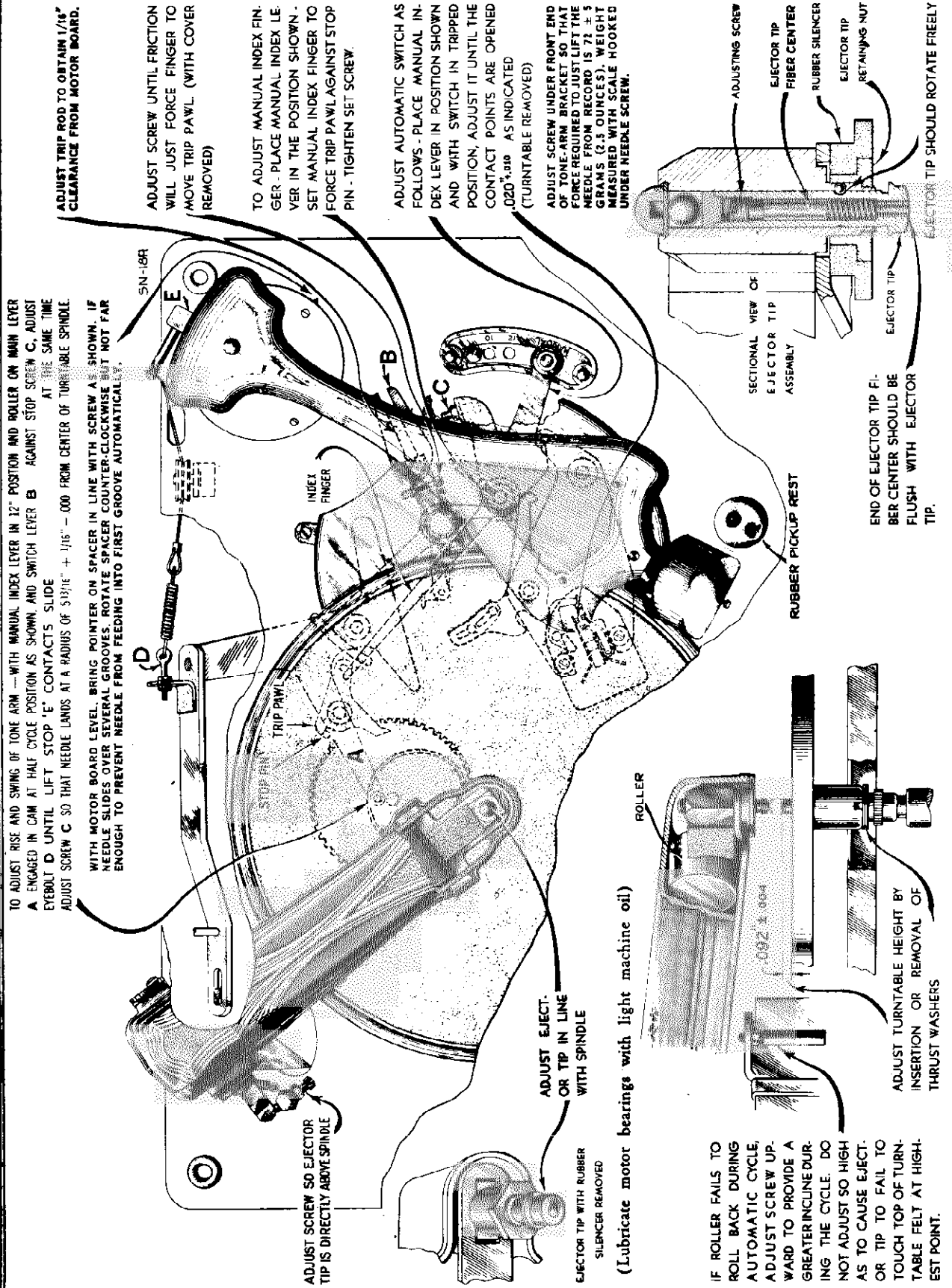
Measured with Milliammeter Connected at Tube Socket
Cathode Terminal under Conditions Similar to
Those of Voltage Measurements

(1) RCA-6K7—R-F Amp.....	5.0 ma.	(9) RCA-6L7—Audio Volume Exp.	7.5 ma.
(2) RCA-6L7—1st Det.....	3.7 ma.	(10) RCA-6C5—Audio Driver.....	4.0 ma.
(3) RCA-6J7—Osc.....	7.0 ma.	(11) RCA-6C5—Expander Amplifier.	1.9 ma.
(4) RCA-6K7—1st I-F Amp.....	5.0 ma.	(12) RCA-6H6—Expander Rectifier..	—
(5) RCA-6K7—2nd I-F Amp.....	7.5 ma.	(13) RCA-2A3—Power Output.....	41.8 ma.
(6) RCA-6H6—2nd Det.—A.V.C...	—	(14) RCA-2A3—Power Output.....	41.8 ma.
(7) RCA-6C5—Audio Voltage Amp.	2.5 ma.	(15) RCA-5Z3—Rectifier	165 ma.*
(8) RCA-6E5—Tuning Tube.....	1.2 ma.		

(*Cannot be measured at socket)

RCA MFG. CO., INC.

MODEL 15U
Automatic Record Changer
Details, Notes



ADJUST TRIP ROD TO OBTAIN 1/16" CLEARANCE FROM MOTOR BOARD.

ADJUST SCREW UNTIL FRICTION WILL JUST FORCE FINGER TO MOVE TRIP PAWL (WITH COVER REMOVED)

TO ADJUST MANUAL INDEX FINGER - PLACE MANUAL INDEX LEVER IN THE POSITION SHOWN - SET MANUAL INDEX FINGER TO FORCE TRIP PAWL AGAINST STOP PIN - TIGHTEN SET SCREW.

ADJUST AUTOMATIC SWITCH AS FOLLOWS - PLACE MANUAL INDEX LEVER IN POSITION SHOWN AND WITH SWITCH IN TRIPPED POSITION, ADJUST IT UNTIL THE CONTACT POINTS ARE OPENED .020" ± .010 AS INDICATED (TURNABLE REMOVED)

ADJUST SCREW UNDER FRONT END OF TONE-ARM BRACKET SO THAT FORCE REQUIRED TO JUST LIFT THE NEEDLE FROM RECORD IS 72 ± 3 GRAMS (2.5 OUNCES). WEIGHT MEASURED WITH SCALE HOOKED UNDER NEEDLE SCREW.

ADJUSTING SCREW
EJECTOR TIP
FIBER CENTER
RUBBER SILENCER
EJECTOR TIP
RETAINING NUT
EJECTOR TIP SHOULD ROTATE FREELY

TO ADJUST RISE AND SWING OF TONE ARM - WITH MANUAL INDEX LEVER IN 12" POSITION AND ROLLER ON MAIN LEVER A ENGAGED IN CAM AT HALF CYCLE POSITION AS SHOWN, ADJUST STOP SCREW C, ADJUST EYEBOLT D UNTIL LIFT STOP 'E' CONTACTS SLIDE AT THE SAME TIME ADJUST SCREW C SO THAT NEEDLE LANDS AT A RADIUS OF 537/16" + 1/16" - .000 FROM CENTER OF TURNABLE SPINDLE.

WITH MOTOR BOARD LEVEL, BRING POINTER ON SPACER IN LINE WITH SCREW AS SHOWN. IF NEEDLE SLIDES OVER SEVERAL GROOVES, ROTATE SPACER COUNTER-CLOCKWISE UNTIL NOT FAR ENOUGH TO PREVENT NEEDLE FROM FEEDING INTO FIRST GROOVE AUTOMATICALLY.

ADJUST SCREW SO EJECTOR TIP IS DIRECTLY ABOVE SPINDLE

ADJUST EJECTOR TIP WITH RUBBER SILENCER REMOVED

(Lubricate motor bearings with light machine oil)

IF ROLLER FAILS TO ROLL BACK DURING AUTOMATIC CYCLE, ADJUST SCREW UPWARD TO PROVIDE A GREATER INCLINE DURING THE CYCLE. DO NOT ADJUST SO HIGH AS TO CAUSE EJECTOR TIP TO FAIL TO TOUCH TOP OF TURNABLE FELT AT HIGH-EST POINT.

END OF EJECTOR TIP FIBER CENTER SHOULD BE FLUSH WITH EJECTOR TIP.

Figure 13—Automatic Record Changer Adjustments

Alignment Procedure

There are seventeen adjustments required for the alignment of the oscillator, first-detector and antenna circuits; one adjustment for the wave-trap; and six adjustments for the i-f system. Fifteen of these adjustments are made with plunger-type air-trimmer capacitors and require the use of an RCA Stock No. 12646 Adjusting Tool. Each of these capacitors has a lock out for securing the plunger in place after adjustment. The remaining nine adjustments are made by means of screws attached to milled magnetic cores. These cores change the inductance of the particular coils in which they are inserted to provide exact alignment. All of these adjustments are accurately made during manufacture and should remain in proper alignment unless affected by abnormal conditions of climate or other means. Loss of sensitivity, improper tone quality, and poor selectivity are the usual indications of improper alignment. Such conditions will usually exist simultaneously. Correct performance of this receiver can only be obtained when these adjustments have been made by a skilled service engineer with the use of adequate and reliable test equipment. The manufacturer of this receiver has such test equipment available for sale through its distributors and dealers.

The extensive frequency range of these receivers necessitates a more or less involved method of alignment. However, if the following directions are carefully applied in the sequence given, normal performance of the increments will be obtained.

The plunger-type air-trimmer capacitors have their approximate plunger settings tabulated on figure 8. If the plungers have been disturbed from their original adjustments, they may be roughly set to the specified dimensions prior to alignment.

In performing services on the "Magic Brain", the leads should be restored to their original positions, since the lead-dress is important for proper operation and dial calibration.

Precautionary Dressing of Leads for "Magic Brain" Alignment
(Refer to Figure 4)

1. Keep blue lead A of S1 to antenna coil L4-5 dressed away from chassis, and from yellow lead X of S1 to antenna coil L5-6.
 2. Bus lead from G10 to S1 should be as short as possible.
 3. Keep blue lead A of S1 to detector coil L18-19 clear of chassis, and third coil of S1.
 4. Keep spaghetti lead C6 to X of S1 apart from spaghetti lead C5 to A of S1, and from chassis.
- Lead "A"**
1. Keep green lead terminal S1 to antenna coil tap L4 away from chassis, coil shield, and coil.
 2. Keep spaghetti lead C5 to A of S1 apart from spaghetti lead C6 to X of S1, and from chassis.

Lead "X"

If for alignment, the test-oscillator frequency should be quite accurate. A convenient and reliable means of accurately checking the frequency of test oscillators, meters, etc., is the RCA Stock No. 9572 Crystal Calibrator.

If the test-oscillator signal cannot be heard as the speaker (heterodyne) oscillator air-trimmer plunger is changed from its minimum-capacity to maximum-capacity position (receiver dial and test oscillator set to the specified frequencies, and the correct oscillator

on figure 2. Set oscillograph power switch to "On" and adjust "Intensity" and "Focus" controls to give a clearly defined spot, or line, on the screen. Set oscillograph "Amp. A" switch to "On." Vertical gain control full-clockwise, "Amp. B" switch to "Timing." "Range" switch to No. 2 position, and "Timing" switch to "Int." Place the "Sync." control, and "Horizontal gain" control to about their mid-positions. For each of the following adjustments, the test-oscillator output must be regulated so that the image obtained on the oscillograph screen will be of the minimum size for accurate observation. The receiver volume-control setting is optional.

I-F Adjustments

- (a) Set "Fidelity" control to counter-clockwise position, "Radio-Phono" switch to "Radio," and "Range Selector" to "Standard Broadcast" band. Connect the "Ant." output of the test oscillator to the grid cap of RCA-6K7 second i-f tube (with grid lead in place) through a .001-mfd. capacitor, with "Grid" to receiver chassis. Tune the test oscillator to 460 kc and place its modulation switch to "On" and its output switch to "Hi."
- (b) Turn on the receiver and test oscillator. Increase the output of the test oscillator until a deflection is noticeable on the oscillograph screen. The figures obtained represent several waves of the detected signal, the amplitude of which may be observed as an indication of output. Cause the wave-image formed (400-cycle waves) to be spread completely across the screen by adjusting the "Horizontal gain" control. The image should be synchronized and made to remain motionless by adjusting the "Sync." and "Freq." controls.
- (c) Adjust the two magnetic core screws L29 and L28 (see figures 3 and 11) of the third i-f transformer (one on top and one on bottom) to produce maximum vertical deflection of the oscillographic image. This adjustment places the transformer in exact resonance with the 460-kc signal.
- (d) The sweeping operation should follow using the frequency modulator. Shift the oscillograph "Timing" switch to "Ext." Insert plug of frequency-modulator cable in test-oscillator jack. Turn the test-oscillator modulation switch to "Off." Turn on the frequency modulator and place its sweep-range switch to "Hi."
- (e) Increase the frequency of the test oscillator by slowly turning its tuning control until two separate, distinct, and similar waves appear on the screen. If only one wave appears, increase the "Freq." control on the oscillograph to obtain two waves. These waves will be identical in shape, totally disconnected, and appear in reversed positions. They will have a common base line, which is discontinuous. Adjust the "Freq." and "Sync." controls of the oscillograph to make them remain motionless on the screen. Continue increasing the test-oscillator frequency until these forward and reverse curves move together and overlap with their highest points exactly coincident. This condition will be obtained at a test-oscillator setting of approximately 575 kc.
- (f) With the images established as in (e), readjust the two magnetic core screws L29 and L28 on the third i-f transformer so that they cause the

curves on the oscillograph screen to become exactly coincident throughout their lengths and have maximum amplitude.

(g) Without altering the adjustments of the apparatus, shift the "Ant." output of the test oscillator to the grid cap of the RCA-6K7 first i-f tube (with grid lead in place), through a .001-mfd. capacitor. Regulate the test-oscillator output so that the amplitude of the oscillographic image is approximately the same as used for adjustment (f) above.

(h) The two second i-f transformer magnetic core screws L27 and L26 (one on top and one on bottom) should then be adjusted so that they cause the forward and reverse curves to become coincident throughout their lengths and have maximum amplitude.

(i) Without altering the adjustments of the apparatus, shift the "Ant." output of the test oscillator to the input of the i-f system, i.e., to the grid cap of the RCA-6L7 first-detector, (with grid lead in place) through a .001-mfd. capacitor. Regulate the test-oscillator output so that the amplitude of the oscillographic image is approximately the same as used for adjustment (h) above.

(j) The two first i-f transformer magnetic core screws L25 and L24 (one on top and one on bottom) should then be adjusted so that they cause the forward and reverse waves to become coincident throughout their lengths and have maximum amplitude.

(k) Note width of oscillographic image at a point which is 50% of maximum amplitude. Turn receiver fidelity control to extreme clockwise position. Note width of oscillographic image at a point which is 50% of maximum amplitude. Under normal conditions the latter measurement should be approximately 60% greater in width than the former measurement. The image should also appear slightly double humped. These conditions indicate proper broadening of the band width of the i-f amplifier. Turn range selector to "Medium wave" (B) band and note increase of amplitude. The amplitude should increase several times. It may be necessary to decrease output of test oscillator to keep image on screen. Turn receiver fidelity control to extreme counter-clockwise position and proceed to "R-F Adjustments."

R-F Adjustments

Make receiver dial adjustments as outlined by "Selector dial," figure 14. Alignment must be made in sequence of "Wave-trap," "Ultra short wave band," "Short wave" band, "Medium wave" band, "Standard broadcast" band, and "Long wave" band.

"Wave-Trap" Adjustment

(a) Connect the "Ant." output of the test oscillator to the antenna terminal "A1" through a 200-mmf. (important) capacitor. Remove the plug of the frequency-modulator cable from the test-oscillator jack. Turn test-oscillator modulation switch to "On." Shift the oscillograph "Timing" switch to "Int." Place receiver range selector in "Standard broadcast" position. Set the receiver dial to a position of no extraneous signals near 600 kc. Tune the test oscillator to 450 kc. Adjust the wave-trap magnetic core screw L1 to the point which causes minimum amplitude of output (maximum suppression of signal) as shown

Cathode-Ray Alignment

Make alignment apparatus connections shown on figure 6. Remove the plug of the frequency-modulator cable from the test-oscillator jack. Connect the receiver chassis to a good external ground. Connect oscillograph "Vertical" output terminals as indicated

by the waves on the oscillograph. An increase of the test-oscillator output may be necessary before this point of minimum amplitude, obtained by correct adjustment of wave-trap screw, becomes apparent on oscillograph screen.

"Ultra Short Wave" Band

(b) Connect the "Ant." output of the test oscillator to the antenna terminal "A1" of the receiver through a 300-ohm resistor. Set the receiver range selector to its "Ultra short wave" position and its dial pointer to 57,000 kc. Adjust the test oscillator to 19,000 kc. The third harmonic of 19,000 kc is used for this adjustment.

Adjust oscillator air-trimmer C23 for maximum (peak) output. Two positions, each producing maximum output, may be found. The position of minimum capacitance (plunger near out) should be used. This places the receiver heterodyne oscillator 460 kc higher in frequency than the incoming signal. Tighten lock nut. Adjust the detector air-trimmer C19, while slightly rocking the gang tuning condenser back and forth through the signal, for maximum (peak) output. Two peaks may be found on this trimmer. The peak of maximum capacitance (plunger near in) should be used. Tighten lock nut. Adjust the antenna air-trimmer C10 for maximum (peak) output while slightly rocking the gang tuning condenser back and forth through the signal. Two peaks may be found on this trimmer which produce maximum output. The peak with maximum capacitance (plunger near in) should be used. Tighten lock nut. Check the image frequency by changing the receiver dial setting to 56,080 kc. If the image signal is received at this position, the adjustment of the oscillator air-trimmer C13 has been correctly made. No adjustments should be made while checking for the image signal.

(c) Re-tune receiver for maximum response to 57,000 kc (see image response). Without disturbing test-oscillator adjustments, change test oscillator to 6,600-14,000 kc range. Tune test oscillator until signal is heard in speaker (should occur at approximately 14,250 kc, fourth harmonic of test oscillator used). Two test-oscillator settings (230 kc apart) will produce a signal at this point. The lower frequency test-oscillator setting should be used, as this places the test oscillator harmonic 460 kc below the frequency of the receiver heterodyne oscillator. Tune receiver for maximum response at a dial setting of approximately 28,500 kc (image should tune in at a dial setting approximately 27,580 kc) without altering test-oscillator adjustment. Test oscillator second harmonic of 14,250 kc is used for the following check. Check calibration of receiver dial. A receiver-dial reading of less than 28,500 kc indicates that the inductance of the oscillator secondary coil L11 is too low and should be increased. If the receiver dial reading is greater than 28,500 kc, the inductance of L11 is too high and should be decreased. If it is necessary to change the inductance of L11, first remove bottom cover of "Magic Brain" and then set receiver dial pointer to 28,500 kc. To decrease inductance, turn the grounded ends (straps) of L11 and L12 (see figure 4) nearer chassis. Do not allow straps to touch chassis except where connected. To increase inductance, move the straps farther away from chassis. Adjust post-

tion of straps until maximum (peak) output results. The alignment of the detector tuned circuit should next be checked at 28,500 kc without changing either the receiver or test oscillator adjustments. An increase of output when the band end of a tuning wave is brought near 4.22 indicates that L22 is too high in inductance, while an increase when the iron end is brought near the coil indicates that the inductance is too low. The inductance of L22 may be varied by changing the spacing between the grounded end (strap) of L22 and the strap connected from C41 to contact on S2 (figure 4). An increase of spacing will increase the inductance, while a decrease of spacing will decrease the inductance. Adjust the spacing until maximum (peak) output results. Replace "Magic Brain" bottom cover and repeat adjustments in (b) prior to those of "Short Wave" Band.

"Short Wave" Band

(d) Set the receiver range selector to its "Short wave" position and its dial pointer to 20,000 kc. Adjust the test oscillator to 20,000 kc. Adjust oscillator air-trimmer C13 until maximum (peak) output is reached. Two peaks may be found with this circuit. The peak with minimum capacitance (plunger near out) should be used. Tighten lock nut. Adjust detector air-trimmer C35 until maximum (peak) output is reached, while slightly rocking the gang tuning condenser back and forth through the signal. Two peaks may be found with this circuit. The peak with maximum capacitance (plunger near in) should be used. Tighten lock nut. Adjust antenna air-trimmer C3 until maximum (peak) output is reached while slightly rocking the gang tuning condenser back and forth through the signal. Two peaks may be found with this circuit. The peak with maximum capacitance (plunger near in) should be used. Tighten lock nut. Check the image frequency by changing the receiver dial setting to 19,080 kc. The image signal should be received at this position indicating that the adjustment of C13 has been correctly made. No adjustments should be made while checking for the image signal.

"Medium Wave" Band

(e) Place receiver range selector to its "Medium wave" position with its dial pointer set to 6,000 kc. Tune the test oscillator to 6,000 kc. Adjust oscillator air-trimmer C14 to produce maximum (peak) output as shown by the waves on the oscillograph. Two peaks may be found with this circuit. The peak with minimum capacitance (plunger near out) should be used. Tighten lock nut. Adjust the detector air-trimmer C16 for maximum (peak) output while slightly rocking the gang tuning condenser back and forth through the signal. Two peaks may be found with this circuit. The peak with maximum capacitance (plunger near in) should be used. Tighten lock nut. Adjust antenna air-trimmer C4 to produce maximum (peak) output. Tighten lock nut.

"Standard Broadcast" Band

(f) Remove the 300-ohm resistor from between the test-oscillator "Ant." post and receiver antenna terminal "A1" and insert a 200-mmf. capacitor in its place. Place receiver range selector to

"Standard broadcast" position with receiver dial pointer set to 600 kc. Tune the test oscillator to 600 kc. Adjust oscillator magnetic core screw L9 (top of large oscillator coil can) for maximum (peak) output as shown by the waves on the oscillograph screen.

(g) Set receiver dial pointer to 1,500 kc. Tune test oscillator to 1,500 kc (1,500-3,100-kc range) and increase its output to produce a registration on the oscillograph screen. Carefully adjust the oscillator, detector, and antenna air-trimmers C16, C17, and C3, respectively, to produce maximum (peak) output as shown by the waves on the oscillograph screen. Shift the oscillograph modulator sweep-range switch to its "Lo" position and insert plug of the frequency-modulator cable in test-oscillator jack. Turn test-oscillator modulation switch to "Off". Re-tune the test oscillator (increase frequency) until the forward and reverse waves show on the oscillograph screen and become coincident at their highest points. This will occur at a test-oscillator setting of approximately 1,680 kc. Adjust trimmers C16, C17, and C3 again, setting each to the point which produces the best coincidence and maximum amplitude of the images.

(h) Remove the plug of the frequency-modulator cable from the test-oscillator jack. Turn test-oscillator modulation switch to "On". Set test-oscillator "Timing" switch to "Int.". Tune test oscillator to 200 kc (200-400-kc range). Tune receiver for maximum response to this signal at a dial reading of approximately 600 kc. The third harmonic of the 200-kc signal is used for this adjustment. Shift oscillograph "Timing" switch to "Ext.". Insert the plug of the frequency-modulator cable in test-oscillator jack. Turn test-oscillator modulation switch to "Off". Re-tune the test oscillator (increase frequency) until the forward and reverse waves show on the oscillograph screen. This will occur at a test-oscillator setting of approximately 230 kc. Disregarding the fact that the two images may or may not come together, adjust the oscillator magnetic core screw L9 (top of large oscillator coil can) to produce maximum (peak) amplitude of the images. Shift the oscillograph "Timing" switch to "Int.". Remove the plug of the frequency-modulator cable from the test-oscillator jack. Turn the test-oscillator modulation switch to "On". Repeat adjustments in (g) above to compensate for any changes caused by the adjustment of L9 core, tightening lock nuts on C16, C17, and C3, respectively after each is adjusted.

"Long Wave" Band

(i) Shift the oscillograph "Timing" switch to "Int.". Remove the plug of the frequency-modulator cable from the test-oscillator jack. Turn the test-oscillator modulation switch to "On". Place receiver range selector to its "Long wave" position. Set the receiver dial pointer to 175 kc. Tune the test oscillator to 175 kc and increase its output until a deflection is noticeable on the oscillograph screen. Adjust oscillator magnetic core screw L10 (located on top of small oscillator coil can) to that maximum (peak) amplitude of output is shown on the oscillograph screen.

(j) Set receiver dial pointer to 350 kc. Tune test oscillator to 350 kc. Adjust the oscillator detector, and antenna air-trimmers C18, C38, and

C6 to produce maximum (peak) output as shown by the waves on the oscillograph screen. Without disturbing the connections, shift the oscillograph "Timing" switch to "Ext.". Place the frequency-modulator sweep-range switch to its "Hi" position and insert plug of frequency-modulator cable in test-oscillator jack. Turn test-oscillator modulation switch to "Off". Re-tune the test oscillator (decrease frequency) until the forward and reverse waves show on the oscillograph screen and become coincident at their highest points. This will occur at a test-oscillator setting of approximately 198 kc. This setting places the test-oscillator frequency to 175 kc. The second harmonic is now used for the 350 kc adjustment. Adjust air-trimmers C18, C38, and C6, again, to produce maximum amplitude of the images and best coincidence throughout their lengths.

(k) Re-tune the receiver to approximately 175 kc so that the forward and reverse waves appear on the oscillograph screen. Adjust the oscillator magnetic core screw L10 to produce maximum (peak) amplitude of the waves, disregarding the fact that the two images may or may not come together.

(l) Shift the receiver dial setting to 350 kc without altering any other adjustments (frequency modulator still in operation). Adjust air-trimmers C18, C38, and C6, respectively, to produce maximum amplitude and best coincidence of the waves. These adjustments compensate for any changes caused by the adjustment of the magnetic core screw L10. Tighten lock nuts on C18, C38, and C6, respectively, after each is adjusted.

Dynamic Amplifier Adjustments

It is essential that correct voltages and currents exist at the RCA-6L7 audio expander stage in order that the expanding function may take place in the proper manner. A screw-driver adjustment is accordingly provided to regulate the RCA-6L7 control grid. No. 3 bias to the correct operating value. Two methods of adjustment are applicable. Either method requires a normal voltage of 300 volts across the filter output. The one to be preferred (a) requires the use of an RCA Stock No. 9633 Beat-Frequency Oscillator or the equivalent, a 100-ohm resistor, a 200-ohm resistor, and a 1,000-ohm-per-volt a.c. voltmeter (rectifier-type) having a "low" range of 1.0 volt and a "high" range of 240 volts or greater. The less accurate method (b) requires the use of an RCA Stock No. 12353 Split-Plate Adapter and a suitable d.c. milliammeter. Both of these procedures are outlined below. CAUTION: Before using either method, be sure that power-supply fuse is in proper position for the line voltage.

(a) Preferred Method

Turn power switch off. Connect the 200-ohm and the 100-ohm resistors in series between the beat-frequency oscillator terminals (upper "250" and "CT") with the 100-ohm resistor connected to "CT". Calibrate the beat-frequency oscillator, adjust it to 1,000 cycles, and reduce its output. Connect the 1,000-ohm-per-volt a.c. voltmeter (1-volt range) to the beat-frequency oscillator terminals (upper "250" and "CT"). Remove the male plug from the receptacle on the shielded cable running be-

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Alignment, Page 3
Notes, Oscillograms

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mechanism from the tone arm, and then remove the magnet assembly. Place the magnet assembly on the poles of a standard pickup magnetizer such as the RCA Stock No. 9549 Pickup Magnetizer and charging the magnet in accordance with the instructions accompanying the magnetizer. It is preferable to check the polarity of the pickup magnet and to remagnetize it so that the same polarity is maintained.

Automatic Record Ejector

The record changing mechanism is designed to be simple and fool-proof. Under normal operating conditions, service difficulties should be negligible. Occasionally, however, certain adjustments may be required. These adjustments are illustrated and explained in figure 13.

It is important when servicing the automatic mechanism, to have it placed on a level support. It is also important to refrain from forcing the mechanism if there is a tendency to bind or jam, since bent levers and possibly broken parts may result.

The tip of the record ejector is adjustable in relation to the turntable spindle, the two being coaxial when properly adjusted. To align the tip, remove the rubber silencer of the ejector assembly, loosen the ejector tip retaining nut and slide the tip assembly to the position where it is in true-line with the axis of the turntable spindle. This adjustment may be depressed by placing several records on the turntable, depressing the spindle through the top record hole and lining up the ejector tip in the spindle hole of the record.

To insure that the ejector tip rotates freely, apply a slight amount of oil to the shank of the tip at the point where it is in contact with the ball bearing.

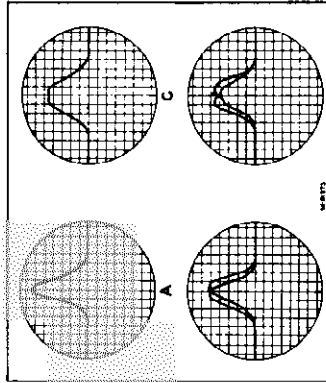


Figure 7-1-F Alignment Oscillogram Curves

- A—Correct curve showing proper i-f alignment as obtained with fidelity control counter-clockwise.
- B—Incorrect curve similar to A showing improper alignment of i-f system caused by one or more circuits being slightly detuned.
- C—Correct showing broadening of curve. A obtained when fidelity control is rotated fully clockwise.
- D—Incorrect curve showing broadening of curve B, obtained when fidelity control is rotated fully clockwise.

ing a small rod or nail into the armature needle hole using it as a lever to test the angular movement of the armature. The limitations of the movement in each direction will be caused by the armature striking the pole pieces. The proper adjustment is obtained when there is equal angular displacement of the armature and adjustment rod or nail to each side of the vertical axis of the magnet and coil assembly. The screws A and B should then be secured, observing care not to disturb the adjustment of the armature clamp. Then place the pickup in a vise and secure the centering spring-clamp by means of the screw C, allowing the centering spring to remain in the position at which the armature is exactly centered between the pole pieces. With a little practice, the correct adjustment of the armature may be readily obtained. The air gap between the pole pieces and the armature should be kept free from dust, filings, and other such foreign materials which would obstruct the movement of the pickup armature.

Damping Block

The viscoloid block which is attached to the back end of the armature shank serves as a mechanical filter to eliminate undesirable resonances and to cause the frequency response to be uniform. Should it be necessary to replace this damping block, it may be done by removing screw D and the cover support bracket from the mechanism and taking off the old viscoloid block. The surface of the armature which is in contact with the viscoloid should be thoroughly cleaned with fine emery cloth. Then insert the new block so that it occupies the same position at it did originally. Make certain that the block is in correct vertical alignment with the armature. The hole in the new viscoloid block is somewhat smaller than the diameter of the armature in order to permit a snug fit. With the viscoloid aligned on the armature, screw D and the cover support bracket should then be replaced. Heat should be applied to the armature (viscoloid side) so that the viscoloid block will fuse at the point of contact and become rigidly attached to the armature. A special-tip soldering iron connected as shown in figure 16 will be found very useful in performing this operation. The iron should be applied only long enough to slightly melt the block and cause a small bulge on both sides.

Resoldering Coil

Whenever there is defective operation due to an open or shorted pickup coil, this coil should be replaced. The method of replacement will be obvious upon inspection of the pickup assembly and by study of the cut-a-way illustrations. Make sure that the new coil is properly centered with the hole in the support strip and glued securely in that position. It is important to re-adjust the armature as previously explained after re-assembly of the mechanism. Only rosin core solder should be used for soldering the coil leads in the pickup. This same type of solder should be used when necessary for soldering the centering spring to the armature.

Magnetizing

Loss of magnetization will not usually occur when the pickup has received normal care because the magnet and pole pieces are one unit and the magnetic circuit remains practically closed at all times. When the pickup has been mishandled, subjected to a strong a-c field, jolted, or dropped, there may be an appreciable loss of magnetic strength, in which case it will be necessary to re-magnetize the entire structure. To do this, it will be necessary to first remove the pickup

cover may be cemented back in place with ambroid upon completion of adjustment.

Antenna and Ground Terminals

These receivers are equipped with an antenna-ground terminal board having three terminals. These terminals are marked "A2," "A1," and "G," the latter being the ground terminal and should always be connected to a good external ground. The transmission-line leads of the RCA RK-40A antenna system should be connected to terminals "A2" and "A1." The receiver coupling units of the RCA RK-40 and the RCA Spider-Web antenna systems should be connected to terminals "A1" and "G." Connect a single-wire antenna to terminal "A1."

Selector Dial

Figure 14 illustrates the relation of the various parts of the dial mechanism when in its "Standard broadcast" position with the range switch likewise turned to its "Standard broadcast" position. In re-assembling the dial after repairs, see that the gears are meshed in accordance with the diagram at the same time noting that the range switch is in its "Standard broadcast" position and the lever attached to the range switch shaft placed in the position shown.

To adjust the dial mechanism, set the range switch to its "Standard broadcast" position. Place a straight-edge across the center of the dial so that its edge is even with the lower (end) marking at both the low-frequency and high-frequency ends of the dial. Under such conditions the straight-edge should be parallel with the top of the chassis base. If the straight-edge is not parallel with the top of the chassis base, loosen the nut on the rear of the roller link pivot stud and move the stud up or down until the link roller moves the dial to the desired position so that the end calibration marks obtain the position mentioned above. Tighten the nut on the roller link pivot stud.

Set the gear tuning condenser to its maximum capacity position. Adjust the dial pointer to the low-frequency (end) mark on "Standard broadcast" scale. This is a friction adjustment.

With the gang tuning condenser plates still in full mesh, loosen the two set screws on the vernier-dial hub. Rotate the vernier dial until the "0" marking is in a vertical plane above the center of the shaft. Tighten set screws.

Magnetic Pickup

The pickup used in the phonograph unit is of an improved design. The horseshoe magnet is rigidly welded to the pole pieces and is irremovable. There is a centering spring attached to the armature to maintain proper adjustment and to provide a limiting effect on the movement of the armature. The frequency response is substantially uniform over a wide range. Service operations which may be necessary on the pickup are as follows.

Centering Armature

Refer to figure 15, showing the pickup inner structure. The armature is shown in its proper relation to the magnet pole pieces, i.e., exactly centered. Whenever this centering adjustment has been disturbed, the screws A, B, and C should be loosened and the armature clamp adjusted to the point where the vertical axis of the armature is at right angles to the horizontal axis of the pole pieces, and centered between them. This centering operation may be facilitated by insert-

between the input transformer T2 and the compensator pack (see figure 12). Connect beat-frequency oscillator terminal "CT" to the large pin on the male plug. Connect the junction of the 200-ohm and the 100-ohm resistors to the small pin on the male plug.

Adjust beat-frequency oscillator output until the voltmeter reads exactly 1.0 volt. Remove the voltmeter leads from beat-frequency oscillator terminals without disturbing any of the oscillator adjustments. Place the voltmeter to its 250-volt or greater range and connect it between the plate prongs of the two RCA-2A3 power-output tubes. Connections to the tube prongs may be made by stripping approximately 1/2 inch of insulation from the ends of two short leads of rubber-covered wire, wrapping one bare end around each plate prong (being careful not to allow the bare ends to short on the chassis when the tubes are placed in their sockets), and connecting the voltmeter to these leads. CAUTION: Do not touch these plate connections after the power is turned on since the potential at these points is rather high and carelessness might result in a serious shock.

Set the "Dynamic amplifier" and "Fidelity control" to their extreme counter-clockwise positions. Set the "Phonograph volume" control to its extreme clockwise position. Turn on the power switch and allow a few minutes for the instrument to become stabilized. Adjust the expander-bias control R46, on rear apron of amplifier (see figure 3), until the voltmeter reads 195 volts. Turn "Phonograph volume" control to extreme counter-clockwise position. Transfer lead from the junction of the 200-ohm and the 100-ohm resistors to the beat-frequency oscillator (upper "250V") terminal without disturbing any of the oscillator adjustments. Adjust "Phonograph volume" control until the voltmeter reads 50 volts. Turn the "Dynamic amplifier" control to its extreme clockwise position allowing maximum expansion to take place. The voltmeter should now read not less than 130 volts if the expander circuit is operating correctly. Failure to do so indicates a defect in the system and the usual service procedure should be followed.

(b) **Alternate Method**

Turn power switch off. Place RCA Stock No. 12353 Split-Plate Adapter under the RCA-6L7 audio-volume expander. Connect a suitable d-c milliammeter to the adapter. Turn both the "Phonograph volume" and the "Dynamic amplifier" controls to their extreme counter-clockwise positions. Turn on power switch and allow a few minutes for the instrument to become stabilized. Adjust expander bias control R46, on rear apron of amplifier (see figure 3), to give 1.0 milliamperes of plate current with no signal input; to the dynamic amplifier.

Loudspeaker

Centering of the loudspeaker voice coil is made in the usual manner with three narrow paper feelers after first removing the front paper dust cover. This may be removed by softening its cement with a very light application of acetone using care not to allow the acetone to flow down into the air gap. The dust

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Stock No.	Description	List Price	Stock No.	Description	List Price	Stock No.	Description	List Price
4427	Bracket—Volume control mounting bracket	\$0.18	12860	Switch—Low frequency tone and power	1.50	12883	Shield—Coil shield for Stock No. 12881.	20
12987	Bracket—Band changer cap switch bracket	.15	12988	Switch—Bias switch (S10)	.65	11198	Socket—Contact 6K7 Radiotron socket.	.20
12988	Cap—Grid contact cap—Package of 5	.30	13616	Tone control (R15)	1.40	11779	Socket—Contact 6L7 Radiotron socket.	.20
13511	Cap—Grid contact cap—Package of 5	.30	12991	Transformer—First intermediate frequency transformer (L24, L23, L40, C46, C47)	2.15	12007	Socket—Contact 6X4 Radiotron socket.	.20
12649	Capacitor—150 Mmfd. (C64)	.36	12990	Transformer—Second intermediate frequency transformer (L28, L29, C56)	1.85	12378	Switch—Range switch and mounting nut (S11, S2, S3)	.36
12650	Capacitor—150 Mmfd. (C65)	.36	12991	Transformer—Third intermediate frequency transformer (L28, L29, C60, C61, C62, R19, R20)	1.35	12466	Resistor—470,000 ohms—insulated, 1/4 watt	1.00
13138	Capacitor—0015 Mfd. (C61)	.30	12861	Volume Control (R18)	1.00	R(18, R19)	Resistor—Contact 5Z3 or 2A3 Radiotron socket	.15
4836	Capacitor—05 Mfd. (C64)	.32	MAGIC BRAIN UNIT ASSEMBLIES		11197	Socket—Contact 6C5 Radiotron socket.	.15	
4840	Capacitor—025 Mfd. (C63)	.32	Board—Contact antenna and ground terminal board	.25	11198	Socket—Contact 6B7 or 6L7 Radiotron socket	.14	
13610	Capacitor—8 Mfd. (C72)	1.00	Bushing—Variable condenser mounting	.45	12464	Transformer—Interstage transformer (T3, L35)	5.95	
5212	Capacitor—18 Mfd. (C74, C75)	1.16	Bushing assembly—Package of 3	.45	12465	Transformer—Power transformer, 10-115 volt, 30-60 cycle (T1)	8.58	
13611	Capacitor—25 Mfd. (C73)	.85	Capacitor—1/2 inch, 200 ohm, complex with 8 contact max plug	1.30	EJECT ARM ASSEMBLIES			
13612	Capacitor—50 Mfd. (C74)	1.20	Cap—Grid contact cap—Package of 5	.15	11541	Arm—Eject arm, complete	8.15	
13613	Capacitor—100 Mfd. (C75)	1.50	Capacitor—Adjustable trimmer capacitor	.38	11533	Ball—1/16 inch diameter steel ball—Package of 10	.30	
12906	Capacitor—27,000 ohms, one 22,000 ohms, one 12,000 ohms, one 3,000 ohms, one 1,000 ohms	.22	Capacitor—Adjustable trimmer capacitor (C10, C11, C12, C13, C14, C15)	.35	10129	Ball—1/16 inch diameter steel ball—Package of 20	.25	
13612	Filter Pack—Comprising two 453 Henry coils, two .560 Mmfd. capacitors	.75	Capacitor—15 Mmfd. (C14)	.30	11529	Bearing—Eject arm bearing and nut	.32	
12866	Post—Chassis lock assembly—Package of 1	.60	Capacitor—36 Mmfd. (C24)	.20	11538	Bracket—Eject arm bracket	1.72	
4240	Lamp—Pilot lamp—Package of 5	.45	Capacitor—56 Mmfd. (C24)	.20	11537	Coiler—Eject arm shaft collar and set	.34	
12868	Link—Link mechanism on band indicator operating arm	.45	Capacitor—56 Mmfd. (C17, C44)	.20	11540	Cover—Eject arm cover	.52	
13609	600 ohms, one 3,000 ohms, one 3,950 ohms, one 25 ohms and one 19 ohms	.95	Capacitor—10 Mmfd. (C18, C19)	.28	11536	Cushion—Counter balance roller cushion located inside of eject arm	.14	
12311	Resistor—1,000 ohms—insulated, 1/4 watt	1.00	Capacitor—18 Mmfd. (C1)	.28	4055	Post—Vertical adjustment post—located inside of eject arm	.30	
5112	Resistor—1,000 ohms—insulated, 1/4 watt	1.00	Capacitor—36 Mmfd. (C2)	.20	3729	Roller—Eject arm counter balance roller located inside of eject arm	.45	
5147	Resistor—3,000 ohms—carbon type, 1 watt	.22	Capacitor—56 Mmfd. (C3)	.20	4580	Screw—No. 6—3/32 x 6 inch square head set screw for eject arm collar—Package of 10	.35	
12312	Resistor—1,300 ohms—insulated, 1/4 watt	1.00	Capacitor—150 Mmfd. (C20)	.36	11534	Spring—No. 8—16 1/2 inch special screw for set arm w/ counter adjustment—Package of 10	.14	
5114	Resistor—3,000 ohms—carbon type, 1/10 watt (R19)	.22	Capacitor—300 Mmfd. (C20)	.40	11535	Shaft and collar assembly	.12	
11282	Resistor—35,000 ohms—carbon type, 1/10 watt (R19)	.75	Capacitor—400 Mmfd. (C20)	.40	4057	Spring—Eject arm bracket spring—Package of 10	.30	
11283	Resistor—220,000 ohms—carbon type, 1/10 watt (R19)	.75	Capacitor—50 Mmfd. (C21)	.20	11531	Spring—Ejector arm spring—Package of 10	.41	
11284	Resistor—100,000 ohms—carbon type, 1/10 watt (R19)	.75	Capacitor—50 Mmfd. (C22)	.20	11539	Yoke—Eject arm yoke assembly	.31	
11598	Resistor—220,000 ohms—carbon type, 1/10 watt (R19)	.75	Capacitor—50 Mmfd. (C23)	.20	PICKUP AND ARM ASSEMBLIES			
12013	Resistor—10 megohm—carbon type, 1/10 watt—located in tuning tube socket	1.00	Capacitor—10 Mmfd. (C24)	.20	11627	Arm—Pickup arm, complete less pickup	8.45	
12679	Resistor—10 megohm—carbon type, 1/10 watt—located in tuning tube socket	1.00	Capacitor—10 Mmfd. (C25)	.20	11548	Back—Pickup back	.35	
12874	Resistor—33 megohm—carbon type, 1/10 watt (R22, R23)	1.00	Capacitor—10 Mmfd. (C26)	.20	10941	Ball—Pickup arm pivot shaft ball bearing—Package of 20	.25	
12870	Shield—Intermediate frequency transformer	.65	Capacitor—10 Mmfd. (C27)	.20	12543	Bracket—Pickup arm operating, adjusting	.11	
12607	Shield—is or 2nd I.F. transformer shield top	.38	Capacitor—10 Mmfd. (C28)	.20	13629	Cable—Pickup arm operating cable—Package of 3	1.20	
12881	Shield—3rd I.F. transformer shield top	.36	Capacitor—10 Mmfd. (C29)	.20	12541	Coil—Pickup coil (L41)	.64	
11197	Socket—Contact 6C5 Radiotron socket	.14	Capacitor—10 Mmfd. (C30)	.20	13630	Connector—Shielded pickup cable and connector assembly approximately 43 inch length	.45	
11198	Socket—Contact 6K7 or 6L7 Radiotron socket	.14	Capacitor—10 Mmfd. (C31)	.20	11546	Cover—Pickup front cover	.32	
11395	Socket—Upper left or lower right-hand dial lamp socket	.15	Capacitor—10 Mmfd. (C32)	.20	12850	Damper—Damper assembly for pickup arm bushing, one lower bushing and one lower bearing	.25	
11222	Socket—Upper right or lower left-hand dial lamp socket	.15	Capacitor—10 Mmfd. (C33)	.20	11723	Electron—Pickup arm excitecathode	.62	
11181	Socket—Pickup tube socket and complete	.45	Capacitor—10 Mmfd. (C34)	.20	14115	Mechanism—Composing unit armature and one damper	7.00	
11196	Socket—8 contact R.F. tank voltage supply socket	.15	Capacitor—10 Mmfd. (C35)	.20	13628	Pickup—Pickup unit, complete	1.35	
12007	Spring—Reaming spring for core in I.F. transformer—Package of 10	.36	Capacitor—10 Mmfd. (C36)	.20	12546	Plug—Pivot shaft bearing plug—Package of 10	.14	
12886	Package of 2	.65	Capacitor—10 Mmfd. (C37)	.20	13631	Roll—Pickup arm tip rod and nut—Package of 10	.30	
			Capacitor—10 Mmfd. (C38)	.20	11549	Screw—Pickup front cover screw—Package of 10	.42	
			Capacitor—10 Mmfd. (C39)	.20	1387	Screw—Nut and washer for mounting pickup to arm—Package of 10	.50	

The prices quoted above are subject to change without notice.

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Parts, Page 2
Dial Change Mechanism

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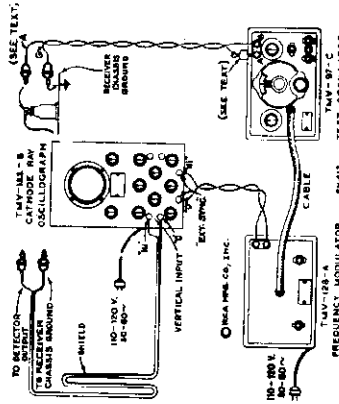


Figure 6—Alignment Apparatus Connections

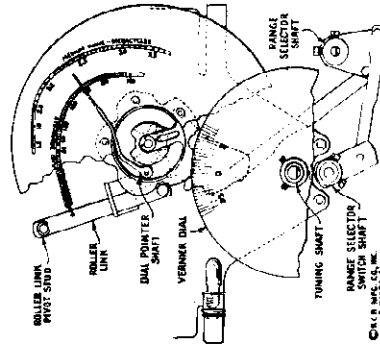
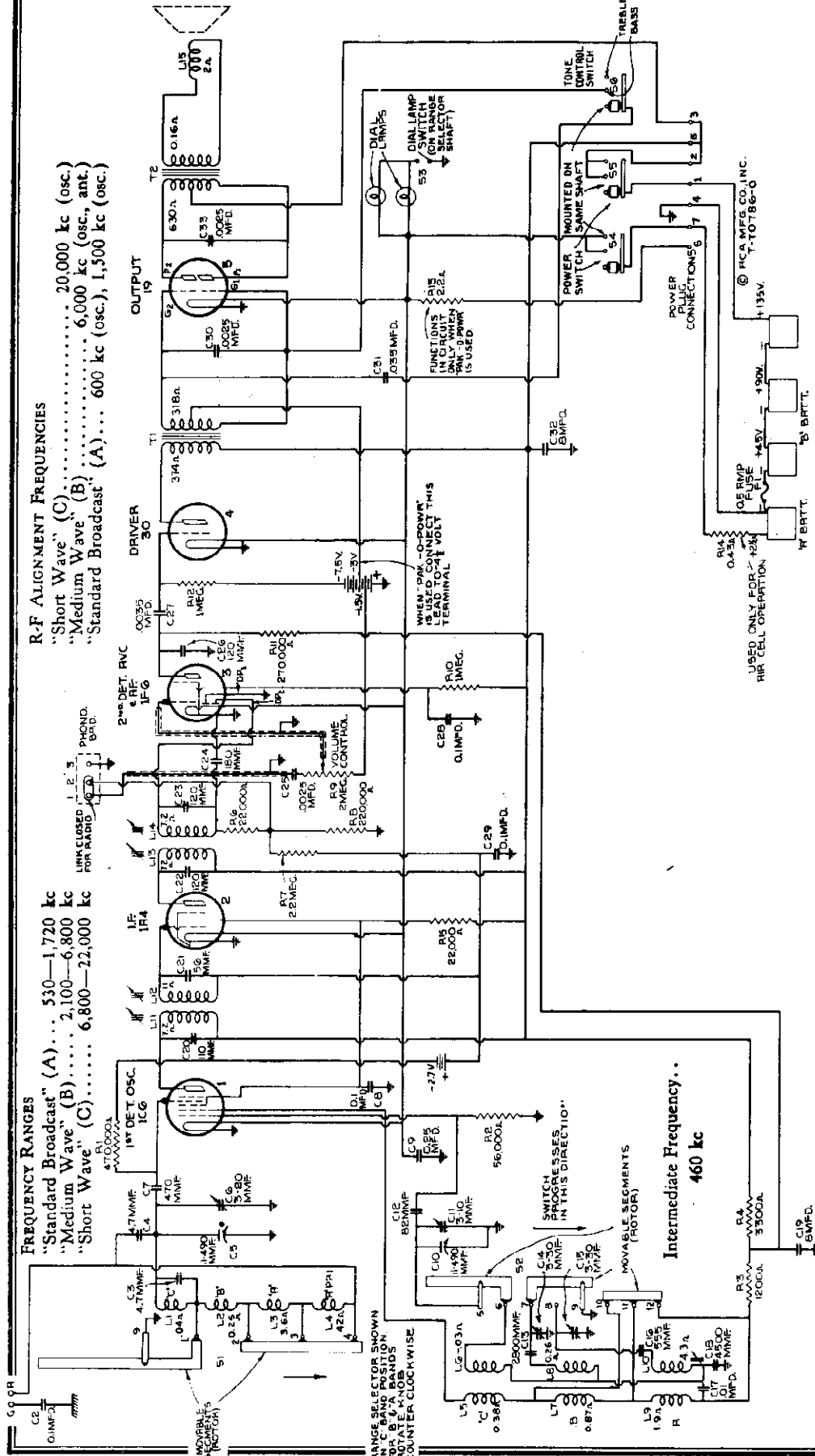


Figure 14—Selector Dial Change Mechanism

Stock No.	Description	List Price	Stock No.	Description	List Price	Stock No.	Description	List Price
12539	Screw—Pickup needle screw—Package of 10	.20	12491	Cable—2-conductor, shielded volume control cable, approximately 7 1/2" long, complete with 2 female connectors—connects amplifier to phonograph volume control	.68	12491	Cable—2-conductor, shielded volume control cable, approximately 7 1/2" long, complete with 2 female connectors—connects amplifier to phonograph volume control	.68
12544	Spring—Pickup arm adjusting spring—Package of 10	.25	13643	Cable—2-conductor, shielded volume control cable, approximately 3 7/8" long, complete with two 2-contact male connectors—connects phonograph volume control and expander control to amplifier	2.00	4674	Connector—2-contact, male connector for pilot lamp socket leads, compensator pack or input transformer cables	.25
13632	Cam—Cam and gear assembly	2.60	11488	Connector—2-contact, male connector for cable stock No. 13619, 13641, 13643, pilot lamp socket leads, compensator pack or input transformer cables	.14	4577	Connector—2-contact, male connector for cable stock No. 13624	.30
13538	Cover—Metal cover for trip lever and friction finger assembly	.36	12565	Connector—2-contact, female connector with oblong openings for cable stock No. 13626 or 13641	.20	4573	Connector—2-contact, female connector for cable stock No. 12490, 13645 or compensator pack cable	.18
6809	Finger—Manual index lever finger assembly	.32	12493	Connector—2-contact, female connector for cable stock No. 13624	.20	11570	Connector—2-contact, female connector for cable stock No. 13624	.32
13670	Finger—Manual index lever—fits pin	.12	12494	Connector—2-contact, female connector for cable stock No. 13624	.20	11971	Connector—2-contact, female connector for cable stock No. 13624	.35
13633	Lever—Manual spring lever	.17	12495	Connector—2-contact, female connector for cable stock No. 13624	.20	5211	Bolt—Speaker mounting bolt assembly—Package of 10	.24
13537	Lever—Trip lever and friction clutch assembly	.42	12496	Connector—2-contact, female connector for cable stock No. 13624	.20	4391	Bolt—1/2" x 1/4" hex head bolt	.70
11535	Pawl—Trip pawl assembly	.94	12497	Connector—2-contact, female connector for cable stock No. 13624	.20	13615	Bracket—Tuning lamp mounting bracket and clamp	.25
6501	Pawl—Trip pawl assembly	.30	12498	Connector—2-contact, female connector for cable stock No. 13624	.20	13103	Cap—Pilot lamp cap and bulb—Package of 5	.65
13635	Plate—First arm actuating plate assembly	.75	12499	Connector—2-contact, female connector for cable stock No. 13624	.20	12540	Cap—Pilot lamp cap and bulb—Package of 5	.65
4584	Plate—Manual index lever finger set screw	.25	12500	Connector—2-contact, female connector for cable stock No. 13624	.20	12915	Crystal—Station selector escutcheon and cover—Pilot lamp cover	3.74
4039	Screw—Top lever, clutch, tension adjuster—Special screws used to fasten main lever and link assembly building—Package of 10	.22	12501	Connector—2-contact, female connector for cable stock No. 13624	.20	11580	Escutcheon—Tuning lamp escutcheon	1.30
4586	Screw—Special screws used to fasten main lever and link assembly building—Package of 10	.30	12502	Connector—2-contact, female connector for cable stock No. 13624	.20	12742	Escutcheon—Tuning lamp escutcheon	1.12
13637	Spacer—Pickup arm mounting spacer	.60	12503	Connector—2-contact, female connector for cable stock No. 13624	.20	12552	Expander Control (R33)	1.06
13638	Spring—Main spring—Package of 10	.40	12504	Connector—2-contact, female connector for cable stock No. 13624	.20	4949	Lamp—Pilot lamp—6.3 volt—Package of 5	1.66
4825	Spring—Main spring—Package of 10	.40	12505	Connector—2-contact, female connector for cable stock No. 13624	.20	12599	Knob—Small vernier station selector knob—Package of 5	.68
4061	Spring—Main spring lever tension spring—Package of 10	.38	12506	Connector—2-contact, female connector for cable stock No. 13624	.20	11347	Knob—Low frequency tone control and volume control knob—Package of 5	.58
2893	Spring—Trip lever latch plate tension spring—Package of 10	.30	12507	Connector—2-contact, female connector for cable stock No. 13624	.20	11582	Knob—Phonograph volume control or expander control knob—Package of 5	.75
13641	Spring—Pickup arm cable tension spring—Package of 10	.35	12508	Connector—2-contact, female connector for cable stock No. 13624	.20	11829	Roller—Record pocket slide roller—Package of 5	.55
3676	Spring—Cam and gear pawl tension spring—Package of 10	.52	12509	Connector—2-contact, female connector for cable stock No. 13624	.20	4560	Screw—Chassis mounting screw assembly (front) and one lock washer—Package of 10	.30
13639	Spring—Eject arm tension spring—Package of 10	.42	12510	Connector—2-contact, female connector for cable stock No. 13624	.20	13102	Screw—Chassis mounting screw assembly (bottom) comprising one screw, two washers, one spacer, one washer and one lock washer—Package of 2	.30
4125	Spring—Eject arm horizontal tension spring—Package of 10	.42	12511	Connector—2-contact, female connector for cable stock No. 13624	.20	11573	Socket—Pilot lamp socket—Package of 2	.28
13636	Stud—Pickup arm lift cable stud and nut—Package of 10	.40	12512	Connector—2-contact, female connector for cable stock No. 13624	.20	11349	Spring—Retaining spring for knob, Stock Nos. 11347, 11581 and 12700—Package of 5	6.00
2917	Washer—Cable stud washer—U" type—Package of 10	.25	12513	Connector—2-contact, female connector for cable stock No. 13624	.20	4982	Spring—Retaining spring for knob, Stock Nos. 11347, 11581 and 12700—Package of 5	.25
9735	MOTOR ASSEMBLIES		12514	Connector—2-contact, female connector for cable stock No. 13624	.20	12554	Transformer—Phonograph volume control (R36)	1.52
9631	Motor—105-125 volts—25 cycles (M1)	49.50	12515	Connector—2-contact, female connector for cable stock No. 13624	.20	12555	Transformer—Phonograph volume control (R36)	1.00
9630	Motor—105-125 volts—50 cycles (M1)	33.35	12516	Connector—2-contact, female connector for cable stock No. 13624	.20	7217	Transformer—Step-down transformer for 220 volt, 50-60 cycle operation	17.40
12030	Suspension Spring—Motor mounting	34.35	12517	Connector—2-contact, female connector for cable stock No. 13624	.20	12554	Volume Control—Phonograph volume control (R36)	1.52
	Comprising six washers, six cup washers, three spring washers and three studs	.60	12518	Connector—2-contact, female connector for cable stock No. 13624	.20			
	AUTOMATIC SWITCH ASSEMBLIES							
3984	Cover—Motor switch cover	.26						
10184	Plate—Automatic brake latch plate—Package of 5	.40						
10174	Spring—Automatic brake spring—Package of 5	.50						
6605	Switch Assembly—Automatic switch, complete	1.90						
3322	Switch—Motor switch (S9)	.75						
11881	Base—Phonograph compartment lamp socket and lid	.55						
12031	Capacitor—Mfd. capacitor with 2-conductor male connector for use with motor	4.18						
13101	Capacitor—Mfd. capacitor with 2-conductor male connector for use with motor	5.05						
4674	Connector—2-contact, male connector for pilot lamp leads	.25						
4577	Connector—2-contact, male connector for pilot lamp leads	.30						
11488	Connector—2-contact, female connector for pilot lamp leads	.14						
11542	Cover—Turntable cover	.88						
11553	Escutcheon—Index escutcheons engraved with 10, 12, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100	.44						
4340	Lamp—Phonograph	.60						

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MODELS 85BK, 85BT Schematic



R-F ALIGNMENT FREQUENCIES
 "Short Wave" (C) 20,000 kc (osc.)
 "Medium Wave" (B) 6,000 kc (osc., ant.)
 "Standard Broadcast" (A) ... 600 kc (osc.), 1,500 kc (osc.)

FREQUENCY RANGES
 "Standard Broadcast" (A) ... 530—1,720 kc
 "Medium Wave" (B) 2,100—6,800 kc
 "Short Wave" (C) 6,800—22,000 kc

- Pilot Lamps (2)** Mazda 2.0 volts, .06 ampere
- BATTERIES REQUIRED**
 "A," one plug-in, 2 1/2-volt Air Cell, or one 2-volt storage battery; "B," three 45-volt, heavy-duty, plug-in type B batteries; "C," one 7 1/2-volt C battery tapped at —1 1/2, —3, and —4 1/2 volts, and three bias cells (Stock No. 12681).
- CURRENT CONSUMPTION**
 "A" at 2 volts (pilot lamps off) 0.56 ampere
 "A" at 2 volts (pilot lamps on) 0.68 ampere
 "B" at 135 volts 19 milliamperes
 Fuse Rating 1/2 ampere
- POWER OUTPUT**
 Undistorted 1.2 watts
 Maximum 2.2 watts
- LOUDSPEAKER**
 Type Permanent-Magnet Dynamic
 Voice Coil Impedance 2.2 ohms at 400 cycles

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Calibrate the tuning dial by adjusting main dial pointer to the low-frequency (end) calibration mark on dial with the gang tuning-condenser plates in full-mesh position; then adjust the small (vernier) pointer to "O." These are friction adjustments.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 4.

Cathode-ray alignment is highly preferable; the connections to the chassis are shown on figure 3. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position. Connect the "low" output terminal of the test oscillator to

the receiver "G" (ground) terminal for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

Order of Alignment	Test Oscillator			Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting				
1	1A4 I-F Grid Cap	.001 Mfd.	460 kc	No Signal 550-750 kc	2nd I-F Trans.	L13 & L14	Max. (peak)
2	1C6 Det. Grid Cap	.001 Mfd.	460 kc	No Signal 550-750 kc	1st I-F Trans.	L11 & L12	Max. (peak)
3	Ant. Term.	300 Ohms	20,000 kc	20,000 kc	"C" Osc.	C11	Max. (peak)*‡
4	Ant. Term.	300 Ohms	6,000 kc	6,000 kc	"B" Osc.	C14	Max. (peak)*
5	Ant. Term.	300 Ohms	6,000 kc	6,000 kc	"B" Ant.	C6	Max. (peak)
6	Ant. Term.	200 Mmfd.	600 kc	600 kc	"A" L-F Osc.	L10	Max. (peak)
7	Ant. Term.	200 Mmfd.	1,500 kc	1,500 kc	"A" H-F Osc.	C15	Max. (peak)
8	Ant. Term.	200 Mmfd.	600 kc	Rock thru 600 kc	"A" L-F Osc.	L10	Max. (peak)
9	Ant. Term.	200 Mmfd.	1,500 kc	Rock thru 1,500 kc	"A" H-F Osc.	C15	Max. (peak)

* Use minimum capacity peak if two peaks can be obtained.

‡ After this adjustment, check for image signal by shifting receiver dial to 19,080 kc.

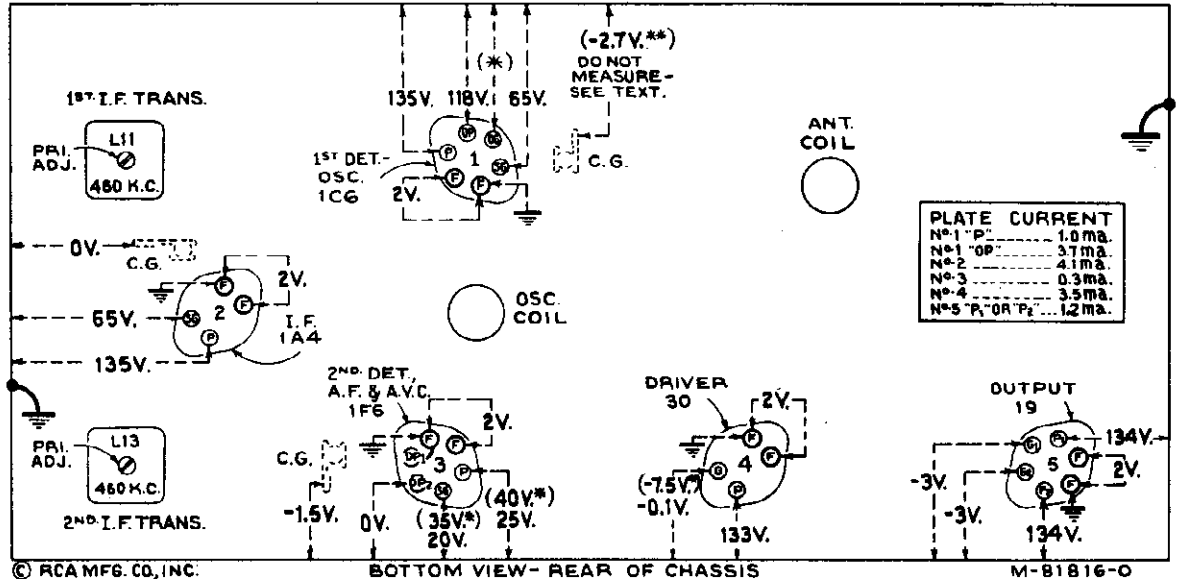


Figure 4—Radiotron Socket Voltages, Coil, and Trimmer Locations

Measured with all batteries at normal voltage—Tuned to approximately 1,000 kc—

No signal being received—Volume control minimum

**CAUTION: Do not attempt to measure voltage on control grid of the 1C6 with any conventional voltmeter due to presence of bias cells.

Note: Two voltage values are shown for some readings. The higher value shown in parenthesis with as-

terisk (*) indicates operating conditions without voltmeter loading. The lower value is the actual measured voltage and differs from the higher value because of the additional loading of the voltmeter through the high series circuit resistance.

Precautionary Lead Dress.—(1) Twisted leads from filament switch to power plug must be dressed against bottom of end shield and fastened with tape. (2) Keep leads of C18 as short as possible. (3) Lead from L1 to C5-C6 should be 3/4 inches long. (4) Lead from L1-L2 to range switch should be 1 1/8 inches long. (5) Keep lead from range switch to C10-C11 as short as possible. (6) Keep lead from range switch to L6 as short as possible. (7) Yellow lead from 2nd i.f. transformer to phonograph terminal board must be dressed away from other wiring.

Phonograph Attachment.—A terminal board is provided for connecting a phonograph into the audio amplifying circuit. RCA Victor Model R-93-S Record Player should be connected as follows: Remove link between terminals 1 and 2 on terminal board. Connect green wire in Radio-Record switch cable to terminal 1, yellow to terminal 2, and shield extension to terminal 3. Tape unused red and blue leads separately. Connect a 2-conductor twisted cable between the Record Player binding posts and the screw terminals on Radio-Record switch.

Bias Cells.—Three bias cells are used only for the purpose of supplying bias potential to the 1C6 first-detector-oscillator tube. These cells should never be measured with an ordinary voltmeter or other device which draws any current. A simple check on these cells may be made by connecting a milliammeter in the plate circuit of the 1C6 tube and noting the plate current reading. Then carefully remove the cells and substitute a battery potential of 2.7 volts in their place and note the new reading on the milliammeter. If the first reading obtained (with bias cells) is more than 40% from the latter reading (with 2.7-volt battery), the bias cells should be replaced. This 40% difference is equivalent to a change of approximately 25% battery voltage.

Operation With CV-8 Pak-O-Powr.—These receivers may readily be operated from an RCA CV-8 Pak-O-Powr, in which case, a six-volt storage battery replaces the "A" and "B" batteries listed under "Batteries required." When using the CV-8, one cell (2 volts) of the storage battery supplies filament voltage to the tubes, while the other two cells (4 volts) supplies power for the CV-8. When installing, the seven prong CV-8 receptacle plugs into the seven prong plug on the rear apron of the receiver chassis and the four battery leads clip on terminals of the storage battery as follows: Red to +6 V.; Blue to +4 V.; Yellow to +4 V.; and brown (fused lead) to -V. The two four-volt leads (Blue and Yellow) should make separate connections to the same battery strap to avoid vibrator buzz which might otherwise result if these two leads are joined together or touch each other. Observe extreme care that proper connections are made to the battery, as a wrong connection will burn out the tubes. The green lead (originally connected to -3 v. on the "C" battery) should be shifted to the -4.5 volt tap. The other "C" battery connections remain unchanged.

The following changes under "Electrical specifications" become effective when employing the CV-8; "A" battery current drain at 6 volts, 1.65 amperes. Fuse rating, 5 amperes. Undistorted output, 1.3 watts. Maximum output, 1.8 watts. Under "Service data," the following voltages apply to the RCA-19 power-output tube. Either plate to chassis, 180 volts. Either grid to chassis, -4 1/2 volts. Plate current (either plate), 1.6 ma.

When servicing, the CV-8 chassis should be insulated from the receiver chassis to avoid vibrator buzz.

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
RECEIVER ASSEMBLIES			
14388	Belt—Variable condenser drive belt	5029	Resistor—55,000 ohms, carbon type, 1/2 watt (R2)
13216	Board—Antenna and ground terminal board	11368	Resistor—250,000 ohms, carbon type, 1/10 watt (R8)
12717	Board—Phonograph terminal board	11453	Resistor—270,000 ohms, carbon type, 1/10 watt (R11)
14338	Bushing—Variable condenser mounting bushing and screw assembly	14482	Resistor—470,000 ohms, carbon type, 1/10 watt (R1)
12607	Cap—First I.F. transformer shield top	12200	Resistor—1 megohm, insulated, 1/2 watt (R12)
12581	Cap—Second I.F. transformer shield top	13730	Resistor—1 megohm, carbon type, 1/2 watt (R10)
12118	Cap—Grid contact cap	12679	Resistor—2.2 megohm, insulated, 1/2 watt (R7)
14383	Capacitor—Adjustable dual trimmer (C14, C15)	14408	Resistor—2.2 ohms, flexible type, 3 watts (R13)
14395	Capacitor—4.7 Mmfd. (C3, C4)	14350	Screw—No. 8-32x3/16 square head set screw for gear Stock No. 30085 and drum Stock No. 14345
12829	Capacitor—56 Mmfd. (C21)	14374	Shield—Antenna coil shield
12813	Capacitor—82 Mmfd. (C12)	13311	Shield—Chassis end shield and rubber mounting foot assembly
14282	Capacitor—110 Mmfd. (C20)	12008	Shield—I.F. transformer shield
12404	Capacitor—120 Mmfd. (C22, C23)	14375	Shield—Oscillator coil shield
12724	Capacitor—120 Mmfd. (C26)	3682	Shield—Radiotron shield
12406	Capacitor—180 Mmfd. (C24)	14171	Socket—Dial lamp socket
13052	Capacitor—470 Mmfd. (C7)	4794	Socket—4-contact 1A4 or 30 Radiotron socket
12727	Capacitor—555 Mmfd. (C8)	4788	Socket—6-contact 1C6, 1F6 or 19 Radiotron socket
14407	Capacitor—2,800 Mmfd. (C13)	12007	Spring—Retaining spring for core Stock No. 12006
12728	Capacitor—4,500 Mmfd. (C18)	12907	Spring—Tension spring for indicator drive gear Stock No. 30085
5107	Capacitor—0.025 Mfd. (C25, C30, C33)	14342	Spring—Tension spring for idler Stock No. 14341
50005	Capacitor—0.035 Mfd. (C27)	14402	Switch—Range switch (S1, S2)
13138	Capacitor—81 Mfd. (C17)	14401	Switch—Tone control switch and power switch (S3, S4, S5, S6)
51198	Capacitor—0.035 Mfd. (C31)	12803	Transformer—Audio transformer pack (T1, T2)
4841	Capacitor—0.1 Mfd. (C2, C8, C28, C29)	14261	Transformer—First I.F. transformer (L11, L12, C20, C21)
4840	Capacitor—0.25 Mfd. (C9)	14283	Transformer—Second I.F. transformer (L13, L14, C22, C23, C24, R8, R8)
5170	Capacitor—0.25 Mfd. (C25, C30, C33)	14400	Volume Control (R9)
14403	Capacitor Pack—Comprising two sections each 8 Mfd. (C19, C32)	14379	Washer—Felt washer for indicator pointer
12681	Cell—Bias cell	REPRODUCER ASSEMBLIES (RL-73-1)	
14372	Coil—Antenna coil and shield (L1, L2, L3, L4)	12642	Cone—Reproducer cone and dust cap (L15)
14373	Coil—Oscillator coil and shield (L5, L6, L7, L8, L9, L10)	5118	Plug—3-contact male connector for reproducer
14397	Condenser—2-gang variable condenser (C5, C6, C10, C11)	9712	Reproducer complete
5119	Connector—3-contact female connector for reproducer cable	MISCELLANEOUS ASSEMBLIES	
12800	Core—Adjustable core and stud assembly for coil Stock No. 14373	4288	Body—Fuse holder female body
12006	Core—Adjustable core and stud for I.F. transformer	4286	Bushing—Fuse holder bushing and ferrule
14399	Dial—Station selector dial scale	14408	Cable—Battery cable complete with fuse, fuse holder, one 7-contact female connector, three 2-contact male connectors and two battery clips
14398	Drive—Variable condenser vernier drive pinion gear and shaft	4288	Cap—Fuse holder male cap
14345	Drum—Variable condenser drive belt drum complete with set screws	12829	Clip—Battery clips, one marked "+" and one unmarked
30085	Gear—Indicator drive gear and hub assembly and pointer stem and gear assembly	12827	Connector—2-contact male connector for battery cable
14405	Holder—Bias cell holder	14409	Connector—7-contact connector for battery cable
14341	Idler—Station selector drive belt idler	14396	Escutcheon—Station selector escutcheon and crystal
14344	Indicator—Station selector indicator pointer	3748	Fuse—1/2 ampere (F1)
14382	Indicator—Vernier indicator pointer	4290	Insulator—Fuse holder insulating sleeve
4348	Lamp—Dial lamp	14359	Knob—Station selector knob
14404	Plug—7-contact male plug located on rear apron of chassis for battery cable	14269	Knob—Volume control, tone control or range switch knob
14340	Pulley—Station selector drive belt pulley and knob shaft	14410	Resistor—0.43 ohms, flexible resistor, 1/2 watt complete with clip (R14)
14361	Reflector—Dial reflector and lamp bracket assembly	11210	Screw—Chassis mounting screw and washer assembly—for Model 85BK
14343	Retainer—Drive shaft and pulley retainer—holds tuning knob shaft and pulley on range switch shaft	11377	Screw—Chassis mounting screw and washer assembly—for Model 85BT
11283	Resistor—1,200 ohms, carbon type, 1/2 watt (R3)	4284	Spring—Fuse holder tension spring
13737	Resistor—3,300 ohms, carbon type, 1/2 watt (R4)	4282	Spring—Retaining spring for knob Stock No. 14359
14284	Resistor—22,000 ohms, carbon type, 1/10 watt (R6)	14270	Spring—Retaining spring for knob Stock No. 14269
11305	Resistor—22,000 ohms, insulated, 1/2 watt (R5)	4285	Washer—Fuse holder insulating washer

RCA MFG. CO., INC.

MODEL 85T
Schematic
Chassis Wiring

MODEL 85T

Five-Tube, Single-Band, A-C, Superheterodyne Receiver

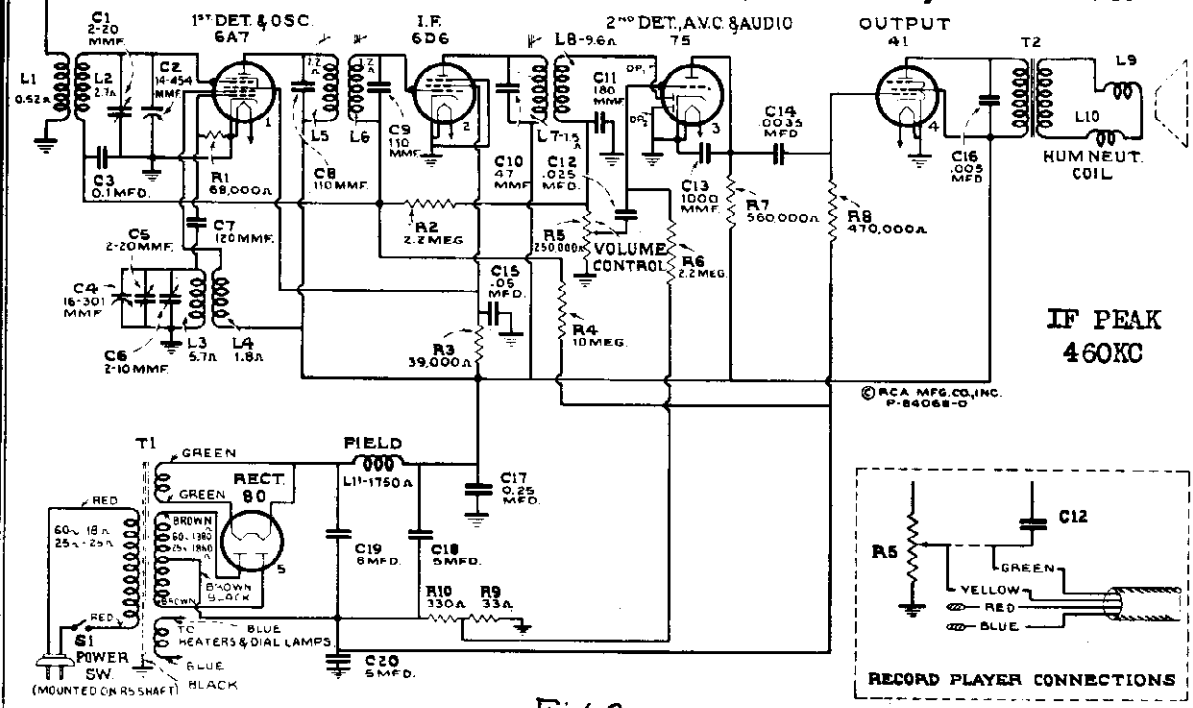


Fig. 2.

Electrodynamic
Type
Voice Coil Impedance { (84011-3) 3.1-
 (84011-6) 2.7- }

LOUDSPEAKER
Type
Power Output Rating
Undistorted ... 1.0 watts
Maximum ... 2.5 watts

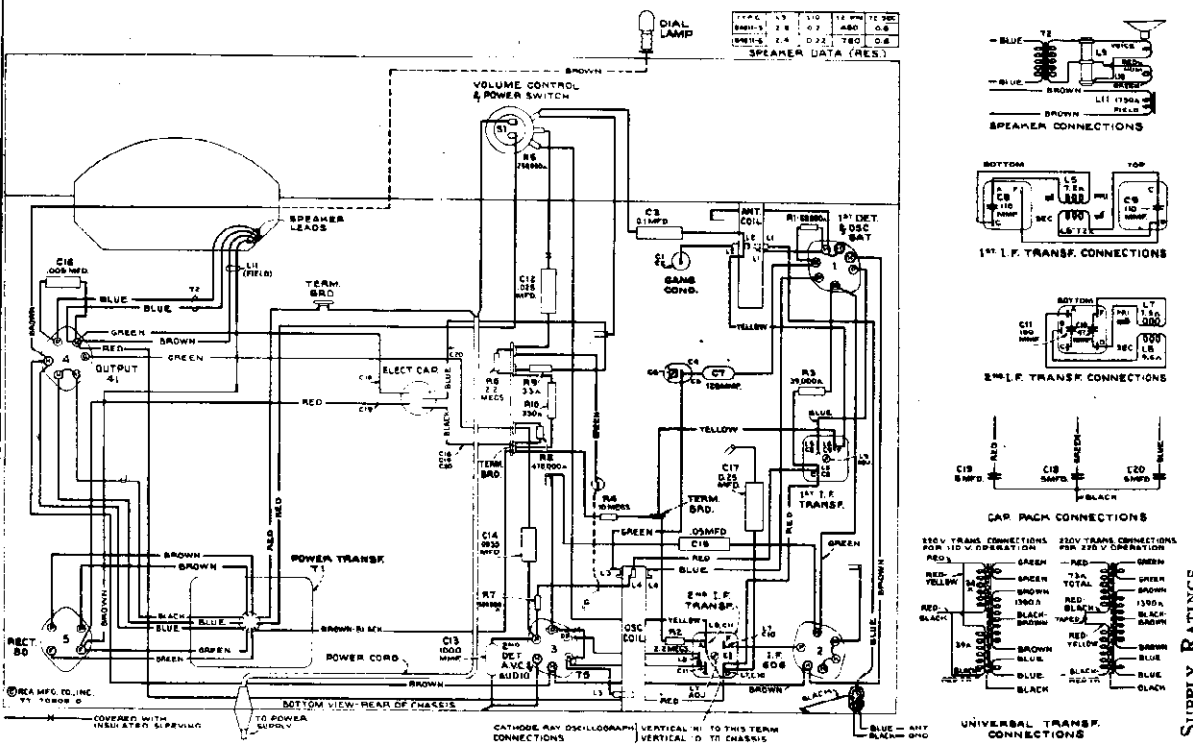


Figure 3—Chassis Wiring Diagram

Frequency Range 530—1,720 kc R-F Alignment Frequency 1,500 kc (osc., ant.)
Intermediate Frequency 460 kc

MODEL 85T
Alignment, Voltage
Socket, Trimmers

RCA MFG. CO., INC.

Alignment Procedure

Calibrate the tuning dial by adjusting dial pointer to the center horizontal line with the gang tuning-condenser plates in full-mesh position. This is a screw-driver adjustment.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 4.

Cathode-ray alignment is preferable; the connections to the chassis are shown on figure 3. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to the receiver chassis for all alignment operations. Regulate

the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

Order of Alignment	Test Oscillator			Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting				
1	6D6 Grid Cap	.001 Mfd.	460 kc	No Signal 550-750 kc	2nd I-F Trans.	L7	Max. (peak)
2	6A7 Grid Cap	.001 Mfd.	460 kc	No Signal 550-750 kc	1st I-F Trans.	L5 and L6	Max. (peak)
3	Ant. Lead (blue)	200 Mmfd.	1,500 kc	1,500 kc	"A" Osc.	C5*	Max. (peak)
4	Ant. Lead (blue)	200 Mmfd.	1,500 kc	1,500 kc	"A" Ant.	C1	Max. (peak)

* Tighten capacitor C6 on bottom of gang (under chassis) for maximum capacity before adjusting C5.

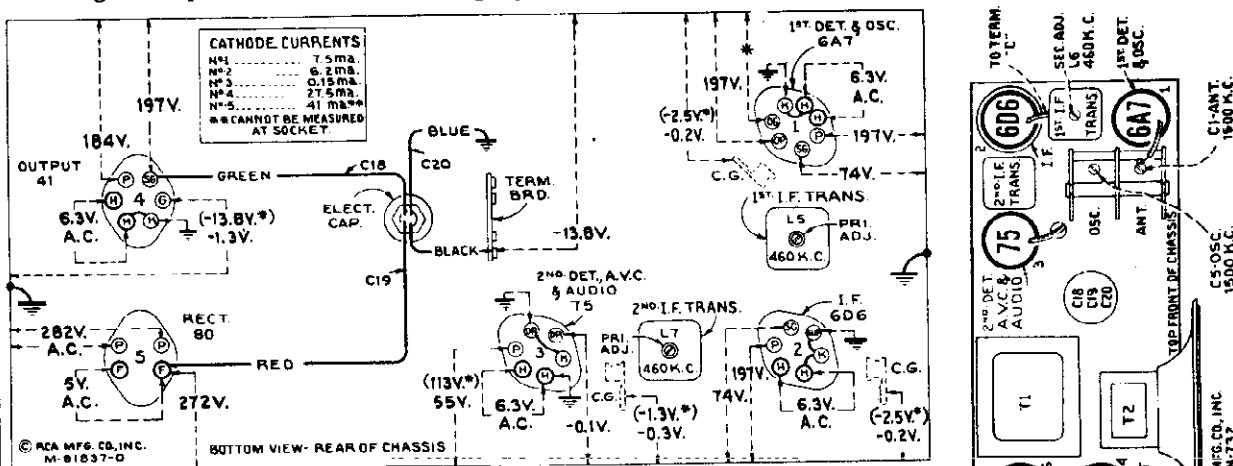


Figure 1—Radiotron, Coil, and Trimmer Locations

Figure 4—Radiotron Socket Voltages, Coil, and Trimmer Locations
 Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc ("Broadcast")—
 No signal being received—Volume control minimum

Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.

Voltage values as specified should hold within $\pm 20\%$ when the receiver is normally operative at its rated line voltage. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250, and 500 volts. Use the nearest range above the specified measured voltage. A-c voltages were measured with a corresponding a-c meter.

RCA MFG. CO., INC.

General Description

This receiver employs a superheterodyne circuit, the arrangement of which is shown on figure 2. Its design includes magnetite-core adjusted i-f transformers; automatic volume control; resistance-coupled audio system; and a 5-inch, electrodynamic loudspeaker.

RADIOTRON COMPLEMENT

- (1) RCA-6A7 First Detector—Oscillator
- (2) RCA-6D6 Intermediate Amplifier
- (3) RCA-75 Second Det., A-F Amp. and A.V.C.
- (4) RCA-41 Audio Power Amplifier
- (5) RCA-80 Full-Wave Rectifier

Service Data

The various diagrams of this booklet contain such information as will be needed to isolate causes for defective operation if such develops. The ratings of the resistors, capacitors, coils, etc., are indicated adjacent to the symbols signifying these parts on the diagrams. Identification titles such as

R1, L1, C1, etc., provide reference between the illustrations and Replacement Parts List. The coils, transformer windings, and reactors are rated in terms of d-c resistance to permit continuity checks.

Precautionary Lead Dress—(1) The green RCA-75 grid cap lead should be twisted with the yellow lead to the volume control to maintain proper position for prevention of hum pickup. (2) The green lead from oscillator coil L3 to tuning condenser C4 should be kept free from chassis. (3) Keep power cord and red primary leads of power transformer away from the green RCA-41 grid lead to prevent hum pickup. (4) Red lead from electrolytic capacitor C19 to RCA-80 socket should be dressed between power transformer and chassis apron to prevent hum pickup.

Phonograph Attachment—See Schematic Circuit Diagram, figure 2.

Loudspeaker—Centering of the loudspeaker voice coil is made in the usual manner with three narrow paper feelers.

REPLACEMENT PARTS

Insist on genuine factory tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
RECEIVER ASSEMBLIES			
14663	Belt—Variable condenser drive belt	14638	Shaft—Station selector knob shaft and pulley
14632	Bracket—Dial mounting bracket	12008	Shield—First I. F. transformer shield
12118	Cap—Grid contact cap	12408	Shield—Second I. F. transformer shield
12405	Capacitor—47 Mmfd. (C10)	11265	Shield—Radiotron shield
14262	Capacitor—110 Mmfd. (C8, C9)	14658	Socket—Dial lamp socket
12724	Capacitor—120 Mmfd. (C7)	4794	Socket—4-contact 80 Radiotron socket
12406	Capacitor—180 Mmfd. (C11)	4766	Socket—6-contact 6D6, 41 or 75 Radiotron socket
12635	Capacitor—1,000 Mmfd. (C13)	4787	Socket—7-contact 6A7 Radiotron socket
5006	Capacitor—0.035 Mfd. (C14)	14637	Spring—Idler pulley tension spring
4838	Capacitor—0.05 Mfd. (C16)	12007	Spring—Retaining spring for core, Stock No. 12006
4870	Capacitor—0.025 Mfd. (C12)	14376	Transformer—First I. F. transformer (L5, L6, C8, C9)
4886	Capacitor—.05 Mfd. (C15)	14642	Transformer—Second I. F. transformer (L7, L8, C10, C11)
4841	Capacitor—0.1 Mfd. (C3)	14666	Transformer—Power transformer, 105-125 volts, 50-60 cycle (T1)
12484	Capacitor—0.25 Mfd. (C17)	14667	Transformer—Power transformer, 105-125 volts, 25-60 cycle (T1)
14669	Capacitor Pack—Comprising one 8-Mfd. and two 5-Mfd. sections (C18, C19, C20)	14668	Transformer—Power transformer, 100-125/200-250 volts, 50-60 cycle (T1)
14670	Coil—Antenna coil (L1, L2)	14645	Volume Control and power switch (R5, S1)
14257	Coil—Oscillator coil (L3, L4)	REPRODUCER ASSEMBLIES	
14662	Condenser—2-gang variable condenser (C1, C2, C4, C5, C6)	14676	Cone—Reproducer cone (L9) for speaker marked 84011-3
12006	Core—Adjustable core and stud for I. F. transformer	14939	Cone—Reproducer cone (L9) for speaker marked 84011-6
14665	Dial—Station selector dial	14675	Reproducer complete (84011-3)
14635	Indicator—Station selector indicator pointer	14677	Transformer—Output transformer (T2) for speaker marked 84011-3
5226	Lamp—Dial lamp	14940	Transformer—Output transformer (T2) for speaker marked 84011-6
14636	Pulley—Idler pulley—less spring	MISCELLANEOUS ASSEMBLIES	
14664	Pulley—Variable condenser drive pulley—located on condenser shaft	14654	Escutcheon—Station selector escutcheon and crystal
14671	Resistor—33 Ohms—Carbon type, ½ watt (R9)	12673	Knob—Station selector or volume control knob
11670	Resistor—330 Ohms—Carbon type, 1 watt (R10)	14267	Screw—Chassis mounting screw and washer
8067	Resistor—39,000 Ohms—Carbon type, ½ watt (R3)	4119	Screw—No. 8-32 x ¼ headless set screw for knob, Stock No. 12673
12333	Resistor—68,000 Ohms—Carbon type, ½ watt (R1)		
11172	Resistor—470,000 Ohms—Carbon type, ½ watt (R5)		
5035	Resistor—580,000 Ohms—Carbon type, ½ watt (R7)		
11626	Resistor—2.2 Megohm—Carbon type, ½ watt (R2, R6)		
13732	Resistor—10 Megohm—Carbon type, ½ watt (R4)		
5129	Ring—Radiotron shield ring		
4389	Screw—No. 6—32x3/16 headless set screw for pulley, Stock No. 14639		

MODEL 85T1
Notes, Parts

RCA MFG. CO., INC.

General Description

This receiver employs a superheterodyne circuit, the arrangement of which is shown on figure 2. Its design includes magnetite-core adjusted i-f transformers; automatic volume control; resistance-coupled audio system; and a 5-inch, electrodynamic loudspeaker.

RADIOTRON COMPLEMENT

- (1) RCA-6A7 First Detector—Oscillator
- (2) RCA-6D6 Intermediate Amplifier
- (3) RCA-75 Second Det., A-F Amp. and A.V.C.
- (4) RCA-41 Audio Power Amplifier
- (5) RCA-80 Full-Wave Rectifier

Service Data

The various diagrams of this booklet contain such information as will be needed to isolate causes for defective operation if such develops. The ratings of the resistors, capacitors, coils, etc., are indicated adjacent to the symbols signifying these parts on the diagrams. Identification titles such as R1, L1, C1, etc., provide reference between the illustrations and Replacement Parts List. The coils, transformer windings, and reactors are rated in terms of d-c resistance to permit continuity checks.

Precautionary Lead Dress—(1) Dress power line leads to the on-off switch away from grid connection terminal on volume control to reduce hum pickup. (2) Keep leads of capacitor C3 as short as possible. (3) Bus lead from range selector (ter. 6) to oscillator coil tap L6L8 should be maintained 3½ inches long for proper alignment. (4) Capacitor C25 should be dressed free of adjacent parts to maintain correct alignment at high-frequency end of "A" band. (5) Bus lead from range selector (ter. 3) to antenna coil L1 should be maintained 2¼ inches long for proper alignment. (6) The RCA-6A7 grid-cap lead (50-ohm resistor R18) to top of tuning capacitor C2 should be dressed properly to prevent shorts and should be maintained flexible to prevent acoustic howl.

Phonograph Attachment—See Schematic Circuit Diagram, figure 2.

Loudspeaker—Centering of the loudspeaker voice coil is made in the usual manner with three narrow paper feelers.

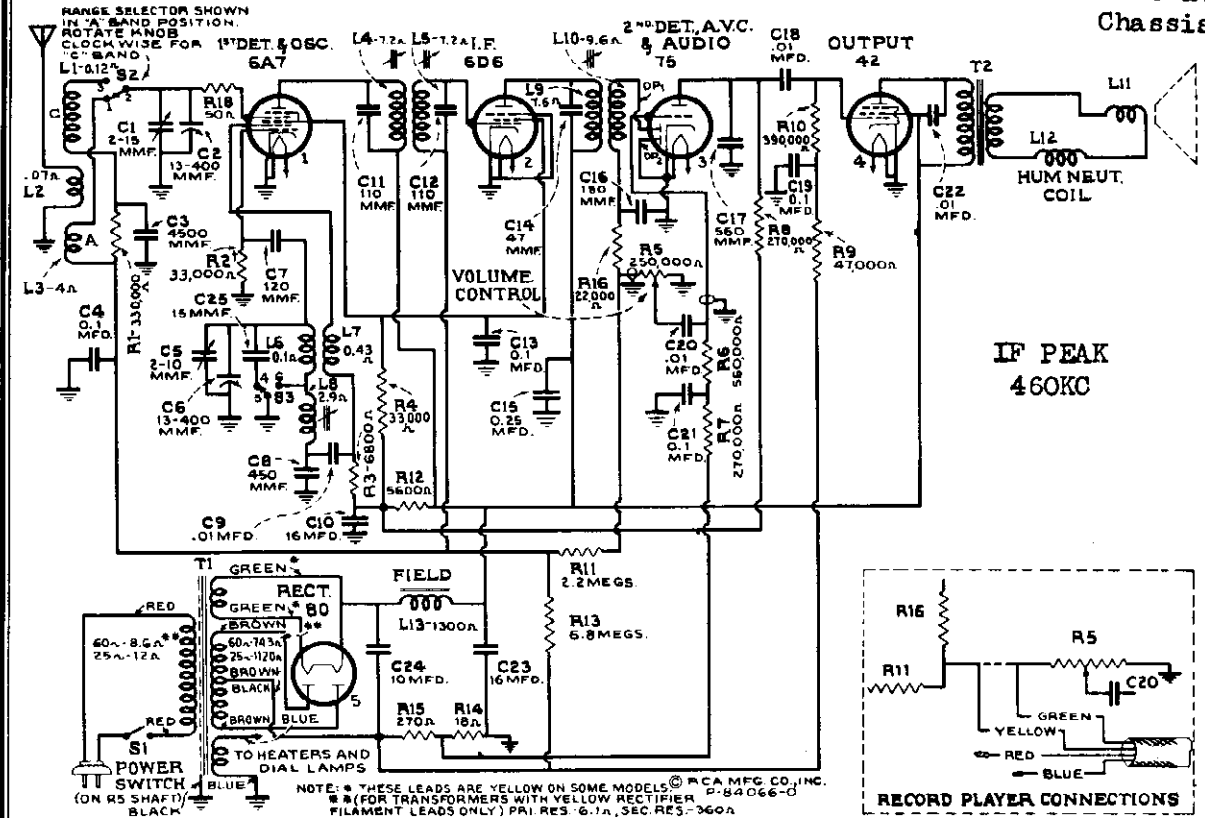
REPLACEMENT PARTS

Insist on genuine factory tested parts which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
RECEIVER ASSEMBLIES			
14634	Belt—Variable condenser drive belt	12679	Resistor—2.2 Megohm—Insulated, ¼ watt (R11)
14632	Bracket—Dial mounting bracket	14661	Resistor—6.8 Megohm—Insulated, ¼ watt (R13)
5237	Bushing—Variable condenser rubber mounting bushing	5129	Ring—Radiotron shield ring
12118	Cap—Grid contact cap	4389	Screw—No. 6—32 x 3/16 headless set screw for pulley, Stock No. 14639
12896	Capacitor—15 Mmfd. (C25)	14638	Shaft—Station selector knob shaft and pulley
12405	Capacitor—47 Mmfd. (C14)	12008	Shield—First I. F. transformer shield
14262	Capacitor—110 Mmfd. (C11, C12)	12408	Shield—Second I. F. transformer shield
12724	Capacitor—120 Mmfd. (C7)	11265	Shield—Radiotron shield
12406	Capacitor—180 Mmfd. (C16)	14658	Socket—Dial lamp socket
12812	Capacitor—450 Mmfd. (C8)	4794	Socket—4-contact 80 Radiotron socket
14724	Capacitor—560 Mmfd. (C17)	4786	Socket—6-contact 8D6, 42 or 75 Radiotron socket
80245	Capacitor—0045 Mfd. (C3)	4787	Socket—7-contact 8A7 Radiotron socket
4858	Capacitor—.01 Mfd. (C20, C22)	14637	Spring—Idler pulley tension spring
13138	Capacitor—.01 Mfd. (C9, C18)	12007	Spring—Retaining spring for core, Stock Nos. 12006 and 14648
4839	Capacitor—.01 Mfd. (C4, C13, C19, C21)	14640	Switch—Range switch (S2, S3)
12484	Capacitor—0.25 Mfd. (C15)	14376	Transformer—First I. F. transformer (L4, L5, C11, C12)
11203	Capacitor—10 Mfd. (C24)	14642	Transformer—Second I. F. transformer (L9, L10, C14, C16)
5212	Capacitor—16 Mfd. (C23)	14655	Transformer—Power transformer, 105-125 volts, 50-60 cycle (T1)
14377	Capacitor—16 Mfd. (C10)	14656	Transformer—Power transformer, 105-125 volts, 25-60 cycle (T1)
14646	Coil—Antenna coil (L1, L2, L3)	14657	Transformer—Power Transformer, 100-125/200-250 volts, 50-60 cycle (T1)
14647	Coil—Oscillator coil (L6, L7, L8)	14645	Volume Control and power switch (R5, S1)
14633	Condenser—2-gang variable tuning condenser (C1, C2, C5, C6)	REPRODUCER ASSEMBLIES	
14648	Core—Adjustable core and stud for oscillator coil	14679	Cone—Reproducer cone (L11) for speaker marked 84010-3
12006	Core—Adjustable core and stud for I. F. transformer	14941	Cone—Reproducer cone (L11) for speaker marked 84010-1
14631	Dial—Station selector dial	14678	Reproducer complete marked 84010-3
14651	Drive—Variable condenser vernier drive and pinion gear	14680	Transformer—Output transformer (T2) for speaker marked 84010-3
14635	Indicator—Station selector indicator pointer	14942	Transformer—Output transformer (T2) for speaker marked 84010-1
5228	Lamp—Dial lamp	MISCELLANEOUS ASSEMBLIES	
14636	Pulley—Idler pulley—less spring	14654	Escutcheon—Station selector escutcheon and crystal
14639	Pulley—Variable condenser drive pulley—located on condenser shaft	12673	Knob—Station selector, volume control or range switch knob
14660	Resistor—18 Ohms—Insulated, ¼ watt (R14)	14267	Screw—Chassis mounting screw and washer
14653	Resistor—50 Ohms—Flexible type, 1/10 watt (R18)	4119	Screw—No. 8—32 x ¼ headless set screw for knob, Stock No. 12673
13819	Resistor—270 Ohms—Wire wound, 1.1 watt (R15)		
5175	Resistor—5,600 Ohms—Carbon type, ¼ watt (R12)		
14659	Resistor—6,800 Ohms—Carbon type, ¼ watt (R3)		
11305	Resistor—22,000 Ohms—Carbon type, ¼ watt (R16)		
5033	Resistor—33,000 Ohms—Carbon type, ¼ watt (R4)		
13735	Resistor—33,000 Ohms—Carbon type, ¼ watt (R2)		
11646	Resistor—47,000 Ohms—Carbon type, ¼ watt (R9)		
11323	Resistor—270,000 Ohms—Carbon type, ¼ watt (R7, R8)		
13733	Resistor—330,000 Ohms—Carbon type, ¼ watt (R1)		
13479	Resistor—390,000 Ohms—Carbon type, ¼ watt (R10)		
5035	Resistor—560,000 Ohms—Carbon type, ¼ watt (R6)		

RCA MFG. CO., INC.

MODEL 85T1
Schematic
Chassis Wiring



POWER OUTPUT RATING
Electrodynamic Undistorted 1.0 watts
Maximum 2.5 watts
ohms at 400 cycles { (84011-3) 3.1-
(84011-6) 2.7-

IF PEAK
460KC

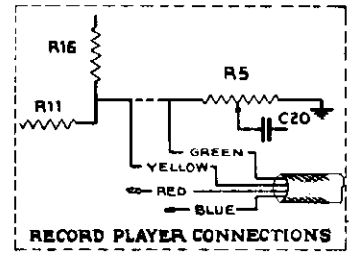
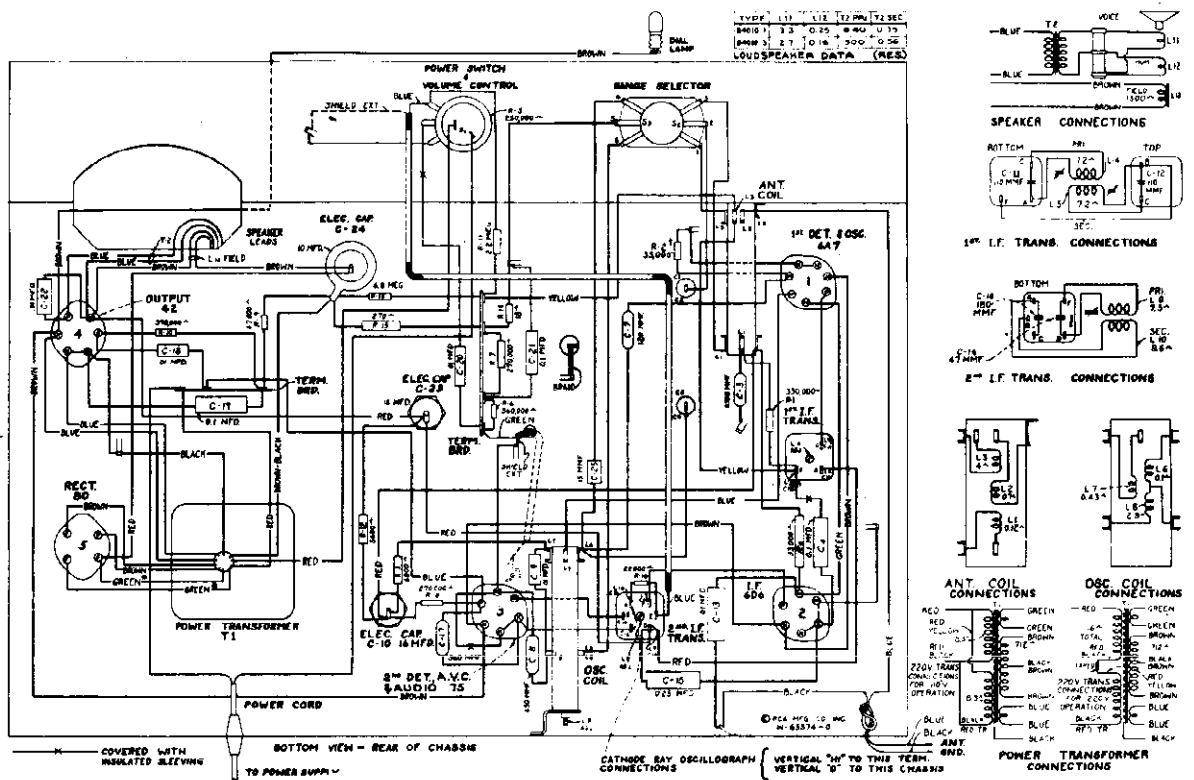


Figure 2—Schematic Circuit Diagram

† Resistor R2 is 56,000 ohms in some instruments. Replace with Stock No. 13735.



FREQUENCY RANGES
"Broadcast" (A) 540-1,720 kc
"Short Wave" (C) 5,800-18,000 kc
Intermediate Frequency..... 460 kc

R-F ALIGNMENT FREQUENCIES
"Broadcast" (A) 600 kc (osc.
"Short Wave" (C) 15,000 kc (osc., ant.
460 kc

POWER SUPPLY RATINGS
Rating A 105-125 volts, 50-60 cycles, 55 watts
Rating B 105-125 volts, 25-60 cycles, 60 watts
Rating C 100-125/200-250 volts, 50-60 cycles, 55 watts

MODEL 85T1

Alignment, Socket Trimmers, Voltage

RCA MFG. CO., INC.

Alignment Procedure

Calibrate the tuning dial by adjusting dial pointer to the center horizontal line with the gang tuning-condenser plates in full-mesh position. This is a screw-driver adjustment.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 4.

Cathode-ray alignment is preferable; the connections to the chassis are shown on figure 3. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output-terminal of the test oscillator to the receiver chassis for all alignment operations. Regulate

the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

Order of Alignment	Test Oscillator			Range-Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting					
1	6D6 I-F Grid Cap	.001 Mfd.	460 kc	"A" Left	No Signal 550-750 kc	2nd I-F Trans.	L9	Max. (peak)
2	6A7 Det. Grid Cap	.001 Mfd.	460 kc	"A" Left	No Signal 550-750 kc	1st I-F Trans.	L4 and L5	Max. (peak)
3	Ant. Lead (blue)	300 Ohms	15,000 kc	"C" Right	15,000 kc	"C" Osc.	C5	Max. (peak)†
4	Ant. Lead (blue)	300 Ohms	15,000 kc	"C" Right	Rock Through 15,000 kc	"C" Ant.	C1	Max. (peak)* ‡
5	Ant. Lead (blue)	200 Mmfd.	600 kc	"A" Left	600 kc	"A" Osc.	L8	Max. (peak)

† Use maximum capacity peak if two peaks can be obtained.

* Use minimum capacity peak if two peaks can be obtained.

‡ After this adjustment, check for image signal by shifting receiver dial to 15,920 kc.

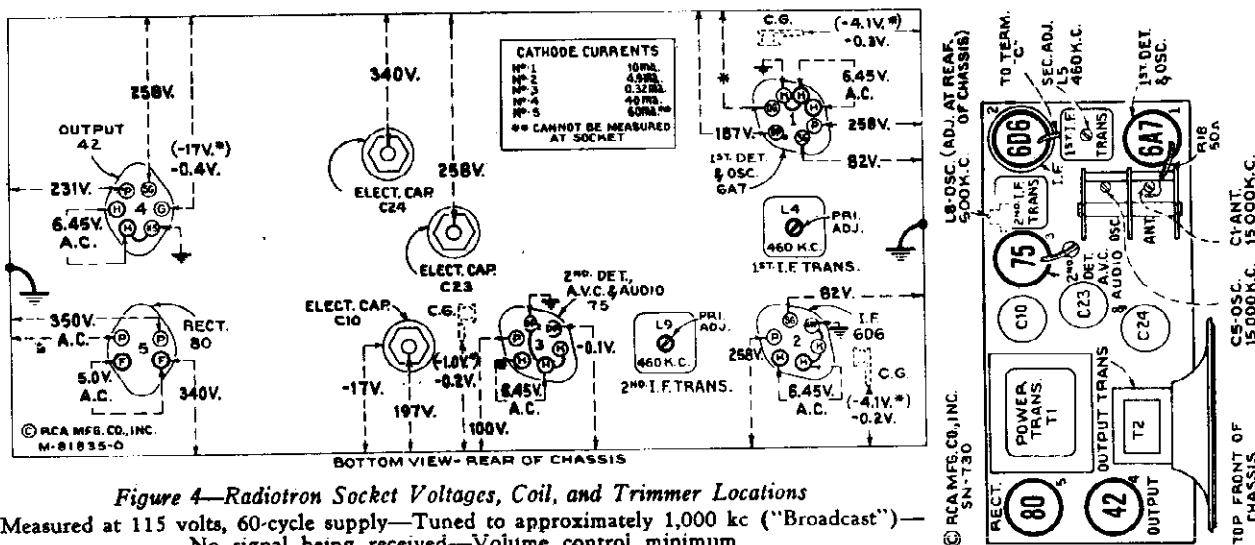


Figure 4—Radiotron Socket Voltages, Coil, and Trimmer Locations

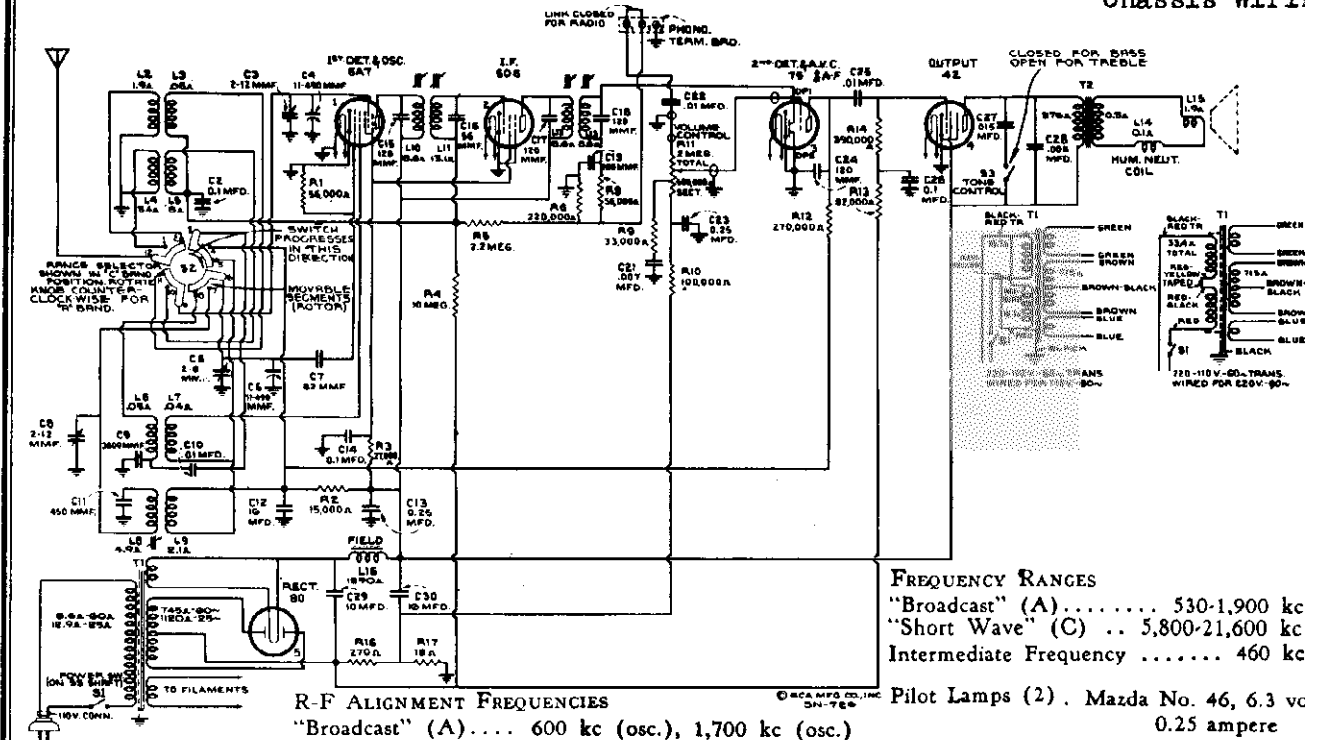
Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc ("Broadcast")—No signal being received—Volume control minimum

Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.

Voltage values as specified should hold within ±20% when the receiver is normally operative at its rated line voltage. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250, and 500 volts. Use the nearest range above the specified measured voltage. A-c voltages were measured with a corresponding a-c meter.

RCA MFG. CO., INC.

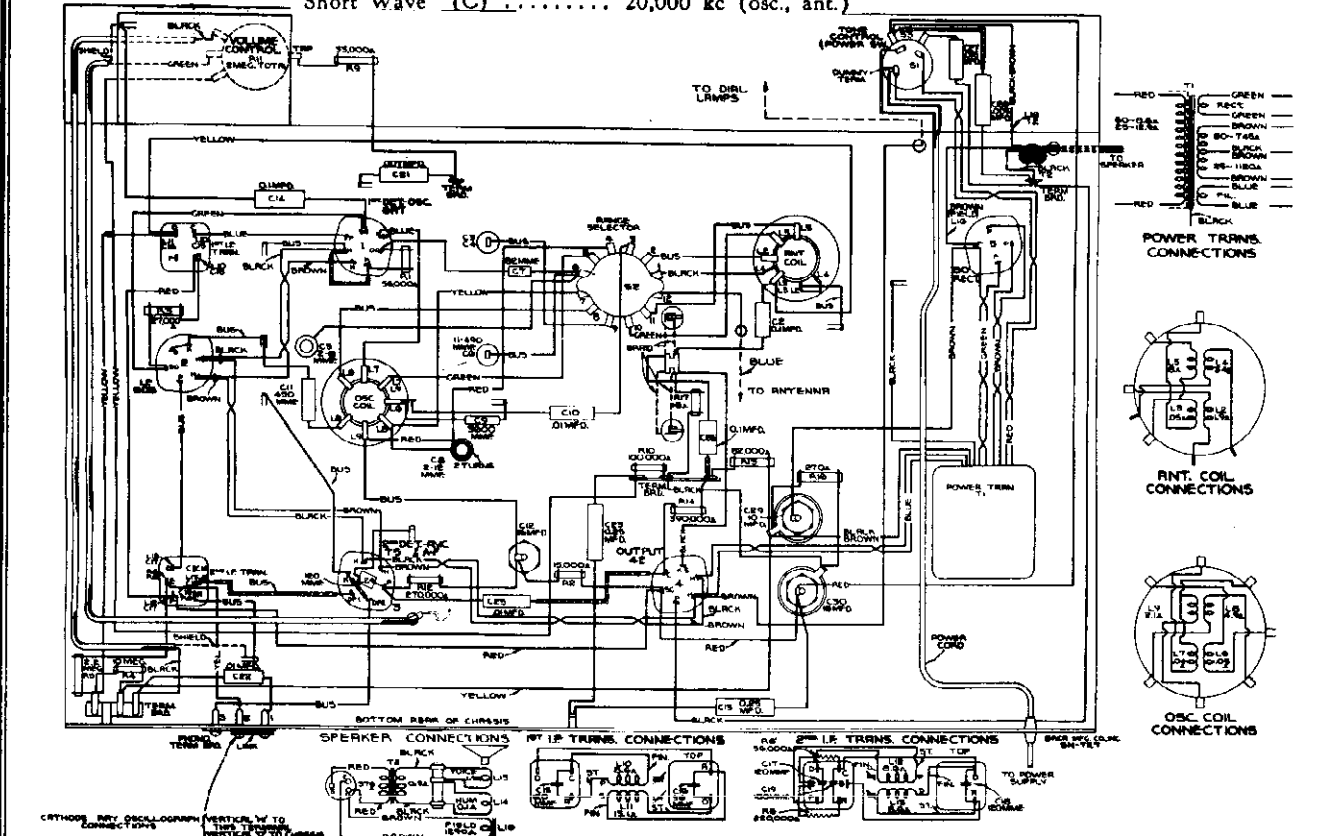
MODEL 85T5
Schematic
Chassis Wiring



FREQUENCY RANGES
 "Broadcast" (A) 530-1,900 kc
 "Short Wave" (C) .. 5,800-21,600 kc
 Intermediate Frequency 460 kc

R-F ALIGNMENT FREQUENCIES
 "Broadcast" (A) 600 kc (osc.), 1,700 kc (osc.)
 "Short Wave" (C) 20,000 kc (osc., ant.)

Pilot Lamps (2) . Mazda No. 46, 6.3 v
 0.25 ampere



POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycles, 75 watt
Rating B	105-125 volts, 25-60 cycles, 75 watt
Rating C	100-125/200-250 volts, 50-60 cycles, 75 watt

POWER OUTPUT RATING

Undistorted	2.0 watts	LOUDSPEAKER Type	Electrodynam
Maximum	4.5 watts	Voice Coil Impedance	2 1/4 ohms at 400 cycl

MODEL 85T5
Alignment, Socket
Trimmers

RCA MFG. CO., INC.

Alignment Procedure

Calibrate the tuning dial by adjusting dial pointer to the low-frequency (end) calibration mark on "Broadcast" scale with the gang tuning-condenser plates in full-mesh position. This is a friction adjustment.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 4.

Cathode-ray alignment is preferable; the connections to the chassis are shown on Figure 3. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator

to the receiver chassis for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

Order of Alignment	Test Oscillator			Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting				
1	6D6 I-F Grid Cap	.001 Mfd.	460 kc	No Signal 550-750 kc	2nd I-F Trans.	L12 and L13	Max. (peak)
2	6A7 Det. Grid Cap	.001 Mfd.	460 kc	No Signal 550-750 kc	1st I-F Trans.	L10 and L11	Max. (peak)
3	Ant. Post	300 Ohms	20,000 kc	20,000 kc	"C" Osc.	C5	Max. (peak)*
4	Ant. Post	300 Ohms	20,000 kc	Rock Thru 20,000 kc	"C" Ant.	C3	Max. (peak)†
5	Ant. Post	200 Mmfd.	600 kc	600 kc	"A" L-F Osc.	L8	Max. (peak)
6	Ant. Post	200 Mmfd.	1,700 kc	1,700 kc	"A" H-F Osc.	C8	Max. (peak)
7	Ant. Post	200 Mmfd.	600 kc	Rock Thru 600 kc	"A" L-F Osc.	L8	Max. (peak)
8	Ant. Post	200 Mmfd.	1,700 kc	1,700 kc	"A" H-F Osc.	C8	Max. (peak)

* Use minimum capacity peak.
† Use maximum capacity peak.

Precautionary Lead Dress.—(1) Keep leads of C2 and C9 as short as possible. (2) Dress leads from power transformer and a-c switch away from antenna coil and associated wiring. (3) Red lead from range selector "ter 4" to oscillator coil L9 should have two tight turns around trimming capacitor C8.

Phonograph Attachment.—A terminal board is provided for connecting a phonograph into the audio-amplifying circuit. RCA Victor Models R-93, R-93-A, R-93-2, R-93-S, or

terminal 2; and shield extension to terminal 3. Tape unused red and blue leads separately. Connect a 2-conductor twisted cable between the Record Player binding posts and the screw terminals on Radio-Record switch.

Loudspeaker.—Centering of the loudspeaker is made in the usual manner with three narrow paper feelers after first removing the front dust cover. This may be removed by softening its cement with a light application of acetone, using care not to allow the acetone to flow into the air gap. The dust cover should be cemented back in place with ambroid upon completion of adjustment.

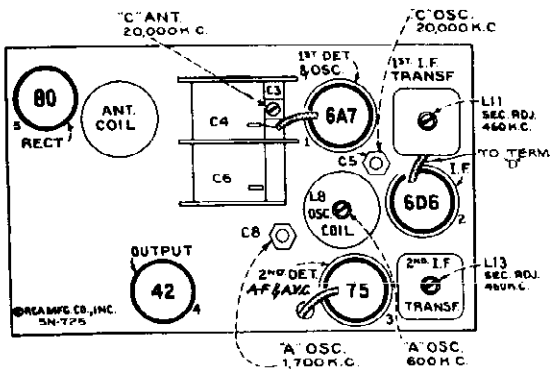


Figure 1—Radiotron, Coil, and Trimmer Locations

R-94 Record Players should be connected as follows: Remove link between terminals 1 and 2 on receiver. Connect green wire in Radio-Record switch cable to terminal 1, yellow to

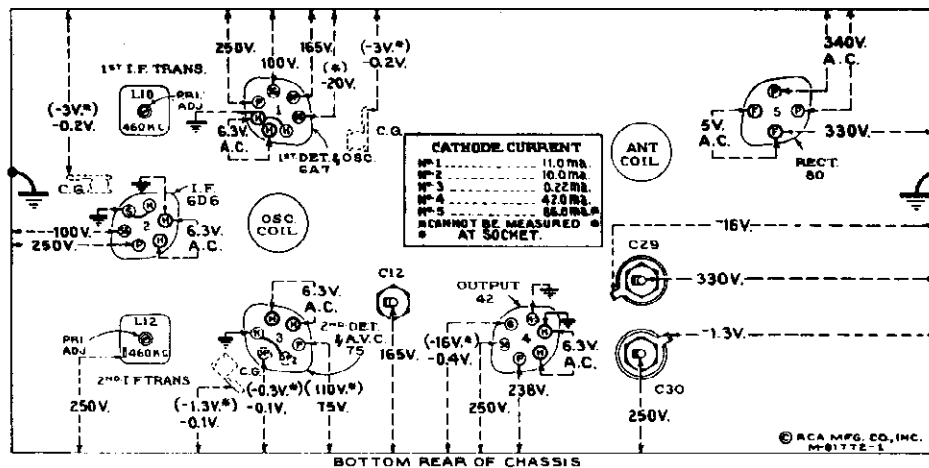


Figure 4—Radiotron Socket Voltages, Coil, and Trimmer Locations
Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc ("Broadcast")—
No signal being received—Volume control minimum

Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.

Voltage values as specified should hold with in $\pm 20\%$ when the receiver is normally operative at its rated line voltage. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250, and .500 volts. Use the nearest range above the specified measured voltage. A-c voltages were measured with a corresponding a-c meter.

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
RECEIVER ASSEMBLIES			
14352	Belt—Variable condenser drive belt	11365	Resistor—82,000 Ohms, Carbon type, $\frac{1}{2}$ watt (R13)
12717	Board—Phonograph terminal board	5145	Resistor—100,000 Ohms, Carbon type, $\frac{1}{2}$ watt (R10)
14338	Bushing—Variable condenser mounting bushing assembly	11398	Resistor—220,000 Ohms, Carbon type, 1/10 watt (R6)
12607	Cap—First I.F. transformer shield top	11323	Resistor—270,000 Ohms, Carbon type, $\frac{1}{2}$ watt (R12)
12581	Cap—Second I.F. transformer shield top	13478	Resistor—390,000 Ohms, Carbon type, $\frac{1}{2}$ watt (R14)
12118	Cap—Grid contact cap	11626	Resistor—2.2 Megohm, Carbon type, $\frac{1}{2}$ watt (R5)
12714	Capacitor—Adjustable trimmer (Medium) (C8)	13732	Resistor—10 Megohm, Carbon type, $\frac{1}{2}$ watt (R4)
12807	Capacitor—Adjustable trimmer (Short) (C5)	14350	Screw—No. 8-32 x 3 16 Square head set screw for gear Stock No. 14349 and drum Stock No. 14345
12629	Capacitor—56 Mmfd. (C16)	12799	Shield—Antenna or oscillator coil shield
13394	Capacitor—82 Mmfd. (C7)	13311	Shield—Chassis end shield and mounting bracket assembly
12404	Capacitor—120 Mmfd. (C15, C17, C18)	12008	Shield—I. F. transformer shield for Stock No. 12801 and No. 12653
12724	Capacitor—120 Mmfd. (C24)	3682	Shield—Shield for 75 Radiotron
12406	Capacitor—180 Mmfd. (C19)	3950	Shield—Shield for 6D6 Radiotron
12812	Capacitor—450 Mmfd. (C11)	14114	Socket—Dial lamp socket
12811	Capacitor—3,600 Mmfd. (C9)	4794	Socket—4 contact 80 Radiotron socket
5148	Capacitor—.007 Mfd. (C21)	4786	Socket—6 contact 6D6, 42 or 75 Radiotron socket
4868	Capacitor—.005 Mfd. (C28)	4787	Socket—7 contact 6A7 Radiotron socket
11315	Capacitor—.015 Mfd. (C27)	12007	Spring—Retaining spring for core Stock No. 12008
4858	Capacitor—.01 Mfd. (C10, C22, C25)	14342	Spring—Tension spring for idler Stock No. 14341
4841	Capacitor—.01 Mfd. (C2, C14, C26)	12907	Spring—Tension spring for indicator gear Stock No. 14351
4840	Capacitor—.025 Mfd. (C23)	14336	Switch—Range switch (S2)
5170	Capacitor—.025 Mfd. (C13)	14337	Switch—Tone control switch and power switch (S1, S3)
11240	Capacitor—10 Mfd. (C29)	12801	Transformer—First I. F. transformer (L10, L11, C15, C16)
5212	Capacitor—16 Mfd. (C30)	12653	Transformer—Second I. F. transformer (L12, L13, C17, C18, R6, R8)
14377	Capacitor—16 Mfd. (C12)	13392	Transformer—Power transformer, 105-125 volts, 50-60 cycle (T1)
12797	Coil—Antenna coil and shield (L2, L3, L4, L5)	13566	Transformer—Power transformer, 105-125 volts, 25-60 cycles (T1)
12798	Coil—Oscillator coil and shield (L6, L7, L8, L9)	13393	Transformer—Power transformer, 105-125, 210-250 volts, 50-60 cycle (T1)
14348	Condenser—2-gang variable tuning condenser (C3, C4, C6)	14335	Volume Control—(R11)
5119	Connector—3-contact female connector for speaker cable	13192	Washer—Felt washer for indicator pointer
12800	Core—Adjustable core and stud assembly for coil Stock No. 12798	REPRODUCER ASSEMBLIES (RL-63F-1)	
12006	Core—Adjustable core and stud for transformer Stock No. 12801 and No. 12653	14356	Board—3 contact reproducer terminal board
14330	Dial—Station dial and mounting bracket assembly	13866	Cap—Cone center dust cap
14353	Drive—Variable condenser vernier drive pinion gear and shaft	12012	Coil—Field coil (L16)
14345	Drum—Variable condenser drive belt drum complete with set screws	11469	Coil—Hum neutralizing coil (L14)
14349	Gear—Indicator drive gear and hub complete with set screws	12842	Cone—Reproducer cone and dust cap (L15)
14351	Gear—Indicator pointer stem and gear complete with tension spring	5118	Plug—3 contact male plug for reproducer
14341	Idler—Station selector drive belt idler	14360	Reproducer—Reproducer complete
14344	Indicator—Station selector indicator pointer	14358	Screw—Screw, washer and lockwasher to hold core in yoke
5226	Lamp—Dial lamp	14355	Transformer—Output transformer (T2)
14028	Nut—Jamb nut for trimmer capacitors	14357	Washer—Spring washer to hold field coil
14340	Pulley—Station selector drive belt pulley and knob shaft	MISCELLANEOUS ASSEMBLIES	
14347	Reflector—Dial reflector and lamp bracket assembly	14479	Escutcheon—Station selector escutcheon and crystal
14343	Retainer—Drive shaft and pulley retainer—holds tuning knob shaft and pulley on range switch shaft	14269	Knob—Volume control, tone control or range switch knob
13674	Resistor—18 Ohms, Carbon type, $\frac{1}{2}$ watt (R17)	14359	Knob—Station selector knob
13819	Resistor—270 Ohms, Insulated wire wound, 1.1 watt (R16)	11377	Screw—Chassis mounting screw and washer assembly
12759	Resistor—15,000 Ohms, Carbon type, $\frac{1}{2}$ watt (R2)	4982	Spring—Retaining spring for knob Stock No. 14359
13177	Resistor—27,000 Ohms, Carbon type, 1 watt (R3)	14270	Spring—Retaining spring for knob Stock No. 14269
13735	Resistor—33,000 Ohms, Carbon type, $\frac{1}{2}$ watt (R9)		
5029	Resistor—56,000 Ohms, Carbon type, $\frac{1}{2}$ watt (R1)		
11282	Resistor—56,000 Ohms, Carbon type, 1/10 watt (R8)		

MODELS 86BK, 86BT
Notes, Parts

RCA MFG. CO., INC.

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
14388	RECEIVER ASSEMBLIES	14390	Resistor—27,000 ohms, carbon type, 1/10 watt (R9)
14389	Belt—Variable condenser drive belt	14391	Resistor—56,000 ohms, insulated, 1/2 watt (R4)
14390	Board—Phonograph terminal board	14392	Resistor—20,000 ohms, carbon type, 1/2 watt (R12)
14391	Board—Antenna and ground terminal board	14393	Resistor—220,000 ohms, carbon type, 1/10 watt (R8)
14392	Bushing—Variable condenser mounting bushing and screw assembly	14394	Resistor—470,000 ohms, carbon type, 1/10 watt (R1, R3)
14393	Cap—First I.F. transformer shield top	14395	Resistor—1 megohm, carbon type, 1/2 watt (R11, R13)
14394	Cap—Second I.F. transformer shield top	14396	Resistor—2.2 megohm, carbon type, 1/2 watt (R8)
14395	Cap—Grid contact cap	14397	Retainer—Drive shaft and pulley retainer
14396	Capacitor—4.7 Mmfd. (C3, C9)	14398	Screw—No. 8-32x3/16 square head set screw for gear
14397	Capacitor—36 Mmfd. (C17)	14399	Shield—No. 30985 and drum Stock No. 14346
14398	Capacitor—36 Mmfd. (C24)	14400	Shield—R.F. transformer shield
14399	Capacitor—82 Mmfd. (C43)	14401	Shield—Oscillator coil shield
14400	Capacitor—120 Mmfd. (C28)	14402	Shield—Radiotron shield
14401	Capacitor—120 Mmfd. (C29, C21)	4784	Socket—4-contact I.A. or 30 Radiotron socket
14402	Capacitor—180 Mmfd. (C26)	4786	Socket—Dial lamp socket
14403	Capacitor—470 Mmfd. (C8, C12)	14171	Socket—Tension spring for indicator drive gear Stock No. 30085
14404	Capacitor—555 Mmfd. (C8)	12807	Spring—Tension spring for indicator drive gear Stock No. 14341
14405	Capacitor—2,800 Mmfd. (C36)	14342	Spring—Tension spring for idler Stock No. 14341
14406	Capacitor—4,500 Mmfd. (C41)	12007	Spring—Retaining spring for core Stock No. 12006
14407	Capacitor—0.025 Mfd. (C26, C30, C32)	14413	Switch—Range switch (S1, S2)
14408	Capacitor—0.035 Mfd. (C31)	14491	Switch—Tone control switch and power switch (S4, S5, S6, S7)
14409	Capacitor—0.1 Mfd. (C7, C23, C40)	14291	Transformer—First I.F. transformer (L17, L18, C18, C19)
14410	Capacitor—0.25 Mfd. (C18, C35)	14293	Transformer—Second I.F. transformer (L19, L20, C20, C21)
14411	Capacitor—Adjustable trimmer (C37, C39)	12803	Transformer—Audio transformer pack (T1, T2)
14412	Capacitor—Adjustable trimmer (long) (C4)	14379	Washer—Felt washer for indicator pointer
14413	Capacitor—Adjustable trimmer (short) (C35)	14395	Volume Control (R10)
14414	Capacitor—Pack comprising two sections each 8 Mfd. (C15, C34)		REPRODUCER ASSEMBLIES
14415	Cell—B681	12687	Console Model (Speaker No. RL71-1)
14416	Coil—Antenna coil and shield (L1, L2, L3, L4)	5118	Cone—Reproducer cone and dust cap (L21)
14417	Coil—Oscillator coil and shield (L11, L12, L13, L14, L15, L16)	9713	Plug—3-contact male connector for reproducer
14418	Coil—R.F. coil and shield (L5, L6, L7, L8, L9, L10)		Reproducer—Complete
14419	Condenser—3-gang variable tuning condenser (C5, C11, C13)	12642	Cone—Reproducer cone and dust cap (L21)
5118	Connector—3-contact female connector for reproducer cable	5118	Plug—3-contact male connector for reproducer
12008	Core—Adjustable core and stud for I.F. transformers	9712	Reproducer—Complete
12800	Core—Adjustable core and stud assembly for oscillator coil		MISCELLANEOUS ASSEMBLIES
14116	Dial—Station selector dial	4890	Body—Fuse holder female body
14117	Drive—Variable condenser vernier drive shaft and pinion set screws	4282	Bushing—Four hole bushing and ferrule
14345	Drum—Variable condenser drive belt drum complete with set screws	4283	Capacitor—0.33 ohms flexible resistor—1/2 watt, complete with clip (R17)
14415	Foot—Chassis mounting foot and bracket assembly	14418	Cap—Fuse holder male cap
30085	Gear—Indicator drive gear and hub assembly and pointer stem and gear assembly	4288	Clip—Battery clips, one marked "+" and one unmarked
14405	Holder—Bias cell holder	12827	Connector—2-contact male connector for battery cable
14341	Idler—Station selector drive belt idler	14409	Connector—7-contact female connector for battery cable
14344	Indicator—Station selector indicator pointer	14396	Escutcheon—Station selector escutcheon and crystal
14382	Indicator—Vernier indicator pointer	3743	Fuse—1/4 ampere (F1)
14028	Lamp—Dial lamp	14269	Knob—Volume control, tone control or range switch knob
14404	Nut—Jamb nut for air trimmer capacitors	14359	Knob—Station selector knob
14340	Pulley—Station selector drive belt pulley and knob shaft	14418	Insulator—Fuse holder insulating sleeve
14351	Reflector—Dial reflector and lamp bracket assembly	14418	Resistor—0.33 ohms flexible resistor—1/2 watt, complete with clip (R17)
14119	Resistor—2.2 ohms, flexible type, 3 watt (R15, R2)	11210	Screw—Chassis mounting screw and washer for Model 86BK
11283	Resistor—1,200 ohms, carbon type, 1/2 watt (R10)	11377	Screw—Chassis mounting screw and washer for Model 86BT
15144	Resistor—2,700 ohms, carbon type, 1/2 watt (R4)	4284	Spring—Fuse holder tension spring
11305	Resistor—22,000 ohms, carbon type, 1/2 watt (R5)	4282	Spring—Retaining spring for knob
14284	Resistor—22,000 ohms, carbon type, 1/10 watt (R7)	14270	Spring—Retaining spring for knob Stock No. 14359

The following changes under "Electrical specifications" become effective when employing the CV-8, "A" battery current drain at 6 volts, 1.65 amperes. Fuse rating, 5 amperes. Undersized output, 1.3 watts. Maximum output, 1.8 watts. Under "Service data," the following voltages from the receiver chassis to avoid vibrator buzz.

apply to the RCA-19 power-output tube. Either plate to chassis, 180 volts. Either grid to chassis, —4 1/2 volts. Plate current (either plate), 1.6 ma. When servicing the CV-8 chassis should be insulated from the receiver chassis to avoid vibrator buzz.

Precautionary Lead Dress.—(1) Twisted leads from filament switch to power plug must be dressed against bottom of end shield and fastened with tape. (2) Lead from terminal No. 6 of S3 to chassis must be as short as possible and in same chassis lance as C15-C34. (3) Keep lead from terminal No. 9 of S3 to L7-L16 as short as possible. (4) Keep lead from L7 to C11 as short as possible. (5) Keep lead from C10 to C11 as short as possible. (6) Keep leads of C41 as short as possible. (7) Keep lead from terminal No. 20 of S2 to C13 as short as possible.

Phonograph Attachment.—A terminal board is provided for connecting a phonograph into the audio amplifying circuit. RCA Victor Model R-93-S Record Player should be connected as follows: Remove link between terminals 1 and 2 on terminal board. Connect green wire in Radio-Record switch cable to terminal 1, yellow to terminal 2, and shield extension to terminal 3. Tape unused red and blue leads separately. Connect a 2-conductor twisted cable between the Record Player binding posts and the screw terminals on Radio-Record switch.

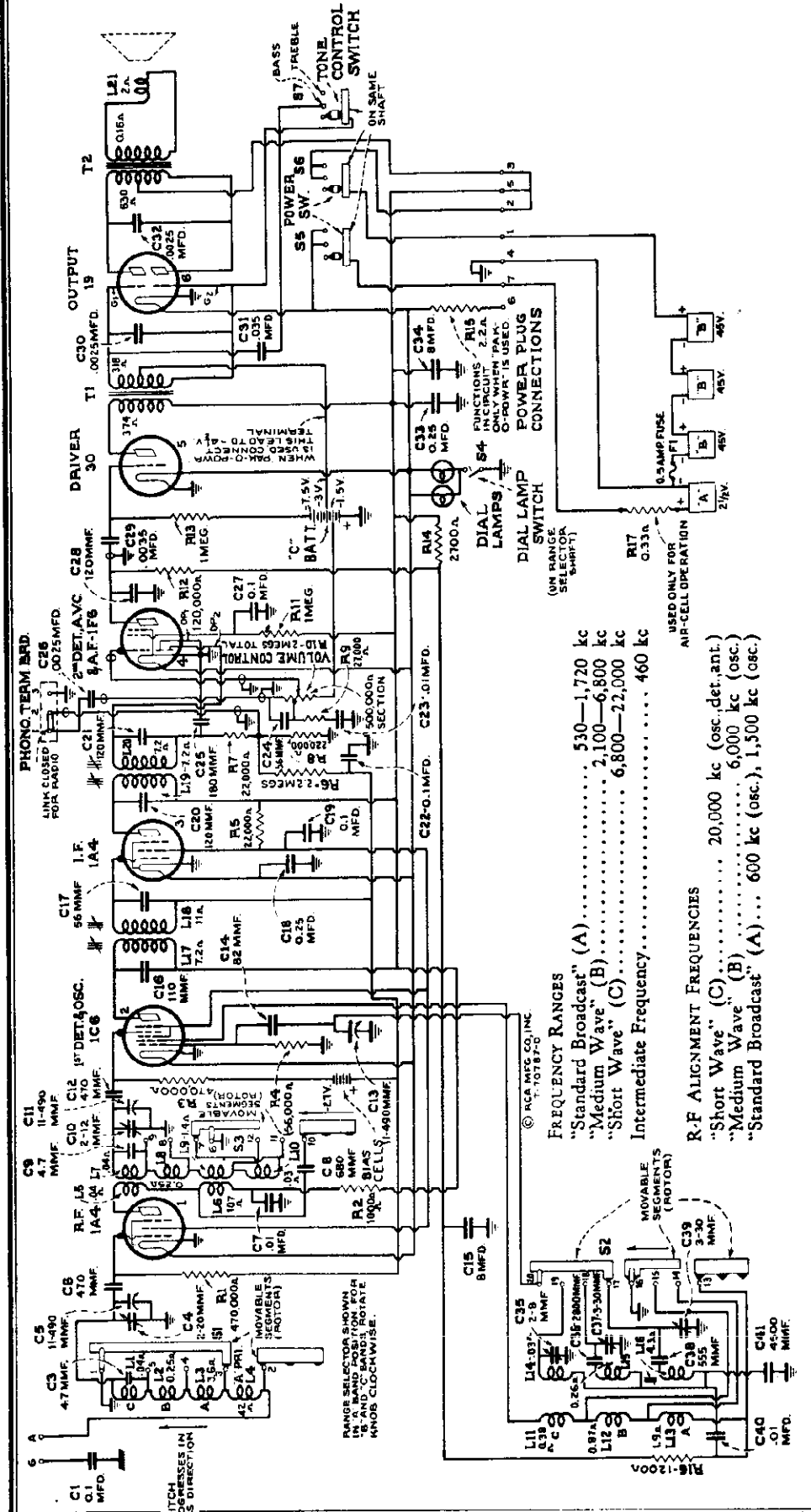
Loudspeaker.—Centering of the loudspeaker is made in the usual manner with three narrow paper feelers after first removing its cement with a light application of acetone, softening its cement with a light application of acetone, using care not to allow the acetone to flow into the air gap. The dust cover should be cemented back in place with ambroid upon completion of adjustment.

Bias Cells.—Three bias cells are used only for the purpose of supplying bias potential to the IC6 first-detector-oscillator tube. These cells should never be measured with an ordinary voltmeter or other device which draws any current. A simple check on these cells may be made by connecting a milliammeter in the plate circuit of the IC6 tube and noting the plate current reading. Then carefully remove the cells and substitute a battery potential of 2.7 volts in their place and note the new reading on the milliammeter. If the first reading obtained (with bias cells) is more than 40% from the latter reading (with 2.7-volt battery), the bias cells should be replaced. This 40% difference is equivalent to a change of approximately 2.5% battery voltage.

Operation With CV-8 Pak-O-Power.—These receivers may readily be operated from an RCA CV-8 Pak-O-Power, in which case, a six-volt storage battery replaces the "A" and "B" batteries listed under "Batteries required." When using the CV-8, one cell (2 volts) of the storage battery supplies filament voltage to the tubes, while the other two cells (4 volts) supplies power for the CV-8. When installing, the seven prong CV-8 receptacle plugs into the seven prong plug on the rear apron of the receiver chassis and the four battery leads clip on terminals of the storage battery as follows: Red to +6 V.; Blue to +4 V.; Yellow to +4 V.; and brown (fused lead) to -V. The two four-volt leads (Blue and Yellow) should make separate connections to the same battery strap to avoid vibrator buzz which might otherwise result if these two leads are joined together or touch each other. Observe extreme care that proper connections are made to the battery, as a wrong connection will burn out the tubes. The green lead (originally connected to -3 v. on the "C" battery) should be shifted to the -4.5 volt tap. The other "C" battery connections remain unchanged.

RCA MFG. CO., INC.

MODELS 86BK, 86B
Schematic, Socket
Trimmer &



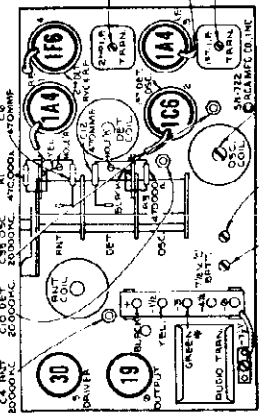
- FREQUENCY RANGES**
- "Standard Broadcast" (A) 530—1,720 kc
 - "Medium Wave" (B) 2,100—6,800 kc
 - "Short Wave" (C) 6,800—22,000 kc
- Intermediate Frequency 460 kc
- R-F ALIGNMENT FREQUENCIES**
- "Short Wave" (C) 20,000 kc (osc., det. ant.)
 - "Medium Wave" (B) 6,000 kc (osc.)
 - "Standard Broadcast" (A) ... 600 kc (osc.), 1,500 kc (osc.)

BATTERIES REQUIRED

- "A," one plug-in, 2 1/2-volt Air Cell, or one 2-volt storage battery; "B," three 45-volt, heavy-duty, plug-in type B batteries; "C," one 7 1/2-volt C battery tapped at 1 1/2, —3, and —4 1/2 volts, and three bias cells (Stock No. 12681).
- CURRENT CONSUMPTION**
- "A" at 2 volts (pilot lamps off) 0.62 ampere
 - "A" at 2 volts (pilot lamps on) 0.74 ampere
 - "B" at 135 volts 21 milliamperes
 - Fuse Rating 1/2 ampere
- POWER OUTPUT**
- Undistorted 1.2 watts
 - Maximum 2.2 watts

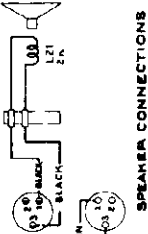
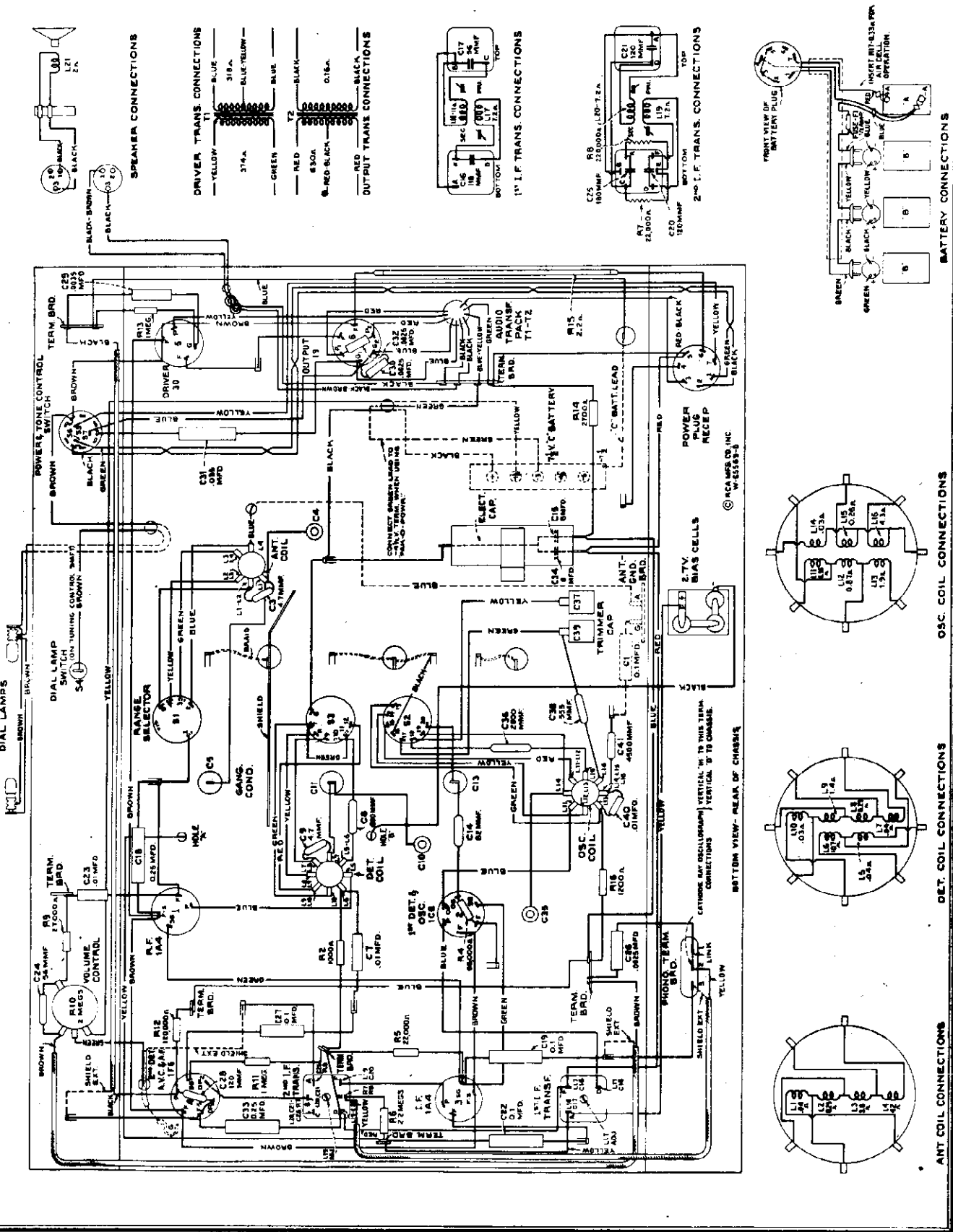
LOUDSPEAKER

- Type Permanent-Magnet Dynamic
- Voice Coil Impedance 2.2 ohms at 400 cycles

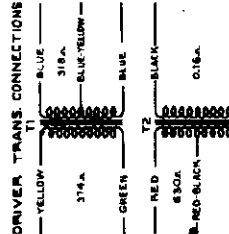


MODELS 86BK, 86BT
Chassis Wiring

RCA MFG. CO., INC.



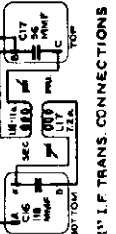
SPEAKER CONNECTIONS



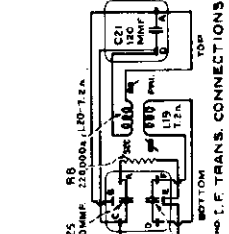
DRIVER TRANS. CONNECTIONS



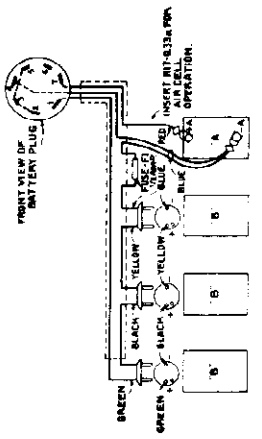
OUTPUT TRANS. CONNECTIONS



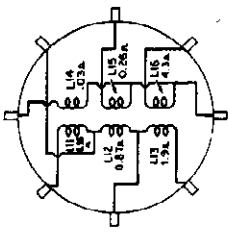
1st I.F. TRANS. CONNECTIONS



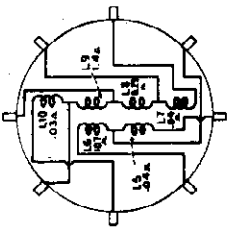
2nd I.F. TRANS. CONNECTIONS



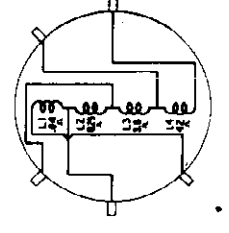
BATTERY CONNECTIONS



OSC. COIL CONNECTIONS



DET. COIL CONNECTIONS



ANT. COIL CONNECTIONS

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RCA MFG. CO., INC.

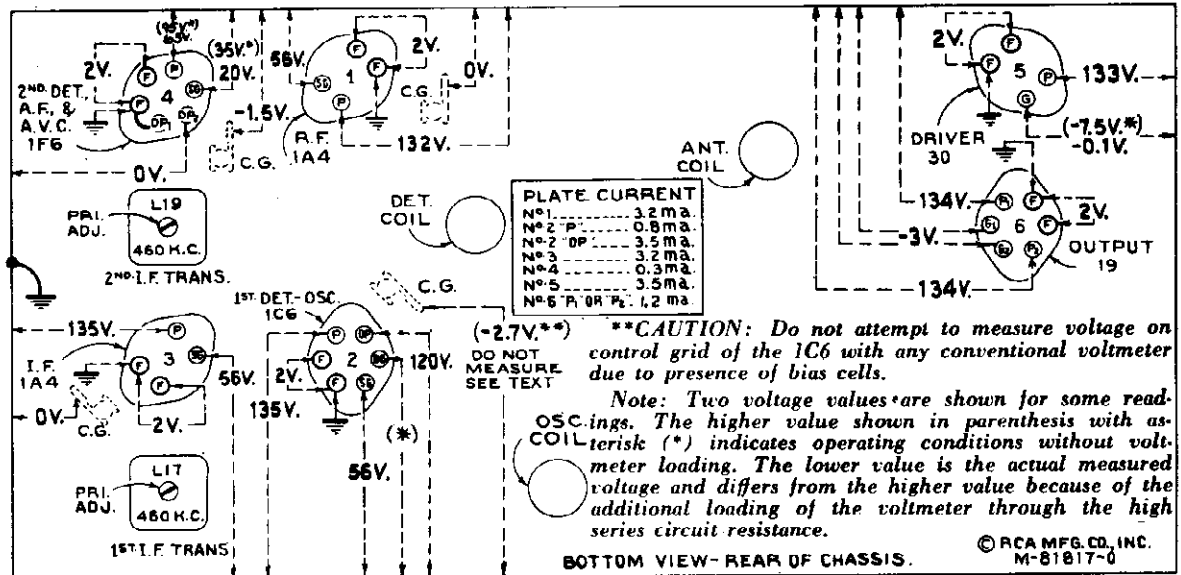


Figure 4—Radiotron Socket Voltages, Coil, and Trimmer Locations
Measured with all batteries at normal voltage—Tuned to approximately 1,000 kc—
No signal being received—Volume control minimum

Alignment Procedure

Calibrate the tuning dial by adjusting main dial pointer to the low-frequency (end) calibration mark on dial with the gang tuning-condenser plates in full-mesh position; then adjust the small (vernier) pointer to "O." These are friction adjustments.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 4.

Cathode-ray alignment is highly preferable; the connections to the chassis are shown on figure 3. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to

the receiver "G" (ground) terminal for all alignment operations. Regulate the output of the test oscillator so the minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

For further details on alignment, refer to booklet "RC: Victor Receiver Alignment."

Order of Alignment	Test Oscillator			Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting				
1	1A4 I-F Grid Cap	.001 Mfd.	460 kc	No Signal 550-750 kc	2nd I-F Trans.	L19 and L20	Max. (peak)
2	1C6 Det. Grid Cap	.001 Mfd.	460 kc	No Signal 550-750 kc	1st I-F Trans.	L17 and L18	Max. (peak)
3	Ant. Term.	300 Ohms	20,000 kc	20,000 kc	"C" Osc.	C35	Max. (peak) *
4	Ant. Term.	300 Ohms	20,000 kc	20,000 kc	"C" Det.	C10	Max. (peak) †
5	Ant. Term.	300 Ohms	20,000 kc	20,000 kc	"C" Ant.	C4	Max. (peak) ‡
6	Ant. Term.	300 Ohms	6,000 kc	Rock Thru 6,000 kc	"B" Osc.	C37	Max. (peak) *
7	Ant. Term.	200 Mmfd.	600 kc	600 kc	"A" L-F Osc.	L16	Max. (peak)
8	Ant. Term.	200 Mmfd.	1,500 kc	1,500 kc	"A" H-F Osc.	C39	Max. (peak)
9	Ant. Term.	200 Mmfd.	600 kc	Rock Thru 600 kc	"A" L-F Osc.	L16	Max. (peak)
10	Ant. Term.	200 Mmfd.	1,500 kc	Rock Thru 1,500 kc	"A" H-F Osc.	C39	Max. (peak)

* Use minimum capacity peak if two peaks can be obtained.

† Use maximum capacity peak if two peaks can be obtained.

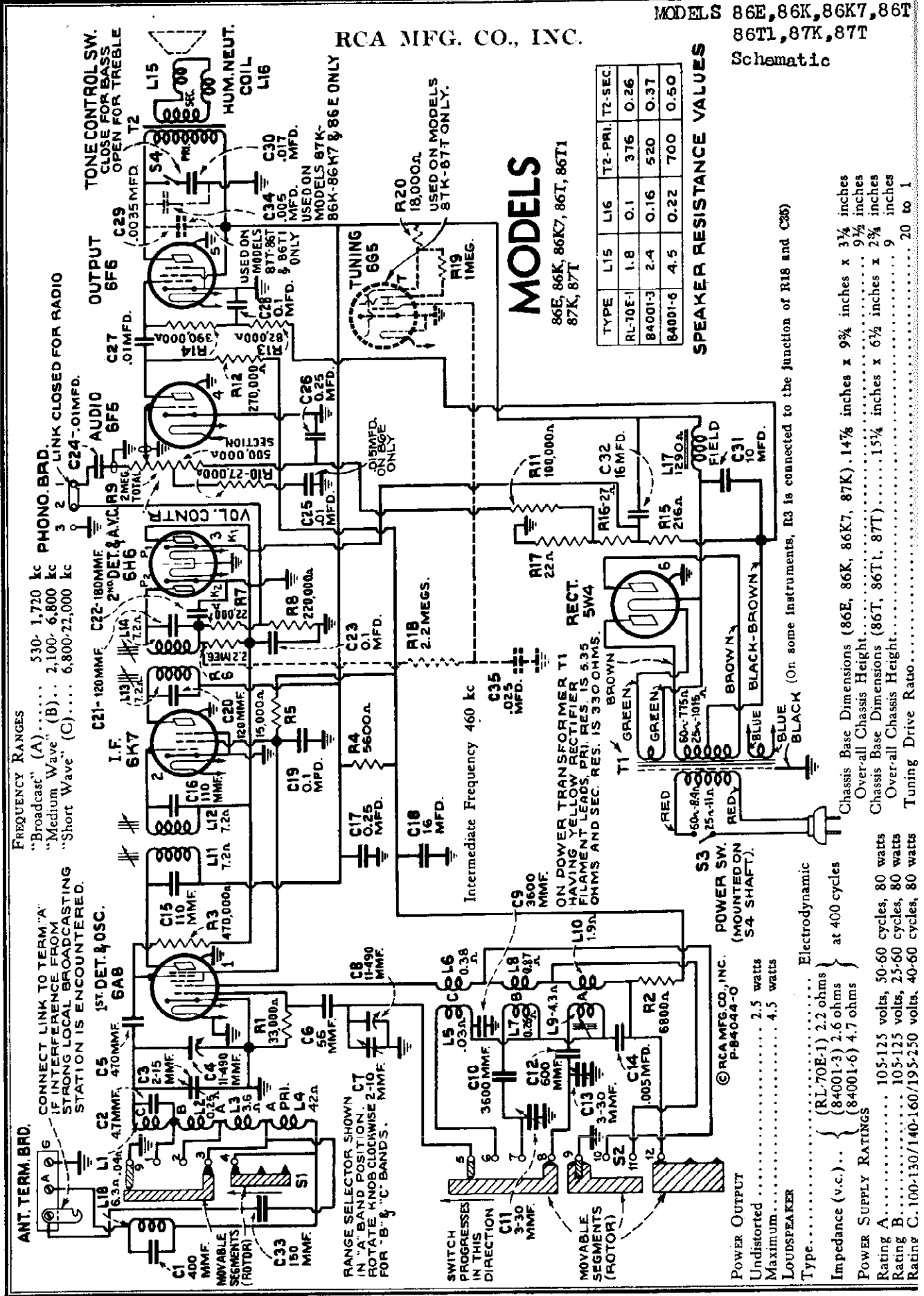
‡ After this adjustment, check for image signal by shifting receiver dial to 19,080 kc.

MODELS 86E, 86K, 86K7, 86T

86T1, 87K, 87T

Schematic

RCA MFG. CO., INC.



MODELS

86E, 86K, 86K7, 86T, 86T1, 87K, 87T

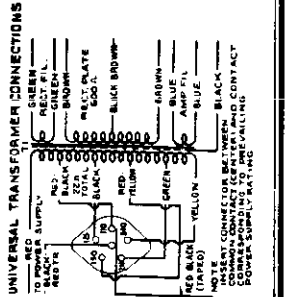
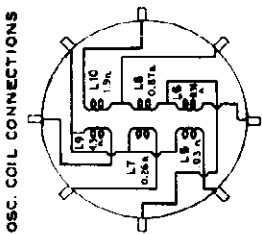
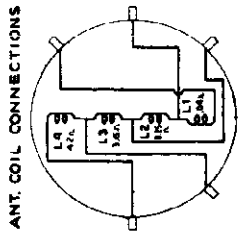
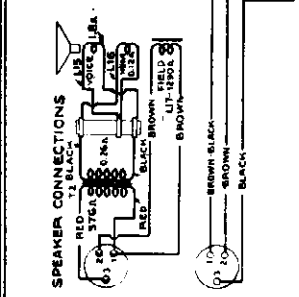
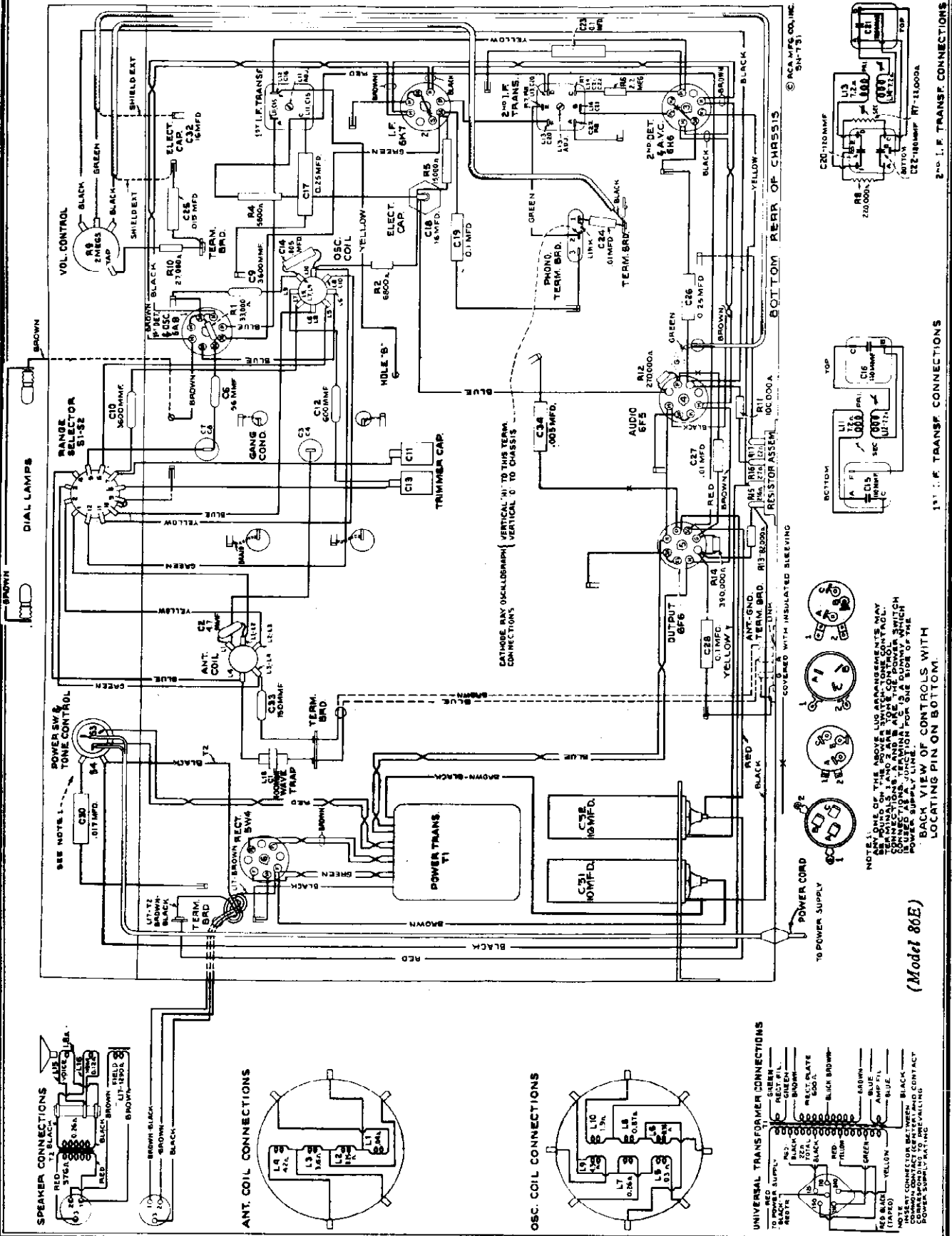
TYPE	L15	L16	T2-PRI.	T2-SEC.
RL-70E-1	1.8	0.1	376	0.26
8A001-3	2.4	0.16	520	0.37
8A001-6	4.5	0.22	700	0.50

SPEAKER RESISTANCE VALUES

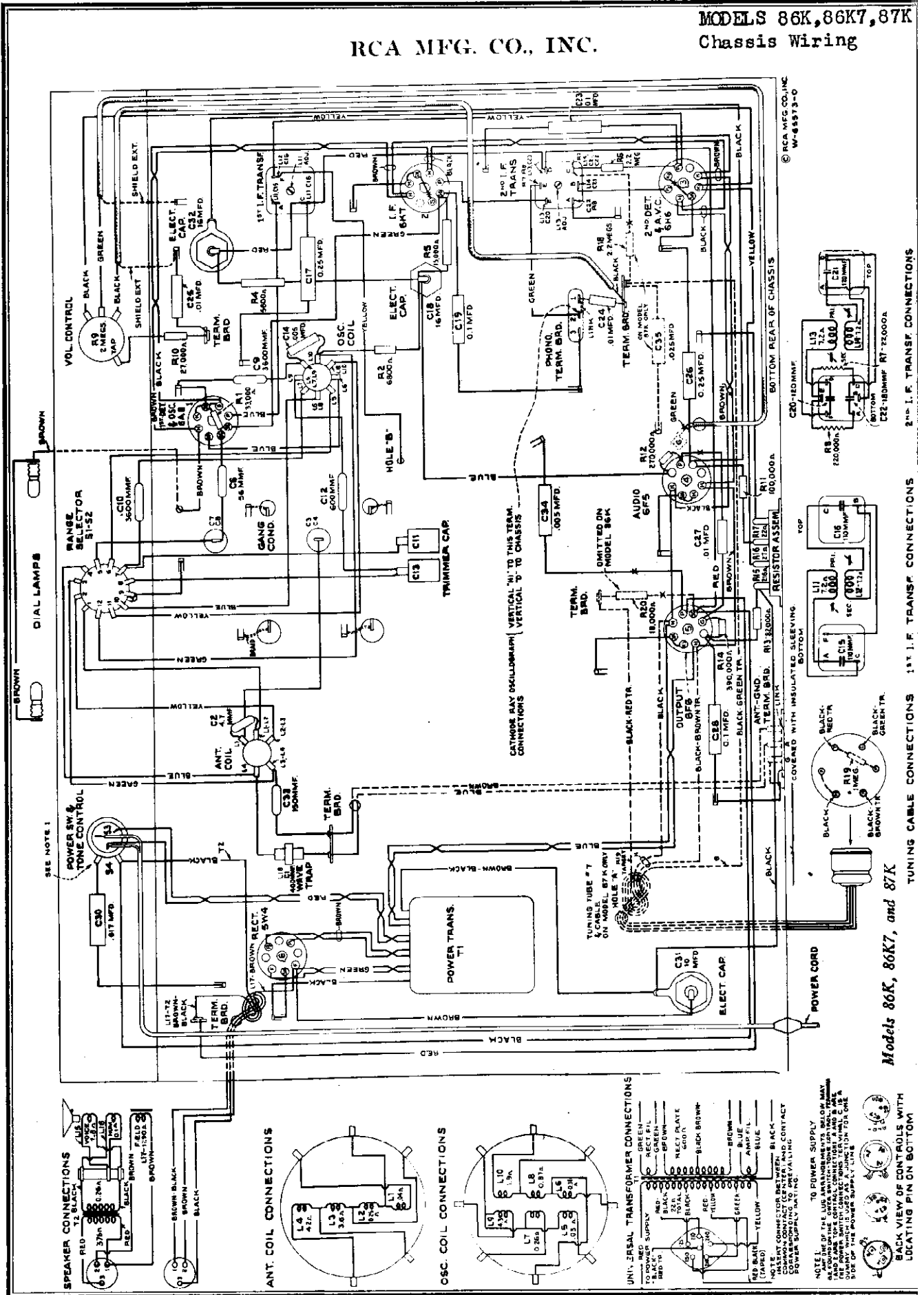
Chassis Base Dimensions (86E, 86K, 86K7, 87K) .14% inches x 9% inches x 3 1/4 inches
 Overall Chassis Height..... 9 1/2 inches
 Chassis Base Dimensions (86T, 86T1, 87T)..... 15% inches x 6 1/2 inches x 2% inches
 Overall Chassis Height..... 9 inches
 Tuning Drive Ratio..... 20 to 1

MODEL 86E
Chassis Wiring

RCA MFG. CO., INC.



RCA MFG. CO., INC.



Models 86K, 86K7, and 87K

NOTE 1: THE LUG ARRANGEMENTS BELOW MAY VARY FROM THE LUG ARRANGEMENTS SHOWN IN THIS WIRING DIAGRAM. CHECK THE LUG ARRANGEMENTS ON THE POWER SUPPLY LINE AS A PRECAUTION FOR CORRECT CONNECTIONS TO THE POWER SUPPLY LINE.

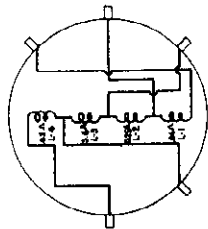
NOTE 2: THE LUG ARRANGEMENTS BELOW MAY VARY FROM THE LUG ARRANGEMENTS SHOWN IN THIS WIRING DIAGRAM. CHECK THE LUG ARRANGEMENTS ON THE POWER SUPPLY LINE AS A PRECAUTION FOR CORRECT CONNECTIONS TO THE POWER SUPPLY LINE.

NOTE 3: THE LUG ARRANGEMENTS BELOW MAY VARY FROM THE LUG ARRANGEMENTS SHOWN IN THIS WIRING DIAGRAM. CHECK THE LUG ARRANGEMENTS ON THE POWER SUPPLY LINE AS A PRECAUTION FOR CORRECT CONNECTIONS TO THE POWER SUPPLY LINE.

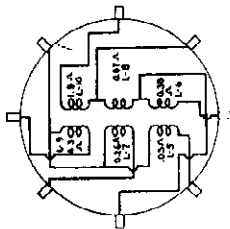
MODELS 86T, 86T1, 87T
Chassis Wiring

RCA MFG. CO., INC.

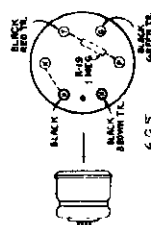
(Models 86T, 86T1, and 87T)



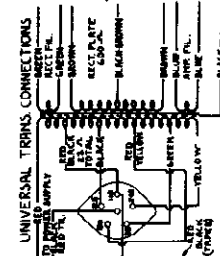
ANT. COIL CONNECTIONS



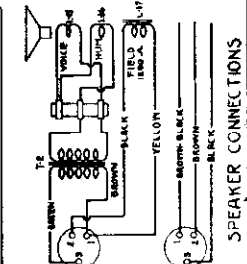
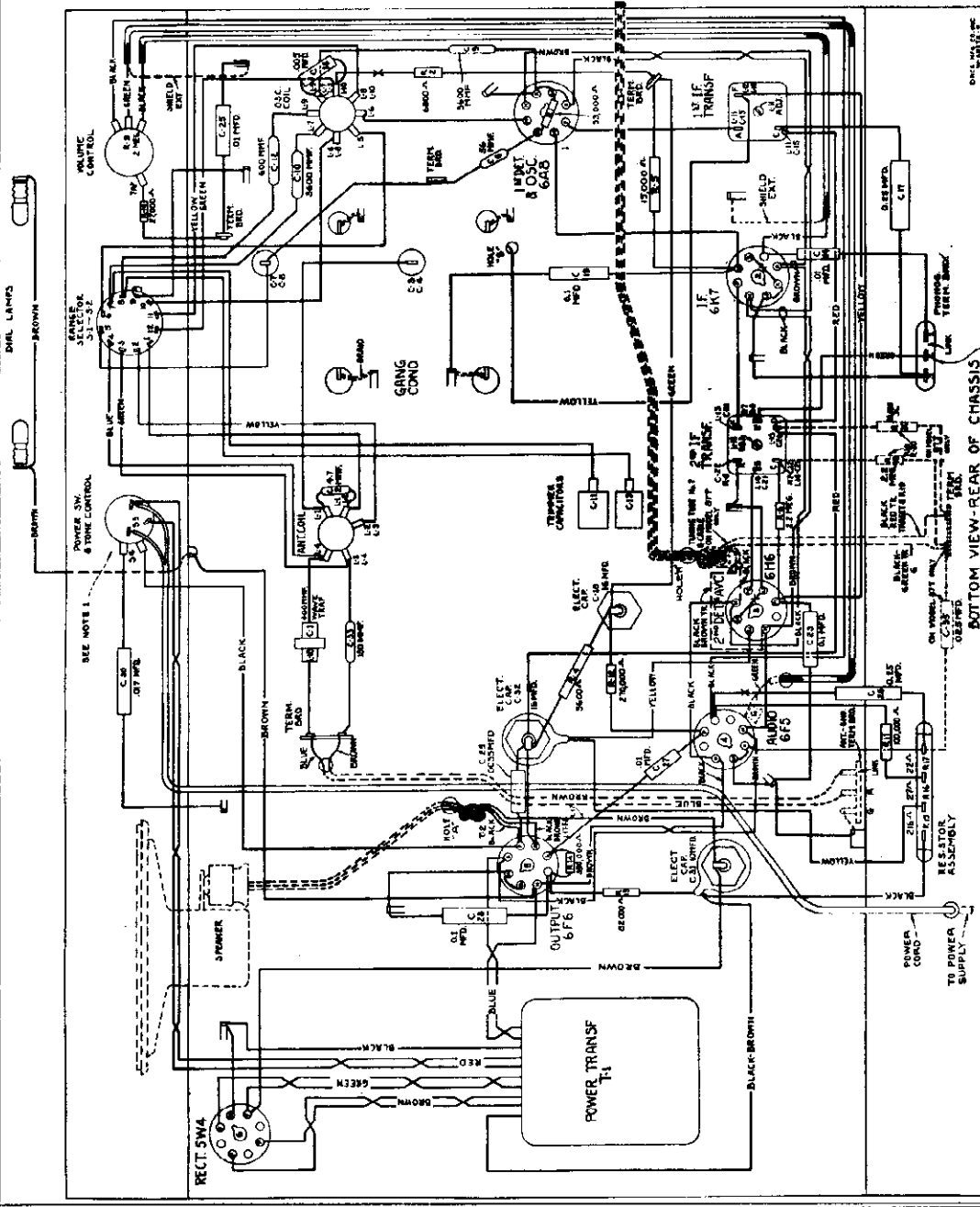
OSC. COIL CONNECTIONS



TUNING COIL CONNECTIONS
87T ONLY

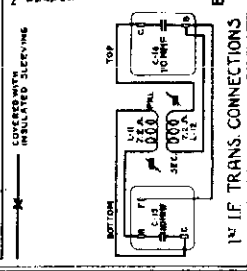
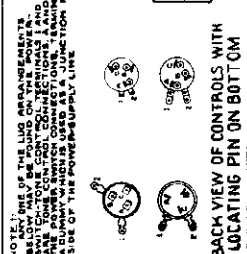
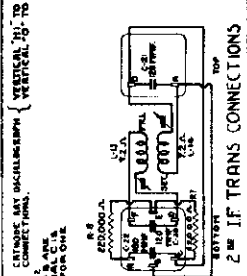


NOTE: SELECT CONNECTOR BETWEEN COMMON CONTACT (CENTER) AND CONTACT CORRESPONDING TO RELEVANT POWER SUPPLY PARTING.



SPEAKER RESISTANCE VALUES

TYPE	W	L	U	R	RES.
1	2.5	0.18	0.80	0.37	
2	4.5	0.22	1.00	0.50	



RCA MFG. CO., INC.

MODELS 86E, 86K, 86K7, 87K
86T, 86T1, 87T
Voltage, Socket, Trimmers

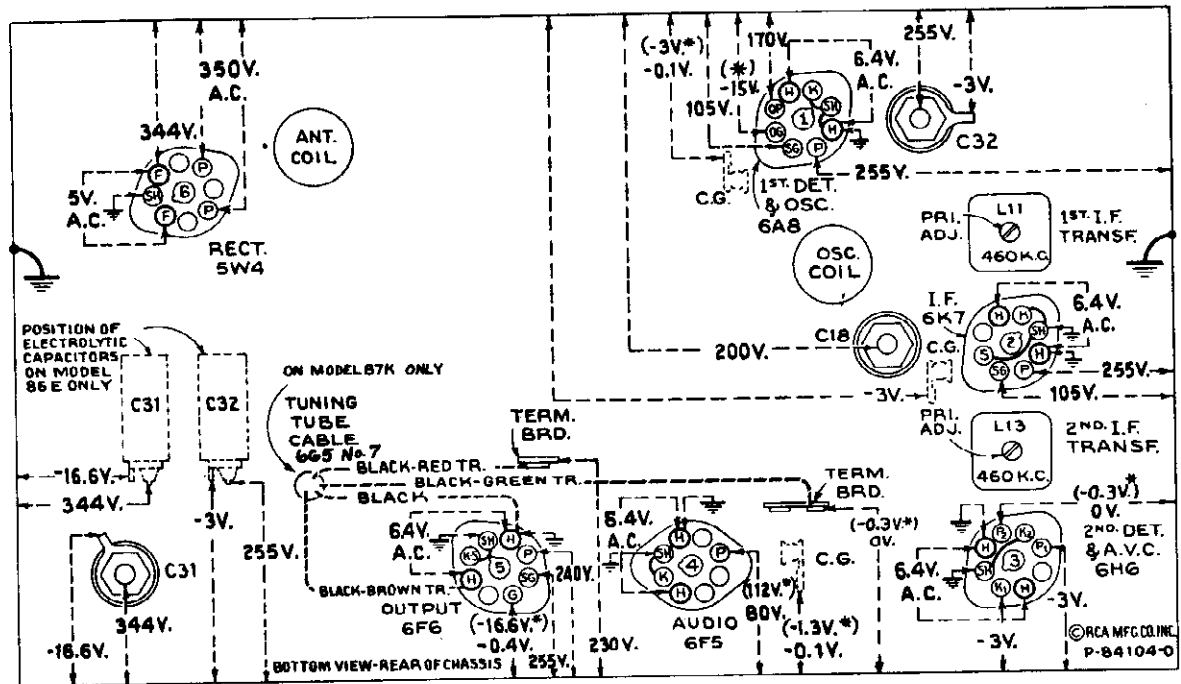


Figure 3—Radiotron Socket Voltages, Coil, and Trimmer Locations (Models 86E, 86K, 86K7, and 87K)

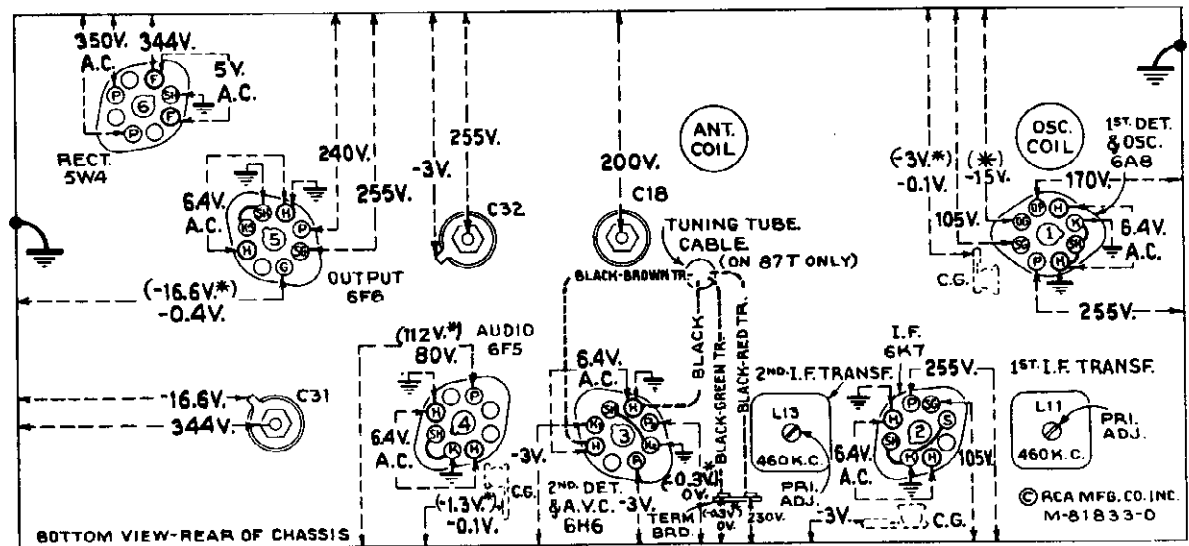


Figure 4—Radiotron Socket Voltages, Coil, and Trimmer Locations (Models 86T, 86T1, and 87T)

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc ("Standard Broadcast")—
No signal being received—Volume control minimum

Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.

Voltage values as specified should hold within $\pm 20\%$ when the receiver is normally operative at its rated line voltage. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250, and 500 volts. Use the nearest range above the specified measured voltage. A-c voltages were measured with a corresponding a-c meter.

MODELS 86E, 86K, 86K7, 87K
86T, 86T1, 87T
Socket, Trimmers
Alignment

RCA MFG. CO., INC.

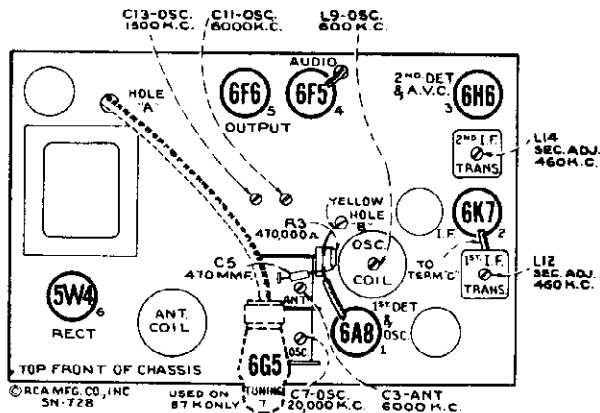


Figure 1—Radiotron, Coil, and Trimmer Locations (Models 86E, 86K, 86K7, and 87K)

R-F ALIGNMENT FREQUENCIES

- "Short Wave" (C)..... 20,000 kc (osc.)
- "Medium Wave" (B)..... 6,000 kc (osc., ant.)
- "Broadcast" (A)..... 600 kc (osc.), 1,500 kc (osc.)

Radiotron Cathode Current Readings
Measured with Milliammeter Connected at Tube Socket Cathode Terminals Under Conditions Similar to Those of Voltage Measurements

(1) RCA-6A8—1st Det.—Osc.....	14. ma.
(2) RCA-6K7—I-F Amp.....	8.5 ma.
(3) RCA-6H6—2nd Det. and A.V.C.....	.....
(4) RCA-6F5—Audio Driver.....	0.26 ma.
(5) RCA-6F6—Power Amplifier.....	37. ma.
(6) RCA-5W4—Rectifier.....	63. ma.**
(7) RCA-6G5—Tuning Tube.....	1.2 ma.

** Cannot be measured at socket.

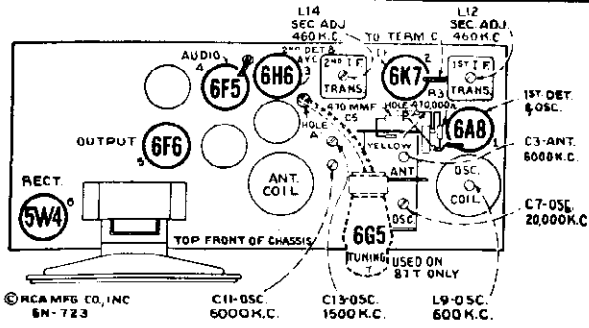


Figure 2—Radiotron, Coil, and Trimmer Locations (Models 86T, 86T1, and 87T)

Alignment Procedure

Calibrate the tuning dial by adjusting main dial pointer to the low-frequency (end) calibration mark on dial with the gang tuning-condenser plates in full-mesh position; then adjust the small (vernier) pointer to "O." These are friction adjustments.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1, 2, 3, and 4.

Cathode-ray alignment is highly preferable; the connections to the chassis are shown on figures 6, 7, and 8. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to the receiver "G" (ground) terminal for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

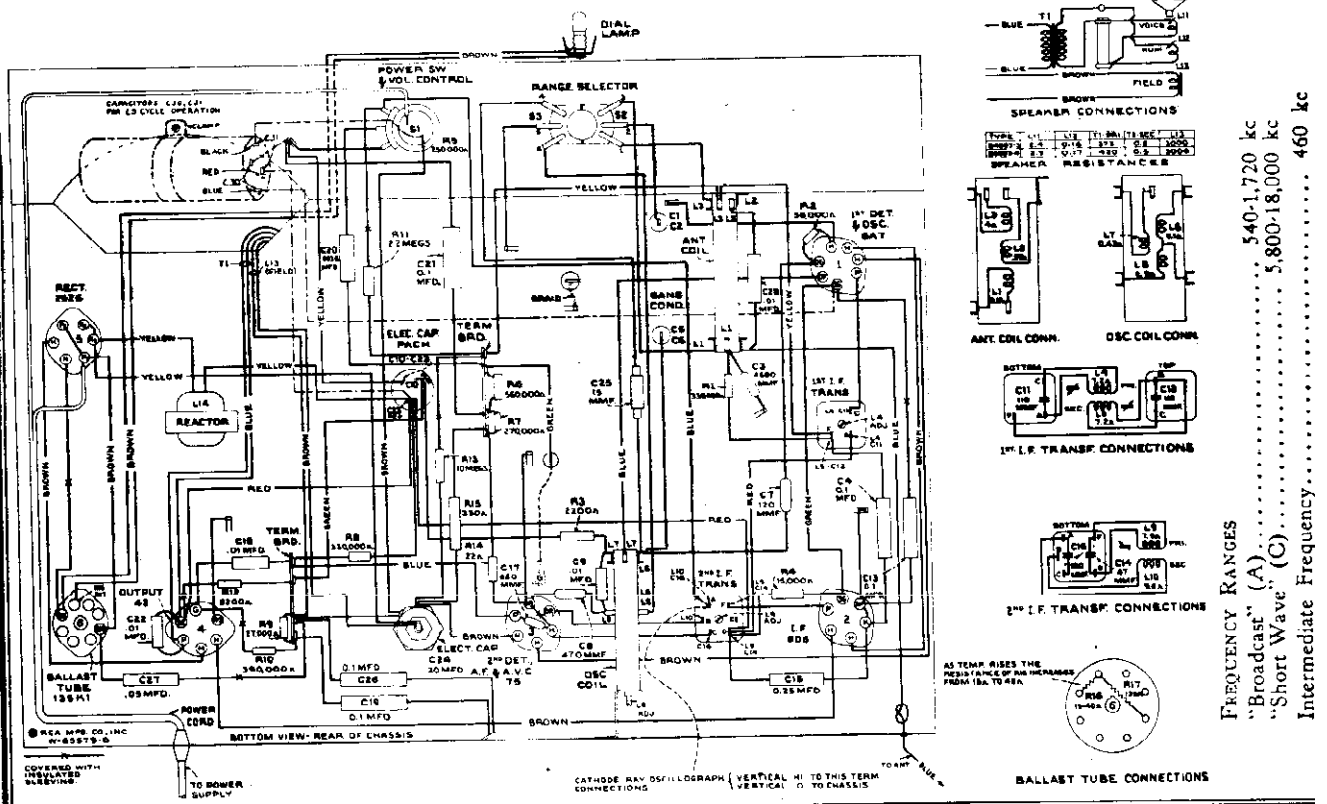
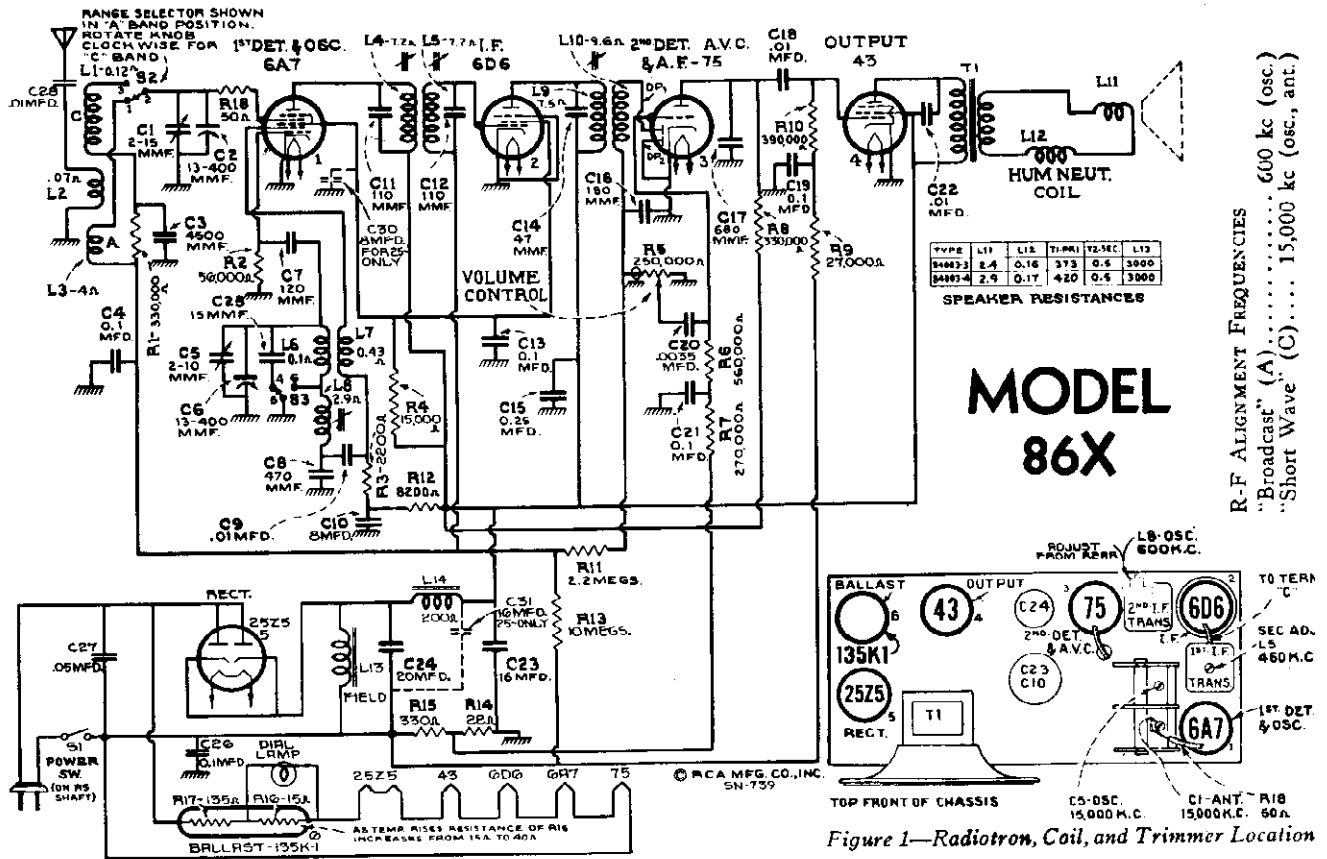
For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting					
1	6K7 I-F Grid Cap	.001 Mfd.	460 kc	"A" Left	No Signal 550-750 kc	2nd I-F Trans.	L13 and L14	Max. (peak)
2	6A8 Det. Grid Cap	.001 Mfd.	460 kc	"A"	No Signal 550-750 kc	1st I-F Trans.	L11 and L12	Max. (peak)
3	Ant. Term.	300 Ohms	20,000 kc	"C" Right	20,000 kc	"C" Osc.	C7	Max. (peak)*†
4	Ant. Term.	300 Ohms	6,000 kc	"B" Center	6,000 kc	"B" Osc.	C11	Max. (peak)*
5	Ant. Term.	300 Ohms	6,000 kc	"B"	6,000 kc	"B" Ant.	C3	Max. (peak)
6	Ant. Term.	200 Mmfd.	600 kc	"A" Left	600 kc	"A" L-F Osc.	L9	Max. (peak)
7	Ant. Term.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" H-F Osc.	C13	Max. (peak)
8	Ant. Term.	200 Mmfd.	600 kc	"A"	600 kc	"A" L-F Osc.	L9	Max. (peak)
9	Ant. Term.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" H-F Osc.	C13	Max. (peak)

* Use minimum capacity peak if two peaks can be obtained.
† After this adjustment, check for image signal by shifting receiver dial to 19,080 kc.

RCA MFG. CO., INC.

MODEL 86X
Schematic, Socket
Chassis Wiring
Trimmers



MODEL 86X
Alignment
Voltage

RCA MFG. CO., INC.

Alignment Procedure

Calibrate the tuning dial by adjusting dial pointer to the center horizontal line with the gang tuning-condenser plates in full-mesh position. This is a screw-driver adjustment.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 4.

Cathode-ray alignment is preferable; the connections to the chassis are shown on figure 3. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to the receiver chassis for all alignment operations. Regulate

the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

Order of Alignment	Test Oscillator			Range-Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting					
1	6D6 I-F Grid Cap	.001 Mfd.	460 kc	"A" Left	No Signal 550-750 kc	2nd I-F Trans.	L8	Max. (peak)
2	6A7 Det. Grid Cap	.001 Mfd.	460 kc	"A" Left	No Signal 550-750 kc	1st I-F Trans.	L4 and L5	Max. (peak)
3	Ant. Lead (blue)	300 Ohms	15,000 kc	"C" Right	15,000 kc	"C" Osc.	C5	Max. (peak)†
4	Ant. Lead (blue)	300 Ohms	15,000 kc	"C" Right	Rock Through 15,000 kc	"C" Ant.	C1	Max. (peak)*‡
5	Ant. Lead (blue)	200 Mmfd.	600 kc	"A" Left	600 kc	"A" Osc.	L8	Max. (peak)

† Use maximum capacity peak if two peaks can be obtained.

* Use minimum capacity peak if two peaks can be obtained.

‡ After this adjustment, check for image signal by shifting receiver dial to 15,920 kc.

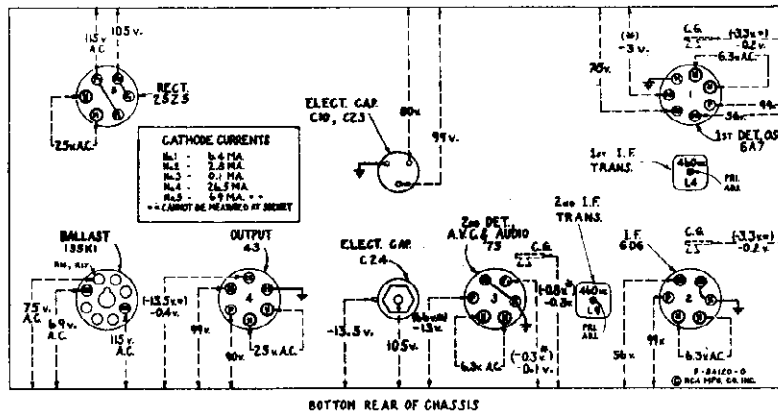


Figure 4—Radiotron Socket Voltages, Coil, and Trimmer Locations

Measured at 115 volts, 60-cycle supply—For 115-volt d-c supply approximately 10% lower, except heater voltage which remains the same—Tuned to approximately 1,000 kc ("Standard Broadcast") -No signal being received—Volume control minimum.

Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.

Voltage values as specified should hold within ±20% when the receiver is normally operative at its rated line voltage. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250 and 500 volts. Use the nearest range above the specified measured voltage. A-c voltages were measured with a corresponding a-c meter.

RCA MFG. CO., INC.

MODEL 86X
Notes, Parts

Electrical Specifications

Pilot Lamp (1)	Mazda No. 40, 6.3 volts, 0.15 ampere
POWER SUPPLY RATINGS	
A-C Rating	105-125 volts, 50-100 cycles, 58 watts
POWER OUTPUT—(125 volt, A-C supply)	
Undistorted	0.5 watt
Maximum	1.2 watts
LOUDSPEAKER	
Type	6-inch Electrodynamic
D-C Rating 105-125 volts, 58 watts	
POWER OUTPUT—(125 volt, D-C supply)	
Undistorted	0.4 watt
Maximum	1.0 watt
Impedance (V.C.)	{(84003-3) 2.6 ohms } {(84003-4) 3.4 ohms } at 400 cycles

Service Data

CAUTION: The chassis is connected to one side of the power supply. Avoid contact of chassis or parts to external ground when servicing.

The various diagrams of this booklet contain such information as will be needed to isolate causes for defective operation if such develops. The ratings of the resistors, capacitors, coils, etc., are indicated adjacent to the symbols signifying these parts on the diagrams. Identification titles such as R1, L1, C1, etc., provide reference between the illustrations and Replacement Parts List. The coils, transformer windings, and reactors are rated in terms of d-c resistance to permit continuity checks.

Precautionary Lead Dress—(1) Dress power line leads to the on-off switch away from grid connection terminal on volume control to reduce hum pick-up. (2) Keep leads of capacitor C3 as short as possible. (3) Bus lead from range

selector (ter. 6) to oscillator coil tap L6L8 should be maintained 3/2 inches long for proper alignment. (4) Capacitor C25 should be dressed free of adjacent parts to maintain correct alignment at high-frequency end of "A" band. (5) Bus lead from range selector (ter. 3) to antenna coil L1 should be maintained 2 1/4 inches long for proper alignment. (6) The RCA-6A7 grid-cap lead (50-ohm resistor R18) to top of tuning capacitor C2 should be dressed properly to prevent shorts and should be maintained flexible to prevent acoustic howl.

Loudspeaker—Centering of the loudspeaker voice coil is made in the usual manner with three narrow paper feelers.

Operation on 25-Cycle A-C Supply—For 25-cycle operation, install RCA Stock No. 14767 capacitor pack and clamp under chassis below speaker and make connections as shown dotted on figure 3. Use a No. 6-32 machine screw for anchoring clamp in hole provided.

REPLACEMENT PARTS

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
RECEIVER ASSEMBLIES			
14634	Belt—Variable condenser drive belt	11400	Resistor—27,000 Ohms—Carbon type, 1/2 watt (R9)
14632	Bracket—Dial mounting bracket	5029	Resistor—56,000 Ohms—Carbon type, 1/2 watt (R2)
5237	Bushing—Variable condenser rubber mounting bushing	11323	Resistor—270,000 Ohms—Carbon type, 1/2 watt (R7)
12118	Cap—Grid contact cap	13733	Resistor—330,000 Ohms—Carbon type, 1/2 watt (R1, R8)
12996	Capacitor—15 Mmfd. (C25)	13479	Resistor—390,000 Ohms—Carbon type, 1/2 watt (R10)
12405	Capacitor—47 Mmfd. (C14)	5035	Resistor—560,000 Ohms—Carbon type, 1/2 watt (R6)
12482	Capacitor—110 Mmfd. (C11, C12)	12679	Resistor—2.2 Megohm—Insulated, 1/2 watt (R11)
12724	Capacitor—120 Mmfd. (C7)	13601	Resistor—10 Megohm—Insulated, 1/2 watt (R13)
12406	Capacitor—180 Mmfd. (C16)	14649	Resistor—Ballast resistor tube type No. 135K1 (R16, R17)
30396	Capacitor—470 Mmfd. (C8)	5129	Ring—Radiotron shield ring
14498	Capacitor—680 Mmfd. (C17)	4389	Screw—No. 6—32x3/16 headless set screw for pulley No. 14639
30245	Capacitor—0045 Mfd. (C3)	14638	Shaft—Station selector knob shaft and pulley
5005	Capacitor—0035 Mfd. (C20)	12008	Shield—First I.F. transformer shield
4858	Capacitor—01 Mfd. (C28)	12408	Shield—Second I.F. transformer shield
13138	Capacitor—01 Mfd. (C9, C18, C22)	11265	Shield—Radiotron shield
4836	Capacitor—05 Mfd. (C27)	14650	Socket—Dial lamp socket
4839	Capacitor—01 Mfd. (C26)	4786	Socket—6-contact 6D6, 25Z5, 43 or 75 Radiotron socket
4841	Capacitor—0.1 Mfd. (C4, C13, C19, C21)	4787	Socket—7-contact 8A7 Radiotron socket
4840	Capacitor—0.25 Mfd. (C15)	11196	Socket—8-contact ballast resistor socket
14643	Capacitor—20 Mfd. (C24)	14637	Spring—Idler pulley tension spring
14644	Capacitor Pack—Comprising one 16 Mfd. and one 8 Mfd. section (C10, C23)	12007	Spring—Retaining spring for core Stock Nos. 12006 and 14648
14787	Capacitor Pack—Comprising one 16 Mfd. and one 8 Mfd. section and one clamp (for 25 cycle operation only) (C30, C31)	14640	Switch—Range switch (S2, S3)
14646	Coil—Antenna coil (L1, L2, L3)	14376	Transformer—First I.F. transformer (L4, L5, C11, C12)
14647	Coil—Oscillator coil (L6, L7, L8)	14642	Transformer—Second I.F. transformer (L9, L10, C14, C16)
14633	Condenser—2 gang variable tuning condenser (C1, C2, C5, C6)	14645	Volume Control and power switch (R5, S1)
14648	Core—Adjustable core and stud for Oscillator coil	REPRODUCER ASSEMBLIES	
12006	Core—Adjustable core and stud for I.F. transformer	14682	Cone—Reproducer cone (L11) for speaker marked 84003-3
14631	Dial—Station selector dial	14936	Cone—Reproducer cone (L11) for speaker marked 84003-4
14651	Drive—Variable condenser vernier drive and pinion gear	14681	Reproducer Complete
14635	Indicator—Station selector indicator pointer	14683	Transformer—Output transformer (T1) for speaker marked 84003-3
4340	Lamp—Dial lamp	14937	Transformer—Output transformer (T1) for speaker marked 84003-4
14636	Pulley—Idler pulley—less spring	MISCELLANEOUS ASSEMBLIES	
14639	Pulley—Variable condenser drive pulley—located on condenser shaft	14654	Escutcheon—Station selector escutcheon and crystal
14641	Reactor—Filter reactor (L14)	12673	Knob—Station selector, volume control or range switch knob
14525	Resistor—22 Ohms—Carbon type, 1/2 watt (R14)	14287	Screw—Chassis mounting screw and washer
14653	Resistor—50 Ohms—Flexible type, 1/10 watt (R18)	4119	Screw—No. 8—32x1/4 headless set screw for knob Stock No. 12673
14652	Resistor—330 Ohms—Wire wound, 1 watt (R15)		
5159	Resistor—2,200 Ohms—Carbon type, 1/2 watt (R3)		
14296	Resistor—8,200 Ohms—Carbon type, 1/2 watt (R12)		
12759	Resistor—15,000 Ohms—Carbon type, 1/2 watt (R4)		

MODEL 88K

Alignment, Parts

RCA MFG. CO., INC.

Calibrate the tuning dial by adjusting main dial pointer to the low-frequency (end) calibration mark on dial with the gang tuning-condenser plates in full-mesh position; then adjust the small (vernier) pointer to "O." These are friction adjustments.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 2.

Cathode-ray alignment is highly preferable; the connections to the chassis are shown on figure 4. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to

the receiver "G" (ground) terminal for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting					
1	6K7 I-F Grid Cap	.001 Mfd.	460 kc	"A" Left	No Signal 550-750 kc	2nd I-F Trans.	L16 and L17	Max. (peak)
2	6L7 Det. Grid Cap	.001 Mfd.	460 kc	"A"	No Signal 550-750 kc	1st I-F Trans.	L14 and L15	Max. (peak)
3	Ant. Term.	300 Ohms	20,000 kc	"C" Right	20,000 kc	"C" Osc.	C20	Max. (peak) *
4	Ant. Term.	300 Ohms	20,000 kc	"C"	20,000 kc	"C" Det.	C9	Max. (peak) †
5	Ant. Term.	300 Ohms	20,000 kc	"C"	20,000 kc	"C" Ant.	C2	Max. (peak) ‡
6	Ant. Term.	300 Ohms	6,000 kc	"B" Center	6,000 kc	"B" Osc.	C23	Max. (peak) *
7	Ant. Term.	200 Mmfd.	600 kc	"A" Left	600 kc	"A" L-F Osc.	L13	Max. (peak)
8	Ant. Term.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" H-F Osc.	C26	Max. (peak)
9	Ant. Term.	200 Mmfd.	600 kc	"A"	600 kc	"A" L-F Osc.	L13	Max. (peak)
10	Ant. Term.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" H-F Osc.	C26	Max. (peak)

* Use minimum capacity peak if two peaks can be obtained.

† Use maximum capacity peak if two peaks can be obtained.

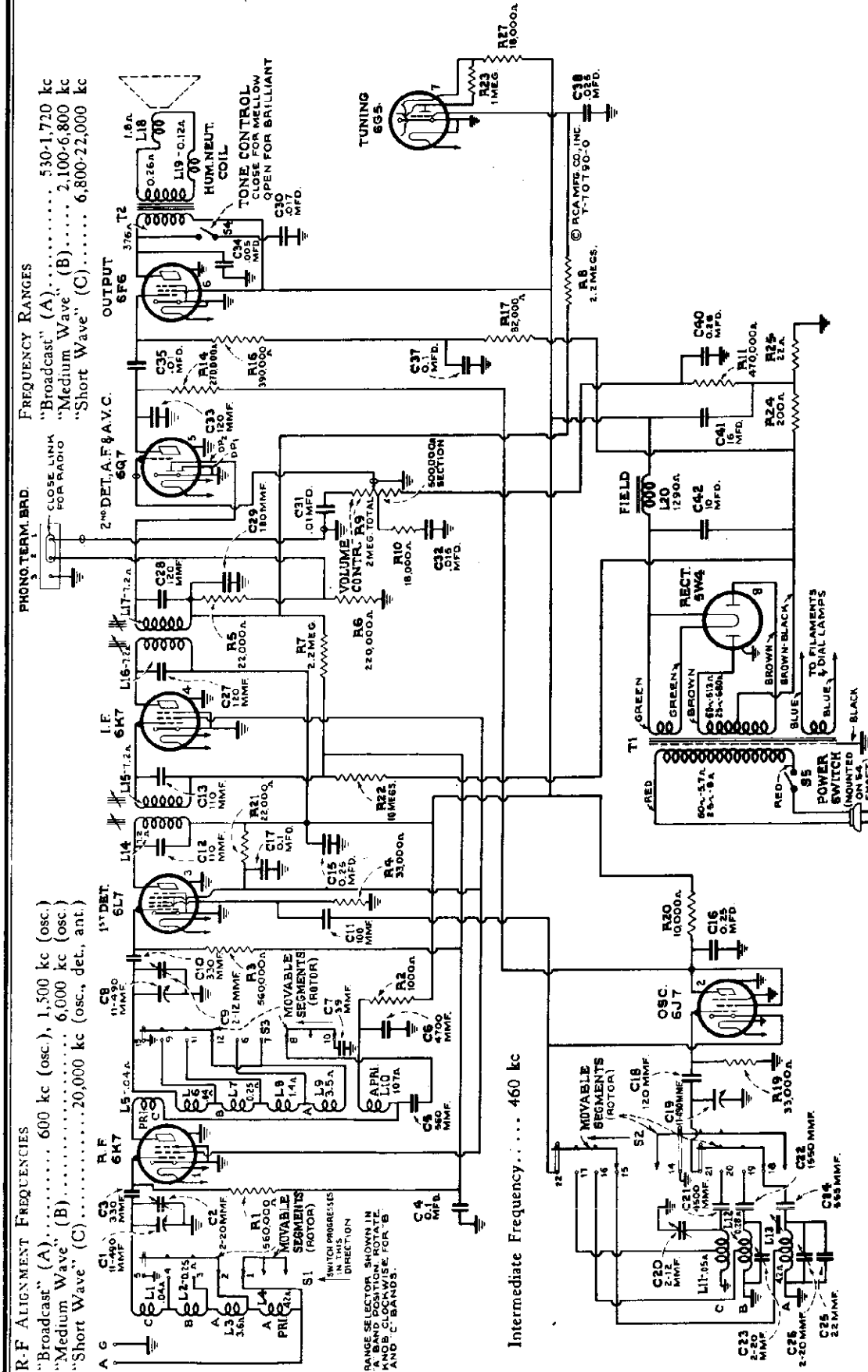
‡ After this adjustment, check for image signal by shifting receiver dial to 19,080 kc.

RECEIVER ASSEMBLIES

12038	Band—Rubber band for tuning tube	12471	Plate—6J7 Radiotron socket mounting plate and rubber cushions—less socket—Stock No. 11198
14394	Belt—Variable condenser drive belt	14340	Pulley—Station selector drive belt pulley and knob shaft
14517	Board—Antenna and ground terminal board	14522	Reflector—Dial reflector and bracket complete with dial lamp brackets, tuning lamp bracket, and tone and band indicators
12717	Board—Phonograph terminal board	14525	Resistor—22 Ohms, Carbon type, 1/2 watt (R25)
14338	Bushing—Variable condenser mounting bushing assembly	14526	Resistor—200 Ohms, Wire wound, 2 1/2 watts (R24)
14524	Cable—Band indicator cable approx. 8 1/2-in. long	5112	Resistor—1,000 Ohms, Carbon type, 1/2 watt (R2)
14523	Cable—Tone control indicator cable approx. 3-in. long	8043	Resistor—10,000 Ohms, Carbon type, 1/2 watt (R20)
14394	Cable—Tuning tube cable and socket	11175	Resistor—18,000 Ohms, Carbon type, 1/2 watt (R10)
12607	Cap—First I-F transformer shield top	14078	Resistor—18,000 Ohms, Carbon type, 1 watt (R27)
12581	Cap—Second I-F transformer shield top	14284	Resistor—22,000 Ohms, Carbon type, 1/10 watt (R5)
11350	Cap—Grid contact cap	13669	Resistor—22,000 Ohms, Carbon type, 2 watt (R21)
12884	Capacitor—Adjustable trimmer (long) (C2, C23, C26)	11300	Resistor—33,000 Ohms, Carbon type, 1/10 watt (R19)
12714	Capacitor—Adjustable trimmer (medium) (C9, C20)	13735	Resistor—33,000 Ohms, Carbon type, 1/2 watt (R4)
14021	Capacitor—22 Mmfd. (C25)	11365	Resistor—82,000 Ohms, Carbon type, 1/2 watt (R17)
13545	Capacitor—39 Mmfd. (C7)	11398	Resistor—220,000 Ohms, Carbon type, 1/10 watt (R6)
12720	Capacitor—100 Mmfd. (C11)	11323	Resistor—270,000 Ohms, Carbon type, 1/2 watt (R14)
14262	Capacitor—110 Mmfd. (C12, C18)	13005	Resistor—390,000 Ohms, Carbon type, 1/10 watt (R16)
12404	Capacitor—120 Mmfd. (C27, C28)	11172	Resistor—470,000 Ohms, Carbon type, 1/2 watt (R11)
12724	Capacitor—120 Mmfd. (C18, C33)	11397	Resistor—560,000 Ohms, Carbon type, 1/10 watt (R1, R3)
12406	Capacitor—180 Mmfd. (C29)	12013	Resistor—1 Megohm, Carbon type, 1/10 watt (R23)
12952	Capacitor—330 Mmfd. (C3, C10)	11828	Resistor—2.2 Megohm, Carbon type, 1/2 watt (R7, R8)
12727	Capacitor—555 Mmfd. (C24)	13732	Resistor—10 Megohm, Carbon type, 1/2 watt (R22)
12537	Capacitor—560 Mmfd. (C5)	14343	Retainer—Station selector knob shaft and pulley retainer
12729	Capacitor—1,550 Mmfd. (C22)	14350	Screw—No. 8—32x3/16 square head set screw for hub and arm on tone or band indicator cable, drum Stock No. 14345, Gear Stock No. 30085
12728	Capacitor—4,500 Mmfd. (C21)	14374	Shield—Antenna or R-F coil shield
12897	Capacitor—4,700 Mmfd. (C6)	14375	Shield—Oscillator coil shield
4838	Capacitor—.005 Mfd. (C34)	12008	Shield—First or second I-F transformer shield
13138	Capacitor—.01 Mfd. (C31, C35)	11195	Socket—5-contact 5W4 Radiotron socket
11315	Capacitor—.015 Mfd. (C32)	11196	Socket—6-contact 6F6, 6K7, 6J7, 6L7, or 6Q7 Radiotron socket
4752	Capacitor—.017 Mfd. (C30)	14114	Socket—Dial lamp socket
4870	Capacitor—.025 Mfd. (C38)	12007	Spring—Retaining spring for core Stock Nos. 12006 and 12800
4830	Capacitor—.01 Mfd. (C4, C17, C37)	12907	Spring—Tension spring for indicator drive gear Stock No. 30085
5170	Capacitor—.025 Mfd. (C16)	14342	Spring—Tension spring for idler Stock No. 14341
12484	Capacitor—.025 Mfd. (C18, C40)	14371	Switch—Low frequency tone and power switch (S4, S5)
11203	Capacitor—10 Mfd. (C42)	14515	Switch—Range switch (S1, S2, S3)
5212	Capacitor—16 Mfd. (C41)	14378	Transformer—First I-F transformer (L14, L15, C12, C13)
14372	Coil—Antenna coil and shield (L1, L2, L3, L4)	14283	Transformer—Second I-F transformer (L16, L17, C27, C28, C29, R5, R6)
14518	Coil—Oscillator coil and shield (L11, L12, L13)	14511	Transformer—Power transformer, 105-125 volts, 50-60 cycles (T1)
14414	Coil—R-F coil and shield (L5, L6, L7, L8, L9, L10)	14512	Transformer—Power transformer, 105-125 volts, 25-60 cycles (T1)
14513	Condenser—3-gang variable tuning condenser (C1, C8, C19)	14335	Volume Control (R9)
5119	Connector—3-contact female connector for speaker cable	14379	Washer—Felt washer for indicator pointer
12006	Core—Adjustable core and stud for Stock Nos. 14376 and 14283		
12800	Core—Adjustable core and stud for coil Stock No. 14516		
14518	Dial—Station selector dial scale complete with tuning tube escutcheon		
14514	Drive—Variable condenser vernier drive pinion gear and shaft		
14345	Drum—Variable condenser drive belt drum complete with set screws		
14519	Indicator—Station selector indicator pointer		
14520	Indicator—Vernier indicator pointer		
5228	Lamp—Dial lamp		
14028	Nut—Jam nut for adjustable trimmer capacitor Stock Nos. 12714 and 12884		

RCA MFG. CO., INC.

MODEL 88K
Schematic



PHONO TERM. BRD. CLOSE LINK FOR RADIO
 2ND DET. A.F. & A.V.C. 6Q7
 I.F. 6K7
 1ST DET. 6L7
 R-F ALIGNMENT FREQUENCIES
 "Broadcast" (A) 530-1,720 kc
 "Medium Wave" (B) 2,100-6,800 kc
 "Short Wave" (C) 6,800-22,000 kc

OSC. 6J7
 TUNING 6G5
 T1 60-57A 25-150A
 T2 376A
 T3 1.0A
 T4 1.0A
 T5 1.0A
 T6 1.0A
 T7 1.0A
 T8 1.0A
 T9 1.0A
 T10 1.0A
 T11 1.0A
 T12 1.0A
 T13 1.0A
 T14 1.0A
 T15 1.0A
 T16 1.0A
 T17 1.0A
 T18 1.0A
 T19 1.0A
 T20 1.0A
 T21 1.0A
 T22 1.0A
 T23 1.0A
 T24 1.0A
 T25 1.0A

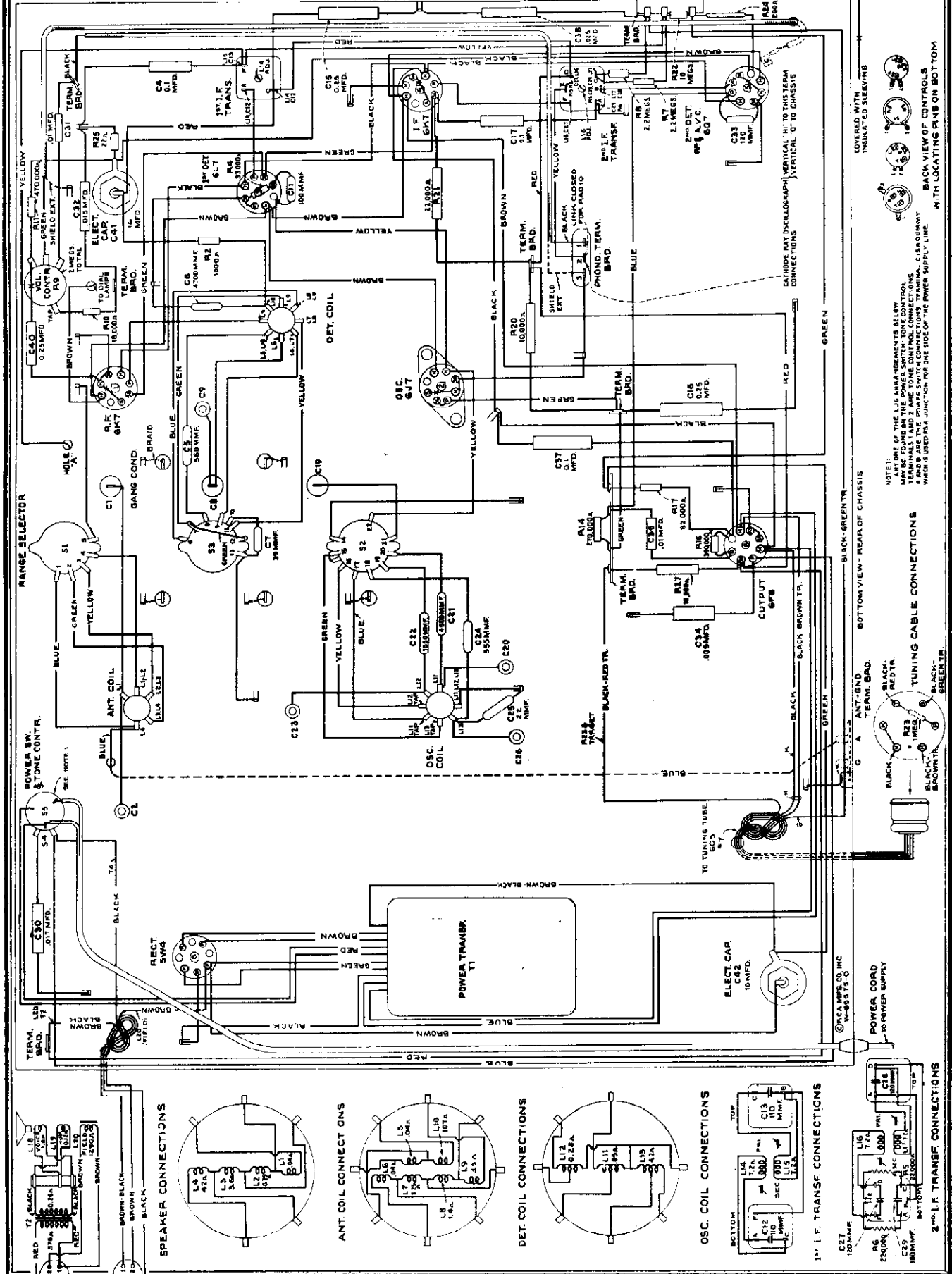
Intermediate Frequency 460 kc

Pilot Lamps (4) Mazda No. 46, 6.3 volts, 0.25 amp.
 POWER SUPPLY RATINGS
 Rating A 105-125 volts, 50-60 cycles, 90 watts
 Rating B 105-125 volts, 25-60 cycles, 90 watts
 Rating C 105-125/200-250 volts, 50-60 cycles, 90 watts
 POWER OUTPUT
 Undistorted 2.5 watts
 Maximum 4.5 watts

LOUDSPEAKER
 Type 12-inch Electrodynamic
 Impedance (v.c.) 2.2 ohms at 400 cycles

MODEL 88K
Chassis Wiring

• RCA MFG. CO., INC.



RCA MFG. CO., INC.

Service Data

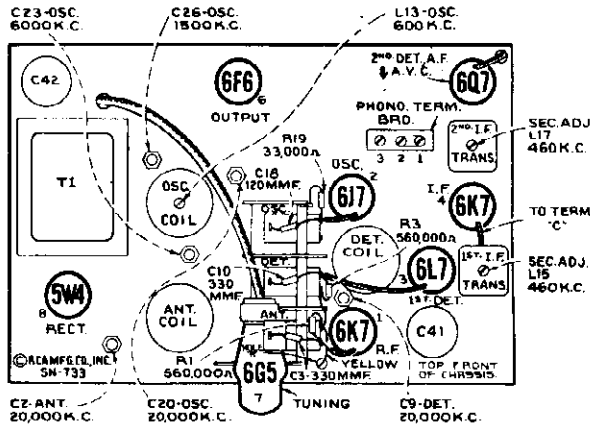


Figure 1—Radiotron, Coil, and Trimmer Locations

Loudspeaker.—Centering of the loudspeaker is made in the usual manner with three narrow paper feelers after first removing the front dust cover. This may be removed by softening its cement with a light application of acetone, using care not to allow the acetone to flow into the air gap. The dust cover should be cemented back in place with ambroid upon completion of adjustment.

Phonograph Attachment.—A terminal board is provided for connecting a phonograph into the audio amplifying circuit. RCA Victor Models R-93, R-93-A, R-93-2, or R-94 Record Players should be connected as follows: Remove link between terminals 1 and 2 on terminal board. Connect green wire in Radio-Record switch cable to terminal 1, yellow to terminal 2, and shield extension to terminal 3. Tape unused red and blue leads separately. Connect a 2-conductor twisted cable between the Record Player binding posts and the screw terminals on Radio-Record switch.

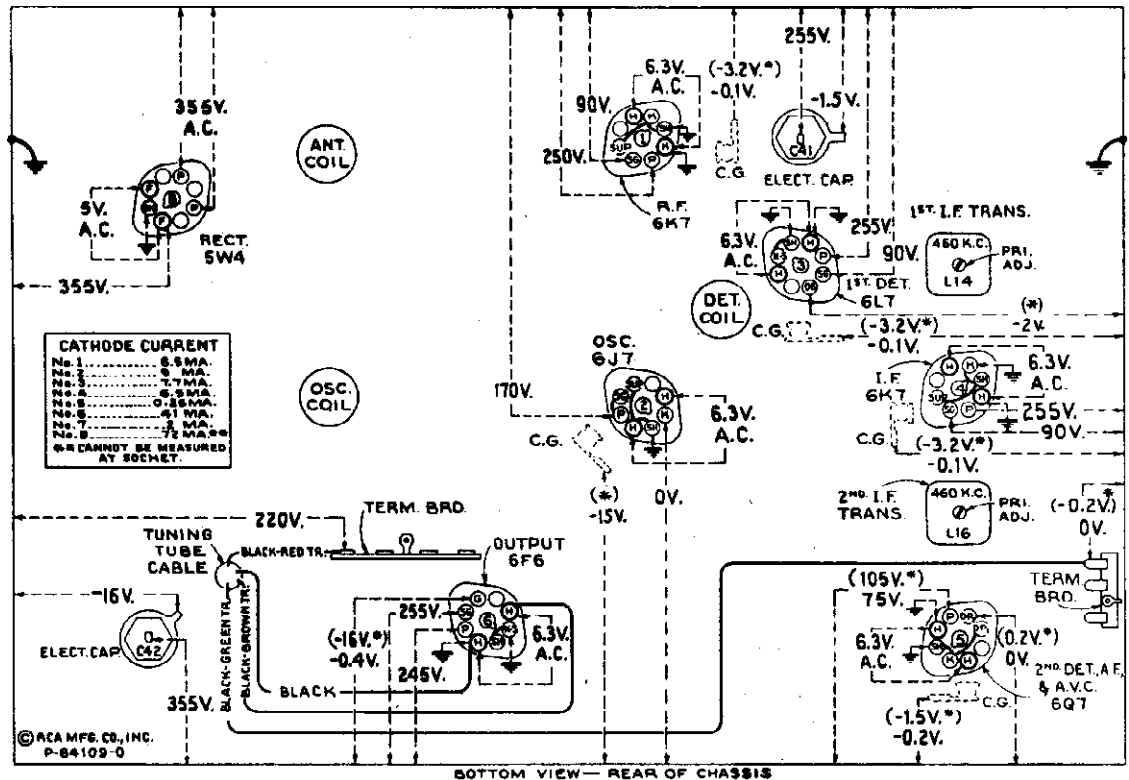


Figure 2—Radiotron Socket Voltages, Coil, and Trimmer Locations

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc ("Standard Broadcast")—
No signal being received—Volume control minimum

Notes: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.

Voltage values as specified should hold within $\pm 20\%$ when the receiver is normally operative at its rated line voltage. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250, and 500 volts. Use the nearest range above the specified measured voltage. A-c voltages were measured with a corresponding a-c meter.

MODELS R-93-A, R-93-2
Motor Details

RCA MFG. CO., INC.

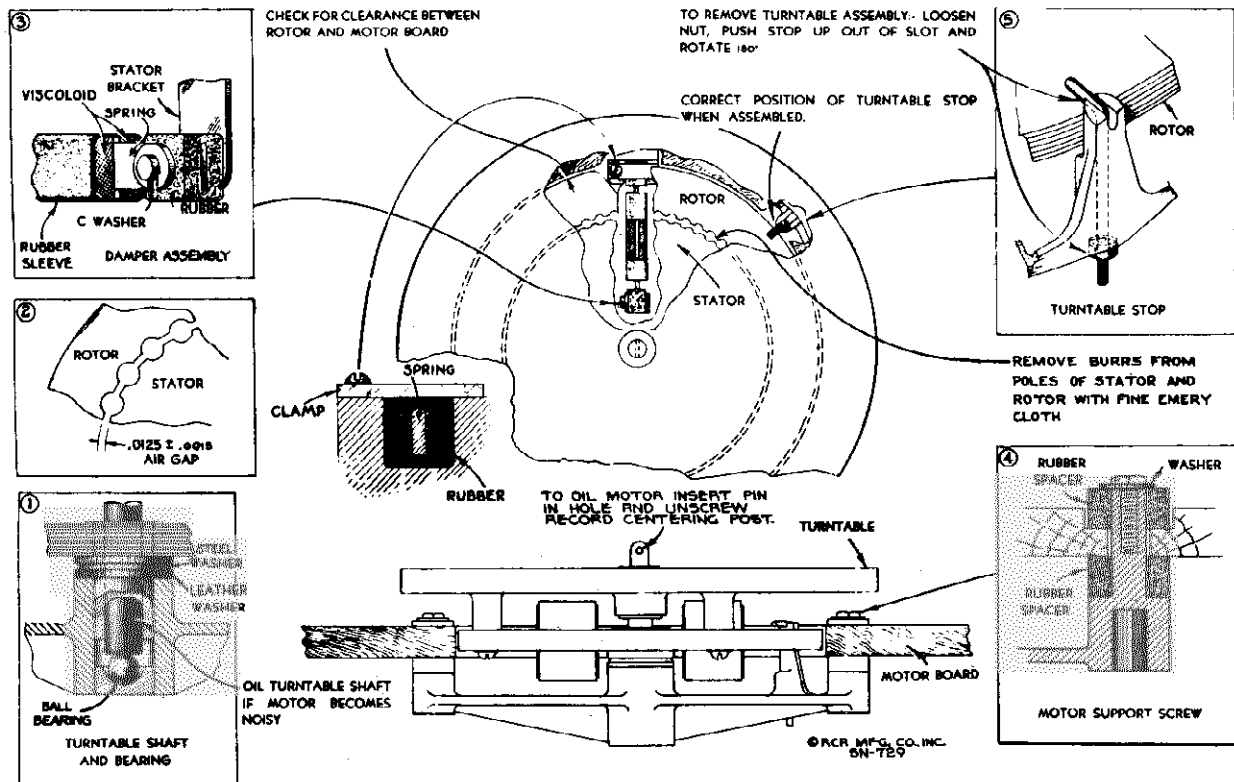


Figure 4—Details of Motor
[Model R-93-A (1st and 2nd prod.)]

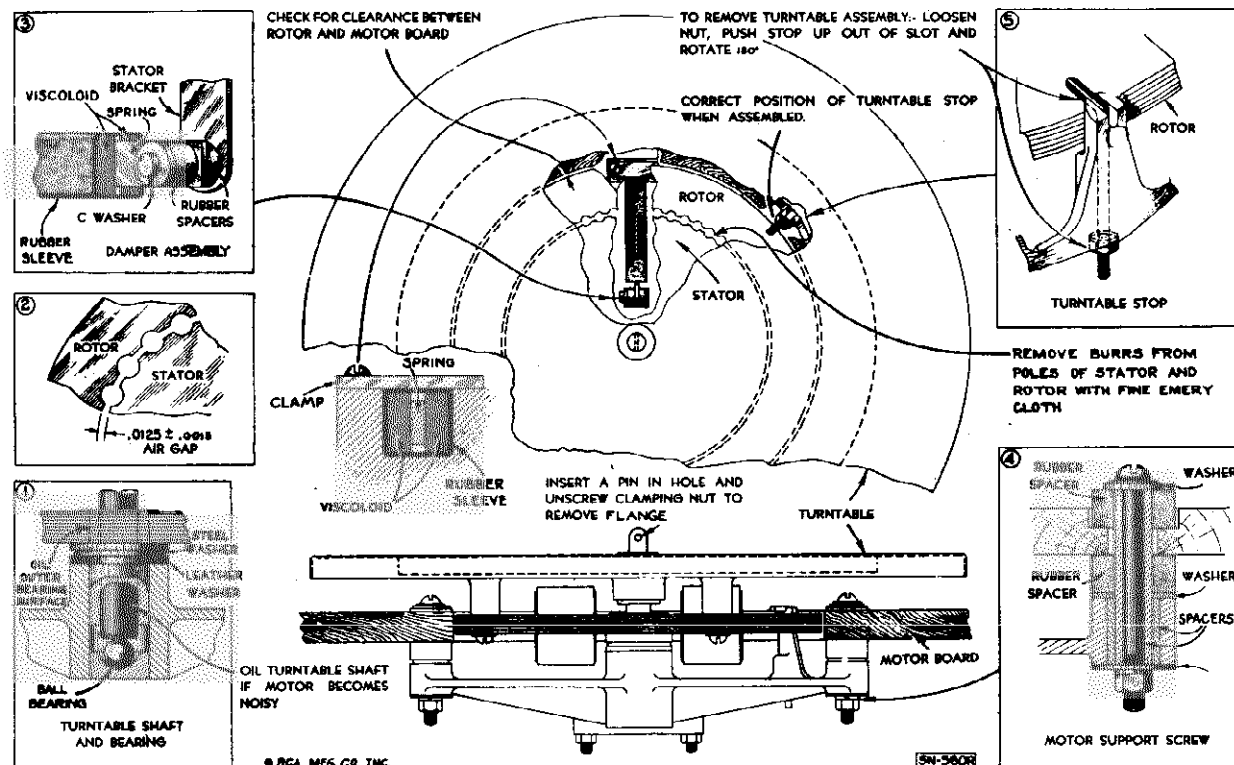


Figure 5—Details of Motor
[Model R-93-2 Deluxe (1st prod.)]

RCA MFG. CO., INC.

MODELS R-93-S, R-94
 Motor Details
 MODELS R-93(3rd Prod.)
 R-93-A, R-93-S, R-94 R-93-2
 Pick-up Details, Schematics

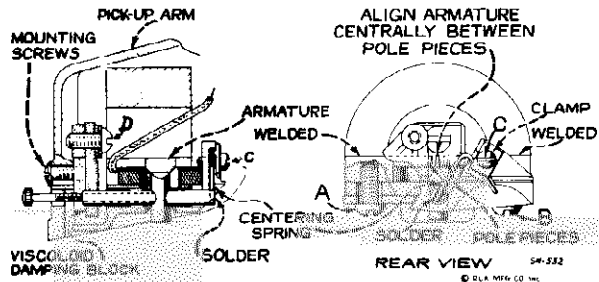


Figure 1—Details of Pickup
 [Models R-93 (3rd prod.), R-93-A (1st prod.), R-93 2 Deluxe (1st prod.), and R-93-S (1st prod.)]

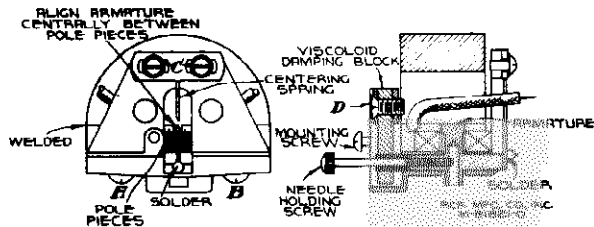


Figure 2—Details of Pickup
 [Models R-93-A (2nd prod.) and R-94 Deluxe (1st prod.)]

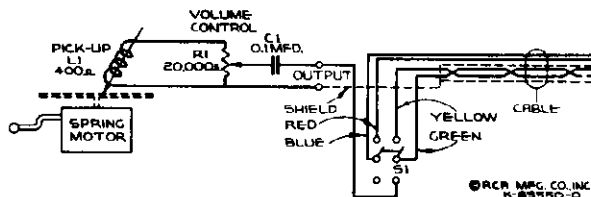


Figure 6—Schematic Circuit Diagram
 [Model R-93-S (1st prod.)]

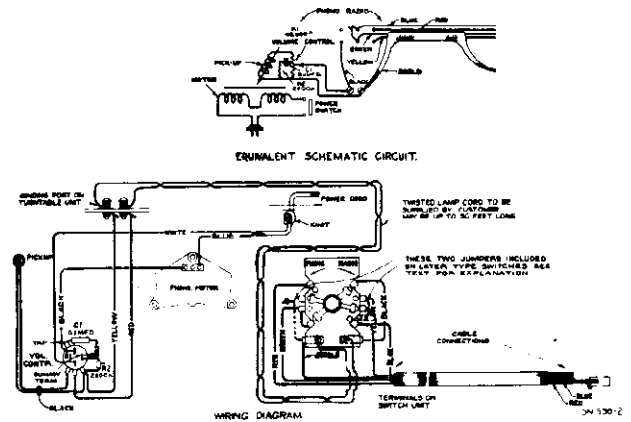


Figure 3—Wiring Diagram and Equivalent Schematic Circuit
 [Models R-93-A (1st and 2nd prod.) and R-94 Deluxe (1st prod.)]

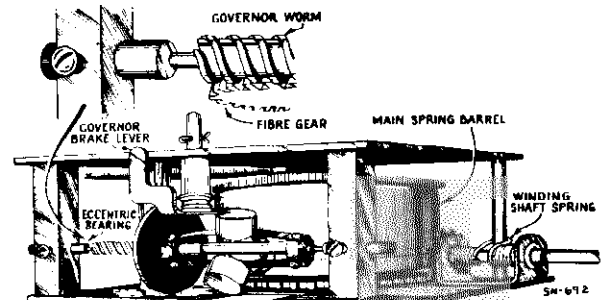


Figure 7—Details of Motor
 [Model R-93-S (1st prod.)]

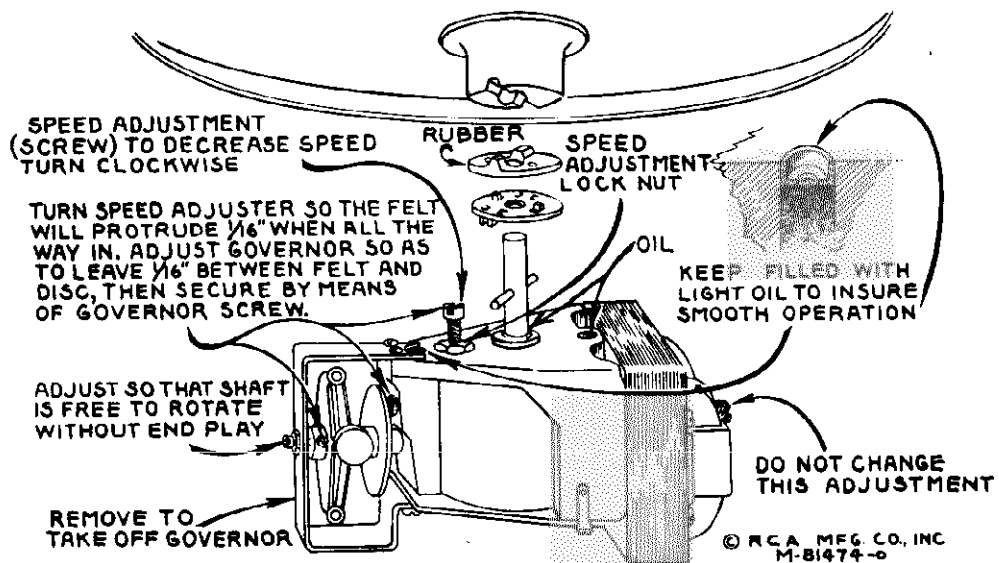


Figure 8—Details of Motor
 [Model R-94 Deluxe (1st prod.)]

MODELS R-93 (3rd Prod.)

Notes R-93-A, R-93-2

RCA MFG. CO., INC.

Introduction

The RCA Victor Record Players Models R-93 (third production), R-93-A (first and second production), R-93-2 Deluxe, R-93-S, and R-94 Deluxe are designed to provide record reproduction to the owner of a radio receiver by utilizing the audio amplifier system and loudspeaker of the radio receiver. Methods of connecting these record players to the radio receiver are outlined in the Model R-93 Service Notes (third edition) and in this booklet. Model R-93 (first and second production) is listed in the "Specifications" tabulation of this booklet, for convenient reference.

Note

1. (Applies to Model R-93-S only). It is necessary to short the 0.1 mid. blocking capacitor C1 in Model R-93-S (see figure 6) for cases in which the control grid d-c bias, or cathode current flow, would be removed or prevented by this capacitor when the record player switch is thrown to "Phono" position. C1 is provided to permit operation on battery receivers without shorting bias batteries, etc. Cases in which it is necessary to short C1 are indicated in "RCA Victor Receivers—Details of Lead Connections" of this booklet.
2. (Record Player Switch Jumpers) — Some record player switches do not have jumpers J1 and J2 (see figure 3) attached. When the switch is so connected and turned to phonograph position, the voltage developed by the pickup is fed into the radio receiver through the green wire and shield, and at the same time the yellow wire is connected to shield. The jumpers J1 and J2 permit the yellow lead to kill radio by connection to shield. The jumpers should be removed where the yellow lead connects in such a position as to short bias batteries, etc. Check the switch to be used for the method chosen and use the jumpers accordingly. Correct jumper connections are indicated in "RCA Victor Receivers—Details of Lead Connections" of this booklet.

To prevent confusion, replacement parts lists are provided separately in this booklet for Models R-93 (third production), R-93-A (first and second production), R-93-2 Deluxe (first production), R-93-S (first production), and R-94 Deluxe (first production), respectively, and should be consulted whenever making replacements to these various models.

Description and Service Data

MODEL R-93

(Third Production)

(Walnut, Red, White, Black)

The Model R-93 (third production) in colors of Walnut, Red, White, or Black are similar electrically to the original R-93 (first and second production) but may be identified mechanically by the curved tone arm. The original Model R-93 had a straight tone arm. Refer to Model R-93 Service Notes (third edition) Phonograph Motor Service Data (second production motors) for motor details and adjustments.

MAGNETIC PICKUP

The pickup used in the phonograph unit is of an improved design. The horseshoe magnet is rigidly welded to the pole pieces and is irremovable. There is a centering spring attached to the armature to maintain proper adjustment and to provide a limiting effect on the movement of the armature. The frequency response is substantially uniform over a wide range. Service operations which may be necessary on the pickup are as follows:

CENTERING ARMATURE

Refer to figure 1 showing the pickup inner structure. The armature is shown in its proper relation to the magnet pole pieces, i. e., exactly centered. Whenever this centering adjustment has been disturbed it will be necessary to remove the pickup mechanism from the tone arm by removing the needle holding screw and the two mounting screws from the front of the tone arm, holding the pickup assembly to keep it from dropping. Unsolder the two leads from the lugs on the terminal board at the rear of the pickup. Insert a small rod or nail into the armature needle hole and replace the needle holding screw, tightening it to hold the rod securely. If the armature clamping screws A and B have not been disturbed, screw or screws C should be loosened which will permit the armature to be moved from side to side, the rod acting as a lever to perform this operation. The proper adjustment is obtained when the armature is moved to the extreme position on each side (the movement being limited by the armature striking the pole pieces) and then brought to the mid position between these two extremes. Screw or screws C should then be tightened. The armature position should then be central between the pole pieces and at right angles to them. With a little practice, the correct adjustment of the armature will be obtained. The air gap between the pole pieces and the armature should be kept free from dust, filings, and other foreign material which would obstruct the movement of the pickup armature.

DAMPING BLOCK

The viscoloid damping block which is attached to the front end of the armature shank serves as a mechanical filter to eliminate undesirable resonances and to cause the frequency response to be uniform. Should it be necessary to replace this damping block, the pickup mechanism should be removed from the tone arm as explained above. Remove screw D and the damping block from the pickup assembly. Make sure that the shaft of the armature which contacts the viscoloid is clean. Then insert the new damping block so that it occupies the same position as that of the original block, and is in correct vertical alignment with the armature. The hole in the block is somewhat smaller than the diameter of the armature in order to permit a snug fit. With the damping block properly aligned on the armature, screw D with its washer should then be replaced. Heat should be applied to the armature (viscoloid side) so that the damping block will fuse at the point of contact and become rigidly attached to the armature. A special-tip soldering iron, constructed as shown in Model R-93 Service Notes (third edition) figure 8, will be found very useful in performing this operation. The iron should be applied only long enough to slightly melt the block, causing a small bulge on both sides.

REPLACING COIL

Whenever there is defective operation due to an open or shorted pickup coil, this coil should be replaced. Remove the pickup mechanism and terminal board as described above. Remove screws A and B and the magnet assembly. Remove the bakelite coil support (with coil attached) and insert the new coil support assembly in its place, after which replace the magnet assembly and center the armature as described above, then reassemble the remainder of the unit. Only rosin core solder should be used for soldering the coil leads and pickup leads to the pickup terminal board. This same type of solder should be used when necessary for soldering the centering spring to the armature.

MAGNETIZING

Loss of magnetization will not usually occur when the pickup has received normal care because the magnet and pole pieces are one unit and the magnetic circuit remains practically closed at all times. When the pickup has been mishandled, subjected to a strong a-c field, jolted, or dropped, there may be an appreciable loss of magnetic strength, in which case it will be necessary to remagnetize the entire structure. To do this, it will be necessary to first remove the pickup mechanism from the tone arm, and then remove the magnet assembly. Place the magnet assembly on the poles of a standard pickup magnetizer such as the RCA Stock No. 95-49 Pickup Magnetizer and charging the magnet in accordance with the instructions accompanying the magnetizer. It is preferable to check the polarity of the pickup magnet and to remagnetize it so that the same polarity is maintained.

MODEL R-93-A

(First and Second Production)

(Walnut)

The cabinet of the Model R-93-A is similar to that of the Model R-93 Walnut finish. This model incorporates an acoustic compensated volume control, see figure 3. Model R-93-A (first production) and Model R-93-A (second production) differ only in the pickup construction, the essential difference being in the armature centering spring and spring clamps. Reference to pickup details, figures 1 and 2 will reveal the fact that the armature centering spring is respectively "V" and "T" shaped for the Model R-93-A (first and second productions). Refer to "Model R-93 (third production)" and figures 1 and 2 for pickup adjustments.

The motor differs slightly in construction and mounting details from that used in the Model R-93 (second production). Refer to figure 4 for motor details. Refer to Model R-93 Service Notes (third edition) for motor coil connections.

MODEL R-93-2 DELUXE

(Walnut)

Model R-93-2 Deluxe is finished in walnut and is electrically identical to Model R-93 (third production), however, the cabinet is larger in size and has a hinged lid which may be closed while playing the records. The turntable is 10 inches in diameter. The motor differs slightly in construction from that used in the Model R-93 (second production). Refer to figure 5 for motor details and to Model R-93 Service Notes (third edition) for motor coil connections.

RCA MFG. CO., INC.

MODELS R-93-S, R-94

Notes
Details of Connections
for Receivers

MODEL R-93-S

(Walnut)

Model R-93-S has a spring wound motor and is primarily intended for use with battery receivers. The pickup and tonearm are identical to those described in "Model R-93 (third production)," therefore the adjustments will be the same. Reference to the Schematic diagram figure 6 will show a capacitor C1 in series with one of the leads to the binding posts. The purpose of C1 is to permit operation on battery receivers without shorting bias batteries, etc. Observe Note 1 under "Introduction" when making connections to radio receivers.

MOTOR

The drive motor is of simple design and substantial construction. It should require little or no service if properly maintained. Attention to lubrication of the moving parts and occasional cleaning of the mechanism will go far to prevent faulty operation. Should it become necessary to repair the motor, the following procedure should be applied referring to figure 7:

REMOVING MOTOR FROM CABINET—Remove the winding key. To dismount the motor, unscrew the spindle cap with a screwdriver and remove turntable, slightly tapping the spindle while exerting an upward lift on the turntable. Remove the bottom cover from the cabinet. Loosen the screw holding the speed regulating lever and remove the latter. The four nuts holding motor to motor board should then be loosened to permit removal of motor assembly.

Caution—Allow the motor mechanism to run down completely before attempting adjustment, repairs, or replacement.

REPLACING MAIN SPRING—In case of main spring failure the entire spring barrel and gear should be replaced. Remove spring barrel spindle screw by unscrewing to right. Remove the "C" washer and two pillar screws holding bottom plate. Remove plate and intermediate spindle shaft. Replace main spring barrel, intermediate spindle shaft, and bottom plates.

WINDING SHAFT SPRING—This spring functions as a friction ratchet. It may be removed by first removing pin holding winding gear on shaft, removing shaft, and then the screw holding the spring.

GOVERNOR ADJUSTMENTS—The mesh of the worm and fibre gears is adjusted by rotation of the eccentric spindle bearings. The adjustments should be made so that the worm meshes properly with the fibre gear and rotates freely without binding. The bearings should be accurately aligned with each other. The minimum of spindle end play which permits smooth operation should be used.

SPEED REGULATOR LEVEL—After assembly, adjust the speed regulator until the turntable rotates at 78 r.p.m.; then loosen the speed regulator screw and set pointer to center of speed indicator scale; tighten screw and re-check turntable speed.

LUBRICATION—All moving parts of the motor should be thoroughly cleaned and lubricated every six months to prevent excess wear and improper operation. A small amount of grease should be applied to the worm gear of the governor, the gear of the winding shaft, and on the small pinion gear. All other points should be lubricated with a drop of light oil. All motor parts should be covered with a light film of oil to prevent rusting.

MODEL R-94 DE LUXE

(Walnut)

The Model R-94 Deluxe cabinet is finished in walnut and has a hinged lid which may be closed while playing the records. This model incorporates an acoustic compensated volume control, see figure 3. An improved type of pickup is used, the construction of which is illustrated in figure 2. Refer to "Model R-93 (third production)" and figure 2 for pickup adjustments.

MOTOR—The phonograph motor is of the governor induction type and is designed to be simple and foolproof. Occasionally, however, certain adjustments may be required. These adjustments are illustrated and explained in figure 8. Application of oil to the felt pad which rubs against the governor disc will insure smooth operation.

RCA VICTOR RECEIVERS—DETAILS OF LEAD CONNECTIONS

MODEL	METHOD OF CONNECTION	GREEN	YELLOW	RED	BLUE	SHIELD	SWITCH
5BT, 5T, 5T1, 5T4, 5T6, 5T6, 5T7, 5T8, 6K, 6K1, 6T, 6T6, 8BK, 8BK6, 8BT, 8BT6, 8K11, 8T2, 8T11	2. Term. Board	1	2	Tape	Tape	3	†
6BK, 6BK6, 6BT, 6BT6	2. Term. Board	1	2	Tape	Tape	3	††
7K, 7T, 7X, 7X1, 8K, 8K1, 8T, 8T10	2. Term. Board	1	2	Tape	Tape	3	†§
6K2, 6K3, 6K10, 6T2, 6T10, 7K1, 7X1	2. Term. Board	2	1	Tape	Tape	3	†
T9-7, T9-8	2. Term. Board	2	3	Tape	Tape	1	†
9K, 9K1, 9K2, 9K3, 9K10, 9T, 10K, 10K1, 10K11, 10T, 10T11, 13K, 15K	2. Term. Board	2	1	4	3	3	††
C6-12, C7-14, C8-19, C8-20, T6-11, T7-12, T8-18, T9-10	4. Grid Clip	Grid Cap Tube	Grid Clip	Tape	Tape	Chassis	†§
C11-3, C13-3, C15-4	5. Adapter	1st Audio Cathode	Cathode Socket Contact	I-F Cathode *	I-F Cathode Socket Contact	Chassis	††§
C6-8, T6-7	5. Adapter	Grid Cap Tube	Grid Clip	Tape	Tape	Both Adapter Cathode Terms.	†§

† Add Jumpers J1 and J2 to Phono-Radio Switch if not present. § Short 0.1 Mfd. Capacitor (C1) in R-93-S Record-Player
†† Remove jumpers J1 and J2 to Phono-Radio Switch if present. * Use a second adapter.

MODELS R-93 (3rd Prod.)
 R-93-S, R-94, R-93A, R-93-2 RCA MFG. CO., INC.
 Specifications, Parts, Page 1

Specifications

Model	Cabinet Finish	Production	Tone Arm Style	Voltage	Freq. Cyc.	Power Consumption Watts	Motor Coil Res. Ohms Total	Type of Motor	Turntable Speed R.P.M.	Pickup Impedance 1000 Cycles	Volume Control Resistance Ohms	Dimensions Inches			Weights		
												Height	Width	Depth	Turntable Dcr. Inches	Net	Shipping
R-93	Walnut	Third	Curved	106— 125	60 50	5 5	200 200	Synchronous (Manual Starting)	78	1,400	20,000	5	11	8	7	8½	10
R-93	Red White Black	Third	Curved	106— 125 106— 125 105— 125 200— 250	60 50 25 50	5 5 5	200 200 660 1,040	Synchronous (Manual Starting)	78	1,400	20,000	5	11	8	7	8½	10
R-93	Walnut	Second	Straight	105— 125 105— 125	60 50 25	5 5	200 660	Synchronous (Manual Starting)	78	1,400	20,000	5	11	8	7	8½	10
R-93	Walnut	First	Straight	105— 125 105— 125 200— 250	60 50 25 50	5 5	218 218 980 1,270	Synchronous (Manual Starting)	78	1,400	20,000	5	11	8	7	8½	10
R-93-A	Walnut	First and Second	Curved	105— 125 105— 125 200— 250	60 50 25 50	5 5	180 180 420 700	Synchronous (Manual Starting)	78	1,400	40,000 Tapped for Compensation	5½	11½	9	7	10	12
R-93-2 Deluxe	Walnut	First	Curved	105— 125 105— 125 200— 250	60 50 25 50	5 5	200 200 660 1,040	Synchronous (Manual Starting)	78	1,400	20,000	5½	13½	13½	10	14	18
R-93-S	Walnut	First	Curved	—	—	—	—	Spring Wound	78 Adjustable	1,400	20,000	5½	12½	10½	9	10	13
R-94 Deluxe	Walnut	First	Curved	105— 125 105— 125 200— 250	60 50 60 50 60	25 25	100 70 290	Governor Induction (Self-Starting)	78 Adjustable	1,400	40,000 Tapped for Compensation	7½	15½	13½	9	14	18

REPLACEMENT PARTS

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
	MOTOR ASSEMBLIES [Model R-93 (third production) Walnut]	11733	Coil—Stator assembly—comprising coil and lamination—110 volts, 60 cycle
10194	Ball—Steel ball bearing	11734	Coil—Stator assembly—comprising coil and lamination—110 volts, 50 cycle
11740	Base—Motor base and bearing assembly	11735	Coil—Stator assembly—comprising coil and lamination—110 volts, 25 cycle
11733	Coil—Stator assembly—comprising coil and laminations—105-125 volt, 60 cycle operation	13081	Coil—Stator assembly—comprising coil and lamination—220 volts, 50 cycle
11734	Coil—Stator assembly—comprising coil and laminations—105-125 volt, 50 cycle operation	11748	Damper—Motor damper assembly—comprising one damper, one damper plate, one screw, two rubber washers and one "C" washer
11748	Damper—Motor damper assembly—comprising one damper, one damper plate, one screw, two rubber washers, and one "C" washer	9721	Motor—110 volts, 60 cycle motor with red turntable (M1)
11873	Motor—105-125 volts—60 cycle motor (M1)	9725	Motor—110 volts, 60 cycle motor with white turntable (M1)
11874	Motor—105-125 volts—50 cycle motor (M1)	9729	Motor—110 volts, 60 cycle motor with black turntable (M1)
4458	Motor Accessories—comprising three nuts, one shield and one screw	9722	Motor—110 volts, 50 cycle motor with red turntable (M1)
11876	Turntable—Turntable assembly complete—with rotor laminations—60 cycle operation	9726	Motor—110 volts, 50 cycle motor with white turntable (M1)
11875	Turntable—Turntable assembly complete—with rotor laminations—50-cycle operation	9730	Motor—110 volts, 50 cycle motor with black turntable (M1)
4083	Washer—Leather washer	9723	Motor—110 volts, 25 cycle motor with red turntable (M1)
4084	Washer—Metal washer	9727	Motor—110 volts, 25 cycle motor with white turntable (M1)
	MOTOR ASSEMBLIES [Model R-93 (third production) Red-White-Black]	9731	Motor—110 volts, 25 cycle motor with black turntable (M1)
10194	Ball—Steel ball bearing		
11740	Base—Motor base and bearing assembly		

REPLACEMENT PARTS—(Continued)

Order on genuine factory tested parts, which are readily identified and may be purchased from authorized dealers.

Table with 3 columns: STOCK No., DESCRIPTION, and STOCK No. (repeated). It lists various mechanical parts such as Motors, Pickups, Cabinets, and Assemblies for RCA models R-93, R-93A, R-93-2, R-93-S, and R-94. Each entry includes a stock number and a detailed description of the part.

MODELS R-96, R-97

Parts

RCA MFG. CO., INC.

LOUDSPEAKER

Centering of the loudspeaker is made in the usual manner with three narrow paper feelers after first removing the front dust cover. This may be removed by softening its cement

with a light application of acetone, using care not to allow the acetone to flow into the air gap. The dust cover should be cemented back in place with ambroid upon completion of adjustment.

REPLACEMENT PARTS

Insist on genuine factory tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
AMPLIFIER ASSEMBLIES		MOTORBOARD ASSEMBLIES (Model R-97)	
12118	Cap—Grid contact cap	14208	Bracket—Bumper bracket and bumper complete
5005	Capacitor—.0035 Mfd. (C3)	14209	Bumper—Rubber bumper
4838	Capacitor—.005 Mfd. (C10)	14830	Cable—Shielded cable 13" long complete with single contact male connector—connects pickup shorting switch to input transformer or compensator
13138	Capacitor—.01 Mfd. (C4, C8)	14212	Escutcheon—Manual index lever and switch escutcheon
12670	Capacitor—.035 Mfd. (C9)	14203	Post—Record post—located on front left hand corner of motorboard
4839	Capacitor—.01 Mfd. (C1, C2, C6)	14210	Rest—Pickup arm rest
5170	Capacitor—.025 Mfd. (C7)	14207	Roller—Pickup lift cable roller and bracket
12484	Capacitor—.025 Mfd. (C5)	14211	Socket—Motorboard socket and shell
11203	Capacitor—.10 Mfd. (C11)	14205	Support—Pickup arm mounting spacer, washers and nut
5212	Capacitor—.16 Mfd. (C12)	14206	Switch—Motor toggle switch (S2)
14783	Connector—2-contact female connector for motor power cable	14629	Switch—Pickup shorting switch (S3)
5119	Connector—3-contact female connector for reproducer cable	14204	Turntable—Complete
11955	Resistor—27 Ohms—Carbon type, $\frac{1}{2}$ watt (R13)	14213	Washer—Pickup arm stop washer and spacing washer
11670	Resistor—330 Ohms—Carbon type, $\frac{1}{2}$ watt (R12)	MOTOR ASSEMBLIES (Model R-97)	
5159	Resistor—2,200 Ohms—Carbon type, $\frac{1}{2}$ watt (R1, R2, R3)	14215	Governor—Governor complete with motor Stock Nos. 9799, 14465 and 14466
5029	Resistor—56,000 Ohms—Carbon type, $\frac{1}{2}$ watt (R9)	14466	Motor—105-125 volts, 25 cycle (M1)
14943	Resistor—180,000 Ohms—Carbon type, $\frac{1}{2}$ watt (R8)	14465	Motor—105-125 volts, 50-60 cycle (M1)
11172	Resistor—470,000 Ohms—Carbon type, $\frac{1}{2}$ watt (R6, R10)	9799	Motor—105-125 volts, 60 cycle (M1)
13730	Resistor—1 Meg.—Carbon type, $\frac{1}{2}$ watt (R5)	14214	Screw—Motor mounting screw and spacer assembly
4241	Resistor—1.5 Meg.—Carbon type, $\frac{1}{2}$ watt (R7)	PICKUP AND ARM ASSEMBLIES (For Model R-96 only)	
4233	Shield—6C6 Radiotron shield	14291	Armature—Pickup armature
14278	Socket—Single contact female pickup cable socket	11732	Coil—Pickup coil (L1)
4794	Socket—4-contact 80 Radiotron socket	14292	Damper—Pickup damper assembly—comprising one damper, one clamp and one screw
4786	Socket—6-contact 6C6 or 42 Radiotron socket	14931	Pickup and Arm Complete
14797	Tone Control and power switch (R11, S1)	3811	Screw—Needle holding screw
14796	Transformer—Power transformer—105-125 volts, 50-60 cycles (T1)	PICKUP AND ARM ASSEMBLIES (For Model R-97 only)	
14843	Transformer—Power transformer—105-125 volts, 25-60 cycles (T1) (Model R97 only)	14291	Armature—Pickup armature assembly
14798	Volume Control (R4)	4064	Cable—Pickup lift cable
MOTORBOARD ASSEMBLIES (Model R-96)		11732	Coil—Pickup coil (L1)
14803	Brake—Turntable brake and motor switch	14292	Damper—Pickup damper block complete with clamp and screw
3261	Rest—Pickup rest	14290	Pickup and Arm Complete
30248	Screw—Motor mounting screw, washer, rubber washers, clamp plate and spacer assembly	3811	Screw—Needle holding screw
30100	Springs—Tension springs for brake Stock No. 14803 comprising 1 long and 1 short spring	4387	Screw—No. 6-32x $\frac{1}{2}$ " headless set screw for pickup arm pivot shaft
14804	Switch—Motor switch (S2)—located on turntable brake Stock No. 14803	REPRODUCER ASSEMBLIES (RL-63-F1)	
MOTOR ASSEMBLIES (Model R-96)		14356	Board—3-contact reproducer terminal board
11703	Governor—Complete motor governor, governor shaft and gear assembly	13886	Cap—Cone center dust cap
14800	Motor—105-125 volts, 60 cycle (M1)	12012	Coil—Field coil (L4)
OPERATING MECHANISM ASSEMBLIES (Model R-97)		11469	Coil—Hum coil (L2)
14199	Bushing—Record separator rotating shaft bushing	12642	Cone—Reproducer cone and dust cap (L3)
14183	Cam—Cam and gear assembly	5118	Plug—3-contact male plug for reproducer
6808	Clutch—Trip lever friction clutch	14360	Reproducer—Reproducer complete
14197	Finger—Friction finger assembly	14358	Screw—Screw, washer and lockwasher to hold core in yoke
14186	Hub—Rotating hub and record separator complete with set screw	14355	Transformer—Output transformer (T2)
14189	Lever—Locating lever assembly	14357	Washer—Spring washer to hold field coil
14201	Lever—Manual index lever assembly	MISCELLANEOUS ASSEMBLIES	
14184	Lever—Main lever and link assembly	4391	Box—Needle box for Model R-97 only
14194	Lever—Pickup arm lever complete with set screws	11762	Box—Needle box for Model R-96 only
14193	Lever—Pickup lift cable lever	11704	Damper—Turntable damper and damper plate
14198	Lever—Reject lever assembly	12673	Knob—Volume control or tone control and power switch knob
14185	Lever—Trip lever and friction clutch assembly	14287	Screw—Amplifier chassis mounting screw and washer
14196	Pawl—Trip pawl assembly	30249	Screw—Motorboard mounting screw, spring, spacer, washer, lockwasher, and rubber washer assembly for Model R-96 only
4663	Screw—Cable lever screw and two locknuts	30250	Screw—Motorboard mounting screw, spring, washers and rubber washer assembly for Model R-97 only
4059	Screw—Trip lever clutch tension adjustment screw	4119	Screw—No. 8-32 headless set screw for knob Stock No. 12673
14200	Screw—No. 8-32 special hex head screw and lockwasher for record separator shaft mounting	14801	Turntable—Complete for Model R-96 only
14188	Screw—No. 10-32x $\frac{7}{16}$ fillister-head cone-pointed set screw for rotating hub		
14195	Screw—No. 10-32x $\frac{5}{16}$ fillister-head cone-pointed set screw for pickup arm lever		
14187	Shaft—Rotating shaft for record separator		
3676	Spring—Cam pawl tension spring		
3666	Spring—Lift cable tension spring		
14190	Spring—Locating lever pawl tension spring		
14191	Spring—Locating lever or reject lever tension spring		
14192	Spring—Main lever tension spring		

RCA MFG. CO., INC.

MODELS R-96, R-97
Schematic
Chassis Wiring

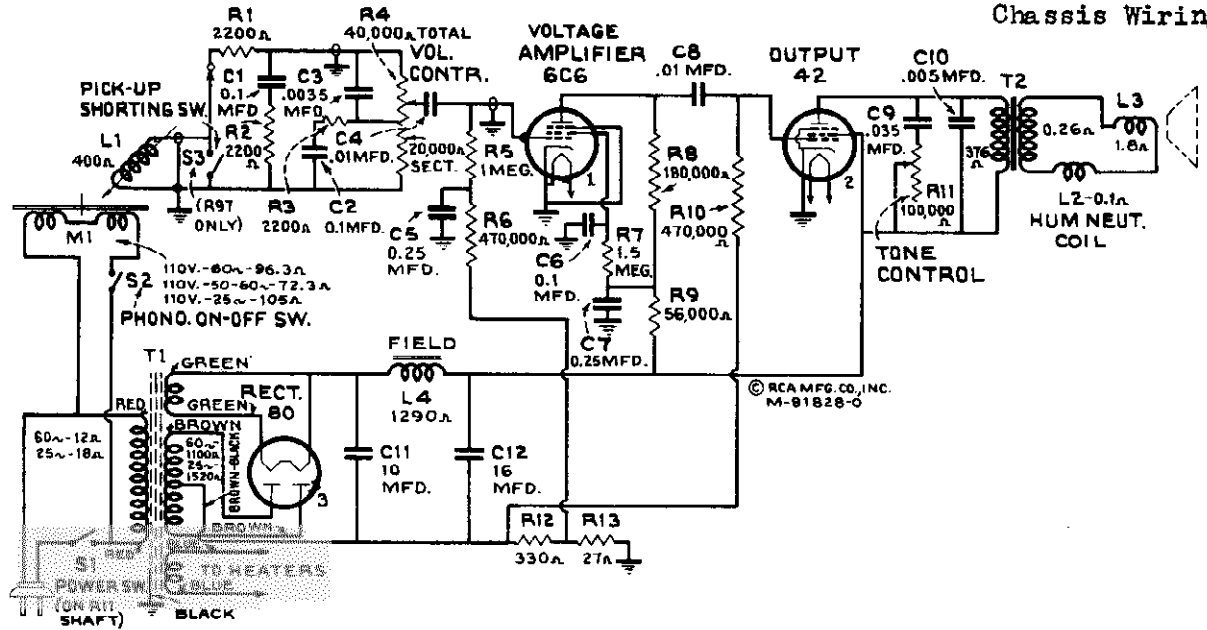


Figure 8—Schematic Circuit Diagram

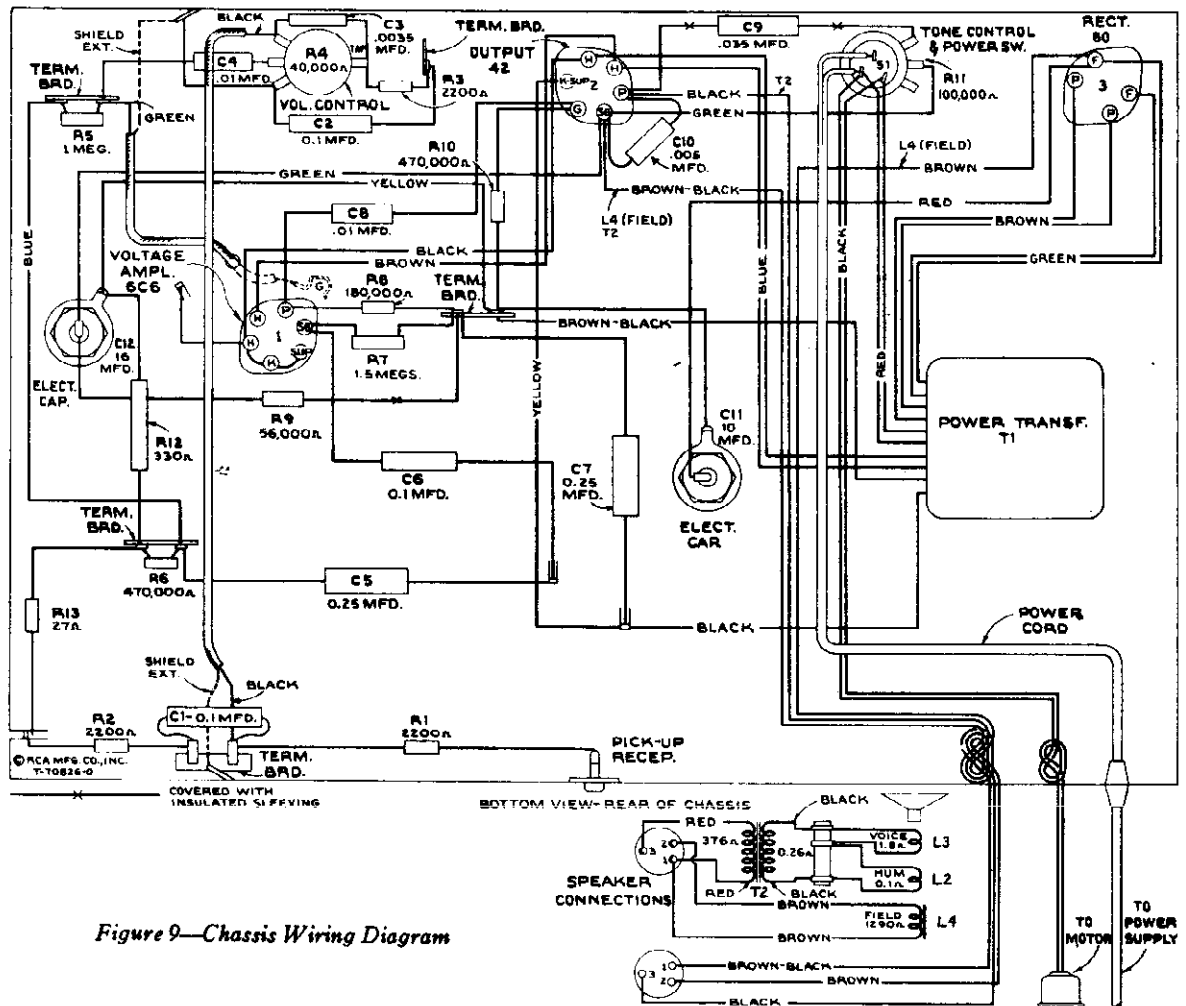


Figure 9—Chassis Wiring Diagram

MODELS R-96,R-97

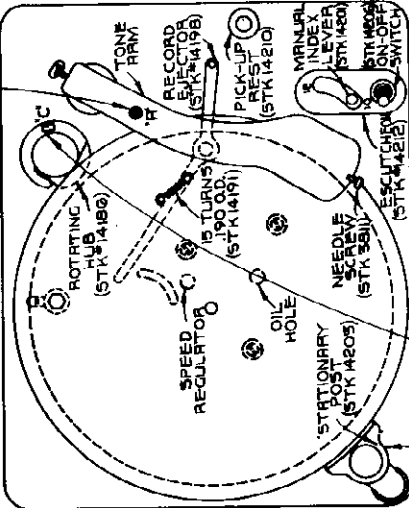
RCA MFG. CO., INC.

Automatic Record Changer Adjustment, Assembly

ADJUST THE LOWERMOST REST POSITION OF THE TONE ARM SO THAT THE NEEDLE POINT RESTS IN A PLANE 1/16" BELOW THE PLANE OF THE TOP OF THE TURNTABLE BY MEANS OF SCREW "4".

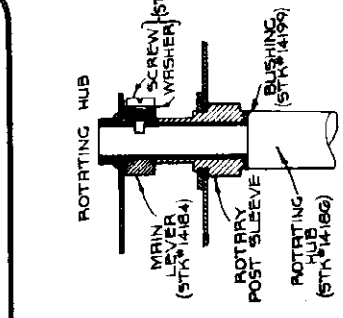
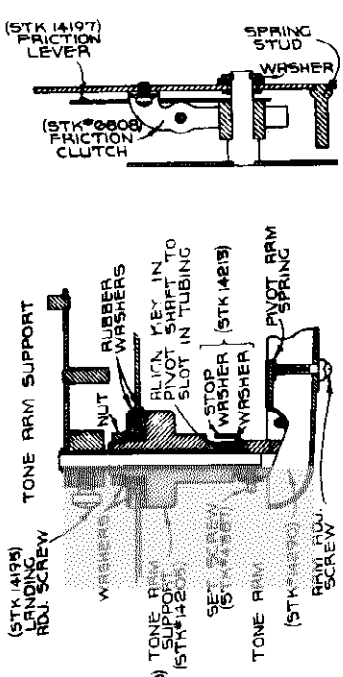
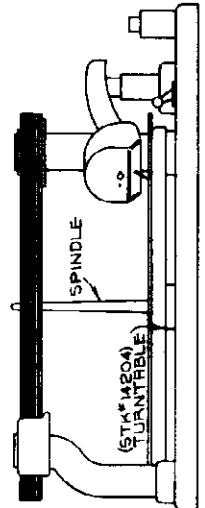
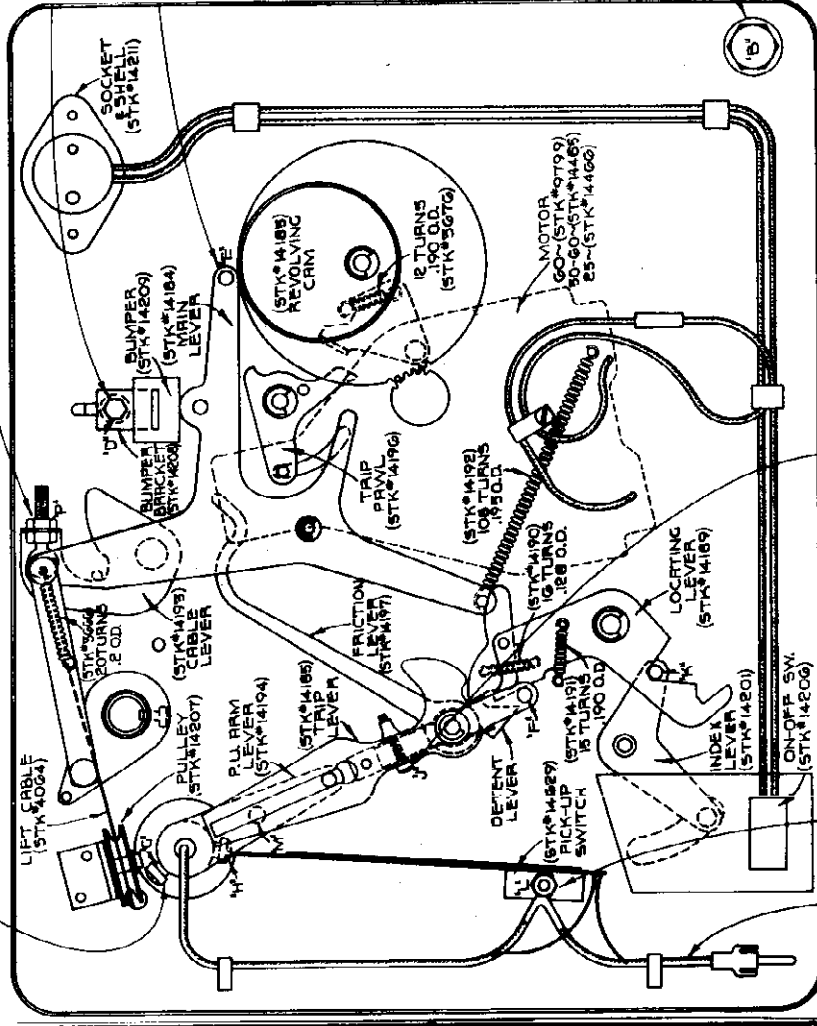
ADJUST THE RISE OF THE TONE ARM SO THAT THE NEEDLE POINT RISES 1/16" ABOVE THE TOP OF THE TURNABLE DURING CYCLE. THIS ADJUSTMENT IS MADE BY MEANS OF THE SCREW AND LOCK NUTS "1" (STK-4203) ON THE CABLE LEVER.

TO ADJUST THE LANDING POSITION OF THE NEEDLE, FIRST LOCATE NEEDLE "4" FROM CENTER OF THE TURNABLE SPINDLE. THEN WITH THE LOCATING LEVER AGAINST THE STOP PIN "1" AND THE PIN "2" ON THE TRIP LEVER CONTACTING, THE LOCATING LEVER TIGHTEN THE BLUNT SCREW "3" ON TONE ARM SUPPORT AND RUN DEVICE THROUGH CYCLE TO A CHECK WHEN CONTACT ADJUSTMENT IS MADE TO TONE ARM SUPPORT. CONE POINTED SCREW "4" (STK-4199) ON TONE ARM SUPPORT.



ADJUST THE REST POSITION OF THE MAIN LEVER BY MEANS OF THE NUT "1" ON THE BUMPER BARCKET "2", THAT THE MAIN LEVER "3", CLEAR THE CLEARANCE FROM THE MAIN LEVER TO THE NEAREST POST DETENT LEVER. NOTE THAT THE PIN "1" AT LEAST 1/16" WHEN THE ABOVE CONDITIONS EXIST.

TO ADJUST RECORD POSTS: PLACE RECORD POSTS TO THE SPINDLE SO THAT IT RESTS ON THE LOWER SHELF OF THE ROT. HUB. MOVE STATIONARY RECORD POST TO A POSITION WHERE IT IS CONCENTRICALLY MOUNTED WITH THE TURNABLE AND THE BEVELED SHELF PROTRUDES UNDER THE RECORD TABLE. TIGHTEN HEXAGON SCREW "1" LOCATED UNDER MOTOR BOARD, WITH RECORD STILL ON LOWER SHELF OF ROTATING HUB ADJUST SCREW "2" (STK-4198) SO THAT THE BEVELED TONGUE ON THE SEPARATING CLAY SLIP WHEN THE RECORD BY 1/8". THESE ADJUSTMENTS SHOULD BE MADE ONLY WHEN THE COMPLETE UNIT IS RESTING ON THE FOUR MOTOR BOARD BUSHINGS.



TO ADJUST TRIP LEVER SCREW "1" (STK-4199) AND FRICTION LEVER TO MOVE TRIP PAWL. TO ADJUST PICK-UP SCREW "3" FROM CENTER OF SPINDLE, ADJUST NUT "1" SO THAT THE BLADE ON SWITCH IS JUST CONTACTING PIN "1".

Figure 7—Automatic Record Changer Adjustments (Model R-97) RCA MFG. CO. INC. 4-10627-C

RCA MFG. CO., INC.

MODEL R-96, R-97

Pick-up & Motor Details
Voltage, Notes, Socket
Adjustments

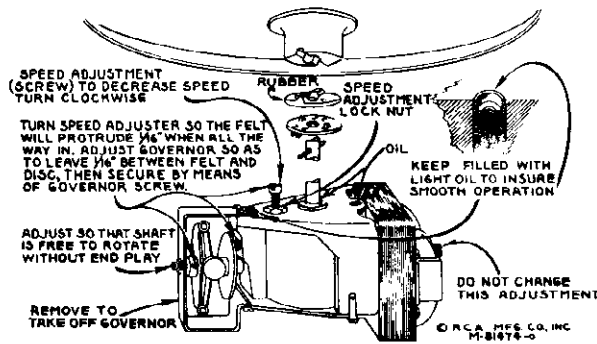


Figure 1—Details of Motor

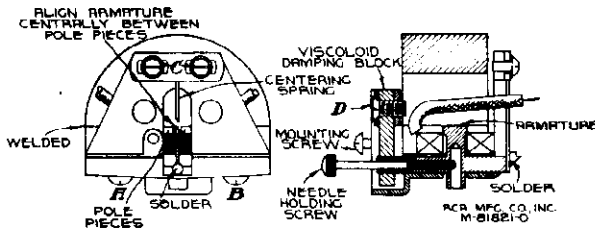


Figure 2—Details of Pickup

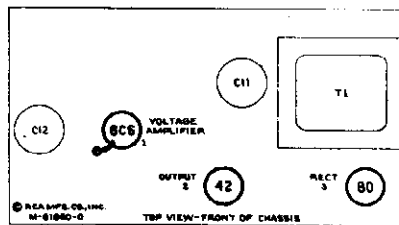


Figure 4—Radiotron Locations

Replacing Coil.—Whenever there is defective operation due to an open or shorted pickup coil, this coil should be

replaced. Remove the pickup mechanism and terminal board as described above. Remove screws A and B and the magnet assembly. Remove the bakelite coil support (with coil attached) and insert the new coil support assembly in its place, after which replace the magnet assembly and center the armature as described above, then re-assemble the remainder of the unit. Only rosin core solder should be used for soldering the coil leads and pickup leads to the pickup terminal board. This same type of solder should be used when necessary for soldering the centering spring to the armature.

Magnetizing.—Loss of magnetization will not usually occur when the pickup has received normal care because the magnet and pole pieces are one unit and the magnetic circuit remains practically closed at all times. When the pickup has been mishandled, subjected to a strong a-c field, jolted, or

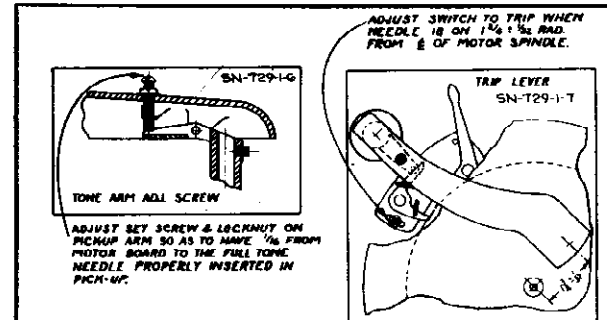


Figure 5—Tone Arm and Motor Switch Adjustments (Model R-96)

dropped, there may be an appreciable loss of magnetic strength, in which case it will be necessary to remagnetize the entire structure. To do this, it will be necessary to first remove the pickup mechanism from the tone arm, and then remove the magnet assembly. Place the magnet assembly or the poles of a standard pickup magnetizer such as the RCA Stock No. 9549 Pickup Magnetizer and charge the magnet in accordance with the instructions accompanying the magnetizer. It is preferable to check the polarity of the pickup magnet and to remagnetize it so that the same polarity is maintained.

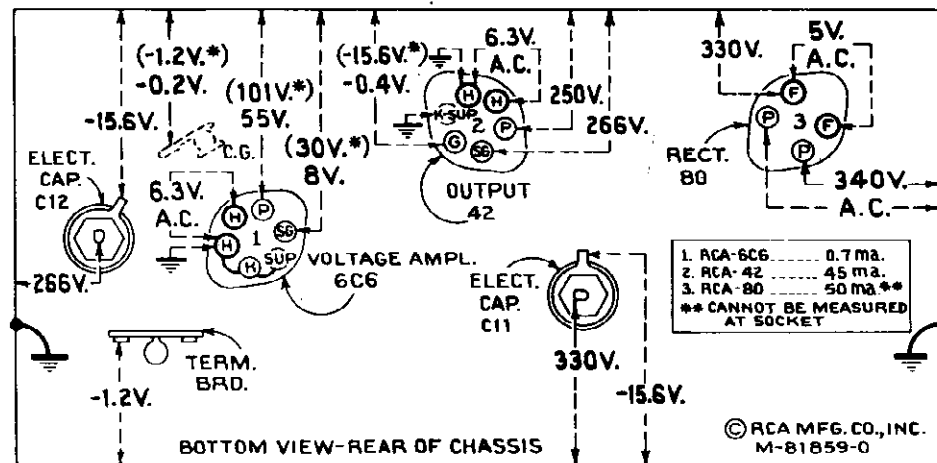


Figure 6—Radiotron Socket Voltages

Measured at 115 volts, 60-cycle supply—Volume control minimum

Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk () indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter.*

Voltage values as specified should hold within $\pm 20\%$ when instrument is normally operative at its rated line voltage. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250, and 500 volts. Use the nearest range above the specified measured voltage. A-c voltages were measured with a corresponding a-c meter.

MODELS R-96, R-97

Notes

RCA MFG. CO., INC.

General Description

The Model R-97 Electric Phonograph consists of a three-tube audio amplifier, an eight-inch dust-proof electrodynamic loudspeaker, and an automatic record changer combined in a hinged-top table-type cabinet. Its design includes a phonograph compensation pack, resistance-coupled audio system, self-starting constant-speed motor, improved magnetic pickup, and a tone control. The phonograph mechanism will play a

series of eight 10-inch records (changes seven) or repeat 12-inch records. It may be operated manually if desired.

The Model R-96 Electric Phonograph is identical to Model R-97 electrically, has a manually operated turntable, and a slightly different cabinet design.

The circuit arrangement of either instrument is shown on figure 8.

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RADIOTRON COMPLEMENT

(1) RCA-6C6..... Audio Voltage Amplifier

(2) RCA-42..... Power Output
(3) RCA-80..... Rectifier

POWER SUPPLY RATINGS

Rating A-6	105-125 volts, 60 cycles, 90 watts
Rating A	105-125 volts, 50-60 cycles, 90 watts
Rating B-2	105-125 volts, 25 cycles, 90 watts
Rating C-6	105-125/200-250 volts, 60 cycles, 90 watts
Rating C-5	105-125/200-250 volts, 50-60 cycles, 90 watts

POWER OUTPUT

Undistorted.....	2.5 watts
Maximum.....	4.5 watts

LOUDSPEAKER

Type.....	8-inch Electrodynamic
Impedance (V.C.).....	2.2 ohms at 400 cycles

MOTOR-BOARD

Type	R-96 Manual	R-97 Automatic-Manual
Turntable Speed (adjustable).....	78 r.p.m.	78 r.p.m.
Pickup	High-impedance Magnetic	
Pickup Impedance	1,400 ohms at 1,000 cycles	

AUTOMATIC RECORD CHANGER

(Model R-97)

The record changing mechanism is designed to be simple and fool-proof. Certain adjustments may be required occasionally. The adjustments are illustrated and explained in figures 1 and 7.

It is important when servicing the automatic mechanism, to have it placed on a level support. It is also important to refrain from forcing the mechanism if there is a tendency to bind or jam, since bent levers and possible broken parts may result.

CAUTION.—Do not leave records stacked on the record holder posts, when not in use, as they are liable to warp, particularly so in warm climates.

MOTOR ADJUSTMENTS

The phonograph motors are of the governor induction type and are designed to be simple and foolproof. Occasionally, however, certain adjustments may be required. These adjustments are illustrated and explained in figure 1. Application of oil to the felt pad which rubs against the governor disc will insure smooth operation.

MAGNETIC PICKUP

The pickup used is of an improved design. The horseshoe magnet is rigidly welded to the pole pieces and is irremovable. There is a centering spring attached to the armature to maintain proper adjustment and to provide a limiting effect on the movement of the armature. The frequency response is substantially uniform over a wide range. Service operations which may be necessary on the pickup are as follows:

Centering Armature.—Refer to figure 2 showing the pickup inner structure. The armature is shown in its proper relation to the magnet pole pieces, i. e., exactly centered. Whenever this centering adjustment has been disturbed it will be necessary to remove the pickup mechanism from the tone arm by removing the needle holding screw and the two mounting screws from the front of the tone arm, holding the pickup assembly to keep it from dropping. Unsolder the two leads from the lugs on the terminal board at the rear of the pickup. Insert a small rod or nail into the armature needle hole and replace the needle holding screw, tightening it to hold the rod securely. If the armature clamping screws

A and B have not been disturbed, screws C should be loosened which will permit the armature to be moved from side to side, the rod acting as a lever to perform this operation. The proper adjustment is obtained when the armature is moved to the extreme position on each side (the movement being limited by the armature striking the pole pieces) and then brought to the mid position between these two extremes. Screws C should then be tightened. The armature position should then be central between the pole pieces and at right angles to them. With a little practice, the correct adjustment of the armature will be obtained. The air gap between the pole pieces and the armature should be kept free from dust, filings, and other foreign material which would obstruct the movement of the pickup armature.

Damping Block.—The viscoloid damping block which is attached to the front end of the armature shank serves as a mechanical filter to eliminate undesirable resonances and to cause the frequency response to be uniform. Should it be necessary to replace this damping block, the pickup mechanism should be removed from the tone arm as explained above. Remove screw D and the damping block from the pickup assembly. Make sure that the shaft of the armature

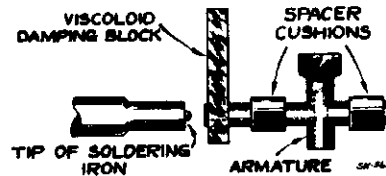


Figure 3—Special Soldering-Iron Tip

which contacts the viscoloid is clean. Then insert the new damping block so that it occupies the same vertical position as that of the original block, and is in correct vertical alignment with the armature. The hole in the block is somewhat smaller than the diameter of the armature in order to permit a snug fit. With the damping block properly aligned on the armature, screw D with its washer should then be replaced. Heat should be applied to the armature (viscoloid side) so that the damping block will fuse at the point of contact and become rigidly attached to the armature. A special-tip soldering iron, constructed as shown in figure 3, will be found very useful in performing this operation. The iron should be applied only long enough to slightly melt the block, causing a small bulge on both sides.

RCA MFG. CO., INC.

MODEL U-101, U-103
Schematic
MODEL U-101
Chassis Wiring

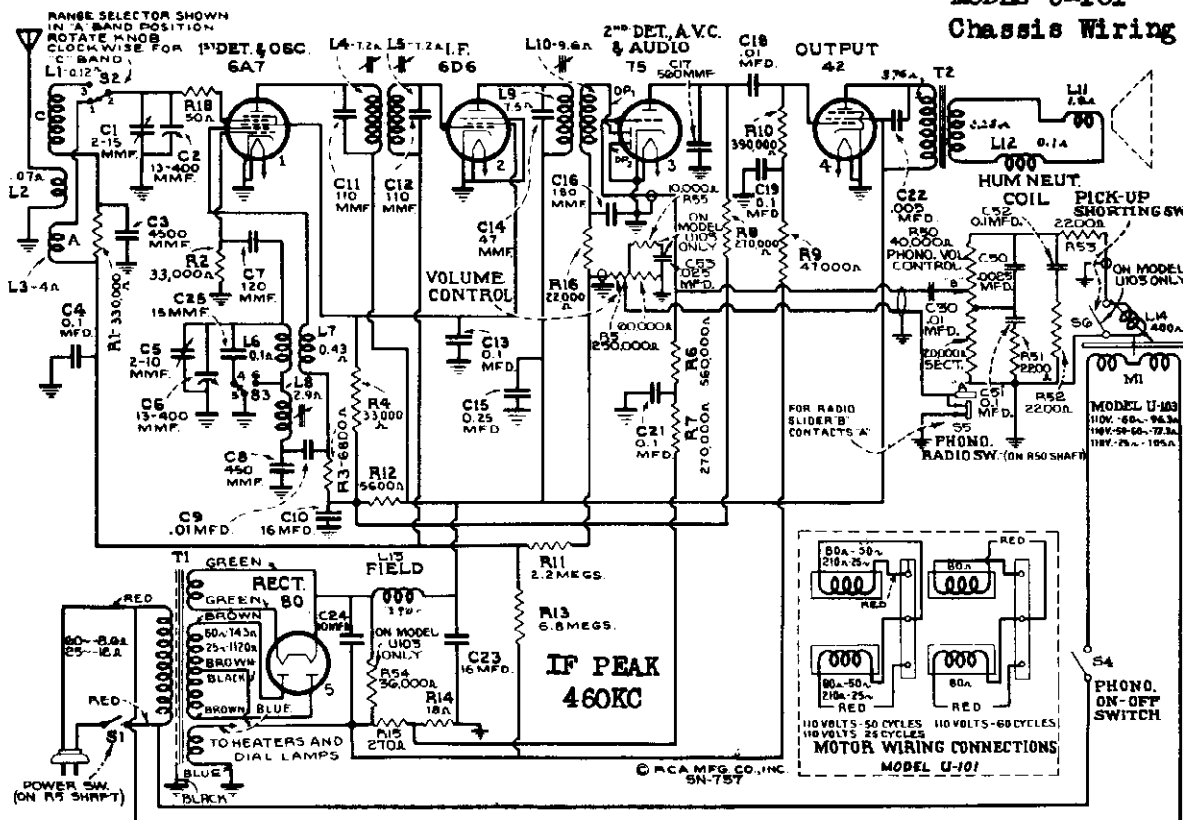


Figure 1—Schematic Circuit Diagram

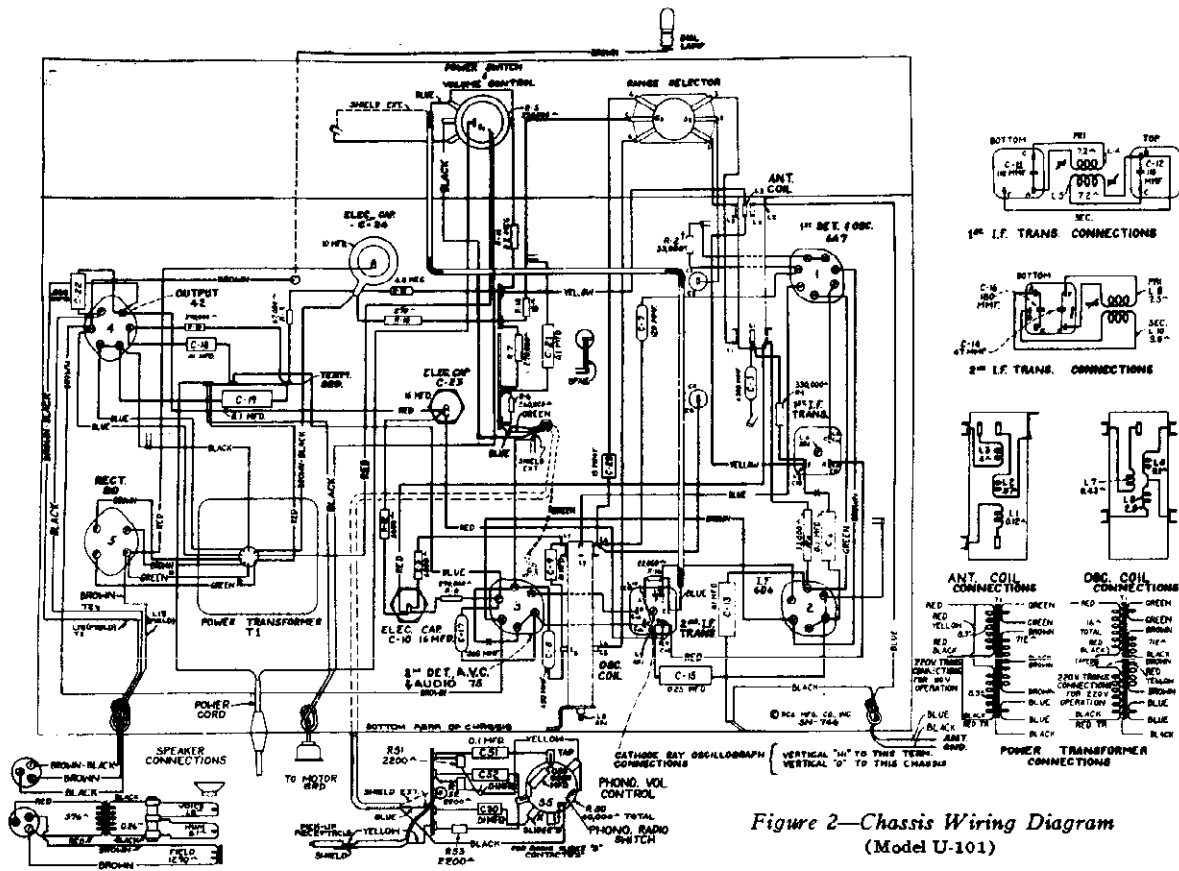


Figure 2—Chassis Wiring Diagram
(Model U-101)

MODEL U-103
Chassis Wiring

RCA MFG. CO., INC.

MODEL S U-101, U-103
Alignment, Socket Trimmers

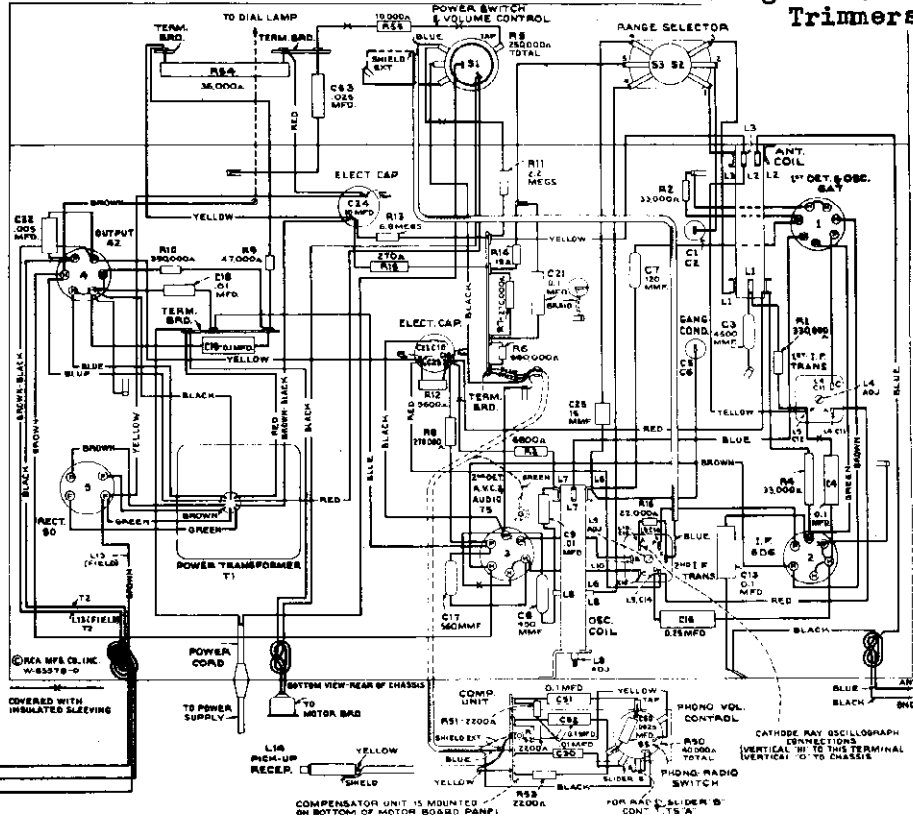
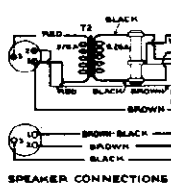
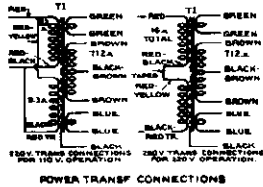
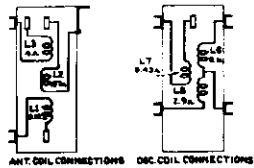
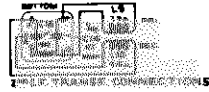
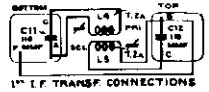
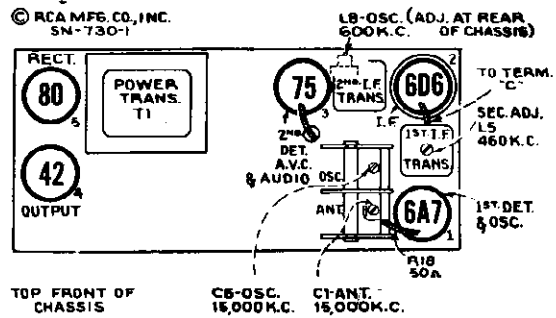


Figure 3—Chassis Wiring Diagram (Model U-103)

Alignment Procedure

Calibrate the tuning dial by adjusting dial pointer to the center horizontal line with the gang tuning-condenser plates in full-mesh position. This is a screw-driver adjustment.

Figure 11—Radiotron, Coil, and Trimmer Locations



Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 9, 10, and 11.

Cathode-ray alignment is preferable; the connections to the chassis are shown on figures 2 and 3. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to the receiver chassis for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

Order of Alignment	Test Oscillator			Range-Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting					
1	6D6 I-F Grid Cap	.001 Mfd.	460 kc	"A" Left	No Signal 550-750 kc	2nd I-F Trans.	L9	Max. (peak)
2	6A7 Det. Grid Cap	.001 Mfd.	460 kc	"A" Left	No Signal 550-750 kc	1st I-F Trans.	L4 and L5	Max. (peak)
3	Ant. Lead (blue)	300 Ohms	15,000 kc	"C" Right	15,000 kc	"C" Osc.	C5	Max. (peak)†
4	Ant. Lead (blue)	300 Ohms	15,000 kc	"C" Right	Rock Through 15,000 kc	"C" Ant.	C1	Max. (peak)*‡
5	Ant. Lead (blue)	200 Mmfd.	600 kc	"A" Left	600 kc	"A" Osc.	L8	Max. (peak)

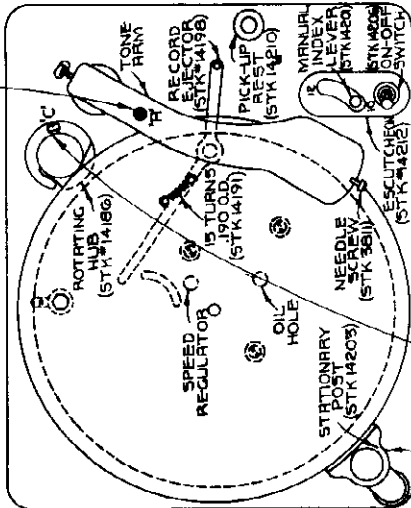
* Use minimum capacity peak if two peaks can be obtained. † Use maximum capacity peak if two peaks can be obtained. ‡ After this adjustment, check for image signal by shifting receiver dial to 15,920 kc.

MODEL U-103

RCA MFG. CO., INC.

Automatic Record Changer
Adjustments, Details

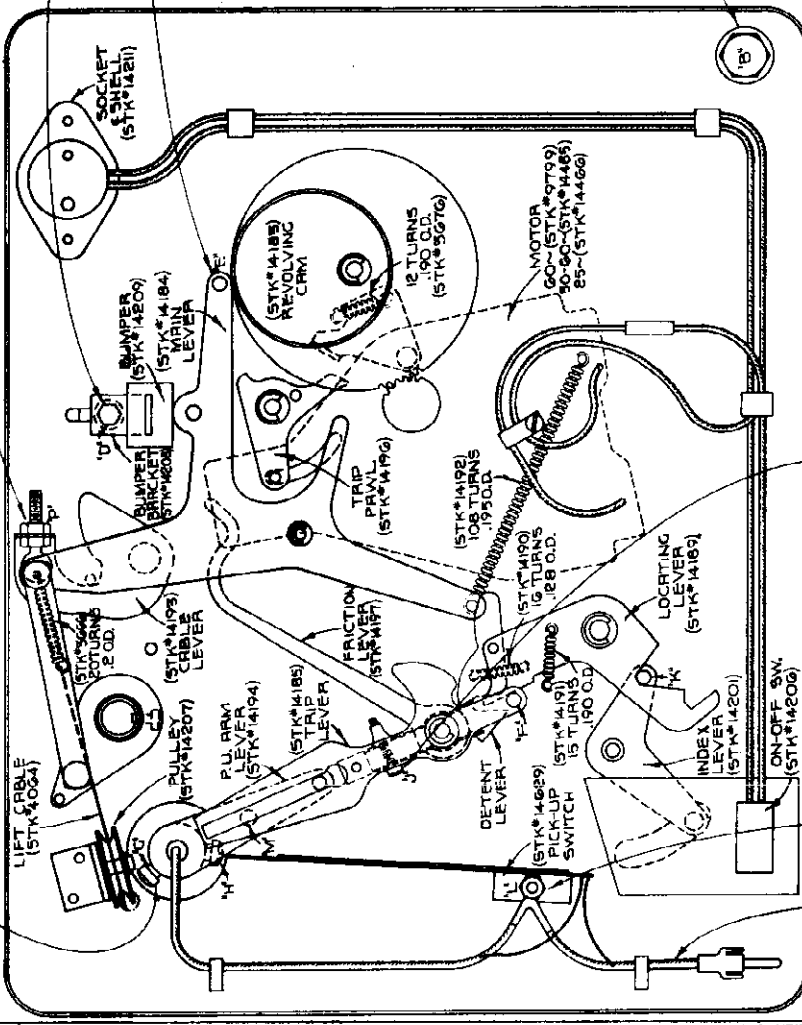
ADJUST THE LOWER MOST REST POSITION POINT RESTS IN A PLANE $1/32"$ BELOW THE PLANE OF SCREW 'H'.



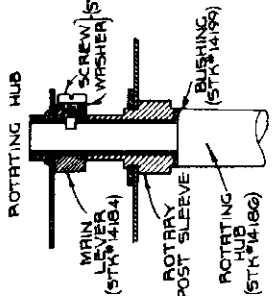
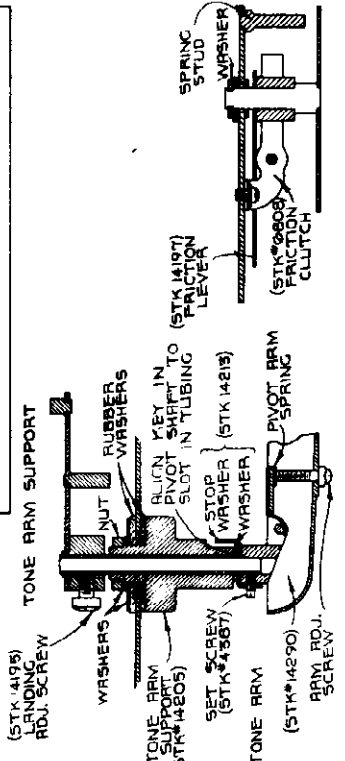
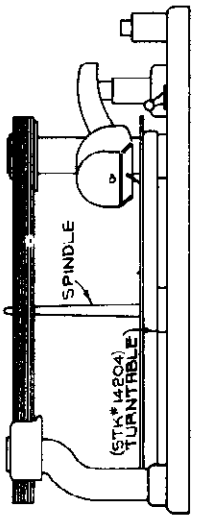
TO ADJUST RECORD POSTS: SO THAT IT RESTS ON THE LOWER SHELF OF THE ROT. HUB, MOVE STATIONARY RECORD POST TO POSITION WHERE RECORDS CAN BE LOCATED UNDER THE RECORD/TAPE TABLE. THE RECORD SCREW IS LOCATED UNDER MOTOR BOARD, WITH RECORD STILL ON LOWER SHELF OF ROTATING HUB ADJUST SCREW 'C' (STK*14188) SO THAT THE BEVELED TONGUE ON THE SEPARATING CRAM CLEARS THE RECORD BY $1/8"$ TO $3/8"$. THESE ADJUSTMENTS SHOULD BE MADE ONLY WHEN THE COMPLETE UNIT IS RESTING ON THE FOUR MOTOR BOARD BUSHINGS.

ADJUST THE REST POSITION OF THE MAIN LEVER BY MEANS OF THE NUT 'D' ON THE BUMPER BRACKET SO THAT THE MAIN LEVER ROLLER CAMEARNS THE NEAREST POSITION. ALSO NOTE THAT THE DETENT LEVER CLEARS THE PIN 'E' AT LEAST $1/16"$ WHEN THE ABOVE CONDITIONS EXIST.

ADJUST THE RAISE OF THE TONE ARM SO THAT THE NEEDLE POINT RISES $1/16"$ ABOVE THE TOP OF THE 15 TURNS .190 O.D. THE SCREW AND LOCK NUTS 'P' (STK*14205) ON THE CABLE LEVER.



TO ADJUST THE LANDING POSITION OF THE NEEDLE FIRST LOCATE NEEDLE $1/16"$ FROM CENTER OF THE TURNABLE SPINDLE THEN WITH THE LOCATING LEVER RISE TO CONTACT IN THE RECORDING LEVER TIGHTEN THE BALL JOINT SCREW 'G' ON TONE ARM SUPPORT AND RUN DEVICE THROUGH CYCLE RS A CHECK WHEN CORRECT ADJUSTMENT IS OBTAINED TIGHTEN CONE POINTED SCREW 'H' (STK*14195) ON TONE ARM SUPPORT.



ADJUST TRIP LEVER SCREW 'J' (STK*14205) UNTIL FRACTION LEVER TO MOVE TRIP PAWL.

Figure 4—
Automatic Record Changer Adjustments
(Model U-103)

TO ADJUST PICK-UP SHORTING SWITCH SET PICK-UP NEEDLE $1/16"$ FROM CENTER OF SPINDLE. ADJUST NUT 'L' SO THAT THE BLADE ON SWITCH IS JUST CONTACTING PIN 'M'.

RCA MFG. CO., INC.
T-7087-C

RCA MFG. CO., INC.

MODEL U-103

Motor Detail

Notes
Radio

POWER SUPPLY RATINGS

	Radio Only	Total
Model U-101		
A-6.. 105-125 volts, 60 cycles.....	75 watts..	80 watts
A-5.. 105-125 volts, 50 cycles.....	75 watts..	80 watts
B-2.. 105-125 volts, 25 cycles.....	80 watts..	85 watts
C-6.. 105-125/200-250 volts, 60 cycles..	75 watts..	80 watts
C-5.. 105-125/200-250 volts, 50 cycles..	75 watts..	80 watts

POWER OUTPUT RATING

Undistorted	2.5 watts
Maximum	4.5 watts

	Model U-101	Model U-103
Type.....	Manual.....	Automatic-Manual
Turntable Speed.....	78 r.p.m....	78 r.p.m.

Type of Pickup..... High-impedance magnetic
Pickup Impedance..... 1,400 ohms at 1,000 cycles

Automatic Record Mechanism
(Model U-103)

The record changing mechanism is designed to be simple and fool-proof. Certain adjustments may be required occasionally. The adjustments are illustrated and explained in figures 4 and 5.

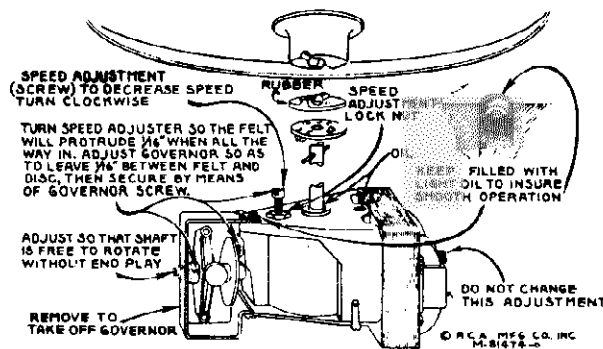


Figure 5—Details of Motor
(Model U-103)

It is important when servicing the automatic mechanism, to have it placed on a level support. It is also important to refrain from forcing the mechanism if there is a tendency to bind or jam, since bent levers and possible broken parts may result.

CAUTION.—Do not leave records stacked on the record holder posts, when not in use, as they are liable to warp, particularly so in warm climates.

MAGNETIC PICKUP

The pickup used in the phonograph unit is of an improved design. The horseshoe magnet is rigidly welded to the pole pieces and is irremovable. There is a centering spring attached to the armature to maintain proper adjustment and to provide a limiting effect on the movement of the armature. The frequency response is substantially uniform over a wide range. Service operations which may be necessary on the pickup are as follows:

Centering Armature.—Refer to figure 6 showing the pickup inner structure. The armature is shown in its proper relation to the magnet pole pieces, i. e., exactly centered. Whenever this centering adjustment has been disturbed it will be necessary to remove the pickup mechanism from the tone arm by removing the needle holding screw and the two mounting screws from the front of the tone arm, holding the pickup assembly to keep it from dropping. Unsolder the two leads from the lugs on the terminal board at the rear of the pickup. Insert a small rod or nail into the armature needle hole and replace the needle holding screw, tightening it to hold the rod securely. If the armature clamping screws A and B have not been disturbed, screws C should be loosened which will permit the armature to be moved from side to side, the rod acting as a lever to perform this operation. The proper adjustment is obtained when the armature is moved to the extreme position on each side (the movement being

LOUDSPEAKER

	Radio Only	Total
Model U-103		
A-6.. 105-125 volts, 60 cycles.....	75 watts..	100 watts
A .. 105-125 volts, 50-60 cycles.....	75 watts..	105 watts
B-2.. 105-125 volts, 25 cycles.....	80 watts..	105 watts
C-6.. 105-125/200-250 volts, 60 cycles..	75 watts..	100 watts
C .. 105-125/200-250 volts, 50-60 cycles	75 watts..	105 watts

Type..... Electrodynamic
V.C. Impedance..... 2.2 ohms at 400 cycles

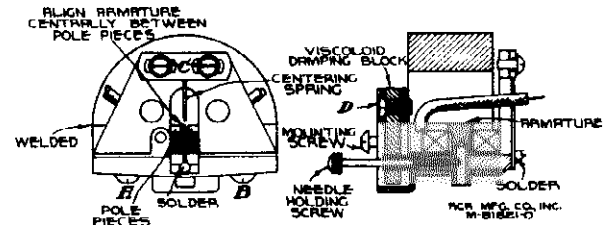


Figure 6—Details of Pickup

limited by the armature striking the pole pieces) and the brought to the mid position between these two extreme Screws C should then be tightened. The armature position should then be central between the pole pieces and at right angles to them. With a little practice, the correct adjustment of the armature will be obtained. The air gap between the pole pieces and the armature should be kept free from dust filings, and other foreign material which would obstruct the movement of the pickup armature.

Damping Block.—The viscoloid damping block which is attached to the front end of the armature shank serves as a mechanical filter to eliminate undesirable resonances and cause the frequency response to be uniform. Should it be necessary to replace this damping block, the pickup mechanism should be removed from the tone arm as explained above. Remove screw D and the damping block from the pickup assembly. Make sure that the shaft of the armature which contacts the viscoloid is clean. Then insert the new damping block so that it occupies the same position as that of the original block, and is in correct vertical alignment with the armature. The hole in the block is somewhat smaller than the diameter of the armature in order to permit a snug fit. With the damping block properly aligned on the armature, screw D with its washer should then be replaced. Heat should be applied to the armature (viscoloid side) so that the damping block will fuse at the point of contact and become rigidly attached to the armature. A special-tip soldering iron, constructed as shown in figure 8 will be found very useful in performing this operation. The iron should be applied long enough to slightly melt the block, causing a small bulge on both sides.

Replacing Coil.—Whenever there is defective operation due to an open or shorted pickup coil, this coil should be replaced. Remove the pickup mechanism and terminal board as described above. Remove screws A and B and the magnet assembly. Remove the bakelite coil support (with coil attached) and insert the new coil support assembly in its place after which replace the magnet assembly and center the armature as described above, then re-assemble the remainder of the unit.

Magnetizing.—In case it becomes necessary to re-magnetize the unit, first remove the pickup mechanism from the tone arm, and then remove the magnet assembly. Place the ma-

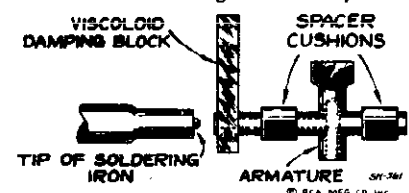


Figure 8—Special Soldering-Iron Tip

MODELS U-101, U-103

Parts

RCA MFG. CO., INC.

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
RECEIVER ASSEMBLIES		MOTORBOARD ASSEMBLIES	
MODEL U-101		MODEL U-101	
14634	Belt—Variable condenser drive belt	14803	Brake—Turntable brake and motor switch
14632	Bracket—Dial mounting bracket	14805	Connector—2-contact male connector for motor and switch leads
5237	Bushing—Variable condenser rubber mounting bushing	3261	Rest—Pickup rest
14802	Cable—2-conductor shielded compensation cable complete with grid contact cap	14235	Screw—Motor mounting screw and washer
12118	Cap—Grid contact cap	30100	Springs—Tension springs for brake Stock No. 14803—comprising 1 long and 1 short spring
12896	Capacitor—15 Mmfd. (C25)	14804	Switch—Motor switch (S4)—located on turntable brake Stock No. 14803
12405	Capacitor—47 Mmfd. (C14)	MOTORBOARD ASSEMBLIES	
14262	Capacitor—110 Mmfd. (C11, C12)	MODEL U-103	
12724	Capacitor—120 Mmfd. (C7)	14208	Bracket—Bumper bracket and bumper complete
12406	Capacitor—180 Mmfd. (C16)	14209	Bumper—Rubber bumper
12612	Capacitor—450 Mmfd. (C8)	14830	Cable—Shielded cable 13-in. long complete with single contact male connector—connects pickup shorting switch to input transformer or compensator
14724	Capacitor—560 Mmfd. (C17)	11704	Damper—Turntable damper and damper plate
14728	Capacitor—4,500 Mmfd. (C3)	14212	Escutcheon—Manual index lever and switch escutcheon
4868	Capacitor—005 Mfd. (C29)	14203	Post—Record post—located on front left hand corner of motorboard
13138	Capacitor—.01 Mfd. (C9, C18)	14210	Rest—Pickup arm rest
4870	Capacitor—.025 Mfd. (C4, C13, C19, C21)	14207	Roller—Pickup lift cable roller and bracket
4839	Capacitor—.025 Mfd. (C15)	14211	Socket—Motorboard socket and shell
12484	Capacitor—.10 Mfd. (C24)	14205	Support—Pickup arm mounting spacer, washers and nut
14814	Capacitor—.16 Mfd. (C23)—Model U101 only	14206	Switch—Motor toggle switch (S4)
5212	Capacitor—.16 Mfd. (C23)—Model U101 only	14208	Switch—Pickup shorting switch (S8)
14377	Capacitor—.16 Mfd. (C10)—Model U101 only	14204	Turntable Complete
14813	Capacitor Pack—Comprising two 16 Mfd. sections (C10, C23)—Model U103 only	14213	Washer—Pickup arm stop washer and spacing washer
14646	Coil—Antenna coil (L1, L2, L3)	MOTOR ASSEMBLIES	
14647	Coil—Oscillator coil (L6, L7, L8)	MODEL U-101	
14633	Condenser—2-gang variable tuning condenser (C1, C2, C5, C6)	10194	Ball—Steel ball bearing
14783	Connector—2-contact female for motor power cable	14233	Base—Motor base and bearing assembly
5119	Connector—3-contact female for speaker cable	14232	Cap—Turntable spindle cap
14648	Core—Adjustable core and stud for oscillator coil	14233	Coil—Stator assembly—comprising coils and laminations—105-125 volts, 60 cycle
12008	Core—Adjustable core and stud for I.F. transformer	14224	Coil—Stator assembly—comprising coils and laminations—105-125 volts, 50 cycle
14631	Dial—Station selector dial	14225	Coil—Stator assembly—comprising coils and laminations—105-125 volts, 25 cycle
14651	Drive—Variable condenser vernier drive and pinion gear	14228	Damper—Motor damper assembly comprising one damper, one damper plate, one screw and one "C" washer
14635	Indicator—Station selector indicator pointer	14806	Motor—105-125 volts, 60 cycle (M1)
5226	Lamp—Dial lamp	14807	Motor—105-125 volts, 50 cycle (M1)
14636	Pulley—Idler pulley—less spring	14808	Motor—105-125 volts, 25 cycle (M1)
14839	Pulley—Variable condenser drive pulley—located on condenser shaft	14227	Shield—Terminal board shield and nuts
14660	Resistor—18 ohms, insulated, 1/2 watt (R14)	14229	Stop—Turntable stop, lockwasher and nut—prevents removal of turntable
14653	Resistor—50 ohms, flexible type, 1/10 watt (R18)	14809	Turntable—Turntable assembly complete with rotor laminations—60 cycle operation
13819	Resistor—270 ohms, wire wound, 1.1 watt (R15)	14810	Turntable—Turntable assembly complete with rotor laminations—50 cycle operation
5175	Resistor—5,600 ohms, carbon type, 1/2 watt (R12)	14911	Turntable—Turntable assembly complete with rotor laminations—25 cycle operation
14859	Resistor—6,800 ohms, carbon type, 1/2 watt (R3)	14812	Turntable—10-in. turntable plate only
14569	Resistor—10,000 ohms, insulated, 1/2 watt (R55)—Model U103 only	4083	Washer—Leather washer for turntable bearing
11305	Resistor—32,000 ohms, carbon type, 1/2 watt (R16)	14230	Washer—Metal washer for turntable bearing
13735	Resistor—33,000 ohms, carbon type, 1/2 watt (R2)	14231	Washer—Metal shim washer for turntable bearing
5033	Resistor—33,000 ohms, carbon type, 1 watt (R4)	MOTOR ASSEMBLIES	
5206	Resistor—38,000 ohms, wire wound, 20 watt (R54)—Model U103 only	MODEL U-103	
11646	Resistor—47,000 ohms, carbon type, 1/2 watt (R9)	14215	Governor—Governor complete for motor Stock No. 8799, No. 14465 and No. 14466
11923	Resistor—50 ohms, flexible type, 1/10 watt (R18)	14466	Motor—105-125 volts, 25 cycle (M1)
13733	Resistor—330,000 ohms, carbon type, 1/2 watt (R7, R8)	14465	Motor—105-125 volts, 50-60 cycle (M1)
13479	Resistor—390,000 ohms, carbon type, 1/2 watt (R10)	9799	Motor—105-125 volts, 60 cycle (M1)
5035	Resistor—560,000 ohms, carbon type, 1/2 watt (R6)	14214	Screw—Motor mounting screw and spacer assembly
12679	Resistor—2.2 meg., insulated, 1/2 watt (R11)	PICKUP AND ARM ASSEMBLIES	
14661	Resistor—6.8 meg., insulated, 1/2 watt (R13)	MODEL U-101	
5129	Ring—Radiotron shield ring	14291	Armature—Pickup armature
4389	Screw—No. 6-32x3/16 headless set screw for pulley No. 14839	11732	Coil—Pickup coil (L14)
14638	Shaft—Station selector knob shaft and pulley	14292	Damper—Pickup damper assembly—comprising one damper, one clamp and one screw
12008	Shield—First I.F. transformer shield	14933	Pickup and Arm complete
12408	Shield—Second I.F. transformer shield	3811	Screw—Needle holding screw
11866	Shield—Radiotron shield	PICKUP AND ARM ASSEMBLIES	
14658	Socket—Dial lamp socket	MODEL U-103	
4794	Socket—4-contact 80 Radiotron socket	14291	Armature—Pickup armature assembly
4786	Socket—6-contact 6D8 or 42 or 7A Radiotron socket	4064	Cable—Pickup lift cable
4787	Socket—7-contact 6A7 Radiotron socket	11732	Coil—Pickup coil (L14)
14837	Spring—Idle pulley tension spring	14292	Damper—Pickup damper block complete with clamp and screw
12007	Spring—Retaining spring for core stock No. 12008 and No. 14648	14290	Pickup and Arm complete
14640	Switch—Range switch (S2, S3)	3811	Screw—Needle holding screw
14376	Transformer—First I.F. transformer (L4, L5, C11, C12)	4387	Screw—No. 6-32x1-in. headless set screw for pickup arm pivot shaft
14642	Transformer—Second I.F. transformer (L9, L10, C14, C16)	REPRODUCER ASSEMBLIES (RL63P-1)	
14655	Transformer—Power transformer, 105-125 volts, 50-60 cycle (T1)	MODEL U-101	
14656	Transformer—Power transformer, 105-125 volts, 25-60 cycle (T1)	14356	Board—3-contact reproducer terminal board
14657	Transformer—Power transformer, 100-125/200-250 volts, 50-60 cycle (T1)	13866	Cap—Cone center dust cap
14826	Volume Control—and power switch (R5, S1)	12012	Coil—Field coil (L13)
OPERATING MECHANISM ASSEMBLIES		11489	Coil—Hum neutralizing coil (L12)
MODEL U-103		12642	Coil—Hum neutralizing coil (L12)
14199	Bushing—Record separator rotating shaft bushing	5118	Plug—3-contact male plug for reproducer
6808	Cam—Cam and gear assembly	14360	Reproducer—Complete
14197	Clutch—Trip lever friction clutch	14358	Screw—Screw, washer and lockwasher to hold core in yoke
14197	Finger—Friction finger assembly	14355	Transformer—Output transformer (T2)
14186	Hub—Rotating hub and record separator complete with set screw	14357	Washer—Spring washer to hold field coil
14189	Lever—Locating lever assembly	REPRODUCER ASSEMBLIES (RL70E-1)	
14184	Lever—Main lever and link assembly	MODEL U-103	
14201	Lever—Manual index lever assembly	13866	Cap—Dust cap for cone center
14183	Lever—Pickup lift cable lever	12012	Coil—Field coil (L13)
14194	Lever—Pickup arm lever complete with set screws	11489	Coil—Hum neutralizing coil (L12)
14198	Lever—Reject lever assembly	12687	Cone—Reproducer cone and dust cap (L11)
14185	Lever—Trip lever and friction clutch assembly	5118	Plug—3-contact male plug for reproducer
14196	Pawl—Trip pawl assembly	14395	Reproducer—Complete
4563	Screw—Cable lever screw and two locknuts	14358	Screw—Screw, washer and lockwasher to hold core in yoke
4059	Screw—Trip lever clutch tension adjustment screw	14355	Transformer—Output transformer (T2)
14200	Screw—No. 8-32 special hex head screw and lockwasher for record separator shaft mounting	14357	Washer—Spring washer to hold field coil
14195	Screw—No. 10-32x5/16 fillister-head, cone-pointed set screw for pickup arm lever	13866	Cap—Dust cap for cone center
14188	Screw—No. 10-32x7/16 fillister-head, cone-pointed set screw for rotating hub	12012	Coil—Field coil (L13)
14187	Shaft—Rotating shaft for record separator	11489	Coil—Hum neutralizing coil (L12)
3676	Spring—Cam pawl tension spring	12687	Cone—Reproducer cone and dust cap (L11)
3666	Spring—Lift cable tension spring	5118	Plug—3-contact male plug for reproducer
14190	Spring—Locating lever pawl tension spring	14395	Reproducer—Complete
14191	Spring—Locating lever or reject lever tension spring	14358	Screw—Screw, washer and lockwasher to hold core in yoke
14192	Spring—Main lever tension spring	14355	Transformer—Output transformer (T2)
		14357	Washer—Spring washer to hold field coil

Screw—Motorboard mounting screw and spacer—for Model U101 only
 Screw—No. 8-32 headless set screw for knob Stock No. 12673
 Volume Control—Photograph volume control and radio record switch (R50, S6)
 Escutcheon—Station selector escutcheon and crystal knob—Station selector, range control, radio volume control or photograph volume control knob
 Resistor—2,200 ohms, insulated, 1/2 watt (R51, R52, R53)
 Screw—Chassis mounting screw and washer—for Model U101 only
 Screw—Chassis mounting screw and washer—for Model U103 only
 14654
 14873
 13716
 14267
 13673
 11762
 4391
 14817
 5107
 14839
 4841

Schematic, Notes

RCA MFG. CO., INC.

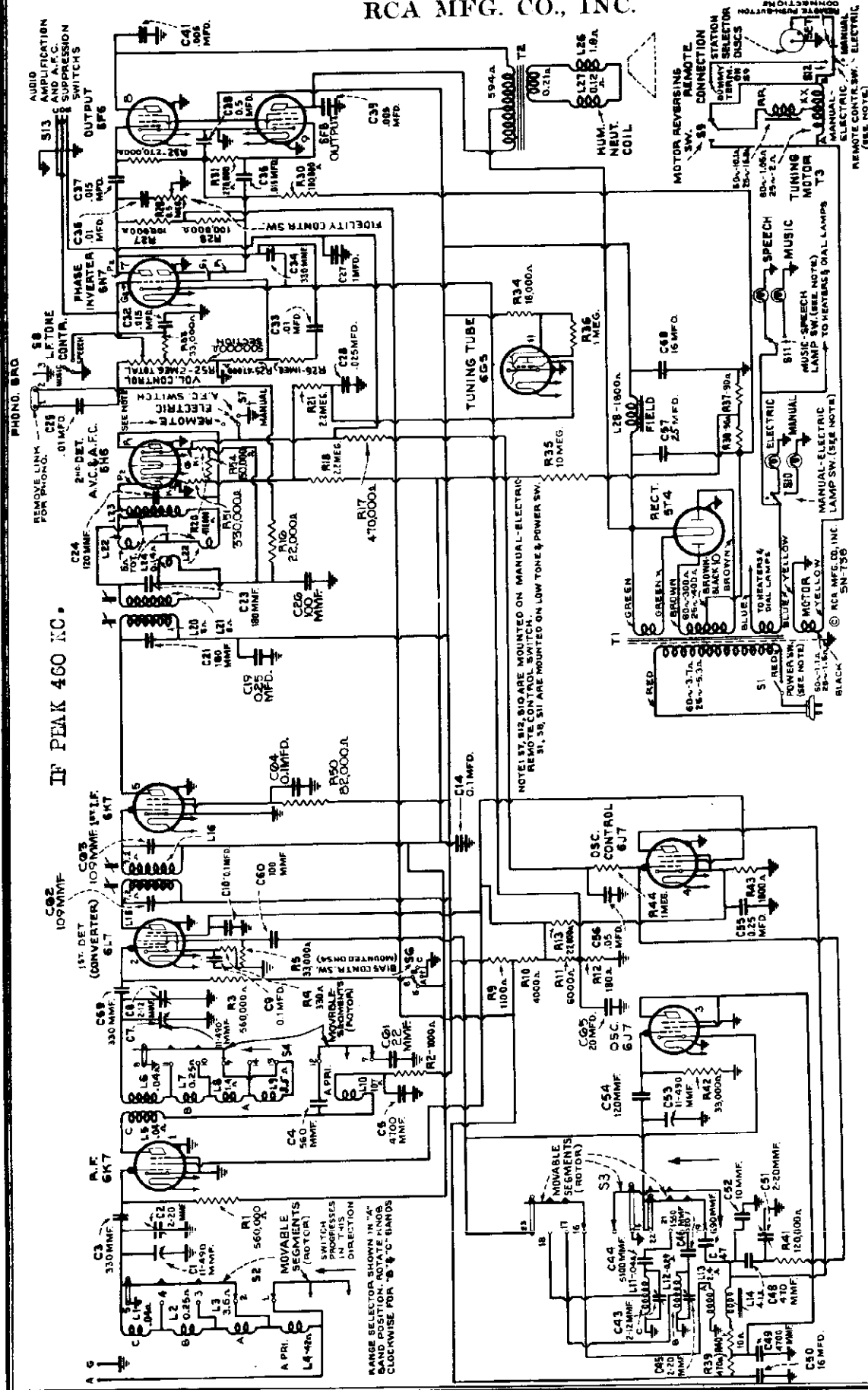


Figure 1—Schematic Circuit Diagram

This receiver employs an eleven-tube, three-band, "Magic Brain" superheterodyne circuit. Features of design include "Electric Tuning" with push-button operation; automatic frequency control; "cumulative-wound" antenna and detector coils; tuned r-f amplifier; magnetic-core adjusted i-f transformers and low-frequency "A" oscillator tracking; straight-board; "Magic Eye" tuning tube; twelve-inch electrodynamic loudspeaker; plunger-type, air-dielectric trimming capacitors; aural-compensated volume control; tone control; "Music-Speech" switch; audio phase inverter; and push-pull power output stage. In addition, this model has a cabinet incorporating the "Sonic Arc" Magic Voice.

MODEL 811K
Chassis Wiring

RCA MFG. CO., INC.

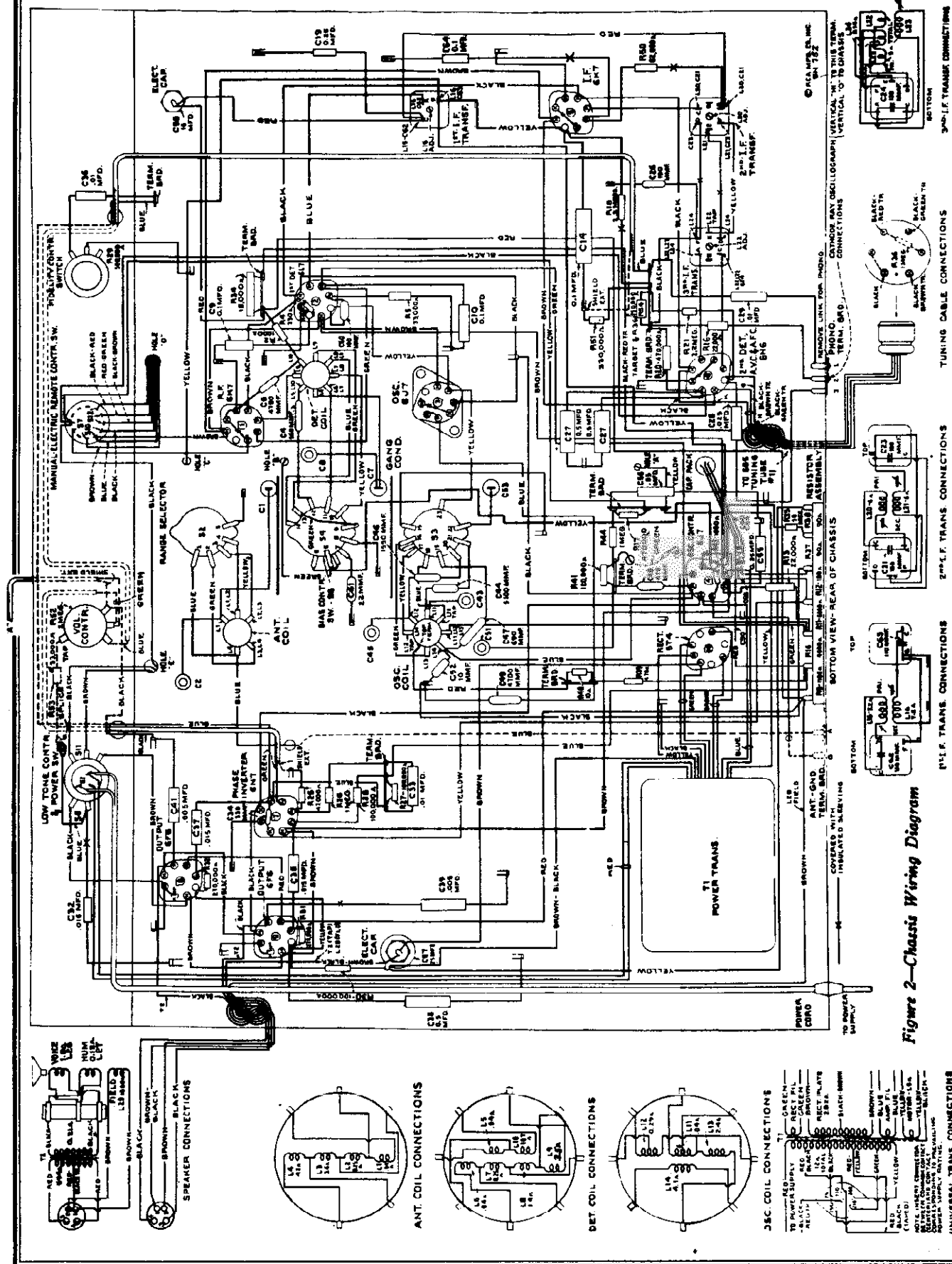


Figure 2—Chassis Wiring Diagram

MODEL 811K
Socket, Trimmers

RCA MFG. CO., INC.

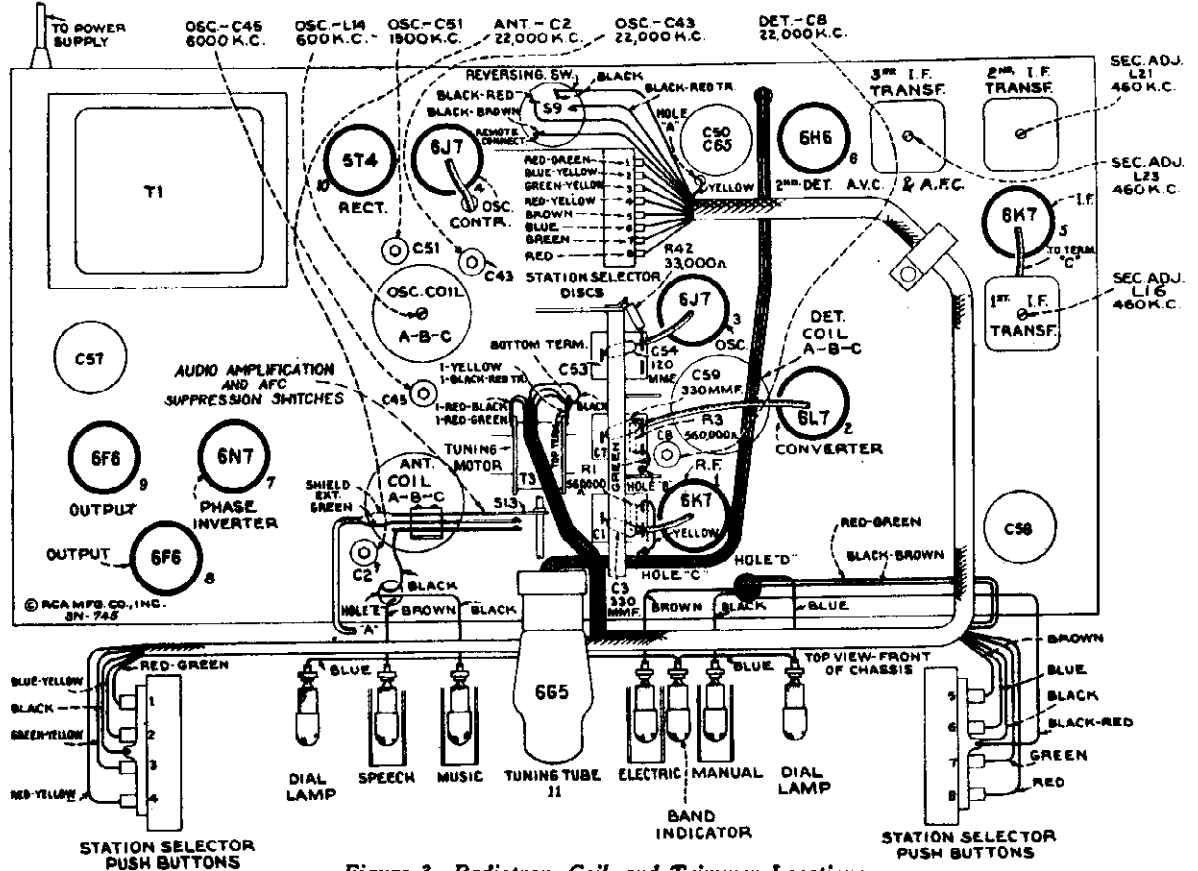


Figure 3—Radiotron, Coil, and Trimmer Locations

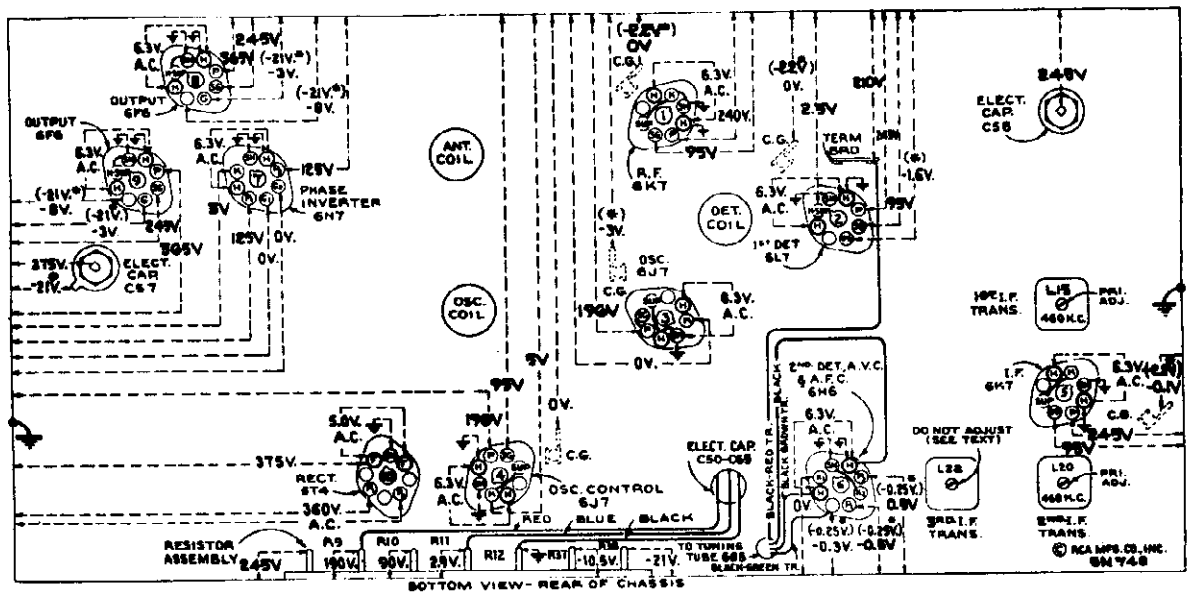


Figure 4—Radiotron Socket Voltages, Coil, and Trimmer Locations

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc ("Broadcast")—"Manual" control—No signal being received—Volume control minimum—Tone control optional

Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter.

Voltage values as specified should hold within $\pm 20\%$ when the receiver is normally operative at its rated line voltage. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250, and 500 volts. Use the nearest range above the specified measured voltage. A-c voltages were measured with a corresponding a-c meter.

MODEL 811K
Specifications
"Electric Tuning" Wiring

RCA MFG. CO., INC.

Electrical Specifications

FREQUENCY RANGES

"Broadcast" (A)..... 530-1,720 kc
"Medium Wave" (B)..... 2,100-6,800 kc
"Short Wave" (C)..... 6,800-23,500 kc

R-F ALIGNMENT FREQUENCIES

"Short Wave" (C)..... 20,000 kc (osc., det., ant.)
"Medium Wave" (B)..... 6,000 kc (osc.)
"Broadcast" (A)..... 600 kc (osc.), 1,500 kc (osc.)

Intermediate Frequency..... 460 kc

RADIOTRON COMPLEMENT

- | | |
|--|--|
| (1) RCA-6K7..... R-F Amplifier | (6) RCA-6H6..... Second Detector, A.V.C., and A.F.C. |
| (2) RCA-6L7..... First Detector | (7) RCA-6N7..... Audio Phase Inverter |
| (3) RCA-6J7..... Heterodyne Oscillator | (8) RCA-6F6..... Power Output |
| (4) RCA-6J7..... Oscillator Control | (9) RCA-6F6..... Power Output |
| (5) RCA-6K7..... I-F Amplifier | (10) RCA-5T4..... Full-Wave Rectifier |
| | (11) RCA-6G5..... "Magic Eye" Tuning Tube |

Pilot Lamps (6)..... Mazda No. 46, 6.3 volts, 0.25 amp.

POWER SUPPLY RATINGS

Rating A 105-125 volts, 50-60 cycles, 140 watts
Rating B 105-125 volts, 25 cycles, 140 watts
Rating C 105-125/140-160/195-250 volts, 50-60 cycles, 140 watts

POWER OUTPUT

Undistorted 10 watts
Maximum 12½ watts

LOUDSPEAKER

Type..... 12-inch Electrodynamic
Impedance (v.c.)..... 2.2 ohms at 400 cycles

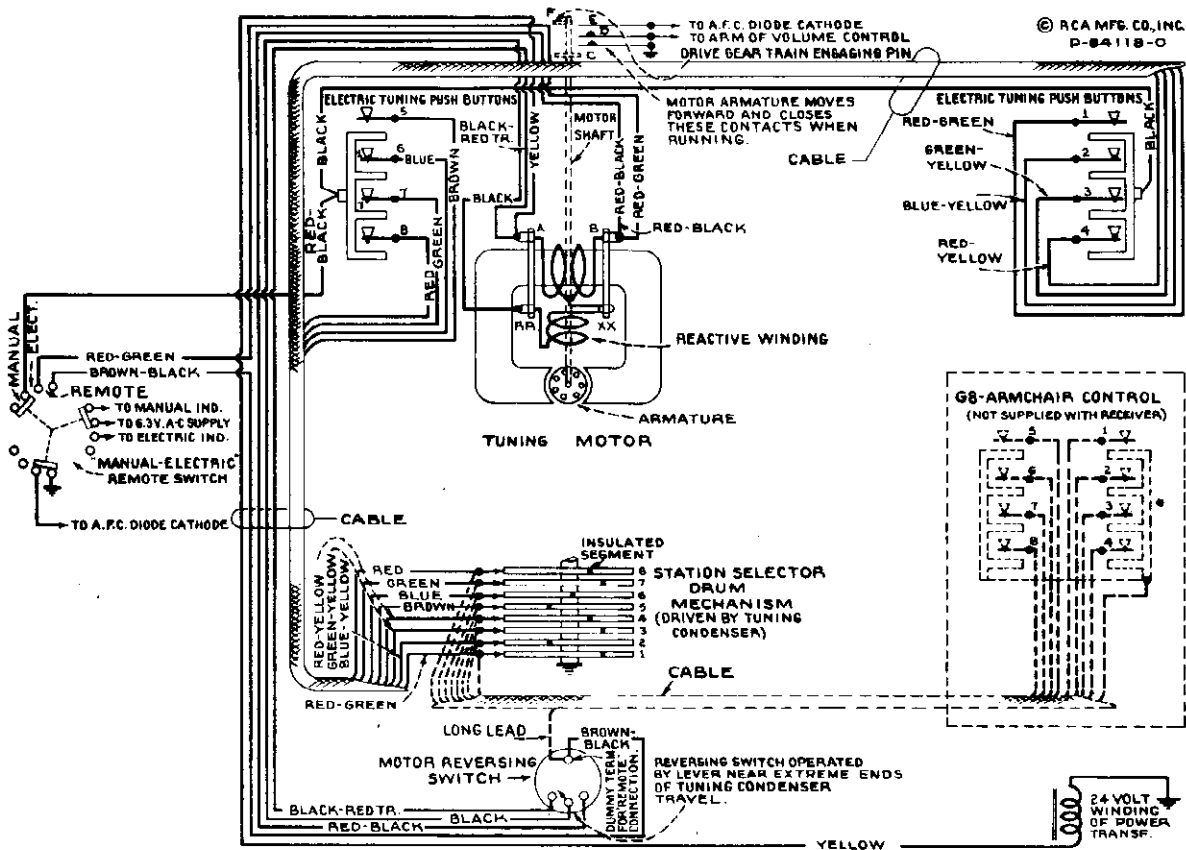


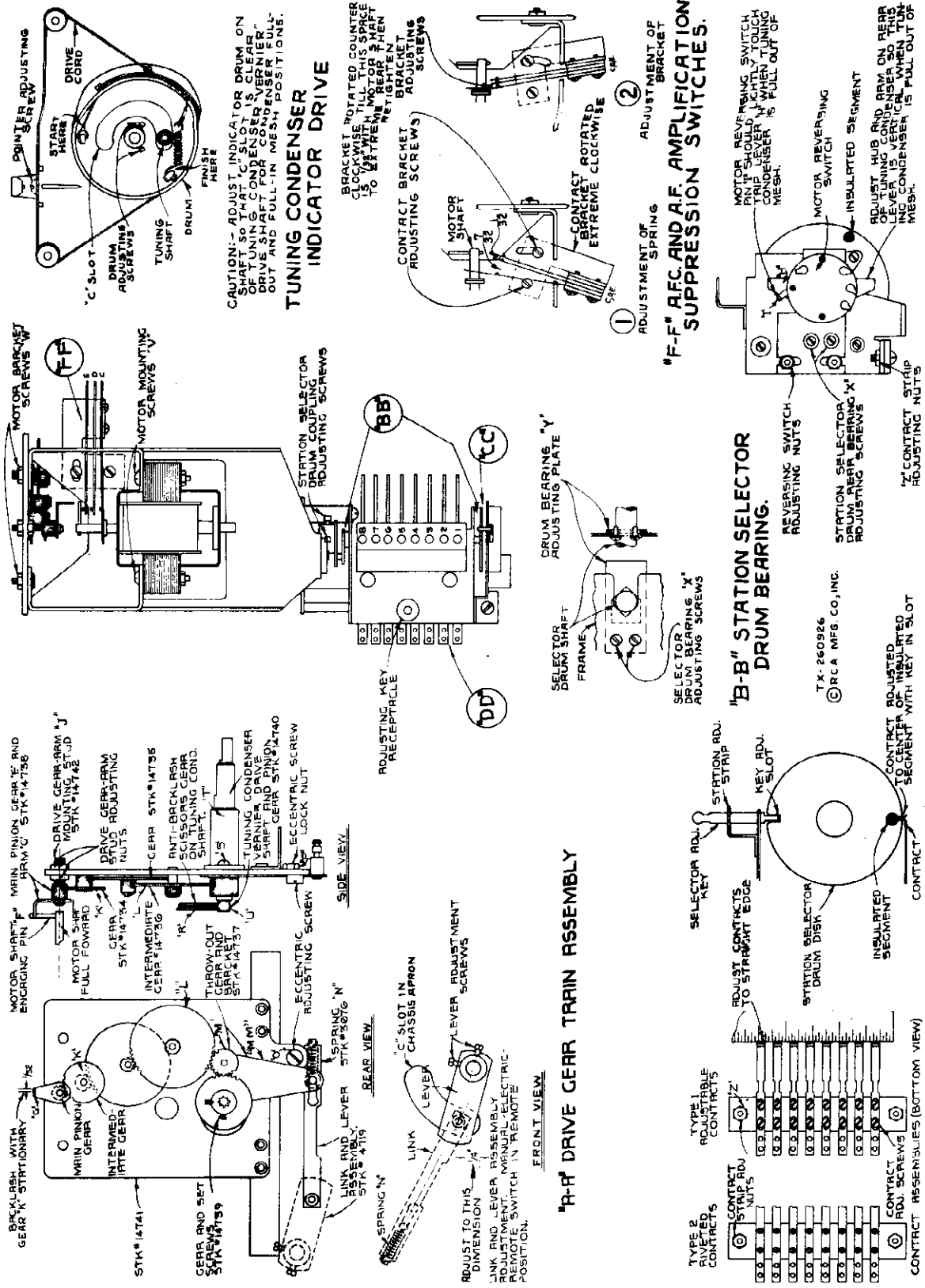
Figure 6—"Electric Tuning" Wiring Diagram
(Viewed from rear of chassis)

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RCA MFG. CO., INC.

MODEL 811K
"Electric Tuning"
Adjustments, Assembly



TUNING INDICATOR DRIVE
CAUTION:—ADJUST INDICATOR DRUM ON BACKSIDE OF CHASSIS. CLEARANCE OF TUNING CONDENSER IS CLEAR. DRIVE SHAFT FOR CONDENSER MUST BE FULLY OUT AND FULL-IN MESH POSITION.

"F-F" A.F.C. AND A.F. AMPLIFICATION SUPPRESSION SWITCHES.

BRACKET ROTATED COUNTER CLOCKWISE TILL THIS SPACE IS FILL WITH "MESH" TO EXTREME TIGHTEN.

CONTACT BRACKET ADJUSTING SCREWS

MOTOR SHAFT

CONTACT ROTATED EXTREME CLOCKWISE

ADJUSTMENT OF SPRING

ADJUSTMENT OF BRACKET

MOTOR REVERSING SWITCH

INSULATED SEGMENT

ADJUST HUB AND ARM ON REAR OF TUNING CONDENSER WHEN THIS LEVER IS FULLY IN MESH. CONDENSER IS FULL OUT OF MESH.

TRIP LEVER TOUCH CONDENSER IS FULL OUT OF MESH.

REVERSE SWITCH ADJUSTING NUTS

STATION SELECTOR DRUM BEARING "X" ADJUSTING SCREWS

"Z" CONTACT STRIP ADJUSTING NUTS

DRUM BEARING "Y" ADJUSTING PLATE

SELECTOR DRUM SHAFT FRAME

SELECTOR DRUM BEARING "X" ADJUSTING SCREWS

"B-B" STATION SELECTOR DRUM BEARING.

TX-260926
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"A-F" DRIVE GEAR TRAIN ASSEMBLY

TYPE 1 ADJUSTABLE CONTACTS

CONTACT STRIP ADJUSTING NUTS

CONTACT ADJUSTING SCREWS

CONTACT ASSEMBLIES (BOTTOM VIEW)

"D-D" STATION SELECTOR DRUM CONTACT ADJUSTMENTS

"C-C" MOTOR REVERSING SWITCH ADJUSTMENT.
Figure 5—"Electric Tuning" Mechanism Adjustments

MODEL 811K

Alignment "Electric Tuning" Notes

RCA MFG. CO., INC.

"O" and lock out "P" on the throw-out gear bracket "MAD". The screw "P" is a lock screw. The lock mechanism of gear...

When Model 811K assembly control is attached to the push button on the front panel when the "Manual/Electric/Remote" control is turned to "Remotes" position.

Section Adjustment Any eight adjustments may be shown for "Electric" tuning. Remove the two enclosure plates from the side of the dial...

When Model 811K assembly control is attached to the push button on the front panel when the "Manual/Electric/Remotes" control is turned to "Remotes" position.

Table with 3 columns: Manual, Mid, and Full Scale. Rows include RCA-451, RCA-452, RCA-453, RCA-454, RCA-455, RCA-456, RCA-457, RCA-458, RCA-459, RCA-460, RCA-461.

ELECTRIC TUNING

The electric tuning mechanism is designed to be as simple in construction and as free from adjustment as possible. The dial drive mechanism is driven by the motor and is connected to the dial...

Section Adjustment Any eight adjustments may be shown for "Electric" tuning. Remove the two enclosure plates from the side of the dial...

When Model 811K assembly control is attached to the push button on the front panel when the "Manual/Electric/Remotes" control is turned to "Remotes" position.

Calibrate the tuning dial by adjusting the pointer to the left side of the horizontal calibration lines with the tuning capacitor plates in full-scale position.

Table with 5 columns: Order of Alignment, Component to Be Adjusted, Frequency Reading, Range Selector, Frequency Dial Setting, Alignment Symbols, Adjust to Obtain, Turn Remotes Control.

Use minimum capacity peak if two peaks can be obtained. After this adjustment, check for image signal by shifting receiver dial to 19,000 kc.

When Model 811K assembly control is attached to the push button on the front panel when the "Manual/Electric/Remotes" control is turned to "Remotes" position.

Calibrate the tuning dial by adjusting the pointer to the left side of the horizontal calibration lines with the tuning capacitor plates in full-scale position.

Table with 5 columns: Order of Alignment, Component to Be Adjusted, Frequency Reading, Range Selector, Frequency Dial Setting, Alignment Symbols, Adjust to Obtain, Turn Remotes Control.

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When Model 811K assembly control is attached to the push button on the front panel when the "Manual/Electric/Remotes" control is turned to "Remotes" position.

RCA MFG. CO., INC.

REPLACEMENT PARTS

list on genuine factory tested parts, which are readily identified and may be purchased from authorized dealers.

Table with columns: STOCK No., DESCRIPTION, STOCK No., DESCRIPTION. Contains parts for Receiver Assemblies, Reprodcer Assemblies, and Miscellaneous Assemblies.

Table with columns: STOCK No., DESCRIPTION, STOCK No., DESCRIPTION. Contains parts for Reprodcer Assemblies and Miscellaneous Assemblies.

care not to allow the acetone to flow into the air gap. The dust cover should be cemented back in place with ambrod upon completion of adjustment.

Service Data

Phonograph Attachment—A terminal board is provided for connecting a phonograph to the audio amplifier circuit. The wiring should be connected as follows: Remove the...

Loadspeaker—Centering of the loudspeaker is made in the usual manner with three narrow paper feelers after first removing the front dust cover. This may be removed by softening its cement with a light application of acetone, using

The various diagrams of this booklet contain such information as will be needed to isolate causes for defective operation of such developa. The ratings of the resistors, capacitors, coils, etc., are indicated adjacent to the symbols signifying these parts on the diagrams. Identification titles such as R1, L1, C1, etc., provide reference between the illustrations and Replacement Parts List. The coil, transformer windings and reactors are rated in terms of dc resistance to permit continuity checks.

Phonograph Lead Dress—(1) Bus lead from oscillator coil directly to ground must be as short as possible for correct alignment. (2) Variable condenser should be 1 1/2 inches long for correct alignment. (3) Bus lead from detector coil to range switch S4 must be as short as possible for correct alignment. (4) Bus lead from detector coil to detector section of variable condenser should be 2 1/2 inches long for correct alignment. (5) Detector tuning capacitor C8 lead should connect directly to variable condenser S7. (6) Bus ground leads must be as short as possible. (7) Bus lead from antenna coil to range switch S2 should be 2 1/2 inches for correct alignment. (8) Bus lead from antenna coil to antenna section C1 of variable condenser must be 3/4 inch overall length. (9) Leads should be dressed away from RCA-6N7 grid. (10) Leads from Nos. 1 and 5 to dressing bus pickups. (11) Resistor R41, R42, and R44 in the oscillator control tube circuit must be

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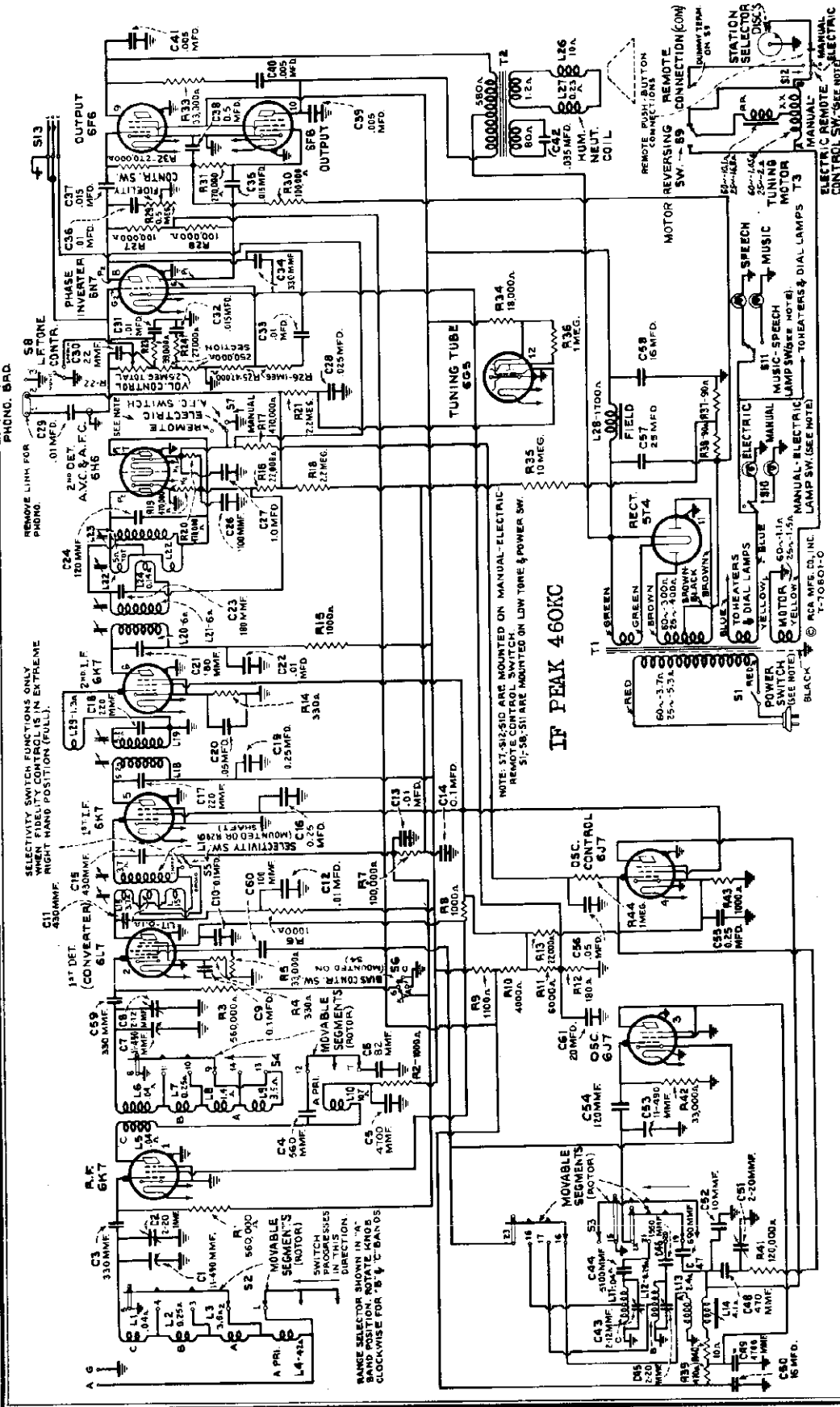


Figure 1—Schematic Circuit Diagram

board; "Magic Eye" tuning tube; twelve-inch electrodynamic loudspeaker; plunger-type, air-dielectric trimming capacitors; two-point aural-compensated volume control; fidelity control; low-frequency tone control; audio phase inverter; and push-pull power output stage. In addition, this model has a cabinet incorporating the "Sonic Arc" Magic Voice.

General Description

This receiver employs a twelve-tube, three-band, "Magic Brain" superheterodyne circuit. Features of design include "Electric Tuning" with push-button operation; automatic frequency control; "cumulative-wound" antenna and detector coils; tuned r-f amplifier; magnetic-core adjusted i-f transformers and low-frequency "A" oscillator tracking; two-stage i-f amplifier; automatic volume control; phonograph terminal

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MODEL 812K
Chassis Wiring

RCA MFG. CO., INC.

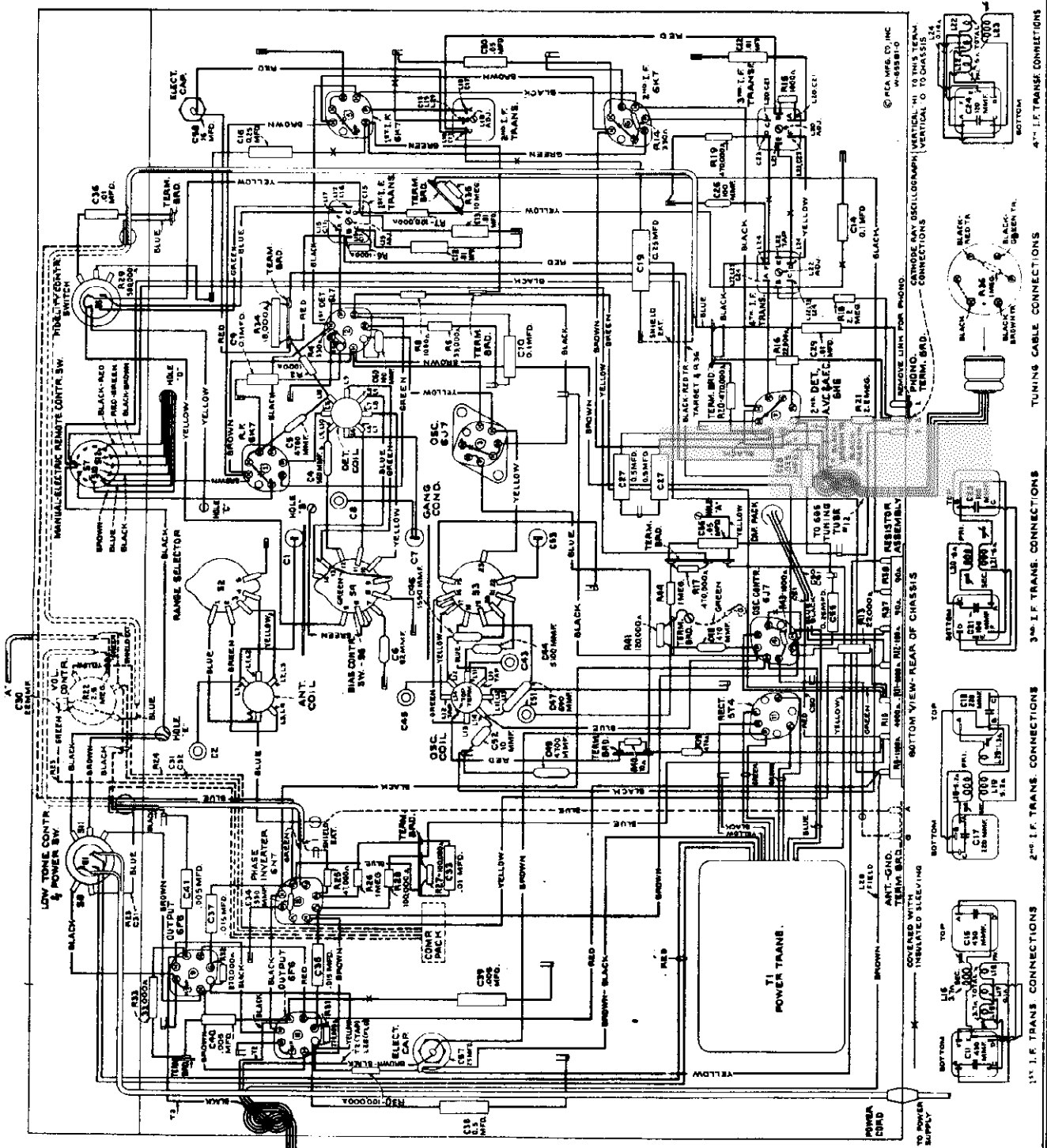
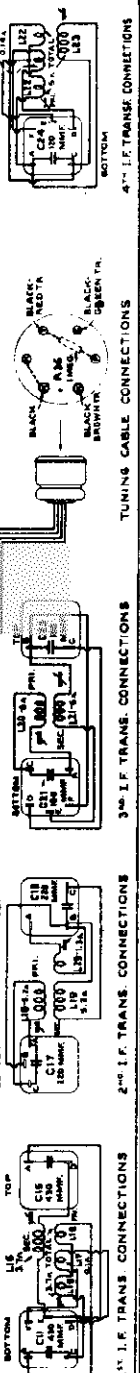
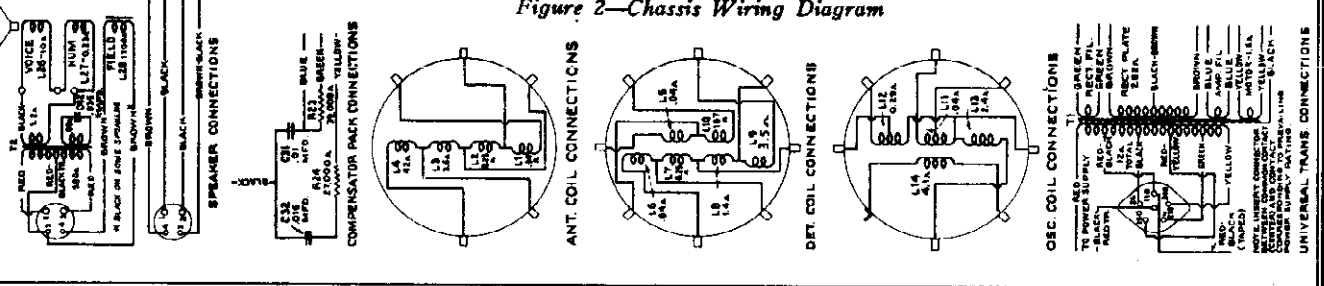


Figure 2—Chassis Wiring Diagram



RCA MFG. CO., INC.

MODEL 812K
Socket, Trimmers
Voltage

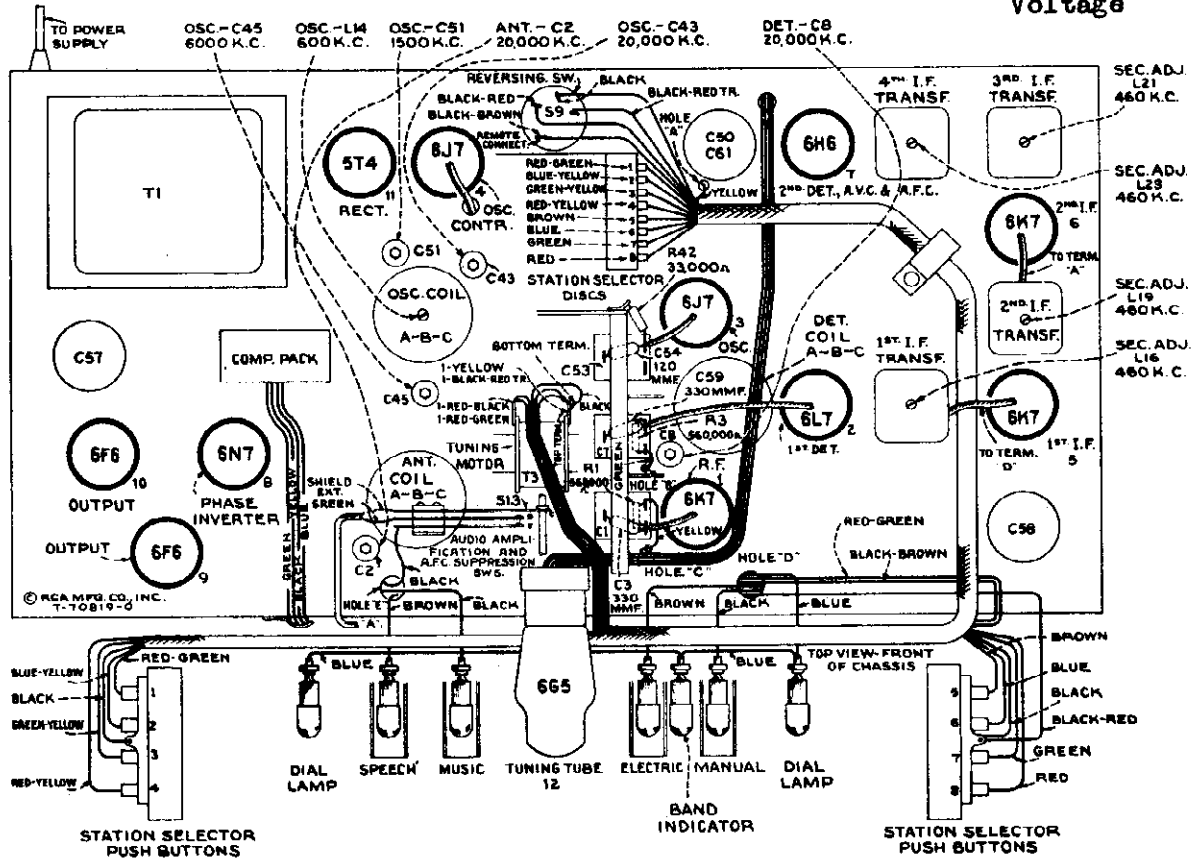


Figure 3—Radiotron, Coil, and Trimmer Locations

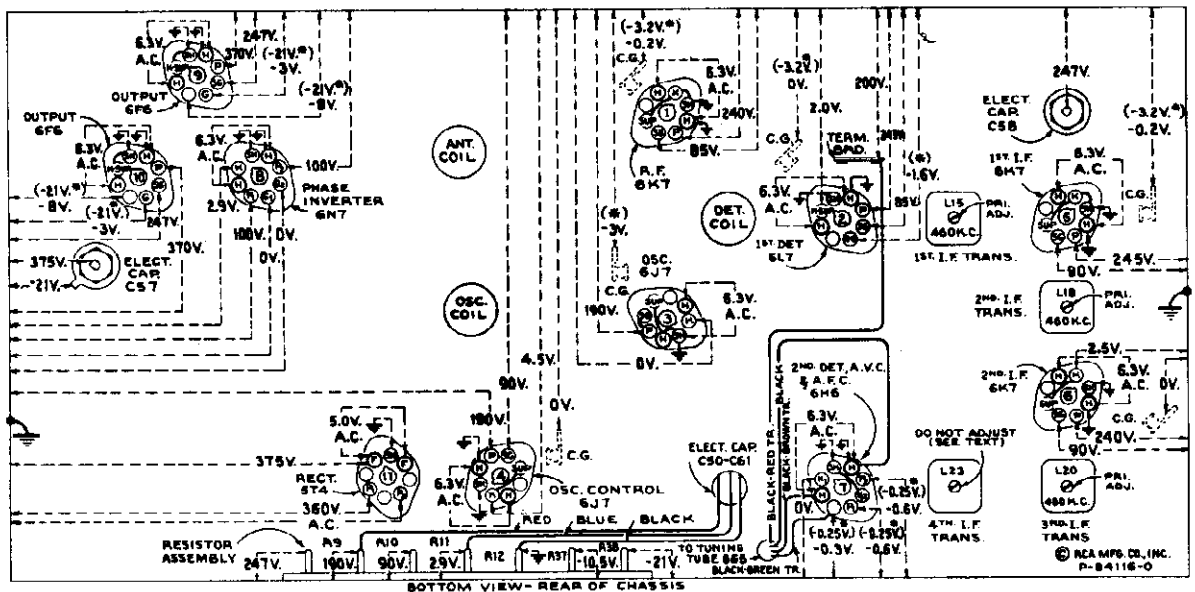


Figure 4—Radiotron Socket Voltages, Coil, and Trimmer Locations

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc ("Broadcast")—"Manual" control—No signal being received—Volume control minimum—Fidelity control optional

Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter.

Voltage values as specified should hold within $\pm 20\%$ when the receiver is normally operative at its rated line voltage. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250, and 500 volts. Use the nearest range above the specified measured voltage. A-c voltages were measured with a corresponding a-c meter.

RCA MFG. CO., INC.

MODEL 812K
"Electric Tuning"
Wiring, Alignment

query again. The point of exact zero-beat is the position for correct adjustment of the discriminator. Zero-beat should also call zero when the "Manual-Electric-Remote" switch is thrown back to "Manual" position. The adjustment is now

Rediator Cathode Current Readings
Measured with Milliammeter Connected at Tube Socket Cathode Terminals Under Conditions Similar to Those of Voltage Measurements

(1) RCA-6K7—R-F Amp.	2.0 ma.
(2) RCA-6K7—Det.	8.5 ma.
(3) RCA-6K7—Osc. Control	8.5 ma.
(4) RCA-6K7—Osc. Control	1.2 ma.
(5) RCA-6K7—1st I-F Amp.	6.0 ma.
(6) RCA-6K7—2nd I-F Amp.	7.5 ma.
(7) RCA-6H6—2nd Det., A.V.C. and A.F.C.	1.8 ma.
(8) RCA-6E6—Phase Inverter	26 ma.
(9) RCA-6E6—Output	116 ma.
(10) RCA-6E6—Rectifier	116 ma.
(11) RCA-6G3—Tuning Tube	2.2 ma.

(*Cannot be measured at socket)

ceiver antenna "A" terminal. With the "Manual-Electric-Remote" switch in "Manual" (right) position, tune in a strong local station near 600 kc or the low-frequency end of the "A" band as accurately as possible by means of the tuning knob. Then, by adjusting the "zero-beat" tuning knob midway between the two points where the eye just appears to start to open. This will place the generated rf carrier signal frequency exactly in the center of the rf amplifier response curve (should be 460 kc if amplifier was properly aligned) and is the frequency to which the a-f-c discriminator (4th if transformer) should be tuned to resonance. Although the tuning knob is in the "zero-beat" position, the grid stop lead of the RCA-6K7, 1st rf amplifier tube, adjust the test-oscillator output to maximum, turn test-oscillator frequency "down" of, and carefully zero-beat the test-oscillator frequency (approximately 460 kc) with the rf carrier signal. Avoid placing the test-oscillator lead nearer to the grid cap lead than specified above, as doing so will tend to detune the rf amplifier. It may be necessary to reduce the local station frequency to approximately 500 kc in order to tune in the grounding antenna "A" terminal to chassis in order to create the zero-beat adjustment.

Throw "Manual-Electric-Remote" switch to "Electric" (center) position. A high whistle or beat note will now be heard. Turn the magnetic core screw L13 (top of 4th if transformer) slowly clockwise. As this screw is turned, the beat note will first increase to a high audio frequency and will then decrease to a zero-beat and then increase in fre-

quency again. The point of exact zero-beat is the position for correct adjustment of the discriminator. Zero-beat should also call zero when the "Manual-Electric-Remote" switch is thrown back to "Manual" position. The adjustment is now

Rediator Cathode Current Readings
Measured with Milliammeter Connected at Tube Socket Cathode Terminals Under Conditions Similar to Those of Voltage Measurements

(1) RCA-6K7—R-F Amp.	2.0 ma.
(2) RCA-6K7—Det.	8.5 ma.
(3) RCA-6K7—Osc. Control	8.5 ma.
(4) RCA-6K7—Osc. Control	1.2 ma.
(5) RCA-6K7—1st I-F Amp.	6.0 ma.
(6) RCA-6K7—2nd I-F Amp.	7.5 ma.
(7) RCA-6H6—2nd Det., A.V.C. and A.F.C.	1.8 ma.
(8) RCA-6E6—Phase Inverter	26 ma.
(9) RCA-6E6—Output	116 ma.
(10) RCA-6E6—Rectifier	116 ma.
(11) RCA-6G3—Tuning Tube	2.2 ma.

(*Cannot be measured at socket)

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Rediator Cathode Current Readings
Measured with Milliammeter Connected at Tube Socket Cathode Terminals Under Conditions Similar to Those of Voltage Measurements

(1) RCA-6K7—R-F Amp.	2.0 ma.
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(4) RCA-6K7—Osc. Control	1.2 ma.
(5) RCA-6K7—1st I-F Amp.	6.0 ma.
(6) RCA-6K7—2nd I-F Amp.	7.5 ma.
(7) RCA-6H6—2nd Det., A.V.C. and A.F.C.	1.8 ma.
(8) RCA-6E6—Phase Inverter	26 ma.
(9) RCA-6E6—Output	116 ma.
(10) RCA-6E6—Rectifier	116 ma.
(11) RCA-6G3—Tuning Tube	2.2 ma.

(*Cannot be measured at socket)

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Throw "Manual-Electric-Remote" switch to "Electric" (center) position. A high whistle or beat note will now be heard. Turn the magnetic core screw L13 (top of 4th if transformer) slowly clockwise. As this screw is turned, the beat note will first increase to a high audio frequency and will then decrease to a zero-beat and then increase in fre-

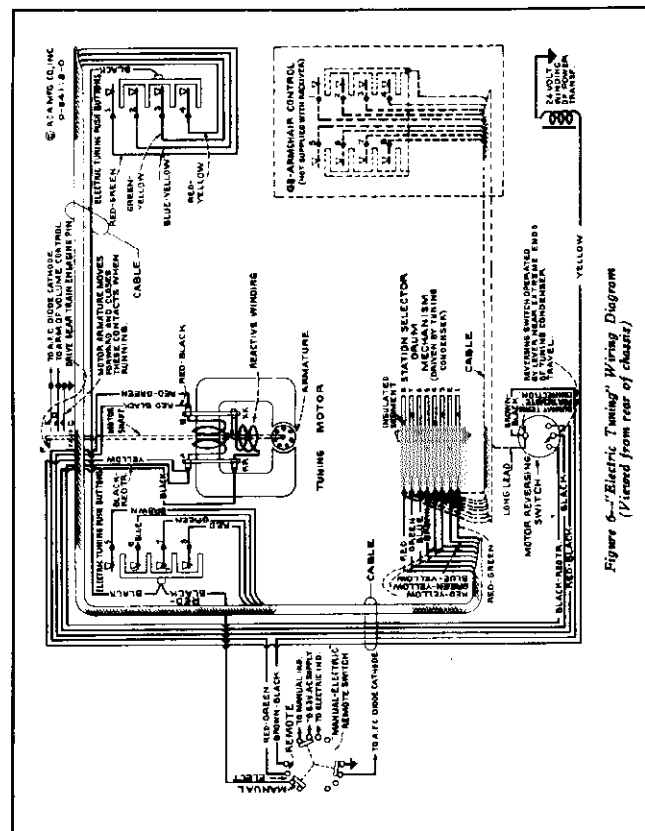


Figure 6.—"Electric Tuning" Wiring Diagram
(Viewed from rear of chassis)

ALIGNMENT PROCEDURE

and if adjustments are balanced below. Adjustment locations are shown on figures 3 and 4. Cathode-ray alignment is preferable; the connections to the chassis are shown on figure 2. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position. Connect the "low" output terminal of the test oscillator to the receiver chassis for all alignment operations. Repeat steps 1 through 13, but do not adjust the test-oscillator output until the receiver is in an observable output condition. This will avoid a-v-c action. The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. No signal, 350-750 kc, means that the receiver should be tuned to a point between 350 and 750 kc where no signal or interference is received from a station or local broadcast station. For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

Order of Alignment	Test Oscillator		Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Range Selector				
1	—	—	—	4th I-F Trans.	L28	Turn Extremes Counter-clockwise
2	6K7 2nd I-F Grid Cap	"A" Left	No Signal 650-750 kc	3rd I-F Trans.	L20 and L21	Max. (peak)
3	6K7 1st I-F Grid Cap	"A"	No Signal 550-750 kc	2nd I-F Trans.	L18 and L19	Max. (peak)
4	6L7 Det. Grid Cap	"A"	No Signal 650-750 kc	1st I-F Trans.	L15 and L16	Max. (peak)
5	Ant.	"C" Right	20,000 kc	"C" Osc.	C45	Max. (peak)*
6	Ant.	"C"	20,000 kc	"C" Det.	C8	Max. (peak)†
7	Ant.	"C"	20,000 kc	"C" Ant.	C2	Max. (peak)‡
8	Ant.	"B" Center	9,000 kc	"B" Osc.	C45	Max. (peak)*
9	Ant.	"A" Left	600 kc	"A" Osc.	L14	Max. (peak)
10	Ant.	200 M.m.f.d.	1,500 kc	"A" Osc.	C61	Max. (peak)
11	Ant.	200 M.m.f.d.	600 kc	"A" Osc.	L14	Max. (peak)
12	Ant.	200 M.m.f.d.	1,500 kc	"A" Osc.	C61	Max. (peak)
13	Proceed to A-F-C Discriminator Adjustments Outlined Below					

* Use minimum capacity peak if two peaks can be obtained.
† Use maximum capacity peak if two peaks can be obtained.
‡ After this adjustment, check for image signal by shifting receiver dial to 19,080 kc.
4th if transformer) has been turned all the way out (extreme counter-clockwise) prior to the preceding tabulated adjustment. Adjustments are as follows: Remote tuning knob on antenna control tube to function or else may cause it to detune the oscillator instead of tuning it to the correct frequency. Assume that the magnetic core adjusting screw L13 (top of

RADIO MFG. ENGINEERS, INC. MODEL RME 69-B Batt. or Batt. Schematics

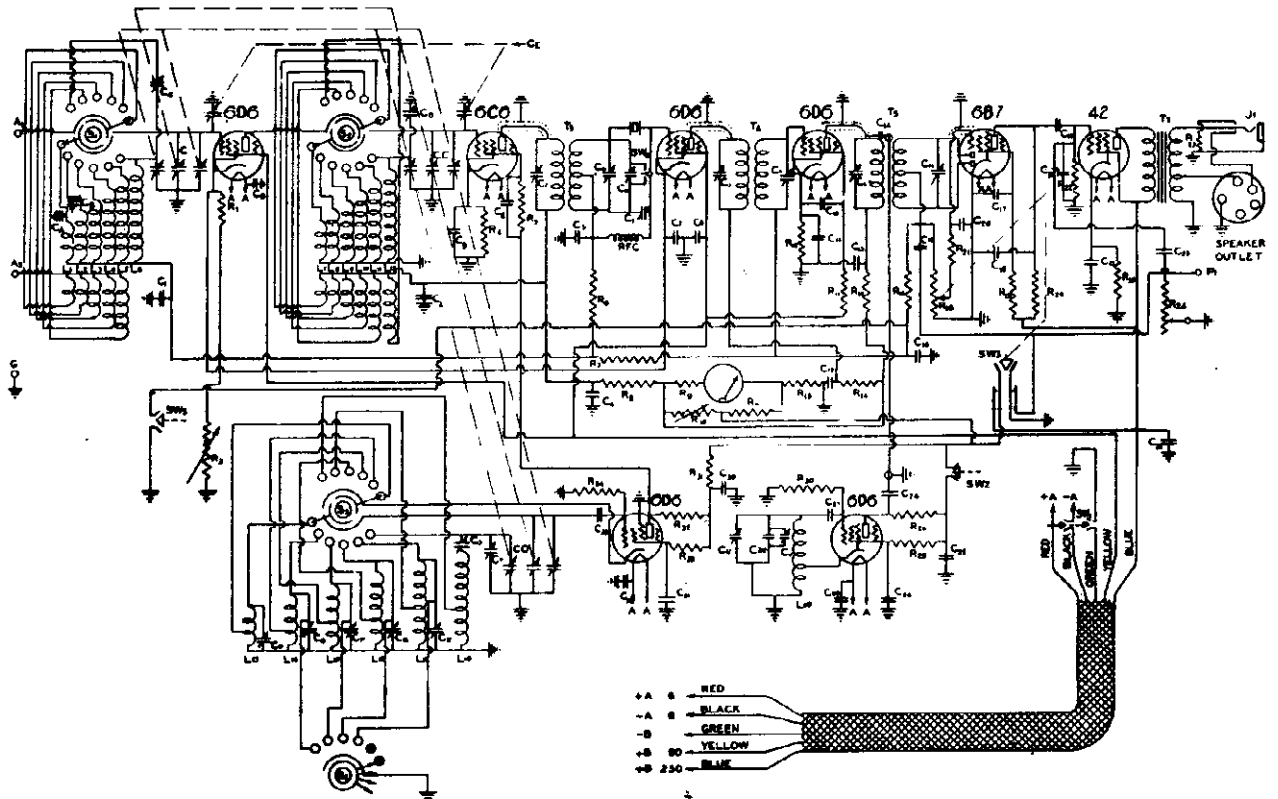


Fig. 16. Schematic Diagram of RME 69-B for Battery Operation

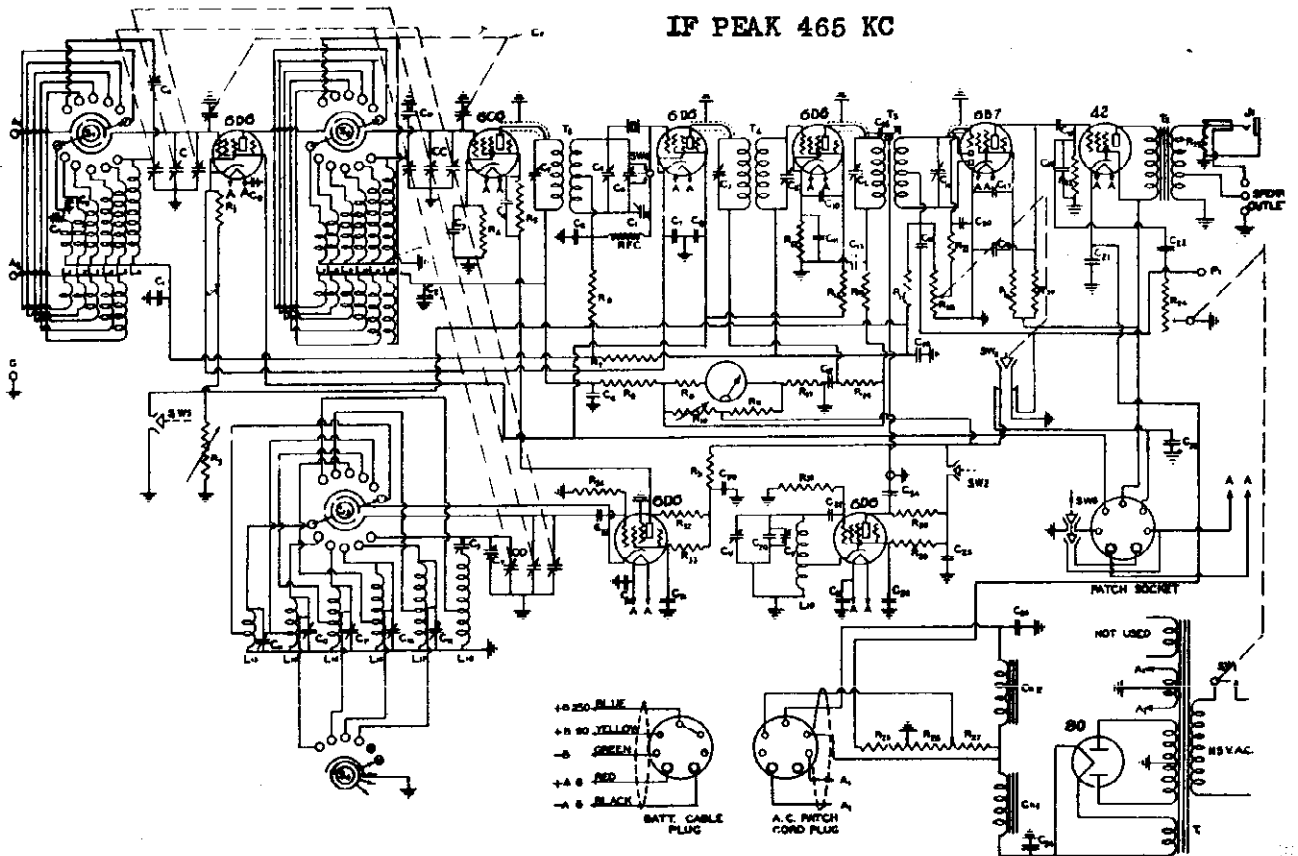


Fig. 17. Schematic Diagram of RME 69-A for AC or Battery Operation

MODEL RME 69-A AC or Batt.

MODEL RME 69-B Batt.

RADIO MFG. ENGINEERS, INC.

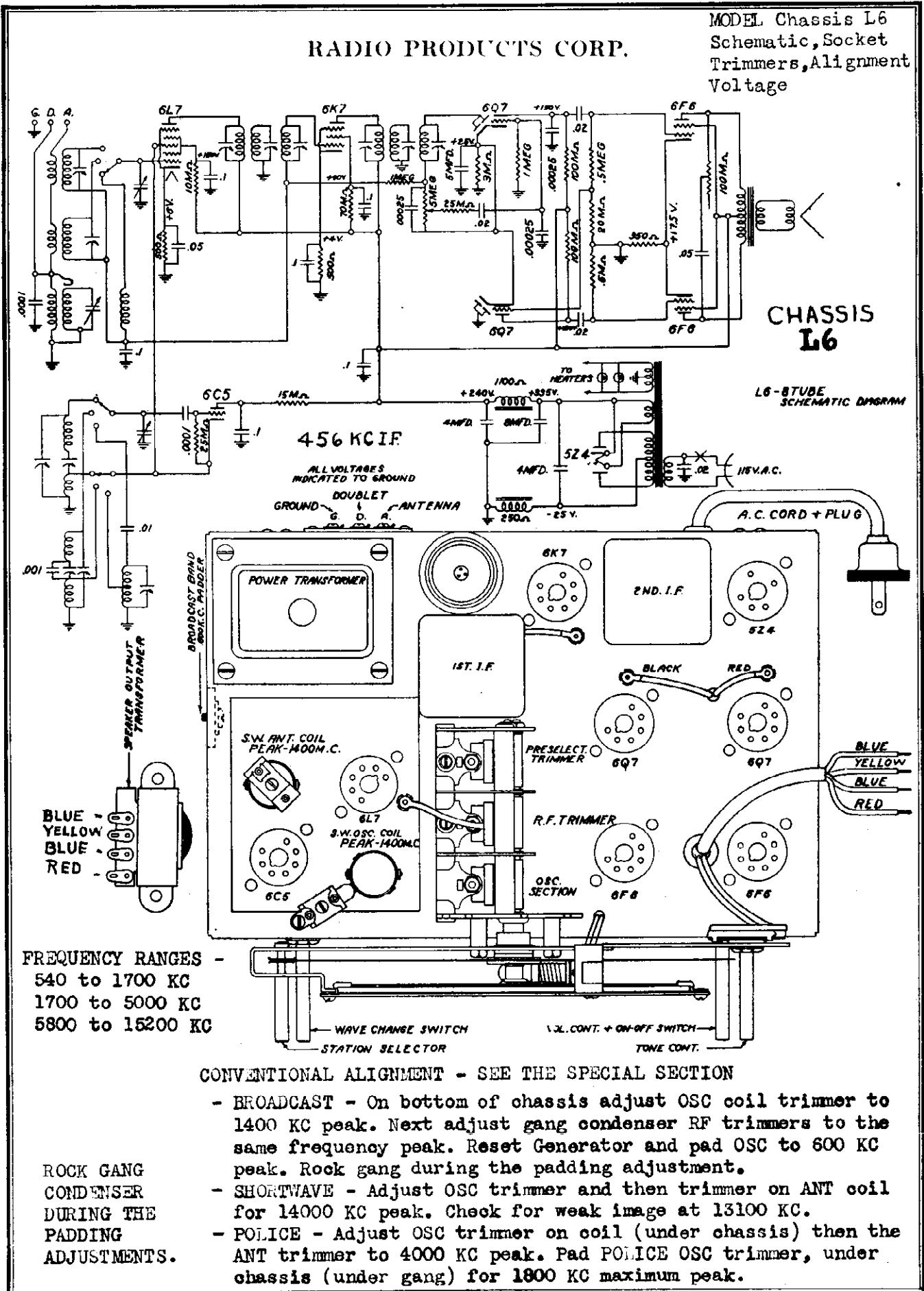
Parts List

DESIGNATION	SPECIFICATION	DESIGNATION	SPECIFICATION
C _a and C _b	30 μfd. adjustable mica padders.	S ₁ , S ₂ , S ₃ , S ₄	Band change switch.
C _b	30 μfd. mica padder.	SW ₁	115 volt line switch.
C _c	Mica trimming condenser on center section	SW ₂	Beat oscillator on and off switch.
C _d	of main tuning condenser. 50 μfd. max.	SW ₃	Switch operated by control "H" for connecting monitor circuit and opening B supply to amplifier stages.
C _e	Dual section resonator control. 4 μfd. minimum, 30 μfd. maximum.	SW ₄	Crystal switch for series or for parallel control.
C _f , C _g , C _h , C _i , C _j , C _k	Adjustable trimming condensers in the intermediate frequency transformers.	SW ₅	Cut-off switch for removing AVC action (operated in tandem with R _g)
C _l	25 μfd. midget air padder	R ₁₄	2,000 ohms, 1/2 watt.
C _m	30 μfd. mica adjustable phasing condenser.	R ₁₅	10,000 ohms, 1/2 watt.
C _n , C _o , C _p , C _r	30 μfd. adjustable padder.	R ₁₆	2,000 ohms, 1/2 watt.
C _q	70 μfd. adjustable padder.	R ₁₇	1 megohm, 1/2 watt.
C _s	.0004 mica condenser shunted by 70 μfd. mica adjustable trimmer.	R ₁₈	250,000 ohm potentiometer audio level control.
C _t	Mica trimmer on the oscillator section of the main tuning condenser.	R ₁₉	1 megohm, 1/2 watt.
C _u	70 μfd. adjustable mica padder.	R ₂₀	100,000 ohms, 1/2 watt.
C _v	25 μfd. variable air condenser	R ₂₁	50,000 ohm, 1/2 watt.
C ₁	.01 μfd. 400 volts.	R ₂₂	250,000 ohms, 1/2 watt.
C ₂	.01 μfd. 400 volts.	R ₂₃	5,000 ohms, 1/2 watt.
C ₃	.01 μfd. 400 volts.	R ₂₄	1,000,000 ohms potentiometer.
C ₄	.01 μfd. 400 volts.	R ₂₅	410 ohms bleeder section.
C ₅	.01 μfd. 400 volts.	R ₂₆	7200 ohms, bleeder section.
C ₆	.01 μfd. 400 volts.	R ₂₇	6800 ohms, bleeder section.
C ₇	.1 μfd. 400 volts.	R ₂₈	10,000 ohms, 1/2 watt.
C ₈	.1 μfd. 400 volts.	R ₂₉	100,000 ohms, 1/2 watt.
C ₉	.002 moulded mica condenser.	R ₃₀	100,000 ohms, 1/2 watt.
C ₁₀	.01 μfd. 400 volts.	R ₃₁	2,000 ohms, 1/2 watt.
C ₁₁	.1 μfd. 400 volts.	R ₃₂	2,000 ohms, 1/2 watt.
C ₁₂	.1 μfd. 400 volts.	R ₃₃	50,000 ohms, 1/2 watt.
C ₁₃	.1 μfd. 400 volts.	R ₃₄	50,000 ohms, 1/2 watt.
C ₁₄	1" of shielded braid wrapped around plate lead of second intermediate frequency amplifier tube. Approximate capacity 10 μfd.	J ₁	Headphone jack.
C ₁₅	.00025 μfd.	RFC	16 millhenries.
C ₁₆	.01 μfd. 400 volts.	CH ₁	30 henries, 100 ma.
C ₁₇	.1 μfd. 400 volts.	CH ₂	30 henries, 50 ma.
C ₁₈	.01 μfd. 400 volts.	T ₁	Main power transformer.
C ₁₉	.00025 μfd. moulded mica condenser.	T ₂	Audio output transformer to 4,000 ohms and 600 ohms.
C ₂₀	20 μfd. 25 volt electrolytic.	T ₃	First intermediate frequency amplifier transformer.
C ₂₁	.01 μfd. 400 volts.	T ₄	Second intermediate frequency amplifier transformer.
C ₂₂	12 μfd. 450 volt electrolytic.	T ₅	Third intermediate frequency amplifier transformer.
C ₂₃	.0001 moulded mica condenser	R ₁	150 ohms, 1/2 watt.
C ₂₄	.01 400 volt electrolytic	R ₂	20,000 ohms, 1 watt.
C ₂₅	.01 μfd. 400 volt.	R ₃	30,000 ohms, variable.
C ₂₆	.0001 μfd. moulded mica.	R ₄	5,000 ohms, 1/2 watt.
C ₂₇	.01 μfd. 400 volt.	R ₅	1 megohm, 1/2 watt.
C ₂₈	.00025 moulded ± 5%	R ₆	250,000 ohms, 1/2 watt.
C ₂₉	.1 μfd. 400 volts.	R ₇	100,000 ohms, 1/2 watt.
C ₃₀	.01 μfd. 400 volts.	R ₈	2,000 ohms, 1/2 watt.
C ₃₁	.01 μfd. 400 volts.	R ₉	500 ohms, 1/2 watt 15%
C ₃₂	.0001 μfd. moulded ± 5%	R ₁₀	200 ohms, wire wound var. R meter balance
C ₃₃	8 μfd. 450 volt electrolytic	R ₁₁	1,000 ohms, 1/2 watt.
C ₃₄	8 μfd. 450 volt electrolytic.	R ₁₂	500 ohms, 1/2 watt.
C ₃₅	.00025 μfd. moulded condenser.	R ₁₃	100,000 ohms, 2 watts.
C ₃₇			

L₁₀ Band 6 first detector grid coil.
 L₁₁ Band 5 first detector grid coil.
 L₁₂ Band 4 first detector grid coil.
 L₁₃ Band 3 first detector grid coil.
 L₁₄ Band 2 first detector grid coil.
 L₁₅ Band 1 first detector grid coil.
 L₁₆ Band 6 oscillator coil.
 L₁₇ Band 5 oscillator coil.
 L₁₈ Band 4 oscillator coil.
 L₁₉ Band 3 oscillator coil.
 L₂₀ Band 2 oscillator coil.
 L₂₁ Band 1 oscillator coil.

RADIO PRODUCTS CORP.

MODEL Chassis L6
Schematic, Socket
Trimmers, Alignment
Voltage



FREQUENCY RANGES -
540 to 1700 KC
1700 to 5000 KC
5800 to 15200 KC

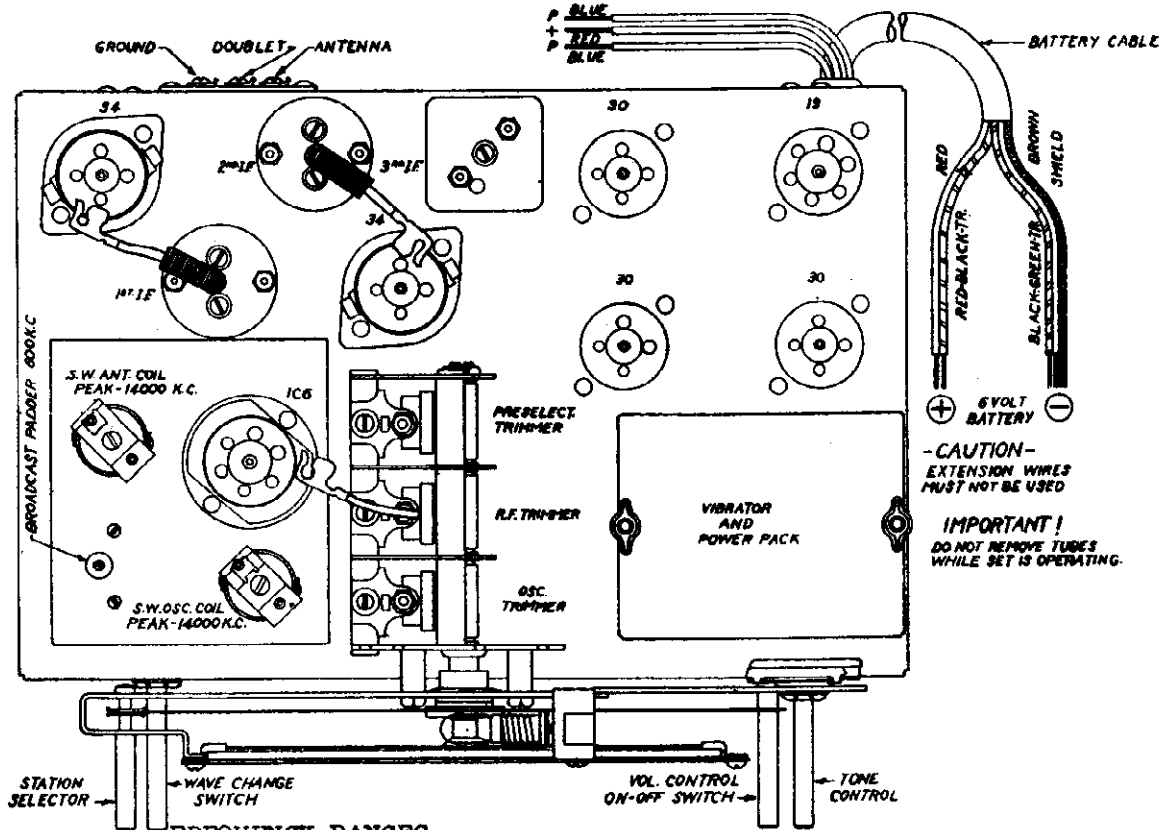
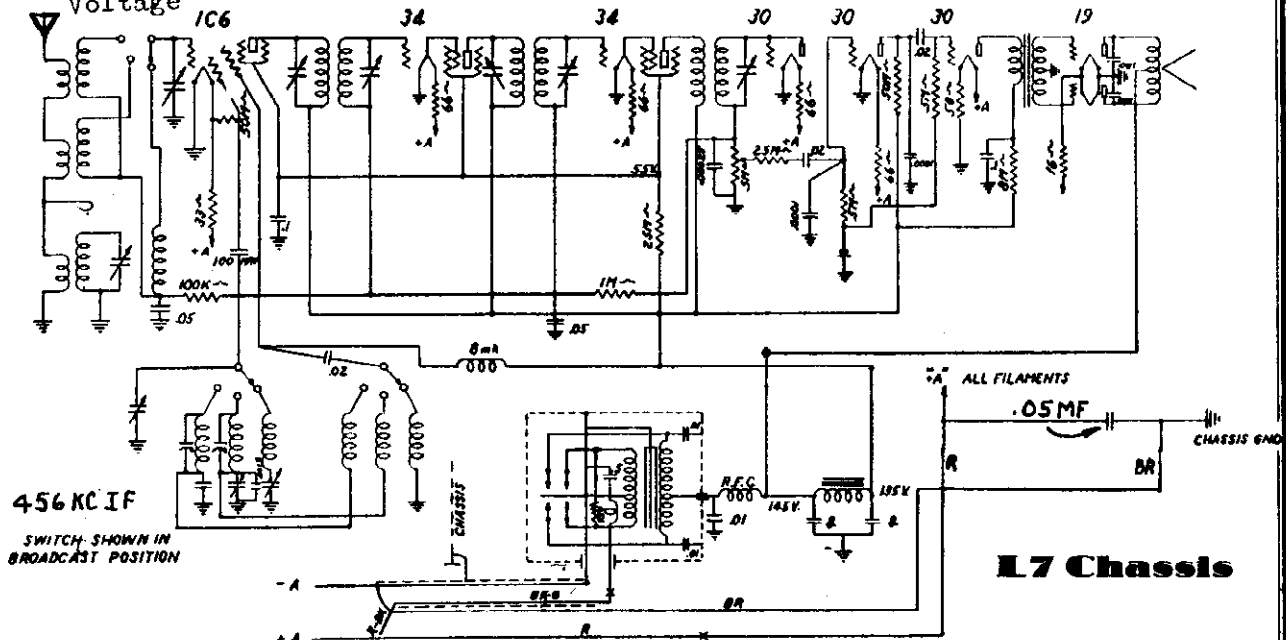
ROCK GANG
CONDENSER
DURING THE
PADDING
ADJUSTMENTS.

CONVENTIONAL ALIGNMENT - SEE THE SPECIAL SECTION

- BROADCAST - On bottom of chassis adjust OSC coil trimmer to 1400 KC peak. Next adjust gang condenser RF trimmers to the same frequency peak. Reset Generator and pad OSC to 600 KC peak. Rock gang during the padding adjustment.
- SHORTWAVE - Adjust OSC trimmer and then trimmer on ANT coil for 14000 KC peak. Check for weak image at 13100 KC.
- POLICE - Adjust OSC trimmer on coil (under chassis) then the ANT trimmer to 4000 KC peak. Pad POLICE OSC trimmer, under chassis (under gang) for 1800 KC maximum peak.

MODEL Chassis L7
Schematic, Socket
Trimmers, Alignment
Voltage

RADIO PRODUCTS CORP.



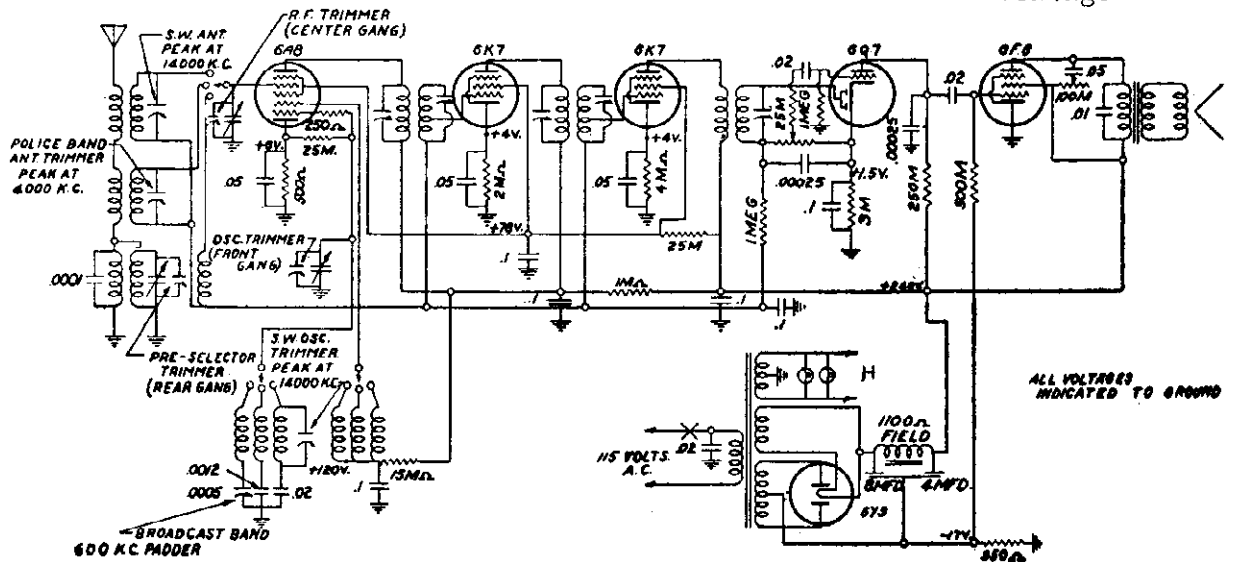
FREQUENCY RANGES

BROADCAST : 540 to 1700 KC - Adjust OSC, RF and then ANT trimmers on gang for max. peak at 1400 KC. Pad OSC circuit at 600 KC to maximum peak while rocking gang.
SHORTWAVE : 5800 to 15200 KC - Adjust OSC and then ANT trimmers on coils for 14000 KC peak, check for weak image frequency at 13100 KC. No padding required.
POLICE : 1700 to 5000 KC - Adjust OSC trimmer (under chassis) on coil and ANT trimmer (under chassis on coil) to 4000 KC peak. Pad the OSC circuit (Under chassis directly under gang) to 1800 KC while rocking gang condenser.

CONVENTIONAL ALIGNMENT - SEE THE SPECIAL SECTION

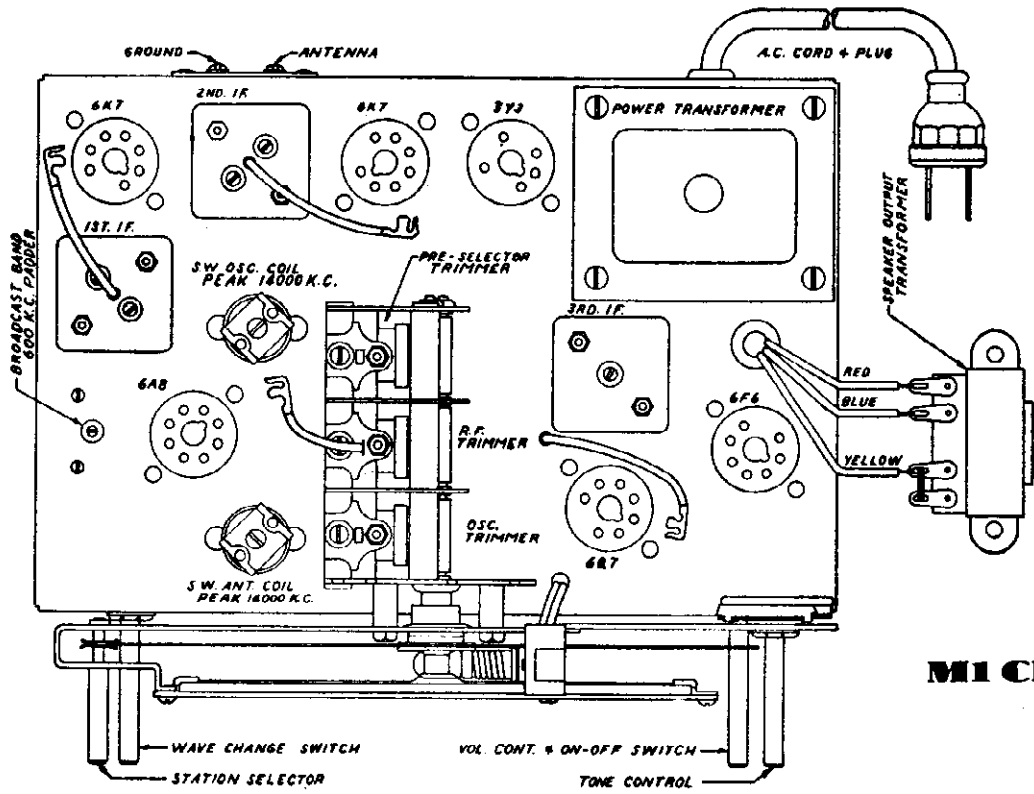
RADIO PRODUCTS CORP.

MODEL Chassis M 1
Schematic, Socket
Trimmers, Alignment
Voltage



ALL VOLTAGES INDICATED TO GROUND

IF PEAK
456 KC



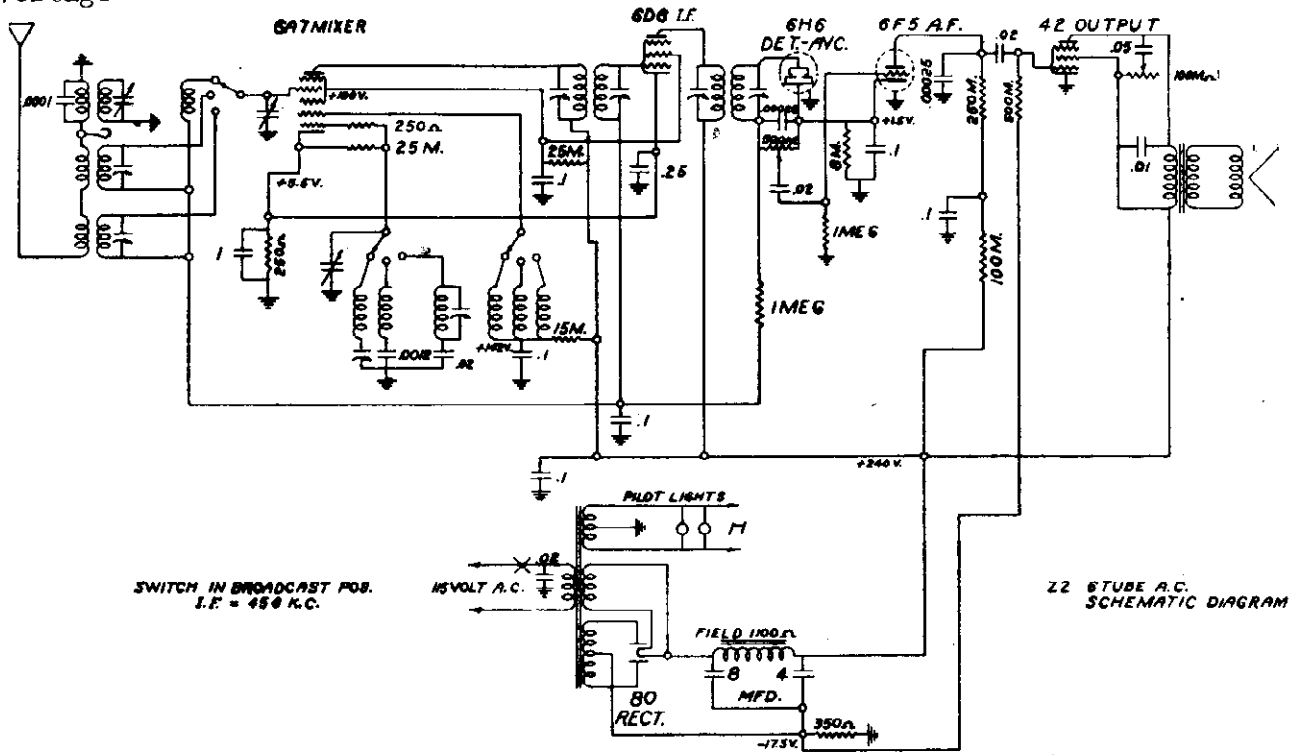
M1 Chassis

CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION

- FREQUENCY RANGES - BROADCAST - 540 to 1700 KC - Adjust OSC, RF and ANT trimmers on gang condenser to a maximum peak of 1400 KC. Pad the OSC circuit at 600 KC while rocking gang condenser.**
- SHORTWAVE - 5800 to 15200 KC - ADJUST OSC and RF trimmers to maximum peak of 14000 KC. No other adjustments required.**
- POLICE - 1700 to 5000 KC - Adjust the ANT coil trimmer to resonance on 4000 KC signal, no other adjustments required.**

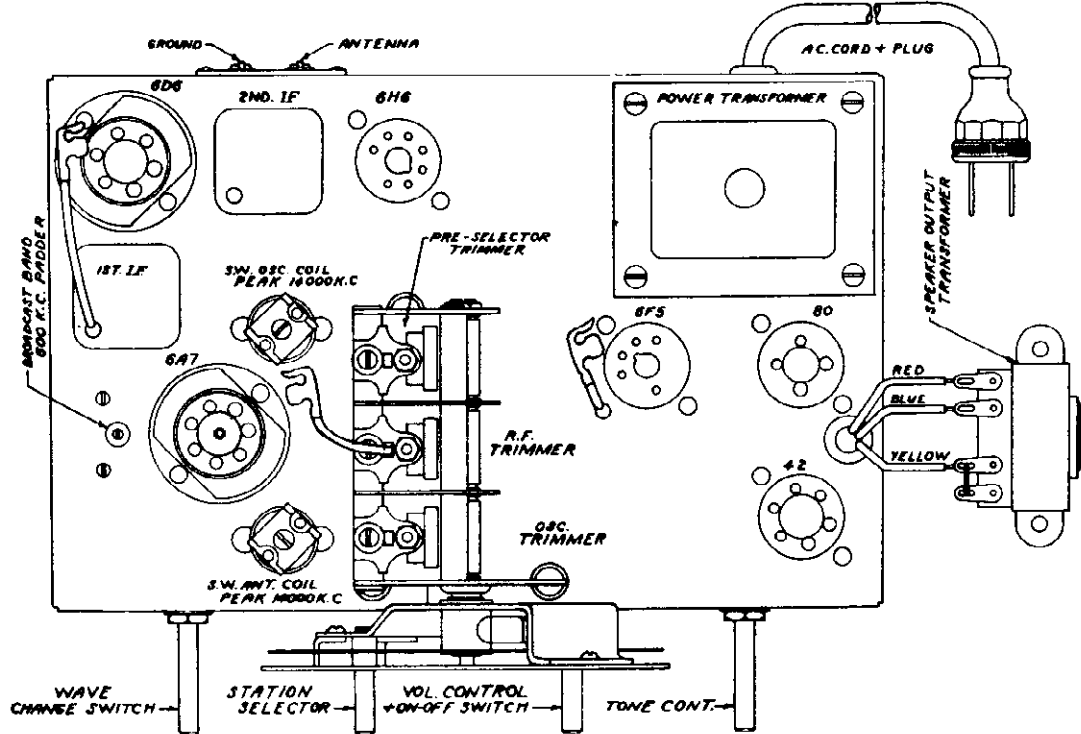
MODEL Chassis Z 2
Schematic, Socket
Trimmers, Alignment
Voltage

RADIO PRODUCTS CORP.



SWITCH IN BROADCAST POS.
I.F. = 450 K.C.

2Z 6TUBE A.C.
SCHEMATIC DIAGRAM



CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION

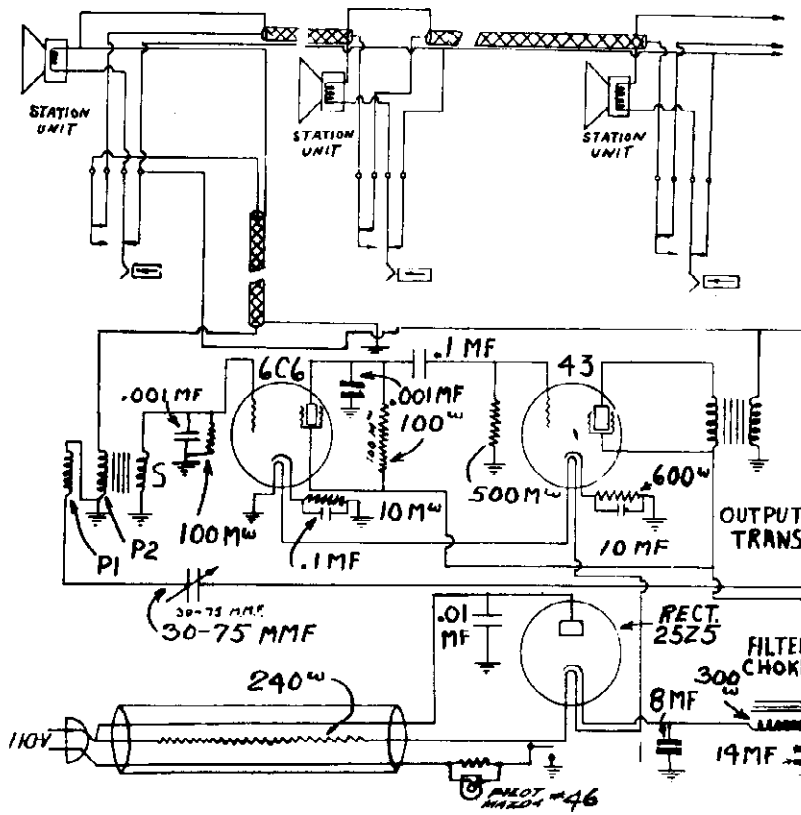
FREQUENCY RANGES - BROADCAST - 540 to 1700 KC - ADJUST OSC, RF AND ANT TRIMMERS ON GANG CONDENSER TO A MAXIMUM PEAK OF 1400 KC. PAD THE OSC CIRCUIT AT 600 KC WHILE LOCKING GANG CONDENSER.

SHORTWAVE - 5800 to 15200 KC - ADJUST OSC AND RF TRIMMERS TO A MAXIMUM PEAK OF 14000 KC. NO OTHER ADJUSTMENTS REQUIRED.

POLICE - 1700 to 5000 KC - ADJUST THE RF ANT COIL TRIMMER TO RESONANCE ON 4000 KC SIGNAL, NO OTHER ADJUSTMENTS REQUIRED.

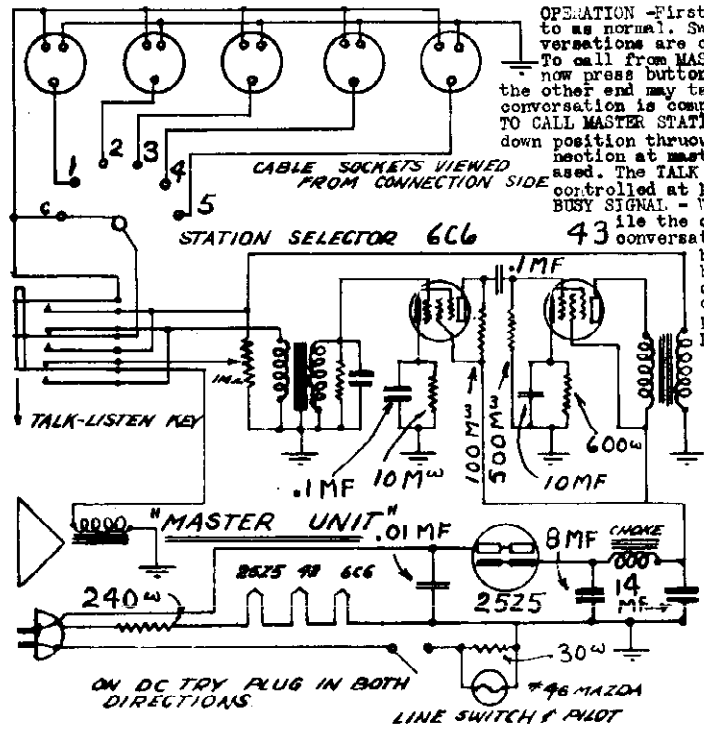
RADOLEK CO.

MODEL 35 Common Talk Sys.
Schematic, Data
MODEL 45 Selective System
Schematic, Data



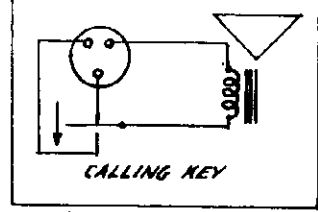
**MODEL 35
COMMON TALK SYSTEM**
OPERATION - To talk, press the button located on top of either unit or any outlying station unit; to listen, just release the button. When one unit is spoken into, all other stations will respond if buttons are in their normal positions.
To place the system into operation, connect cord to 110-120 volts AC or DC (check polarity for DC operation). To turn current on, operate toggle switch and note that pilot lamp is on. Insert one end of cable in socket located at rear of master station cabinet. Insert the plug on the other end of the cable into the socket marked "IN" of 1st station unit. A second station unit is connected by running the second cable from the "OUT" socket of the first station unit to the "IN" socket of the second. A third and fourth unit may be connected in the same fashion by the use of extra cables and station units.

WARNING - The amplifier chassis or the shields of the cable must not touch any grounded object such as radiators, conduit, water pipes, etc.
For distances over 100 feet use open wire system in stead of the twisted cables to reduce capacity.



OPERATION - First position "C" of selector switch is referred to as normal. Switch must be returned to "C" after all conversations are completed so that outlying stations may call. To call from MASTER unit operate selector to desired station; now press button to talk and release to listen. The party on the other end may talk or listen without manual effort. When the conversation is completed return "C" to normal selector position. TO CALL MASTER STATION - The party must HOLD the push button in down position thruout conversation, unless operator switches connection at master unit, in which case the button may be released. The TALK and LISTEN condition is under any condition controlled at MASTER station.
BUSY SIGNAL - When a party at any outlying station calls while the circuit is busy, he hears only that half of conversation originating at the calling station as a busy signal, and is expected to release the button and make his call later. If the busy conversation is on a selected circuit, another party calling will neither get a response nor create interference to the busy parties.

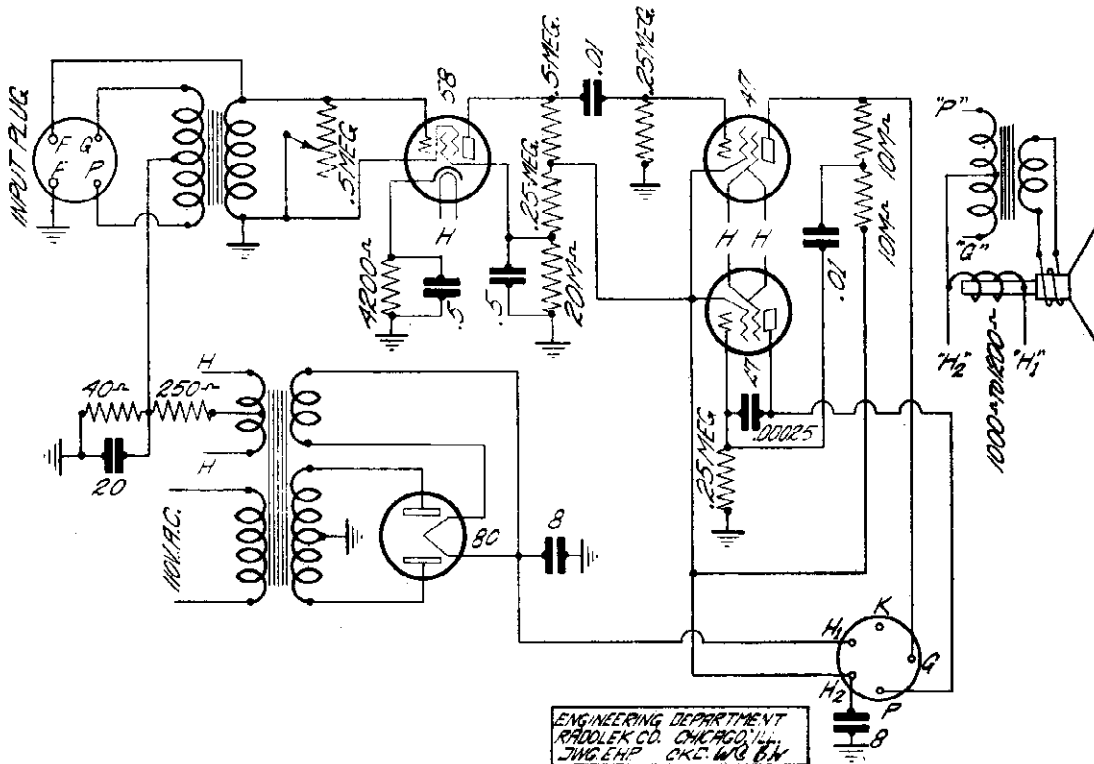
**MODEL 45
SELECTIVE SYSTEM**



"STATION UNIT"
PREFABRICATED STATION CONNECTOR CABLES CONSIST OF TWISTED PAIR #22 STRANDED WIRE IN SHIELD WITH OVERALL COTTON BRAID.

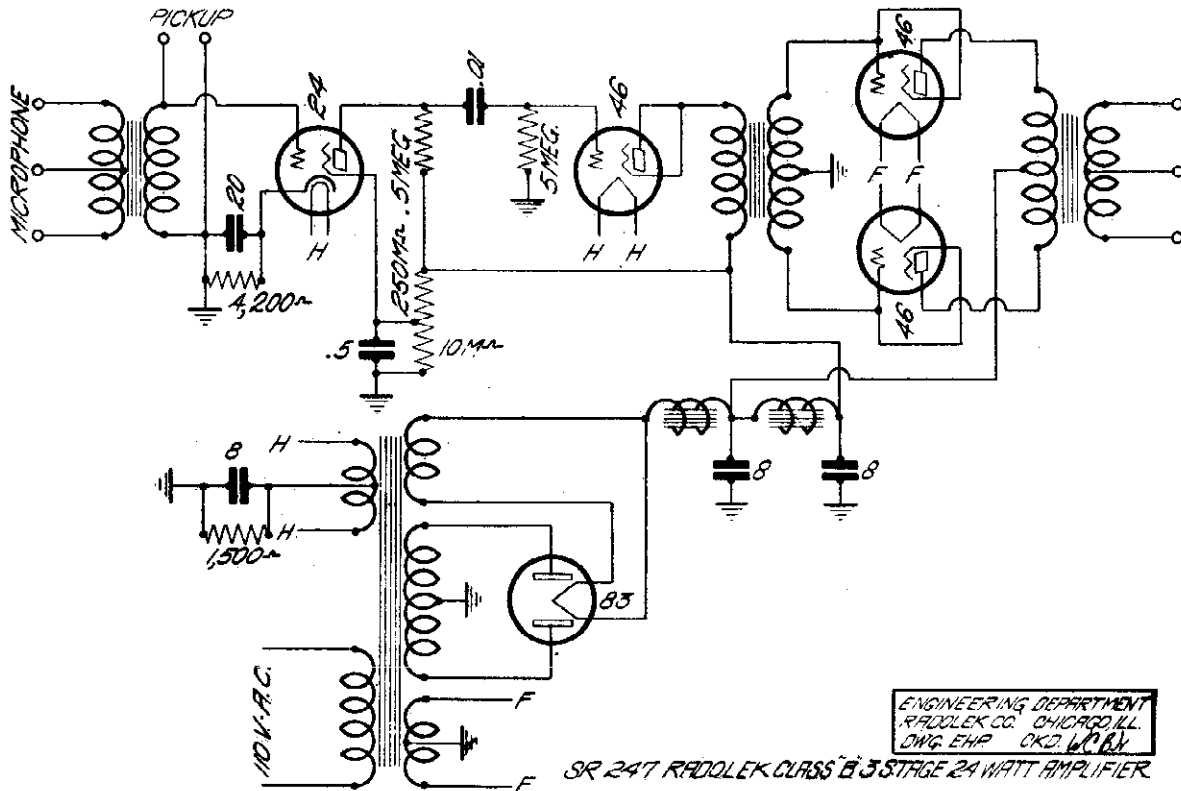
MODEL SR 241 Amplifier
 MODEL SR 247 Amplifier
 Schematics

RADOLEK CO.



ENGINEERING DEPARTMENT
 RADOLEK CO. CHICAGO, ILL.
 DWG. EHP CKD. W.B. BK

SR 241 RADOLEK 2 STAGE P.P. UNIVERSAL INPUT AMPLIFIER

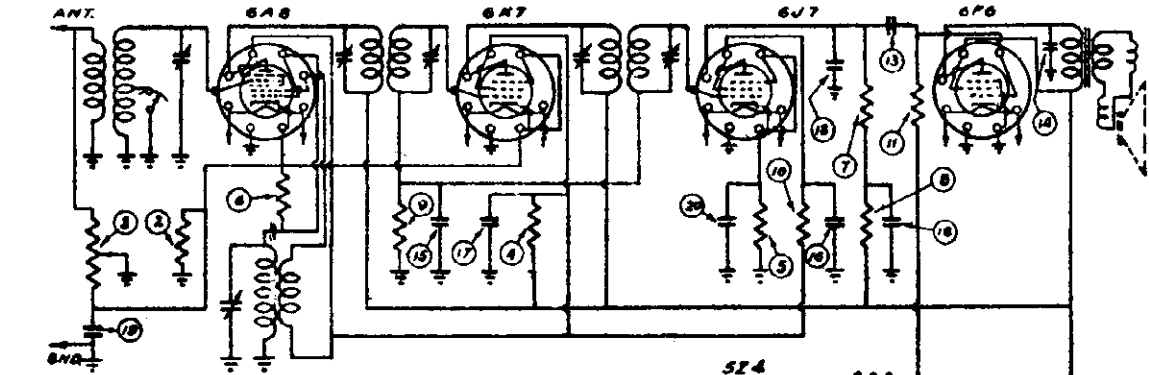


ENGINEERING DEPARTMENT
 RADOLEK CO. CHICAGO, ILL.
 DWG. EHP CKD. W.B. BK

SR 247 RADOLEK CLASS B 3 STAGE 24 WATT AMPLIFIER

REMLER COMPANY, LTD.

MODEL 46, Above Ser. #83786
 MODEL 52, Above Ser. #78143
 Schematics, Voltage, Trimmers
 Alignment



A. C. VOLTAGES

Line	120 volts
Filaments:	
6A8, 6K7, 6J7, 6F6	6 "
5Z4	5 "

B. C. VOLTAGES

No signal, full volume

From ground to:	
6A8 Plate	240 volts
6A8 Screen	75 "
6A8 Osc. Plate	75 "
6A8 Cathode	3.3 "
6K7 Plate	240 "
6K7 Screen	75 "
6K7 Cathode	3.3 "
6J7 Plate	65 "
6J7 Screen	15 "
6J7 Cathode	2 "
6F6 Plate	230 "
6F6 Screen	240 "
6F6 Grid Bias	15 "

IF PEAK
450 K.C.

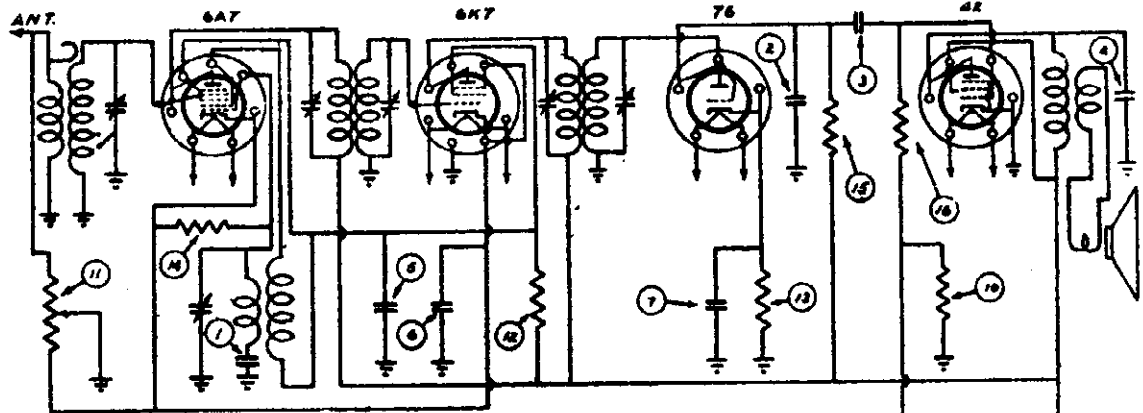
MODEL 46

BEGINNING SERIAL No. 83786

Voltages read with 1000-ohm per volt meter.

RESISTORS		CONDENSERS	
1	400 OHMS	12	.001 MFD
2	5000 "	13	.01 "
3	11000- <i>step 200</i>	14	.01 "
4	15000 "	15	.05 "
5	25000 "	16	.05 "
6	100000 "	17	.05 600V.
7	250000 "	18	.05 "
8	200000 "	19	1 "
9	500000 "	20	.25 "
10	1 Meg.	21	4 "
11	1 Meg.	22	4 "

The antenna-R.F. coil is located over the variable condenser and is trimmed by the trimmer on the rear section of the variable condenser. The oscillator coil is mounted under the chassis and is trimmed by the front trimmer section. The I.F. transformers and trimmers are mounted under the chassis.



A. C. VOLTAGES:

Line	120 volts
Filaments - #80	5 "
6A7, 6K7, 76, 42	6 "

D. C. VOLTAGES:

Full volume, no signal

From ground to:	
80 Rectifier filament	215 volts
42 Plate	200 "
42 Screen	215 "
42 Grid - bias	16 "
76 Plate	50 "
76 Cathode	5 "
6K7 Plate	215 "
6K7 Screen	100 "
6K7 Cathode	3.5 "
6A7 Plate	215 "
6A7 Osc. Plate	100 "
6A7 Screen	100 "
6A7 Cathode	3.5 "

IF PEAK
450 K.C.

MODEL 52

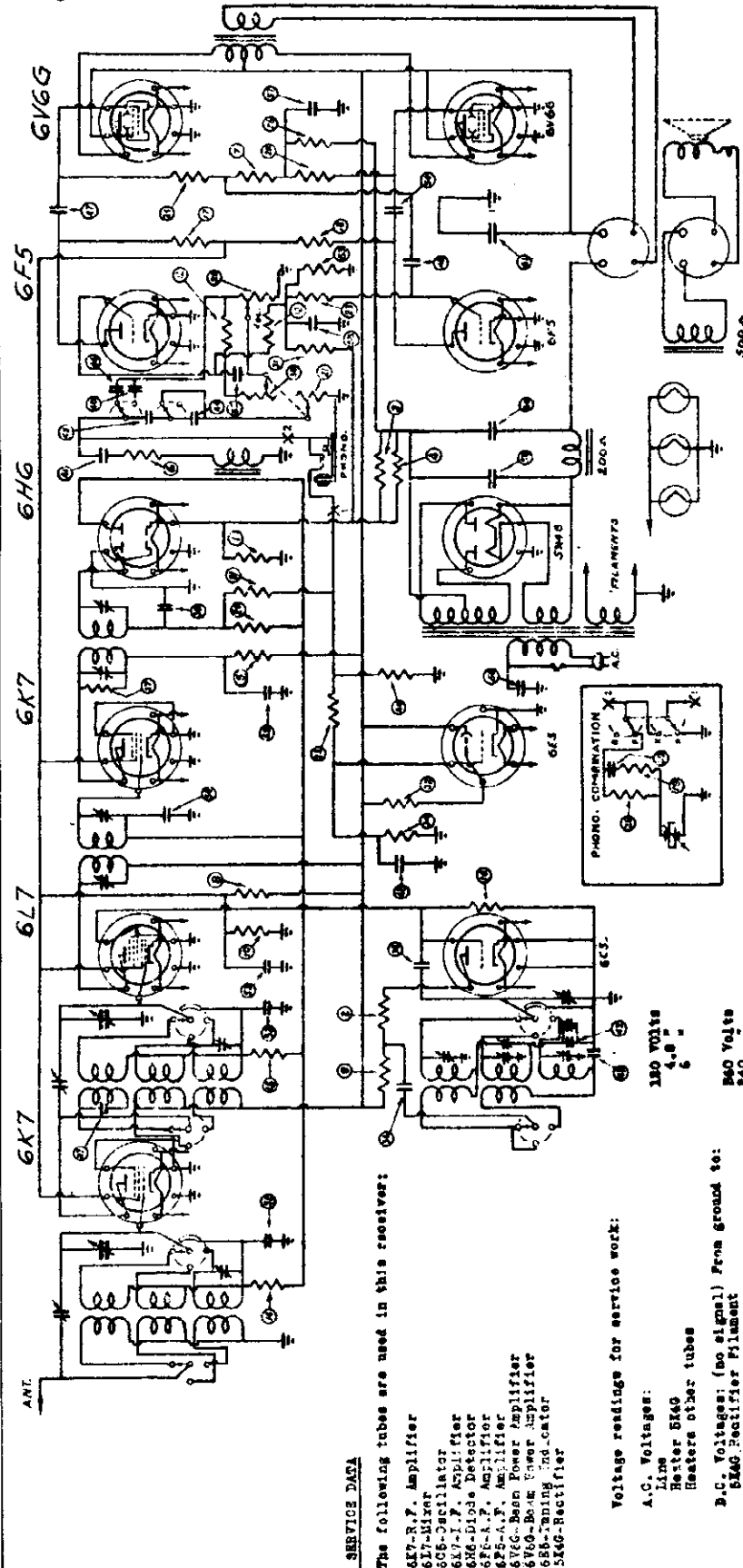
BEGINNING SERIAL No. 78143

Voltages read with 1000-ohm per volt meter.

CONDENSERS		RESISTORS	
1	.00045	10	400
2	.001	11	11000
3	.01	12	15000
4	.01	13	50000
5	.05	14	100000
6	.05	15	500000
7	.25	16	1 Meg.
8	4		
9	4		

The antenna-R.F. coil is located over the variable condenser and is trimmed by the trimmer on the rear section of the variable condenser. The oscillator coil is mounted under the chassis and is trimmed by the front trimmer section. The I.F. transformers and trimmers are mounted under the chassis.

MODEL 89, Above Ser. # 92582
 Schematic, Voltage, Trimmers REMLER COMPANY, LTD.
 Alignment



SERVICE DATA

The following tubes are used in this receiver:

- 6X7-R.F. Amplifier
- 6C6-Oscillator
- 6X7-I.F. Amplifier
- 6X6-Diode Detector
- 6Z5-A.F. Amplifier
- 6Z5-A.F. Amplifier
- 6V6G-Beam Power Amplifier
- 6V6G-Beam Power Amplifier
- 6BB-Tuning Ind.-cator
- 5X4G-Rectifier

Voltage readings for service work:

- A.C. Voltages:
 - Line 120 Volts
 - Heater 5K4G 4.5 "
 - Heaters other tubes 6 "
- D.C. Voltages: (no signal) Ferns ground to:
 - 5K4G Rectifier Filament 240 Volts
 - 6C6 240 "
 - 6V6G Plates 16.5 "
 - 6V6G Screens 60 "
 - 6V6G Bias 1.5 "
 - 6Z5 Bias 1.5 "
 - 6X7 I.F. Plate 200 "
 - 6X7 I.F. Screen 100 "
 - 6X7 I.F. Bias 8 "
 - 6L7 Plate 260 "
 - 6L7 Screen 100 "
 - 6L7 Bias 3 "
 - 6C6 Plate 160 "
 - 6X7 R.P. Plate 250 "
 - 6X7 R.F. Screen 100 "
 - 6X7 R.F. Bias 3 "
 - 6Z5 Target Voltage 260 "
 - 6Z5 Voltage across speaker field 75 "

Model 89
 Beginning Serial No. 92582
 450 KC./F.

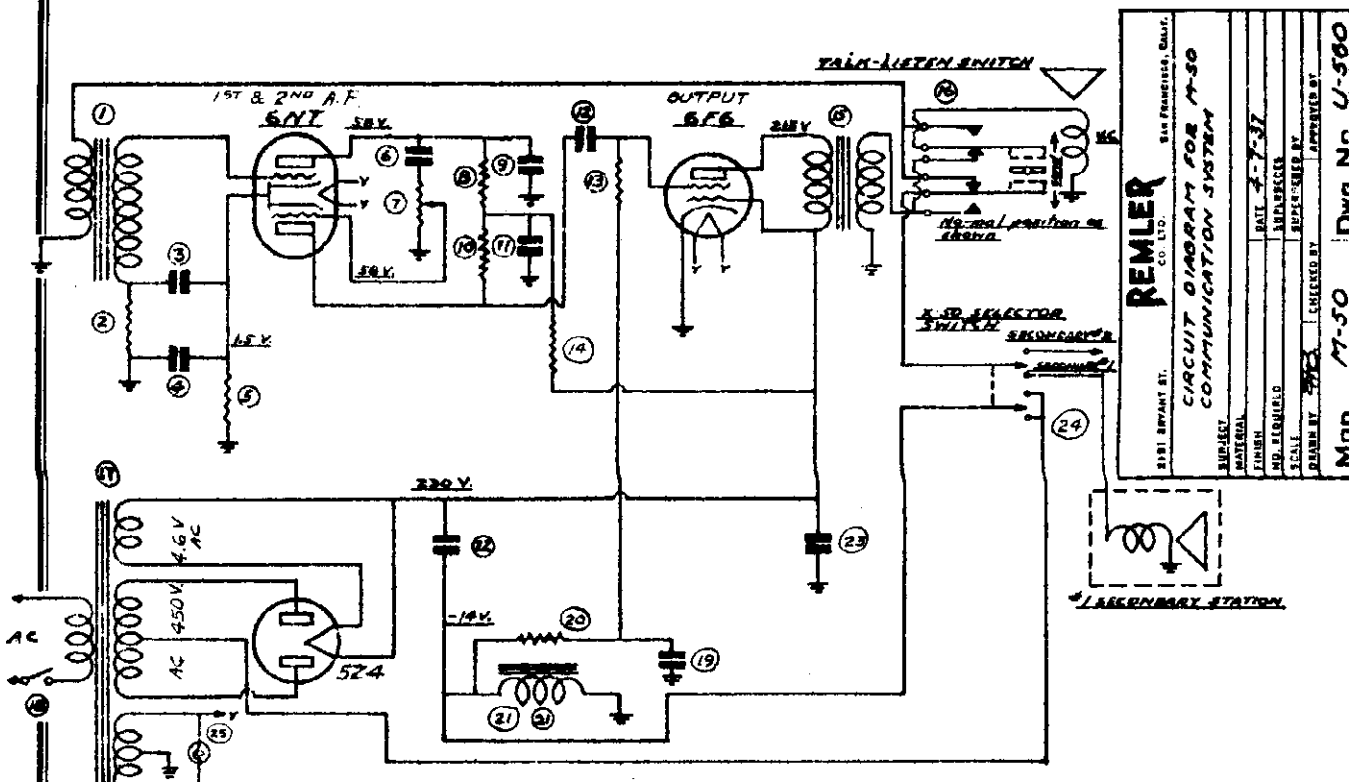
RESISTORS		CONDENSERS	
1	25 Ohms	33	1.0 MFD 250 V
2	150	36	0.003
3	185	37	0.003
4	400	38	0.003
5	2000	39	0.003
6	5000	40	0.005
7	10000	41	0.01
8	15000	42	0.01
9	50000	43	0.04
10	50000	44	0.04
11	50000	45	0.2
12	50000	46	0.5
13	500000	47	0.5
14	1000000	48	0.5
15	1000000	49	0.5
16	1000000	50	0.5
17	1000000	51	1
18	1000000	52	1
19	1000000	53	20 250 V
20	250000	54	0.5
21	500000	55	0.5
22	500000	56	0.1
23	500000	57	5
24	500000	58	5
25	500000	59	10 475 V
26	500000	60	10
27	500000	61	10
28	500000	62	0.5 200V
29	1 Meg	63	500000 pf
30	1 "		
31	1 "		
32	1 "		
33	1 "		
34	1 "		

The R.F., Mixer and oscillator coils are located in the large square shields on the right end of the chassis. Trimmers for these circuits are mounted along the end of the chassis, beneath the coils in the following order: R.F. short wave, mixer short wave, oscillator broadcast, oscillator medium wave, oscillator short wave. From front to rear. The R.F., broadcast and mixer broadcast trimmers are mounted on the range switch assembly. Oscillator pads are located at the back of the variable condenser. The pad nearest the end of the chassis is for the broadcast band and the medium wave is next. Trimmers for the I.F. transformers are adjustable thru holes in the I.F. transformer shield cans. The I.F. frequency is 450 K.C.

MODELS SC-50, SWC-50 Call-Back Connections

MODEL M-50 Communication Sys. Schematic, Parts

REMLER COMPANY, LTD.

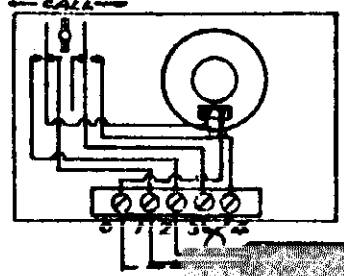


REMLER CO. LTD.	SAN FRANCISCO, CALIF.
CIRCUIT DIAGRAM FOR M-50 COMMUNICATION SYSTEM	
MATERIAL	DATE 4-7-37
FINISH	APPROVED BY
NO. REVISED	CHECKED BY
SCALE	APPROVED BY
DRAWN BY	7-50
Dwg No U-560	

NO.	DESCRIPTION	PART NO.	NO.	DESCRIPTION	PART NO.	NO.	DESCRIPTION	PART NO.
1	Input Trans.	N 1539	3	.1MFD. 200V.		2	100M ohms 1/2 watt	
15	Output Trans.	5C 1085	4	.1MFD. 200V.		5	2000M ohms 1/2 watt	
17	Power Trans.	5C 1665	6	.0006 MFD.		7	500M ohms vol. cont.	
21	Choke	5000	9	.002 MFD. 600V.		8	100M ohms 1/2 watt	
16	Talk-Listen SW.	ST 522	11	.25 MFD. 400V.		10	100M ohms 1/2 watt	
18	A.C. Switch	F 11	12	.004 MFD. 800V.		13	250M ohms 1/2 watt	
24	Selector SW.	X-50	18	.1 MFD. 200V.		14	100M ohm 1/2 watt	
25	Pilot Light		22	4.MFD. 450V.)		20	1 MEG. 1/2 watt	
			23	4.MFD. 450V.)		21	Speaker	

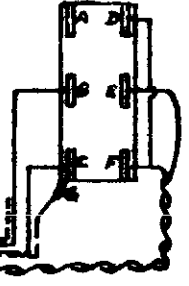
SC-50 AND SWC-50 CALL-BACK SECONDARY

C-50 Call Back Switch Rear View



SWC-50 OR SC-50 CALLBACK UNIT

X-50 Selector Key as mounted in M-50 & M-70 Units Rear View



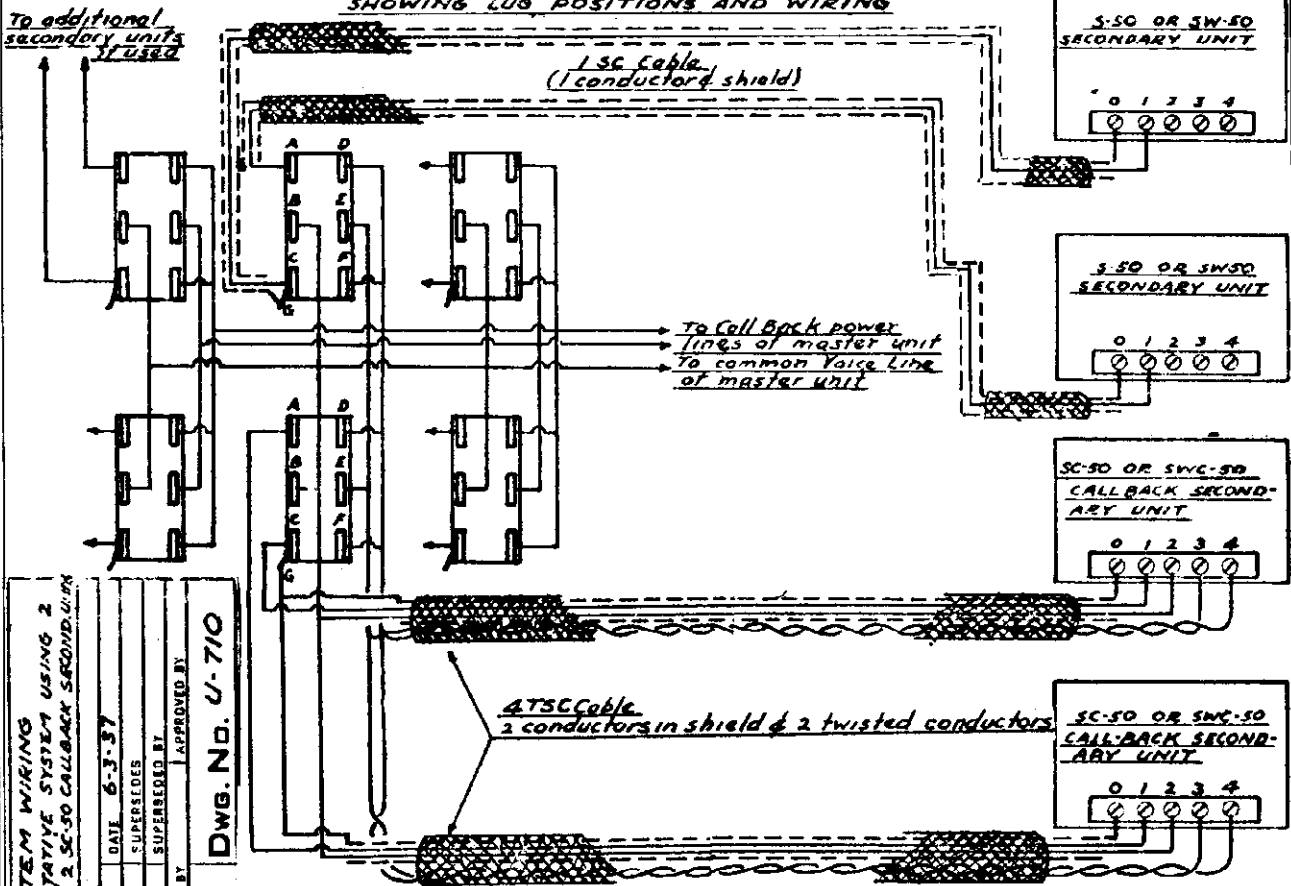
475C CABLE

DWG. NO. B

MODEL M-50 Communication Sys.
X-50 Switch Wiring, Data

REMLER COMPANY, LTD.

M-50 MULTIPLE STATION COMMUNICATION SYSTEM
REAR VIEW OF SIX X-50 SWITCHES
SHOWING LUG POSITIONS AND WIRING

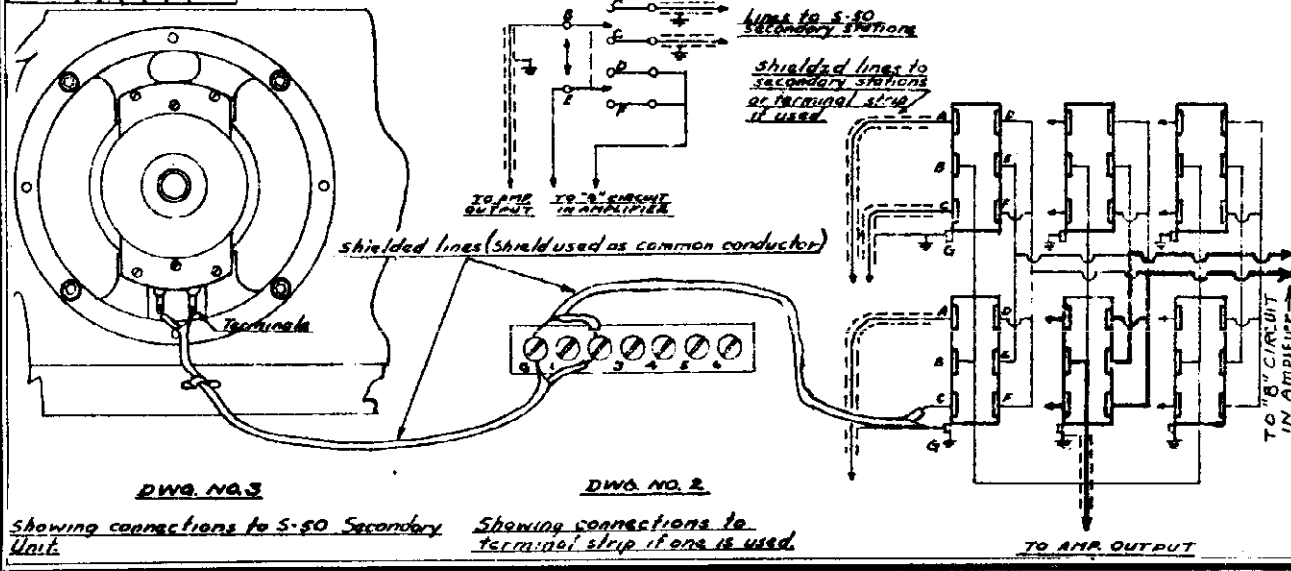


The M-50 master station unit is equipped at the factory with one X-50 two station selector key which permits immediate hookup with two S-50 secondary station units. When more than two S-50 secondary units are used in the system, extra station selector keys, type S-50, are required. Each key will control two stations.

M-50 SYSTEM WIRING
SHOWING REPRESENTATIVE SYSTEM USING 2
SUBJECT: S-50 SECONDARY & 2 SC-50 CALLBACK SECONDARY UNITS

MATERIAL	DATE	6-3-37
NO. REQUIRED	SUPERSEDES	
SCALE	SUPERSEDED BY	
DRAWN BY	CHECKED BY	APPROVED BY
MOD. M-50		
DWG. NO. U-710		

SCHEMATIC DIAGRAM FOR X-50 SWITCH WIRING



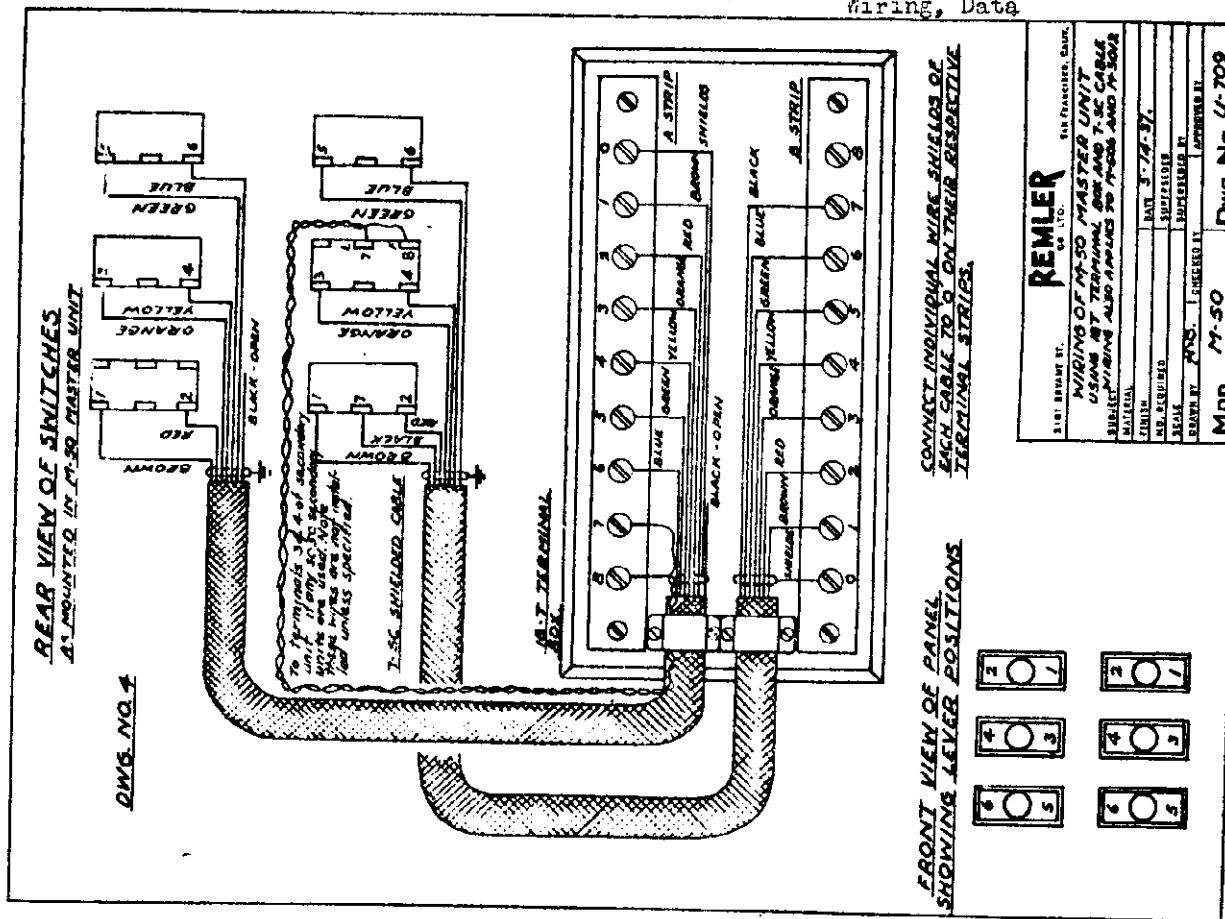
DWG. NO. 3
Showing connections to S-50 Secondary Unit.

DWG. NO. 2
Showing connections to Terminal strip if one is used.

TO AMP. OUTPUT

REMLER COMPANY, LTD.

MODEL M-50 Communication Sys.
7-SC Cable & 18T Term. Box
Wiring, Data



WIRING INSTRUCTIONS FOR M-50 TYPE INTER-COMMUNICATION SYSTEM USING 18-T TERMINAL BLOCK AND 7-SC CABLE

The 7-SC cable is a seven conductor cable with each conductor individually shielded. The shields are all bonded together and connected to a ground lug on the M-50 chassis and to "0" terminal on the 18-T block. The shields are used as the common or voice return circuit from the various secondary units. The conductors of the cable are connected to the selector switch "voice" terminals as shown in the upper section of the drawing. The conductors are color coded and are connected so that the brown wire of the upper cable goes to #1 terminal of the upper row of switches and to #1 terminal of the "A" terminal box strip, etc. At the bottom of the drawing is shown the switch lever positions which correspond to the terminal box strip numbers.

The 18-T terminal box provides two strips called "A" strip and "B" strip, of nine terminals numbered from 0 to 8 each, which provide terminating points for all voice and call-back lines for twelve secondary units. The terminals "1" to "6" inclusive on each strip are the voice line terminals, only one secondary being connected to each terminal. The "0" terminals on each strip are the common ground or voice return terminals for all secondary units connected to the strip, as well as common ground for the call-back voice line if a call-back type of secondary is used. The "7" terminal on the "B" strip is the call-back voice line terminal for all call-back type secondaries. The terminals "7" and "8" on the "A" strip may be used for the call-back power terminals for all call-back type secondaries.

NOTE: The call-back power wires from the master unit to terminals "7" and "8" of "A" strip are not installed at the factory. To illustrate a representative system using 1 - M-50 master unit, 4 - S-50 secondary units and 2 - SC-50 secondary call-back units, the connections are as follows:

Referring to Dwg. No. 6 of the secondary units, the "0" terminals on all secondaries are connected to "0" on the "A" strip. The "1" terminals on each secondary is connected to "1-2-3-4-5-6" (as required) on the "A" strip; one secondary only to each terminal. Terminals "2" of the SC-50 call-back secondaries are both connected to terminal "7" of "B" strip. Terminals #3 of the two SC-50 secondary units are both connected to terminal "7" of "A" strip and terminal #4 of both secondaries are connected to terminal "8" of "A" strip. The connections for additional secondary units, if used, are carried out in the same respective manner.

MODEL M-50 Communication Sys.
Master Unit
C-50 Call-Back Switch Wiring
Data

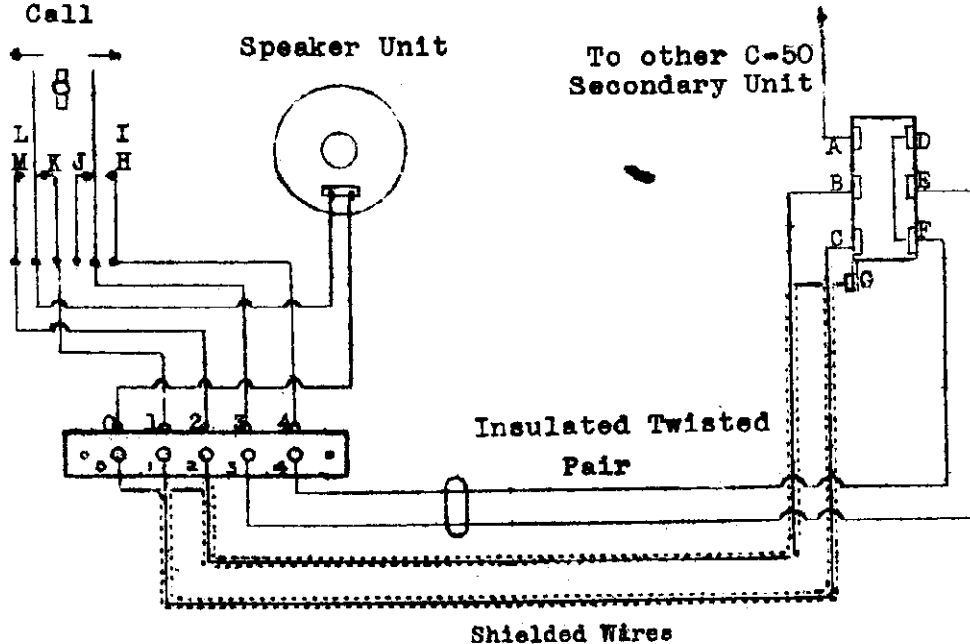
REMLER COMPANY, LTD.

C-50 Call Back Switch

DRAWING NO. 4

C-50 Call Back Switch
Rear View
Call

X-50 Selector Key
Rear View

**WIRING:**

Two single-conductor shielded wires and a well insulated twisted pair are required for connections between the M-50 master unit and each SC-50 call back secondary unit. Referring to drawing No. 4, the insulated twisted pair of wires are connected to terminals E and (D-F) of the master unit selector key and are run to terminals No. 3 and 4 of SC-50 call back unit. One shielded connector is connected to terminal B of the selector key and run to terminal 2 of the secondary unit. The other shielded wire is connected to either terminals A or C of the selector key (as required) and to terminal one of the secondary unit. The shield of both shielded wires is connected to the ground lug G, of the selector key and to the zero terminal of the secondary unit. These connections, it will be noted, provide for turning on the plate supply of the master unit and for bridging around the selector keys in order to effect call back regardless of the position of these selector keys.

M-50 Master Unit

Additional selector keys may be installed on the M-50 master unit at any time, by removing the front switch cover-plate, cutting out the paper "knock-out" and installing the additional key switch in any of the five openings that are provided in the mounting plate. The key switch is fastened to the rear of the mounting plate with the grounding lug (G) (See drawing No. 1) at the lower left, looking at the rear of the unit. The necessary screws for mounting are furnished with each switch. When extra key switches are installed, certain common circuits must be connected from the original switch to all the additional switches added in multiple. The common leads are the amplifier output, which connects to the left hand center (B) terminal of each switch, and two leads which are used to break the plate circuit return of the amplifier, one lead connecting to the center right (E) terminal of each switch and the other lead connecting both the top and bottom right hand (D and F) terminals of each switch.

A cable clamp is provided on the chassis of the M-50 master unit, under which the leads to the switches should be clamped at the time they are installed.

MODEL M-70 Communication

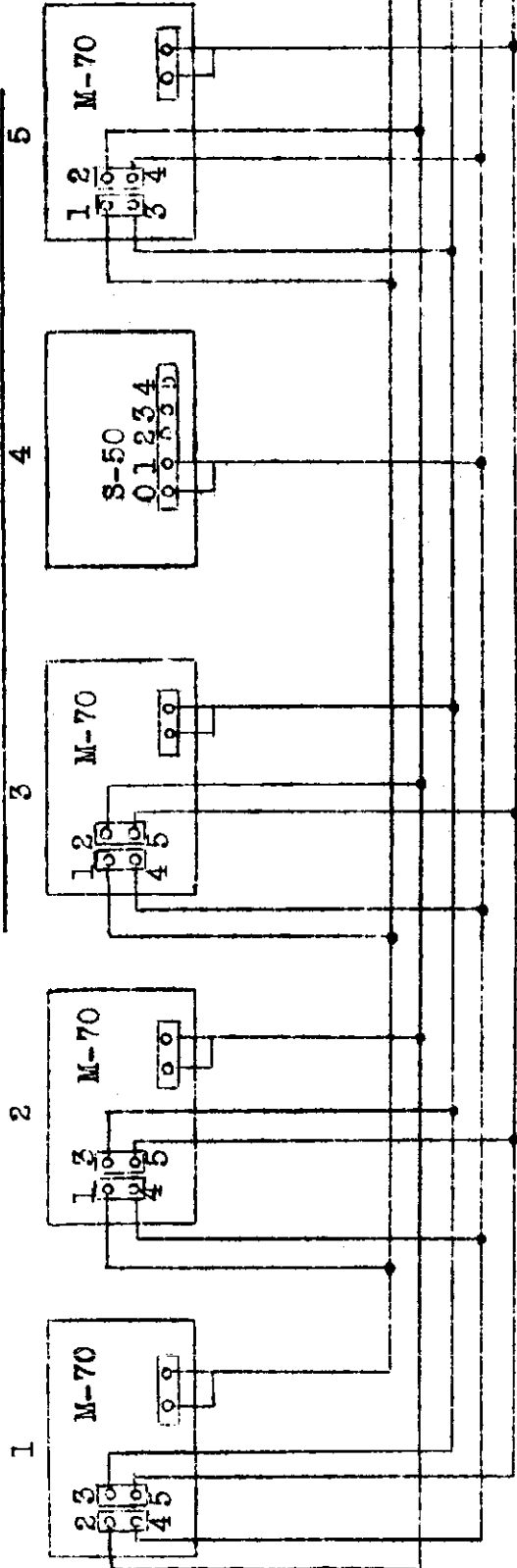
REMLER COMPANY, LTD.

Master Unit
S-50 Secondary Unit
Wiring

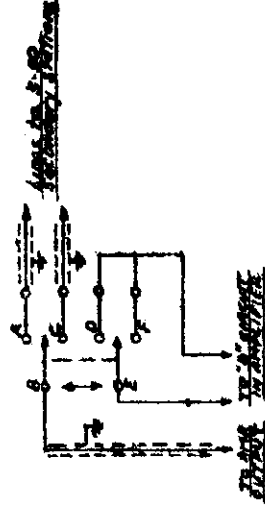
"1" Bus
"2" Bus
"3" Bus
"4" Bus
"5" Bus

LAYOUT FOR REPRESENTATIVE REMLER INTER-COMMUNICATION SYSTEM

4 M-70 MASTER UNITS AND 1 S-50 SECONDARY UNIT

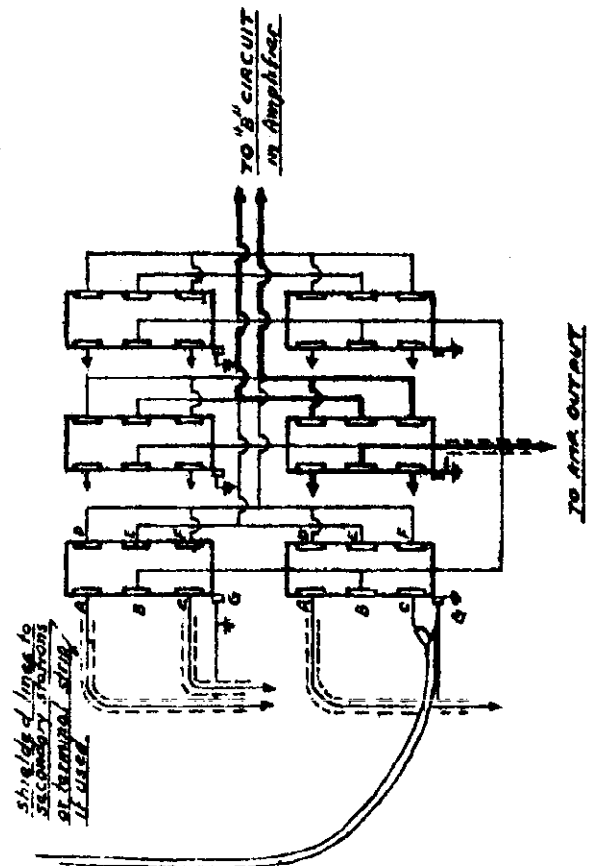


SCHEMATIC DIAGRAM FOR ALSO MASTER UNITS



Showing Back View of 6 no. S-50 switches
Switch and wires installed at factory
shown in heavy lines.

©M.S. 1941



MODEL M-50

MODEL M-70

Installation, Operation

REMLER COMPANY, LTD.

INSTRUCTIONS FOR INSTALLATION AND OPERATION OF REMLER M-70 MULTIPLE MASTER INTER-COMMUNICATION SYSTEM

The M-70 inter-communication unit is equipped with a relay which automatically arranges the terminal connections of the unit to enable it to operate as either a master station or a secondary station.

Whenever the M-70 station is not in use; that is, when the A.C. switch is turned off or when the selector keys are all in neutral, the station becomes a secondary unit with the secondary unit terminals connecting to two terminals, "M" (marked "zero" and "1") located on the back of the unit. From these two "M" or pickup terminals, a shielded line must be run to the selector keys of every other M-70 station desiring to call this particular unit.

When the M-70 station is turned on and the selector keys thrown to call a secondary station, the relay converts the unit to a master station, enabling conversation to be held with the unit selected by the selector key; provided the called station is not in use. If the M-70 station called is carrying on a conversation at the time, a busy hum will be heard. If the station called has previously been called by another unit, the noise of this conversation will be heard indicating that the unit is in use.

The M-70 master station unit is equipped at the factory with one X-50 selector key which permits immediate hookup with two other M-70 master stations, two S-50 secondary stations, or one M-70 and one S-50. When more than two secondary stations are used in the system, extra station selector keys, type X-50, are required. Each additional key will accommodate two additional stations, either M-70 or S-50.

For the necessary wiring between units, we recommend the use of a single conductor shielded wire covered by a cloth braid. This wire is known as our type 1-SC. In multiple station systems it is usually preferable to use a multi-conductor cable from the selector keys of the M-70 unit to a conveniently mounted terminal block on the wall or floor near where the unit will be used. This cable (known as type 7-SC) consists of seven individually shielded wires, covered by a cloth braid, and may be purchased in any length desired. A wall mounting terminal block consisting of hardwood base, sufficient screw terminals for a complete thirteen station system and sheet metal protective cover is available completely assembled, or furnished in disassembled kit form at a lower price.

When wiring the M-70 units a shielded line should be connected to the "M" or pickup terminals of the unit, secured under the cable clamp provided, and run to every other station in the system desiring to call this unit. The shield must be connected to the "0" terminal and the hot wire connected to terminal "1". A separate wire need not be run to each other station, the one wire may be run consecutively from one station to the next with individual connecting wires tapped off this line at each unit.

The shielded line from each individual station unit must be soldered to the terminals of the desired selector key of the M-70 master. The shield should be connected to the ground lug "G" (see drawing No. 1) and the insulated or "hot" wire should be connected to the upper left ("A" terminal) or lower left ("C" terminal) of the selector key, when viewed from the back of the unit.

S-50 secondary stations are wired in the same manner, a shielded line being run from this secondary station to the selector key terminals of each M-70 master desiring to call this secondary. The shield is connected to terminal "0" and the hot wire to terminal "1" of the S-50 secondary unit.

INSTRUCTIONS FOR INSTALLATION AND OPERATION OF REMLER M-50 MULTIPLE STATION INTER-COMMUNICATION SYSTEM

The M-50 master station unit is equipped at the factory with one 1-50 two-station selector key which permits immediate hookup with two S-50 or SC-50 secondary units. When more than two secondary stations are used in the system, extra station selector keys, type X-50, are required; each key will control two stations.

NOTE: The station selector key installed at the factory has wired to terminals "A" and "C" (See drawing No. 7), a short length of 1-SC cable. The lines from the secondary units may be spliced to this cable.

The wiring which is required between station units consists of one single-conductor and shield voice line from the master station to each secondary station. We recommend for this wiring the use of our type 1-SC cable. The shield of the 1-SC cable is connected to terminal zero on the secondary unit (See drawing No. 8). The conductor of the cable is connected to terminal No. 1. The shield acts as one conductor and the insulated wire as the second conductor. These lines are then run to the M-50 master unit selector keys. On the M-50 unit the shields of the cable are soldered to ground lug "G" on the selector key (See drawing No. 7) and the insulated conductors are soldered to lugs "A" or "C". The lugs "A" and "C" are the voice terminals of the selector key and one secondary unit may be connected to each lug; that is, for every X-50 selector key two secondary units may be used.

Additional X-50 selector keys may be installed on the M-50 master unit at any time, by removing the front switch cover-plate, cutting out the paper "knock-out" and installing the additional key switch in any of the five openings that are provided in the mounting plate. The key switch is fastened to the rear of the mounting plate with the grounding lug (G) (See drawing No. 7) at the lower left, looking at the rear of the unit. The necessary screws for mounting are furnished with each switch. When extra key switches are installed, certain switch circuits must be connected from the original switch to all the additional switches added in multiples. The common leads are the common voice line which connects to the left hand center (S) terminal of each switch, and two leads which are used to break the plate circuit return of the amplifier, known as the call-back power lines, one lead connecting to the center right (E) terminal of each switch and the other lead connecting both the top and bottom right hand (D and F) terminals of each switch.

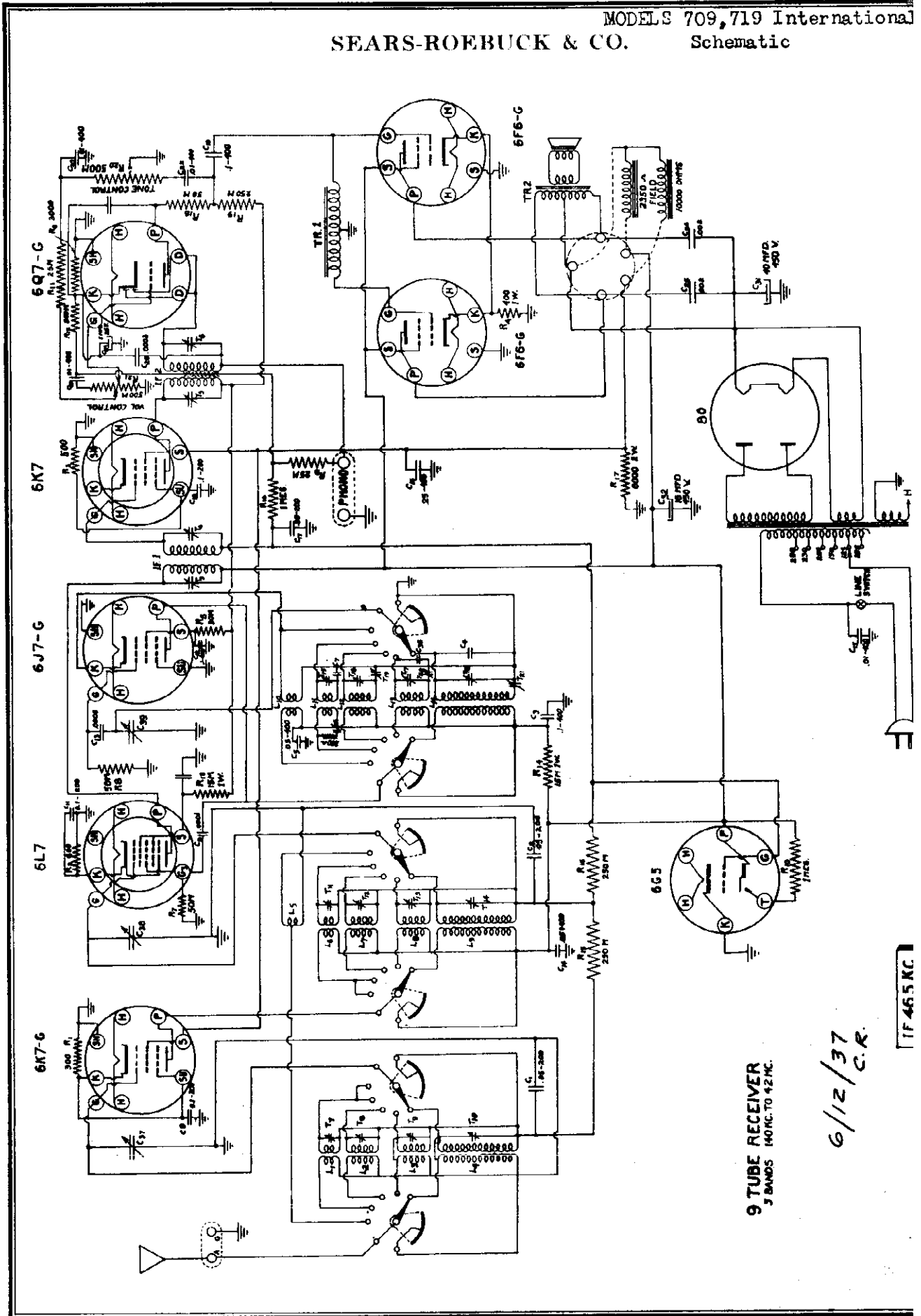
If desired, a multiple conductor cable, our type 7-SC may be soldered to the terminals of the selector keys and to the terminals of a connecting block, our type 18-1, as shown on drawing No. 4. The terminal block may be mounted wherever convenient near the master unit. The shielded lines from the secondary stations may then be connected to this terminal block as described on Drawing No. 4. A cable clamp is provided on the chassis of the M-50 master unit, under which the leads to the switches should be clamped at the time they are installed.

OPERATION:

After the system has been connected it may be placed in operation by turning the small rotary A.C. power switch knob, which is on the front of the M-50 unit, to the clockwise position. The pilot lamp on the front panel will glow, indicating that the power is on. When it is desired to communicate with a secondary station, the selector key should be thrown to that secondary station's position as indicated on the designation plate. After this selection is made, the talk-listen switch, which is operated by the lever on the extreme lower right of the cabinet, is depressed while speaking. When an answer is wanted, release the talk-listen switch lever which will automatically assume the receiving position so that the secondary unit may reply. When the communication is completed, the station selector key should be returned to the center or neutral position. When the key is in this neutral position the plate supply current is disconnected and the unit is silent. Located on the rear of the cabinet is the volume control knob. This knob should be adjusted to the desired volume level at the time of installation and should require no further attention.

NOTE: For installation information on the SC-50 and SMC-50 call-back type secondary units see drawing No. 8.

SEARS-ROEBUCK & CO. MODELS 709, 719 International Schematic



9 TUBE RECEIVER
3 BANDS 140 MC. TO 42 MC.

6/12/37
C.R.

TF 46.5 KC.

MODELS 709, 719
International
Voltage, Trimmers
Alignment

SEARS-ROEBUCK & CO.

SOCKET READINGS FOR MODEL A-9 SERIES

All Voltages taken from ground with line voltage 115 volts.

TUBE	POSITION	PLATE	SCREEN GRID	KATHODE	FILAMENT
6K7-G	1st. R.F.	250 V.	115 V.	2 V.	6 V.
6L7	Mixer	245 V.	172 V.	5.5 V.	6 V.
6J7	Oscillator	135 V.	155 V.	-	6 V.
6K7	I.F.	245 V.	115 V.	3.5 V.	6 V.
6Q7-G	Diode Det.	60 V.	-	1 V.	6 V.
6F6-G	P.P. Audio	325 V.	250 V.	19 V.	6 V.
6F6-G	P.P. Audio	325 V.	250 V.	19 V.	6 V.

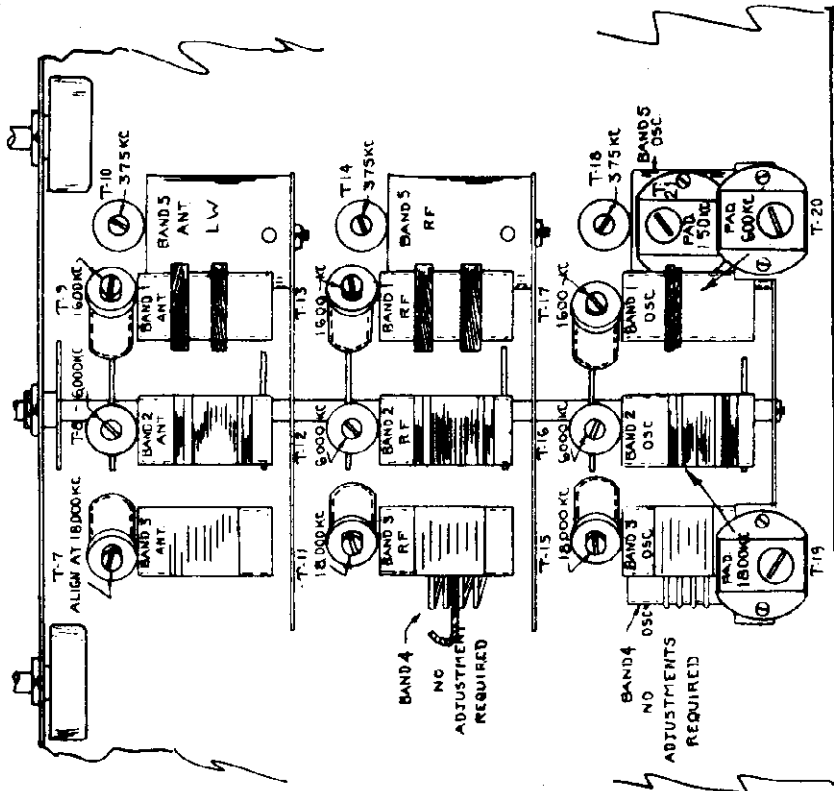
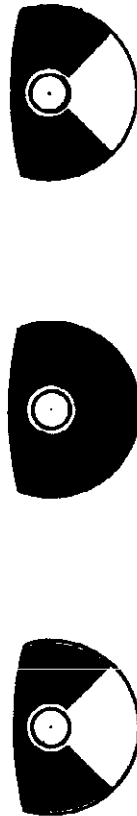


FIG. 5



OUT OF TUNE IN TUNE OUT OF TUNE

THE ELECTRIC EYE

The movement of the Electric Eye or resonance indicator is easily understood, as the station is tuned in, the green sections of the eye will draw together and tend to draw together depending upon the strength of the station. Rotate the tuning knob back and forth until the exact resonance point is found.

SEARS-ROEBUCK & CO.

MODELS 709, 719
International
Line Voltage Date
Socket, Trimmers
Alignment Notes

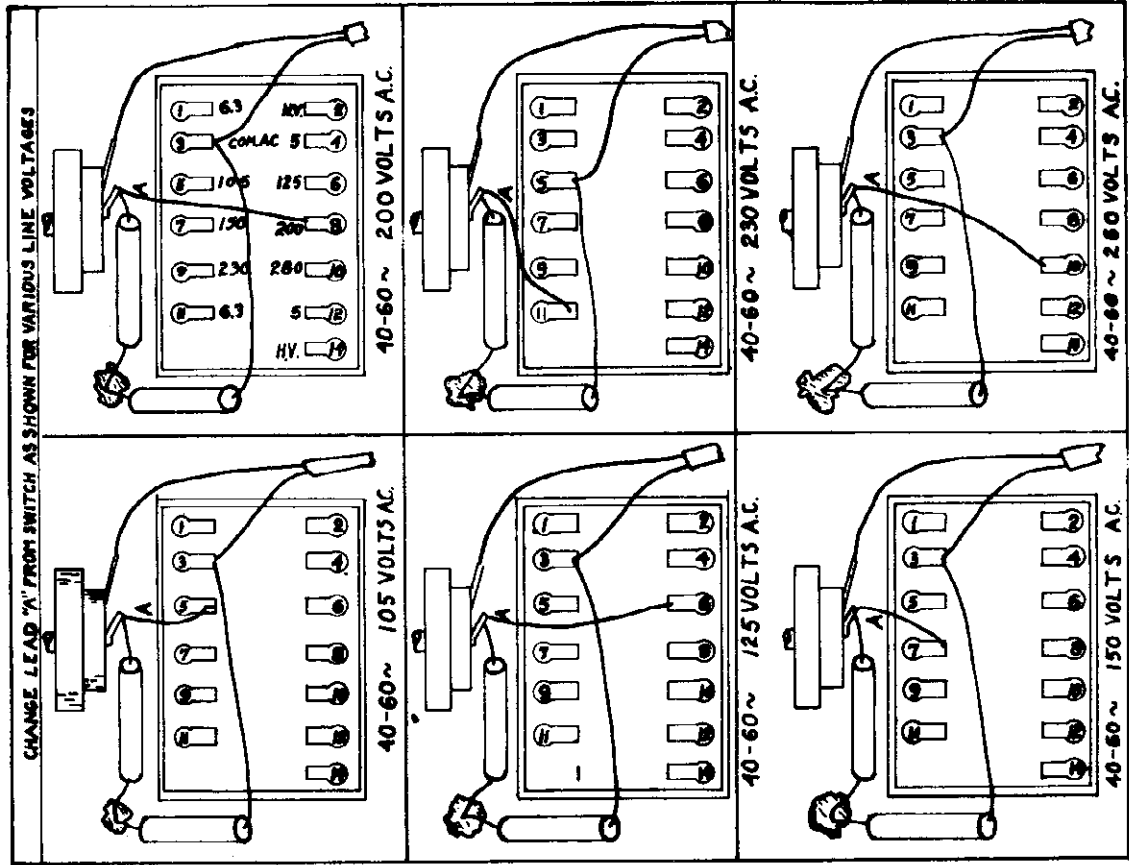


FIG. 3

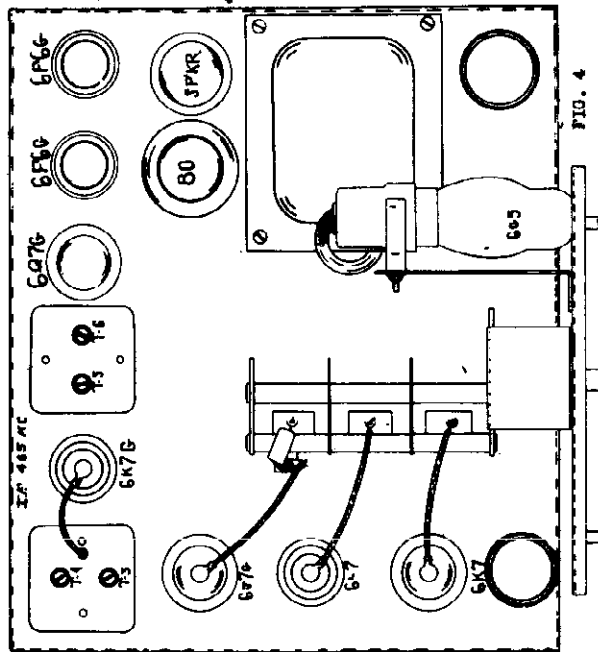


FIG. 4

NOTES ON ALIGNMENT

It is assumed that if an alignment procedure becomes necessary that the service man has an oscillator capable of accurately covering the range of the receiver and that a meter output indicator is used.

The I. F. Stages are aligned in the usual manner by feeding 485 KC into the grid of the 6L7 tube.

Follow Figure 4 and Figure 5 showing trimmer locations and alignment frequency.

Always adjust the oscillator first in any particular band.

Use as low an output as possible from the test oscillator in making the various adjustments.

After trimming at the high frequency end of the dial and adjusting the padding condenser at the other end, always recheck the settings of the trimmer at the high frequency end of the dial.

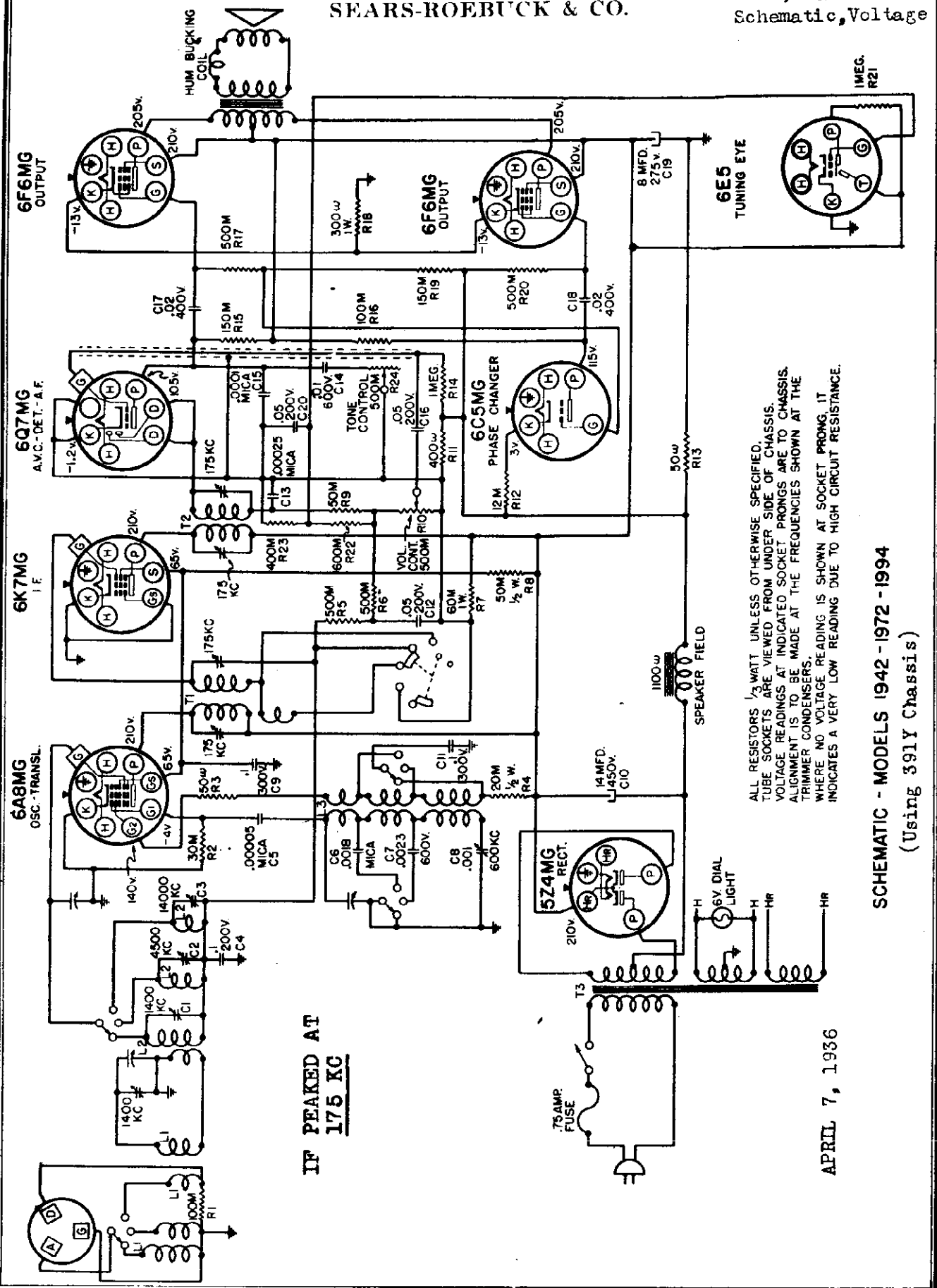
BE SURE THAT THE ALIGNMENT SIGNAL IS THE TRUE FUNDAMENTAL AND NOT A HARMONIC. Check for image frequency in the usual manner.

BEFORE STARTING ALIGNMENT CHECK POSITION OF TUNING HAND AND MAKE CERTAIN THAT IT IS EXACTLY STRAIGHT ACROSS ON THE FIRST CALIBRATION LINE WHEN THE CONDENSERS ARE AT MAXIMUM CAPACITY ROTATION.

MODELS 1942, 1972, 1994

SEARS-ROEBUCK & CO.

Late, Chassis 391Y
Schematic, Voltage



ALL RESISTORS 1/2 WATT UNLESS OTHERWISE SPECIFIED.
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE
TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT
INDICATES A VERY LOW READING DUE TO HIGH CIRCUIT RESISTANCE.

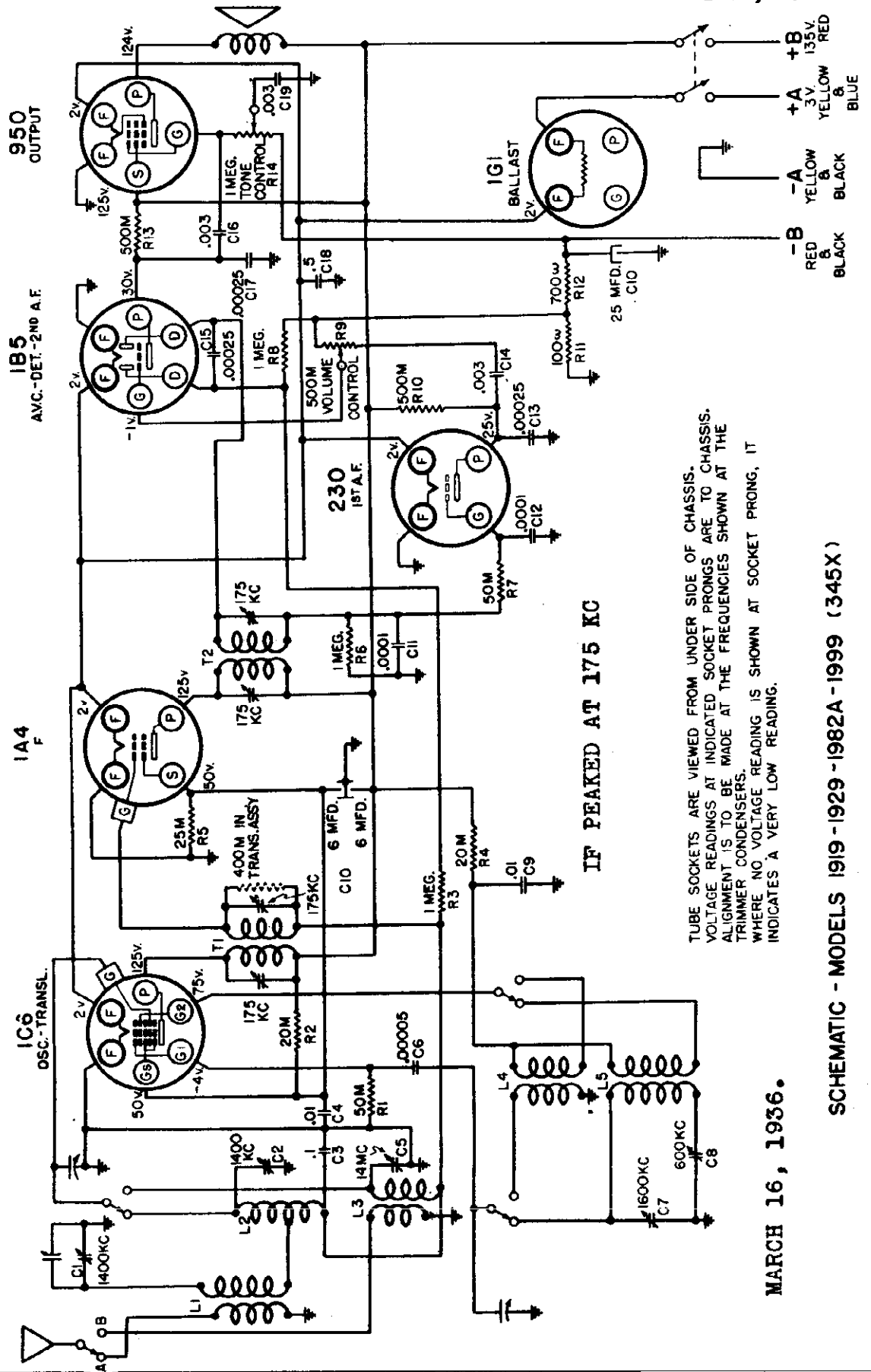
SCHEMATIC - MODELS 1942 - 1972 - 1994
(Using 391Y Chassis)

APRIL 7, 1936

Schematic, Voltage

SEARS-ROEBUCK & CO.

MODELS 1919, 1929, 1982A
1999, 345X Chassis



IF PEAKED AT 175 KC

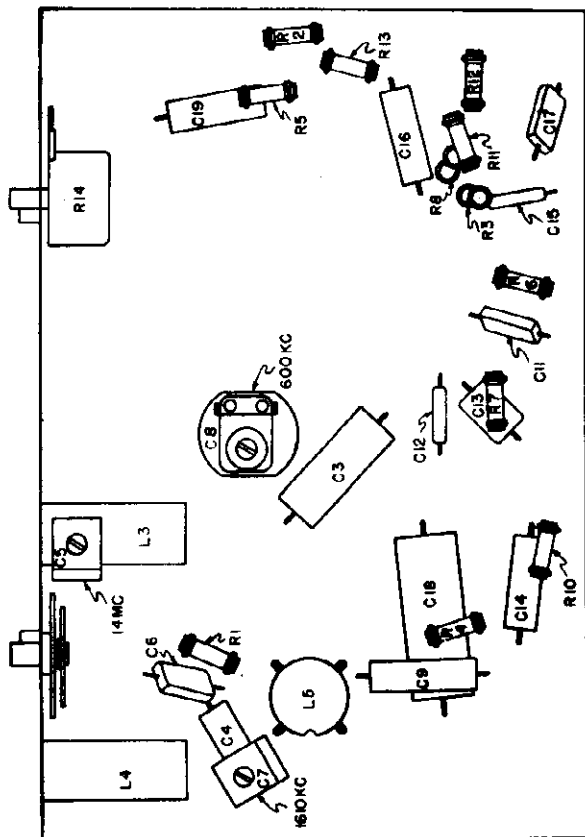
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS. WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES A VERY LOW READING.

MARCH 16, 1936.

SCHEMATIC - MODELS 1919 - 1929 - 1982A - 1999 (345X)

MODELS 1919, 1929, 1982A
 1999, 345X Chassis
 Chassis, Alignment, Data
 Sensitivity

SEARS-ROEBUCK & CO.



C1, C2, C3, C4, L1, L2, T1, T2 ARE MOUNTED ON TOP OF THE CHASSIS
 LOCATIONS OF PARTS - MODELS 1919-1929-1982A-1999

ALIGNMENT PROCEDURE
IP Alignment

1. Connections:

Connect the ground lead of the test oscillator to the receiver chassis. Connect the output lead of the test oscillator, in series with a .1 mfd condenser, to the positions mentioned below for alignment. Connect the output meter, in series with a .5 mfd condenser, across the loud speaker terminals.

2. Receiver Settings:

Turn the Wave Band switch to the BROADCAST position and the Station Selector to about 550 kc. Turn the receiver Volume Control all the way on and the Tone Control to its brilliant position (clockwise).

3. Alignment:

(a) Set the test oscillator to 175 kc. Connect its output (through the .1 mfd condenser) to the control grid cap of the 1A4 tube and peak the IP output transformer. The IP output transformer is the one without a grid lead, mounted at the back of the chassis.

(b) Change the test oscillator output connection to the control grid of the 1C6 tube and peak the IP input transformer. This is the transformer with a grid lead, mounted alongside of the Variable Condenser.

(c) Change the test oscillator output connection back to the 1A4 tube and repeat operation "A". Then change the connection back to the 1C6 tube and repeat operation "B". Always keep the receiver Volume Control turned all the way on and the test oscillator output at its lowest possible value.

BROADCAST BAND ALIGNMENT

1. Connections:

The ground lead of the test oscillator is left connected to the receiver chassis as for IP alignment. Disconnect the .1 mfd condenser from the output lead of the test oscillator. In its stead a .0002 mfd mica condenser is to be connected from the antenna lead of the receiver to the output lead of the test oscillator.

2. Receiver Settings:

Turn the Wave Band switch to the BROADCAST position, the Volume Control all the way on, and the Tone Control to its brilliant position (clockwise).

3. Alignment:

(a) Set the test oscillator to 1610 kc. Open the variable condenser all the way and peak the broadcast oscillator trimmer, C7.

(b) Set the test oscillator to 1400 kc and tune in its signal. Then peak the broadcast antenna trimmer, C1, and the broadcast translator trimmer, C2. The antenna trimmer is the one on the variable condenser section nearest the dial. The translator trimmer is accessible through the hole in top of the translator shield can, mounted behind the volume control.

(c) Set the test oscillator to 800 kc and tune in its signal. Then adjust the broadcast oscillator padder, C8. The variable should be rocked a degree or two during the adjustment.

(d) Repeat the 1610 kc adjustment, then the 1400 kc adjustment, and then the 800 kc adjustment for greater accuracy. Always keep the receiver Volume Control all the way on and the test oscillator output at its lowest possible value.

(e) Check the dial calibration by setting the test oscillator to 1000 kc and tuning in its signal. If necessary, turn the dial pointer to 1000 kc, being careful that the variable condenser is not allowed to turn.

SHORT WAVE ALIGNMENT

1. Connections:

Connections remain the same as for Broadcast Band alignment except that the .0002 mfd condenser in series with the test oscillator output lead is disconnected and a 400 ohm resistor connected in its stead.

2. Receiver Settings:

Turn the Wave Band switch to the SHORT WAVE position. The Volume Control is to be left all the way on and the Tone Control in its brilliant position, as for Broadcast Band alignment.

3. Alignment:

(a) Set the test oscillator to 14,000 kc and tune in its signal. Peak the short wave translator trimmer, C5. The variable should be rocked a degree or two during the adjustment. If two peaks can be found at two different settings of the trimmer, use the adjustment in which the trimmer is screwed further out (lesser capacity).

(b) The calibration of this band may be varied by shifting the gray lead that runs from one of the short wave oscillator coil lugs to one of the mounting lugs. If this lead is shifted to change calibration, the 14,000 kc adjustment should be repeated.

SENSITIVITIES

The following figures are given as an indication of the approximate sensitivities that should be had at various points in the receiver. It is necessary to have a test oscillator with an accurately calibrated attenuator so that its power output can be known. The output meter is to be connected, in series with a .5 mfd condenser across the loud speaker terminals. An output meter reading of 50 volts should be obtained for each of the input voltages shown for the frequencies listed.

The Volume Control of the receiver must be all the way on and the Tone Control turned all the way to the right. The ground lead of the test oscillator is to be connected to the chassis and the output lead of the test oscillator connected in series with the value of condenser or resistor, shown in the following list for the particular frequency at which the measurement is being made.

INPUT POINT	DUMMY ANTENNA	FREQUENCY	MICROVOLTS
Translator Grid	.1 mfd.	175 kc.	55 *
IP Grid	.1 mfd.	175 kc.	3500 *
Translator Grid	.1 mfd.	1000 kc.	120
Stator, Ant. Cond.	.1 mfd.	1000 kc.	340
Antenna Lead	.00025 mfd.	600 kc.	50
Antenna Lead	.00025 mfd.	1000 kc.	30
Antenna Lead	.00025 mfd.	1400 kc.	45
Antenna Lead	400 ohms	6000 kc.	45
Antenna Lead	400 ohms	10000 kc.	20
Antenna Lead	400 ohms	14000 kc.	20

* With Wave Band Switch in BROADCAST position and dial pointer at 550 KC.

SILVERTONE MODELS 1919, 1929, 1982A, 1999

General Description:

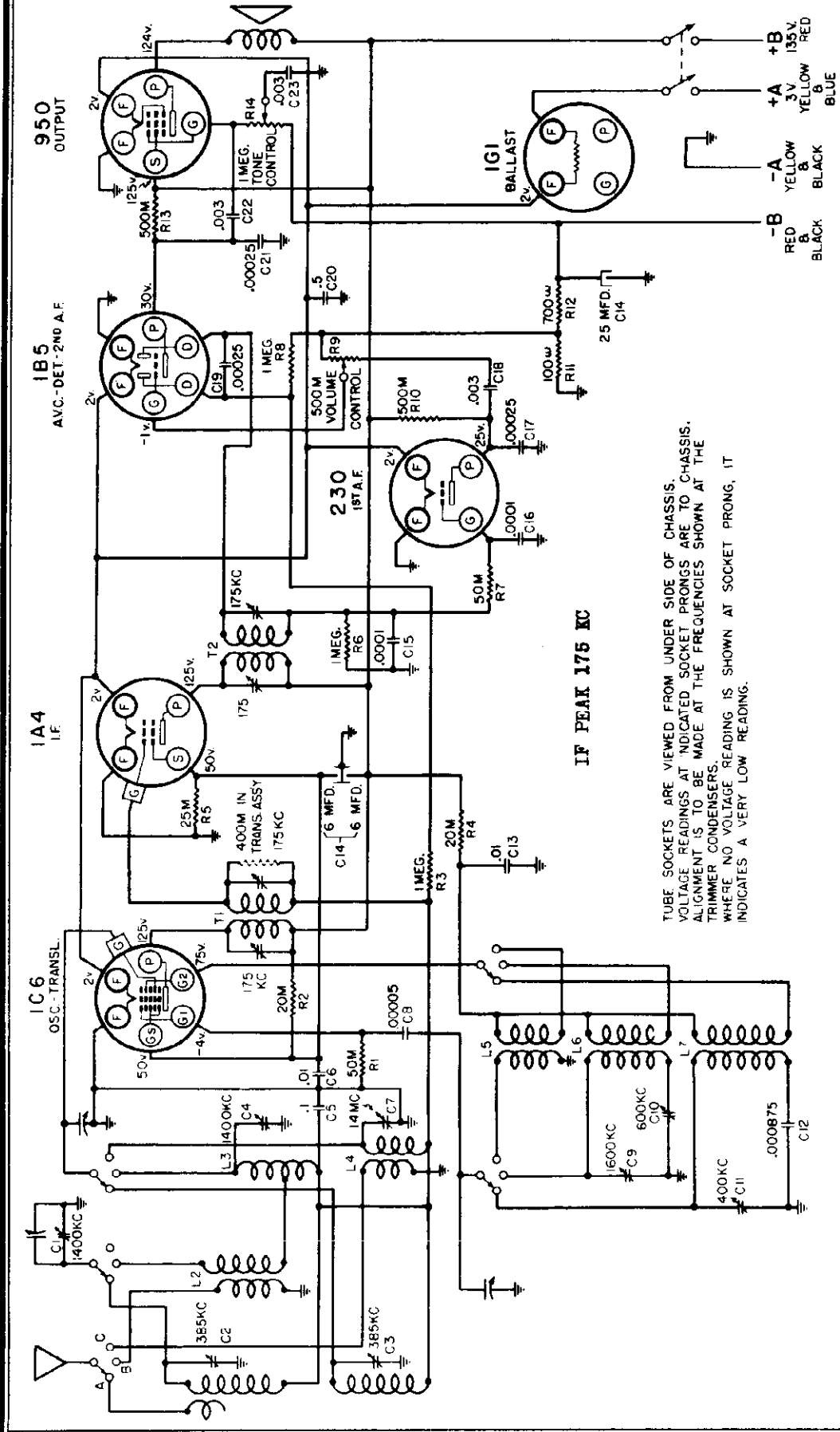
Although these receivers have the same model numbers as the ones described in Service Manual #7, Fall 1935 Series, they use a different chassis and have a different tube complement. The chassis used in the models described in Manual #7 can be identified through the fact that they are rubber stamped "345". The chassis used in the models described in the present Manual are rubber stamped "345X".

The Circuit:

These receivers are six tube battery powered superheterodynes, having a BROADCAST range and a FOREIGN Short Wave range. A filament Ballast tube is used to maintain the filament voltage at its proper value with a three volt dry cell block or an air cell "A" supply. If a two volt storage battery is used for "A" supply, the Ballast tube should be replaced by a Catalog #5022 adapter.

The diode current flowing through the 1 megohm resistor, R3, provides AVC voltage for the 1C6 and 1A4 tubes. The 100 ohm resistor, R11, provides residual bias.

SEARS-ROEBUCK & CO.



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE
TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT
INDICATES A VERY LOW READING.

Color Code Of The Electrolytic Condenser, C14:

- Black - Common, grounded
- Brown - Minus 25 mfd.
- Red - Plus 6 mfd.
- Blue - Plus 6 mfd.

These receivers are six tube battery powered superhetero-
dynes. In addition to the BROADCAST range they incorporate a
WEATHER Band and a Foreign SHORT WAVE range.

- B RED & BLACK
- A YELLOW & BLACK
- +A YELLOW & BLUE
- +B RED & RED

MODELS 1947, 1948

Chassis, Trimmers
Alignment, Sensitivity

SEARS-ROEBUCK & CO.

ALIGNMENT PROCEDURE

IF Alignment:

1. Connect the high scale of the output meter, in series with a .5 mfd condenser, across the loud speaker terminals. Connect the ground lead of the test oscillator to the chassis. Turn the Wave Band switch to the BROADCAST position and the Station Selector to about 1000 kc. During all of the alignment procedure the Volume Control of the receiver must be on full, the Tone Control in its brilliant position (fully clockwise) and the output from the test oscillator kept at its lowest possible value.
2. Connect the output lead of the test oscillator, in series with a .1 mfd condenser, to the control grid of the 1A4 tube. Set the test oscillator to 175 kc and peak the IF output transformer. This transformer is the square can unit mounted behind the Variable Condenser.
3. Change the test oscillator output connection to the control grid of the 1C6 tube and peak the IF input transformer. (Leave the .1 mfd condenser connected in series with the test oscillator lead.) The IF input transformer is the square can unit with grid lead, mounted alongside of the Variable Condenser.
4. Change the test oscillator connection back to the 1A4 tube and recheck the IF output transformer adjustment. Then change the test oscillator connection to the 1C6 tube and recheck the IF input transformer adjustment.

RF Alignment; Broadcast Band B:

1. Leave the output meter connected across the loud speaker terminals and the ground lead of the test oscillator connected to the chassis, as for IF alignment. Connect the output lead of the test oscillator, in series with a .00025 mfd mica condenser, to the green antenna lead of the receiver. During all of the alignment the Volume Control must be turned on full, the Tone Control in its brilliant position and the output power from the test oscillator kept at its lowest possible value.
2. Turn the Wave Band switch to the "B" (BROADCAST) position. Open the Variable Condenser plates all the way. Set the test oscillator to 1600 kc and adjust the broadcast oscillator trimmer, C9, for maximum output meter reading.
3. Set the test oscillator to 1400 kc and tune in its signal. Then peak the broadcast antenna and translator trimmers. The antenna trimmer is the one mounted on the variable condenser section nearest the dial. The translator trimmer is accessible through the hole in the top of the round shield can mounted on top of the chassis, next to the IF input transformer. The variable should be rocked back and forth a degree or two while making the adjustments.
4. Set the test oscillator to 600 kc and tune in its signal. Peak the broadcast oscillator padder, C10. The variable should be rocked during the adjustment.
5. Repeat the 1600 kc and then the 1400 and 600 kc adjustments for greater accuracy.

RF Alignment; Long Wave Band A:

1. The Broadcast band must have been aligned before the Long Wave band. The output meter and test oscillator connections are the same as for Broadcast band alignment. Keep the receiver Volume Control on full, the Tone Control brilliant, and the test oscillator output power at the lowest possible value.
2. Turn the Wave Band switch to the "A" position. Set the test oscillator to 400 kc. Open the variable condenser plates all the way and adjust the long wave oscillator trimmer, C11, for maximum output meter reading.
3. Set the test oscillator to 385 kc and tune in its signal. Then peak the preselector trimmers, C2 and C3.
4. Repeat the 400 kc and then the 385 kc adjustments for greater accuracy. Always keep the receiver Volume Control on full, the Tone Control in its brilliant position, and the test oscillator output at the lowest possible value consistent with a satisfactory output meter reading.

Short Wave Band C:

1. Remove the .00025 mfd condenser, used in series with the test oscillator output lead for previous alignment. Replace this condenser with a 400 ohm carbon resistor. Turn the Wave Band switch to the "C" position. All other connections and settings remain the same as for previous alignment.
2. Set the test oscillator to 14,000 kc and tune in its signal. Then peak the short wave translator trimmer, C7. The variable should be rocked a degree or two during the adjustment. If two peaks can be obtained at two different settings of the trimmer, use the one in which the trimmer is screwed further out (lesser capacity).

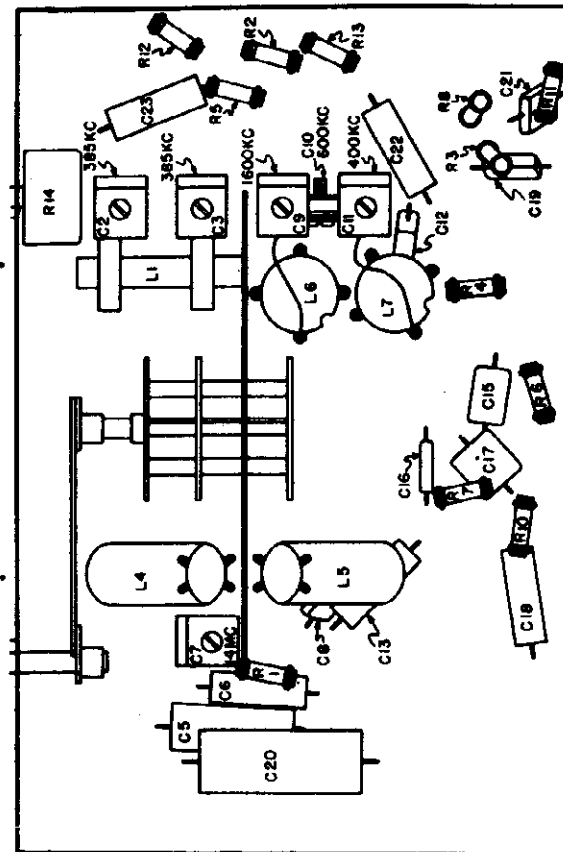
SENSITIVITIES

The following figures are given as an indication of sensitivities that should be had at various points in the receiver. It is necessary to have a test oscillator with an accurately calibrated attenuator so that its power output can be known. The output meter is to be connected, in series with a .3 mfd condenser, across the loud speaker terminals. An output meter reading of 8 1/2 volts should be obtained for each of the input voltages shown for the frequencies listed.

The Volume Control of the receiver must be all the way on and the Tone Control turned all the way to the right. The ground lead of the test oscillator is to be connected to the chassis and the output lead of the test oscillator connected in series with the value of condenser or resistor shown in the list for the particular frequency at which the measurement is being made.

INPUT POINT	DURLEY ANTENNA	FREQUENCY	MICROVOLTS
Translator Grid	.1 mfd	175 kc	55 *
IF Grid	.1 mfd	175 kc	3500 *
Translator Grid	.1 mfd	1000 kc	55
Stator, Ant. Cond.	.1 mfd	1000 kc	150
Antenna Lead	.00025 mfd	1000 kc	25
Antenna Lead	.00025 mfd	600 kc	36
Antenna Lead	.00025 mfd	1000 kc	40
Antenna Lead	.00025 mfd	1400 kc	60
Antenna Lead	.00025 mfd	400 kc	30
Antenna Lead	.00025 mfd	385 kc	36
Antenna Lead	.00025 mfd	225 kc	125
Antenna Lead	400 ohms	8000 kc	35
Antenna Lead	400 ohms	10000 kc	20
Antenna Lead	400 ohms	14000 kc	25

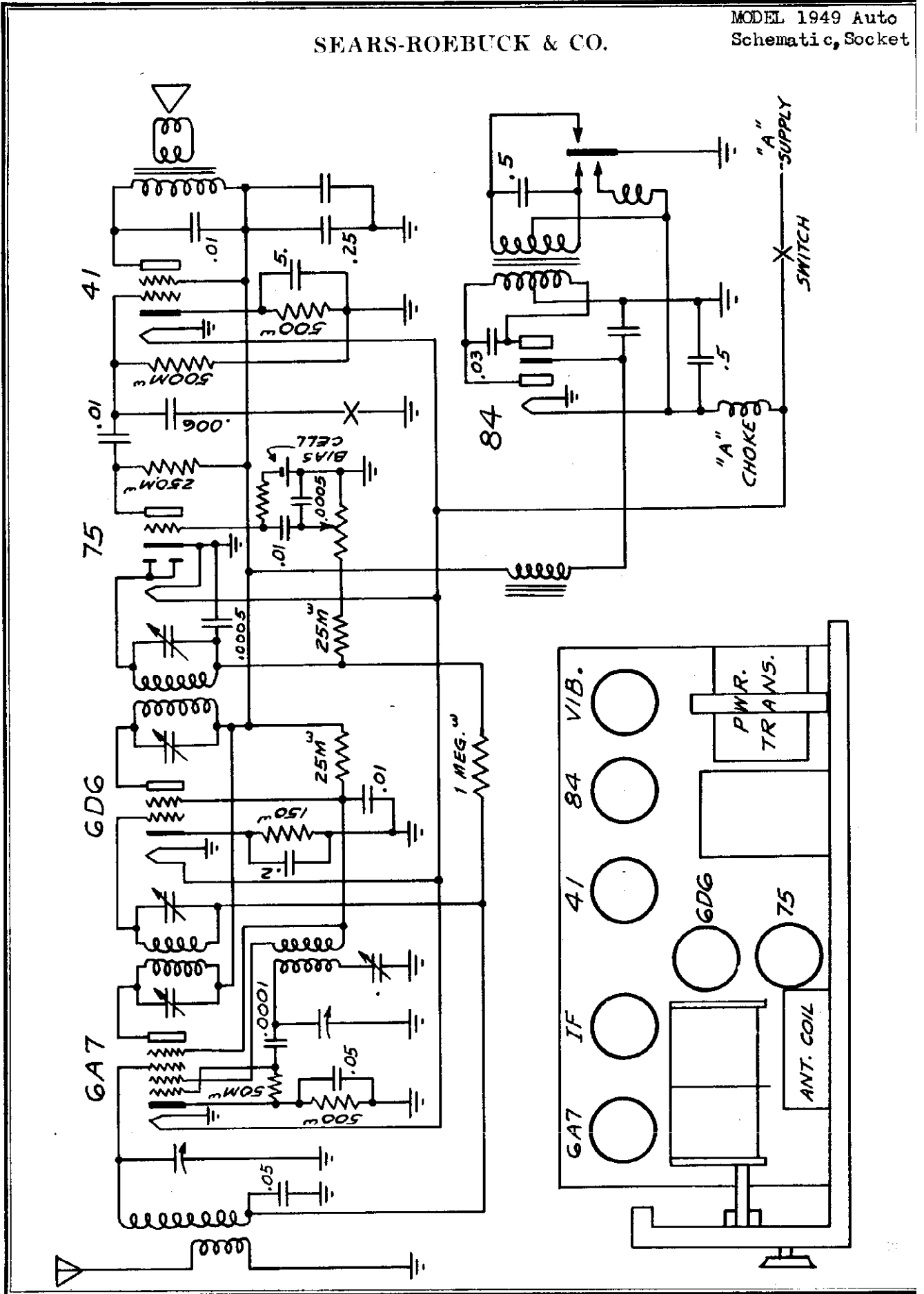
* Wave Switch in BROADCAST position and dial set at 550 kc.

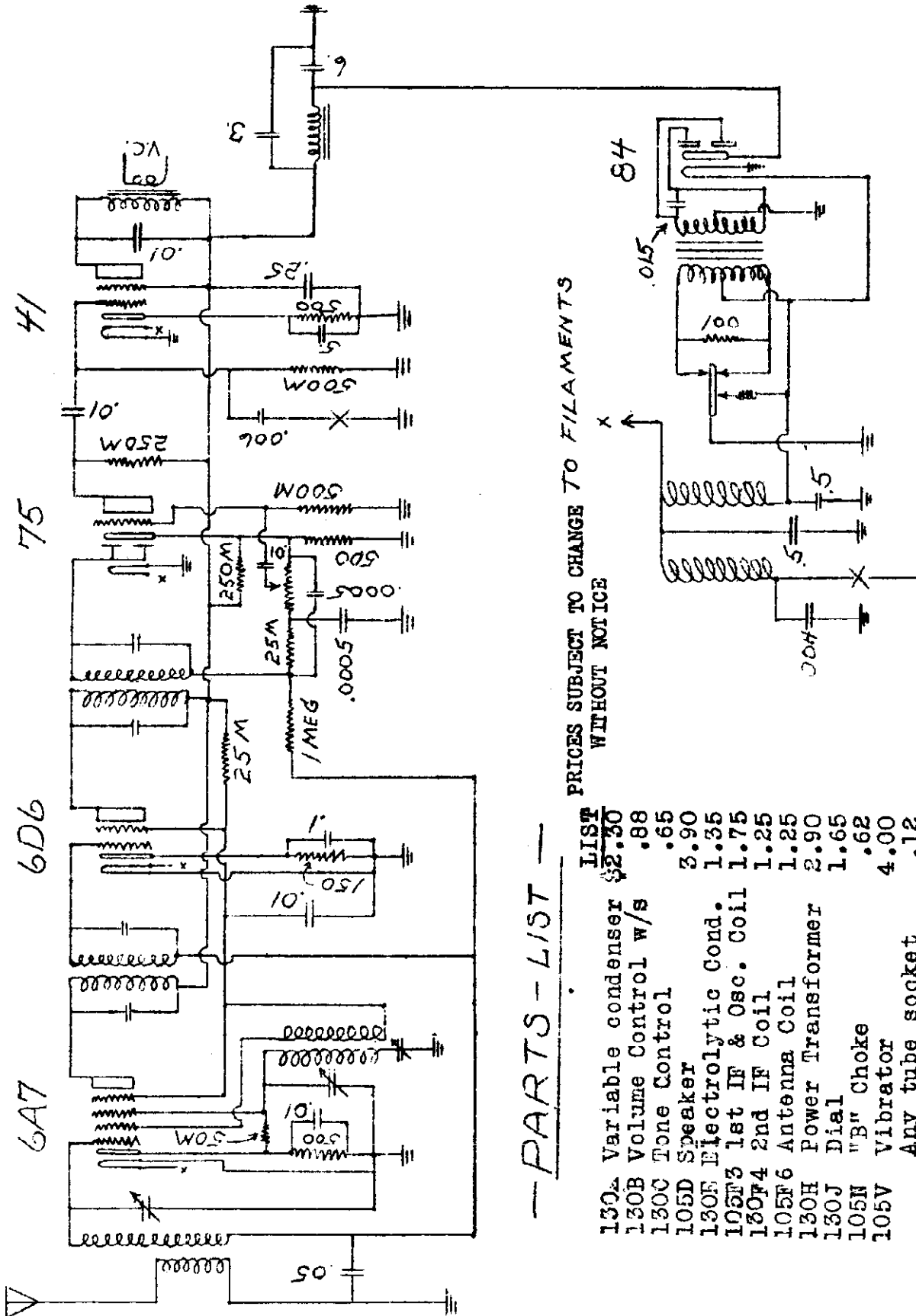


T1, T2, R9, C1, C4, C14, L2 & L3
ARE MOUNTED ON TOP OF THE CHASSIS.
LOCATIONS OF PARTS - MODELS 1947-1948

SEARS-ROEBUCK & CO.

MODEL 1949 Auto
Schematic, Socket



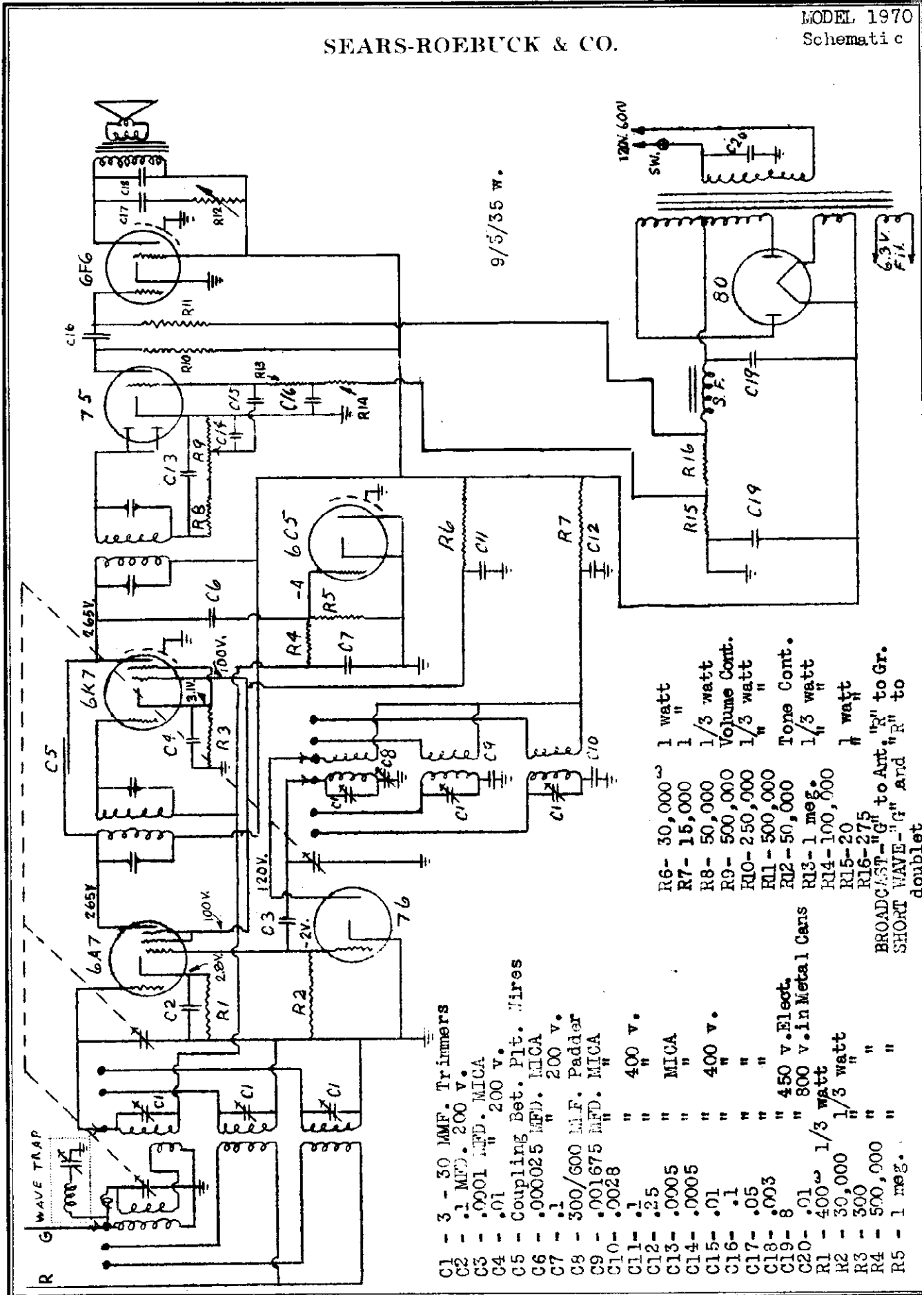


PARTS - LIST

PRICES SUBJECT TO CHANGE TO FILAMENTS
WITHOUT NOTICE

Part Number	Description	Price
130A	Variable condenser	\$2.30
130B	Volume Control w/s	.88
130C	Tone Control	.65
105D	Speaker	3.90
130E	Electrolytic Cond.	1.35
105F3	1st IF & Osc. Coil	1.75
130F4	2nd IF Coil	1.25
105F6	Antenna Coil	1.25
130H	Power Transformer	2.90
130J	Dial	1.65
105N	"B" Choke	.62
105V	Vibrator	4.00
	Any tube socket	.12
	Any carbon resistor	.10
	By pass condensers	.15

SEARS-ROEBUCK & CO.



- C1 - 3 - 30 MMF. Trimmers
- C2 - .1 MFD. 200 v.
- C3 - .0001 MFD. MICA
- C4 - .01 " 200 v.
- C5 - Coupling Bet. Plt. Wires
- C6 - .000025 MFD. MICA
- C7 - .1 " 200 v.
- C8 - 300/600 M.F. Padder
- C9 - .001675 MFD. MICA
- C10 - .0028 " "
- C11 - .1 " 400 v.
- C12 - .25 " " MICA
- C13 - .0005 " " "
- C14 - .0005 " " 400 v.
- C15 - .01 " " "
- C16 - .1 " " "
- C17 - .05 " " "
- C18 - .003 " " "
- C19 - 8 " 450 v. Elect.
- C20 - .01 " 800 v. in Metal Cans
- R1 - 400 Ω 1/3 watt
- R2 - 30,000 " "
- R3 - 300 " "
- R4 - 500,000 " "
- R5 - 1 meg. " "
- R6 - 30,000 Ω 1 watt
- R7 - 15,000 " 1/3 watt
- R8 - 50,000 " 1/3 watt
- R9 - 500,000 Volume Cont.
- R10 - 250,000 1/3 watt
- R11 - 500,000 " "
- R12 - 50,000 Tone Cont.
- R13 - 1 meg. 1/3 watt
- R14 - 100,000 " "
- R15 - 20 " 1 watt
- R16 - 275 " "
- BROADCAST - "G" to Ant, "R" to Gr.
- SHORT WAVE - "G" and "R" to doublet

MODEL 1970

Alignment, Socket Trimmers, Voltage

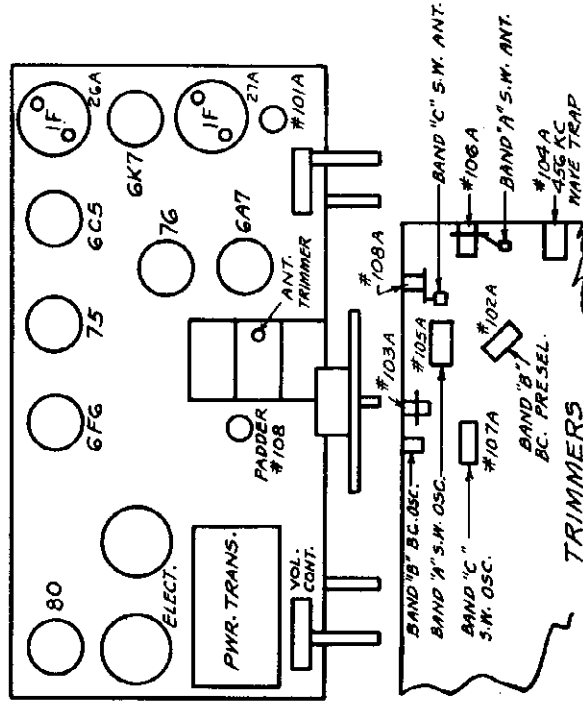
SEARS-ROEBUCK & CO.

10- Set band switch on position "C" (all the way to the left.) Still using 400 ohms in series with the antenna, apply a 14 MC signal. Adjust dial to 14 MC. Adjust Band "C" oscillator trimmer for maximum response. If two points of response are noted, the correct adjustment is the one obtained when the least capacity is used (condenser open.) Adjust Band "C" antenna trimmer for maximum response, remembering that the point obtained with the antenna trimmer practically closed is the correct one.

VOLTAGES MEASURED FROM POINT TO CHASSIS, USING A 1000-ohm-per-volt meter. (Line: 120 volts A.C.)

750 volt scale	100 volt scale	10 volt scale	FILAMENT
6A7 265 V	100 V	2.8 V	6.1 V AC
78 120 V	100 V	3.1 V	6.1 V AC
6K6 265 V			6.1 V AC
6C5			6.1 V AC
78 190 V			6.1 V AC
6F6 250 V	265 V	Filament to chassis	6.1 V AC
80 265 V			

* Does not indicate true grid voltage due to high resistance of grid circuit.



ALIGNMENT OF RECEIVER

1- Connect the test oscillator through a .1 mfd condenser to the control grid cap of the 6A7 tube, without removing the grid cap and being certain the shield cap is in place. The red and black wires coming from the receiver are connected together and connected to the ground lead of the test oscillator.

2- Connect the output meter to the voice coil of the speaker.

3- Advance volume control all the way on and turn tone control to "high" position.

4- Set the test oscillator to 456 KC and adjust the I F trimmer condensers for maximum output, using the weakest possible signal from the test oscillator in order to make the AVC action of the receiver inoperative. If the signal from the test oscillator is strong enough to produce more than a readable indication on the output meter then incorrect results may be obtained.

5- If, for any reason, the test oscillator cannot be controlled to give the desired low indication on the output meter, then it is permissible to slightly retard the volume control.

6- Set band switch of the receiver to position "B" (all the way to the right). Remove the test oscillator output lead from the grid of the 6A7 tube and connect it through a .00025 mfd condenser (instead of the .1mfd condenser) to the green antenna lead of the receiver. Tune the receiver to read 1400 KC on the dial and adjust the test oscillator to 1400 KC. When the signal is tuned in adjust the broadcast oscillator trimmer (see Fig.) for maximum response. Then adjust the broadcast prescaler trimmer for maximum response. Then adjust the one trimmer located on the top of the center section of the variable condenser, in the same manner.

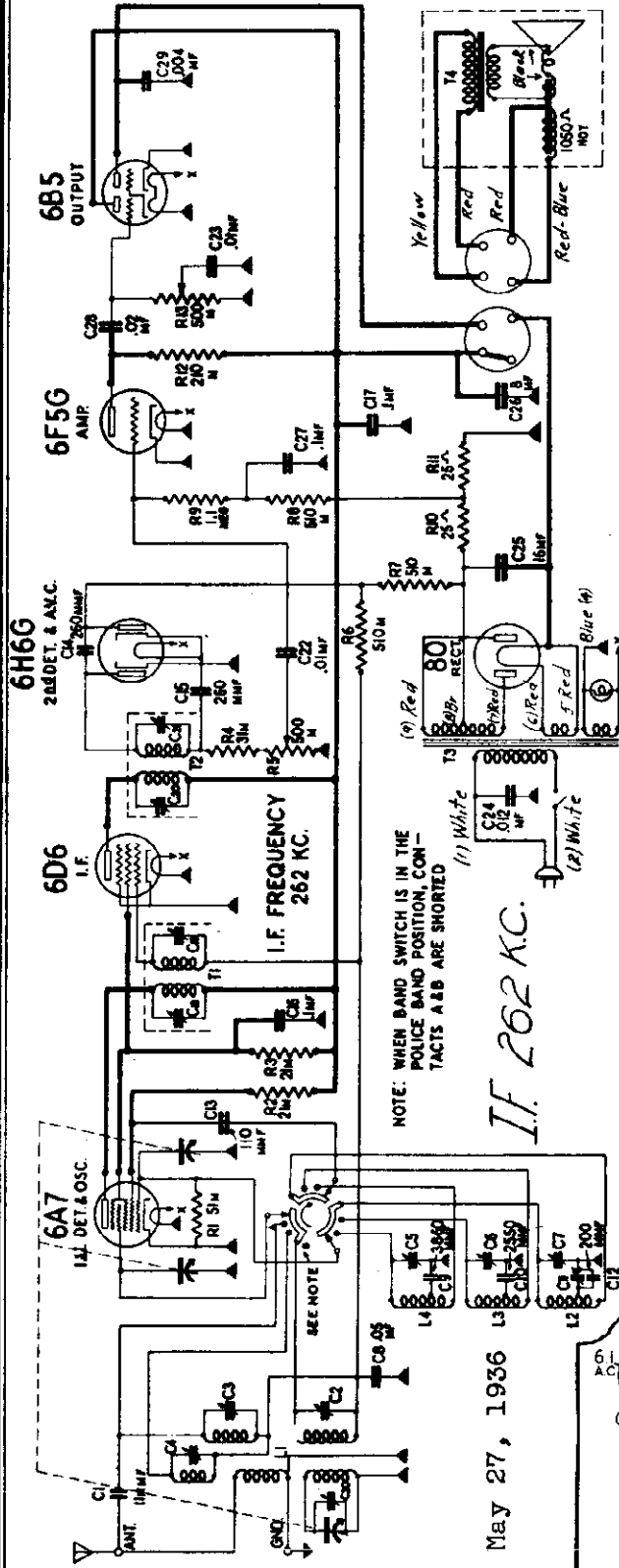
7- Apply a 600 KC signal to the antenna and tune this signal on the receiver. Adjust the padder condenser for maximum response. To make this adjustment it is necessary to tune the receiver back and forth past the signal at the same time that the padder is being carefully adjusted.

8- Apply a strong 456 KC signal to the antenna. Adjust the wave trap for minimum signal. (If the code interference is experienced with the receiver after all alignment adjustments have been made, then the wave trap should be adjusted to reduce the code interference to a minimum).

9- Set band switch on position "A" (center position). Connect a 400-ohm resistor between the test oscillator and receiver antenna lead, in place of the .00025 mfd condenser. Apply a 4 MC signal and tune in this signal for maximum response. Adjust antenna trimmer (see Fig.) to identify "Band 'A' - SW - Antenna trimmer" for maximum response. (Note: Maximum response may be had with the trimmer either practically open or practically closed. The closed position is the correct one.)

SEARS-ROEBUCK & CO.

MODELS 1986, 1987, 4403, 4463
 4464, 4484, 4563, 4564, 4584
 Chassis 100150
 Schematic, Socket, Voltage



May 27, 1936

POWER SUPPLY
 All models available.....105-135 volts, 50-60 cycle, 50 watts

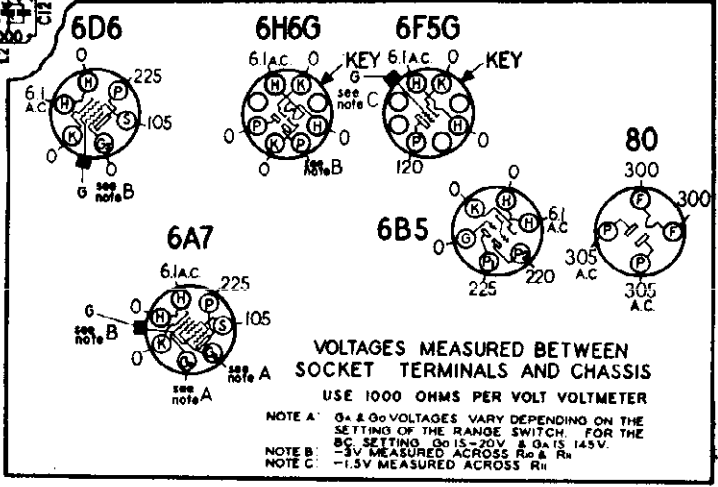
FREQUENCY RANGES
 Band A.....525 to 1800 KC.
 Band P.....1760 to 6000 KC.
 Band F.....5800 to 18,100 KC.

INTERMEDIATE FREQUENCY.....262 KC

LOUD SPEAKER
 Type.....Dynamic
 Size.....6" or 8"
 Field Coil Res.....1050 ohms (Hot)
 Field Coil Voltage.....75 volts

OPERATING FEATURES
 Fidelity Range.....50-5000 cycles
 Tone Control.....Variable
 Automatic Volume Control

CHASSIS FEATURES
 Preselector on Bc. Band
 Number of I.F. Stages.....1
 Antenna.....Conventional



BOTTOM VIEW OF CHASSIS

MODELS 1986, 1987, 4403, 4463
 4464, 4484, 4563, 4564, 4584
 Chassis 100150

SEARS-ROEBUCK & CO.

Socket, Trimmers, Chassis Alignment

ALIGNMENT PROCEDURE

PRELIMINARY

Output meter connections.....Across voice coil leads
 Output meter reading to indicate 1 watt output.....2 volts
 Average sensitivity in microvolts for 1 watt output.....See chart below
 Dummy antenna value to be in series with generator output.....See chart below
 Connection of generator output lead.....See chart below
 Generator modulation.....50%, 400 cycles
 Position of volume control.....full clockwise
 Position of tone control.....full clockwise

BAND SWITCH	POSITION OF * DIAL POINTER	GENERATOR FREQUENCY	DUMMY ANTENNA CONNECTION	GENERATOR CONNECTION	TRIMMERS ADJUSTED (in order shown)	MICRO VOLTS
Band A I.F.	1000 KC.	262 KC.	.1 Mfd.	6A7 Grid	C18, C19, C20, C21	125
	1500	1500	.00025	Ant. Lead	C7, C30, C2	50
	600(Rock)**	600	.00025	Ant. Lead	C11	50
Band P	5000 KC.	5000 KC.	400 Ohm	Ant. Lead	***	85
	16000 KC.	16000 KC.	400 Ohm	Ant. Lead	C5, C3	50

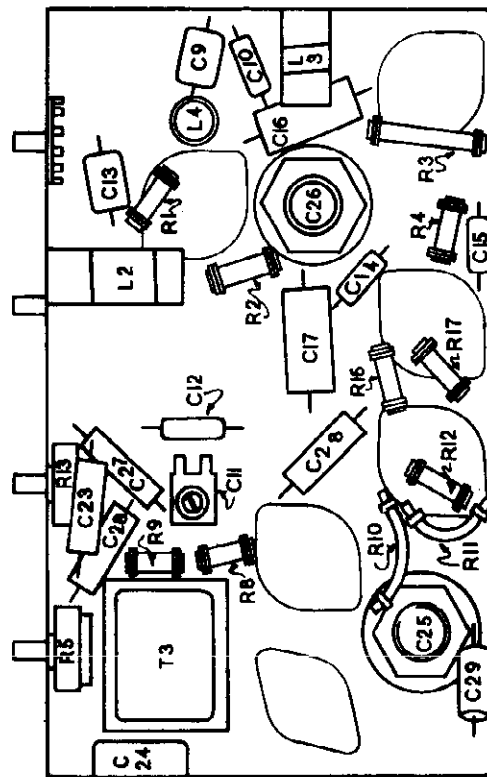
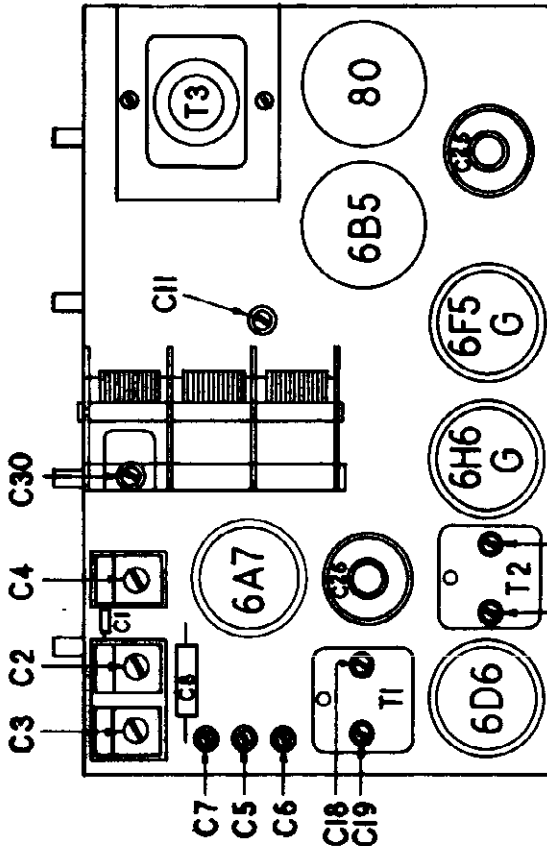
IMPORTANT ALIGNMENT NOTES

* Before attempting to align the receiver check to see that the dial pointer coincides with the horizontal dividing line of the scale when the gang condenser is in full mesh, and adjust if necessary.

After adjusting the I.F. trimmers C18, C19, C20 and C21, go back and repeat the adjustment, since the setting of each trimmer will have some effect on the others.

** When aligning the broadcast band at 600 KC. it is necessary to adjust trimmer C11 while slowly rocking the gang condenser through a small distance. Rocking the gang is essential if maximum sensitivity is to be obtained.

*** When aligning the short wave bands, care should be observed in adjusting trimmers C6 and C5, since, two possible adjustments of these trimmers will result in signal peaks. The proper peak is that which occurs with the trimmer screw farthest out.



SEARS-ROEBUCK & CO.

MODEL S 4414, 4415, 4500
4505, 4506
Schematic, Socket, Chassis
Alignment

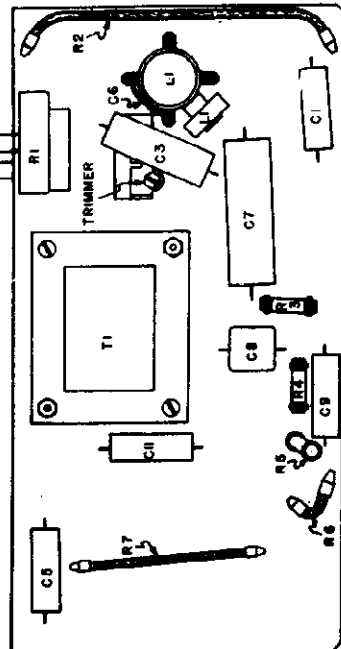
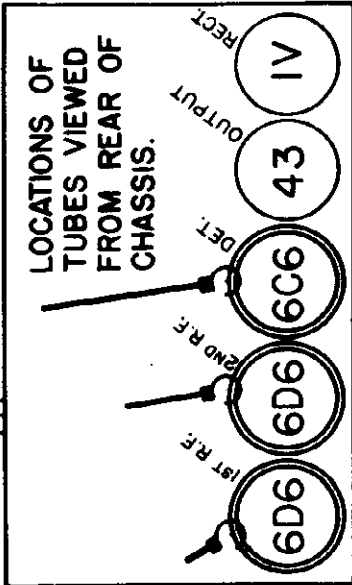
May 15, 1936

LOUD SPEAKER:

Type ----- Dynamic
Size ----- 5"
Field Coil Resistance ----- 1750 ohms
Field Coil Voltage Drop App. 120 volts

POWER OUTPUT:

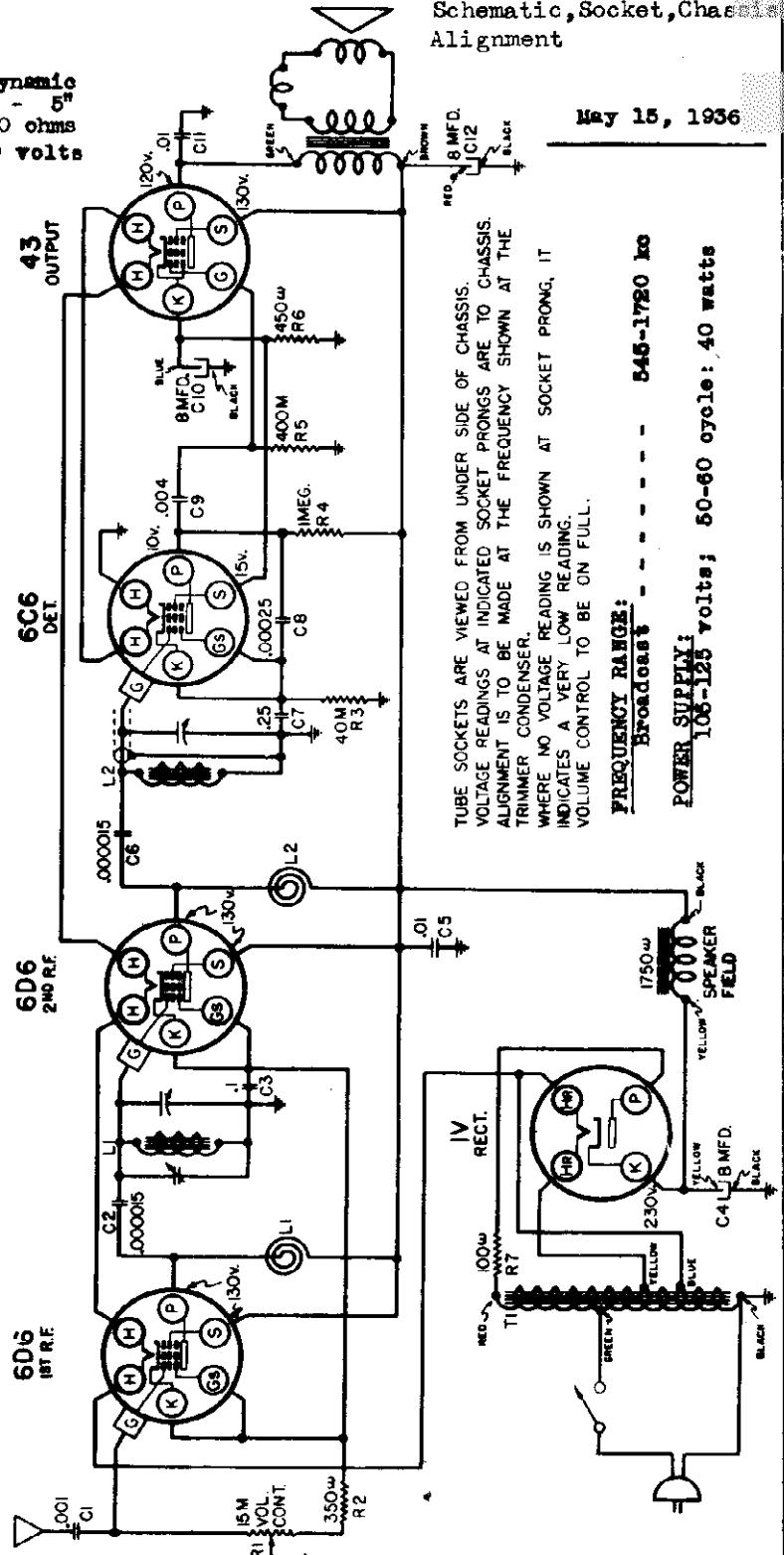
Type ----- Single Pentode
Undistorted ----- .98 watts
Maximum ----- 1.64 watts



C4, C6, C7, & L1 ARE MOUNTED ON TOP OF CHASSIS.

ARRANGEMENT OF TUBES

LOCATIONS OF PARTS UNDER CHASSIS



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT THE TRIMMER CONDENSER. WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES A VERY LOW READING. VOLUME CONTROL TO BE ON FULL.

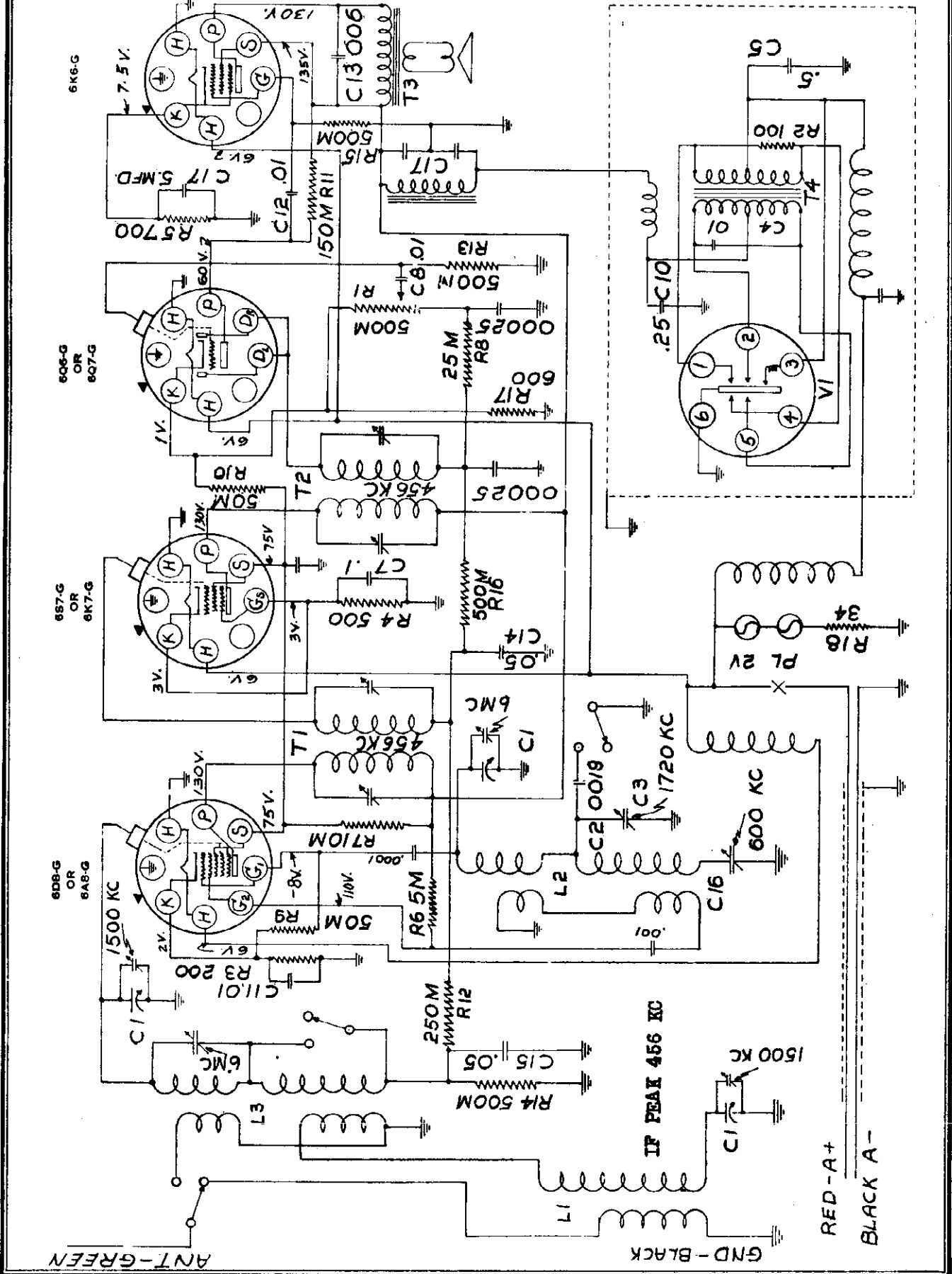
FREQUENCY RANGE: Broadcast ----- 545-1750 kc
POWER SUPPLY: 105-125 volts; 50-60 cycle; 40 watts

ALIGNMENT: Tune in a 1400 kc sig. & adjust trimmer for max. response. Vol. Cont. setting is reduced to give a low vol. level. Rock var. cond. a degree or two during adjustment. Trimmer is accessible when chassis is in cabinet, thru a hole in plate at bottom of cab. An insulated screw driver should be used. **CAUTION:** An auto-transf. is used instead of the usual power transf. having separate primary & secondary windings. The chassis may be above gnd. potential and care must thus be taken NOT to allow any grounded object to come in contact with the chassis while it is plugged into the line. The chassis is insulated from cabinet metal bottom cover with rubber grommets.

MODELS 4418, 4421, 4430
4434, 4521

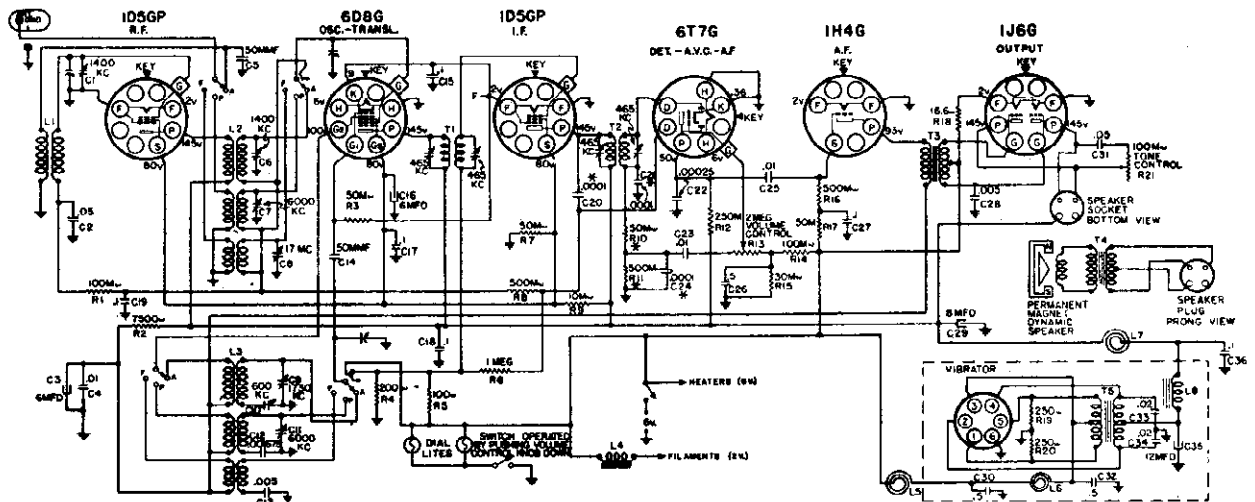
SEARS-ROEBUCK & CO.

Schematic, Voltage Alignment



SEARS-ROEBUCK & CO.

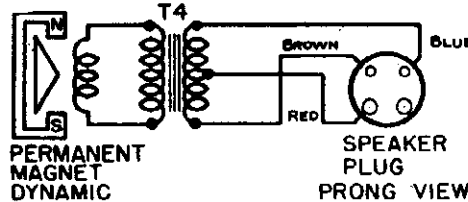
MODELS 4419, 4459, 4519, 4559

Schematic, Spkr. Wiring
Interference Elimination

* PART OF T2 ASSEMBLY

January 27, 1937

IF PEAK 465 KC

PERMANENT
MAGNET
DYNAMICSPEAKER
PLUG
PRONG VIEW

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE
TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT
INDICATES A VERY LOW READING.
FIGURES AT CATHODES INDICATE CATHODE CURRENT IN MILLIAMPERES

ELIMINATING WHISTLE AT 930 KC:

A whistle, due to a beat between the second harmonic (930 kc) of the 465 kc IF, and a 930 kc signal may be experienced. In localities where the 930 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the IF frequency of the receiver.

Determine at what point between 900 kc and 960 kc the whistle will be least objectionable. Dividing this frequency by two will give the new IF frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 915 kc would not be objectionable, the IF should be realigned at $915/2$ or 457.5 kc.

Align the IF at the new frequency and then realign the rest of the receiver as described under, "ALIGNMENT PROCEDURE".

SET DEAD AT 2 MC ON BAND "F":

In original production receivers the 50M ohm resistor, R3, was connected to ground. In later production chassis, rubber stamped with the letter, "A", or a subsequent letter, the resistor connection was made to the cathode of the 6D8G tube. This prevents failure to oscillate at 2 mc on the Police Band with certain 6D8G tubes. Trouble of this sort in the field with earlier production receivers can be corrected by changing the oscillator tube or preferably by changing the connection of R3 to the cathode of the 6D8G tube.

WAVE-TRAP TO ELIMINATE INTERFERENCE FROM SHIP OR AIRPORT TRANSMITTERS:

In locations near ship transmitters or airports or air beacon stations, code interference may be experienced. Part #1013114256 wave-trap is designed to eliminate such interference.

Mount the trap, by means of two wood screws, at any convenient place on the chassis shelf or cabinet where it will be near the antenna terminal of the receiver. Connect the yellow lead of the wave-trap to the antenna downlead. Connect the green lead of the wave-trap to the antenna terminal of the receiver. Cut off any excess length of green wire from the trap so that the green lead from the wave-trap to the chassis is as short as possible. The yellow lead from the wave-trap should be run so that it is as far as possible from the green lead. Connect one of the black leads from the wave-trap to the ground terminal of the receiver. Connect the other wave-trap black lead to the ground used for the installation.

The trap is pre-tuned to the IF frequency so that normally no further adjustment is necessary. However, should interference still be experienced, tune the receiver between approximately 550 and 600 kc. Then adjust the wave-trap, by means of the trimmer screw at the bottom of the container, until the interference is eliminated. Addition of the trap will reduce the sensitivity of the receiver around 600 kc by approximately 50%. The customer should be forewarned of this to avoid complaints of reduced sensitivity.

MODELS 4419, 4459, 4519, 4559

Socket, Trimmers, Chassis Alignment, Sensitivity

SEARS-ROEBUCK & CO.

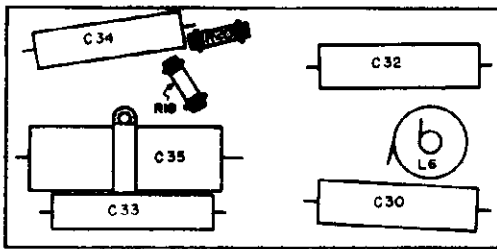
POWER OUTPUT: Type	WAVE BAND SWITCH POSITION	POSITION OF DIAL POINTER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Undistorted	"A"	Closed	465 kc	.1 mfd.	6D8G Grid	T2, T1	IF	6300
Maximum	"A"	Open	1730 kc	.0002 mfd.	Ant. Term.	C9	Oscillator	30
	"A"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C6, C1	Transl., Ant.	8
	"A"	600 kc (rock)	600 kc	.0002 mfd.	Ant. Term.	C10	Padder	15
	"P"	6 mc	6 mc	400 ohms	Ant. Term.	C11, C7 *	Osc., Transl.	30
	"P"	2.2 mc	2.2 mc	400 ohms	Ant. Term.	-	-	150
	"P"	17 mc	17 mc	400 ohms	Ant. Term.	**	-	-
	"F"	17 mc (rock)	17 mc	400 ohms	Ant. Term.	C8	Translator	30
	"F"	7 mc	7 mc	400 ohms	Ant. Term.	-	-	200

IMPORTANT ALIGNMENT NOTES

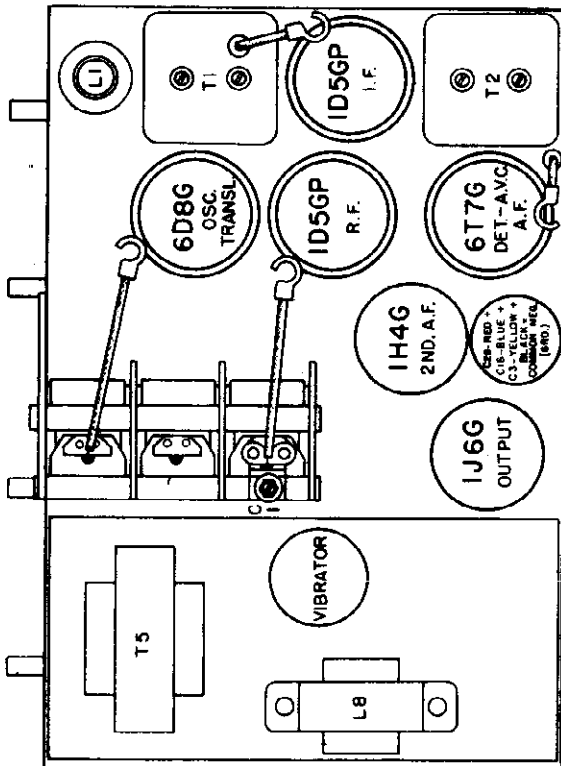
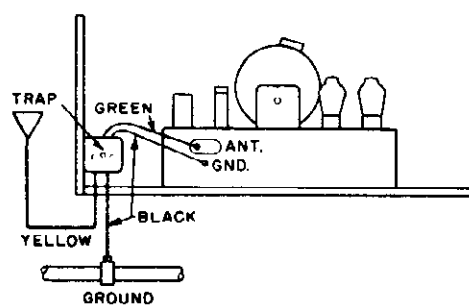
* When adjusting C11 two peaks may be found. The one in which the trimmer is screwed further out (lesser capacity) is the correct one.

** Twist or untwist the twisted leads on the wave switch until the 17 mc calibration is correct.

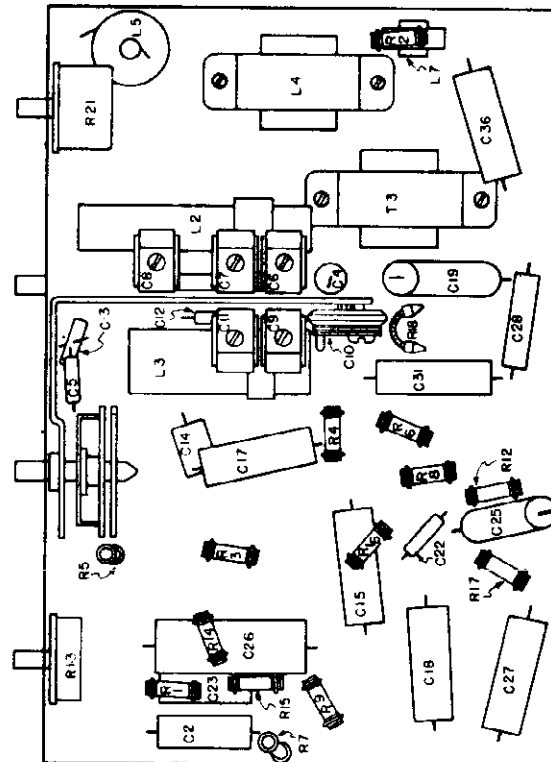
POWER OUTPUT:
Type
Undistorted
Maximum



LOCATIONS OF PARTS IN BOTTOM OF POWER SUPPLY HOUSING



LOCATIONS OF PARTS ON TOP OF CHASSIS



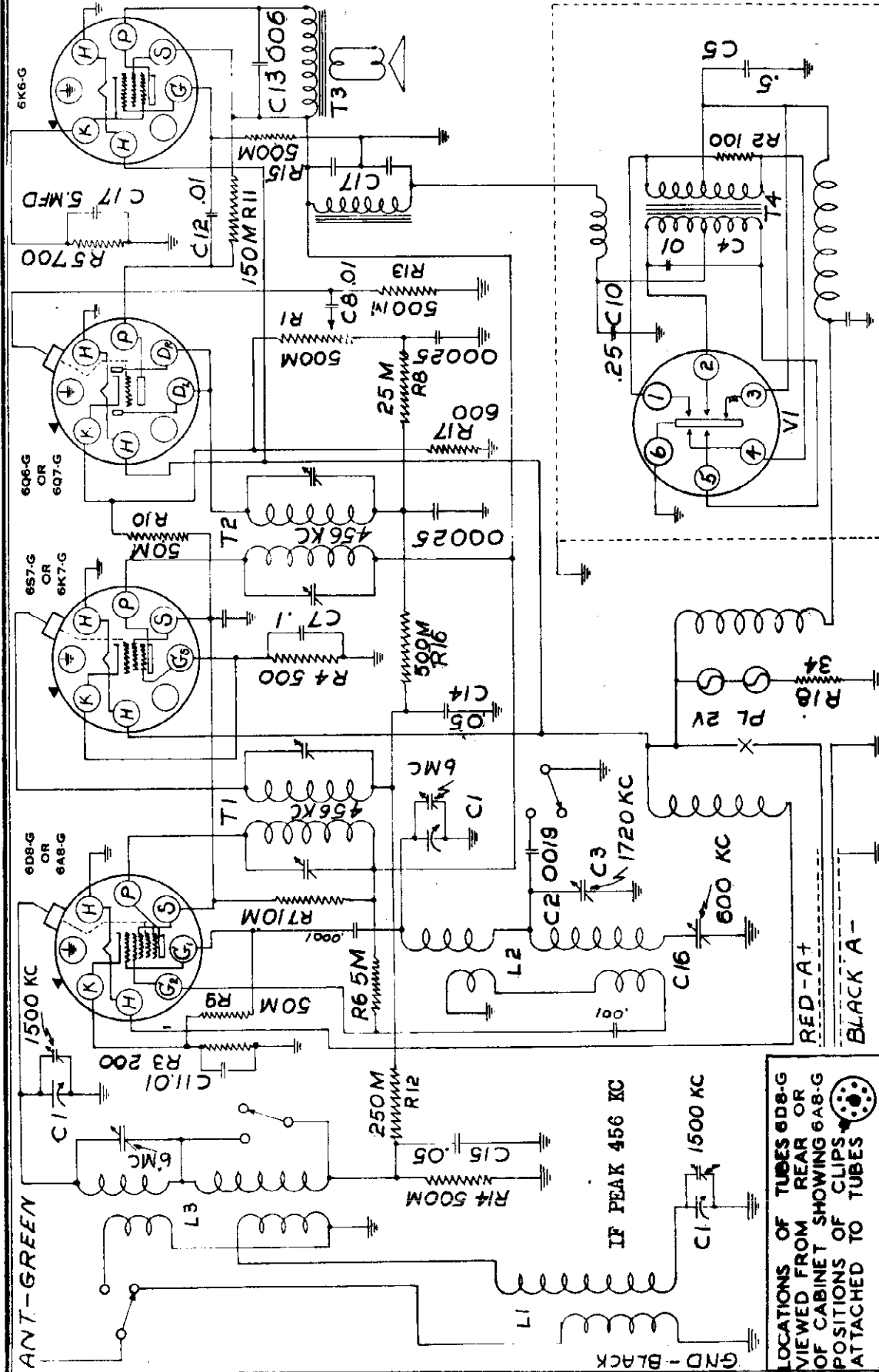
LOCATIONS OF PARTS UNDER CHASSIS

Schematic, Socket

SEARS-ROEBUCK & CO.

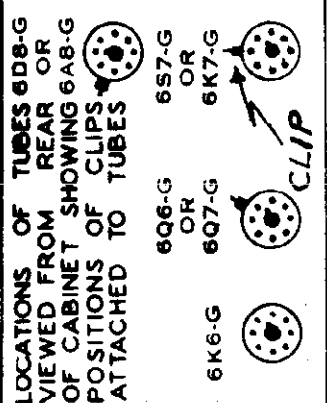
MODELS 4421, 4434, 4521

Chassis 104127



DATE: - Oct. 25, 1936 IF PEAKED AT 456 KC

Before connecting this receiver, be sure that the power supply to be used is of proper voltage; that is, 6 volts, direct current. It is recommended that a standard six volt storage battery is used for this purpose. It is important, however, to make sure that the red wire of the battery cable is connected to the Positive (+) terminal of the storage battery and the black wire connected to the Negative (-) terminal.



MODELS 4421, 4434, 4521
Alignment, Voltage

SEARS-ROEBUCK & CO.

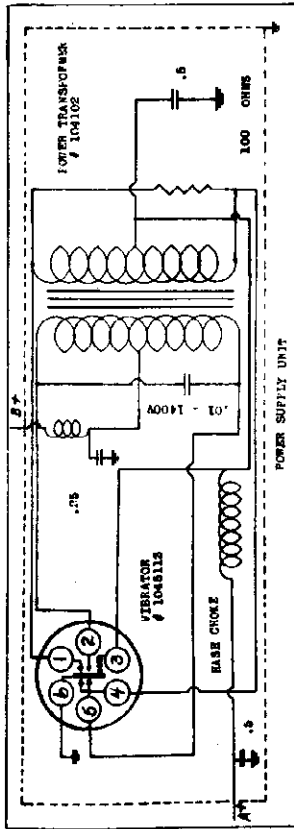


Fig. 3.

ELECTRICAL SPECIFICATIONS

- TUBE COMPLEMENT**
 1 6D6G (6A6G) 1st Det. & Osc. 1 6Q6G (6Q7G) 2nd Det.--AVC-Audio
 1 6S7G (6X7G) I.F. Amp. 1 6K6G PWR Output
- POWER SUPPLY**
 Standard Six Volt Storage Battery
- FREQUENCY RANGES**
 Band A 540-1720 KC. 1720-1500 800 KC.
 Band PF 2.1-7 MC. 6 MC.
- INTERMEDIATE FREQUENCY** 456 KC.

- POWER OUTPUT**
 Type Class A
 Maximum 1.06 Watts
 Speaker P.M. Dynamic
 Size 6 inch

VOLTAGE CHART

All voltages measured from chassis to socket terminals. Use 1000 ohm per volt voltmeter.

TUBE	PRIO 1A	72	75	76	77	78
6D6-G	0	0	130	75	76	110
6S7-G	0	0	130	76	3	6
6K6-G	0	0	90		6	1
6X4-G	0	0	130	135	0	7.5

ALIGNMENT PROCEDURE

PRELIMINARY

Output meter connections Across voice coil leads
 Output meter to indicate 50 mV. 7.5 Volt
 Average sensitivity in microvolts for 50 mV. output See chart below

Generator ground connection Receiver Chassis
 Dummy ant. in series with generator output See chart below
 Connection of generator output lead See chart below
 Generator modulation 30%; 400 cycles

Position of volume control Maximum

BAND SWITCH	POSITION OF DIAL	GENERATOR FREQUENCY	DUMMY ANTENNA CONNECTION	GENERATOR LEAD	TRIMMERS ADJUSTED IN ORDER SHOWN	MV
BAND A	540 KC	456 KC	.1 MFD	6D6-G GRID		80
BAND PF	6 MC	6 MC	.400 ohm	Ant. LEAD	Trimmer on Var.Osc.Sec.	
BAND PF	6 MC	6 MC	.400 ohm	Ant. LEAD	Trimmer on Coil L2	40
BAND A	1720 KC	1720 KC	.00025	Ant. LEAD C3		
BAND A	500 KC	600 KC	.00025	Ant. LEAD C-16		25
BAND A	1500 KC	1500 KC	.00025	Ant. LEAD	Trimmer on variable Trimmer on variable	25

Align Short Wave Before Broadcast band as indicated in chart.

IMPORTANT ALIGNMENT NOTES

Before attempting to align the receiver, check to see that the dial pointer coincides with the horizontal dividing line of the scale when the gang condenser is in full mesh.

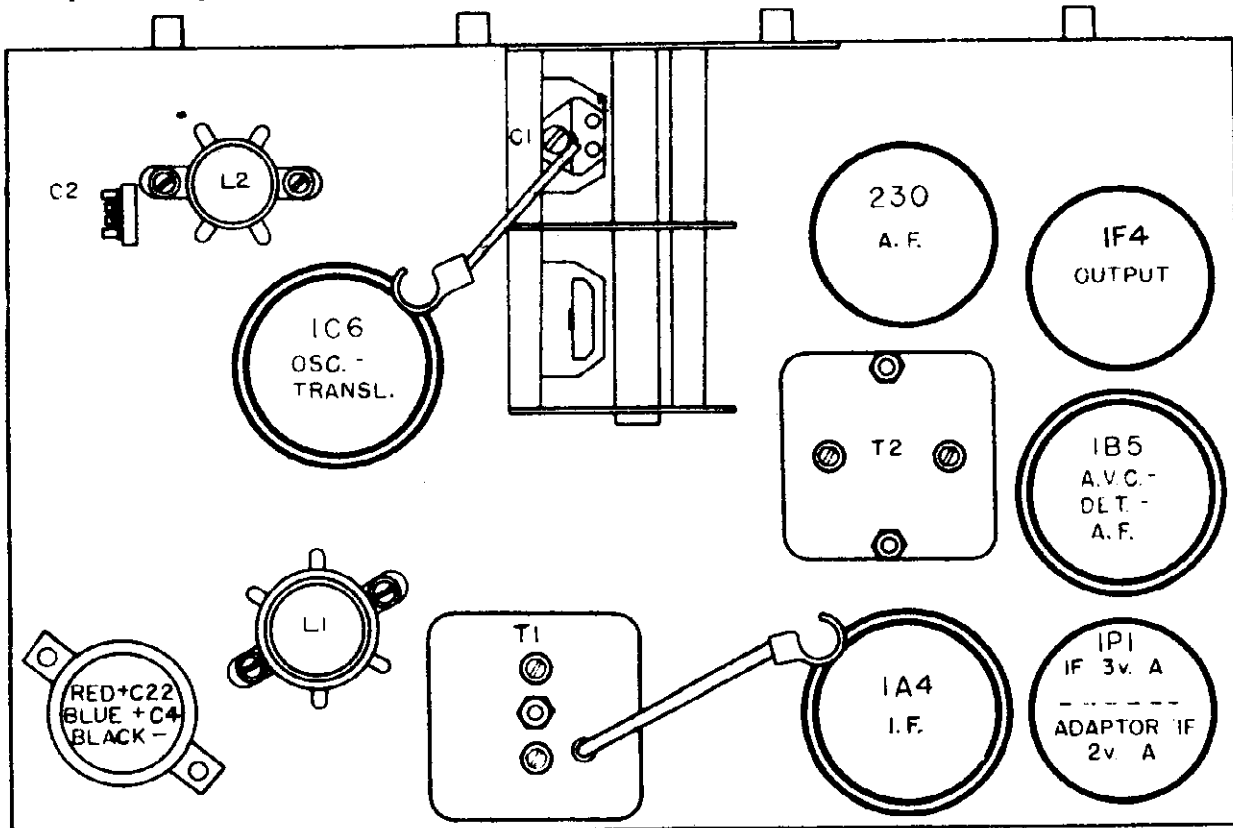
After adjusting the I.F. trimmers, go back and repeat the adjustment, since the setting of each trimmer will have some effect on the others.

When aligning the broadcast band at 600 KC. it is necessary to adjust trimmer C-16 while slowly rocking the gang condenser through a small distance. Rocking the gang is essential if max. sensitivity is to be obtained.

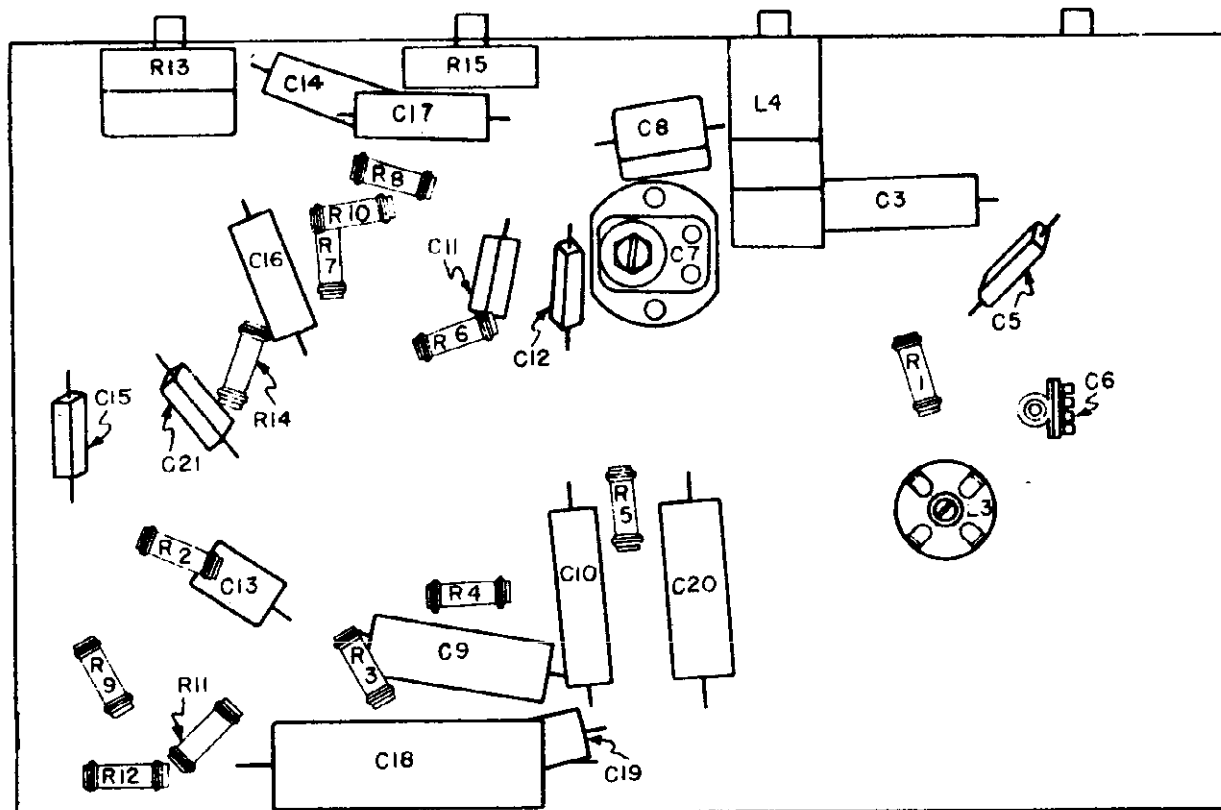
When aligning the short wave band, care should be taken in adjusting the oscillator trimmer on the variable condenser, since two possible adjustments of these trimmers will result in signal peaks. The proper peak is that which occurs with the trimmer screw farthest out.

MODELS 4422, 4423, 4524A
4532, 4542A
Socket, Trimmers, Chassis

SEARS-ROEBUCK & CO.



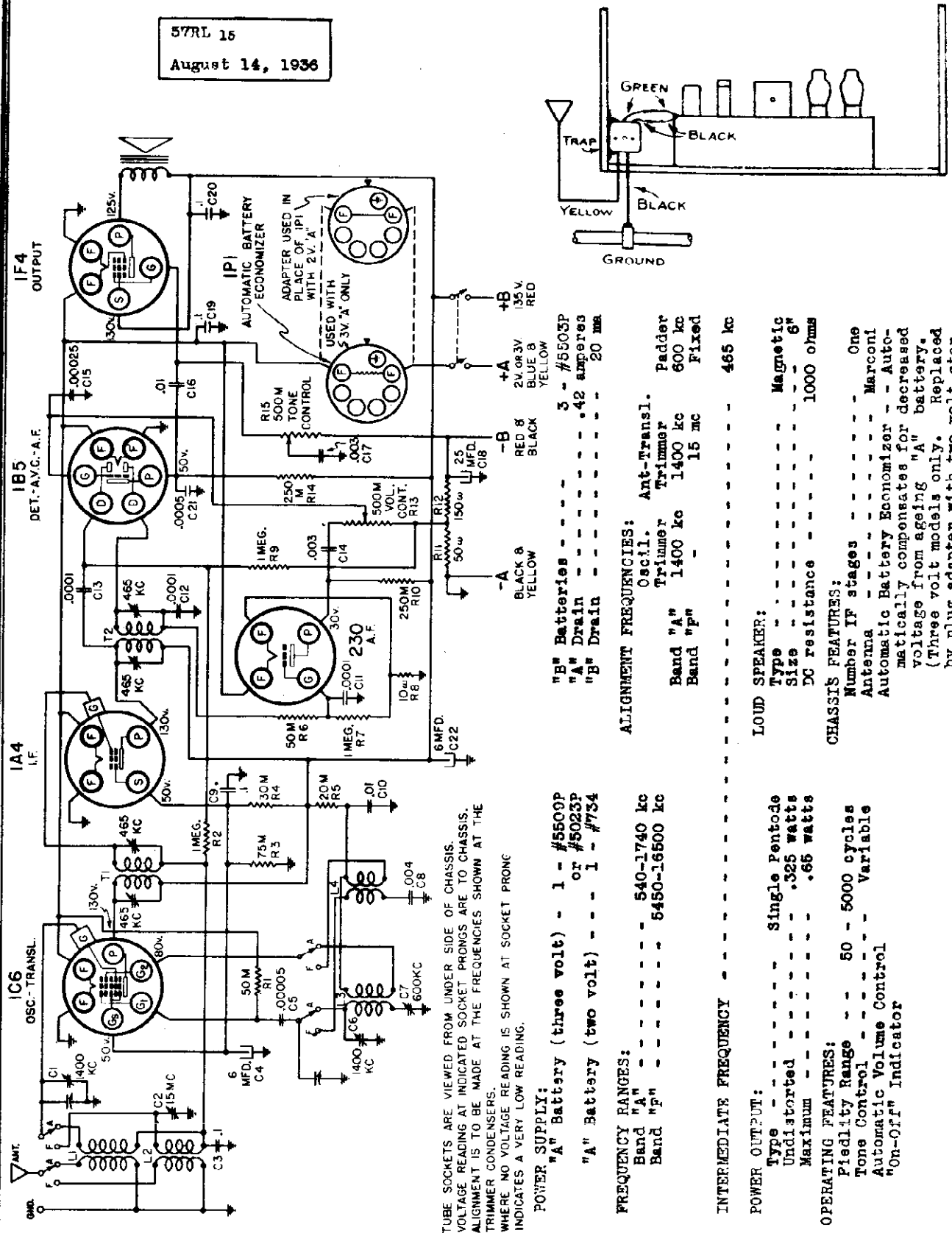
LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS

SEARS-ROEBUCK & CO.

57RL 15
August 14, 1936



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READING AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS. WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG INDICATES A VERY LOW READING.

- POWER SUPPLY:
 "A" Battery (three volt) - 1 - #5500P
 "A" Battery (two volt) - 1 - #734
- FREQUENCY RANGES:
 Band "A" - 540-1740 kc
 Band "B" - 5450-16500 kc

- ALIGNMENT FREQUENCIES:
 Oscil. - Ant-Transl.
 Trimmer - Trimmer
 Band "A" - 1400 kc
 Band "B" - 15 mc
- "B" Batteries - 3 - #5500P
 "A" Drain - .42 amperes
 "B" Drain - 20 ma

- INTERMEDIATE FREQUENCY - 465 kc
- POWER OUTPUT:
 Type - Single Pentode
 Undistorted - .325 watts
 Maximum - .65 watts
- OPERATING FEATURES:
 Fidelity Range - 50 - 5000 cycles
 Tone Control - Variable
 Automatic Volume Control
 "On-Off" Indicator

- LOUD SPEAKER:
 Type - Magnetic
 Size - 6"
 DC resistance - 1000 ohms
- CHASSIS FEATURES:
 Number If stages - One
 Antenna - Marconi
 Automatic Battery Economizer - Auto-
 matically compensates for decreased
 voltage from ageing "A" battery.
 (Three volt models only. Replaced
 by plug adapter with two volt stor-
 -"")

MODELS 4422, 4423, 4524A

4532, 4542A

SEARS-ROEBUCK & CO.

Alignment, Sensitivity
Interference Elimination

PRELIMINARY:

- Output meter connection - - - - - 4000 ohm meter, in series with a .5 mfd. condenser, across speaker terminals.
- Output meter reading to indicate 50 milliwatts - - - - - 8.5 volts
- Generator ground lead connection - - - - - Receiver chassis
- Dummy antenna value to be in series with generator output - - - - - See chart below
- Connection of generator output lead - - - - - See chart below
- Generator modulation - - - - - 50%, 400 cycles
- Approximate average sensitivity in microvolts for 50 milliwatts output - - - See chart below
- Position of volume control - - - - - Fully clockwise
- Position of tone control - - - - - Fully clockwise
- Position of dial pointer - - - - - Along center line of dial with variable fully meshed.

WAVE BAND SWITCH POSITION	POSITION OF DIAL POINTER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTED (IN ORDER SHOWN)	MICROVOLTS
"A"	1000 kc	465 kc	.1 mfd.	1A4 Grid	T2	-
"A"	1000 kc	465 kc	.1 mfd.	1C6 Grid	T1	-
"A"	1400 kc	1400 kc	.0002 mfd.	Antenna Lead	C6, C1	15
"A"	600 kc (rock)	600 kc	.0002 mfd.	Antenna Lead	C7	15
"F"	15 mc (rock)	15 mc	400 ohms	Antenna Lead	C2	15
"F"	6 mc	6 mc	400 ohms	Antenna Lead	-	80

IMPORTANT ALIGNMENT NOTES

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The figures given in the "Microvolts" column are only approximate.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

After the alignment procedure has been completed, tune in a broadcast station at about 900 kc and, if necessary, shift the dial pointer to the station's frequency marking on the dial.

ELIMINATING WHISTLE AT 930 KC:

A whistle, due to a beat between the second harmonic (930 kc) of the 465 kc IF, and a 930 kc signal may be experienced. In localities where the 930 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the IF frequency of the receiver.

Determine at what point between 900 kc and 960 kc the whistle will be least objectionable. Dividing this frequency by two will give the new IF frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 915 kc would not be objectionable, the IF should be realigned at 915/2 or 457.5 kc.

Align the IF at the new frequency and then realign the rest of the receiver as described under, "ALIGNMENT PROCEDURE".

WAVE-TRAP TO ELIMINATE INTERFERENCE FROM SHIP OR AIRPORT TRANSMITTERS:

In locations near ship transmitters or airports or air beacon stations, code interference may be experienced. Part #1013114256 wave-trap is designed to eliminate such interference.

Mount the trap, by means of two wood screws, at any convenient place on the chassis shelf or cabinet where it will be near the antenna terminal of the receiver. Connect the yellow lead of the wave-trap to the antenna downlead. Splice the green lead of the wave-trap to the green antenna lead of the receiver. Cut off any excess length of wire from the trap and from the chassis antenna lead so that the green lead from the wave-trap to the chassis is as short as possible. The yellow lead from the wave-trap should be run so that it is as far as possible from the green lead. Splice one of the black leads from the wave-trap to the black ground lead of the receiver. Connect the other wave-trap black lead to the ground used for the installation.

The trap is pre-tuned to the IF frequency so that normally no further adjustment is necessary. However, should interference still be experienced, tune the receiver between approximately 550 and 600 kc. Then adjust the wave-trap, by means of the trimmer screw at the bottom of the container, until the interference is eliminated. Addition of the trap will reduce the sensitivity of the receiver around 600 kc by approximately 50%. The customer should be forewarned of this to avoid complaints of reduced sensitivity.

MODELS 4426, 4427, 4446
4447, 4526, 4546

SEARS-ROEBUCK & CO

MODELS 4426A, 4526A, 454
Schematics, Voltage

POWER SUPPLY:

"A" Battery (three volt) - 1 - #5502P
"A" Battery (two volt) - 1 - #5011
"B" Batteries - 3 - #5131P

"A" Drain - - - - - 74 amperes
"B" Drain - - - - - 31 ma

INTERMEDIATE FREQUENCY

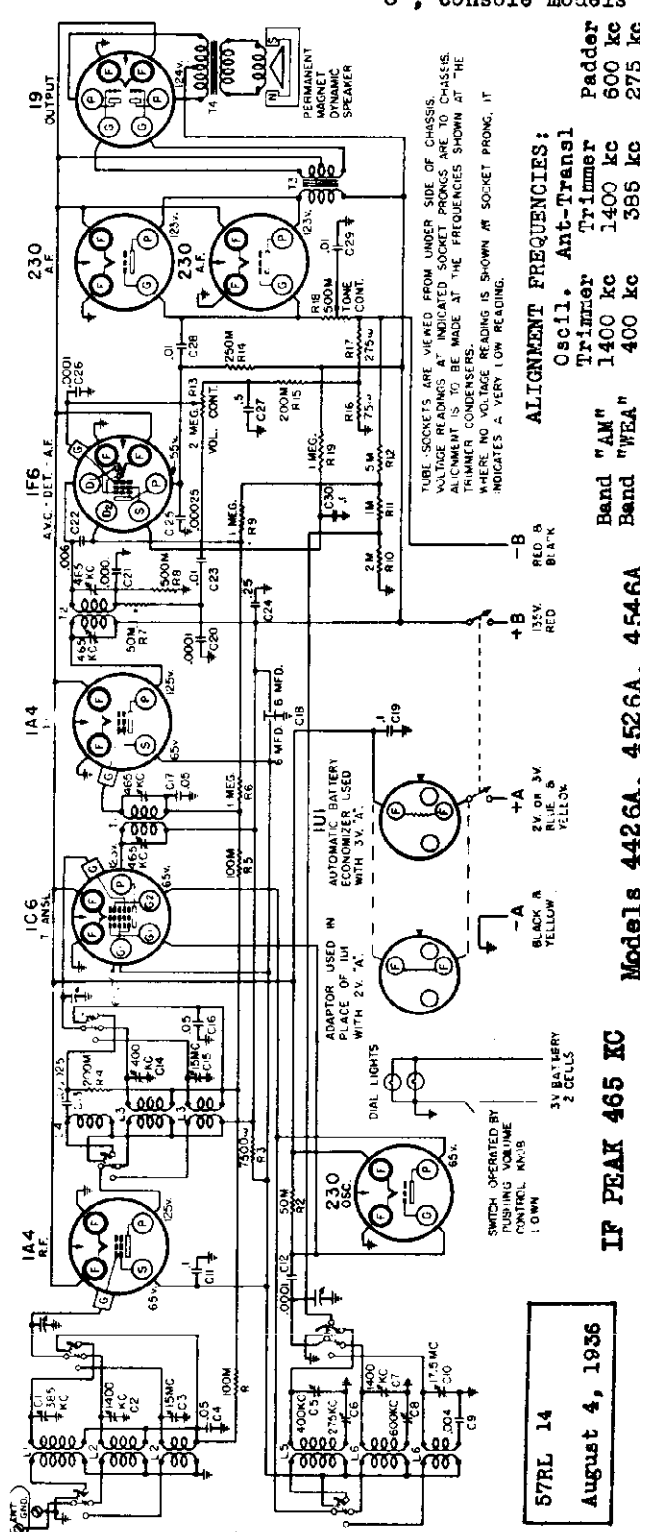
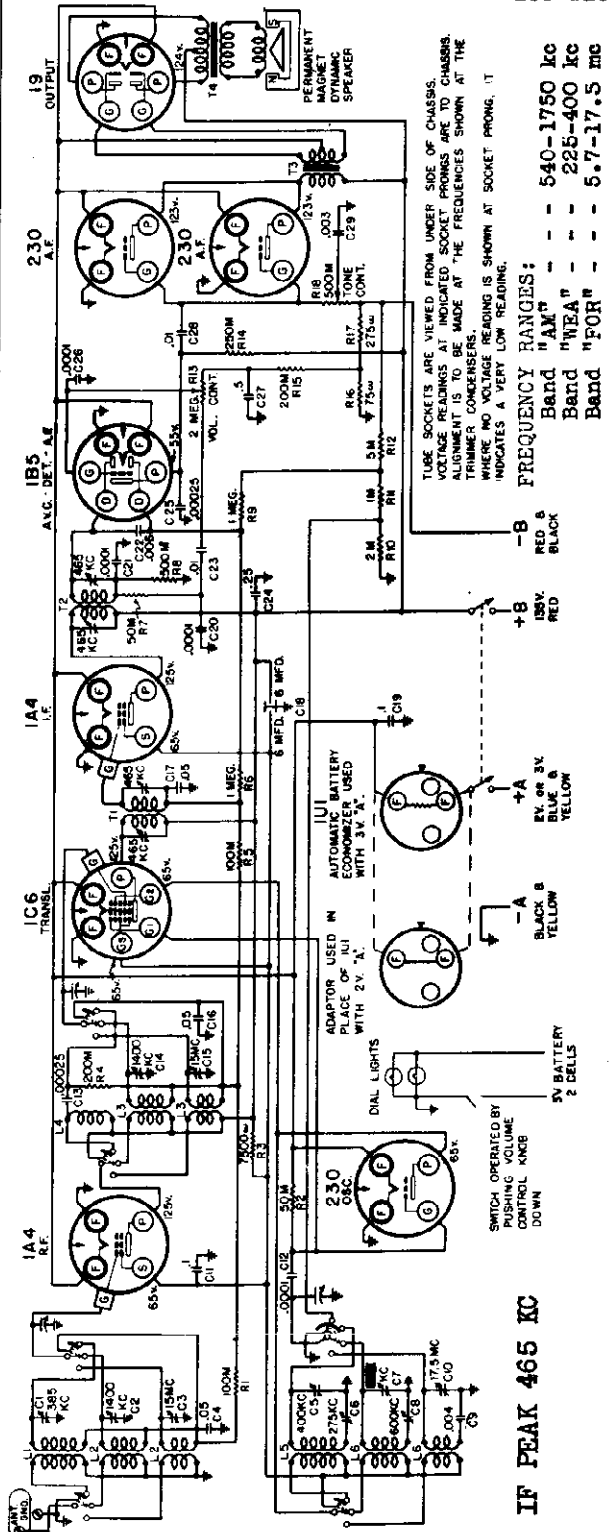
465 kc

POWER OUTPUT:

Type - - - - - Class "B"
Undistorted - - - - - 1 watt
Maximum - - - - - 1.0 watt

LOUD SPEAKER:

Type - - - - - Permanent Magnet Dynamic
Size - - - - - 6" table models;
8" console models



Models 4426, 4427, 4446, 4447, 4526, 4546

Models 4426A, 4526A, 454

57RL 14
August 4, 1936

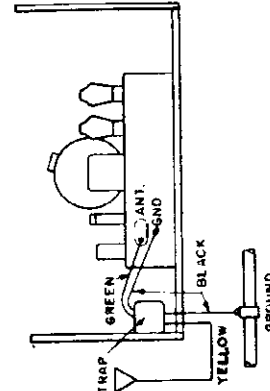
MODELS 4426, 4427, 4446
 4447, 4526, 4546
 MODELS 4426A, 4526A, 4546A.
 Alignment, Sensitivity
 Interference Elimination

SEARS-ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection ----- Across speaker voice coil
 Output meter reading to indicate 50 milliwatts ----- .34 volts
 Average sensitivity in microvolts for 50 milliwatts output ----- See chart below
 Generator ground lead connection ----- Receiver chassis
 Dummy antenna value to be in series with generator output ----- See chart below
 Connection of generator output lead ----- See chart below
 Generator modulation ----- 30%, 400 cycles
 Position of volume control ----- Fully on
 Position of tone control ----- Fully clockwise
 Position of dial pointer ----- To fall on second line from left, of ornamental lines running from the center of the dial to the band markings, when variable is fully meshed.



WAVE BAND SWITCH	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	MICROVOLTS
"A"	600 kc	465 kc	.1 mfd.	L44 IF Grid	T2	-
"A"	600 kc	465 kc	.1 mfd.	1C6 Grid	T1	-
"A"	1400 kc	1400 kc	.0002 mfd.	Antenna Terminal	C7, C2, C14	6
"A"	600 kc (rock)	600 kc	.0002 mfd.	Antenna Terminal	C8	15
"W"	400 kc	400 kc	.0002 mfd.	Antenna Terminal	C5	30
"W"	385 kc	385 kc	.0002 mfd.	Antenna Terminal	C1	30
"W"	275 kc (rock)	275 kc	.0002 mfd.	Antenna Terminal	C6	50
"P"	17.5 mc	17.5 mc	400 ohms	Antenna Terminal	C10	10
"P"	15 mc	15 mc	400 ohms	Antenna Terminal	C5, C16	5
"P"	6 mc	6 mc	400 ohms	Antenna Terminal	None	60

IMPORTANT ALIGNMENT NOTES

Values shown under, "Microvolts" are approximate.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two during the adjustment.

The alignment procedure should be repeated band by band to secure greater accuracy. In particular, the WEATHER band alignment may have to be repeated several times since the adjustments have an effect on each other.

After the alignment has been completed, check the calibration by tuning in a broadcast station at about 900 kc. Adjust the dial pointer to the station's frequency, if necessary.

Always keep the output from the signal generator at its lowest possible value.

WAVE-TRAP TO ELIMINATE INTERFERENCE FROM SHIP OR AIRPORT TRANSMITTERS:

In locations near ship transmitters or airports or air beacon stations, cede interference may be experienced. Part #101511-256 wave-trap is designed to eliminate such interference.

Mount the trap, by means of two wood screws, at any convenient place on the chassis shelf or cabinet where it will be near the antenna terminal of the receiver. Connect the yellow lead of the wave-trap to the antenna downlead. Connect the green lead of the wave-trap to the antenna terminal of the receiver. Cut off any excess length of green wire from the trap so that the green lead from the wave-trap to the chassis is as short as possible. The yellow lead from the wave-trap should be run so that it is as far as possible from the green lead. Splice one of the black leads from the wave-trap to the black ground lead of the receiver. Connect the other wave-trap black lead to the ground used for the installation.

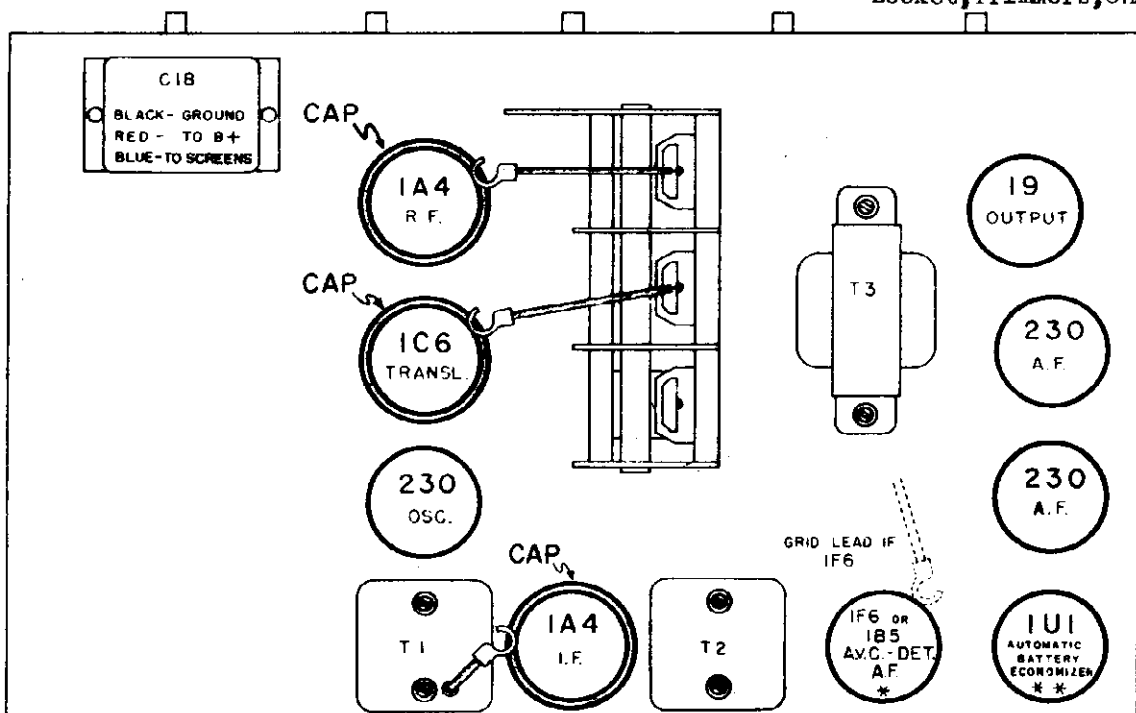
The trap is pre-tuned to the IF frequency so that normally no further adjustment is necessary. However, should interference still be experienced, tune the receiver between approximately 550 and 600 kc. Then adjust the wave-trap, by means of the trimmer screw at the bottom of the container, until the interference is eliminated. Addition of the trap will reduce the sensitivity of the receiver around 800 kc by approximately 80%. The customer should be forewarned of this to avoid complaints of reduced sensitivity.

ELIMINATING WHISTLE AT 950 KC:
 A whistle, due to a beat between the second harmonic (950 kc) of the 465 kc IF and a 950 kc signal may be experienced. In localities where the 950 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the IF frequency of the receiver. Determine at what point between 900 kc and 960 kc the whistle will be least objectionable. Dividing this frequency by two will give the new IF frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 915 kc would not be objectionable, the IF should be realigned at 915/2 or 457.5 kc.

Align the IF at the new frequency and then realign the rest of the receiver as described under, "ALIGNMENT PROCEDURE".
BATTERY REPLACEMENT:
 The dry "A" battery should be replaced when its voltage drops to 1.8 volts under load. The "B" batteries should be replaced when the voltage of the 45 volt block has dropped to 34 volts, under load.

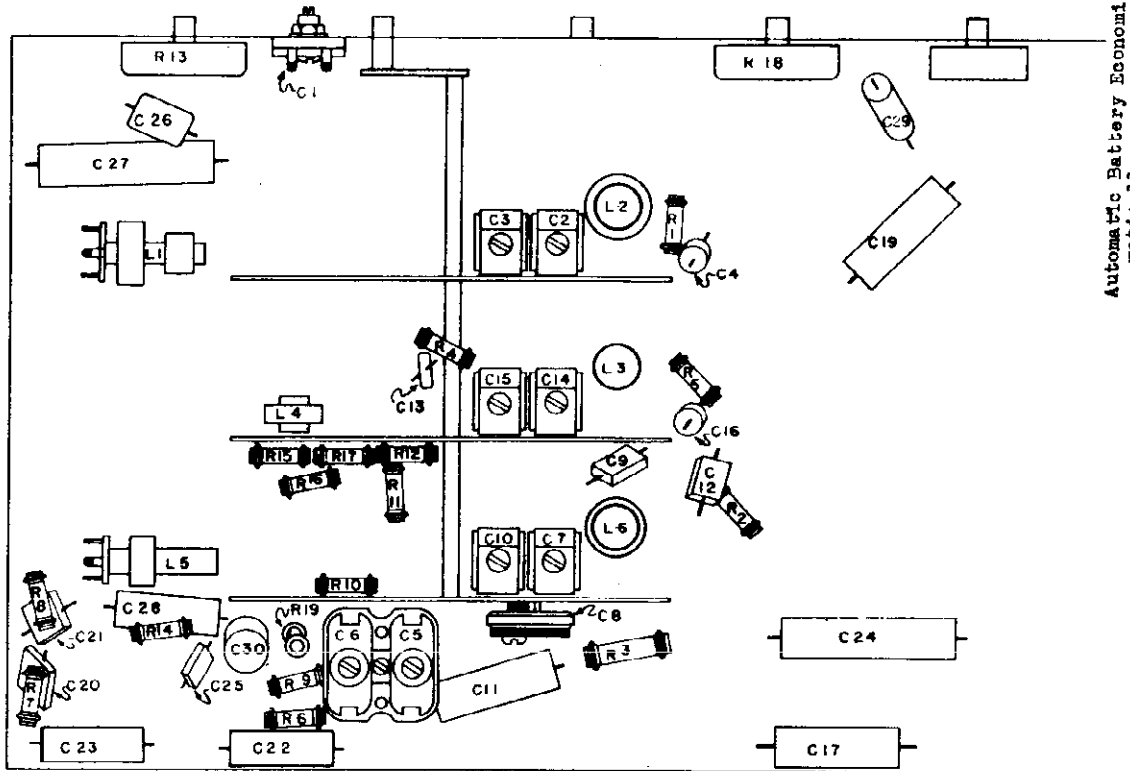
SEARS-ROEBUCK & CO.

MODELS 4426, 4427, 4446
 4447, 4526, 4546
 MODELS 4426A, 4526A, 4546A
 Socket, Trimmers, Chassis



* 1B5 used on Models 4426, 4427, 4446, 4447, 4526, 4546
 1F6 used on Models 4426A, 4526A, 4546A
 ** 1U1 used only with 3 volt dry A battery
 Replaced by adapter for 2 volt storage A

LOCATIONS OF PARTS ON TOP OF CHASSIS



* Only for Models 4526A, 4426A, 4546A

LOCATIONS OF PARTS UNDER CHASSIS

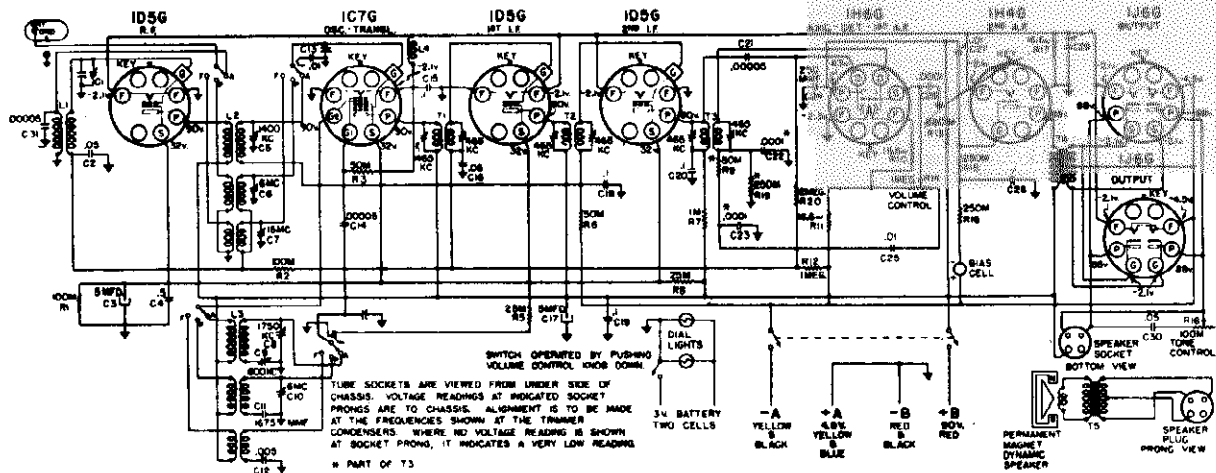
Automatic Battery Economizer - - Auto-
 matically compensates for decreased
 voltage from ageing "A" battery.
 (Three volt models only. Replaced
 by Plug adapter with two volt stor-
 age adapter.)

MODELS 4439, 4440, 4455

4456, 4539

SEARS-ROEBUCK & CO.

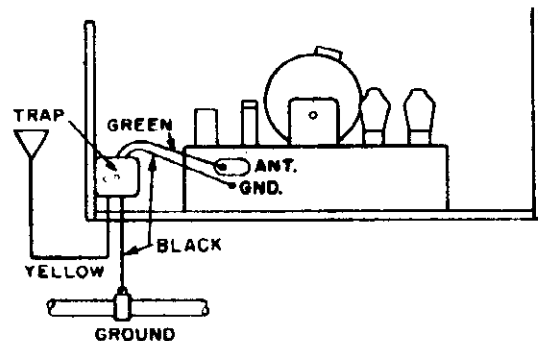
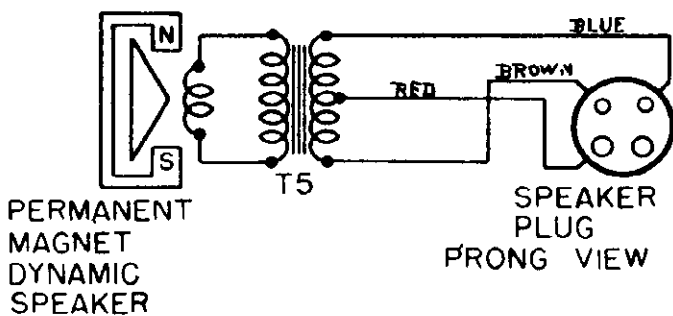
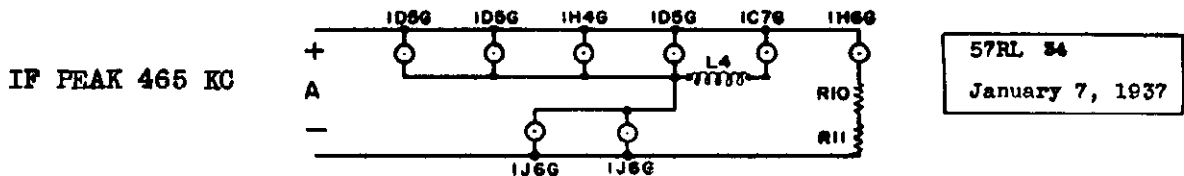
Schematic, Voltage, Data



THE FILAMENT CIRCUIT:

These models may be used with either a 4½ volt dry "A" battery or a 4 volt storage battery without requiring any changes in connections.

Since the tubes have two volt filaments and the "A" supply is four volts, the filaments are connected in a series parallel arrangement. The two 1J6G tubes are connected in parallel with each other to form one group. All of the other tubes except the 1H6G are connected in parallel to form a second group. These two groups are then connected in series across the "A" supply. The 1H6G tube is connected in series with the two resistors, R10 and R11, of 18.6 ohms each, across the "A" supply. A simplified diagram of the filament circuit is shown below.



POWER SUPPLY:

- "A" Battery (4½ volt dry) . . . 1 - #5032P
- "A" Battery (4 volt storage) . . . 1 - #5049
- "B" Batteries 2 - #5138P

- "A" Drain 0.54 amperes
- "B" Drain (no signal) 23 ma

FREQUENCY RANGES:

- Band "A" 540-1750 kc
- Band "P" 2-6.2 mc
- Band "F" 6-18 mc

ALIGNMENT FREQUENCIES:

	Oscil. Trimmer	Ant.-Transl. Trimmer	Padder
Band "A"	1750 kc	1400 kc	600 kc
Band "P"	6 mc	6 mc	Fixed
Band "F"	-	17 mc	Fixed

INTERMEDIATE FREQUENCY 465 kc

POWER OUTPUT:

- Type Parallel Class "B"
- Undistorted 0.4 watt
- Maximum 1 watt

LOUD SPEAKER:

- Type PM Dynamic
- Size 6½"

SEARS-ROEBUCK & CO.

MODELS 4439, 4440, 4455
4456, 4539
Socket, Trimmers, Chassis
Alignment, Sensitivity

ALIGNMENT PROCEDURE

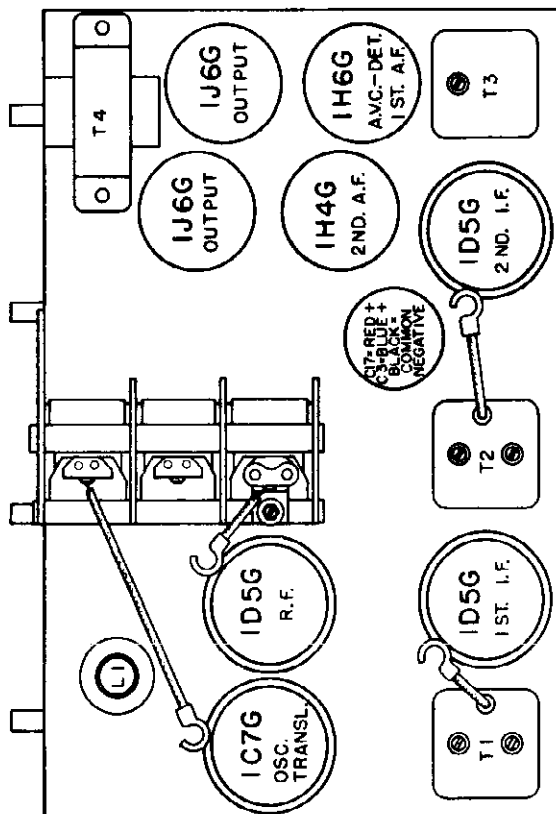
PRELIMINARY:

Output meter connection Across speaker voice coil
Output meter reading to indicate 50 milliwatts 0.35 volts
Average sensitivity in microvolts for 50 milliwatts output See chart below
Generator ground lead connection Receiver chassis
Dummy antenna value to be in series with generator output See chart below
Connection of generator output lead See chart below
Generator modulation 30%, 400 cycles
Position of Volume Control Fully on
Position of tone control Fully clockwise
Position of Dial Pointer To fall on left edge of band indicator
Blocks when variable is fully meshed.

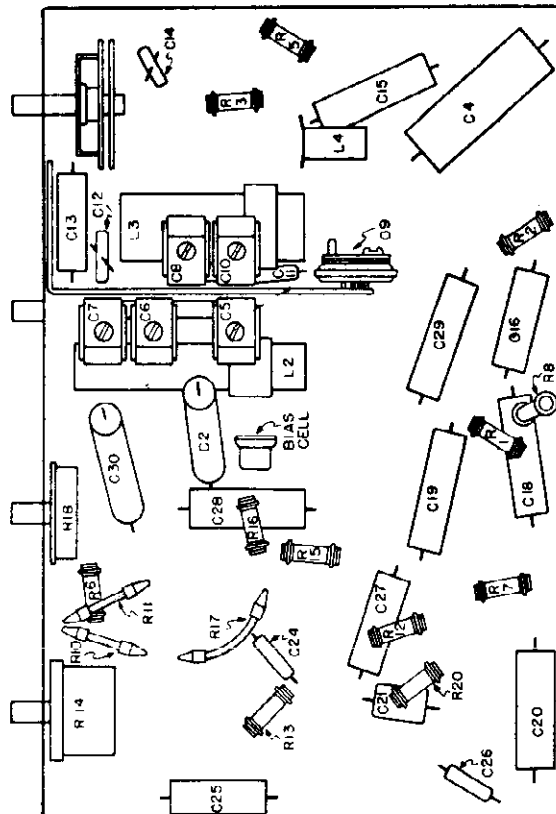
WAVE BAND SWITCH POSITION	POSITION OF DIAL POINTER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
A	550 kc	465 kc	.1 mfd.	1776 Trans-lator Grid	F3, F2, F1	IF Output, Interstage, Input	150
A	Variable Fully Open	1750 kc	.0002 mfd.	Ant. Term.	C8	Oscillator	30
A	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C5, C1	RF, Antenna	12
A	800 kc (rock)	900 kc	.0002 mfd.	Ant. Term.	C9	Sec. Pad.	12
A	540 kc	540 kc	.0002 mfd.	Ant. Term.	-	-	30
A	6 mc	6 mc	400 ohms	Ant. Term.	C10 *	Oscillator	-
A	6 mc	6 mc	400 ohms	Ant. Term.	C6	Translator	5
A	2 mc	2 mc	400 ohms	Ant. Term.	-	-	20
A	18 mc	18 mc	400 ohms	Ant. Term.	**	-	15
A	17 mc (rock)	17 mc	400 ohms	Ant. Term.	C7	Translator	6
A	6 mc	6 mc	400 ohms	Ant. Term.	-	-	25

IMPORTANT ALIGNMENT NOTES

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.
 (*) Two peaks will be found at two different settings of the trimmer. The correct one is the one in which the trimmer is screwed further out (lesser capacity).
 (**) Adjust the calibration at 18 mc by pushing the yellow lead that comes from the center section of the variable either nearer to or away from the variable.
 It is advisable to repeat the entire alignment procedure band by band and in the original order to insure greater accuracy.
 Always keep the output power from the test oscillator at its lowest possible value. This will prevent the AVC action of the receiver from interfering with accurate alignment. As the sensitivity is increased by alignment, the generator output power should be reduced correspondingly.
 Values shown under, "Microvolts", are only approximate.



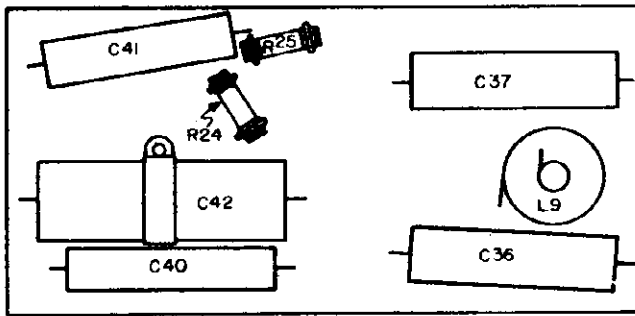
LOCATIONS OF PARTS ON TOP OF CHASSIS



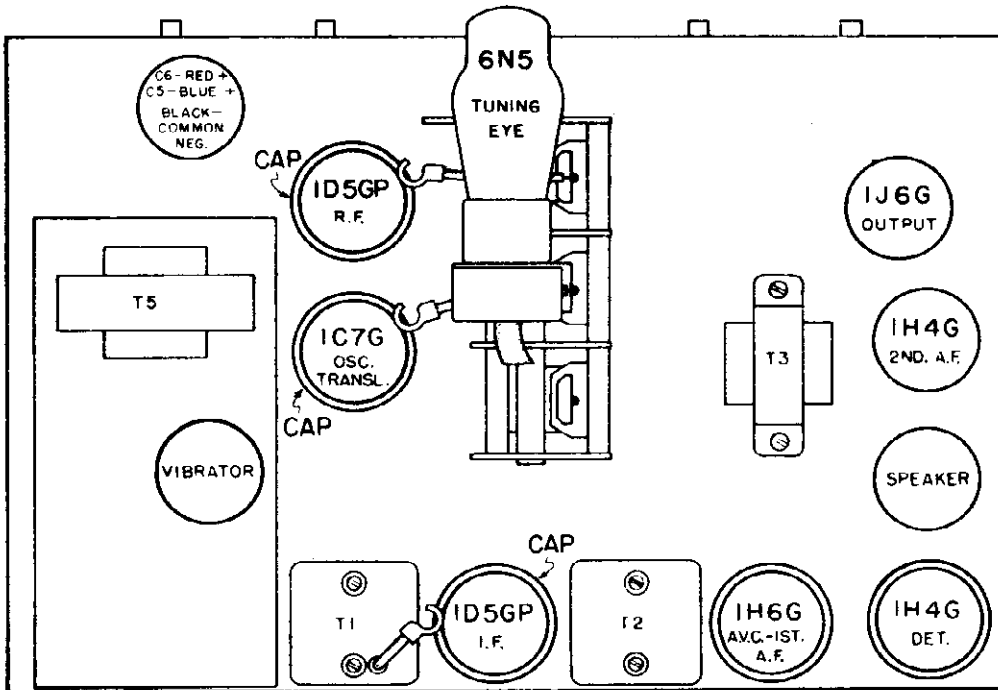
LOCATIONS OF PARTS UNDER CHASSIS

MODELS 4441, 4451
 Socket, Trimmers
 Chassis, Notes

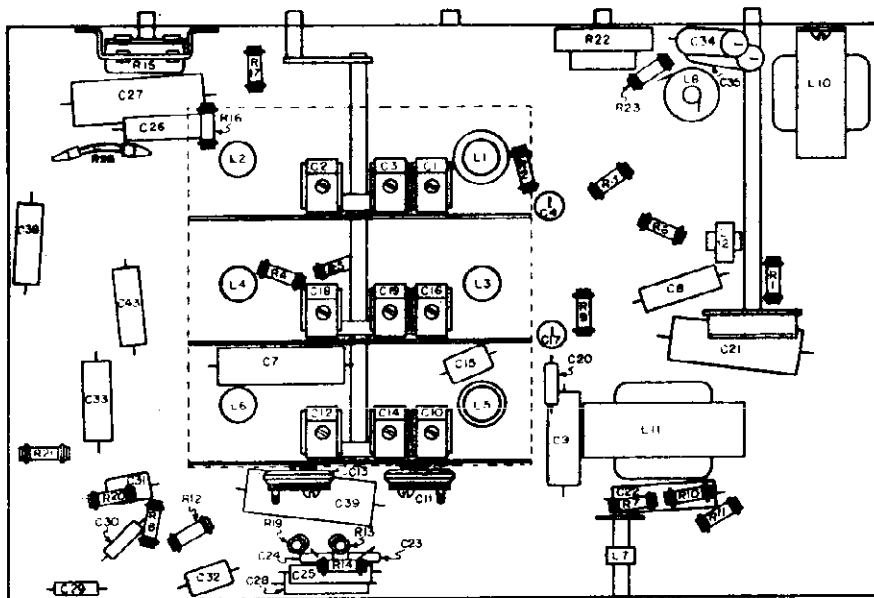
SEARS-ROEBUCK & CO.



LOCATIONS OF PARTS UNDER POWER SUPPLY UNIT



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS.

CHASSIS FEATURES:
 Number RF stages . . . One on Broadcast band
 Number IF stages One
 Number condensers in gang Three
 Antenna Conventional
 Synchronous Vibrator - Rectifier

CONTROL OPERATION:
 Turning right: Volume increase. Pushing down: Dial Light on; Tuning Eye on.
 Turning right: "AM" "POL" "FOR"
 Dual ratio: 10 to 1; 50 to 1
 Turning right: Power on; Bass to treble
 Right: sharp. Left: broad.

MECHANICAL SPECIFICATIONS

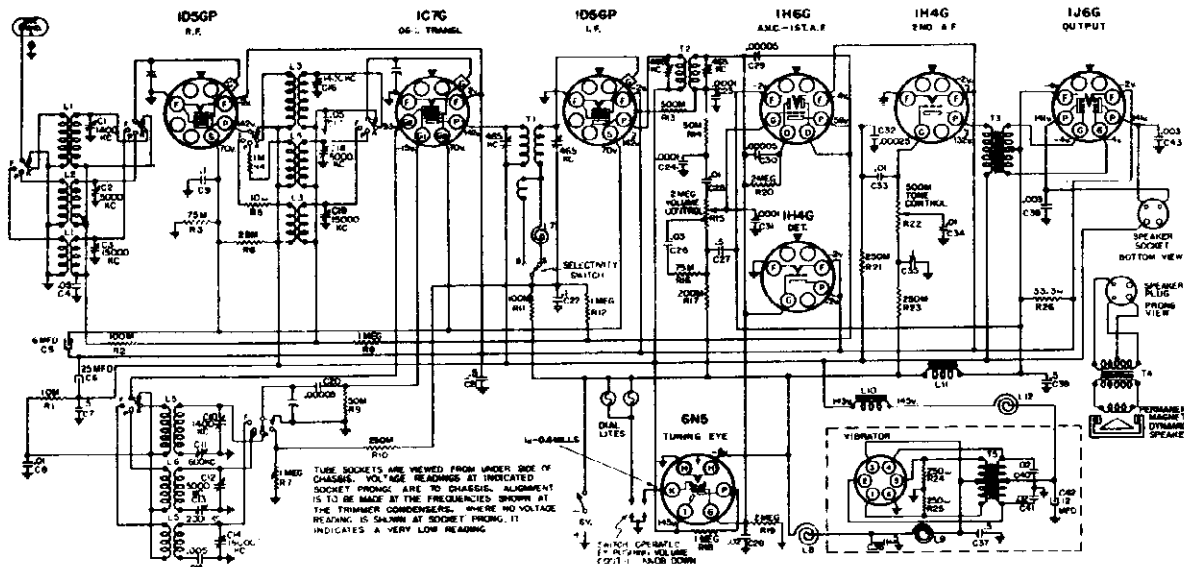
- OPERATING CONTROLS:**
1. Left knob . . . Volume Control, Dial Light Switch, Tuning Eye Switch
 2. Next to left knob, Wave Band Switch
 3. Center knob . . . Station Selector
 4. Next to right knob, "On-Off" Switch and Tone Control
 5. Right knob . . . Selectivity Switch

Alignment, Sensitivity
Interference Elimination

SEARS-ROEBUCK & CO.

MODELS 4441, 4451
Schematic, Voltage

January 28, 1937



WAVE BAND SWITCH POSITION	POSITION OF DIAL POINTER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	465 kc	.1 mfd.	1C7G Grid	T2, T1	IF	350
"AM"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C10, C16, C1	Osc., Transl., RF	40
"AM"	600 kc (rock)	600 kc	.0002 mfd.	Ant. Term.	C11	Padder	40
"POL"	5 mc	5 mc	400 ohms	Ant. Term.	C12, C18, C2	Osc., Transl., RF	45
"POL"	2 mc (rock)	2 mc	400 ohms	Ant. Term.	C13	Padder	55
"FOR"	15 mc	15 mc	400 ohms	Ant. Term.	C14, C19, C3	Osc., Transl. RF	20
"FOR"	18 mc	18 mc	400 ohms	Ant. Term.	-	-	350
"FOR"	6 mc	6 mc	400 ohms	Ant. Term.	-	-	175

IMPORTANT ALIGNMENT NOTES

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

Always keep the output from the signal generator at its lowest possible value to prevent the AVC action of the receiver from interfering with accurate alignment. As the receiver sensitivity is increased through alignment, the output from the generator should be decreased to compensate.

ELIMINATING WHISTLE AT 930 KC:

A whistle, due to a beat between the second harmonic (930 kc) of the 465 kc IF, and a 930 kc signal may be experienced. In localities where the 930 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the IF frequency of the receiver.

Determine at what point between 900 kc and 960 kc the whistle will be least objectionable. Dividing this frequency by two will give the new IF frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 915 kc would not be objectionable, the IF should be realigned at 915/2 or 457.5 kc.

Align the IF at the new frequency and then realign the rest of the receiver as described under, "ALIGNMENT PROCEDURE".

WAVE-TRAP TO ELIMINATE INTERFERENCE FROM SHIP OR AIRPORT TRANSMITTERS:

The trap is pre-tuned to the IF frequency so that normally no further adjustment is necessary. However, should interference still be experienced, tune the receiver between approximately 550 and 800 kc. Then adjust the wave-trap, by means of the trimmer screw at the bottom of the container, until the interference is eliminated. Addition of the trap will reduce the sensitivity of the receiver around 600 kc by approximately 50%. The customer should be forewarned of this to avoid complaints of reduced sensitivity.

MODELS 4450, 4550

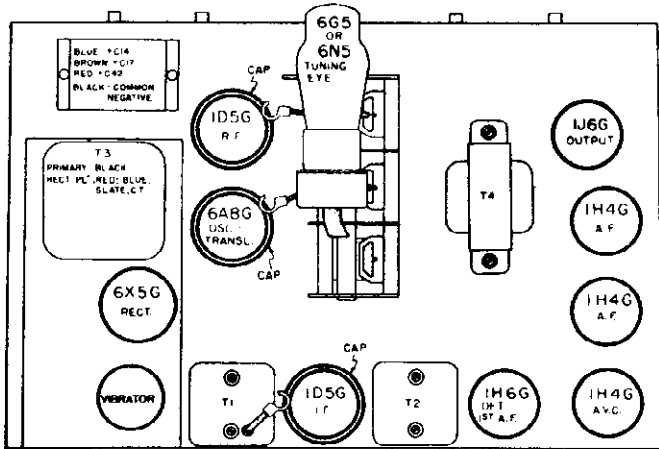
Socket, Trimmers, Chassis
Sensitivity Notes, Data

SEARS-ROEBUCK & CO.

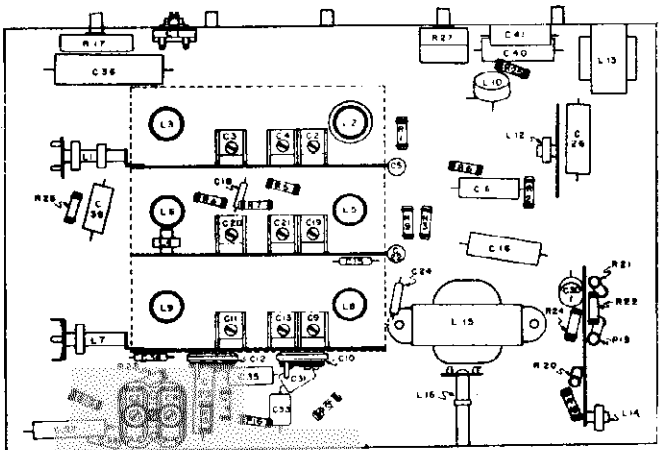
OPERATION OF THE 6G5 OR 6N5 TUNING EYE TUBE:

The type 6G5 or 6N5 tuning eye tube, used in this receiver, operates over a signal input range about three times greater than can be handled by the 6E5 tube, used in some of last years receivers. With the 6E5 tube, if the circuits are designed so that the tube responds to a moderately weak signal, it will overlap with strong signals. Any signal stronger than that required to close the eye cannot be tuned accurately by the eye. The 6G5 or 6N5 tube provides an even more sensitive indication for weak signals than the 6E5 and will not overlap except under extreme local conditions.

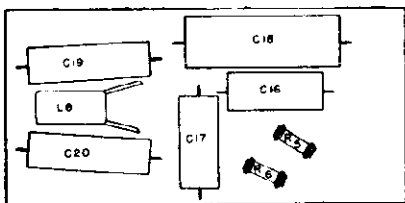
However, the range of signal input over which the receiver must work is so great that even this 6G5 or 6N5 variable mu tube cannot completely satisfy all conditions. In addition to the limitations of the tube itself, there are variations between receivers, even though they be of the same model, that affect the signal required to close the eye. If several tubes are available to choose from, it may be possible to select one that will operate more satisfactorily in a particular location.



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS



LOCATIONS OF PARTS UNDER POWER SUPPLY UNIT

OPERATING FEATURES:
Fidelity Range - - - 50 - 5000 cycles
Tone Control - - - - - Variable
Selectivity Control - - - Two position
Automatic Volume Control

CONTROL OPERATION:
Turning right: sharp. Left: broad
Turning right: Power on; bass to treble
Turning right: 10:1; 50:1
Turning right: "WEA", "AM", "POL", "FOR"
Turning right: volume increase. Pushing down, illuminate dial and actuate tuning eye.

FREQUENCY RANGES:
Band "WEA" - - - - - 220-400 kc
Band "AM" - - - - - 540-1750 kc
Band "POL" - - - - - 1750-5850 kc
Band "FOR" - - - - - 5.8-17.5 mc

OPERATING CONTROLS:
1. Right knob - - - Selectivity Control
2. Next to right knob - "On-Off" Switch and Tone Control
3. Middle knob - - - Station Selector
4. Next to left knob - Wave Band Switch
5. Left knob - - - - - Volume

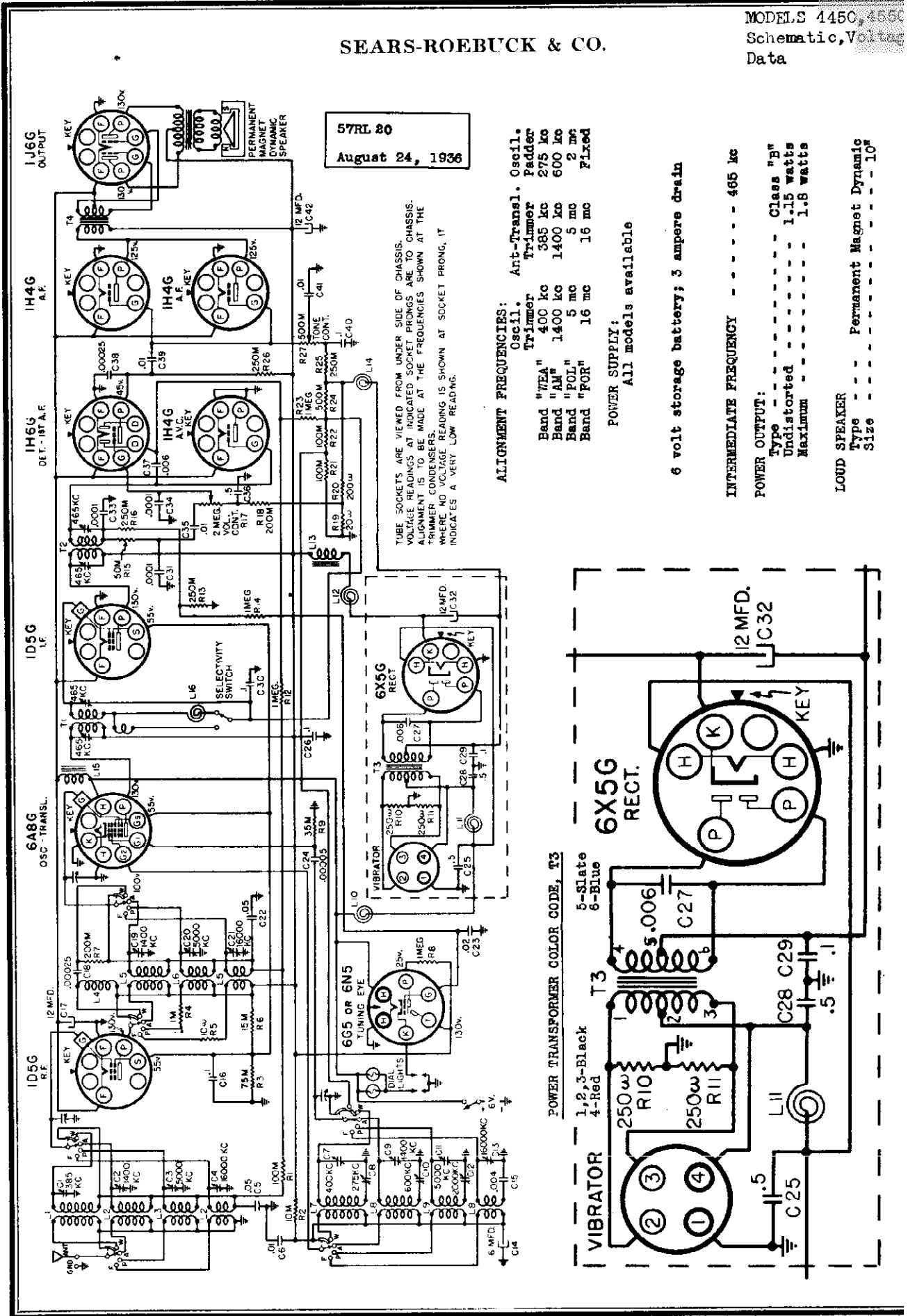
CHASSIS FEATURES:
Number RF stages - - - - - One
Number IF stages - - - - - One
Antenna - - - - - Conventional

VARIABLE SELECTIVITY:

Variable Selectivity is obtained by a two position switch. It changes the selectivity of the IF input transformer, T1, by connecting or disconnecting coupling turns between primary and secondary. The coil, L16, compensates for the loss of inductance when the coupling turns are disconnected, thereby keeping the transformer tuned to 465 kc.

SEARS-ROEBUCK & CO.

MODEL S 4450, 4550
Schematic, Voltage
Data



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS. WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES A VERY LOW READING.

ALIGNMENT FREQUENCIES:

Oscill.	Ant-Transl.	Oscil.
Trimmer	Padder	
Band "WEA"	400 kc	275 kc
Band "AM"	1400 kc	600 kc
Band "POL"	5 mc	2 mc
Band "FOR"	16 mc	16 mc
		Fixed

POWER SUPPLY:
All models available

6 volt storage battery; 3 ampere drain

INTERMEDIATE FREQUENCY ----- 465 kc

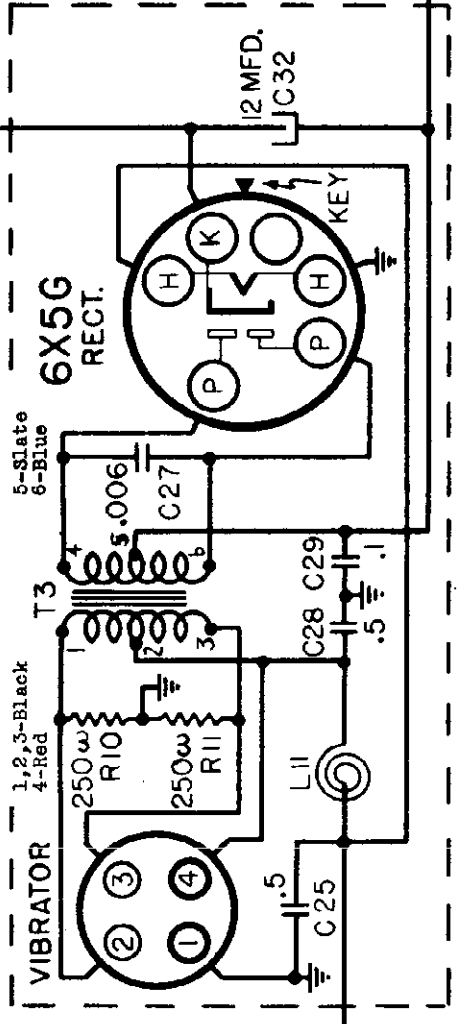
POWER OUTPUT:

Type	Class "B"
Undistorted	1.15 watts
Maximum	1.8 watts

LOUD SPEAKER

Type	Permanent Magnet Dynamic
Size	10"

POWER TRANSFORMER COLOR CODE, T3



MODELS 4450, 4550
Alignment, Sensitivity
Whistle Elimination

SEARS-ROEBUCK & CO.

TEN TUBE, FOUR BAND, SIX VOLT STORAGE BATTERY OPERATED SUPERHETERODYNE

ALIGNMENT PROCEDURE

PRELIMINARY:

- Output meter connections - - - - - Across speaker voice coil leads
- Output meter reading to indicate .5 watts output - - - - - 1.05 volts
- Dummy antenna value to be in series with generator output - - - - - See chart below
- Connection of generator output lead - - - - - See chart below
- Connection of generator ground lead - - - - - Receiver chassis
- Generator modulation - - - - - 30%, 400 cycles
- Position of volume control - - - - - Fully clockwise
- Position of tone control - - - - - Fully clockwise
- Position of selectivity control - - - - - Fully clockwise
- Position of dial pointer - - To fall on second line from right, of ornamental lines running from tuning eye toward dial center, when variable is fully meshed.

WAVE BAND SWITCH POSITION	POSITION OF DIAL POINTER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	APPROXIMATE MICROVOLTS
"AM"	550 kc	465 kc	.1 mfd.	6AG Grid	T2, T1	-
"AM"	1400 kc	1400 kc	.0002 mfd.	Antenna Terminal	C9, C2, C19	15
"AM"	600 kc (rock)	600 kc	.0002 mfd.	Antenna Terminal	C10	30
"WEA"	Fully clockwise	400 kc	.0002 mfd.	Antenna Terminal	C7	50
"WEA"	385 kc	385 kc	.0002 mfd.	Antenna Terminal	C1	80
"WEA"	275 kc (rock)	275 kc	.0002 mfd.	Antenna Terminal	C8	175
"POL"	5 mc	5 mc	400 ohms	Antenna Terminal	C11, C3, C20	40
"POL"	2 mc (rock)	2 mc	400 ohms	Antenna Terminal	C12	65
"FOR"	16 mc	16 mc	400 ohms	Antenna Terminal	C13, C4, C21	30
"FOR"	6 mc	6 mc	400 ohms	Antenna Terminal	-	125

These models use a six volt storage battery for the "A" supply. A plug-in vibrator used with a step-up transformer and 6X5G rectifier tube furnishes the plate and screen voltage.

THE DIAL LIGHT AND TUNING EYE SWITCH:

Pushing down on the Volume Control knob actuates a switch to illuminate the dial. Pushing further down on the knob actuates another switch to cause the Tuning Eye to function. When the knob is released, both the dial light and the Tuning Eye become disconnected.

IMPORTANT ALIGNMENT NOTES

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

After completing the alignment for each band repeat it in the original order, for greater accuracy. This is particularly necessary for the Weather Band as the adjustments affect each other. Always keep the output power from the generator at its lowest possible value to prevent the AVC action of the set from interfering with accurate alignment.

After the alignment procedure has been completed, tune in a station at about 900 kc. If necessary, shift the dial pointer so that it indicates the station's frequency on the dial.

Values shown under, "Microvolts", are only approximate.

ELIMINATING WHISTLE AT 930 KC:

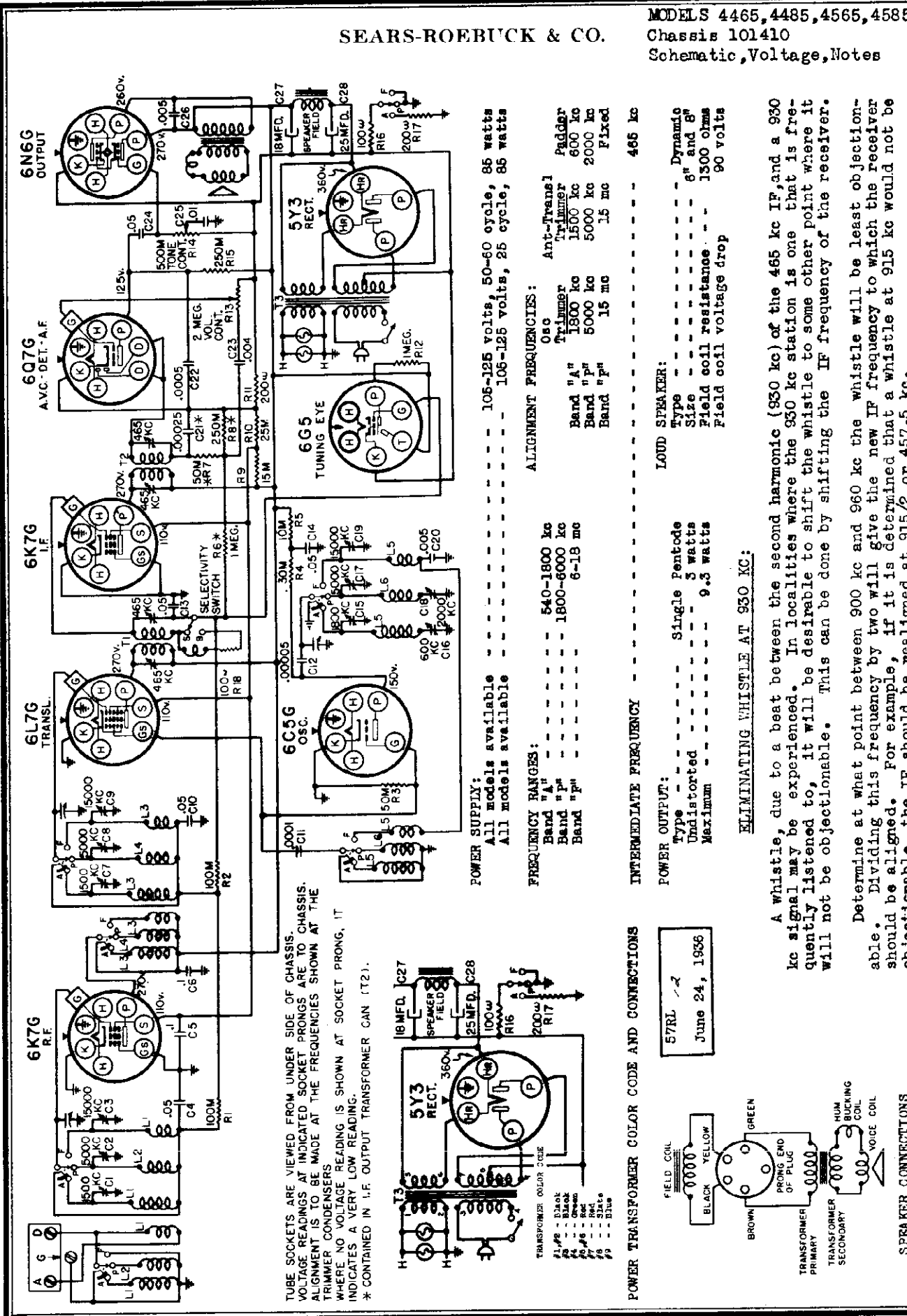
A whistle, due to a beat between the second harmonic (930 kc) of the 465 kc IF, and a 930 kc signal may be experienced. In localities where the 930 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the IF frequency of the receiver.

Determine at what point between 900 kc and 960 kc the whistle will be least objectionable. Dividing this frequency by two will give the new IF frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 915 kc would not be objectionable, the IF should be realigned at 915/2 or 457.5 kc.

Align the IF at the new frequency and then realign the rest of the receiver as described under, "ALIGNMENT PROCEDURE".

SEARS-ROEBUCK & CO.

MODELS 4465, 4485, 4565, 4585
Chassis 101410
Schematic, Voltage, Notes



MODELS 4465, 4485, 4565, 4585

Distortion Elimination
Sensitivity, Data SEARS-ROEBUCK & CO.

SUBJECT: ELIMINATING DISTORTION AT LOW VOLUME
Chassis in Which This Change May Be Necessary:

Chassis which are rubber stamped with the letter "P" after the number 101-410, on the Chassis Identification Sticker, are the only ones in which this change may be necessary. Chassis with any other rubber stamped letter or with no letter are not affected.

Chassis with the rubber stamped letter "H" have a 50 mfd. condenser, C26, connected from the high side of the volume control to the movable arm. If distortion, occurring only at low volume levels, is encountered, this 50 mfd. condenser should be removed from the circuit.

SUBJECT: APPROXIMATE AVERAGE SENSITIVITY IN MICROVOLTS FOR .5 WATTS OUTPUT
SUBJECT: PREVENTION OF MOTORBOATING

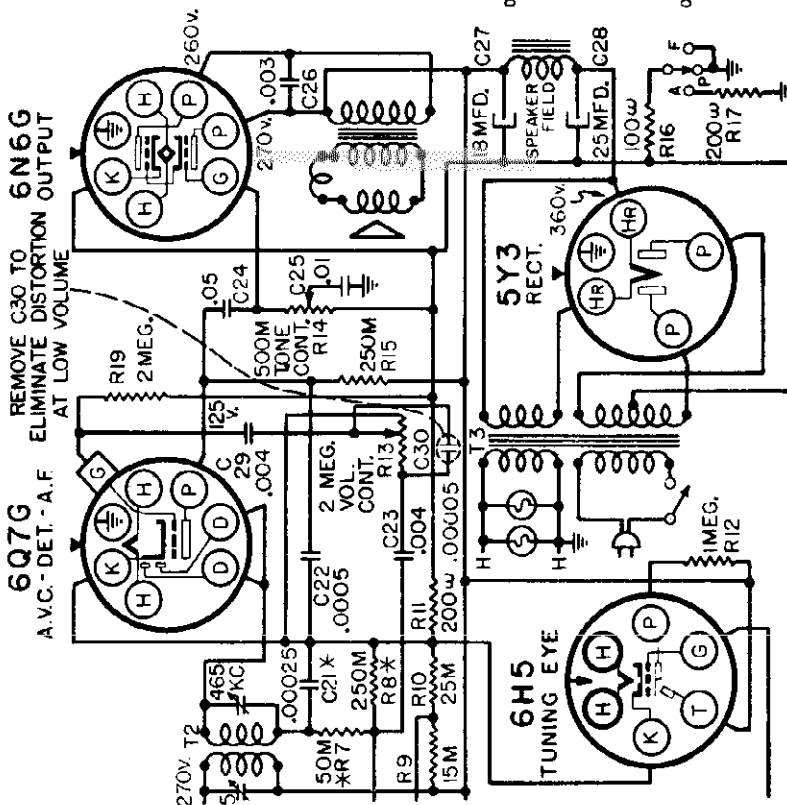
APPROXIMATE AVERAGE SENSITIVITY IN MICROVOLTS FOR .5 WATTS OUTPUT:

The generator connections and the receiver settings are to be as described in Service Instructions #5741 12, for this model. The generator modulation is to be 50% at 400 cycles.

Band	Frequency	Microvolts
"A"	600 kc	25
"A"	1000 kc	15
"A"	1600 kc	12
"A"	1800 kc	30
"P"	2 mc	100
"P"	3 mc	20
"P"	5 mc	8
"P"	6 mc	2
"P"	6 mc	8
"P"	6 mc	50
"P"	10 mc	8
"P"	12 mc	4
"P"	15 mc	2

PREVENTION OF MOTORBOATING:

If the two grid leads from the variable condenser, to the 6N7G RF tube and 617G transformer tube, are too close together motorboating may occur. If necessary, separate the leads to prevent this possibility.



OPERATING FEATURES:
Fidelity Range - - - 50 - 5000 cycles
Tone Control - - - Variable
Selectivity Control - - - Two position
Resonance Indicator - - - Tuning Eye
Sensitivity Control - - - Automatic
Automatic Volume Control
Dual Ratio Tuning

CHASSIS FEATURES:
Number Tuned RF stages - - - One
Number IF stages - - - One
Number condensers in gang - - - Three
Antenna - - - Doublet or Conventional

MECHANICAL SPECIFICATIONS

OPERATING CONTROLS:
1. Left knob - - "On-Off" switch and volume
2. Next to left knob - Wave Band Switch
3. Middle knob - Station Selector
4. Next to right knob - Tune Control
5. Right knob - Selectivity Control

CONTROL OPERATION:
Turning right; Power on; volume increase
Turning right; "AM" "PM", "FOR"
Turning right; 10:1, 50:1
Turning left; Bass; right; treble
Turning right; sharp; turning left; broad

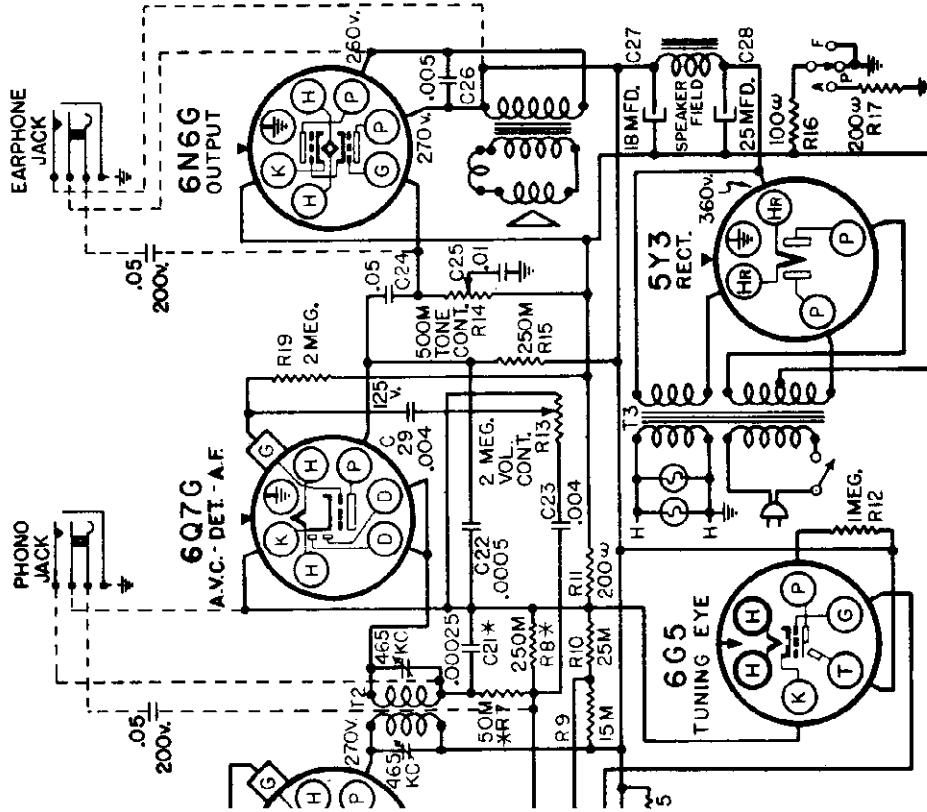
MODELS 4465, 4485, 4565, 4585

Phono Jack Connections
Interference Elimination
Notes

SEARS-ROEBUCK & CO.

CONNECTING A PHONOGRAPH PICK-UP JACK OR AN EARPHONE JACK:

A hole, plugged with a brass insert, will be found at the rear of the chassis. This hole is provided for the installation of either a phono pick-up jack or an earphone jack. The circuits are shown in the illustration below. The additional condensers are .05 mfd. 200 volts. The part number of the jack is 1011813685.



CONSOLE SPEAKERS:

In later production, the speaker of Console Models was mounted on felt cushions instead of being screwed directly to the baffle. For shipping purposes this cushion mounting is made rigid by screwing the two wooden strips, that hold the felt cushions, tightly to the baffle. To secure the advantage of the felt cushions and to insure best tone, the screws at each end of the two wooden strips should be loosened about one turn, thereby allowing the speaker to have a non-rigid mounting.

CONDENSER DRIVE:

A front bearing bracket was provided for the condenser drive shaft in later production to correct trouble due to alignment of the condenser drive. This misalignment causes the rear bearing to slip and provide insufficiently rigid support for the drive shaft. This bracket, part #1014618006, can be added when necessary to units not having it originally. It is mounted between the dial and the dial mounting bracket by means of the lower two dial mounting screws.

REPLACEMENT OF THE OSCILLATOR TUBE:

There are two types of 6G5 tubes, one shielded and the other unshielded. They can be told apart easily by appearance. The shielded type has a perforated mesh screen surrounding the other elements. This screen is about an inch in diameter and comes very close to the inside of the bulb. The unshielded type does not have this perforated mesh screen. The plates of the tube, of solid metal and about 3/8" diameter, is visible. It is important that only the unshielded type 6G5G, without the perforated mesh screen, be used in the oscillator socket. Use of the shielded type will upset band "F" calibration and interfere with proper performance.

THE WAVE SWITCH:

Two different types of Wave Switches have been used. They can be told apart by the construction of the index plate and indexing arm. In one type, part #102716389, the indexing arm has two ball bearings that contact against the stop of the index plate. In the other type, part #102716385, the index arm is in the shape of a flat "g" spring with a small roller and shaft at each end of the arm, to contact the stops of the index plate. Individual parts for the Wave Switches may be bought separately and are so listed in the Parts List. #1 contact plate is the one nearest the knob end of the shaft. #2 plate is the next one and #3 plate is the one farthest from the knob end of the shaft.

CONNECTION OF THE 6G5 CATHODE:

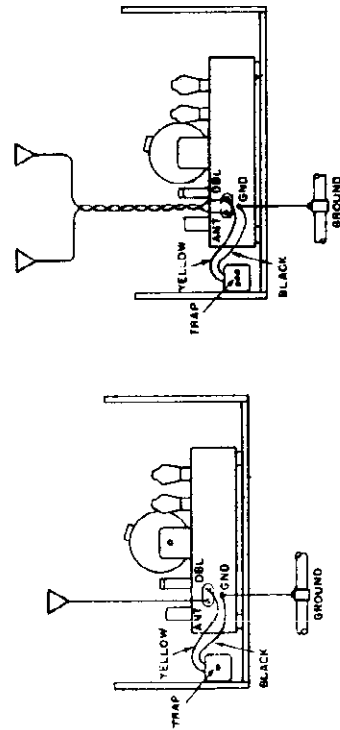
Examine the plate colored cathode lead of the 6G5 tuning eye tube. If it is connected to the cathode of the 6N6G it should be removed from there and connected instead to the cathode of the 6Q7G. The latter connection is the correct one and is shown in the portion of the schematic on the other side of this page. An indication of the incorrect connection is that the volume will increase if the 6G5 tube is removed from its socket.

WAVE-TRAP TO ELIMINATE INTERFERENCE FROM SHIP OR AIRPORT TRANSMITTERS:

In locations near ship transmitters or airports or air beacon stations, extra interference may be experienced. Part #1013116455 wave-trap is designed to eliminate such interference. It can be ordered from Colonial Radio Corporation, 284 Reno Street, Buffalo, N. Y. Use Purchase Order blank, form F5284. The retail selling price is \$1.00.

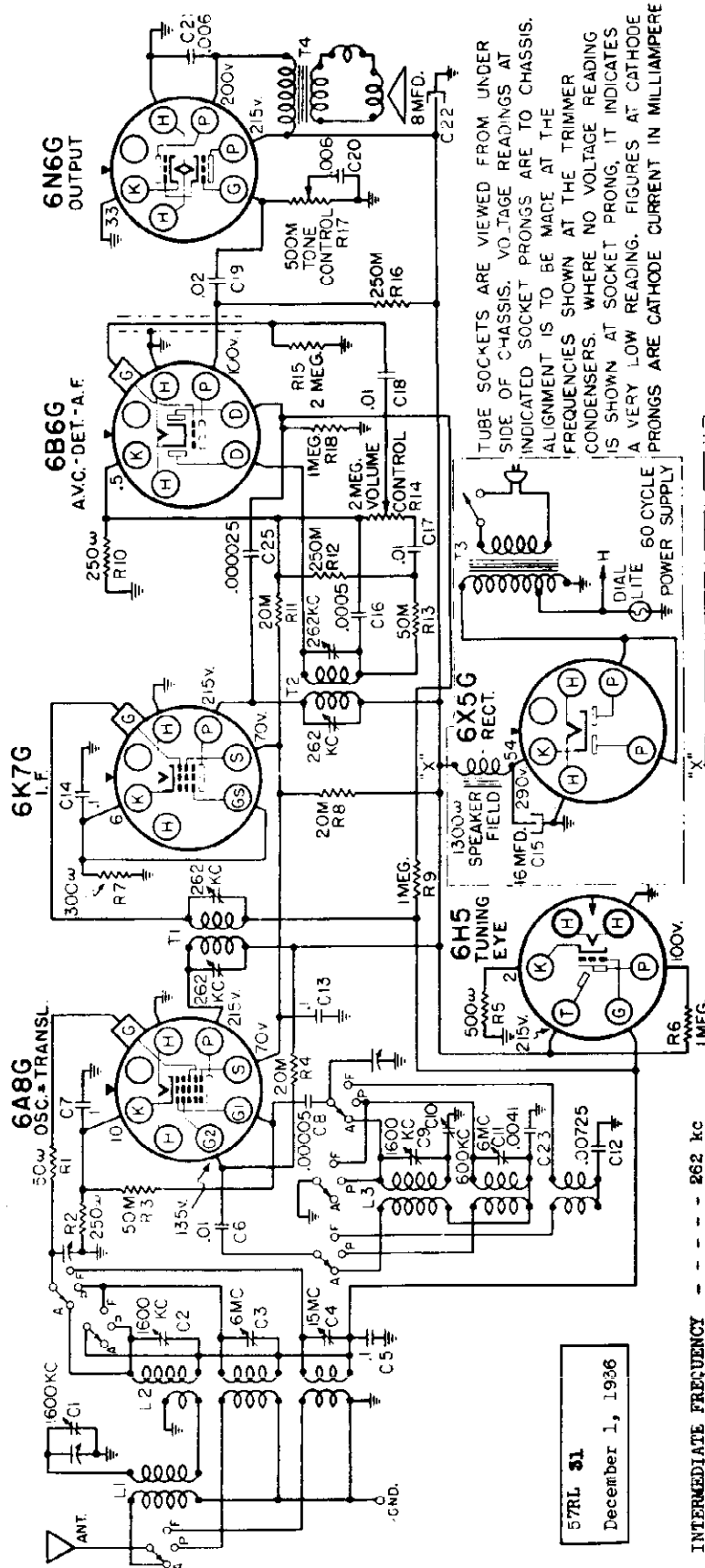
Mount the trap, by means of two wood screws, at any place on the chassis shelf or cabinet where it will be near the antenna terminals of the receiver. Connect the yellow lead of the trap to the terminal marked "YELL", on the terminal block at the rear of the chassis. Connect the black lead of the trap to the ground terminal on the chassis. Any connection should be cut off the wave-trap lead to the ground terminal on the chassis. The antenna or speaker connections to the receiver are not to be changed in any way.

The trap is pre-tuned to the IF frequency so that normally no further adjustment is necessary. However, should interference still be experienced, tune the receiver between approximately 580 and 600 kc. Then adjust the wave-trap by means of the trimmer screw at the bottom of the condenser, until the interference is eliminated. Addition of the trap will reduce the sensitivity of the receiver around 600 kc by approximately 50%. The customer should be forewarned of this to avoid complaints of reduced sensitivity.



SEARS-ROEBUCK & CO.

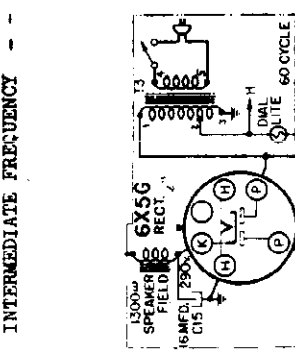
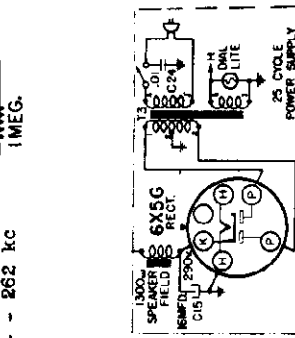
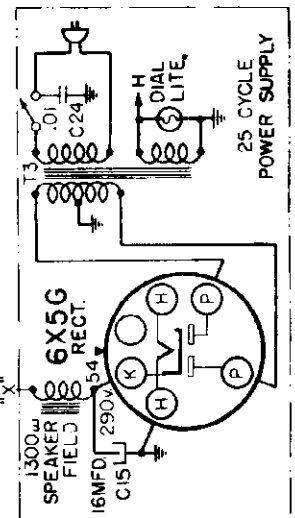
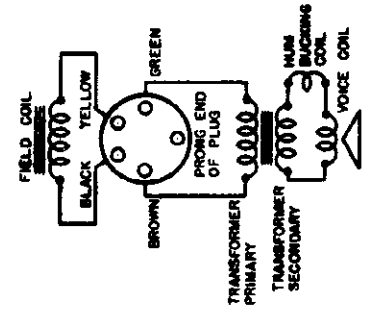
MODELS 4468, 4470, 4490
Schematic, Voltage, Data



57RL 31
December 1, 1936

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS. WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES A VERY LOW READING. FIGURES AT CATHODE PRONGS ARE CATHODE CURRENT IN MILLIAMPERE

INTERMEDIATE FREQUENCY - - - - 262 kc



ALIGNMENT FREQUENCIES:

Oscil.	Ant.-Transl.	Padder
1600 kc	1600 kc	600 kc
6 mc	6 mc	Fixed
-	15 mc	Fixed

1.5 CYCLE TRANS. COLOR CODE

1-Red	4,5-Blue
2-Green	6,7-Black

60 CYCLE TRANS. COLOR CODE

1-Red	3-Black
2-Orange	4,5-Blue

MODELS 4468, 4470, 4490

Alignment, Sensitivity Notes

SEARS-ROEBUCK & CO.

DIFFERENCES BETWEEN 25 CYCLE AND 60 CYCLE POWER SUPPLY:

The 6X56 rectifier tube is used as a half wave rectifier for 60 cycle supply. Full wave rectification is used for 25 cycle supply.

OPERATION OF THE 6HS TUNING EYE TUBE:

The type 6HS tuning eye tube, used in this receiver, operates over a signal input range about three times greater than can be handled by the 6E5 tube, used in some of last year's receivers. With the 6E5 tube, if the circuits are designed so that the tube responds to a moderately weak signal, it will overlap with strong signals. Any signal stronger than that required to close the eye cannot be tuned accurately by the eye. The 6HS tube provides an even more sensitive indication for weak signals than the 6E5 and will not overlap except under extreme local conditions.

However, the range of signal input over which the receiver must work is so great that even the 6HS tuning eye tube cannot completely satisfy all conditions. In addition to the limitations of the tube itself, there are variations between receivers, even though they be of the same model, that affect the signal required to close the eye. If several tubes are available to choose from, it may be possible to select one that will operate more satisfactorily in a particular location.

INSTALLING A WAVE-TRAP:

In locations near ship transmitters or airports or air beacon stations, code interference may be experienced. Part #1012114477 wave-trap is designed to eliminate this type of interference. These traps may be ordered from Colonial Radio Corporation, 254 Rano Street, Buffalo, N. Y., using Purchase Order blank, form FE284. The retail selling price of the #1012114477 wave-trap is \$1.00. Be sure to mention the part number when ordering the wave-trap.

Mount the trap, by means of two wood screws, at any convenient place on the chassis shelf or cabinet where it will be near the antenna terminal of the receiver. Connect the green lead of the trap to the antenna terminal of the receiver. (The location of the antenna will also remain connected to this antenna terminal of the receiver.) Connect the black lead of the trap to ground.

The traps act as a series resonant circuit across antenna and ground. The traps are pre-tuned to the IF frequency so that ordinarily no further adjustment will be necessary. However, if interference still is experienced, tune the trap by means of the trimmer screw at the bottom of the container, until the interfering signal is eliminated.

POWER SUPPLY:
All models available ----- 105-125 volts, 50-60 cycle, 55 watts
All models available ----- 105-125 volts, 25 cycle, 45 watts

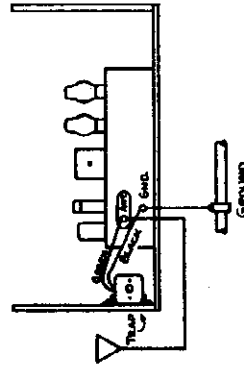
FREQUENCY RANGES:
Band #A ----- 540-1800 kc
Band #B ----- 2.6-2.8 mc
Band #C ----- 6.4-18 mc

POWER OUTPUT:
Type ----- Triple Twin
Undistorted ----- 2 watts
Maximum ----- 4 watts

OPERATING FEATURES:
Fidelity Range ----- 50 - 5000 cycles
Tone Control ----- Variable
Automatic Volume Control

LOUD SPEAKER:
Type ----- Dynamic
Size ----- 6" and 8"
Field coil resistance ----- 1500 ohms
Field coil voltage drop ----- 7½ volts

CHASSIS FEATURES:
Pre-selector on band #A ----- Conventional
Antenna -----
Tuning Eye -----



ALIGNMENT PROCEDURE

- Output meter connections ----- Across voice coil leads
- Output meter reading to indicate .5 watts output ----- 1.5 volts
- Average sensitivity in microvolts for .5 watts output ----- See chart below
- Dummy antenna value to be in series with generator output ----- See chart below
- Connection of generator output lead ----- See chart below
- Generator modulation ----- 30%, 400 cycles
- Position of Volume Control ----- Fully clockwise
- Position of Tone Control ----- Fully clockwise
- Position of Dial Pointer ----- To fall on center line of dial when variable is fully meshed.

WAVE BAND SWITCH POSITION	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	550 kc	.1 mfd.	6A80 Grid	C9, C1	IF Output IF Input	-
"A"	1600 kc	.0002 mfd.	Ant. Term.	C9, C2, C1	Osc., transl., antenna	55
"A"	800 kc (rock)	.0002 mfd.	Ant. Term.	C10	Osc. Pad.	50
"B"	6 mc	400 ohms	Ant. Term.	C11	Oscillator	-
"B"	6 mc (rock)	400 ohms	Ant. Term.	C3	Translator	50
"B"	15 mc (rock)	400 ohms	Ant. Term.	C4	Translator	45
"B"	7 mc	400 ohms	Ant. Term.	Loop at bracket end of L5	-	50

IMAGE ADJUSTMENT

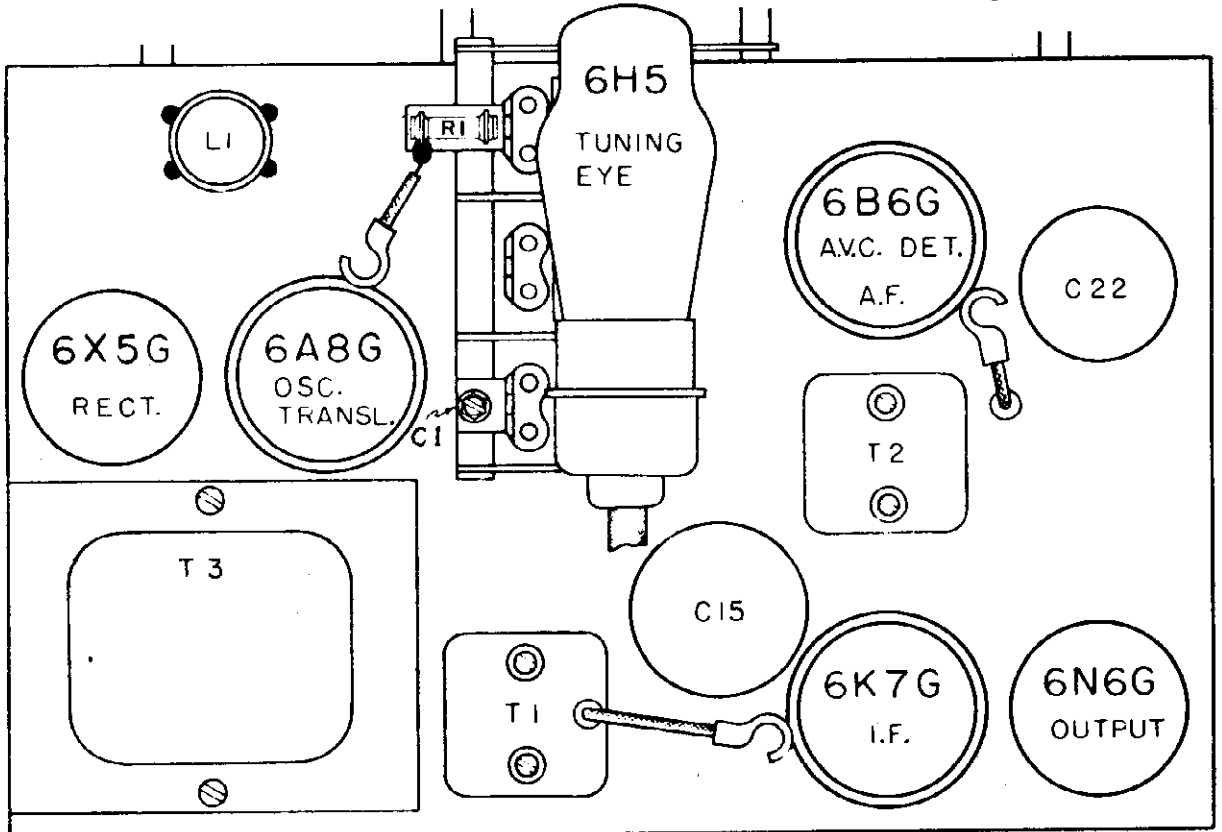
Set the generator to 1584 kc and tune in the signal lags at about 1000 kc on the receiver. The generator should be adjusted for high output (.1 volts). There is a lead coming from L1 through a hole in the chassis to the wave switch. Adjust the position of this lead under the chassis for minimum image response.

IMPORTANT ALIGNMENT NOTES

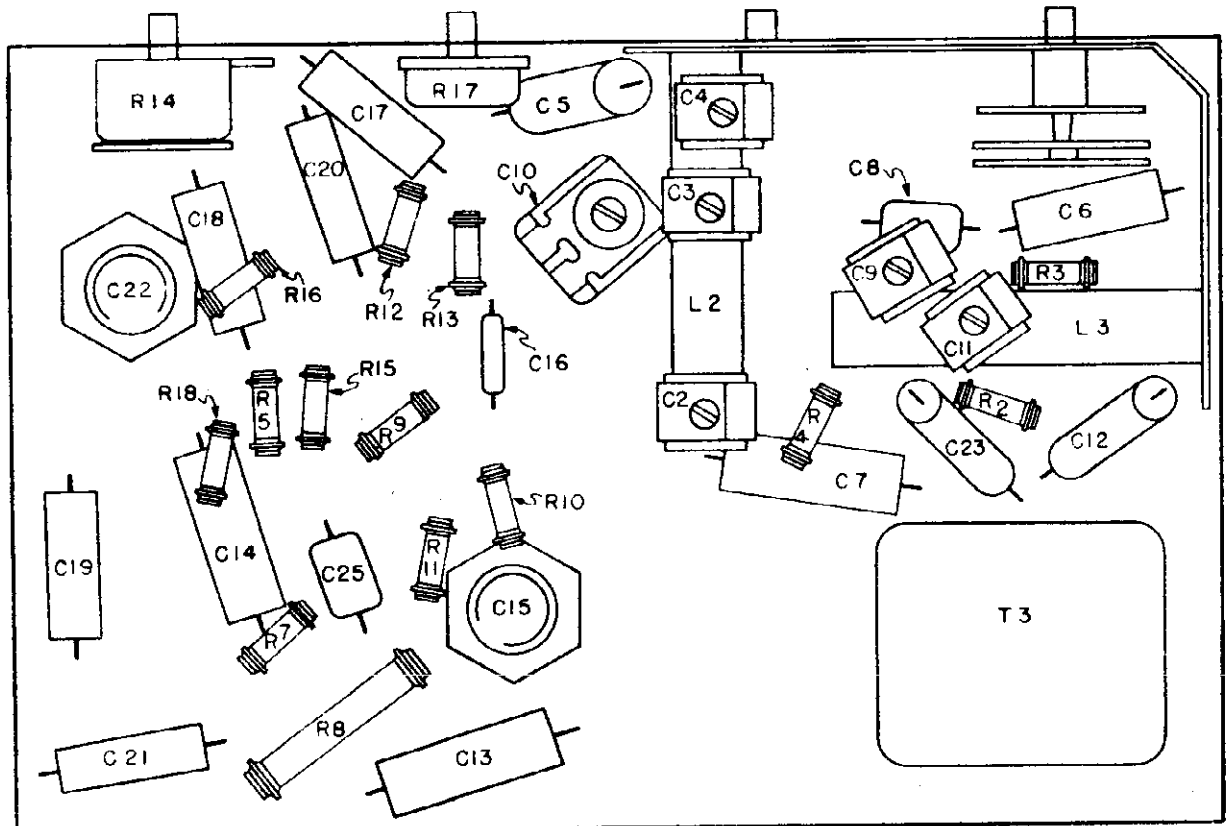
- Where indicated by the word, "rock", the variable should be rocked back and forth a degree or two while making the adjustment.
- It is advisable to repeat the entire alignment procedure band by band and in the original order to insure greater accuracy.
- Always keep the output from the test oscillator at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly.
- After the alignment procedure has been completed, tune in a broadcast signal at about 1000 kc. If necessary, shift the dial pointer so that it indicates this frequency.
- Values shown under, "Microvolts", are only approximate.

SEARS-ROEBUCK & CO.

MODELS 4468, 4470, 4490
Socket, Trimmers, Chassis



LOCATIONS OF PARTS TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS

MODELS 4486, 4586, 4586A

Whistle Elimination

SEARS-ROEBUCK & CO.

Data

GENERAL INFORMATION

The sensitivity is automatically increased on bands "P" and "F" by removal of the residual bias furnished by the resistor, R14. This resistor is connected in the circuit only when the Wave Band switch is in position "A". Contacts on the Wave Band switch automatically perform this switching.

Variable selectivity is obtained by a two position switch. It changes the selectivity of the IF input transformer by connecting or disconnecting coupling turns between primary and secondary.

ELIMINATING WHISTLE AT 930 KC:

A whistle, due to a beat between the second harmonic (930 kc) of the 465 kc IF, and a 930 kc signal may be experienced. In localities where the 930 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the IF frequency of the receiver.

Determine at what point between 900 kc and 960 kc the whistle will be least objectionable. Dividing this frequency by two will give the new IF frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 915 kc would not be objectionable, the IF should be realigned at 915/2 or 457.5 kc.

Align the IF at the new frequency and then realign the receiver as described under, "ALIGNMENT PROCEDURE".

POWER SUPPLY:

All models available ----- 105-125 volts, 50-60 cycle, 85 watts
 All models available ----- 105-125 volts, 25 cycle, 90 watts

FREQUENCY RANGES:

Band "A" ----- 540-1800 kc
 Band "P" ----- 1800-6000 kc
 Band "F" ----- 6-18 mc

ALIGNMENT FREQUENCIES:

	Oscil. Trimmer	Ant-Transl. Trimmer	Oscil. Padder
Band "A"	1800 kc	1500 kc	600 kc
Band "P"	5 mc	5 mc	2 mc
Band "F"	15 mc	15 mc	Fixed

INTERMEDIATE FREQUENCY -----

465 kc

POWER OUTPUT:

Type ----- Push-Pull Pentode
 Undistorted ----- 6 watts
 Maximum ----- 10 watts

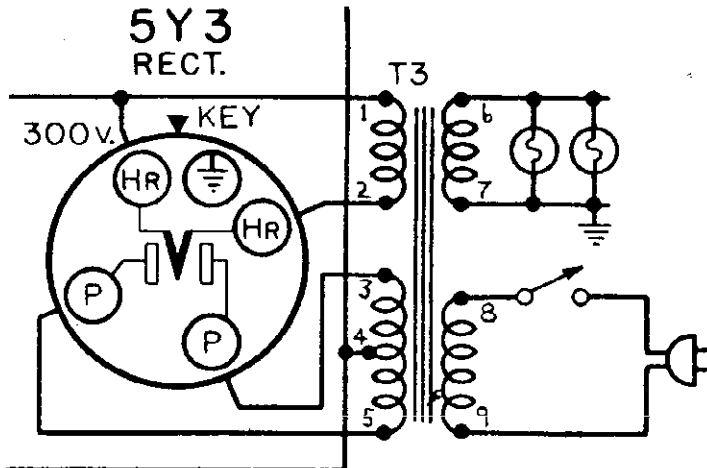
LOUD SPEAKER:

Type ----- Dynamic
 Size ----- 10"
 Field coil resistance - 650 ohms, hot
 Speaker field coil voltage drop - 60 volts

ELIMINATING HUM

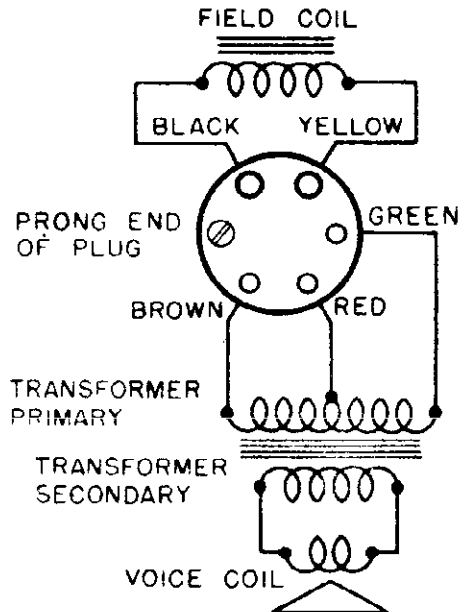
Excessive hum may be caused by a faulty 6C5G phase changer tube. Such tubes may test O.K. in a tube tester but cause hum due to leakage between the heater and cathode. If excessive hum is encountered, try changing the 6C5G phase changer tube.

Under certain conditions reversing the line plug will eliminate hum.



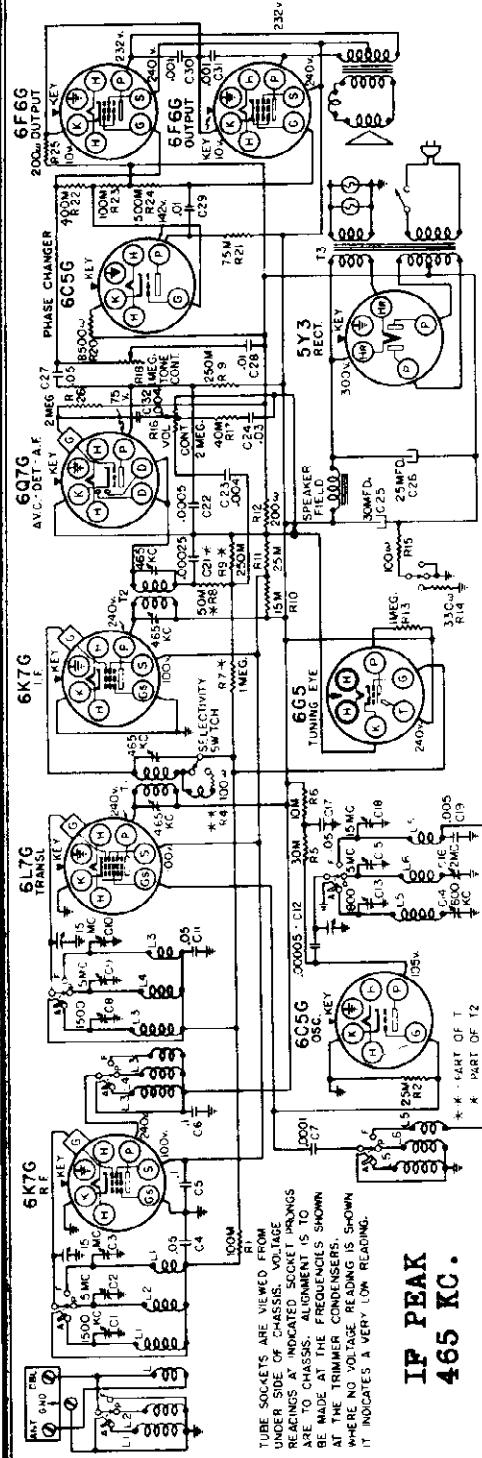
POWER TRANSFORMER COLOR CODE

1-Red	4-Slate	7-Black
2-Red	5-Blue	8-Green
3-Red	6-Black	9-Black



SEARS-ROEBUCK & CO.

MODEL S 4486, 4586, 4586A
Schematic, Voltage
Phono Pick-up Jack Data
Interference Elimination



WAVE-TRAP TO ELIMINATE INTERFERENCE FROM SHIP OR AIRPORT TRANSMITTERS:

In locations near ship transmitters or airports or air beacon stations, code interference may be experienced. Part #1013115433 wave-trap is designed to eliminate such interference. It can be ordered from Colonial Radio Corporation, 254 Rano Street, Buffalo, N. Y. Use Purchase Order blank, form F5284. The retail selling price is \$1.00.

Mount the trap, by means of two wood screws, at any place on the chassis shelf or cabinet where it will be near the antenna terminals of the receiver. Connect the yellow lead of the trap to the terminal marked, "DBL", on the terminal block at the rear of the chassis. Connect the black lead of the trap to the ground terminal on the chassis. Any excess length should be cut off the wave-trap leads so that they are as short as possible. The antenna or doublet connections to the receiver are not to be changed in any way.

The trap is pre-tuned to the IF frequency so that normally no further adjustment is necessary. However, should interference still be experienced, tune the receiver between approximately 550 and 600 kc. Then adjust the wave-trap, by means of the trimmer screw at the bottom of the container, until the interference is eliminated. Addition of the trap will reduce the sensitivity of the receiver around 600 kc by approximately 50%. The customer should be forewarned of this to avoid complaints of reduced sensitivity.

57RL 18
August 20, 1936

CONNECTING A PHONOGRAPH PICK-UP JACK OR AN EARPHONE JACK:

A hole, plugged with a brass insert, will be found at the rear of the chassis. This hole is provided for the installation of either a phonograph pick-up jack or an earphone jack. The circuit for the earphone jack connection is shown in Fig. 1. The circuit for the phonograph pick-up jack connection is shown in Fig. 2. The condenser shown is .05 mfd. 200 volt. The part number of the jack is 1011813585. It can be ordered directly from Colonial Radio Corporation, 254 Rano Street, Buffalo, N. Y. The retail selling price is \$.80.

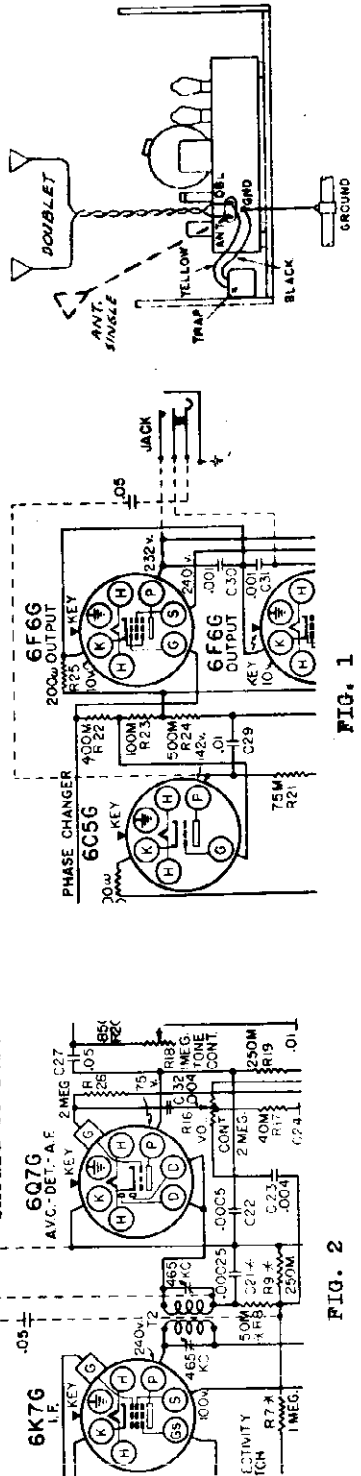


FIG. 1

FIG. 2

MODELS 4486, 4586, 4586A
 Socket, Trimmers, Chassis
 Alignment, Sensitivity

SEARS-ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

- Output meter connections - - - - - Across speaker voice coil
- Output meter reading to indicate .5 watts output - - - - - .85 volts
- Approximate average sensitivity in microvolts for .5 watts output - - - - - See chart below
- Dummy antenna value to be in series with generator output - - - - - See chart below
- Connection of generator output lead - - - - - See chart below
- Generator modulation - - - - - 30%, 400 cycles
- Position of volume control - - - - - Fully clockwise
- Position of tone control - - - - - Fully clockwise
- Position of selectivity control - - - - - Fully clockwise
- Position of dial pointer - - - - - To fall on second line from right, of ornamental lines running from tuning eye toward center of dial, when variable is fully meshed.

WAVE BAND SWITCH POSITION	POSITION OF DIAL POINTER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	APPROXIMATE MICROVOLTS
"AM"	550 kc	485 kc	.1 mfd.	6L7 Grid	T2, T1	-
"AM"	1800 kc	1800 kc	.0002 mfd.	Antenna Terminal	C15	90
"AM"	1500 kc	1600 kc	.0002 mfd.	Antenna Terminal	C1, C8	20
"AM"	600 kc (rook)	600 kc	.0008 mfd.	Antenna Terminal	C14	32
"POL"	5000 kc	5000 kc	400 ohms	Antenna Terminal	C15 (*)	-
"POL"	5000 kc	5000 kc	400 ohms	Antenna Terminal	C9, C9	2
"POL"	2000 kc (rook)	2000 kc	400 ohms	Antenna Terminal	C16	18
"FOR"	15 mc	15 mc	400 ohms	Antenna Terminal	C18 (*)	-
"FOR"	15 mc	15 mc	400 ohms	Antenna Terminal	C3, C10	2
"FOR"	6 mc	6 mc	400 ohms	Antenna Terminal	-	40

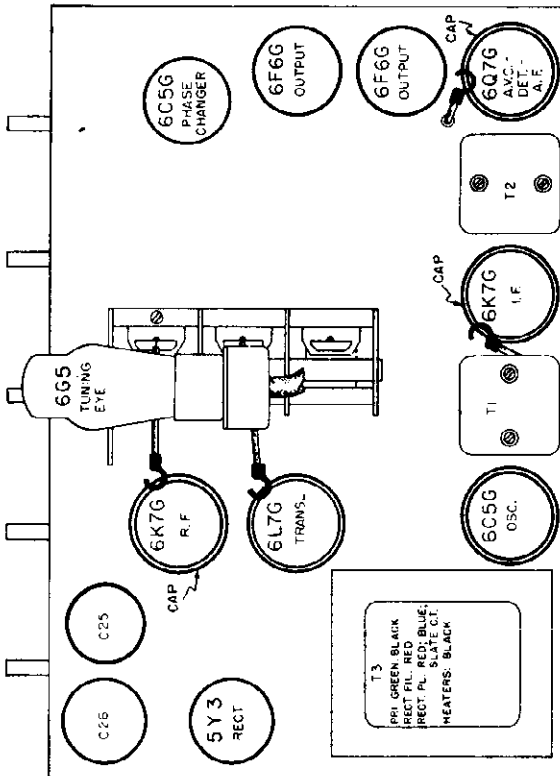
IMPORTANT ALIGNMENT NOTES

(*) If two peaks can be obtained at two different settings of the trimmer adjusting screw, use the adjustment in which the trimmer is screwed further out (lesser capacity). Where indicated by the word, "Rook", the variable should be rooked back and forth a degree or two while making the adjustment.

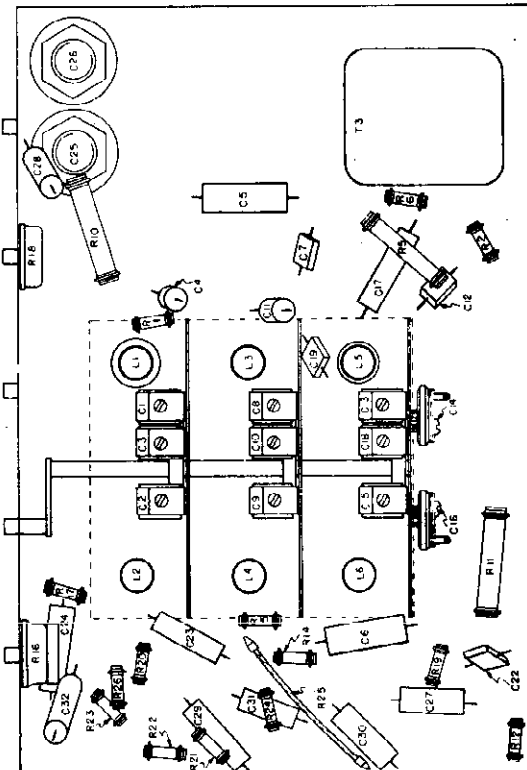
Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from the generator at its lowest possible value, to prevent the AVO action of the set from interfering with accurate alignment.

The shield plate that covers the coil assembly should be left in place while making the alignment adjustments. The trimmer screws are accessible through the holes in the shield. Only the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy antenna used for alignment of any other band.

After the alignment procedure has been completed, tune in a station at about 900 kc. If necessary, shift the dial pointer to the station's frequency on the dial.



LOCATIONS OF PARTS ON TOP OF CHASSIS -



LOCATIONS OF PARTS UNDER CHASSIS -

SEARS-ROEBUCK & CO.

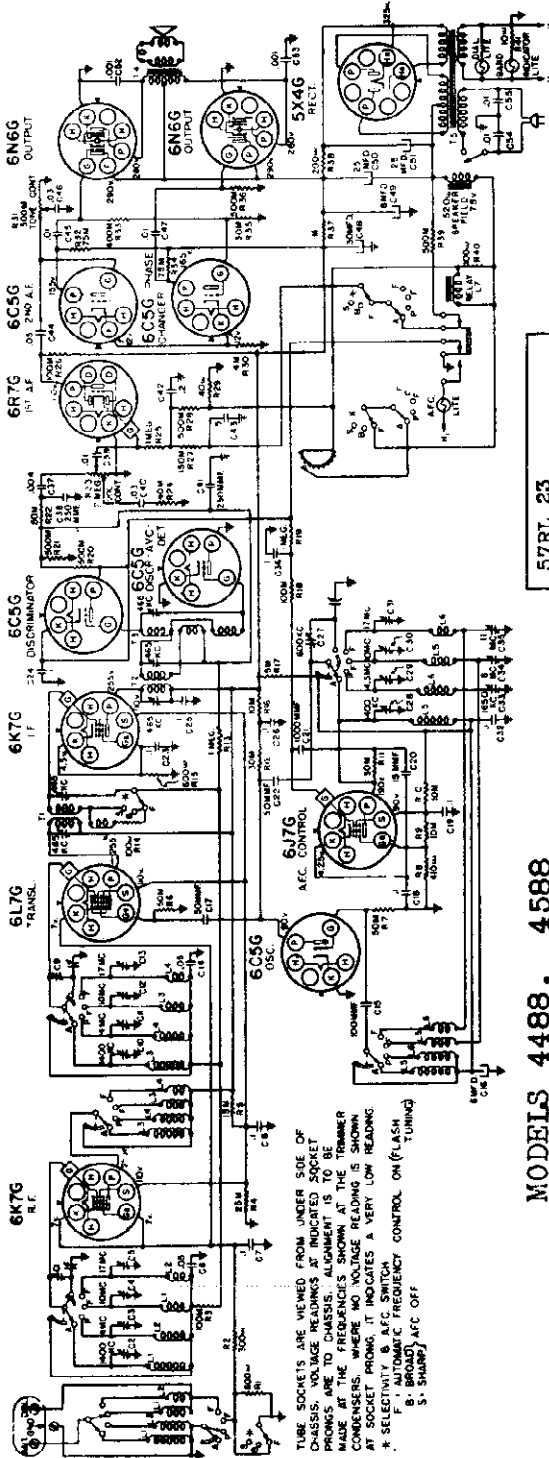
MODELS 4488, 4588
 MODEL S 4488A, 4588A
 Schematics, Voltage

POWER SUPPLY:
 All models available - - - - - 105-125 volts, 50-60 cycle, 135 watts
 All models available - - - - - 105-125 volts, 25 cycle, 135 watts

INTERMEDIATE FREQUENCY - - - - - 465 kc

POWER OUTPUT:
 Type - - - - - Push-Pull
 Undistorted - - - - - 12.0 watts
 Maximum - - - - - 16.9 watts

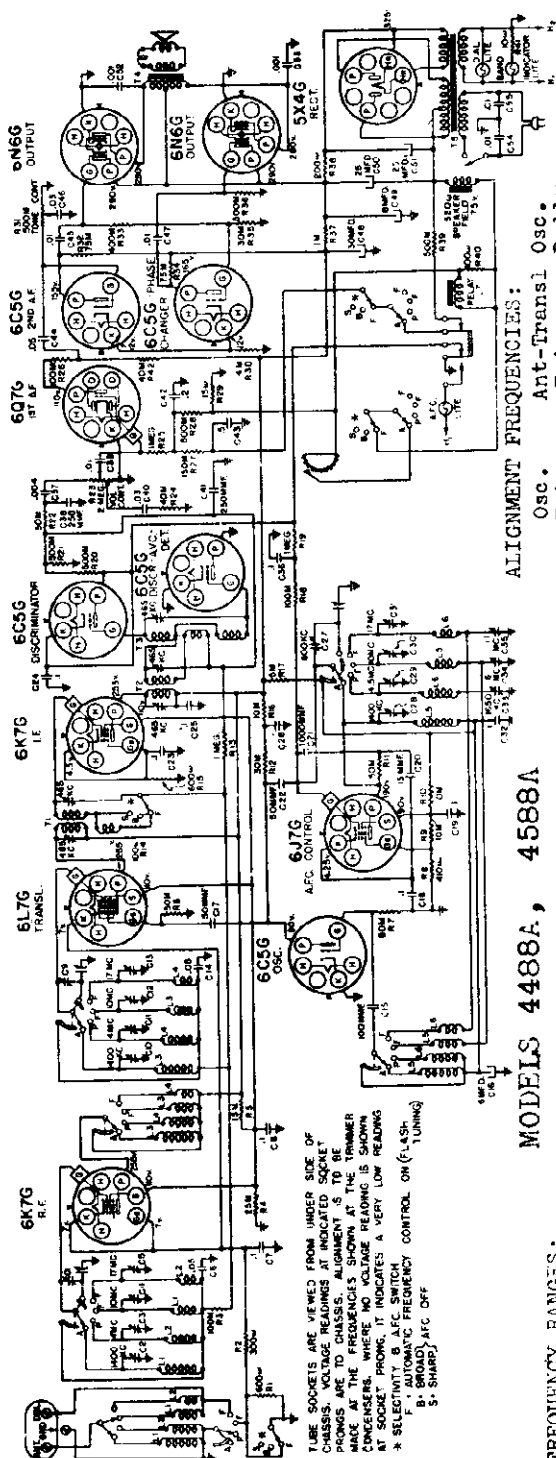
LOUD SPEAKER:
 Type - - - - - Dynamic
 Size - - - - - 12"
 Field coil resistance - - - - - 520 ohms
 Field coil voltage drop - - - - - 75 volts



57RL 23
 September 4, 1936

MODELS 4488, 4588

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCY ADJUSTMENT SOCKET PRONGS. A VERY LOW READING AT SOCKET PRONGS INDICATES A VERY LOW READING AT SELECTIVITY & AFC SWITCH.
 F. AUTOMATIC FREQUENCY CONTROL ON (FLASH TUNING)
 S. SHUNTS AFC OFF



ALIGNMENT FREQUENCIES:
 Osc. Ant-Transl Osc.
 Trimmer Trimmer Padder
 1400 kc 1400 kc 600 kc
 4 mc 4 mc 1650 kc
 10 mc 10 mc 6 mc
 17 mc 17 mc 11 mc

MODELS 4488A, 4588A

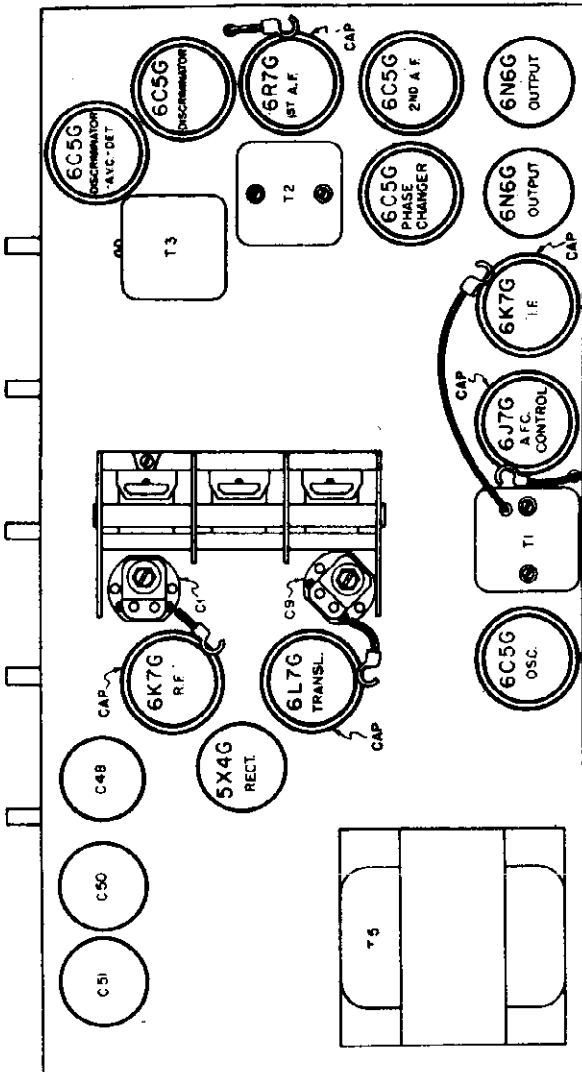
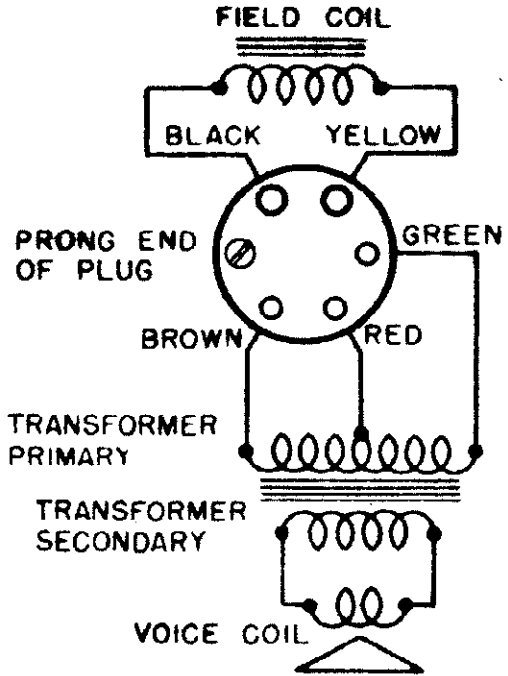
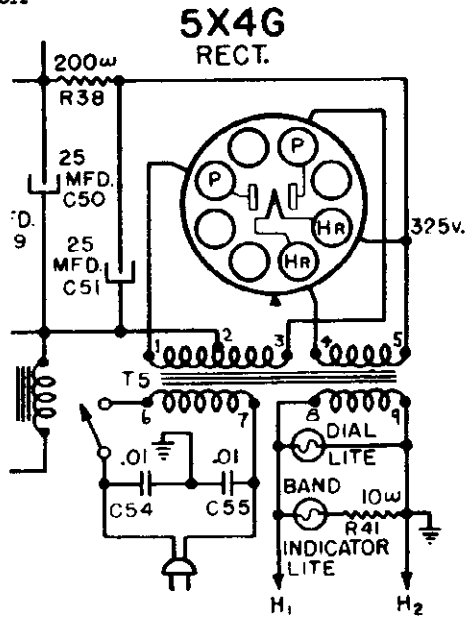
FREQUENCY RANGES:
 AMERICAN Band - - - - - 540-1500 kc
 POLICE Band - - - - - 1.5-4.5 mc
 FOREIGN Band - - - - - 6-11 mc
 FOREIGN Band - - - - - 10-18 mc

MODELS 4488, 4588
 Socket, Trimmers
 Chassis, Color Code
 MODELS 4488A, 4588A
 Color Code

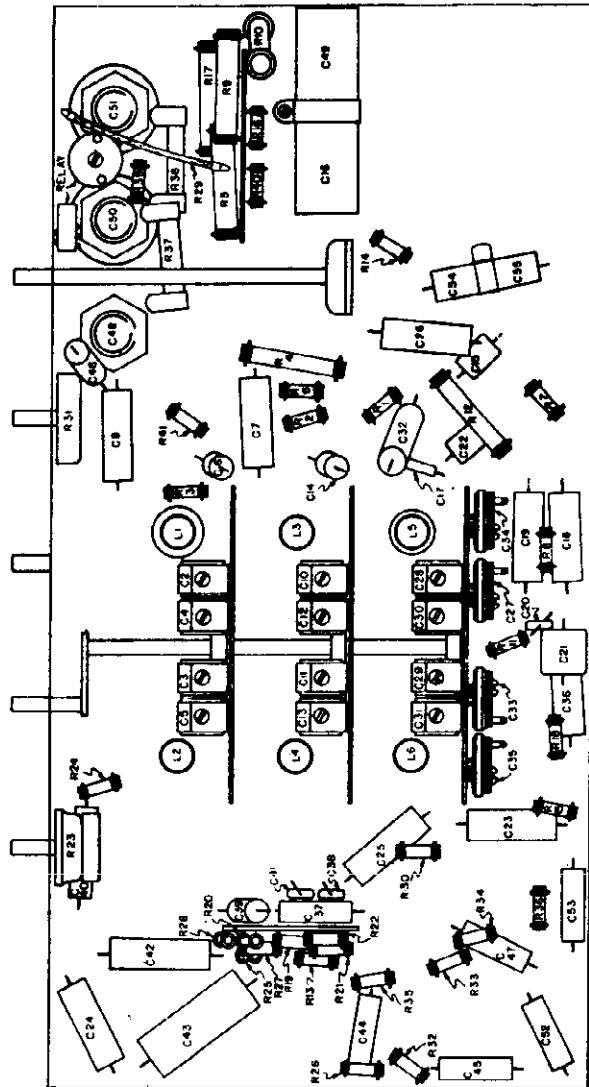
SEARS-ROEBUCK & CO.

POWER TRANSFORMER, T5, COLOR CODE

- 4-5-Red
- 6-Black
- 7-Green
- 8&9-Black
- 1-Red
- 2-Slate
- 3-Blue



LOCATIONS OF PARTS ON TOP OF CHASSIS MODELS 4488, 4588



LOCATIONS OF PARTS UNDER CHASSIS MODELS 4488, 4588

SEARS-ROEBUCK & CO.

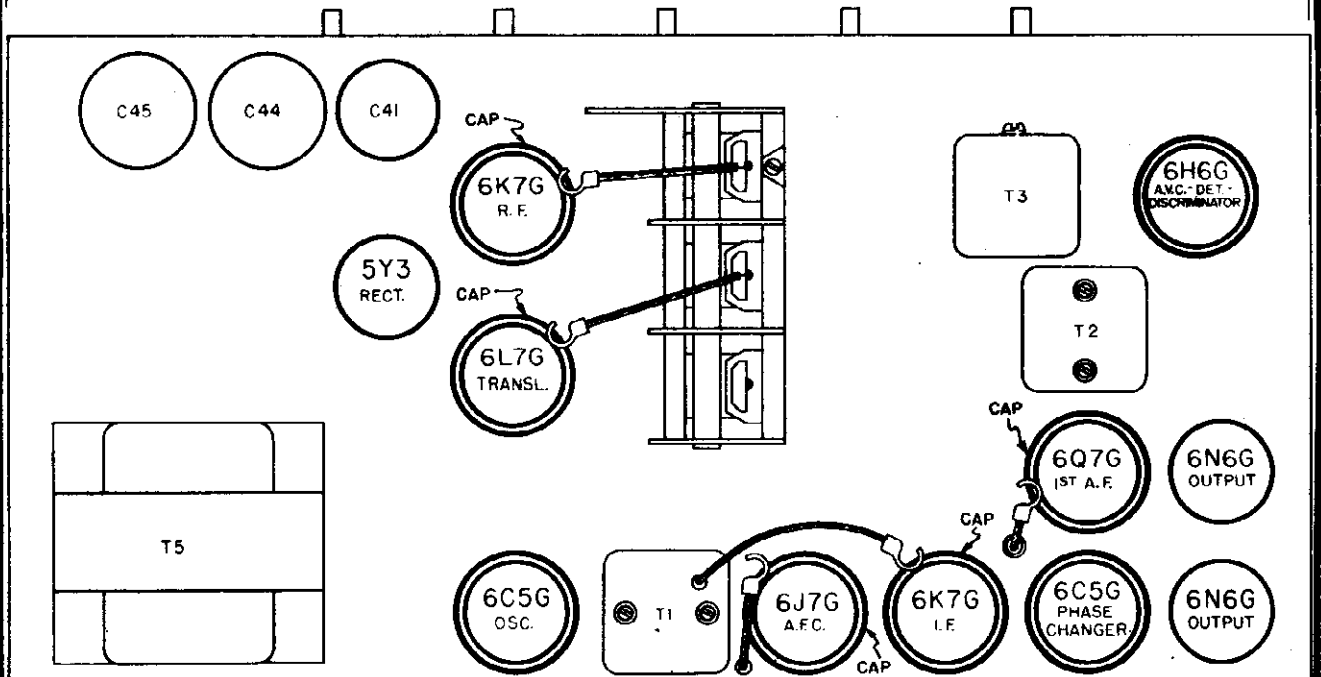
MODELS 4488A, 4588A
 Socket, Trimmers
 Chassis

OPERATING FEATURES:

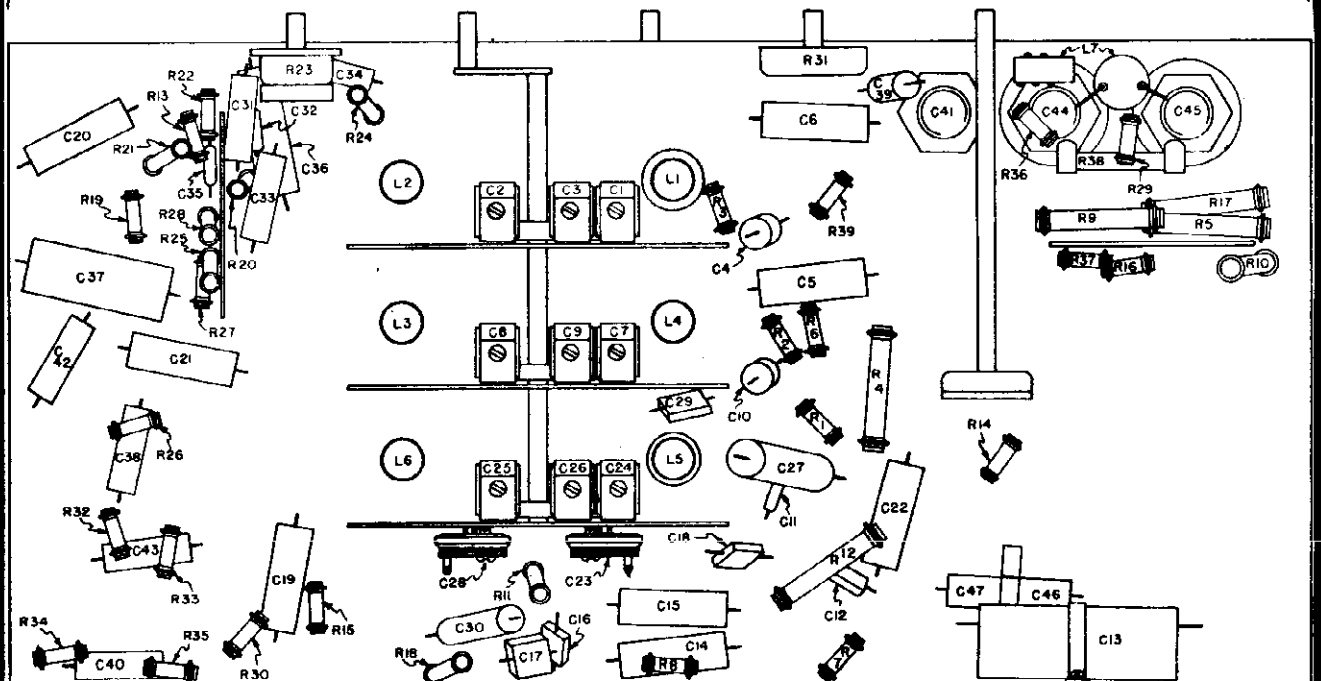
Fidelity Range - - - - 30 - 8000 cycles
 Tone Control - - - - - Variable
 Selectivity Control - - Two position
 Automatic Frequency Control (Flash
 Tuning)
 Automatic Volume Control
 Illuminated Visual Band Indicator

CHASSIS FEATURES:

Number RF stages - - - - - One
 Number IF stages - - - - - One
 Antenna - - Doublet or Conventional



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS

MODELS 4486, 4588

MODELS 4488A, 4588A

Alignment, Sensitivity
Dial Drive Parts

SEARS-ROEBUCK & CO.

PRELIMINARY:

ALIGNMENT PROCEDURE

Output meter connections - - - - - Across speaker voice coil
 Output meter reading to indicate .5 watts output - - - - - 2.5 volts
 Dummy antenna value to be in series with generator output - - - - - See chart below
 Connection of generator output lead - - - - - See chart below
 Generator modulation - - - - - 30%, 400 cycles
 Approximate average sensitivity in microvolts for .5 watts output - - - - - See chart below
 Position of Volume Control - - - - - Fully on
 Position of Tone Control - - - - - Fully clockwise
 Position of Flash Tuning and Selectivity Switch knob - - - - - Sharp, fully counter clockwise
 Position of Dial pointer - - - - - To fall on 10 mc mark when variable is fully meshed

WAVE BAND POSITION	POSITION OF DIAL POINTER	GENERATOR FREQUENCY	DUMMY ANTENNA CONNECTION	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER APPROXIMATE SHOW) MICROVOLTS
"AM"	550 kc	465 kc	.1 mfd.	6L7G Grid	T2, T1
"AM"	1400 kc	1400 kc	.0002 mfd.	Antenna Terminal	G29, G2, G10 15
"AM"	600 kc (Rock)	600 kc	.0002 mfd.	Antenna Terminal	C27 15
"POL"	4 mc	4 mc	400 ohms	Antenna Terminal	C29, C5, C11 2
"POL"	1650 kc (Rock)	1650 kc	400 ohms	Antenna Terminal	C33 30
"FOR" (Next to "POL")	10 mc	10 mc	400 ohms	Antenna Terminal	C50 * -
"FOR" (Next to "POL")	8 mc (Rock)	6 mc	400 ohms	Antenna Terminal	C54 15
"FOR" (Next to "POL")	10 mc	10 mc	400 ohms	Antenna Terminal	C4, G15 2
"FOR" (Next to "POL")	6500 kc	6500 kc	400 ohms	Antenna Terminal	G1, G9 ** 15
"FOR" (Next to "POL")	17 mc	17 mc	400 ohms	Antenna Terminal	G51 * -
"FOR"	17 mc	17 mc	400 ohms	Antenna Terminal	G5, G13 2
"FOR"	11 mc (Rock)	11 mc	400 ohms	Antenna Terminal	C35 80

IMPORTANT ALIGNMENT NOTES

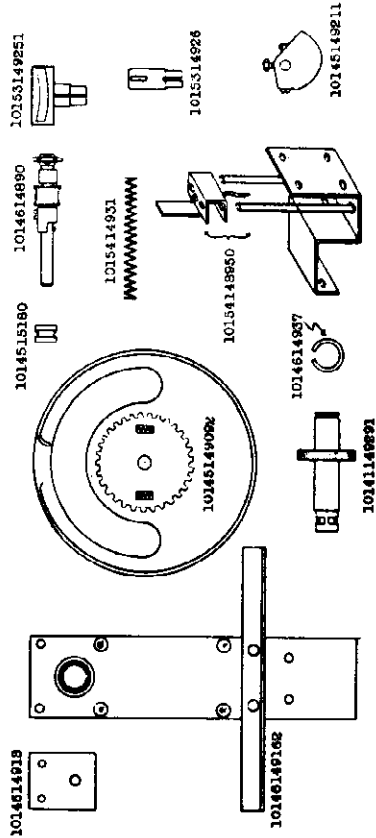
Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.
 * Two peaks will be found at two different settings of the trimmer. Use the one in which the trimmer is screwed further in (greater capacity).
 ** Use a bakelite screw-driver in making these two adjustments. These adjustments should not be touched after this band has been lined up.
 Repeat the entire alignment step by step in the original order for greater accuracy. Always keep the generator output power at its lowest possible value. This will prevent the AVC action of the receiver from interfering with accurate alignment.
 The shield covering the coils at the bottom of the chassis should be left in place during the alignment. The trimmer condensers are accessible through the holes in the shield.

Only the dummy antenna indicated in the chart for any particular band should be used. Disconnect the dummy antenna used for alignment of any other band.
 After the alignment procedure has been completed, tune in a station at about 900 kc. If necessary, shift the dial pointer to the exact frequency of the station.
 After the alignment has been completed, the A.F.C. adjustment should be made as follows:

A.F.C. ADJUSTMENT

CAUTION: The right hand knob must be in the "B" (broad) position for operations 1 through 5. Two signal generators are necessary to make the adjustments. The Volume and Tone Controls must be turned all the way to the right. The generator ground connection is to be made to the chassis.
 1. Set one signal generator to 1050 kc and 5000 microvolts output. Connect its output to the "AM" terminal of the set, through a .0002 mfd. condenser.
 2. Tune the receiver for maximum output (at 1050 kc). Then switch the signal generator modulation switch to the "off" position.
 3. Short the movable arm to the toothed disc with a piece of wire. The Flash Tuning light should become illuminated.

4. Set the second signal generator to 465 kc and 10,000 microvolts output. Connect its output, in series with a .000015 mfd. condenser to the control grid of the 6L7G tube.
 5. Carefully turn the variable condenser until "zero beat" note is heard (with right hand knob in "BROAD" position).
 6. Turn the right hand knob to the "FLASH" position (fully clockwise). Then adjust the discriminator unit, to, for "zero beat". The correct setting will be obtained at about the center of its trimmer range. The adjustment is a very sharp one.
 7. Turn the right hand knob to the "SHARP" and then to the "BROAD" positions. The receiver still should be in the "SHARP" and "BROAD" positions if the A.F.C. is properly adjusted. If it does not, carefully repeat operation #6.
 8. The A.F.C. can be checked for "pull in" in the following manner. Remove the signal generator connection from the 6L7G grid. Switch on the modulation of the 1050 kc generator and set the generator to give 5000 microvolts output. Reduce the Volume Control setting of the receiver to give 1.5 volts reading on the output meter. Increase the signal generator frequency until the output meter reads .5 volt. Note the frequency of the signal generator at this output meter reading. Then decrease the signal generator frequency from 1050 kc until the output meter again reads .5 volt and note the signal generator frequency. If the A.F.C. is operating properly, the signal generator can be shifted 15 to 20 kc either side of 1050 kc before the output meter reading is reduced from 1.5 volts to .5 volt.



DIAL DRIVE REPLACEMENT PARTS

tion. Bend the end of the slip, opposite the call letters, over one of the celluloid tabs so that the call letters will be under the celluloid. See Fig. 3. Then place the tab end and call letter slip under the holder at the outside edge of the dial at a point opposite the end of the dial pointer. The call letters will then be illuminated whenever the dial pointer is opposite them (and the radio is switched to the AMERICAN band and the right hand knob is in the "FLASH" position).

8. In the same manner, insert the proper call letter slip and a celluloid tab for each of the other stations selected. (These tabs can be pulled out and the call letters of other stations inserted at any time should you wish to change the selection of stations.)

9. Replace the glass in the cabinet front panel. Hold it centered in the scotchbion with one hand inserted at the top and the other at the bottom. Press the glass into the scotchbion, pressing the remainder of the rim into the plastic. It may be helpful to tip the cabinet back against the wall to prevent the possibility of the glass falling out during the operation.

10. If two of the selected stations are powerful ones and close together in frequency (10 to 50 kc) the receiver may go from one to the other. If the stations are far apart, or if the selected frequency is very low, the receiver will stay on the one station. To correct this, bend down the originally bent up tab of the station and instead bend up the two adjacent teeth which are further apart.

HOW THE A.F.C. - FLASH TUNING CIRCUITS OPERATE:

The I.F. frequency of the receiver is 455 kc. If a station is tuned in exactly, then the oscillator frequency is 465 kc higher than the station's frequency, creating an I.F. of 465 kc. However, if the receiver is tuned, for example, 5 kc lower than the station's frequency, the oscillator frequency will be 5 kc lower and the resultant I.F. will be 460 kc. Similarly, if the receiver is tuned 5 kc higher than the station's frequency, the resultant I.F. will be 470 kc. The I.F. is fed to the discriminator transformer, T3. By means of the tuned circuits of the discriminator transformer, I.F. higher than 465 kc is fed through one 500Ω discriminator tube, T4, and frequencies lower than 465 kc are fed through the other 500Ω discriminator tube, T5. The polarity and value of the voltage drops, with respect to ground, across these two resistors depend upon the extent to which the I.F. is higher or lower than 465 kc. This voltage, developed upon the discriminator circuit, is fed to the control grid of the 6J7G Automatic Frequency Control tube to control the oscillator frequency, as described in the following paragraph.

The oscillator coil inductance, L5, determines the oscillator frequency for any given position of the variable condenser. If another inductance were connected in parallel to it, the total inductance would be lessened and the oscillator frequency would increase. The combination of the 6J7G A.F.C. tube together with the condensers, C50, C51 and the resistor, R11, have the effect of an inductance in parallel with the inductance, L5. This is so for the following reason:

In an inductance the phase relations between the voltage across it and the current through it are such that the voltage leads the current by 90 degrees. The phase relations of the voltage and current in the plate circuit of the 6J7G tube are such that the voltage leads the current by 90 degrees. Therefore, this combination acts as an inductance in parallel to the inductance L5. The extent to which it does so is determined by the value of the voltage impressed on the control grid of the 6J7G tube. This voltage is obtained from the discriminator circuit as previously described. The effect of this equivalent parallel inductance is to change the AMERICAN band oscillator frequency. By properly choosing the value of the variable condenser, the amount of voltage impressed on the control grid of the oscillator frequency circuit can be made to compensate almost exactly for the change in inductance which the station, in the station's selected position, presents which is equivalent to perfect tuning. Providing the station is selected between 465 kc and 480 kc, the A.F.C. can take hold. As mentioned previously, this is within 15 kc of the station for strong stations, but decreases for weaker stations.

The A.F.C. tube is connected in the circuit all the time and on all bands. However, the voltage from the discriminator circuit is fed to its control grid only on the AMERICAN band and when the Variable Selectivity - Flash Tuning knob is turned to the "FLASH" position. On all other bands and positions of the Selectivity - Flash Tuning knob the control grid bias of the 6J7G tube is fixed. Therefore, it corrects the I.F. frequency only on the AMERICAN band.

The Flash Tuning mechanism consists essentially of the toothed disc at the rear of the variable condenser and the relay, 17. The function of the toothed disc is to operate the relay when the variable condenser is turned to the various pre-selected stations. The relay contacts close the Flash Tuning light circuit, illuminating the station's call letters. At the same time they remove the high negative bias which blocks off the audio, keeping the receiver silent until the pre-selected station is tuned in.

The relay coil normally is energized. It is short circuited by the bent up tooth of the disc contacting the movable arm. This is why the Flash Tuning light flashes for a second or so when the receiver is first turned on -- the rectifier has not heated sufficiently to furnish current to energize the relay.

THE AUTOMATIC FREQUENCY CONTROL - FLASH TUNING:

These models incorporate a completely new feature, Automatic Frequency Control - Flash Tuning. This double feature, which is designed to operate only on the AMERICAN band, does several things. The Automatic Frequency Control removes the necessity for accurate tuning. Depending upon the strength of the station, it is necessary to tune only within 15 kc or less of the station's frequency. The Automatic Frequency Control then will "take hold" and tune the station far more accurately than can be done manually. This is done entirely with radio circuits, no moving parts being involved.

The Flash Tuning mechanism greatly simplifies tuning. It is necessary merely to turn the dial pointer to the station's call letters. The call letters then will become illuminated and, by virtue of the A.F.C., the station will automatically be tuned in exactly. Until the station's position is reached, the receiver is completely silent. As soon as the station is selected, the circuits of the A.F.C. Flash Tuning feature work is given after the following instructions for setting up the Flash Tuning feature.

SETTING UP:

1. The glass in the cabinet front panel must be removed to allow insertion of the station call letters, as described later. This glass is held in place by a split ring (the split is at the top). See Fig. 1. The tool illustrated is furnished in the same envelope with the instructions. Use the screw-driver end of this tool to remove the split ring by prying out one of its ends, as indicated in Fig. 1. Be very careful not to insert the tool so deep that it touches the glass, else the glass may become chipped.

The glass can be removed by placing the hand on it and tipping the cabinet forward. Take care during the operation not to allow the split ring to fly out or the glass to drop and break.

2. Make a list of the broadcasting stations to which you desire to have the FLASH Tuning mechanism respond. These stations must be local stations or strong stations at medium distance that give reliable daylight reception. A sheet containing the call letters of broadcasting stations is furnished in the same envelope with the Instruction Leaflet. Cut out the station's call letters of the selected stations. The short vertical lines before and after the station's call letters and the long horizontal lines will serve as a guide along which to cut. When properly done, these cut slips will be a trifle over 1/4" long and 1/4" wide.

3. Turn the Flash Tuning and Selectivity Switch knob to the "REAR" position. Then tune in the first station on your list of selected stations.

4. Leaving your station tuned in, go to the rear of the radio. You will see a semi-circular toothed disc, as illustrated in Fig. 2. There is also a flat spring arm, with a small rectangular projection on its end, that comes near the teeth of the semi-circular disc. The station's call letters are still resting on the teeth of the semi-circular disc. The rounded projection of the spring arm, which touches the semi-circular disc, is directly under the rounded projection of the spring arm. Mark this tooth with a pencil. Note that there is a double row of teeth and either the tooth that faces you or the tooth that faces the front of the radio may be bent up, depending upon which one is nearer the rounded projection of the spring arm. After you have marked the tooth, turn off the radio. Then tune away from the station (with the Station Selector knob, not the movable arm) and bend this marked tooth straight up, using the slotted end of the tool provided. See Fig. 2. It is important that the slot of the tool fit as far down as possible on the tooth before bending. This is necessary so that the complete tooth will be bent up instead of just part of the tooth. When this is properly done, the projection of the spring arm will touch the bent up tooth when the toothed disc is rotated by turning the Station Selector knob.

5. Turn the radio on again and tune in the next station on your list of selected stations. Mark the tooth that is under the projection of the spring arm when this station is tuned in. Turn off the radio, tune away from the station so that the spring arm will be in the way and bend up this marked tooth, using the tool provided. Proceed in the same manner for each of the other stations on your selected list. Turn off the radio each time before bending up the tooth. Otherwise a slight spark may occur, although there is no danger of shock. When properly done, the spring arm will touch each of the teeth that has been bent up but will not touch any of the other teeth, as the Station Selector knob is turned.

6. Turn the Flash Tuning and Selectivity Switch knob to the "FLASH" position. Now again tune in the first station on your selected list. As its position is reached, the bent up tooth will touch the spring arm and a light will flash on the dial at a position opposite the end of the dial pointer.

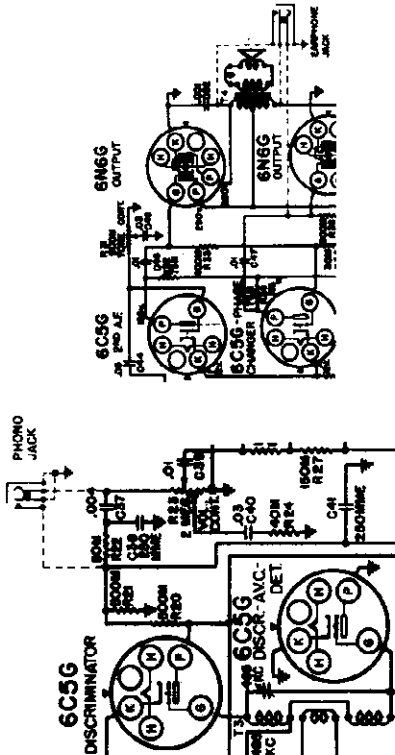
7. A small envelope containing celluloid tabs is furnished in the same large envelope with the instructions. Select the cut out slip bearing the call letters of your chosen station.

SEARS-ROEBUCK & CO.

MODELS 4488, 4588
 MODELS 4488A, 4588A
 Interference Elimination
 Phono.Pickup Jack Data

INSTALLING A JACK FOR THE USE OF EARPHONES AND PHONOGRAPH PICK-UP:

There is a hole, plugged with a brass insert, at the rear of the chassis. This hole is provided so that a jack can be installed for earphones or phono pickup connections. The schematic section shows the connections. With the connections as shown, the loud speaker will not operate when the earphones are plugged in. The earphones are plugged in the connections to the two plugs furthest from the frame of the chassis. Otherwise the earphone plug must be removed from its jack when loud speaker reception is wanted. If the jack is wired as a phono-graph pick-up jack, the right hand knob of the receiver must not be in the "FLASH" position when phono-graph operation is wanted. It may be put in either the "B" or "SHARP" position. The Volume and Tone Controls of the receiver will function for phono-graph reproduction.



AFTERCA CONNECTIONS:

There is a terminal board at the rear of the chassis marked "AF", "TEL", "GND", indicating antenna, doublet, and ground, respectively. The "TEL" terminal is left unconnected when a conventional antenna is used. When a doublet is used, one wire of the twisted pair is connected to the "AF" terminal and the other doublet wire is connected to the "TEL" terminal.

VARIABLE SELECTIVITY:

Variable Selectivity is obtained by connecting or disconnecting coupling turns between primary and secondary of the IF input transformer, P1. In the "SHARP" position of the right hand knob, the coupling turns are connected and the selectivity is increased, thereby increasing the high frequency audio response of the receiver.

REPLACEMENT OF THE OSCILLATOR TUBE:

There are two types of 6055 tubes, one shielded and the other unshielded. They can be sold apart easily by appearance. The shielded type has a perforated mesh screen surrounding the other elements. This screen is about an inch in diameter and comes very close to the inside of the bulb. The unshielded type does not have this perforated mesh screen. The plate is unshielded and is connected to the "A" terminal of the 6055 socket. The unshielded type is used in the 6055 socket. Use of the shielded type will upset the calibration of the Foreign bands and interfere with proper performance.

THE AVC CIRCUIT:

The voltage drop across the 500K ohm resistor, R2, is fed to the control grids of the 6N70 and 6N73 tubes to provide AVC. The drop across this resistor is also used in the discriminator circuit as described previously. The audio voltage across the resistor is coupled to the AF stages through the condenser, C37.

OPERATING CONTROLS:

1. Left knob - "On-Off" Switch and Volume
2. Next to left knob - Wave Band Switch
3. Middle knob - Station Selector
4. Next to right knob - Tone Control
5. Right knob - Selectivity Control

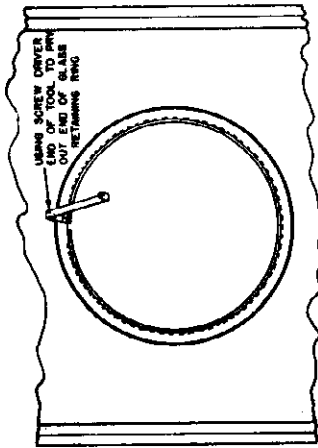


Fig. 4

WAVE-TRAP TO ELIMINATE INTERFERENCE FROM SHIP OR AIRPORT TRANSMITTERS:

In locations near ship transmitters or airports or air beacon stations, odds inter-ference may be experienced. A wave-trap is designed to eliminate such inter-ference. It is recommended that you contact the Radio Shack, Buffalo, N. Y. Use Purchase Order blank, form P0284. The retail selling price is \$1.00.

Mount the trap, by means of two wood screws, at any place on the chassis shelf or cabinet where it will be near the antenna terminals of the receiver. Connect the yellow lead of the trap to the terminal marked, "TEL", on the terminal block at the rear of the chassis. The other lead of the trap should be connected to the ground terminal of the chassis. The antenna lead length should be cut off the leads to the trap, if possible. The antenna or doublet connections to the receiver are not to be changed in any way.

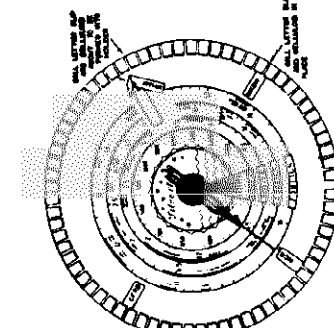
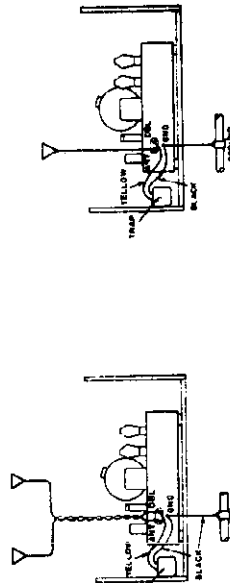


Fig. 3



The trap is re-tuned to the IF frequency so that normally no further adjustment is necessary. However, should interference still be experienced, tune the receiver between approximately 550 and 600 Kc. Then adjust the wave-trap, by means of the trimmer screw at the bottom of the condenser, until the interference is eliminated. Addition of the trap will reduce the sensitivity of the receiver around 600 Kc by approximately 50%. The customer should be forewarned of this to avoid complaints of reduced sensitivity.

ELIMINATING WHISTLE AT 930 KC:

A whistle, due to a beat between the second harmonic (450 Kc) of the 465 Kc IF and a 900 Kc signal may be experienced in the vicinity of 930 Kc. This whistle is objectionable. It will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the IF frequency of the receiver.

Determine at what point between 900 Kc and 940 Kc the whistle will be least objectionable. Shifting this frequency by two will give the new IF frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 915 Kc would not be objectionable, the IF should be realigned at 915/2 or 457.5 Kc. Try to keep the new IF frequency as near 465 Kc as possible.

Align the IF at the new frequency and then realign the antenna, translator, and oscillator stages. When re-adjust the A.F.C. according to the procedure described in this Manual, but setting the signal generator to the new IF frequency instead of 465 Kc.

In addition, certain circuit changes are required when relay type #5 is installed. The .02 mfd. 500 volt condenser is connected from the spring arm that contacts the teeth of the contact disc to the movable arm. A .1 mfd. 500 volt condenser is connected from the contact disc to the stationary arm. These condensers are C06 and C07 in the Schematic Section, Fig. 1. Fig. 2 shows how the condensers should be mounted.

CORRECTING DIAL DRIVE SLIPPAGE:

Dial drive slippage may be due to the movable arm being set too close to the beehive disc. The arm will then press unnecessarily hard against the bent up teeth of the condenser too hard to turn. If this appears to be the case, the adjusting screw on the movable arm should be loosened and the arm re-set so that it does not press too hard against the teeth.

ELIMINATING INTERFERENCE OF STATION OTHER THAN CHOSEN A.F.C. STATION:

The following condition sometimes occurs. Normally, a station that has been set up on the beehive disc will be heard whenever the dial pointer is turned to its call letters. It sometimes happens though that the station will only be heard if it is approached from one end of the dial, but an adjacent station will be heard if approached from the other end of the dial. This is due to the fact that the proper tooth was not selected carefully enough for the station when the dial was set. The remedy is to put the receiver in the "SHARPER" position, tune in the desired station very carefully, and to be sure to turn up the tooth that is under the projection of the contacting arm.

CORRECTING FAULTY A.F.C. TUNING:

Normally, when the receiver is in the "Flash" tuning position, a station will not be heard until the "Flash" tuning light operates. If the tuning is faulty, the station may be heard before its call letters become illuminated and may continue to be heard after the pointer has been turned past the station's position and the "Flash" tuning light has gone out. If this type of trouble is encountered, it can be corrected by making the circuit changes shown in Fig. 3. This will insure that the new connections to the tubes remain in place. The A-1 tubes are to be broken. The cathode connections of the tubes remain the same. The .500 mfd. 500 volt condenser, C08, is to be connected directly from the suppressor terminal of the 6E70 IP tube socket to ground. The suppressor of the 6E70 IP tube is to be connected to the 400 ohm .01 mfd. capacitor, C09, shown in Fig. 3. These changes increase the tuning action by putting a negative biasing voltage on the suppressor of the IP and IF tubes.

NOTE: In extreme cases, that is if the receiver is located near a very powerful station, tuning may be still unsatisfactory on that station even after the changes mentioned in the preceding paragraph have been made. If desired, in such extreme cases the tuning can be further improved by changing the value of R03 from 5000 ohms (9500 ohms in some sets) to 10000 ohms. This is done by changing the amount of "thump" or "click" that occurs when tuning stations in or out. Since this change is only for extreme cases, the 1000 ohm resistor is not included in the kit.

CORRECTING TOO HIGH MINIMUM VOLUME:

Sometimes, with the Volume Control set to its lowest position, the volume still is too high. This will occur in sets with the "Flash" tuning position. To correct this, examine the lead that runs from the "Flash" tuning position to the IP transformer. This lead must not be permitted to come close to the grid terminal of the 6C6G phase changer tube socket. There should be at least 1/2" clearance between the lead and the 6C6G grid terminal. In later production, this lead was covered with copper tape and the 6C6G grid terminal. In later production, this shielding also prevents reoperation which may occur under conditions of such shielding. This shielding also prevents reoperation, so, must be realigned. In addition, the condenser, C03, connected to the shieldable arm of the Volume Control, should be changed from .01 mfd. to .06 mfd. to help reduce minimum volume. It is advisable to cover the shielding with insulating tubing.

If the center tap lug of the Volume Control is grounding to the chassis, it will prevent the volume from going to a low value. Examine this lug to be sure that it is not grounding to the chassis.

There have been instances of defective Volume Controls caused by arcing of the switch turning the resistance element. Controls have been improved, eliminating this condition and it will not occur in replacement controls.

CORRECTING MICROPHONICS:

Trouble may be experienced in the Model 101419 (not the 101412A) due to a microphone 6E70 tube. This is particularly true of 6E70 tubes having a yellow colored Silver-tone label. Tubes with a Gray label are of different manufacture and are less microphonic. However, to correct this, use the 6E70 tube instead of a 6E70 tube will correct microphonics. 6E70 tubes having a yellow label are of different manufacture and are less microphonic. The circuit changes, converting the 101412 into a 101412A, are described in the following paragraph.

As shown in the Schematic Section, Fig. 4, the connection of C44 is changed to the other side of R20. The 400 ohm, 1/3 watt resistor, R42, is added. The value of R20 is changed to 10000 ohms. In the illustration, the solid lines indicate the original 101412 connections. *R42* indicates original connections to be broken. Dotted lines show new 101412A connections.

CHASSIS DESIGNATION IF THE CHANGES MENTIONED IN THIS SUPPLEMENT HAVE ALREADY BEEN MADE:

Chassis in which all the changes mentioned in this Supplement have been made at the factory will be indicated by the letter, "P", on a subsequent letter rubber stamped on the chassis Identification Sticker at the rear of the chassis. Accordingly, do not attempt to make any of these changes on chassis marked with the letter, "P", or subsequent letter.

- To Correct Relay Trouble
 - (1) - 1/2 mfd. 500 volt condenser
 - (1) - .02 mfd. 500 volt condenser
 - (1) - .1 mfd. 500 volt condenser
- To Correct Faulty A.F.C. Tuning
 - (1) - .5000 ohm, 1/3 watt resistor
 - (1) - .1 mfd. 500 volt condenser
- To Correct Too High Minimum Volume
 - (1) - .06 mfd. 500 volt condenser
- To Replace 6E70 Tube With 6E70 Tube
 - (1) - .5000 ohm, 1/3 watt resistor
 - (1) - .1 mfd. 500 volt condenser

CORRECTING RELAY TROUBLE:

Relay trouble usually is indicated by one or more of the following symptoms:

1. Flash Tuning light stays on at all times.
2. Receiver does not operate in "Flash" position.
3. Flash Tuning light does not light (although this may be due to a burnt out bulb).
4. Radio remains muted even though not in "Flash" position.

The Service Instructions, E7E1 22, for this Model describe two types of relay and one type of coil that the second type should be used to correct these troubles. The original type of relay being used in the kit is of the first type. A third type of relay, part #101531556, has been developed and will be the one supplied for replacement purposes even though the original one was type #1 or type #2. The tabulation below shows how the three types of relay can be identified.

Relay Type Number

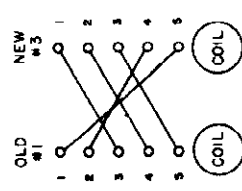
- | | |
|----|---|
| #1 | No shield cover. |
| | Shield cover but no paint spot on shield cover. |
| | Yellow paint spot on shield cover. |
| #2 | Red paint spot on cover. |
| | Red and green paint spot on cover. |
| #3 | Blue paint spot on cover. |

Relay type #1 was the first one used and most of the relay trouble probably will be experienced with this type. Relay type #2 is considerably improved and should give very much less trouble than type #1. It has the same coil construction as type #1 but has a different contact arrangement. Relay type #3 has the same contact arrangement as type #2 but has considerably stiffer springs and heavier contact pressure. It also requires a different coil requiring 66 milliamperes to operate this relay instead of the 60 milliamperes minimum required for type #1 and #2.

THE TYPE #3 RELAY SHOULD BE INSTALLED IN THE EVENT OF ANY RELAY TROUBLE WITH EITHER TYPE #1 OR TYPE #2 RELAY.

Replacing Relay Types #1 or #2 with Type #3:

The connections to the terminals of the type #3 relay remain the same for the new type #3. The connections from type #1 to #3 are: Consider the terminal to be numbered from 1 to 5 with terminal 5 the one nearest the coil. The lead that originally connected to terminal 1 of the type #1 relay is to be connected to terminal 5 of the type #3 relay. The original terminal 2 connection is to be changed to terminal 4. The original terminal 3 connection, to terminal 1. The original terminal 4 connection, to terminal 2. The original terminal 5 connection to terminal 5.



CHANGING TERMINAL CONNECTIONS FROM TYPE #1 RELAY TO TYPE #3 RELAY:

SEARS-ROEBUCK & CO.

MODELS 4488, 4588, 4588A
Changes Schematics

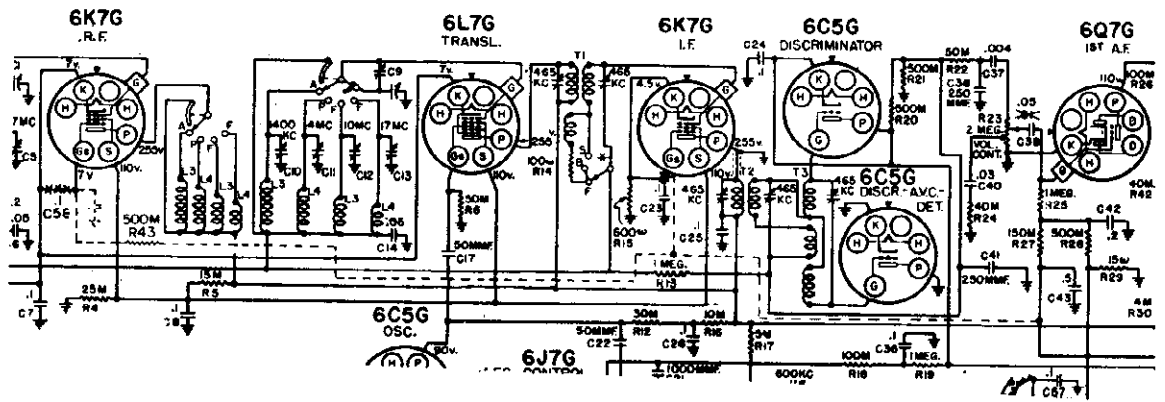


FIG. 3

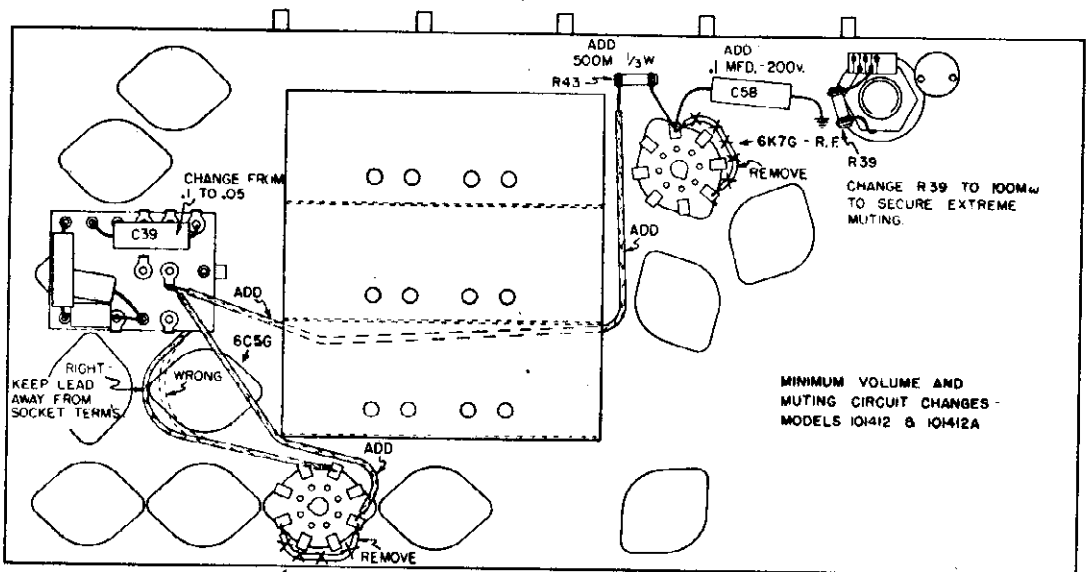


FIG. 3A

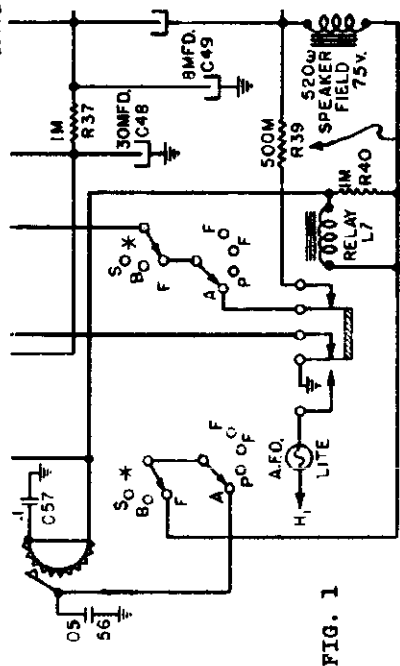


FIG. 1

CHANGE R39 TO 100M
TO SECURE EXTREME
MUTING.

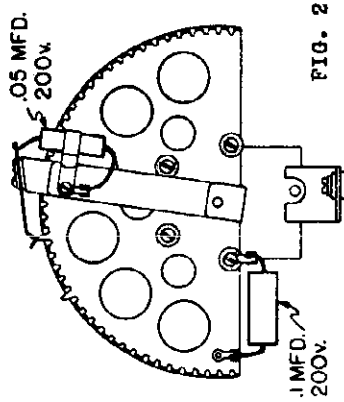


FIG. 2

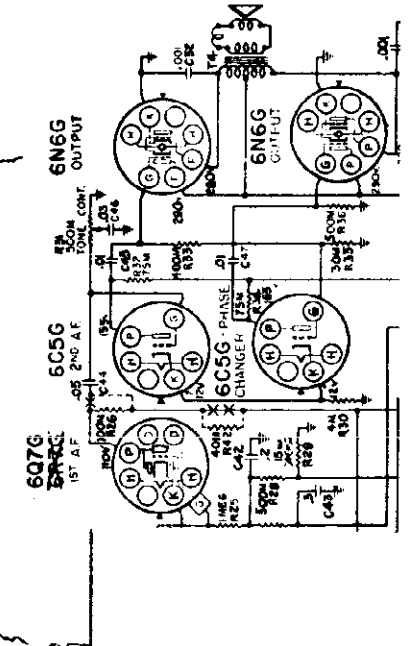
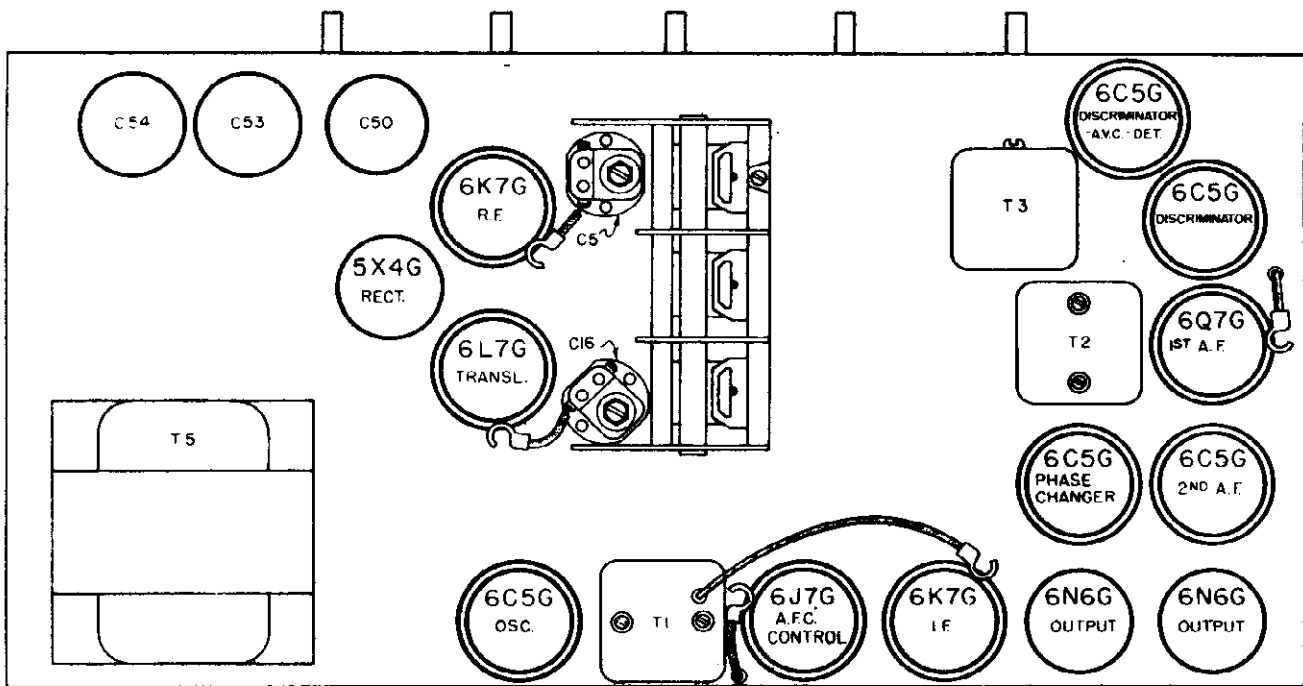


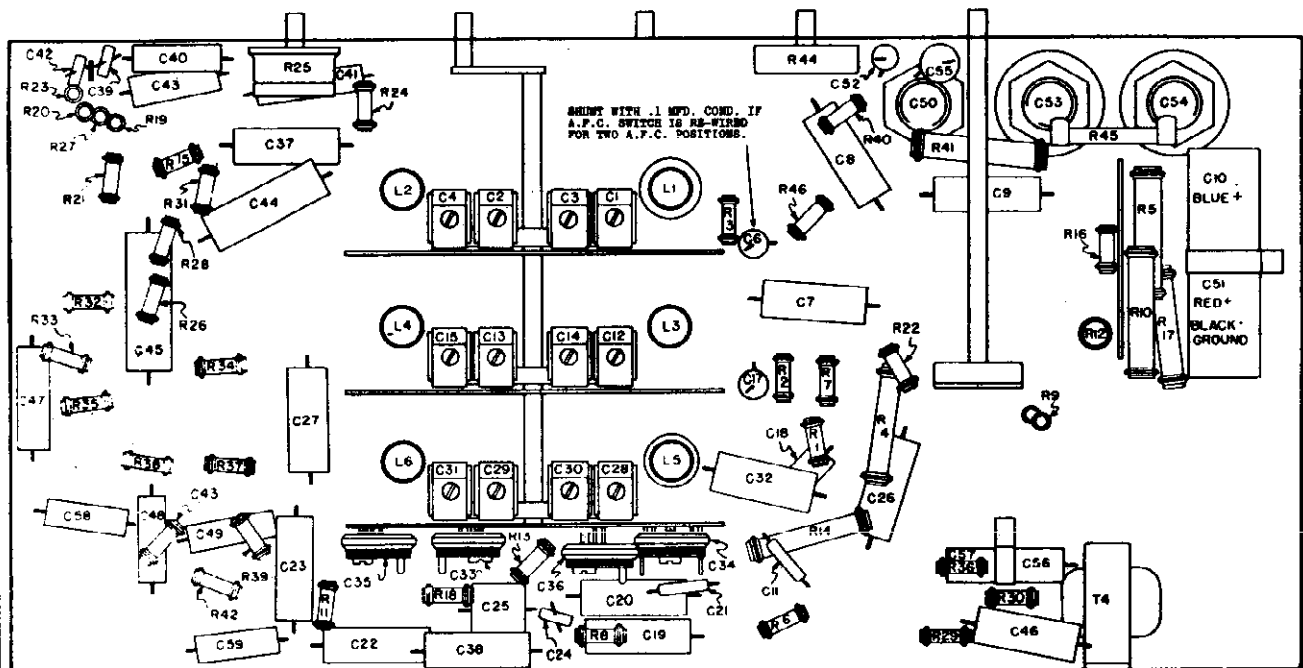
FIG. 4

MODELS 4488B, 4588B
 Socket, Trimmers
 Chassis

SEARS-ROEBUCK & CO.



LOCATIONS OF PARTS ON TOP OF CHASSIS - 101412B



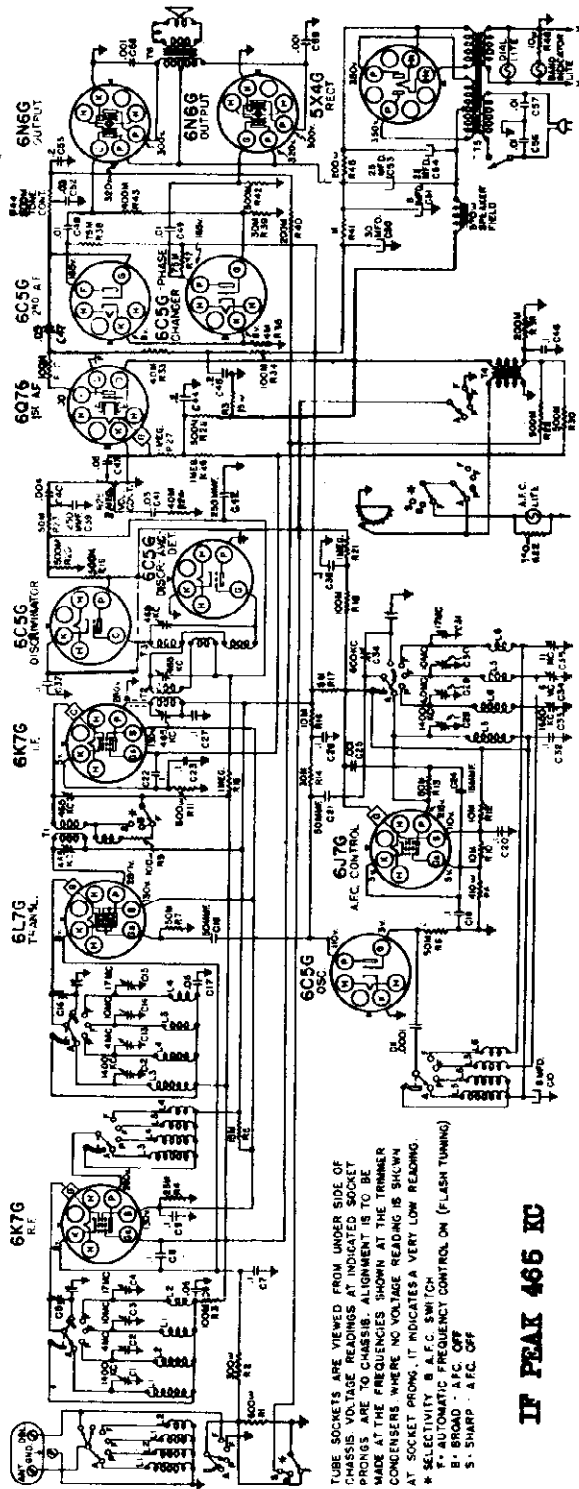
LOCATIONS OF PARTS UNDER CHASSIS - 101412B

SEARS-ROEBUCK & CO.

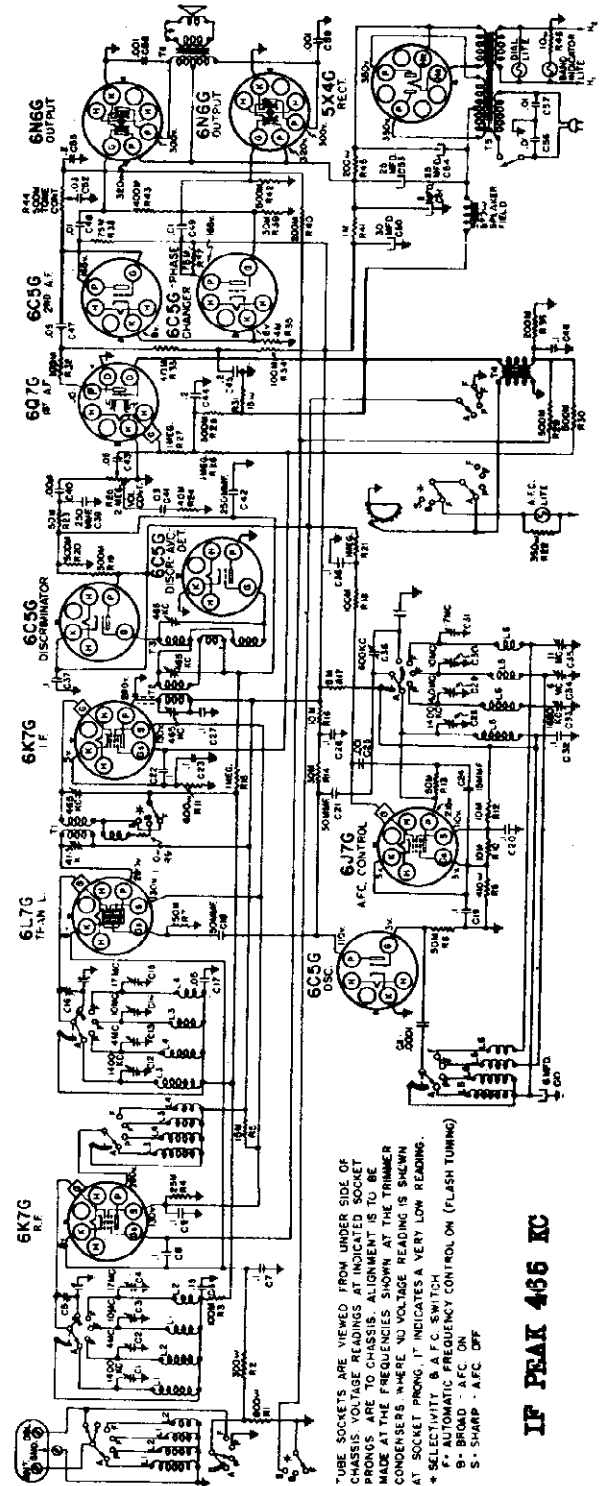
MODELS 4488B, 4588B
Schematics, Voltage

THIRTEEN TUBE, FOUR BAND SUPERHETERODYNE

MODELS 4488B, 4588B

57RL 23
Supplement No. 8
October 30, 1936

WIRING DIAGRAM - 101412B - ONE A.F.C. POSITION



WIRING DIAGRAM - 101412B TWO A.F.C. POSITIONS

MODELS 4488, 4588, 4488A
4588A, 4488B, 4588B

SEARS-ROEBUCK & CO.

Changes

CHANGE IN CONNECTIONS AND OPERATION OF THE FLASH TUNING - SELECTIVITY SWITCH (RIGHT HAND KNOB):

The right hand knob has three positions marked, "SHARP", "B" (BROAD); "FLASH". In all of the sets using a relay and in the first production of these using a transformer the relay was operated in the conventional manner in the "SHARP" and "B" positions. In the "FLASH" position, the A.F.C. and Flash Tuning circuits were connected. In later production sets using the transformer, the operation and connections of the A.F.C. - Selectivity Switch have been changed so that the radio operates in the conventional manner only in the "SHARP" position. In the "B" position, the A.F.C. is connected and Selectivity is **SHARP**. In the "FLASH" position, the A.F.C. also is connected and Selectivity is **SHARP**. In other words, in later production there are two A.F.C. positions with a choice of broad or sharp selectivity. There is one non-A.F.C. position with sharp selectivity.

With the original connection of the A.F.C. switch, providing only broad selectivity in the "FLASH" position, difficulty may be encountered in some locations due to adjacent channel interference or heterodyne whistles. In such difficulty is encountered in sets having the original connection, the switch may be changed to provide the two selectivity positions for A.F.C. Flash Tuning. Fig. 1 shows the switch connection changes for sets using the relay. Fig. 2 shows the switch connection changes for sets having an A.F.C. transformer. Note that former sets the original #10 connection is removed entirely from the switch. In transformer sets the original #10 connection is removed entirely. In addition, in sets of all types (101412, 101412A, 101412B), a .1 mfd. condenser must be shunted across the .05 mfd. condenser, C8. See the Locations of Parts diagram. In later production of Model 101412B, embodying the two A.F.C. - Selectivity positions, a .15 mfd. condenser is used for C8.

MODELS 4488, 4488B, 4588, 4588A, 4588B

SUBJECT: A.F.C. INACCURACY DUE TO DIFFERENCE IN LINE VOLTAGE

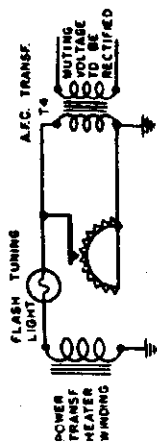
The setting of the teeth for A.F.C. stations is affected by the voltage of the power supply line. For example, suppose the stations to be set up at the Retail Store on a 120 volt line. If the radio is then delivered to the customer's home and the voltage there is considerably lower, say 105 volts, the A.F.C. settings will not be correct. The shift may amount to three or four kilocycles.

Accordingly, if the A.F.C. stations are not set up at the customer's home, care must be taken to see that the line voltage at the time the stations are set up is the same as the average line voltage at the customer's home. It may be necessary to use a series resistor or a booster transformer to duplicate the line voltage conditions that exist at the customer's home.

SUBJECT: CIRCUIT CHANGES TO ELIMINATE ANY JUMP CHANNEL INTERFERENCE IN MODELS 4488-4588-4588A-4488A-4488B-4588B

The 101412 and 101412A chassis, described in Service Instructions 57RL 23 and in Supplement #1, use a relay to accomplish the various switching required by the Automatic Frequency Control - Flash Tuning feature. In later production of this Model the circuit was changed, eliminating the relay. A transformer is used in place of the relay to accomplish the same results. Such chassis are identified by the number, 1014123.

The simplified diagram below shows how the transformer is used to mute the receiver and to operate the Flash Tuning light.



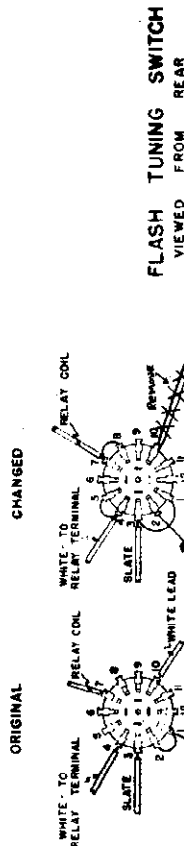
The A.F.C. transformer is a step-up transformer. Its primary is connected, in series with the Flash Tuning light bulb, across the heater winding of the power transformer. The toothed disc and contacting arm is connected across the primary of the A.F.C. transformer, as shown. The operation then is as follows: When the contacting arm is not engaging a tooth on the disc, the power transformer heater voltage is impressed in series with the Flash Tuning light bulb, upon the primary of the A.F.C. transformer. At this time the Flash Tuning light bulb, its impedance is too high to allow current to flow through the primary of the A.F.C. transformer. The voltage across the diode plates of the 607G tube is stepped up in the secondary and rectified by the diode plates of the 607G tube. This diode voltage (approximately 40 volts) is applied to the diode plates of the RF and IF tubes and to the secondary of the second AF tube, to provide muting. These are the conditions that exist when the right hand knob is turned to a Flash position and the receiver is tuned between Flash stations.

When the receiver is tuned to a Flash station, the contacting arm touches the tooth bent up for the station. This short circuits the primary of the A.F.C. transformer, with the impedance of this primary removed from the circuit the full voltage of the heater winding is impressed across the Flash Tuning light bulb causing it to light. Since the A.F.C. primary is short circuited, no voltage is developed across its secondary, thereby removing the muting bias. The receiver then is in operating condition and receives the station selected for flash tuning.

In the original sets using a relay, one set of contacts on the relay was used to prevent the A.F.C. from operating until the bent up tooth contacted the movable arm. This was necessary to prevent a strong station from being "pulled over" from an adjacent channel as the receiver was tuned through it, since the receiver was alive up to the audio stage. When the A.F.C. transformer is used in place of the relay, this "pull over" cannot occur because the receiver is made inoperative right at its input by muting of the RF tube.

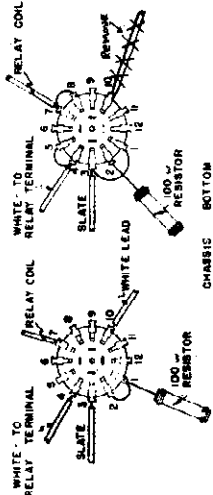
IMPORTANT NOTE IN SETTING UP A.F.C. STATIONS:

IT IS VERY IMPORTANT THAT THE RECEIVER BE TUNED ON FOR TWENTY MINUTES BEFORE SETTING UP A.F.C. STATIONS ON THE TUNING DISC. IF STATIONS ARE SET UP WITH THE RECEIVER WARM, FREQUENCY DRIFT MAY CHANGE THE ACCURACY AND RELIABILITY OF THE SETTING WHEN THE RECEIVER WARMS UP.



ORIGINAL

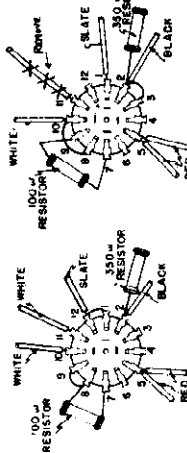
CHANGED



FLASH TUNING - SELECTIVITY SWITCH CIRCUIT CHANGE. SETS WITH RELAY.

FIG. 1

ORIGINAL



CHANGED

FLASH TUNING SWITCH VIEWED FROM REAR

FLASH TUNING - SELECTIVITY SWITCH CIRCUIT CHANGE. SETS WITH TRANSFORMER.

FIG. 2

MODELS 4488, 4588,
4488A, 4588A,
4488B, 4588B

FLASH TUNING SWITCH VIEWED FROM REAR

SEARS-ROEBUCK & CO.

MODEL S 4488, 4588, 4488A

4588A, 4488B, 458

Revised Alignment
AFC Adjustment

WAVE BAND SWITCH POSITION	POSITION OF DIAL POINTER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"VOL" (Next to "VOL")	10 mc	10 mc	400 ohms	Ant. Term.	C5, C14	Ant., Transl. 4
"VOL" (Next to "VOL")	4800 kc	4800 kc	400 ohms	Ant. Term.	C5, C16 **	Ant. Pad., Transl. Pad. 20
"VOL"	17 mc	17 mc	400 ohms	Ant. Term.	C31 *	Oscillator -
"VOL"	17 mc	17 mc	400 ohms	Ant. Term.	C4, C15	Ant., Transl. 6
"VOL"	11 mc (0)	11 mc	400 ohms	Ant. Term.	C36	Gas. Pad. 60

IMPORTANT ALIGNMENT NOTES

Waves indicated by (i) the variable should be rocked back and forth a degree or two while making the adjustment.

* Two peaks will be found at two different settings of the trimmer. Use the one in which the trimmer is screwed further in (greater capacity).

** Use a bakelite screw-driver in making these two adjustments. These adjustments should not be touched after this band has been lined up.

Repeat the entire alignment step by step in the original order for greater accuracy. Always keep the generator output power at its lowest possible value. This will prevent the AFC action of the receiver from interfering with accurate alignment.

The shield covering the coils at the bottom of the chassis should be left in place during the alignment. The trimmer condensers are accessible through the holes in the shield.

Only the dummy antenna indicated in the chart for any particular band should be used. Disconnect the dummy antenna used for alignment of any other band. No connection is to be made to the doublet terminal.

After the alignment has been completed, the A.F.C. adjustment should be made as follows:

A.F.C. ADJUSTMENT

CAUTION! The right hand knob must be in the "SHARP" position for operations 1 through 5. It is preferable to have two signal generators to make the adjustments. However, if two generators are not available, a broadcast station of approximately 1000 kc can be used for just capable of giving satisfactory results. The station chosen should be of medium strength. That is, one which will give a good signal but not be so strong that the volume control knob will be turned all the way to the right. The generator ground connection is to be made to the chassis.

1. Set one signal generator (or the broadcast station) to 1000 kc and 5000 microvolts output. Connect its output to the "air" terminal of the set, through a .0002 mfd. condenser.

2. Tune the receiver for maximum output (at 1000 kc). Then switch the signal generator modulation switch to the "off" position.

3. Short the movable arm to the toothed disc with a piece of wire. The Flash Tuning light should become illuminated.

4. Set the second signal generator to 485 kc and 10,000 microvolts output. Connect its output in series with a .00015 mfd. condenser to the control grid of the 6L70 tube. Turn the modulation switch to the "off" position.

5. Carefully turn the variable condenser until "zero beats" note is heard (with right hand knob in "SHARP" position).

6. Turn the right hand knob to the "FLASH" position (fully clockwise). Then adjust the discriminator unit, τ , for "zero beats". The correct setting will be obtained at about the center of the trimmer range. The adjustment is a very sharp one.

7. Turn the right hand knob to the "SHARP" and then to the "BROAD" positions. The receiver will sound more beat notes in the "SHARP" and "BROAD" positions if the A.F.C. is properly adjusted. If it does not, carefully repeat operation #6.

8. The A.F.C. can be checked for "pull in" in the following manner. Remove the signal generator connection from the 6L70 grid. (Two generators must be used.) Switch on the modulation of the 1000 kc generator and set the generator to give 5000 microvolts output. Reduce the frequency of the 485 kc generator until the output meter reading is about 1000 microvolts. Increase the signal generator frequency until the output meter reading is about 10,000 microvolts. The volume of the signal generator at this output meter reading. Then decrease the signal generator frequency until the output meter again reads .5 volt and note the signal generator frequency. If the A.F.C. is operating properly, the signal generator can be shifted 15 to 20 kc either side of 1000 kc before the output meter reading is reduced from 1.5 volts to .5 volt.

IMPORTANT NOTE ABOUT SETTING UP A.F.C. STATIONS ON ADJACENT CHANNELS:

In paragraph #10 under "SETTING UP THE AUTOMATIC FREQUENCY CONTROL" in the Service Instructions, the suggestion is made that if adjacent channel stations are selected the two lead function apart be used instead of the correct ones for the stations. For example, suppose the station to be selected is 710 kc and the correct function is "VOL" and "VOL" corresponding to 700 kc and 710 kc. Instead of using "VOL" and "VOL", the "VOL" and "VOL" would be bent up instead. The purpose of this is to prevent the receiver from tuning to one station to the other as the air signal strength varies. This suggestion will be helpful only if the station is sufficiently strong. Otherwise the mistuning will affect the tone quality. It is best to select, for A.F.C. tuning, stations at least 20 kc apart in frequency.

CHANGE IN PROCEDURE FOR REMOVING DIAL GLASS FOR SETTING UP FLASH TUNING STATION CALIBRATIONS

The Service Instructions for this model describe how to remove the dial glass by taking off the split retaining ring that holds it. In receivers using the 10L4PB chassis this procedure has been simplified by using an escutcheon with the dial glass moulded into it. It is held in place in the front of the cabinet by four screws. Accordingly, it is necessary merely to remove these four screws in order to take off the moulded escutcheon and dial glass.

CHANGE IN PROCEDURE FOR REMOVING PICK-UP JACK OPERATOR:

The Service Instructions for this model state that if a phonograph pick-up jack is used the right hand knob must be in either the "SHARP" position. This is true only for the 10L4PB chassis. In receivers using the A.F.C. position (Flash), in later production receivers using the A.F.C. position (Flash), or in receivers using the A.F.C. position (Flash) changed to provide these two positions, the right hand knob must be in the "SHARP" position for phonograph operation. This must be done, of course, to remove the muting from the audio tube, permitting phonograph reproduction.

REVISED ALIGNMENT PROCEDURE:

PREAMBLER:

Output meter connections - - - - - Across speaker voice coil
 Output meter reading to indicate .5 watts output - - - - - 2.5 volts
 Dummy antenna value to be in series with generator output - - - - - See chart below
 Connection of generator output lead - - - - - See chart below
 Generator modulation - - - - - 50%, 400 cycles
 Approximate average sensitivity in microvolts for .5 watts output - - - - - See chart below
 Position of Volume Control - - - - - Fully on
 Position of Tone Control - - - - - Fully clockwise
 Position of Flash Tuning and Selectivity Switch knob - - - - - Sharp, fully counter clockwise
 Position of Dial Pointer - - - - - To fall on 10 mc mark when variable is fully meshed

WAVE BAND SWITCH POSITION	POSITION OF DIAL POINTER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"VOL"	550 kc	485 kc	.1 mfd.	6L70 Grid	IF Output IF Input	-
"VOL"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C28, C1, C12	0mc., Ant., Translator 20
"VOL"	600 kc (1)	800 kc	.0002 mfd.	Ant. Term.	C26	0mc. Pos. 12
"VOL"	4 mc	4 mc	400 ohms	Ant. Term.	C29, C2, C13	0mc., Ant., Translator 4
"VOL"	1650 kc (0)	1650 kc	400 ohms	Ant. Term.	C25	0mc. Pad. 20
"VOL" (Next to "VOL")	10 mc	10 mc	400 ohms	Ant. Term.	C20 *	Oscillator -
"VOL" (Next to "VOL")	5 mc (0)	6 mc	400 ohms	Ant. Term.	C24	0mc. Pad. 20

MODELS 4502, 4504, 4508

Schematic, Voltage

SEARS-ROEBUCK & CO.

Notes

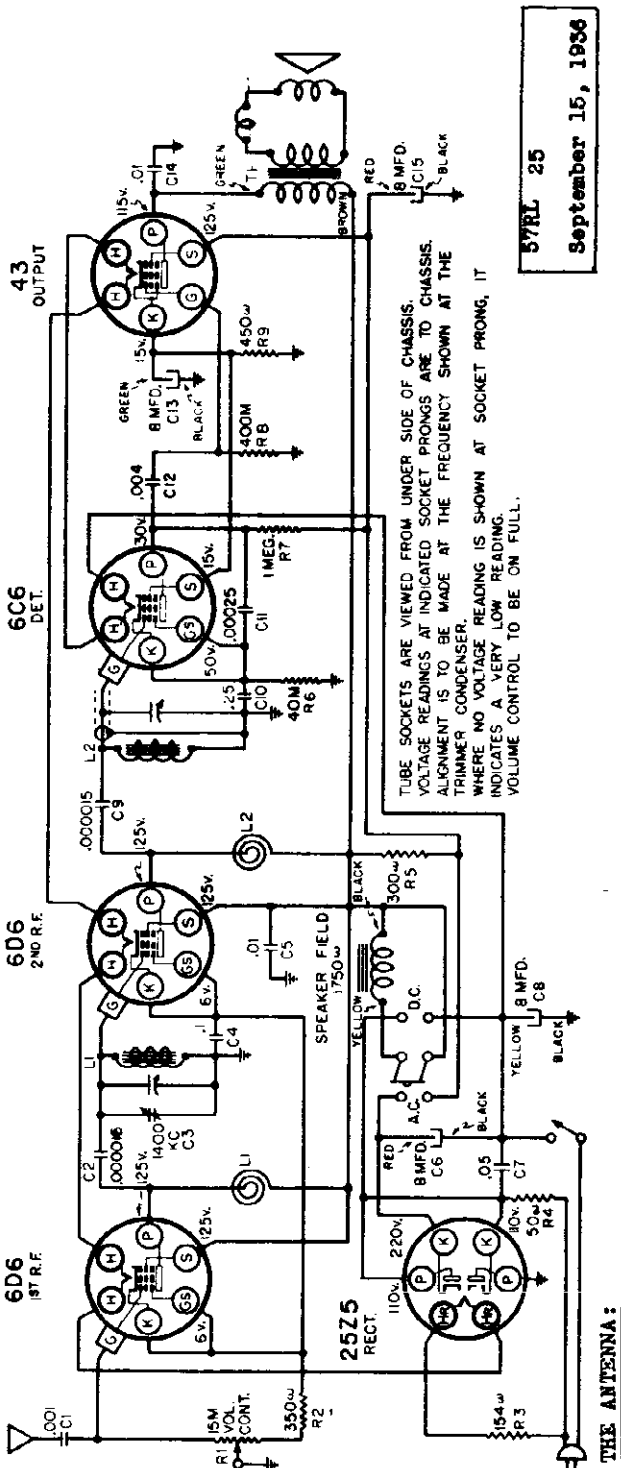
POWER SUPPLY: All models available ----- 25-60 cycle or DC, 48 watts

FREQUENCY RANGE: Broadcast ----- 545-1720 kc

ALIGNMENT FREQUENCY: 1400 kc

POWER OUTPUT: Type ----- Single Pentode
Undistorted ----- 1 watt
Maximum ----- 1.85 watts

LOUD SPEAKER: Type ----- Dynamic
Size ----- 5"
Field Coil Resistance ----- 1750 ohms
Field Coil Voltage Drop (Approximate) ----- 120 volts



57RL 25
September 15, 1936

OPERATING FEATURES:

Fidelity Range ----- 100 - 3000 cycles
Tone Control ----- None
Sensitivity Control ----- None
Automatic Volume Control ----- None

An attached antenna wire is supplied with the receiver. It should be uncoiled and extended as far from the radio as possible. If interference between stations is encountered, uncoil the antenna only far enough to obtain satisfactory reception, free of interference. In locations remote from broadcasting stations additional pick-up can be had by connecting the end of the antenna to a conventional outdoor antenna lead-in.

THE FILAMENT CIRCUIT AND POWER SUPPLY:

The filaments of all of the tubes are connected in series. Accordingly, if any one tube burns out the others will not light. It is necessary to replace only the burned out tube; the others then will light. A resistor, built into the line cord, reduces the line voltage to the value required by the tube filaments.

There is an AC-DC switch, accessible from the bottom of the cabinet and operated with a screw-driver. This switch must be in the proper position for AC or DC operation, as shown on the label at the bottom of the cabinet. If the receiver is operated from DC, the polarity of the line cord plug must be correct. If the receiver fails to operate after allowing a minute or two for the tubes to become heated, turn the plug half way around and re-insert it in its receptacle.

The line cord must not be shortened or altered in any way. To do so would affect the value of resistance built into it.

CAUTION:

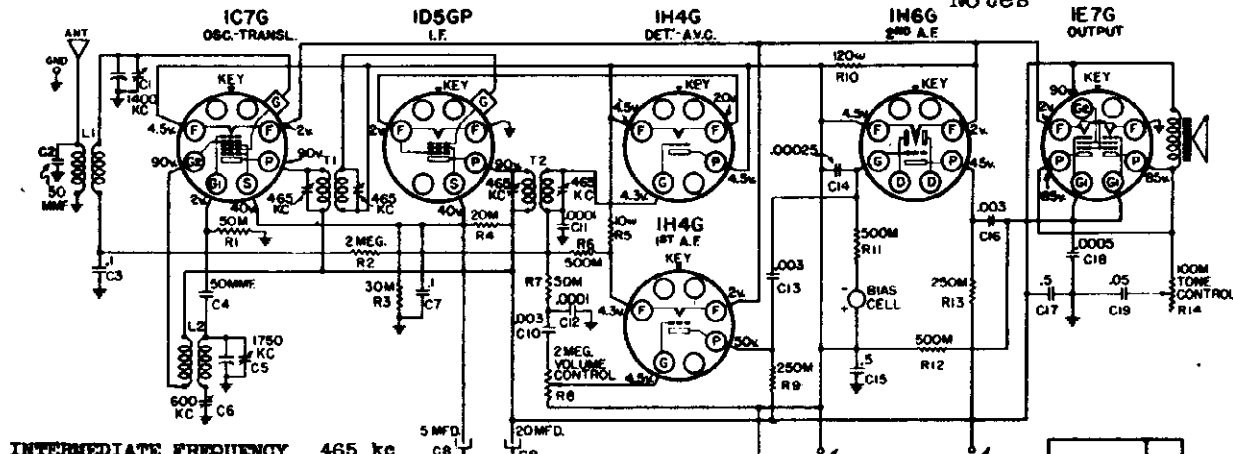
Under certain conditions, the chassis may be above ground potential by a value equal to the line voltage. For this reason, care must be taken not to allow any grounded object to come in contact with the chassis while the power cord is plugged into the line. The chassis is insulated from the metal bottom cover of the cabinet by means of rubber grommets.

SEARS-ROEBUCK & CO.

MODELS 4498, 4499, 45

Schematic, Voltage

Notes



INTERMEDIATE FREQUENCY 465 kc
 TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
 VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS
 ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE
 TRIMMER CONDENSERS.
 WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT
 INDICATES A VERY LOW READING.

WAVE-TRAP TO ELIMINATE INTERFERENCE FROM SHIP OR AIRPORT TRANSMITTERS:

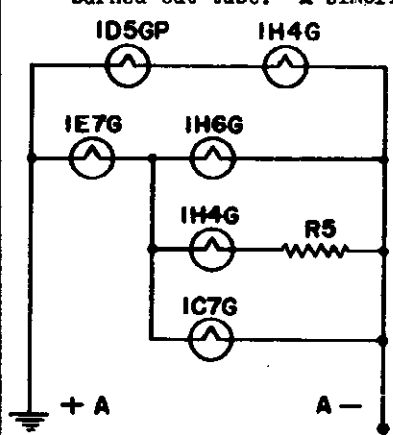
In locations near ship transmitters or airports or air beacon stations, code interference may be experienced. Part #1013114256 wave-trap is designed to eliminate such interference.

Mount the trap, by means of two wood screws, at any convenient place on the chassis shelf or cabinet where it will be near the antenna terminal of the receiver. Connect the yellow lead of the wave-trap to the antenna download. Splice the green lead of the wave-trap to the green antenna lead of the receiver. Cut off any excess length of wire from the trap and from the chassis antenna lead so that the green lead from the wave-trap to the chassis is as short as possible. The yellow lead from the wave-trap should be run so that it is as far as possible from the green lead. Splice one of the black leads from the wave-trap to the black ground lead of the receiver. Connect the other wave-trap black lead to the ground used for the installation.

The trap is pre-tuned to the IF frequency so that normally no further adjustment is necessary. However, should interference still be experienced, tune the receiver between approximately 550 and 600 kc. Then adjust the wave-trap, by means of the trimmer screw at the bottom of the container, until the interference is eliminated. Addition of the trap will reduce the sensitivity of the receiver around 600 kc by approximately 50%. The customer should be forewarned of this to avoid complaints of reduced sensitivity.

THE FILAMENT CIRCUIT:

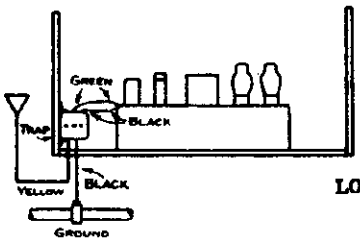
Since the tube filaments are rated at two volts and the "A" supply is four volts, a series parallel arrangement is used for the tube filament circuit. Accordingly, if any one tube burns out its companion tube will also be affected. It is necessary to replace only the burned out tube. A simplified circuit of the filament connections is shown below.



POWER OUTPUT:

Type	Twin Pentode
Undistorted	0.25 watts
Maximum	0.6 watts

57RL 38
 January 25, 1937



LOUD SPEAKER:

Type	Magnetic
Size	6"
Approximate DC resistance	1000 ohms

POWER SUPPLY:

"A" Battery (4 1/2 volt dry)	1 - #5031P
"A" Battery (4 volt storage)	1 - #5049
"B" Batteries	2 - #5131P

"A" Drain 0.3 amperes
"B" Drain 22 ma

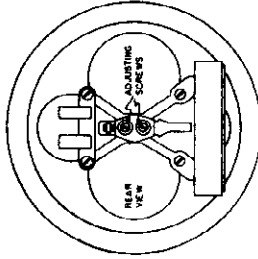
FREQUENCY RANGE:
 Broadcast 540-1750 kc

ALIGNMENT FREQUENCIES:

Oscillator	1750 kc	Translator	1400 kc	Padder	600 kc
Trimmer		Trimmer			

MODELS 4498, 4499, 4598
Socket, Trimmers, Notes
Alignment, Sensitivity

SEARS-ROEBUCK & CO.



BATTERY CONNECTIONS:

- A- Black and yellow
- B- Yellow and blue
- C- Red and black
- D- 90B

SPEAKER ADJUSTMENT:

There are two adjusting screws at the rear of the speaker, as shown in the illustration. Speaker rattles can be corrected by turning the screws in or out until the rattle is eliminated.

ELIMINATING WHISTLE AT 930 KC:

A whistle, due to a beat between the second harmonic (930 kc) of the 465 kc IF, and a 930 kc signal may be experienced. In localities where the 930 kc station is one that is frequently listened to, it will be desirable to adjust the whistle to some other point where it will not be objectionable. This can be done by shifting the IF frequency of the receiver.

Determine at what point between 900 kc and 960 kc the whistle will be least objectionable. Dividing this frequency by two will give the new IF frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 915 kc would not be objectionable, the IF should be realigned at 915/2 or 457.5 kc.

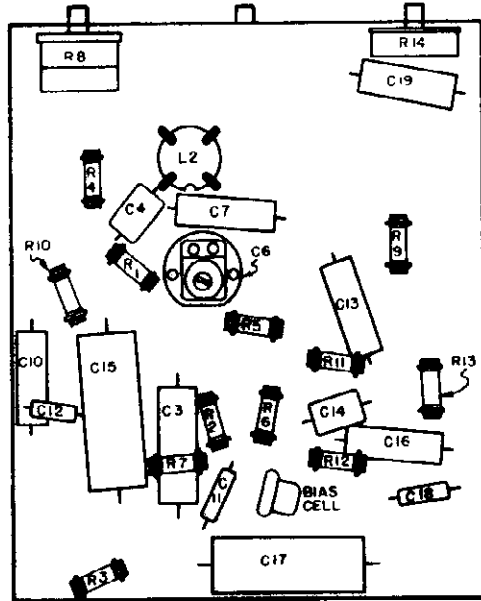
Align the IF at the new frequency and then realign the rest of the receiver as described under "ALIGNMENT PROCEDURE".

BATTERY REPLACEMENT:

The dry "A" battery should be replaced when its voltage drops to 3.4 volts, under load. The "B" batteries should be replaced when the total voltage has dropped to 88 volts, under load.

THE BIAS CELL:

The bias cell is filled with thick liquid. When the receiver is in its normal position the bias cell will be mounted on its side, which is the correct position, so that the liquid will come into contact with the carbon block and the inside of the seal container. However, the receiver may be stood on its end when working on it on the bench. In this position the liquid will cause severe distortion. Accordingly, the necessary precaution should be observed when working on the receiver on the service bench.



LOCATIONS OF PARTS UNDER CHASSIS.

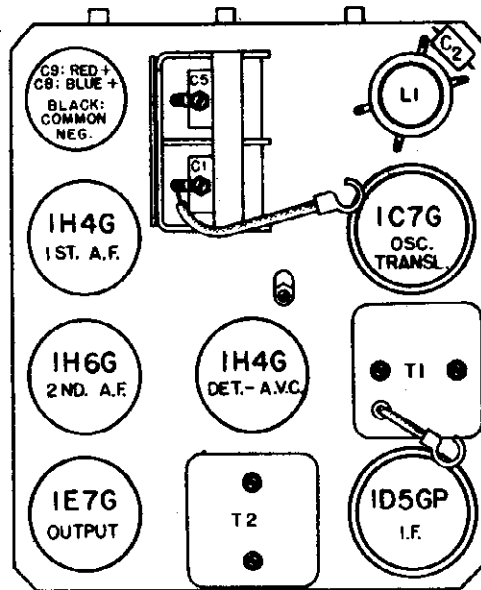
ALIGNMENT PROCEDURE

PRELIMINARY:	OUTPUT METER CONNECTIONS	OUTPUT METER READING TO INDICATE 50 MILLIWATTS	AVERAGE SENSITIVITY IN MICROVOLTS FOR 50 MILLIWATTS OUTPUT	GENERATOR GROUND LEAD CONNECTION	DUMMY ANTENNA VALUE TO BE IN SERIES WITH GENERATOR OUTPUT	CONNECTION OF GENERATOR OUTPUT LEAD	GENERATOR MODULATION	POSITION OF VOLUME CONTROL
	4000 ohm meter, in series with a .5 mfd. condenser, across speaker terminals.	8.5 volts	See chart below	Receiver chassis	See chart below	See chart below	30%, 400 cycles	Fully on

TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	TALKER FUNCTION	APPROXIMATE MICROVOLTS
T1, T2	IF	90
C5	Osc. Trim.	90
C1	Trimmer	20
C8	Osc. Pad.	15

IMPORTANT ALIGNMENT NOTES

The variables should be rotated back and forth a degree or two while making the 900 kc adjustment. The alignment procedure should be repeated in the original order, step by step, to insure greater accuracy. Always keep the output power from the generator at its lowest possible value to prevent the ATC of the receiver from interfering with accurate alignment. After the alignment has been completed, check the calibration by tuning in a broadcast station at about 900 kc. Adjust the dial pointer to the station's frequency, if necessary.



LOCATIONS OF PARTS ON TOP OF CHASSIS.

OPERATING FEATURES:
Fidelity Range 50 - 3000 cycles
Automatic Volume Control

CHASSIS FEATURES:
Number IF stages None
Number IF stages One
Number condensers in gang Two
Antenna Conventional
Dial calibrated in kilocycles and meters

SEARS-ROEBUCK & CO. MODELS 4501, 4503, 4507 Schematic, Voltage, Not.

POWER SUPPLY:
 All models available - - - - - 105-125 volts; 50-60 cycle AC only, 40 watts

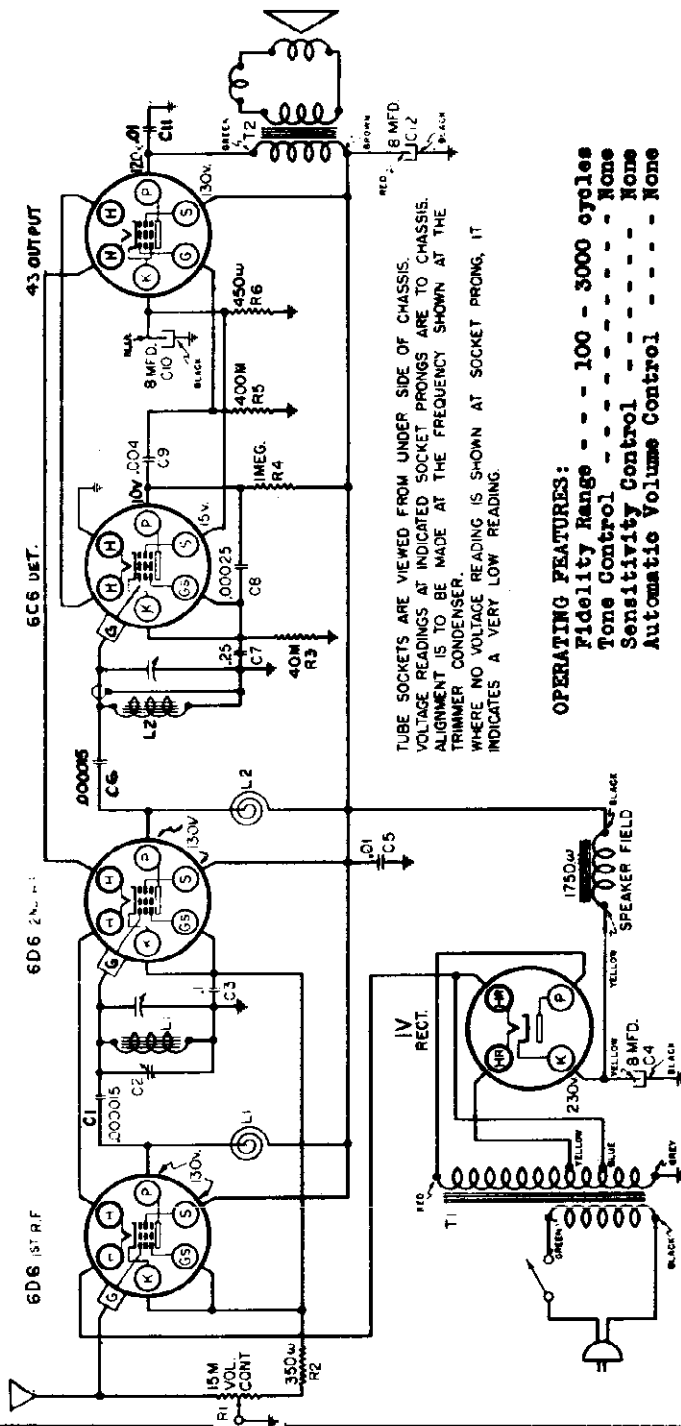
FREQUENCY RANGE:
 Broadcast - - - - - 545-1720 kc

ALIGNMENT FREQUENCY:
 1400 kc

POWER OUTPUT:
 Type - - - - - Single Pentode
 Undistorted - - - - - .98 watts
 Maximum - - - - - 1.64 watts

LOUD SPEAKER:
 Type - - - - - Dynamic
 Size - - - - - 5"
 Field coil resistance - - - - - 1750 ohms
 Field coil voltage drop (approximate) - - - - - 120 volts

CHASSIS FEATURES:
 Number of tuned RF stages - - - - - Two
 Number of condensers in gang - - - - - Two
 Antenna - - - - - Self-contained
 Dial - - - - - KC calibration on large tuning knob.



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT THE TRIMMER CONDENSER. WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES A VERY LOW READING.

OPERATING FEATURES:
 Fidelity Range - - - - - 100 - 3000 cycles
 Tone Control - - - - - None
 Sensitivity Control - - - - - None
 Automatic Volume Control - - - - - None

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 September 15, 1936

GENERAL INFORMATION

THE ANTENNA:

An attached antenna wire is supplied with the receiver. It should be uncoiled and extended as far from the radio as possible. If interference between stations is encountered, uncoil the antenna only far enough to obtain satisfactory reception, free of interference. In locations remote from broadcasting stations additional pick-up can be had by connecting the end of the antenna to a conventional outdoor antenna lead-in.

THE FILAMENT CIRCUIT:

All of the tubes, except the 1V, are connected in series. Accordingly, if any one tube burns out the others will not light. It is necessary to replace only the burned out tube; the others then will light.

THE POWER TRANSFORMER:

The Model 101426 is identical to the Model 101393 except that the 101426 uses a power transformer with separate primary and secondary. (The 101393 uses an auto-transformer.) Accordingly, the chassis of the 101426 is at ground potential. (The 101393 chassis under

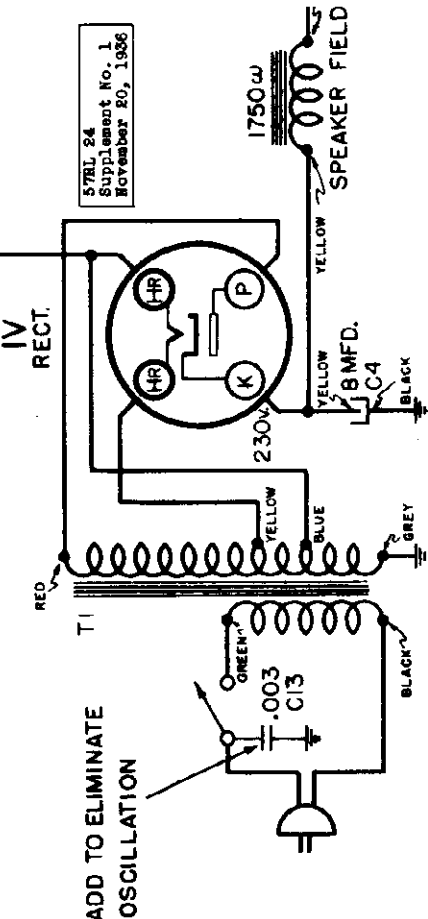
MODELS 4501, 4503, 4507
Socket, Trimmers, Parts
Notes

SEARS-ROEBUCK & CO.

Alignment

SUBJECT: ELIMINATING OSCILLATION

Oscillation may occur due to variations in tubes. To overcome such oscillation, connect a .003 condenser from the line side of the switch to the chassis. This condenser may be of at least 800 volts rating, or higher. Preferably 800 volts. This condenser is C13 in the Schematic section below, and has been added in later production sets.



ADD TO ELIMINATE OSCILLATION

POWER TRANSFORMER COLOR CODE

- 1-Green
- 2-Black
- 3-Red
- 4-Yellow
- 5-Blue
- 6-Gray

REPLACEMENT PARTS AND PRICE LIST

SYNCHRONIC LOCATION	PART NUMBER	DESCRIPTION
	1015514797	Antenna Cord - White
	1015514050	Antenna Cord - Black
	1015514783	Antenna Cord - Brown
	1015414800	Button - Snap, variable condenser shield
	10180143181	Cabinet - Ivory with grille
	10180140281	Cabinet - Black with grille
	10180145541	Cabinet - Brown with grille
	1018414479	Cloth - Grille, front, ivory, with paper baffle
	10180145551	Cloth - Grille, front, gold, with paper baffle
	10180147401	Cloth - Grille, rear, ivory, with paper baffle
	10180145536	Cloth - Grille, rear, gold, with paper baffle
	1018014741	Cloth - Grille, rear, ivory
	101814038	Coil - UP
	101814035	Condenser - Variable
	1018015401	Condenser - Electrolytic, triple, dry
		Condenser - .88 mfd., 200 V.
		Condenser - .1 mfd., 200 V.

SCHEMATIC PART NUMBER DESCRIPTION

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
C6, 011		Condenser - .01 mfd., 400 V.
C6		Condenser - .0005 mfd. mist
C6		Control - Volume, switch
R1	1028414054	Grid - Line, white
	1028514759	Grid - Line, black
	1028514061	Grid - Line, brown
	1028514781	Grid - Line, ivory
	10260140611	Cover - Cabinet bottom
	1028414058	Grassmat - Chassis mounting
	102814735	Knob - Volume control, black
	102814736	Knob - Tuning, ivory, gold lettered calibration
	102814538	Knob - Tuning, ivory, brown lettered calibration
	102814322	Knob - Volume control, ivory
	102814059	Knob - Volume control, black
	102814637	Knob - Volume control, brown
		Resistor - 1 megohm, watt
R4		Resistor - 400 ohm, 1/2 watt
R5		Resistor - 400 ohm, 1/2 watt
R5		Resistor - 400 ohm, 1/2 watt
R6		Resistor - 400 ohm, 1/2 watt
R6		Resistor - 400 ohm, 1/2 watt
R2		Resistor - 400 ohm, 1/2 watt
		Shield - tube
		Socket - 4 prong
		Socket - 6 prong
		Speaker - 5" Dynamic
		Cone and voice coil
		Field coil
		Transformer - Power
R7		Transformer - Power
Z1		Transformer - Power

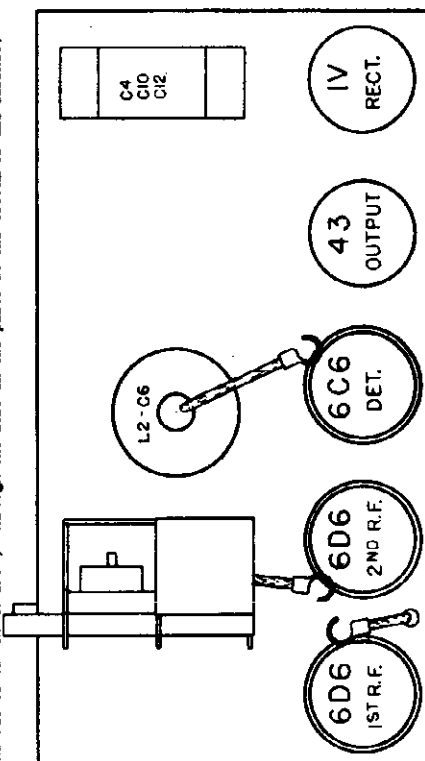
WHERE NO PART NUMBER IS ASSIGNED, ORDER BY DESCRIPTION AND QUANTITY

ALIGNMENT PROCEDURE

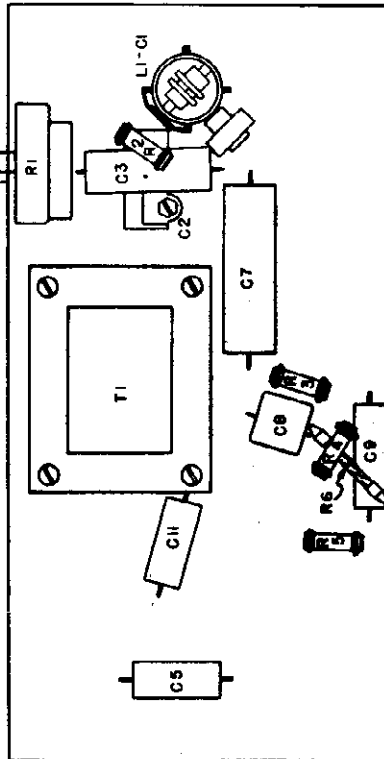
The receiver need not be taken out of the cabinet for alignment.

Either a broadcast signal of about 1400 kc or a test oscillator signal may be used. If a broadcast signal is used, the antenna of the receiver should be extended as in a normal installation. If a test oscillator signal is used, a wire should be connected to the test oscillator terminal on the back of the receiver's antenna wire. The generator ground connection should be connected to ground.

Tune in the 1400 kc signal and adjust the trimmer for maximum loud speaker response. This can be done most accurately if the Volume Control setting is reduced to give a low volume level. The variable should be rocked a degree or two during the adjustment. The location of this trimmer is shown in the Location of Parts Diagram. It is accessible, when the chassis is in the cabinet, through the hole in the plate at the bottom of the cabinet.



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS

SEARS-ROEBUCK & CO.

MODELS 4569, 4589
Schematic, Voltage

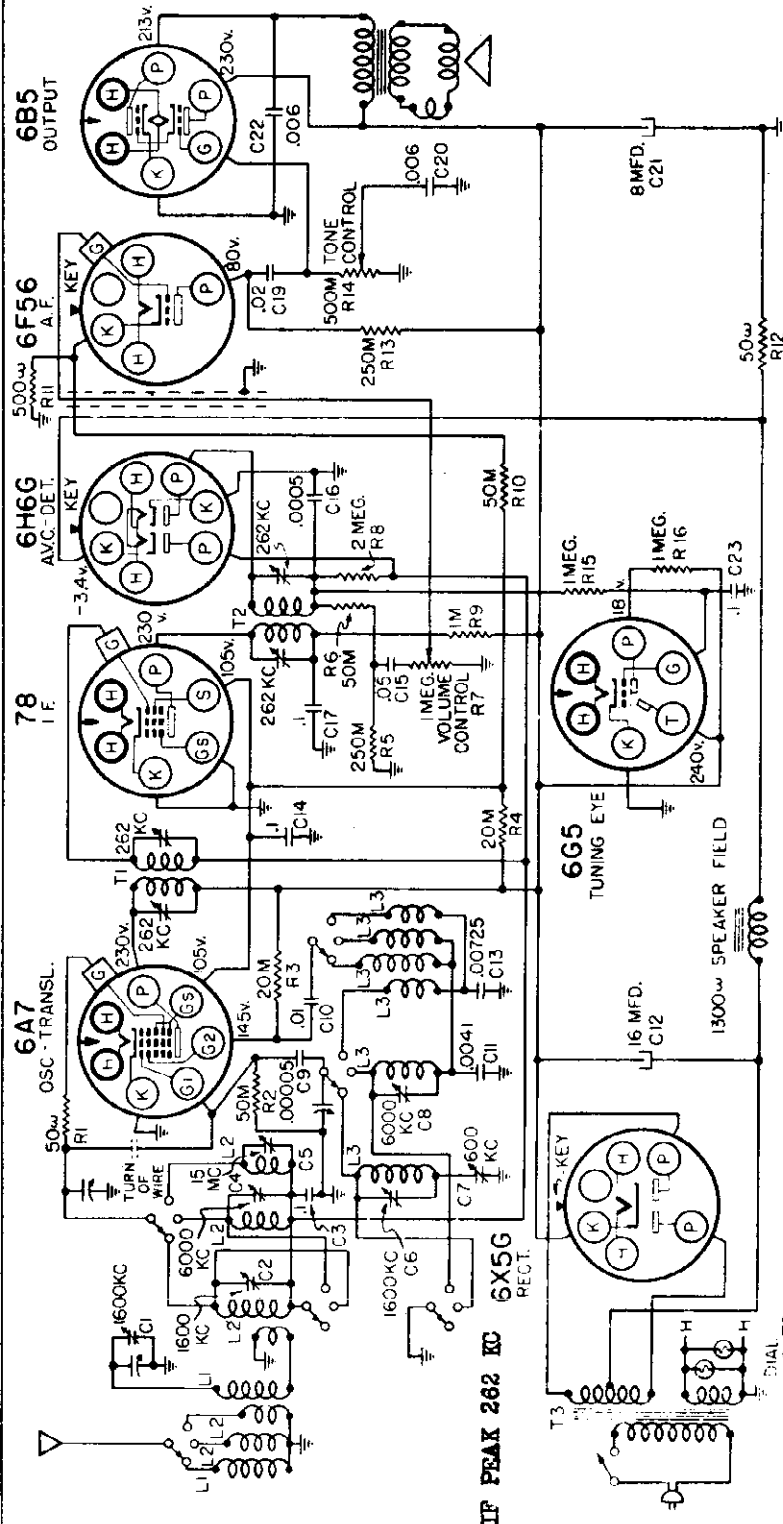
POWER SUPPLY:

All models available - 105-125 volts, 50-60 cycle, 48 watts
All models available - 105-125 volts, 25 cycle, 50 watts

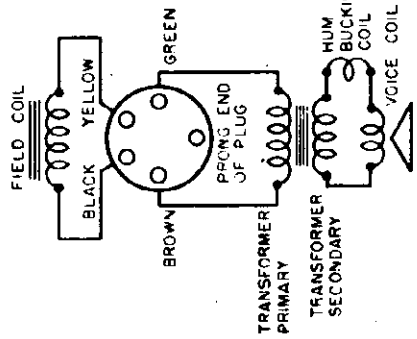
FREQUENCY RANGES:

Band "A" 545-1825 kc
Band "P" 2.1-6.3 mc
Band "F" 6.3-19 mc

INTERMEDIATE FREQUENCY 262 kc



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS. WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES A VERY LOW READING.



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October 1, 1936

TRANSFORMER COLOR CODE

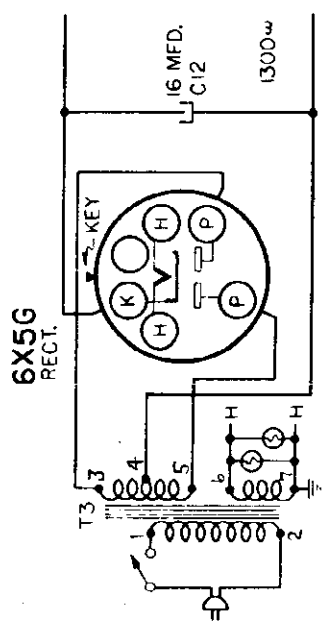
- 1-Blue
- 2-Blue
- 3-Red
- 4-Green
- 5-Red
- 6-Black
- 7-Black

POWER OUTPUT:

Type Single Pentode
Undistorted 2.66 watts
Maximum 4 watts

LOUD SPEAKER:

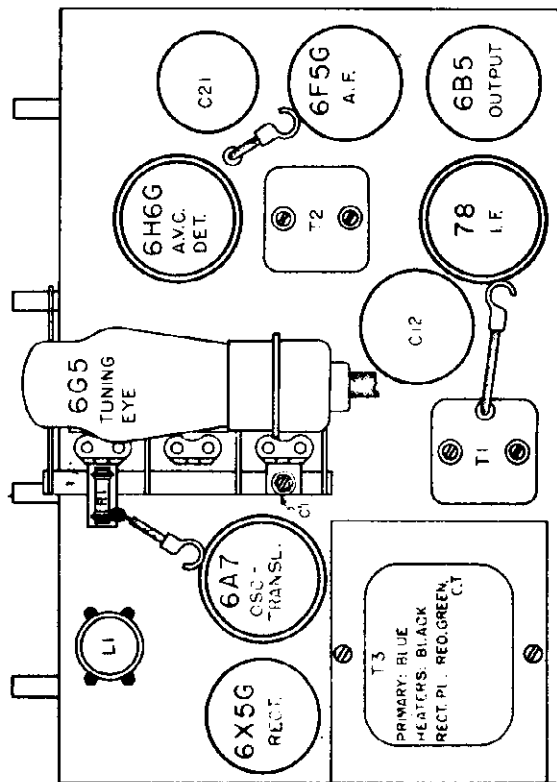
Type Dynamic
Size 6" and 8"
Field coil resistance 1300 ohms
Field coil voltage 75 volts



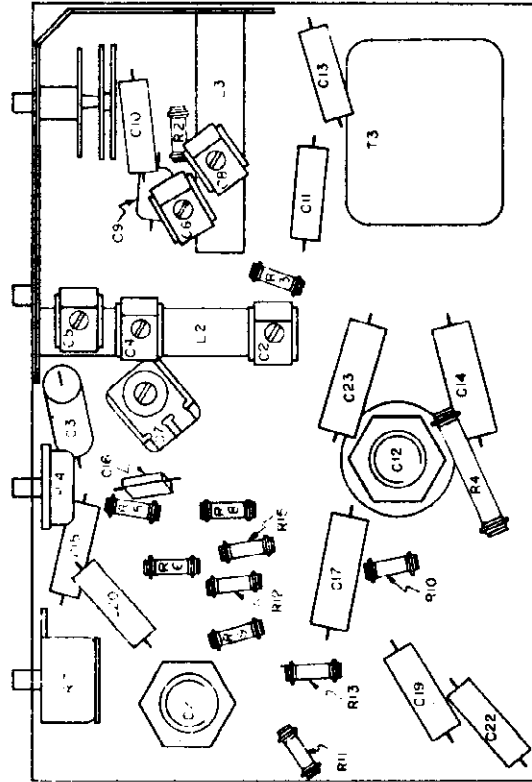
MODELS 4569, 4589

Socket, Trimmers
Alignment, Sensitivity

SEARS-ROEBUCK & CO.



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS

ALIGNMENT PROCEDURES

WAVE BAND SWITCH POSITION	POSITION OF DIAL POINTER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	APPROXIMATE MICROVOLTS
"A"	-	252 kc	.1 mfd.	6A7 Gr-1d	T2, T1	150
"A"	To fall on first short line on dial between 250 and tuning eye when variable is fully meshed.	1500 kc	.0002 mfd.	Antenna Terminal	C6, C2, C1	40
"A"	800 kc (rock)	800 kc	.0002 mfd.	Antenna Terminal	C7	40
"P"	6 mc	6 mc	400 ohms	Antenna Terminal	C8	-
"P"	6 mc (rock)	6 mc	400 ohms	Antenna Terminal	C4	25
"P"	15 mc (rock)	15 mc	400 ohms	Antenna Terminal	C5	25
"P"	7 mc	7 mc	400 ohms	Antenna Terminal	Loop at bracket end of L3	80

TRIMMERS

WAVE BAND SWITCH POSITION	POSITION OF DIAL POINTER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	APPROXIMATE MICROVOLTS
"A"	-	252 kc	.1 mfd.	6A7 Gr-1d	T2, T1	150
"A"	To fall on first short line on dial between 250 and tuning eye when variable is fully meshed.	1500 kc	.0002 mfd.	Antenna Terminal	C6, C2, C1	40
"A"	800 kc (rock)	800 kc	.0002 mfd.	Antenna Terminal	C7	40
"P"	6 mc	6 mc	400 ohms	Antenna Terminal	C8	-
"P"	6 mc (rock)	6 mc	400 ohms	Antenna Terminal	C4	25
"P"	15 mc (rock)	15 mc	400 ohms	Antenna Terminal	C5	25
"P"	7 mc	7 mc	400 ohms	Antenna Terminal	Loop at bracket end of L3	80

IMAGE ADJUSTMENT

Set the generator to 1524 kc and tune in the signal image at about 1000 kc on the receiver. The generator should be adjusted for high output (11 volts). There is a lead running from LI through a hole in the chassis to the wave switch. Adjust the position of this lead under the chassis for minimum image response.

IMPORTANT ALIGNMENT NOTES

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment. It is advisable to repeat the entire alignment procedure band by band and in the original order to insure greater accuracy.

Always keep the output from the test oscillator at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly. This will prevent the AVC from interfering with accurate alignment.

After the alignment procedure has been completed, tune in a broadcast signal at about 500 kc. If necessary, shift the dial pointer so that it indicates this frequency.

Values shown under, "Microvolts", are only approximate.

SEARS-ROEBUCK & CO.

MODEL 4587
Schematic, Voltage
Data

POWER SUPPLY:

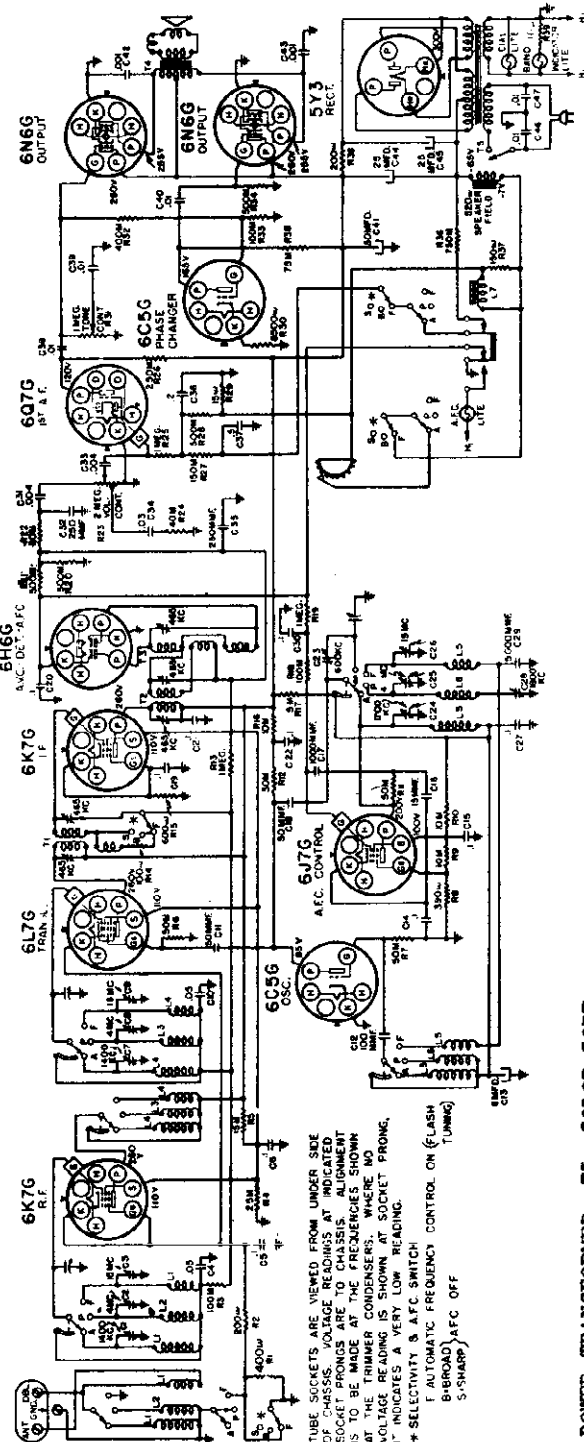
All models available - - - - - 105-125 volts, 50-60 cycle, 110 watts
All models available - - - - - 106-125 volts, 25 cycle, 110 watts

FREQUENCY RANGES:

AMERICAN Band - - - - - 540-1550 kc
POLICE Band - - - - - 1550-5400 kc
FOREIGN Band - - - - - 5.9-17 mc

ALIGNMENT FREQUENCIES:

	Osc. Trimmer	Ant-Transl. Trimmer	Osc. Padder
Band "AM"	1400 kc	1400 kc	600 kc
Band "POL"	4 mc	4 mc	1.8 mc
Band "FOR"	15 mc	15 mc	Fixed



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September 10, 1936

INTERMEDIATE FREQUENCY - - - - - 465 kc

POWER OUTPUT:

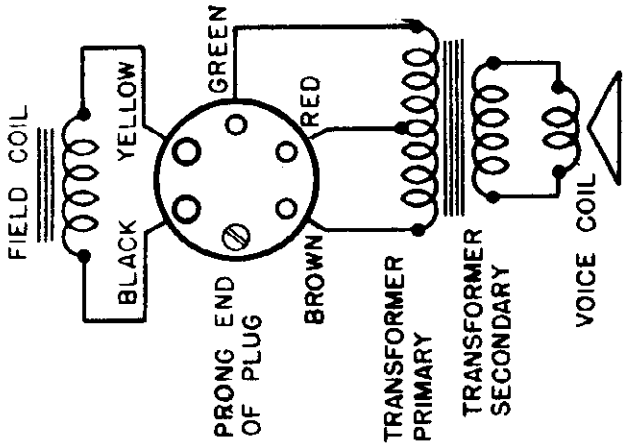
Type - - - - - Push-Pull
Undistorted - - - - - 9 watts
Maximum - - - - - 11.4 watts

LOAD SPEAKER:

Type - - - - - Dynamic
Size - - - - - 10"
Field coil resistance - - - - - 520 ohms
Field coil voltage drop - - - - - 60 volts

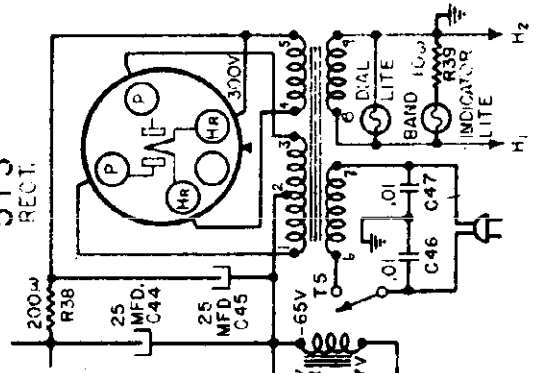
CHASSIS FEATURES:

Number RF stages - - - - - One
Number IF stages - - - - - One
Antenna - - - - - Doublet or Conventional



POWER TRANSFORMER, T5, COLOR CODE

- 1-Red
- 2-Slate
- 3-Blue
- 4&5-Red
- 6-Black
- 7-Green
- 8&9-Black



WAVE-TRAP TO ELIMINATE INTERFERENCE FROM SHIP OR AIRPORT TRANSMITTERS:

Mount the trap, by means of two wood screws, at any place on the chassis shelf or cabinet where it will be near the antenna terminals of the receiver. Connect the yellow lead of the trap to the terminal marked, "DBL", on the terminal block at the rear of the chassis. Connect the black lead of the trap to the ground terminal of the chassis. Any excess length should be cut off the leads so that they are as short as possible. The antenna or doublet connections to the receiver are not to be changed in any way.

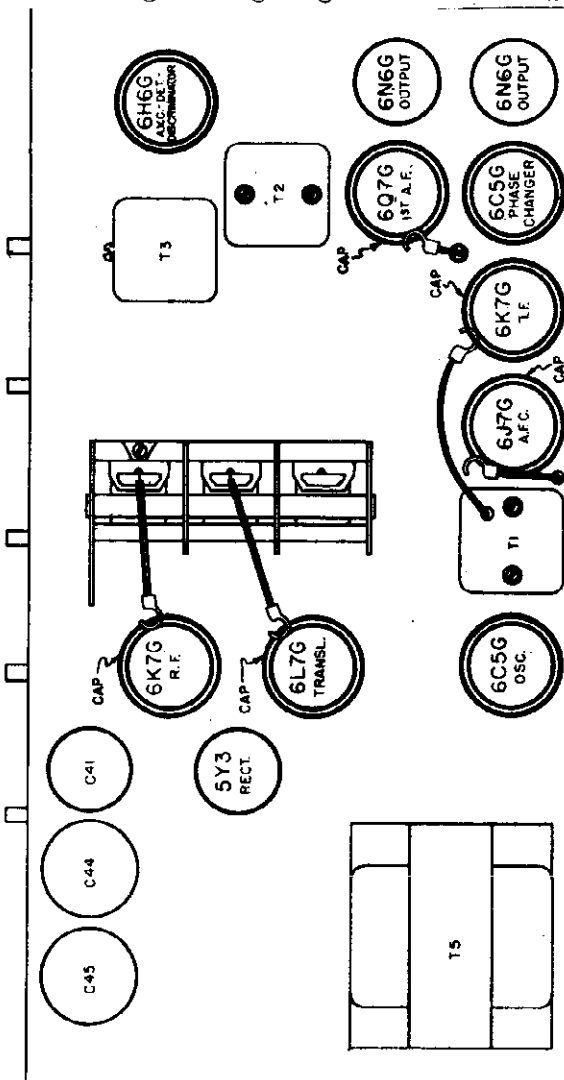
The trap is pre-tuned to the IF frequency so that normally no further adjustment is necessary. However, should interference still be experienced, tune the receiver between approximately 550 and 600 kc. Then adjust the wave-trap, by means of the trimmer screw at the bottom of the container, until the interference is eliminated. Addition of the trap will reduce the sensitivity of the receiver around 600 kc by approximately 50%. The customer should be forewarned of this to avoid complaints of reduced sensitivity. See DW65.

ELIMINATING WHISTLE AT 930 KC:

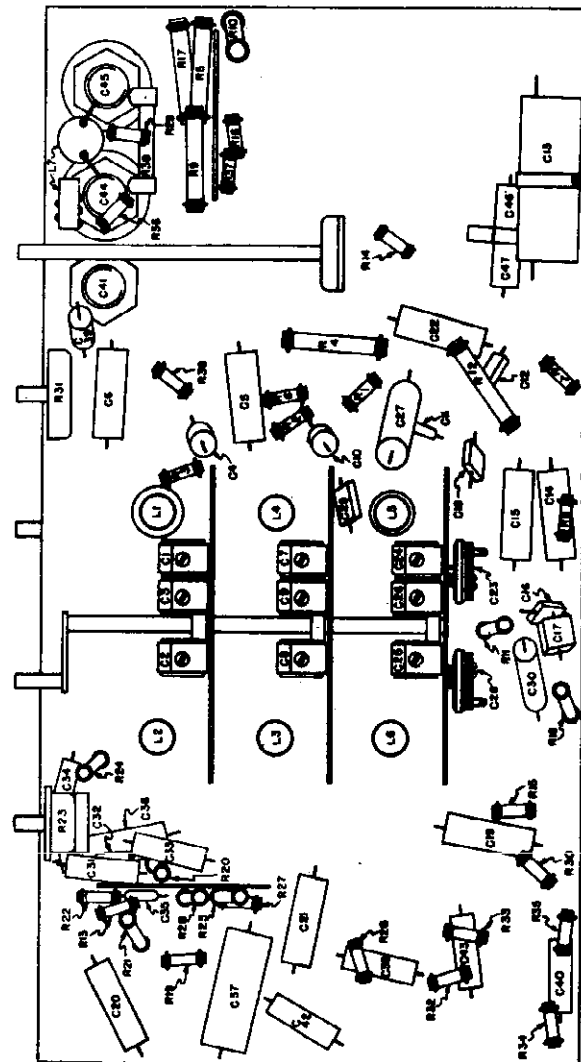
A whistle, due to a beat between the second harmonic (930 kc) of the 465 kc IF, and a 930 kc signal may be experienced. In localities where the 930 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the IF frequency of the receiver.

Determine at what point between 900 kc and 960 kc the whistle will be least objectionable. Dividing this frequency by two will give the new IF frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 915 kc would not be objectionable, the IF should be realigned at $915/2$ or 457.5 kc. Try to keep the new IF frequency as near 465 kc as possible.

Align the IF at the new frequency and then realign the antenna, translator, and oscillator stages. Then re-adjust the A.P.C. according to the procedure described in this Manual, but setting the signal generator to the new IF frequency instead of 465 kc.



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS

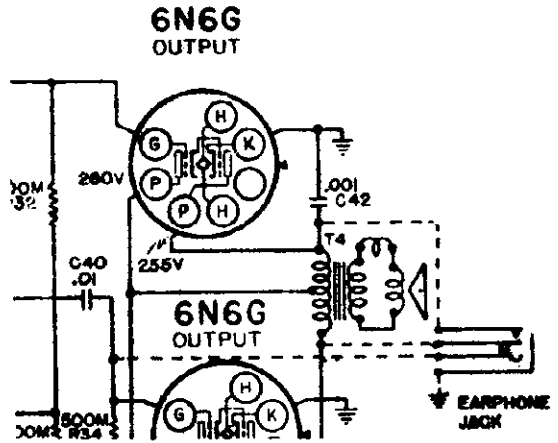
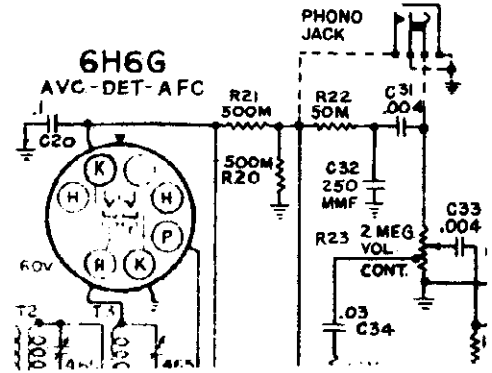
SEARS-ROEBUCK & CO.

MODEL 4587
Alignment, Sensitivity
Jack Installation

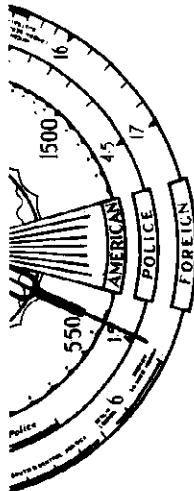
8. Turn the receiver for maximum output (at 1060 kc). Then switch the signal generator modulation switch to the "off" position.
9. Short the variable arm to the touched disc with a piece of wire. The Flash Tuning light should become illuminated.
4. Set the second signal generator to 445 kc and 10,000 microvolts output. Connect its output, in series with a .00005 mfd. condenser to the control grid of the 6L7G tube.
5. Carefully turn the variable condenser until "zero beat" note is had (with right hand knob in "BROAD" position).
6. Turn the right hand knob to the "FLASH" position (fully clockwise). Then adjust the discrimination unit for "zero beat". The correct setting will be obtained at about the center of 75 trimer range. The adjustment is a very sharp one.
7. Turn the right hand knob to the "SHARP" and then to the "BROAD" positions. The receiver still should give zero beat in the "SHARP" and "BROAD" positions if the A.P.C. is properly adjusted. If it does not, carefully repeat operation #6.
8. The A.P.C. can be checked for "pull in" in the following manner. Remove the signal generator connection from the 6L7G grid. Switch on the modulation of the 1060 kc generator and set the generator to give 5000 microvolts output. Reduce the Volume Control setting of the receiver to give 1.5 volts reading on the output meter. Increase the signal generator frequency until the output meter reads .5 volt. Note the signal generator frequency from 1060 kc with the output meter reading .5 volt and note the signal generator frequency from 1060 kc with the output meter reading 1.5 volt and note the signal generator frequency. If the A.P.C. is operating properly, the signal generator can be shifted 15 to 80 kc either side of 1060 kc before the output meter reading is reduced from 1.5 volts to .5 volt.

INSTALLING A JACK FOR THE USE OF EARPHONES AND PHONOGRAPH PICK-UP:

There is a hole, plugged with a brass insert, at the rear of the chassis. This hole is provided so that a jack can be installed for earphone or phonograph pick-up connections. The schematic section shows the connections. With the connections as shown, the loud speaker will not operate when the earphones are plugged in. If it is desired to have the loud speaker operate at the same time the earphones are plugged in, the earphone plug must be turned from its jack when loud speaker reception is wanted. Otherwise the earphone plug must be turned from its jack when loud speaker reception is wanted. If the jack is wired as a phone jack pick-up jack, the right hand knob of the receiver must not be in the "FLASH" position when phonograph operation is wanted. It may be put in either the "B" or "SHARP" position. The Volume and Tone Controls of the receiver will function for phonograph reproduction.



- ALIGNMENT PROCEDURE**
- Output meter connections ----- Across speaker voice coil
 - Output meter reading to indicate .5 watts output ----- -1.1 volts
 - Dummy antenna value to be in series with generator output ----- See chart below
 - Connection of generator output lead ----- See chart below
 - Generator modulation ----- 30%, 400 cycles
 - Approximate average sensitivity in microvolts for .5 watts output ----- See chart below
 - Position of Volume Control ----- Fully on
 - Position of Tune Control ----- Fully clockwise
 - Position of Flash Tuning and Selectivity Switch knob ----- Sharp, fully counter clockwise
 - Position of Mal. Pointer when variable is fully meshed ----- as illustrated below



WAVE BAND	GENERATOR FREQUENCY	GENERATOR OUTPUT	ANTENNA CONNECTION	APPROXIMATE SENSITIVITY IN MICROVOLTS
"A1"	580 kc	.1 mfd.	6L7G Gr-16	75, 71
"A1"	1400 kc	.0008 mfd.	Antenna Terminal C94, C1, C7	15
"A1"	600 kc (peak)	.0008 mfd.	Antenna Terminal C25	20
"P01"	4 mc	400 ohms	Antenna Terminal C28, C2, C8	5
"P01"	1.8 mc (peak)	400 ohms	Antenna Terminal C28	40
"P01"	15 mc	400 ohms	Antenna Terminal C28, C3, C9	5
"P01"	6 mc	400 ohms	Antenna Terminal	60

IMPORTANT ALIGNMENT NOTES

Where indicated by the word, "peak", the variable should be rotated back and forth a degree or two while making the adjustment.

Repeat the entire alignment step by step in the original order for greater accuracy. Always keep the generator output at its lowest possible value. This will prevent the AVC section of the receiver from interfering with accurate alignment.

The shield covering the coils at the bottom of the chassis should be left in place during the alignment. The trimmer condensers are accessible through the holes in the shield. Only the dummy antenna indicated in the chart for any particular band should be used. Disconnect the dummy antenna used for alignment of any other band.

After the alignment has been completed, the A.P.C. adjustment should be made as follows:

A.P.C. ADJUSTMENT

The right hand knob must be in the "B" (broad) position for operations 1 through 5. Two signal generators are necessary to make the adjustments. The Volume and Tone Controls must be turned all the way to the right. The generator ground connection is to be made to the chassis.

1. Set one signal generator to 1060 kc and 5000 microvolts output. Connect its output to the "A1" terminal of the set, through a .0008 mfd. condenser.

MODEL 4587
Dial Data

SEARS-ROEBUCK & CO.

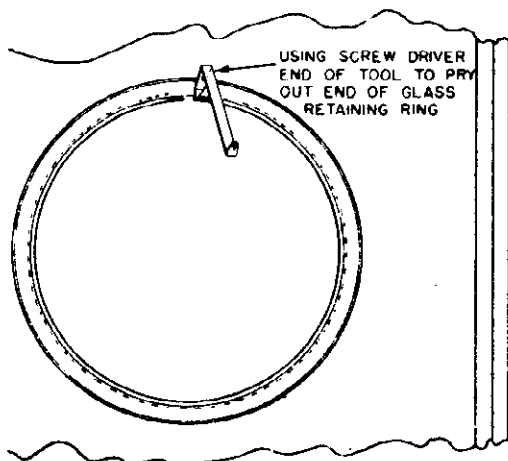
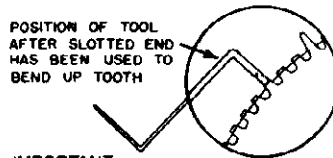


FIG. 1



IMPORTANT

TOOL MUST BE PUSHED AS FAR AS POSSIBLE ON TOOTH BEFORE BENDING

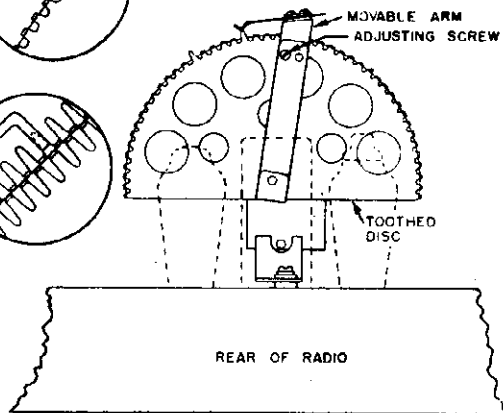
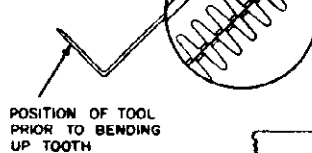


FIG. 2

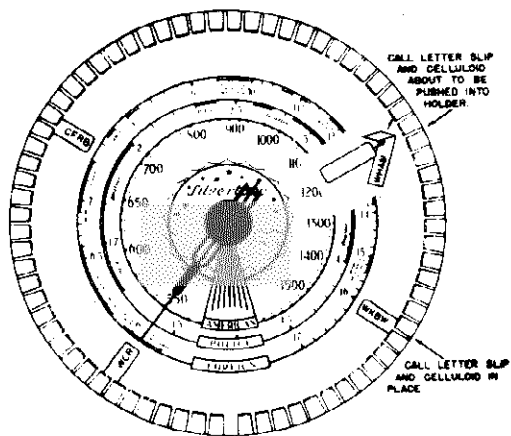


FIG. 3

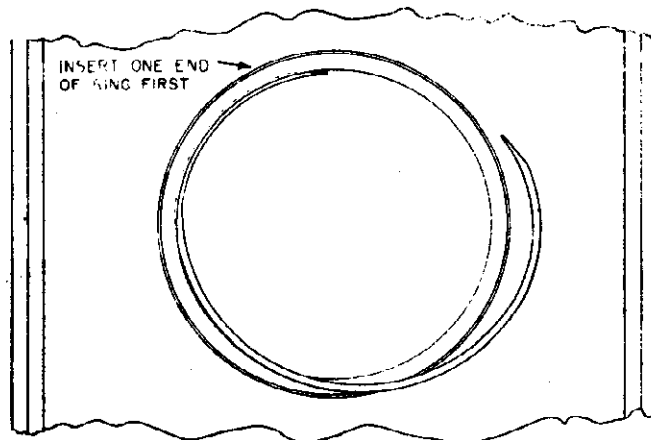


FIG. 4

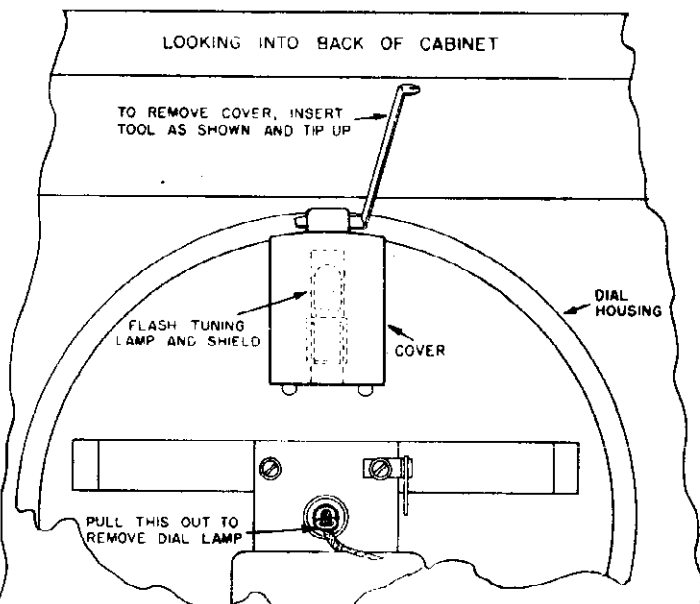
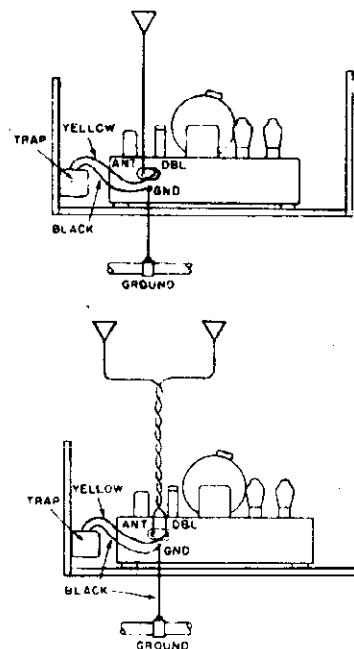


FIG. 7



SEARS-ROEBUCK & CO.

the dial pointer. The call letters will then be illuminated whenever the dial pointer is opposite the "Flash" position (and the radio is switched to the AMERICAN band and the right hand knob is in the "FLASH" position).

8. In the same manner insert the proper call letter slip and a celluloid tab for each of the other stations selected. (These tabs can be pulled out and the call letters of other stations inserted at any time should you wish to change the selection of stations.)

9. Replace the glass in the cabinet front panel. Hold it centered in the southeasth with one hand, insert one end of the split ring in place as shown in Fig. 4 and continue pressing the remainder of the ring into place until it is completely seated. It may be helpful to tip the cabinet back against the wall to prevent the possibility of the glass falling out during the operation.

10. If two of the selected stations are powerful ones and close together in frequency (10 to 20 kc) the receiver set 50 from one to the other. If they are widely spaced, adjust their relative strength varies with the time of day. To correct this, bend down the originally bent up for the two stations and instead bend up the two adjacent teeth which are further apart.

HOW THE A.F.C. - FLASH TUNING CIRCUITS OPERATE:

The I. P. frequency of the receiver is 465 kc. If a station is tuned in exactly, the oscillator frequency is 465 kc higher than the station's frequency. If the station's frequency is 5 kc lower, the oscillator frequency will be 5 kc lower and the resultant I.P. will be 470 kc. Similarly, if the receiver is tuned 5 kc higher than the station's frequency, the resultant I.P. will be 470 kc. The I.P. is fed to the discriminator transformer, T3. By means of the tuned circuits of the discriminator transformer, I.P. higher than 465 kc is fed through one of the diode plates of the 6B6G tube and frequencies lower than 465 kc are fed through the other diode plate of the 6B6G tube. The resultant diode current creates voltage drops across the 800K ohm resistors, R20 and R21. The polarity and value of the voltage drops with respect to ground, across these two resistors depend upon the extent to which the I.P. is higher or lower than 465 kc. This voltage, developed by the discriminator circuit, is fed to the control grid of the 6A7G automatic frequency control tube to control the oscillator frequency, as described in the following paragraph.

The oscillator coil inductance, L5, determines the oscillator frequency for any given position of the variable condenser. If another inductance were connected in parallel to it, the total inductance would be lessened and the oscillator frequency would increase. The combination of the 6A7G A.F.C. tube together with the condensers, C15, C17 and the resistor, R11, having the effect of an inductance in parallel with the inductance, L5. This is so for the following reason:

In an inductance the phase relations between the voltage across it and the current through it are such that the voltage leads the current by 90 degrees. The phase relations of the voltage and current in the plate circuit of the 6A7G tube are such that the voltage leads the current by 90 degrees. Therefore, this combination acts as an inductance in parallel to the inductance L5. The extent to which it does so is determined by the value of the voltage impressed on the control grid of the 6A7G tube. This voltage is obtained from the discriminator circuit as previously described. The effect of this equivalent parallel inductance is to change the AMERICAN band oscillator frequency. By properly choosing constants, this oscillator frequency change can be made to compensate almost exactly for the oscillator frequency error due to inexact tuning. In this way, the I.P. is always 465 kc, which is equivalent to perfect tuning, provided the station is approached nearly enough so that the A.F.C. can take hold. As mentioned previously, this is within 15 kc of the station for strong stations, but decreases for weaker stations.

The A.P.C. tube is connected in the circuit all the time and on all bands. However, the voltage from the discriminator circuit is fed to its control grid only on the AMERICAN band and when the variable Selectivity-Flash tuning knob is turned to the "FLASH" position. On all other bands and positions of the Selectivity-Flash tuning knob the control grid bias of the 6A7G tube is fixed. Therefore, it corrects the I.P. frequency only on the AMERICAN band.

The Flash tuning mechanism consists essentially of the toothed disc at the rear of the variable condenser and the relay, L7. The function of the toothed disc is to operate the relay when the variable condenser is turned to the various pre-selected stations. The relay contacts close the Flash tuning light circuit, illuminating the station's call letters. At the same time they remove the high negative bias which blocks off the audio, keeping the receiver silent until the pre-selected station is tuned in.

The relay coil normally is energized. It is short circuited by the bent up tooth of the disc preceding the movable contact. This is why the Flash tuning light flashes for a second or so after the station is turned on -- the rectifier has not heated sufficiently to furnish current to energize the relay.

GENERAL INFORMATION

THE AUTOMATIC FREQUENCY CONTROL - FLASH TUNING:

These models incorporate a completely new feature, Automatic Frequency Control - Flash tuning. This double feature, which is designed to operate only on the AMERICAN band, does away with the "beat" phenomenon which has troubled so many of our accurate tuning devices during the past few years. On the AMERICAN band, it is necessary to tune only 15 kc or less from the strength of the station. On the other bands, it is necessary to "take hold" and tune the station far more accurately than can be done manually. This is done entirely with radio circuits, no moving parts being involved.

The Flash tuning mechanism greatly simplifies tuning. It is necessary merely to turn the dial pointer to the station's call letters. The call letters then will become illuminated and, by virtue of the A.F.C., the station will automatically be tuned in exactly. Until the station's position is reached, the receiver is completely silent. A description of how the circuits of the A.F.C. - Flash tuning feature work is given after the following instructions for setting up the Flash tuning feature.

SETTING UP:

1. The glass in the cabinet front panel must be removed to allow insertion of the station call letters, as described later. This glass is held in place by a split ring (the split is at the top). See Fig. 1. The tool illustrated is furnished in the same envelope with the Instructions. Use the screw-driver end of this tool to remove the split ring by prying out one of its ends, as indicated in Fig. 1. Be very careful not to insert the tool so deep that it touches the glass, else the glass may become chipped.

The glass can be removed by placing the hand on it and tipping the cabinet forward. Take care during the operation not to allow the split ring to fly out or the glass to drop and break.

2. Make a list of the broadcasting stations to which you desire to have the FLASH TUNING mechanism respond. These stations must be local stations or strong stations at medium distance that give reliable daylight reception. A sheet containing the call letters of broadcasting stations is furnished in the same envelope with the Instruction Leaflet. Cut out the call letters of the selected stations. The short vertical lines before and after the station's call letters and the long horizontal lines will serve as a guide along which to cut. When properly done, these cut slips will be a trifle over 1/4" long and 1/4" wide.

3. Turn the Flash tuning and Selectivity Switch knob to the "FLASH" position. Then tune in the first station on your list of selected stations.

4. Leaving your station tuned in, go to the rear of the radio. You will see a small circular toothed disc, as illustrated in Fig. 2. There is also a flat spring arm with a small rounded projection, as illustrated in Fig. 2. The teeth of this small circular disc which touch the toothed disc are the teeth of the station tuned in. Carefully note which tooth on the small circular disc is directly under the rounded projection of the spring arm. Mark this tooth with a pencil. Note that there is a double row of teeth and either the tooth that faces you or the tooth that faces the front of the radio may be bent up, depending upon which one is nearer the rounded projection of the spring arm. After you have marked the tooth, turn off the radio. Then tune away from the station (with the Station Selector knob, not the movable arm) and bend this marked tooth straight up, using the slotted end of the tool provided. See Fig. 2. It is important that the slot of the tool fit as far down as possible on the tooth before bending. This is necessary so that the complete tooth will be bent up instead of just part of the tooth. When this is properly done, the projection of the spring arm will touch the bent up tooth when the toothed disc is rotated by turning the Station Selector knob.

5. Turn the radio on again and tune in the next station on your list of selected stations. Mark the tooth that now is under the projection of the spring arm when this station is tuned in. Turn off the radio, tune away from the station so that the spring arm will be in the way and bend up this marked tooth, using the tool provided. Proceed in the same manner for each of the other stations on your selected list. Turn off the radio each time before bending up the tooth. Otherwise a slight spark may occur, although there is no danger of shock. When properly done, the spring arm will touch each of the teeth that has been bent up but will not touch any of the other teeth, as the Station Selector knob is turned.

6. Turn the Flash tuning and Selectivity Switch knob to the "FLASH" position. Now again tune in the first station on your selected list. As its position is reached, the bent up tooth will touch the spring arm and a light will flash on the dial at a position opposite the end of the dial pointer.

7. A small envelope containing celluloid tabs is furnished in the same large envelope with the Instructions. Select the cut out slip bearing the call letters of your chosen station. Bend the end of the slip, opposite the call letters, over one of the celluloid tabs so that the call letters will be under the celluloid. See Fig. 3. Then place the tab and call letter slip under the holder at the outside edge of the dial at a point opposite the end of

MODEL 4587

Dial Data, Flash Tuning Notes

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The FLASH TUNING lamp (the one that moves around the outer edge of the dial and flashes on for the station call letters) is accessible for replacement through a small removable cover at the top of the dial housing. (Accessible from the rear of the radio.) This cover snaps on the top of the dial housing and can be removed with the fingers or by means of a screw driver, as shown in Fig. 7. Turn the Station Selector knob so that the dial pointer is straight up. The lamp shade can then be removed by grasping the end of it and pulling it up through the opening in the dial housing. The lamp can then be removed and replaced. When pulling the lamp shade back, the narrow slit in it must face the front of the dial so that the light will fall on the dial. The arm that carries the flash tuning lamp must coincide with the dial pointer. If it does not, it can be moved to coincide with the dial pointer. It is not necessary to remove the cover at the top of the dial housing (with the chassis out of the radio) if the light is only slightly out of line with the pointer. It can be made to coincide by turning the lamp shade slightly.

The BAND INDICATOR lamp (the one that lights up the three Wave Band designations) circuit contains a special resistor that reduces the voltage to this lamp so that it probably never will burn out. Should replacement of the BAND INDICATOR lamp ever be necessary, the chassis will be taken out of the cabinet and the dial removed in order to gain access to the lamp. This procedure is described in the following paragraph. For replacement of any of the lamps use only the same type as supplied originally.

Loosen the set screws in the knobs at the front of the radio and remove the knobs. Remove the four screws that are under the shelf on which the chassis rests. Remove the single screw that is in the speaker plug and pull out the speaker plug from the back of the radio. The chassis then can be taken out of the cabinet. Rotate the Station Selector shaft (the middle one) to the right until the dial pointer goes as far as it can go. Carefully note the exact position of the dial pointer on the dial. Then pull the dial pointer off of its shaft. Next carefully bend up the metal tabs that hold the dial in the dial housing. Bend the tabs only slightly. Do not pull them down. If the tabs are bent too far up, they may not fit into the dial housing when re-assembled. The tabs are bent too far up if they do not fit into the dial housing when re-assembled. The tabs are bent too far up if they do not fit into the dial housing when re-assembled. Pull the lamp socket and replace the lamp. The shield will be accessible. Pull the band designator lamp and replace the lamp. The shield must be put back on so that the band designator lamp is properly illuminated. When re-assembling, leave the Station Selector shaft turned all the way to the right. This is done before pulling the dial pointer off of its shaft. Then push the dial pointer back on its shaft so that it comes to the same position on the dial as was noted for it before it was pulled off of its shaft.

ANTENNA CONNECTIONS:

There is a terminal board at the rear of the chassis marked "LAMP", "DIAL", "AMP", indicating antenna, doublet, and ground, respectively. The "DIAL" terminal is left unconnected when a conventional antenna is used. When a doublet is used, one wire of the twisted lead is connected to the "AMP" terminal and the other downlead wire is connected to the "DIAL" terminal.

VARIABLE SELECTIVITY:

Variable Selectivity is obtained by connecting or disconnecting coupling turns between primary and secondary of the IF input transformer. In the "DIAL" position of the right hand control knob, the coupling turns are disconnected and the selectivity becomes sharp. In the "B" position (broad) the coupling turns are connected and selectivity is broadened, thereby increasing the high frequency audio response of the receiver.

REPLACEMENT OF THE OSCILLATOR TUBE:

There are two types of 6C50 tubes, one shielded and the other unshielded. They can be told apart easily by appearance. The shielded type has a perforated mesh screen surrounding the cathode filament. This screen is about an inch in diameter and comes very close to the tube of the tube. The unshielded type does not have this perforated mesh screen. The plate of the unshielded type is about 1/8" diameter, is visible. It is important that only the unshielded type 6C50 with the perforated mesh screen, be used in the oscillator socket. Use of the shielded type will upset the calibration of the Foreign band and interfere with proper performance.

THE AVC CIRCUIT:

The voltage drop across the 500K ohm resistor, R21, is fed to the control grids of the 6AV6 and 6Y70 tubes to provide AVC. The drop across this resistor is also used in the discriminator circuit as described previously. The audio voltage across the resistor is coupled to the AF stages through the condenser, C51.

IF THE A.F.C. - FLASH TUNING MECHANISM DOES NOT OPERATE PROPERLY:

If the A.F.C. Flash Tuning mechanism does not operate properly, first check the toothed disc and spring arm. The spring arm should touch each of the teeth that have been bent up and should not touch any of the other teeth, as the Station Selector knob is turned. To adjust the spring arm, so that it does touch only the bent up teeth, proceed as follows. Loosen the screw marked, "Adjusting Screw", in Fig. 2, which will permit the spring arm to be tipped so that it does make contact only with the bent up teeth. Then tighten the adjusting screw.

Another likely cause of improper A.F.C. - Flash Tuning operation is the relay. A small amount of dust may interfere with proper closing of the contacts. Remove the contacts and pass a strip of plain paper back and forth between them. The traces of relay the contacts. The earlier type is part #101381497. It can be identified through the fact that the relay coil leads are black. The later type relay is part #1013815558. Its leads are colored. This later type will be supplied for replacement. The earlier type relay is shown schematically in Fig. 5. The later type, in Fig. 6. The proper sequence of operation for the contacts is indicated under each illustration. If necessary, slightly bend the contacts so that they do operate in the sequence indicated. The tension of the springs should be such that they relay closes with a current of 50 milliamperes. This can be tested by connecting the relay in series with a six volt storage battery, a 100 ohm rheostat, and a milliammeter of the proper range.



FIG. 5

WITH RELAY NOT ENGINED - CIRCUIT 1-2 OPEN 3-4 OPEN 4-8 CLOSED
 WITH RELAY ENGINED - CIRCUIT 1-2 CLOSED 3-4 CLOSED 4-5 OPEN



FIG. 6

WITH RELAY NOT ENGINED - CIRCUIT 1-3 OPEN 2-3 CLOSED 4-5 OPEN
 WITH RELAY ENGINED - CIRCUIT 1-2 CLOSED 2-3 OPEN 4-5 CLOSED

WHEN FLASH TUNING LIGHT STAYS ON, OR LIGHT COULDS ON SET BUILT IS IMPROPER IN FLASH TUNING POSITION CHECK THE RELAY CONTACTS AS OUTLINED ABOVE.

If the later type relay is used to replace the earlier type, the connections to the relay must be changed. The following tabulation shows to what lugs of the newer type relay the connections should be made after removing them from the lugs of the old relay.

NEW TYPE RELAY

Wire from lug #1 To lug #5
 Wire from lug #2 To lug #4
 Wire from lug #3 To lug #1
 Wire from lug #4 To lug #2
 Wire from lug #5 To lug #3

ORIGINAL RELAY

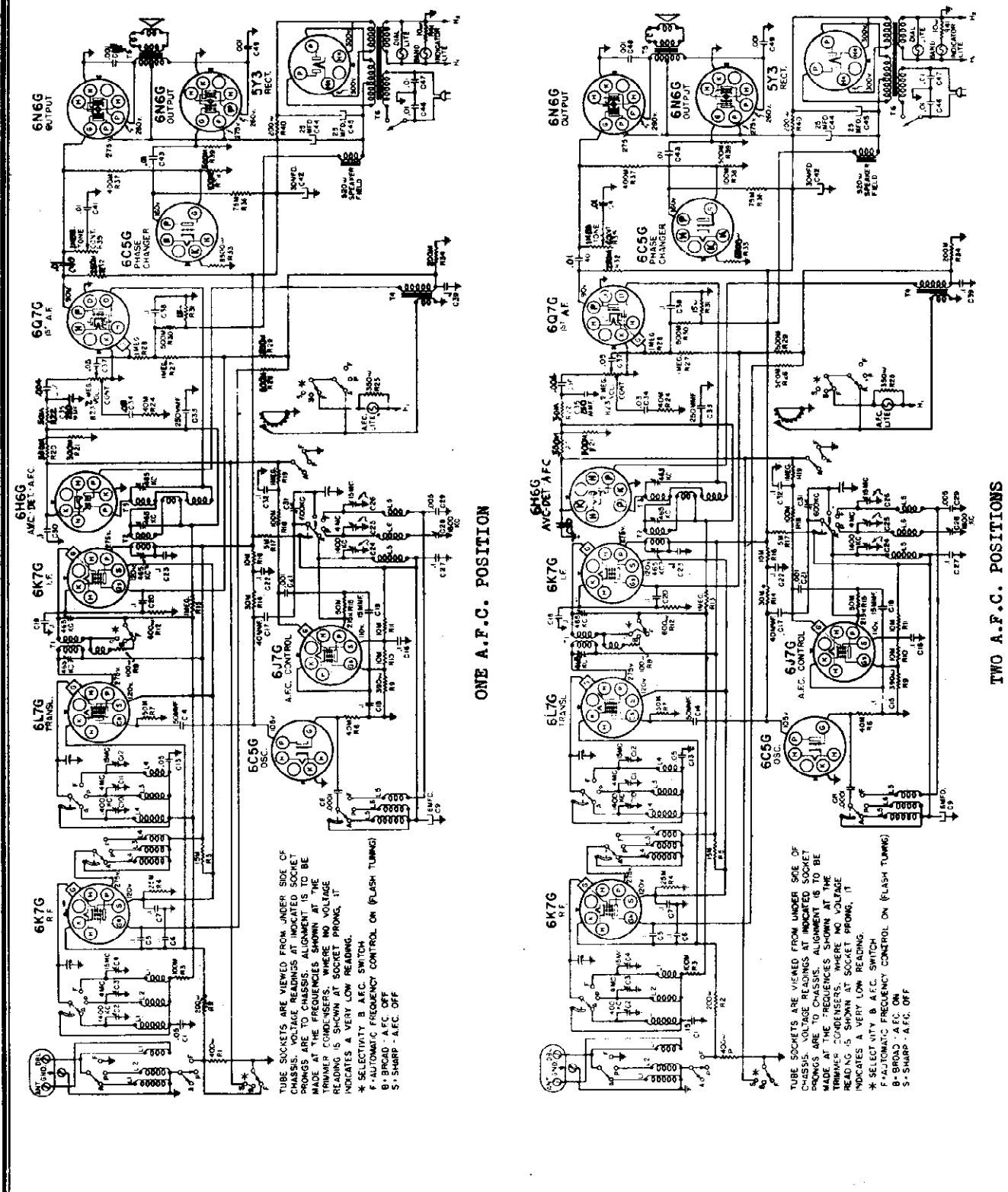
Wire from lug #1
 Wire from lug #2
 Wire from lug #3
 Wire from lug #4
 Wire from lug #5

REPAIRING THE DIAL LAMPS:

There are three lamps in the dial mechanism. The lamp that illuminates the dial is in the center of the dial. It can be removed for replacement by pulling the small handle that projects from the rear center of the dial housing. (Accessible from the back of the radio.) When putting the lamp holder back into place, be careful that it is not pushed in too far. The dial pointer should be pushed off of its shaft. Position the lamp so that the dial is illuminated to the best advantage.

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57RL 22
Supplement No. 3
October 28, 1936



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE READING IS SHOWN AT SOCKET PRONG. IT INDICATES A VERY LOW READING.

* SELECTIVITY B. A.F.C. SWITCH
 F. AUTOMATIC FREQUENCY CONTROL ON (FLASH TUNING)
 B. BROAD A.F.C. OFF
 S. SHARP A.F.C. OFF

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE READING IS SHOWN AT SOCKET PRONG. IT INDICATES A VERY LOW READING.

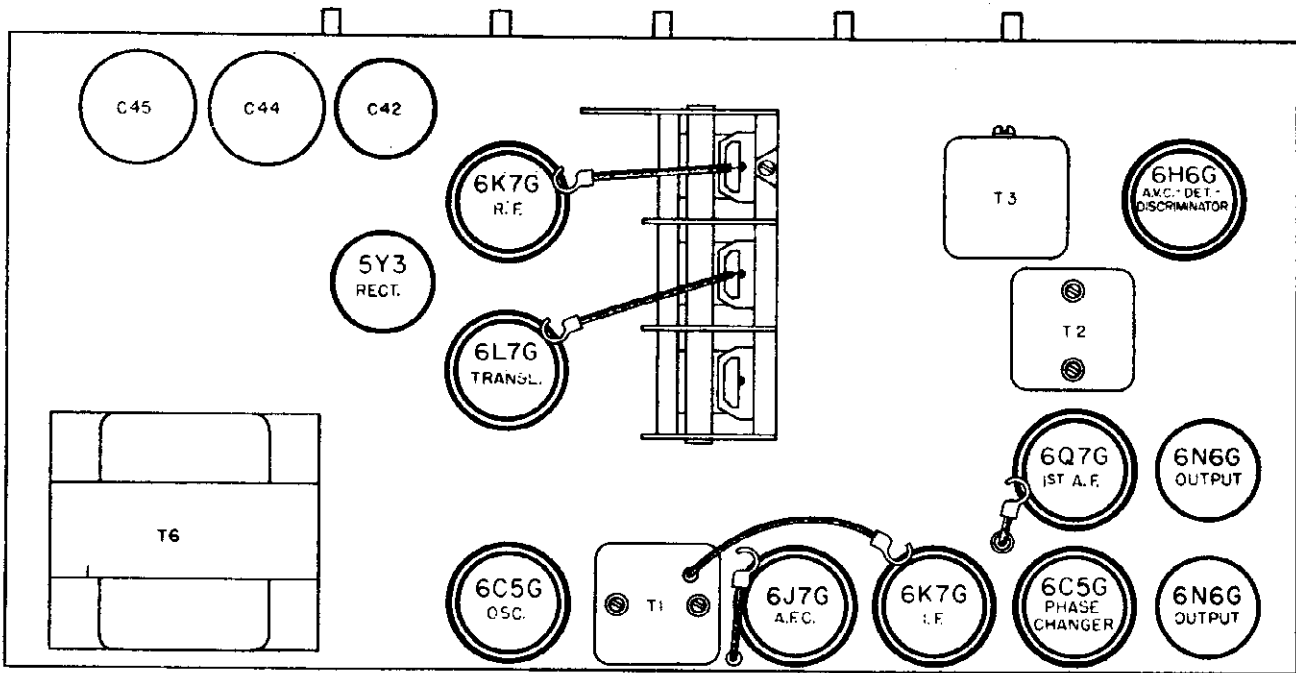
* SELECTIVITY B. A.F.C. SWITCH
 F. AUTOMATIC FREQUENCY CONTROL ON (FLASH TUNING)
 B. BROAD A.F.C. OFF
 S. SHARP A.F.C. OFF

ONE A.F.C. POSITION

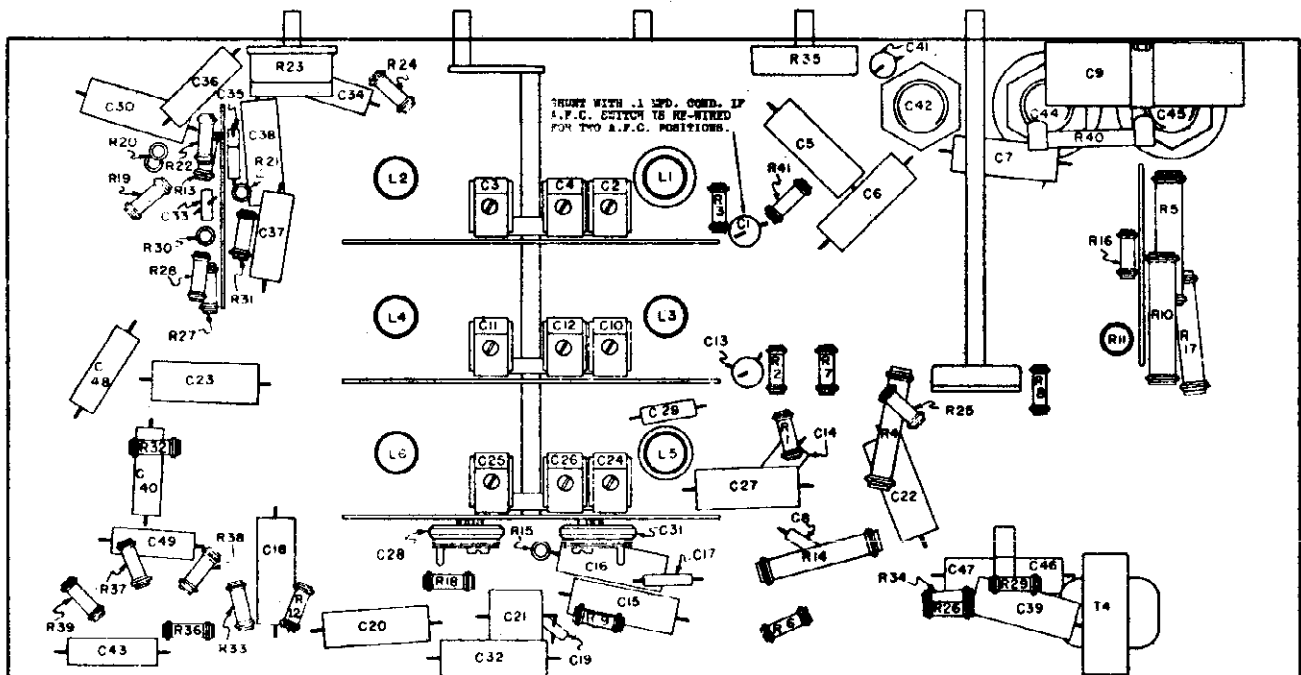
TWO A.F.C. POSITIONS

MODEL 4587A
 Socket, Trimmers
 Chassis

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LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS

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MODEL 4587A
Alignment, Sensitivity
Notes

REVISED ALIGNMENT PROCEDURE:

PRELIMINARY:

- Output meter connections ----- Across speaker voice coil
- Output meter reading to indicate .5 watts output ----- 1.1 volts
- Dummy antenna value to be in series with generator output ----- See chart below
- Connection of generator output lead ----- See chart below
- Generator modulation ----- 50%, 400 cycles
- Approximate average sensitivity in microvolts for .5 watts output ----- See chart below
- Position of Volume Control ----- Fully on
- Position of Tone Control ----- Fully clockwise
- Position of Flash Tuning and Selectivity Switch Knob ----- Sharp, fully counter clockwise
- Position of Dial Pointer when variable is fully meshed ----- As illustrated below



WAVE BAND POSITION OF DIAL SWITCH POSITION	GENERATOR FREQUENCY	DUMMY ANTENNA CONNECTION	TRIMMERS ADJUSTED (IN ORDER)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	550 kc	.1 mfd.	T2, T1	IF Output IF Input	-
"AM"	1400 kc	.0002 mfd.	C24, C2, C10	Osc., Ant., Translator*	50
"AM"	800 kc *	.0002 mfd.	C31	Osc. Pad.	50
"POL"	4 mc	400 ohms	C25, C3, C11	Osc., Ant., Translator	6
"POL"	1.8 mc *	400 ohms	C28	Osc. Pad.	40
"FOR"	Var. Fully Open	400 ohms	C26	Osc.	-
"FOR"	15 mc	400 ohms	C4, C12	Ant., Transl.	5
"FOR"	6 mc	400 ohms	-	-	60

IMPORTANT ALIGNMENT NOTES

* Where indicated by (*) the variable should be rocked back and forth a degree or two while making the adjustment.

Repeat the entire alignment step by step in the original order for greater accuracy. Always keep the generator output power at its lowest possible value. This will prevent the AVC action of the receiver from interfering with accurate alignment.

The shield covering the coils at the bottom of the chassis should be left in place during the alignment. The trimmer condensers are accessible through the holes in the shield.

Only the dummy antennas indicated in the chart for any particular band should be used. Disconnect the dummy antenna used for alignment of any other band.

After the alignment has been completed, the A.F.C. adjustment should be made as follows:

A.F.C. ADJUSTMENT

CAUTION: The right hand knob must be in the "SHARP" position for operations 1 through 5. It is preferable to have two signal generators to make the adjustments. However, if two generators are not available, a broadcast station of approximately 1050 kc can be used for one of the generators. However, the station chosen must be of medium strength that is, one just capable of giving adequate reception in the neighborhood of the receiver. The station selected, the volume and tone controls, be turned all the way to the right. The generator ground connection is to be made to the chassis.

1. Set one signal generator (or the broadcast station) to 1050 kc and 5000 microvolts output. Connect its output to the "ANT" terminal of the set, through a .0002 mfd. condenser.
2. Tune the receiver for maximum output (at 1050 kc). Then switch the signal generator modulation switch to the "off" position.
3. Short the movable arm to the toothed disc with a piece of wire. The Flash Tuning light should become illuminated.
4. Set the second signal generator to 485 kc and 10,000 microvolts output. Connect its output, in series with a .0002 mfd. condenser to the control grid of the 6L7G tube. Turn the modulation switch to the "off" position.
5. Carefully turn the variable condenser until "zero beat" note is had (with right hand knob in "SHARP" position).
6. Turn the right hand knob to the "FLASH" position (fully clockwise). Then adjust the discriminator unit, T5, for "zero beat". The correct setting will be obtained at about the center of T5 trimmer range. The adjustment is a very sharp one.
7. Turn the right hand knob to the "SHARP" and then to the "BROAD" positions. The receiver still should give zero beat in the "SHARP" and "BROAD" positions if the A.F.C. is properly adjusted. If it does not, carefully repeat operation #6.
8. The A.F.C. can be checked for "pull in" in the following manner. Remove the signal generator connection from the 6L7G grid. (Two generators must be used.) Switch on the modulation of the 1050 kc generator and set the generator to give 5000 microvolts output. Reduce the Volume Control setting of the receiver to give 1.5 volts reads on the output meter. Increase the signal generator frequency until the output meter reads .5 volt. Note the frequency of the signal generator at this output meter reading. Then decrease the signal generator frequency from 1050 kc until the output meter again reads .5 volt and note the signal generator frequency. If the A.F.C. is operating properly, the signal generator can be varied 15 to 20 kc either side of 1050 kc before the output meter reading is reduced from 1.5 volts to .5 volt.

INCREASED FREQUENCY RANGE:

It will be noticed that the frequency range of the Police band of the Model 101011A has been extended to approximately 5 megacycles and the frequency range of the Foreign band to approximately 18 megacycles.

CHANGE IN PROCEDURE FOR REMOVING DIAL GLASS FOR SETTING UP FLASH TUNING STATION CALL LETTERS

The Service Instructions for this model describe how to remove the dial glass by taking off the split retaining ring that holds it. In receivers using the 101011A chassis this procedure has been simplified by using an escutcheon with the dial glass moulded into it. It is held in place in the front of the cabinet by four screws. Accordingly, it is necessary merely to remove these four screws in order to take off the moulded escutcheon and dial glass.

CHANGE IN PHONOGRAPH PICK-UP JACK OPERATION:

The Service Instructions for this model state that if a phonograph pick-up jack is used the right hand knob must be in either the "SP" or "SHARP" position. This is true only for those receivers that are wired to have the one A.F.C. position ("FLASH"). In later production receivers having the two A.F.C. positions ("SP" and "FLASH") or in receivers that are changed to provide these two positions, the right hand knob must be in the "SHARP" position for phonograph operation. This must be done, of course, to remove the mating from the first audio tube, permitting phonograph reproduction.

MODELS 4587, 4587A

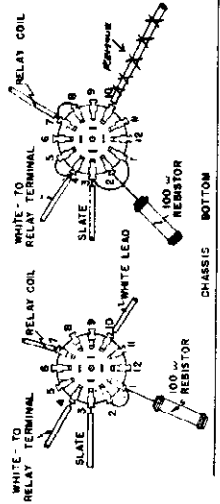
Changes

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With the original connection of the A.F.C. switch, providing only broad selectivity in the "FLASH" position, difficulty may be encountered in some locations due to adjacent channel interference or heterodyne whistles. If such difficulty is encountered in sets having the original connection, the circuit may be changed to provide the two selectivity positions for A.F.C. - Flash Tuning. Fig. 1 shows the switch connection changes for sets using the relay. Fig. 2 shows the switch connection changes for sets having an A.F.C. transformer. Note that in relay sets the original #10 connection is removed entirely from the switch. In transformer sets the original #11 connector is removed entirely. In addition, in relay sets (101411), a .1 mfd. condenser must be shunted across the .05 mfd. condenser, 64. In transformer sets (101411A), the .05 mfd. condenser that must be shunted is 61. See the locations of parts diagram. In later production of Model 101411A, embodying the two A.F.C. - Selectivity positions, a .15 mfd. condenser is used for 64.

FLASH TUNING SWITCH

VIEWED FROM REAR
ORIGINAL CHANGED

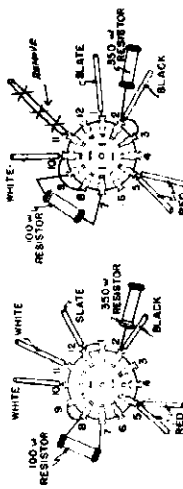


FLASH TUNING - SELECTIVITY SWITCH CIRCUIT CHANGE. SETS WITH RELAY.

FIG. 1

FLASH TUNING SWITCH

VIEWED FROM REAR
ORIGINAL CHANGED



FLASH TUNING - SELECTIVITY SWITCH CIRCUIT CHANGE. SETS WITH TRANSFORMER.

FIG. 2

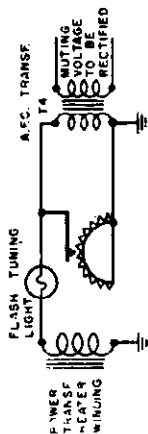
IMPORTANT NOTE ABOUT SETTING UP A.F.C. STATIONS ON ADJACENT CHANNELS:

In paragraph #10 under, "SETTING UP THE AUTOMATIC FREQUENCY CONTROL", in the Service Instructions, the suggestion is made that if adjacent channel stations are selected the two teeth further apart be used instead of the correct ones for the stations. For example, suppose a 700 kc and a 710 kc station is to be selected. Instead of bending up the teeth corresponding to 700 kc and 710 kc, the teeth corresponding to approximately 687 kc and 713 kc would be bent up instead. The purpose of this is to prevent the receiver from jumping from one station to the other as their signal strengths vary. This suggestion will be helpful on stations 25 and 26 kc apart. In later production of Model 101411A, the teeth are spaced some quality. It is best to select, for A.F.C. tuning, stations at least 50 kc apart in frequency.

SUBJECT: CIRCUIT CHANGE TO ELIMINATE ADJACENT CHANNEL INTERFERENCE IN MODELS 4587-4587A
ELIMINATION OF THE RELAY:

The 101411 chassis (Model 4587) described in Service Instructions 578L 2E and in Supplement #1, uses a relay to accomplish the various switching required by the Automatic Frequency Control. Flash tuning required in later production of this model, the circuit was changed, eliminating the relay transformer in place of the relay to accomplish the same results. Such chassis are identified by the number, 101411A (Model 4587A).

The simplified diagram below shows how the transformer is used to mute the receiver and to operate the Flash Tuning light.



The A.F.C. transformer is a step-up transformer. Its primary is connected in series with the flash tuning light bulb, across the heater winding of the power transformer. The toothed disc and contacting arm is connected across the primary of the A.F.C. transformer. The operation then is as follows: When the contacting arm is not engaging a bent-up tooth on the disc, the power transformer heater voltage is impressed, in series with the flash tuning light bulb, upon the primary of the A.F.C. transformer. Although current flows through the primary, its impedance is too high to pass sufficient current to light the flash tuning light bulb. The voltage impressed on the A.F.C. transformer primary is stepped up in the secondary and rectified by one of the diode plates of the 6HG tube. This diode voltage (approximately 60 volts) is applied to the suppressors of the RF and IF tubes and to the control grid of the first AF tube, to provide muting. These are the conditions that exist when the right hand knob is turned to a flash position and the receiver is tuned between flash stations.

When the receiver is tuned to a flash station, the contacting arm touches the tooth bent up for the station. This short circuits the primary of the A.F.C. transformer. With the impedance of this primary removed from the circuit the full voltage of the heater winding is impressed across the flash tuning light bulb causing it to light. Since the A.F.C. primary is short circuited, no voltage is developed across its secondary, thereby removing the muting bias. The receiver then is in operating condition and receives the station selected for flash tuning.

In the original sets using a relay, one set of contacts on the relay was used to prevent the A.F.C. from operating until the bent up tooth contacted the movable arm. This was necessary to prevent a strong station from being "pulled over" from an adjacent channel as the receiver was tuned through it, since the receiver was alive up to the audio stage. When the A.F.C. transformer is used in place of the relay, this pull over cannot occur because the receiver is made inoperative right at its input by muting of the RF tube.

IMPORTANT NOTE IN SETTING UP A.F.C. STATIONS:

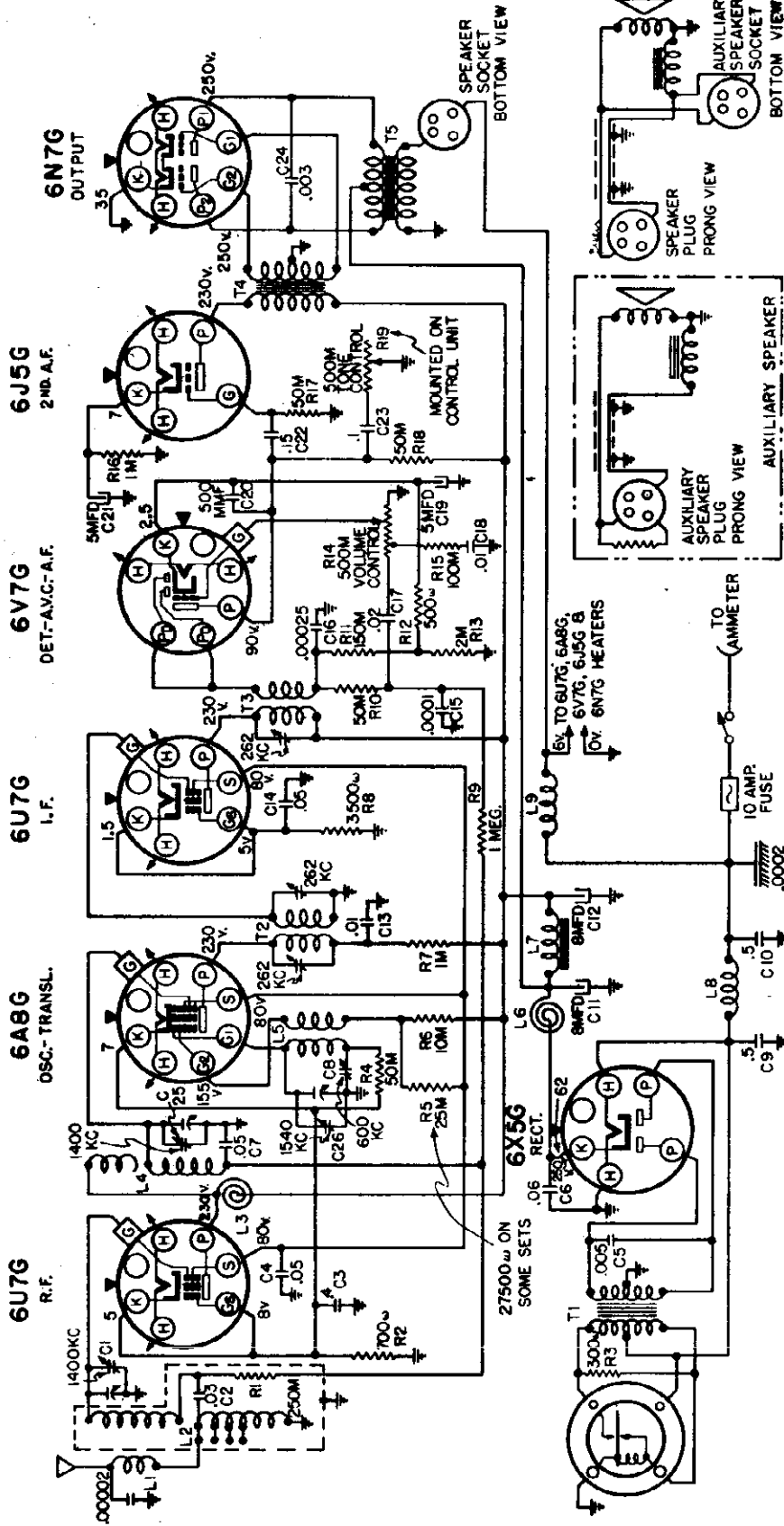
IT IS VERY IMPORTANT THAT THE RECEIVER BE TUNED ON FOR TWENTY MINUTES BEFORE SETTING UP A.F.C. STATIONS ON THE TOOTHED DISC. IF STATIONS ARE SET UP WITH THE RECEIVER "COLD", FREQUENCY DRIFT MAY CHANGE THE ACCURACY AND RELIABILITY OF THE SETTING WHEN THE RECEIVER WARMENS UP.

CHANGE IN CONNECTIONS AND OPERATION OF THE FLASH TUNING - SELECTIVITY SWITCH (RIGHT HAND KNOB):

The right hand knob has three positions marked, "SHARP"; "B" (BROAD); "FLASH". In all of the sets using a relay and in the first production of those using a transformer the receiver operated in the conventional manner in the "SHARP" and "B" positions. In the "FLASH" position, the A.F.C. and flash tuning circuits were connected. In later production sets using the transformer, the operation and connections of the A.F.C. - Selectivity Switch have been changed so that the radio operates in the conventional manner only in the "SHARP" position. In the "B" position, the A.F.C. is connected and selectivity is broad. In the "FLASH" position, the A.F.C. also is connected and selectivity is sharp. In other words, in latest production there are two A.F.C. positions with a choice of broad or sharp selectivity. There is one non-A.F.C. position with sharp selectivity.

SEARS-ROEBUCK & CO.

MODEL 4601
Schematic
Voltage



POWER SUPPLY:
"A" 6 volt, Automobile storage battery.
"B" Vibrator-Rectifier

"A" Drain 8.25 amperes
"B" Drain 55 ma

ALIGNMENT FREQUENCIES:
Oscillator Ant.-Translator 540-1540 kc
Trimmer 1400 kc

LOUD SPEAKER:
Type Dynamic
Size 8"
Approximate field resistance 4 ohms

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES A VERY LOW READING.
FIGURES AT CATHODES INDICATE CATHODE CURRENT IN MILLIAMPERES.

FREQUENCY RANGE:
Broadcast 540-1540 kc

INTERMEDIATE FREQUENCY Class "B"
POWER OUTPUT:
Type 8 watts
Undistorted 11 watts
Maximum 11 watts

57RL-41
March 4, 1937

MODEL 4601

Socket, Trimmers
Alignment, Sensitivity

SEARS-ROEBUCK & CO.

ALIGNMENT PROCEDURE

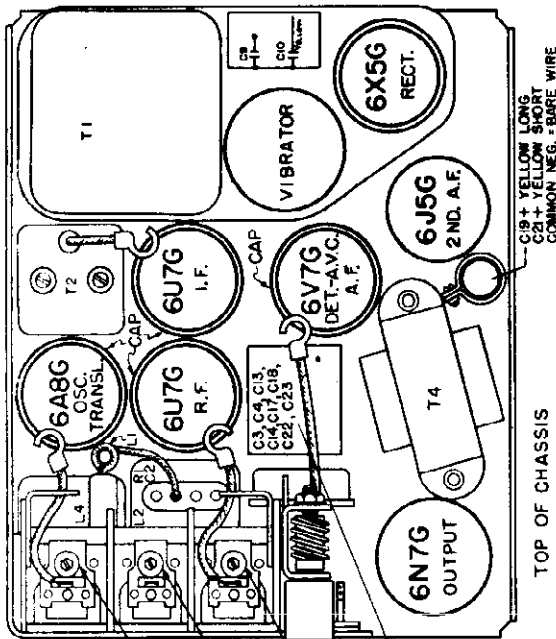
PRELIMINARY:

- Output meter connections Across loud speaker voice coil
- Output meter reading to indicate 1 watt 1.05 volts
- Average sensitivity in microvolts for 1 watt output See chart below
- Generator ground lead connection Receiver chassis
- Dummy antenna value to be in series with generator output See chart below
- Connection of generator output lead See chart below
- Generator modulation 30%, 400 cycles
- Position of Volume Control Fully on
- Position of Tone Control Fully clockwise (treble)
- Position of Antenna Tap #3 hole
- The Chassis must be in its case although the covers may be removed during the alignment procedure.

TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	GENERATOR FREQUENCY	DUMMY ANTENNA CONNECTION	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Closed	288 kc	.1 mfd.	IF	800
Fully Open	1540 kc	.0003 mfd. Antenna Conn.	Osc. Trim.	1
1400 kc	1400 kc	.0003 mfd. Antenna Conn.	Ant. Transl.	1
800 kc (peak)	800 kc	.0003 mfd. Antenna Conn.	Padder	2

IMPORTANT ALIGNMENT NOTES

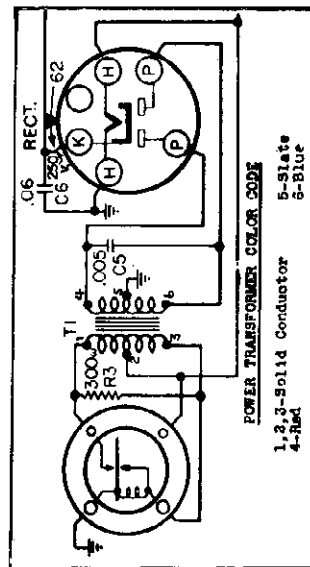
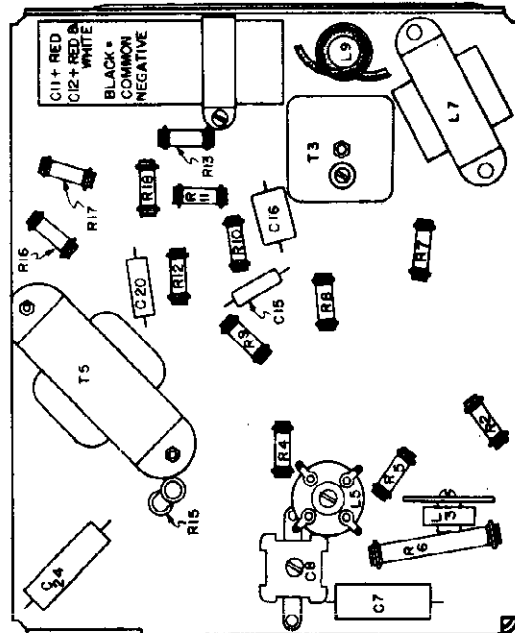
The variable should be rotated back and forth a degree or two while making the 800 kc adjustment.
 The alignment procedure should be repeated in the original order, step by step, to insure greater accuracy.
 Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.



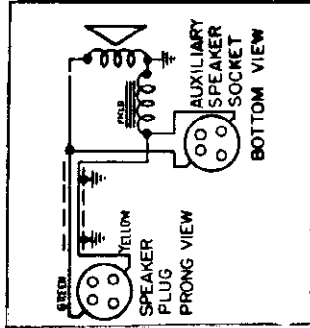
TOP OF CHASSIS

LOCATIONS OF PARTS

UNDER CHASSIS



POWER TRANSFORMER COLOR CODE
 1-2, 3-Solid Conductor
 4-Red
 5-Slate
 6-Blue

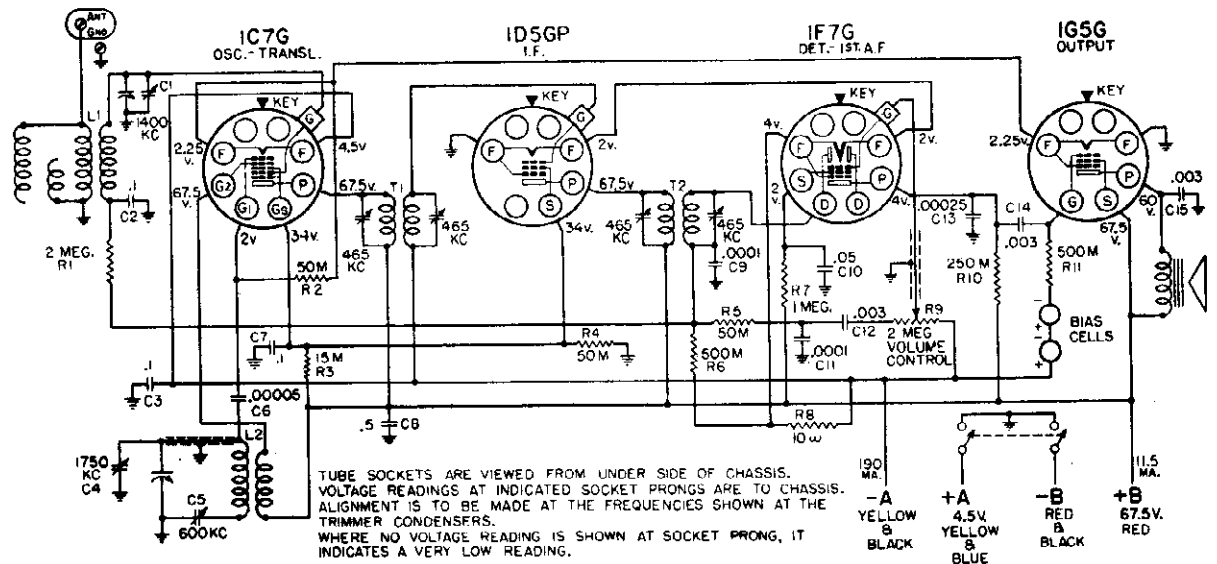


AUXILIARY SPEAKER SOCKET
 BOTTOM VIEW

Trimmers, Chassis, Alignment
Sensitivity, Notes

SEARS-ROEBUCK & CO.

MODELS 4602-3, 4620-1, 4630-1
4720, 4730
Schematic, Voltage, Socket



JUNE 3, 1937

ALIGNMENT PROCEDURE

- PRELIMINARY:**
- Output meter connections 4000 ohm Weston meter, across speaker terminals
 - Output meter reading to indicate 50 milliwatts 9.4 volts
 - Average sensitivity in microvolts for 50 milliwatts output See chart below
 - Generator ground lead connection Receiver chassis
 - Dummy antenna value to be in series with generator output See chart below
 - Connection of generator output lead See chart below
 - Generator modulation 30%, 400 cycles
 - Position of Volume Control Fully on
- | POSITION OF VARIABLE | GENERATOR FREQUENCY | DUMMY ANTENNA | GENERATOR CONNECTION | TRIMMER ADJUSTMENTS (IN ORDER SHOWN) | TRIMMER FUNCTION | APPROXIMATE MICROVOLTS |
|----------------------|---------------------|---------------|----------------------|--------------------------------------|-----------------------|------------------------|
| Cl-cord | 465 kc | .1 mfd. | 1C7G Transl. Grid | T2, T1 | IF | 325 |
| 1-400 kc * | 1400 kc | .0003 mfd. | Antenna Term. | C1, C4 | Translator Oscillator | 85 |
| 600 kc (peak) | 800 kc | .0003 mfd. | Antenna Term. | C5 | Paeder | 80 |

IMPORTANT ALIGNMENT NOTES

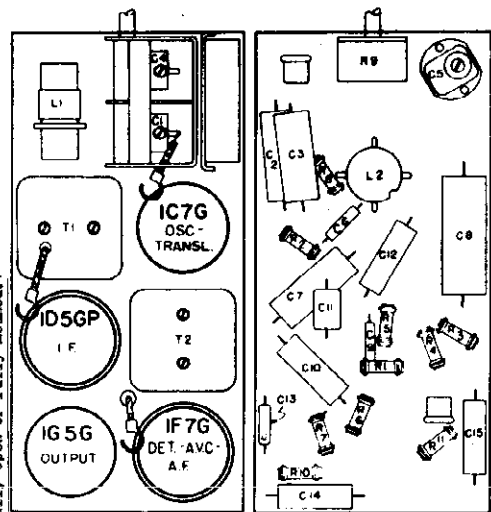
* Using the dial as a template make a dummy dial of cardboard with only the 1400 kc calibration on it. Slip this dummy dial over the shaft, hold it horizontal so that the 1400 mark will be in the same position as the 1400 mark of the actual dial, and turn the dial pointer to the 1400 kc mark. (The dial pointer should be horizontal when the condenser is fully open or fully meshed.)

INTERMEDIATE FREQUENCY 465 kc

POWER OUTPUT:
Type Single Pentode
Undistorted 0.125 watts
Maximum 0.2 watts

POWER SUPPLY:
"A" Battery (4½ volt dry) 1 - #6030
"A" Battery (4 volt storage) 1 - #6049
"B" Battery (87½ volts) 1 - #6040
"A" Drain 0.18 amperes
"B" Drain 15 ma

LOUD SPEAKER:
Type Magnetic
Size 6 inch
DC resistance App. 1500 ohms



LOCATIONS OF PARTS ON TOP OF CHASSIS.

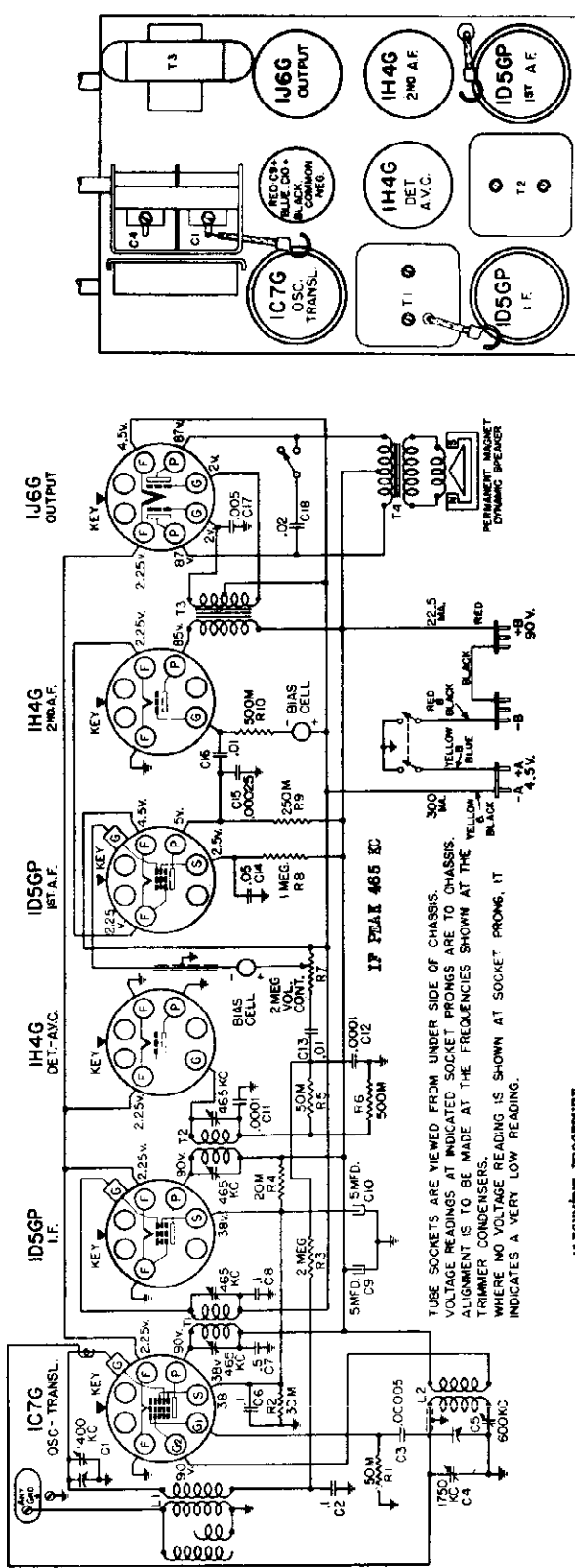
LOCATIONS OF PARTS UNDER CHASSIS.

MODELS 4604-5, 4624-5, 4634-5

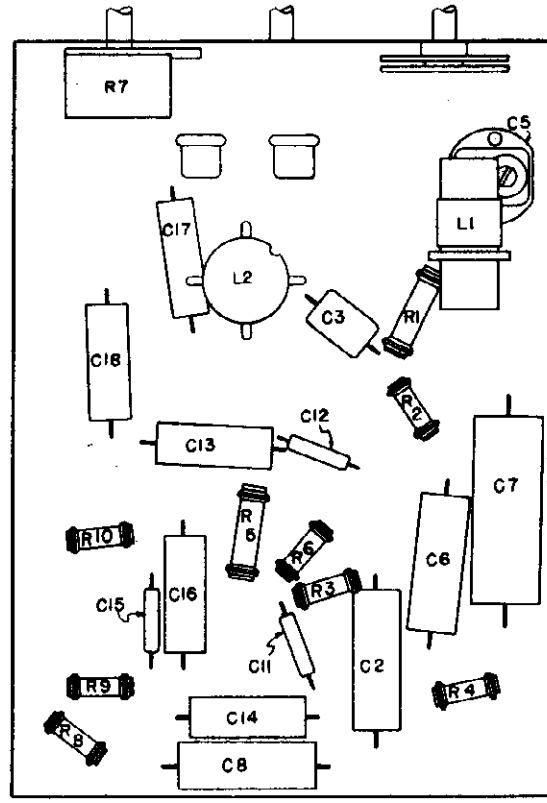
4724

SEARS-ROEBUCK & CO.

Schematic, Voltage, Socket Trimmers, Chassis, Alignment



LOCATIONS OF PARTS ON TOP OF CHASSIS



JUNE 4, 1937

LOCATIONS OF PARTS UNDER CHASSIS

ALIGNMENT PROCEDURE

- Output meter connection Across loud speaker voice coil
- Output meter reading to indicate 50 milliwatts 0.37 volts
- Generator ground lead connection Receiver chassis
- Dummy antenna value to be in series with generator output See chart below
- Connection of generator output lead See chart below
- Generator modulation 30%, 400 cycles
- Approximate average sensitivity in microvolts for 50 milliwatts output See chart below
- Position of Volume Control Fully clockwise
- Position of Tone Control Fully clockwise

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA CONNECTION	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Closed	485 kc	.1 mfd.	1.076 Transl. Grid	T9, T1	IF	180
1400 kc *	1400 kc	.0003 mfd.	Antenna Term.	O4, C1	Oscillator Translator	50
600 kc (rook)	600 kc	.0003 mfd.	Antenna Term.	C5	Padder	35

IMPORTANT ALIGNMENT NOTES

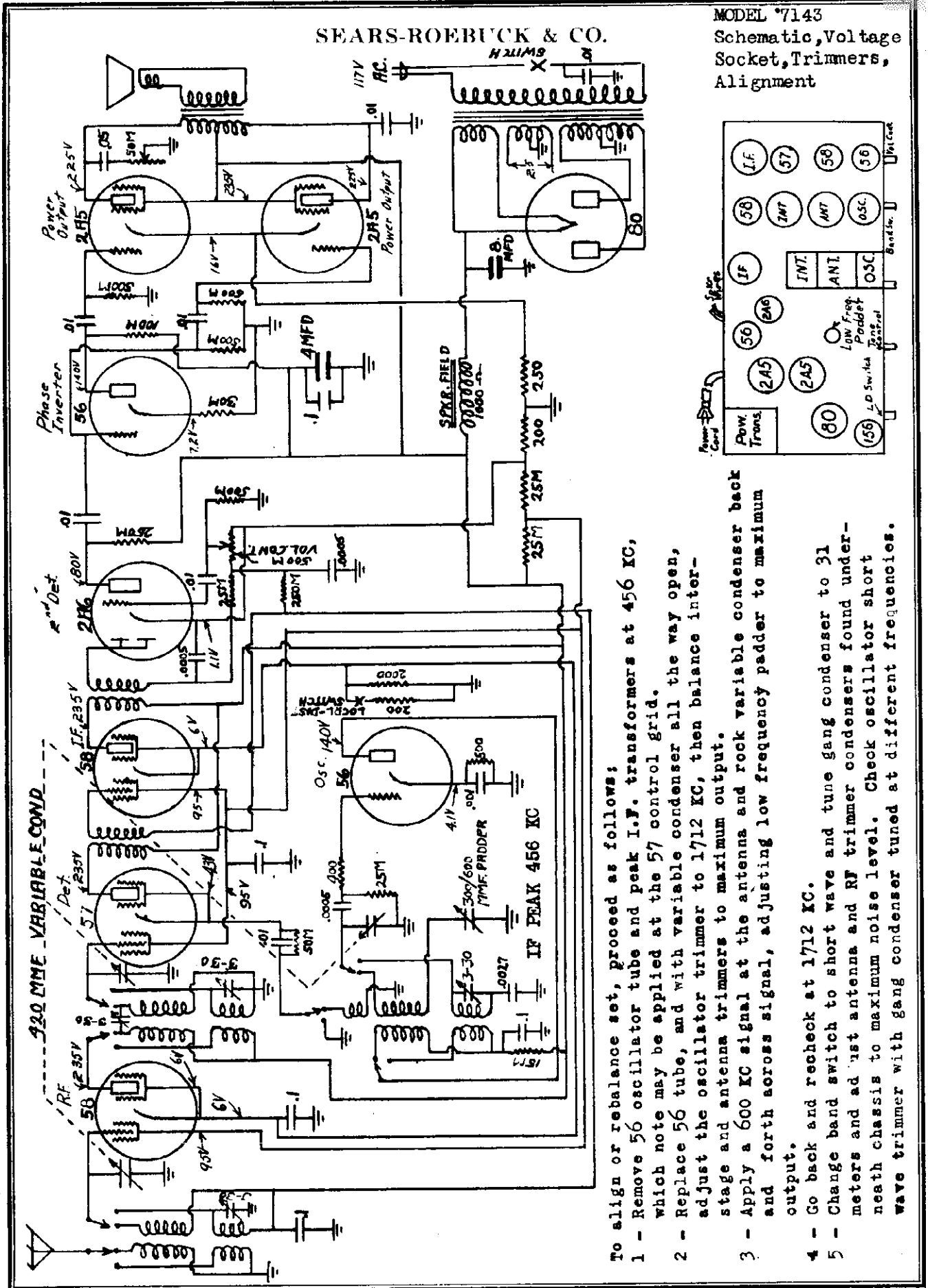
* Using the dial as a template make a dummy dial of cardboard with only the 1400 kc calibration on it. Slip this dummy dial over the dial, not at its horizontal line, the 400 mark will be at the 1400 mark of the dial. Turn the dial and turn the 400 pointer to the 1400 kc mark. (The dial pointer should be horizontal when the condenser is fully open or fully washed.)

PRELIMINARY:

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE YELLOW TRIMMER CONDENSERS. WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES A VERY LOW READING.

SEARS-ROEBUCK & CO.

MODEL 7143
Schematic, Voltage
Socket, Trimmers,
Alignment

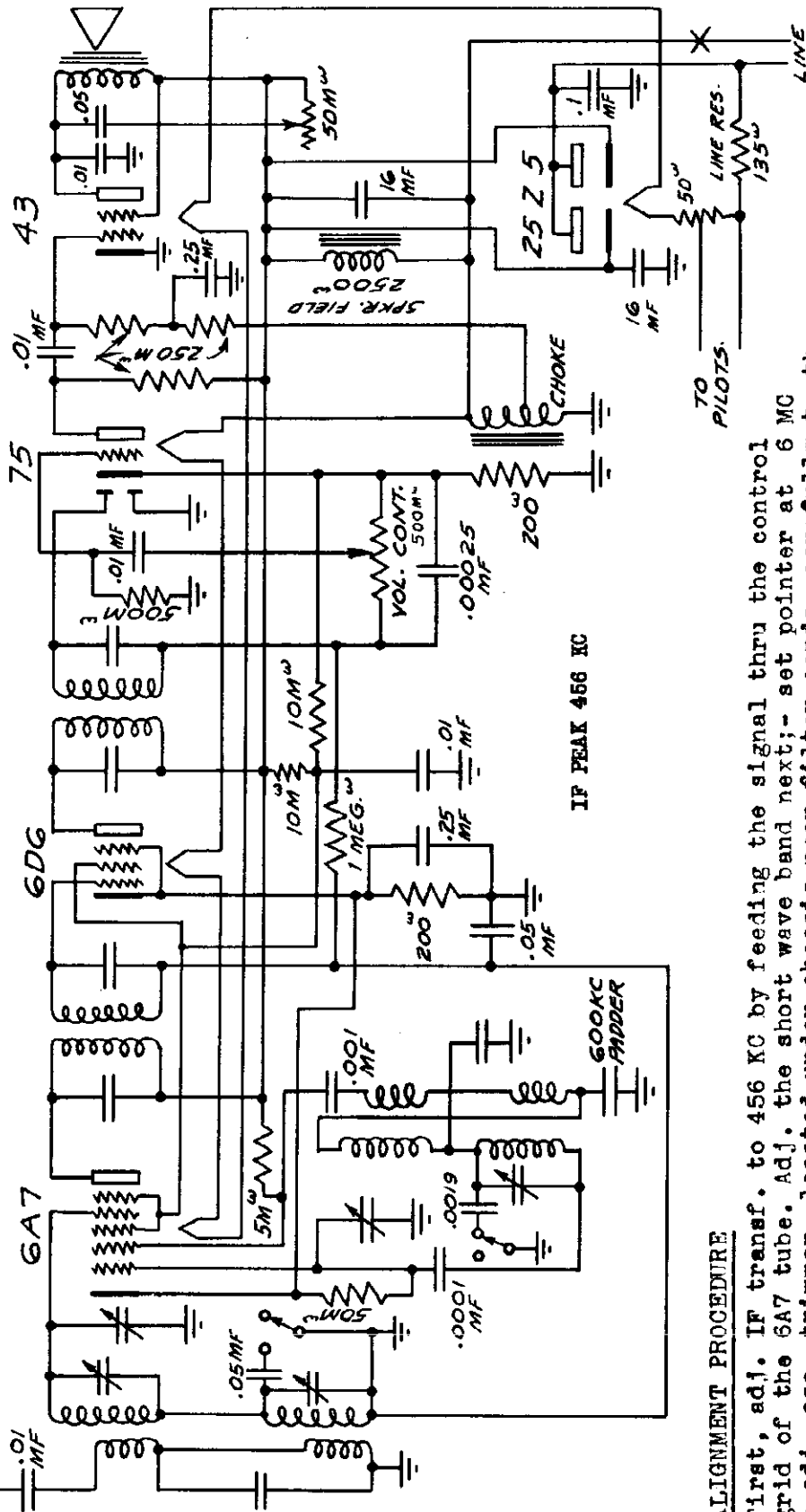


To align or rebalance set, proceed as follows:

- 1 - Remove 56 oscillator tube and peak I.F. transformers at 456 KC, which note may be applied at the 57 control grid.
- 2 - Replace 56 tube, and with variable condenser all the way open, adjust the oscillator trimmer to 1712 KC, then balance inter-stage and antenna trimmers to maximum output.
- 3 - Apply a 600 KC signal at the antenna and rock variable condenser back and forth across signal, adjusting low frequency padder to maximum output.
- 4 - Go back and recheck at 1712 KC.
- 5 - Change band switch to short wave and tune gang condenser to 31 meters and adjust antenna and RF trimmer condensers found underneath chassis to maximum noise level. Check oscillator short wave trimmer with gang condenser tuned at different frequencies.

MODEL 7172X
Schematic
Alignment

SEARS-ROEBUCK & CO.



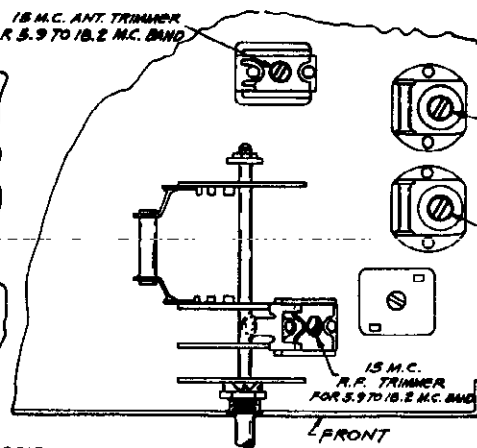
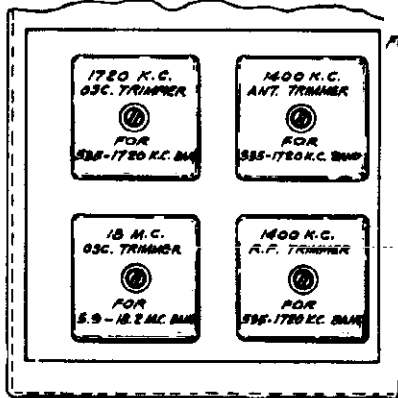
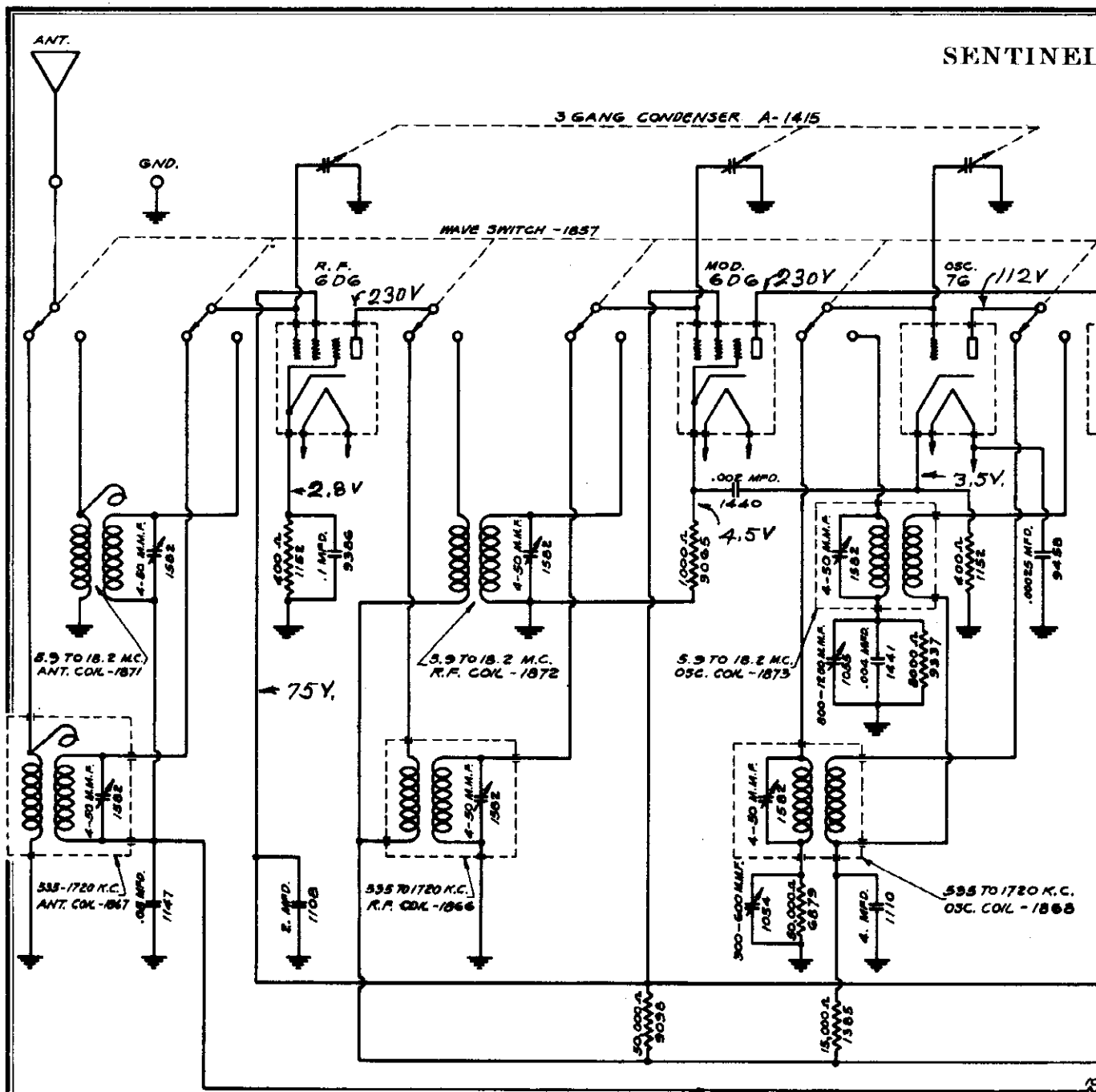
ALIGNMENT PROCEDURE

First, adj. IF transf. to 456 KC by feeding the signal thru the control grid of the 6A7 tube. Adj. the short wave band next; - set pointer at 6 MC & adj. osc. trimmer, located under chassis near filter conds. carefully to the fundamental rather than image (fund. is second peak as you adj. from max. cap.); then adj. the short wave ant. trimmer, located on top of chassis near var. cond., for max. signal; next dial across short wave band checking it at 2.5 and 4 MC to see that it does not stop oscillating. If this should occur, try changing 6A7 tubes to find one that will oscillate at 2.2 MC. If you experience any difficulty in finding a satisfactory tube, it may be necessary to use separate bias on 6A7 (200 ohm res. and .1/4 mfd cond.) in order to use the tubes available.

Now, set band switch to broadcast position and adj. padder at about 600 Kc for max. gain, rocking the var. cond. with each adj. of the padder - then with gang all the way open, adj. B.C. osc. trimmer located under chassis near outer edge, to 1717 KC and set B.C. ant. trimmer located on top of chassis near outer edge, for maximum gain.

This set is designed to operate on 105-125 volts AC-DC

DO NOT CONNECT A GROUND TO THIS SET.



FREQUENC

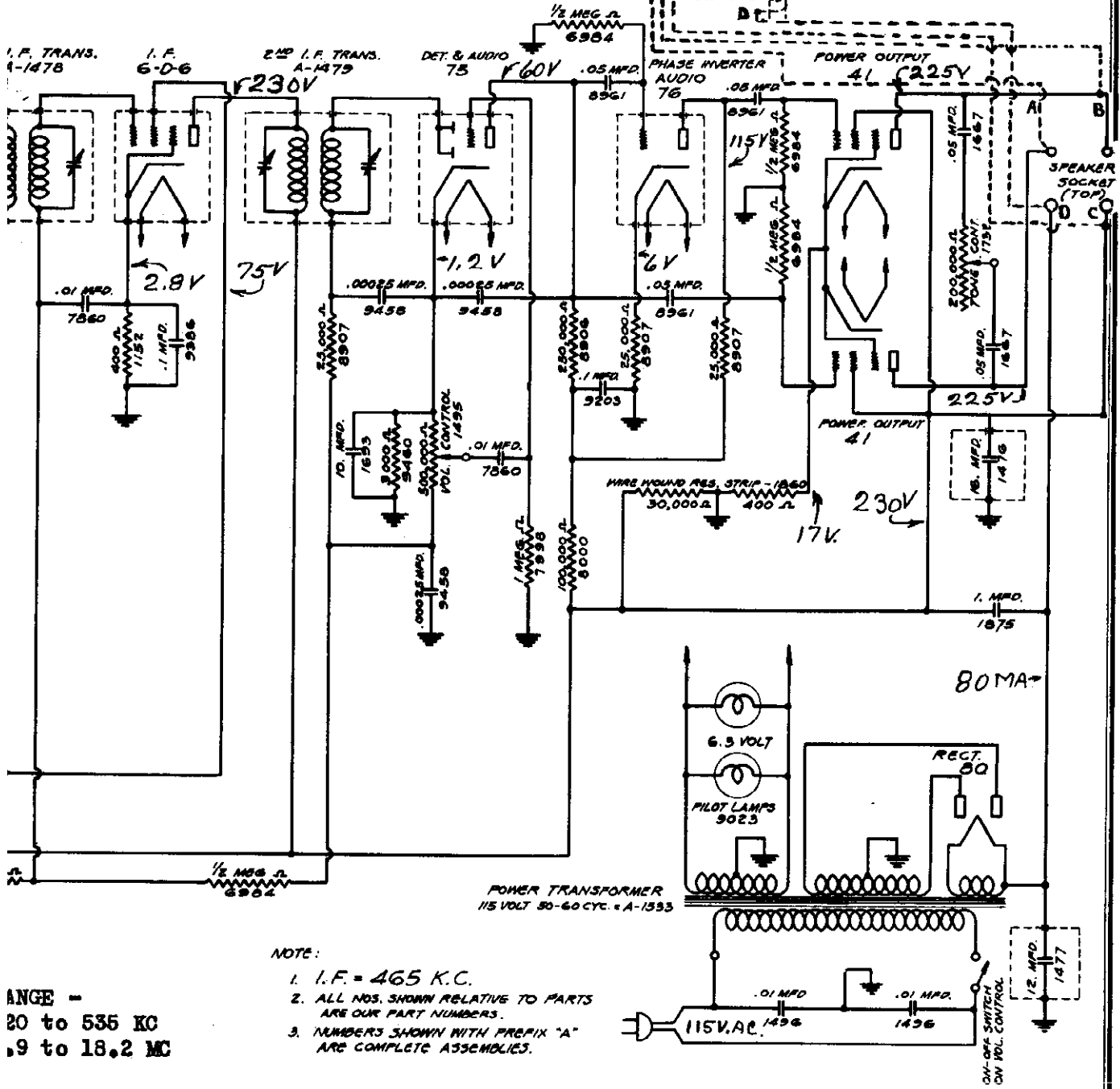
CONVENTIONAL Peak I-F trimmers and generator to oscillator circuit

to peak. Dial and while rocking the FOREIGN band osci

ADIO CORP.

DYN. SPEAKER
8" DIA. = 1858
10" DIA. = 1859

MODEL 6A
Schematic, Voltage
Trimmers, Alignment



- NOTE:
1. I.F. = 465 KC.
 2. ALL NOS. SHOWN RELATIVE TO PARTS ARE OUR PART NUMBERS.
 3. NUMBERS SHOWN WITH PREFIX "A" ARE COMPLETE ASSEMBLIES.

RANGE -
20 to 535 KC
.9 to 18.2 MC

ALIGNMENT - SEE SPECIAL SECTION.

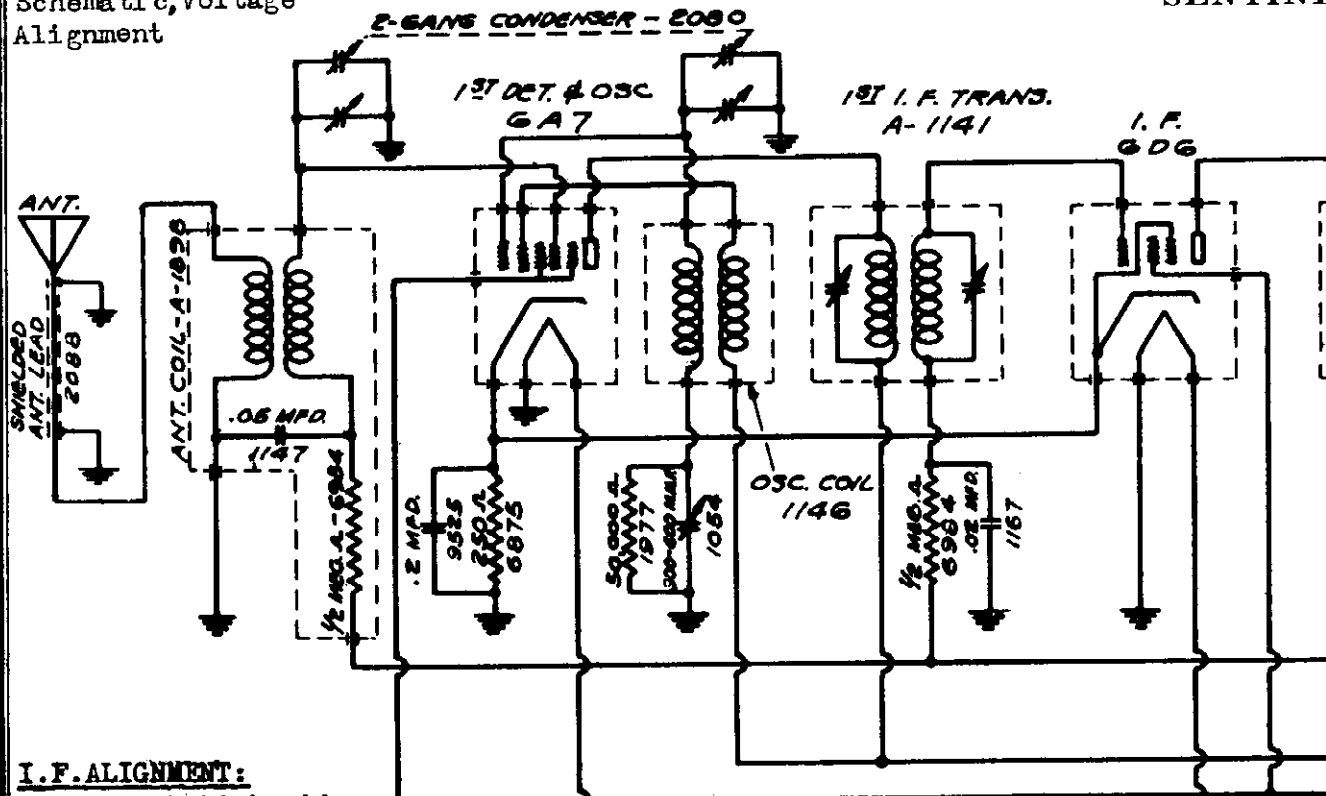
465 KC. BROADCAST - Dial and trimmer to 1720 KC, peak oscillator trimmer. Dial to 1720 KC, peak antenna and R-F trimmers. Dial and generator at 600 KC, pad the trimmer for maximum peak, while rocking the variable gang condenser.

FOREIGN - Dial and generator at 18 MC, adjust the oscillator trimmer for maximum peak. Dial and generator at 15 MC, adjust the R-F and antenna trimmers to maximum sensitivity. Dial and generator at 6.5 MC, pad the trimmer for maximum peak while rocking the variable condenser.

MODEL 10MF

Schematic, Voltage Alignment

SENTINEL

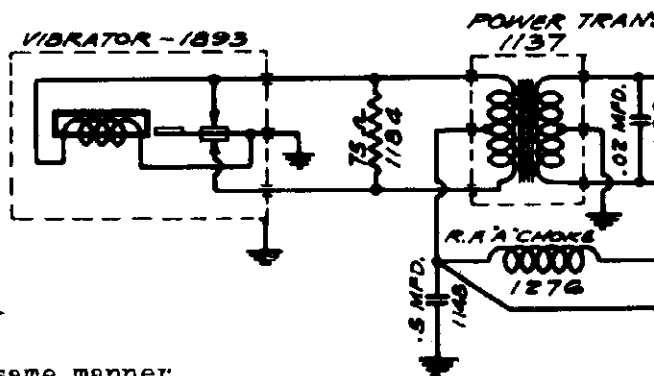


I.F. ALIGNMENT:

1. Attach high side of test oscillator output to control grid of 6A7, leaving control grid disconnected. Connect a 1 megohm resistor from control grid to chassis. Connect GND side of the oscillator to the chassis.
2. Set test oscillator at 370 KC (must be accurate), adjust output of oscillator so that a convenient reading is obtained on the output meter.
3. Align 1st I.F. transformer by turning one of the trimmer screws up and down until maximum reading is obtained on output meter, then adjust other trimmer screw for maximum sensitivity.
4. Adjust 2nd I.F. transformer in the same manner.

NOTE:

1. I.F. = 370 K.C.
2. ALL NUMBERS SHOWN RELATIVE TO PARTS ARE OUR PART NUMBERS
3. NUMBERS SHOWN WITH PREFIX "A" ARE COMPLETE ASSEMBLIES.

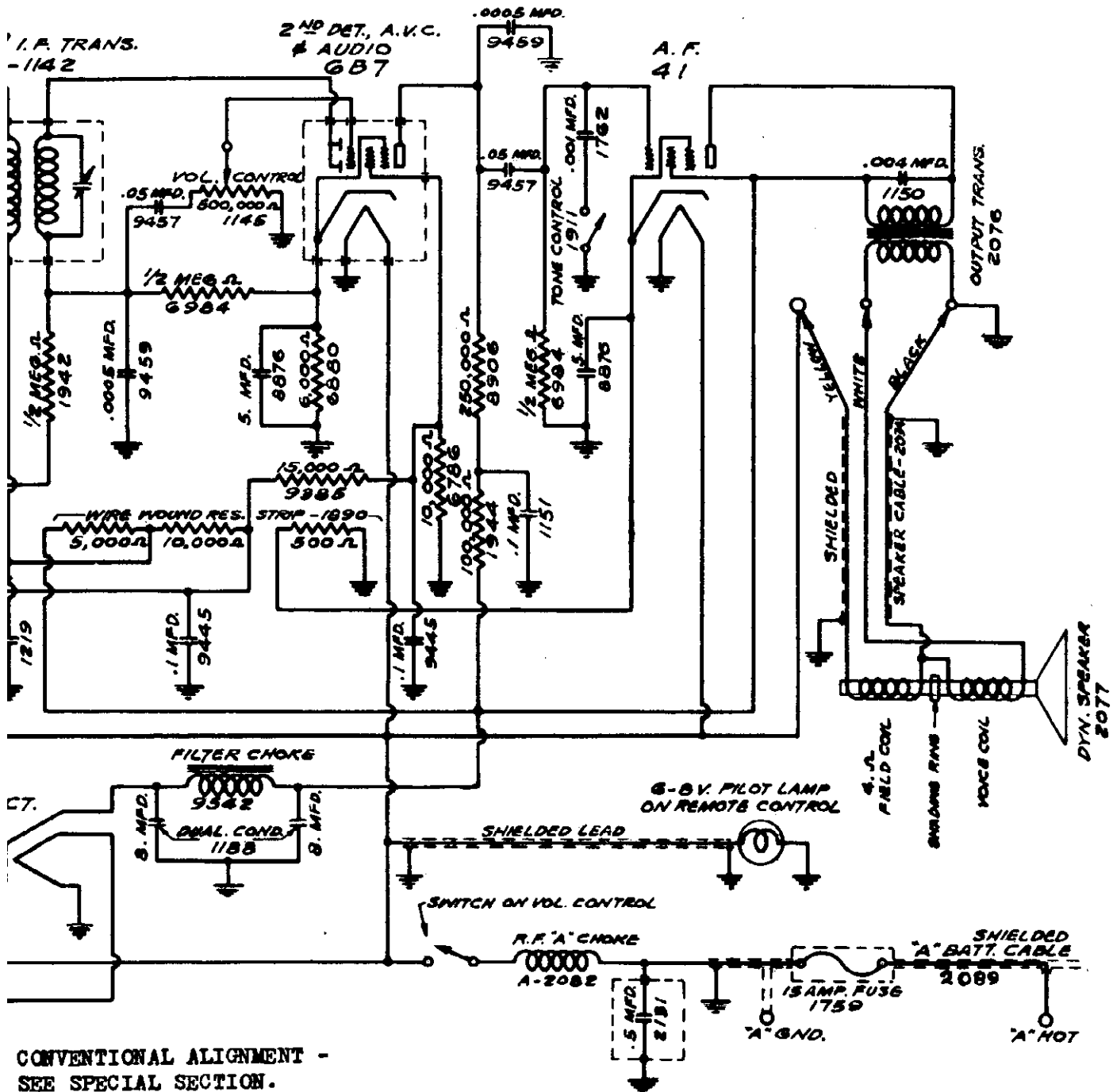


TO ALIGN VARIABLE CONDENSER:

It is necessary to remove receiver chassis from set housing to align variable gang and padding condensers.

1. Properly connect the remote control head, shafts, and adjust the dial needle on the dial face from the back so that the dial calibration is correct.
2. Connect the high output side of test oscillator to ANT. and GND. to chassis.
3. Tune the receiver dial and set the test oscillator frequency to 1400 KC. Bring the 1400 KC signal to maximum output by adjusting trimmer located on top of oscillator section (front section) of gang condenser. Next adjust the antenna section (rear section) for maximum 1400 KC signal sensitivity.
4. Tune receiver dial and set test oscillator to approximately 600 KC and while rocking gang condenser adjust the 600 KC padding condenser, which is located and accessible thru the hole in the left hand side of chassis, for maximum output.

RADIO CORP.



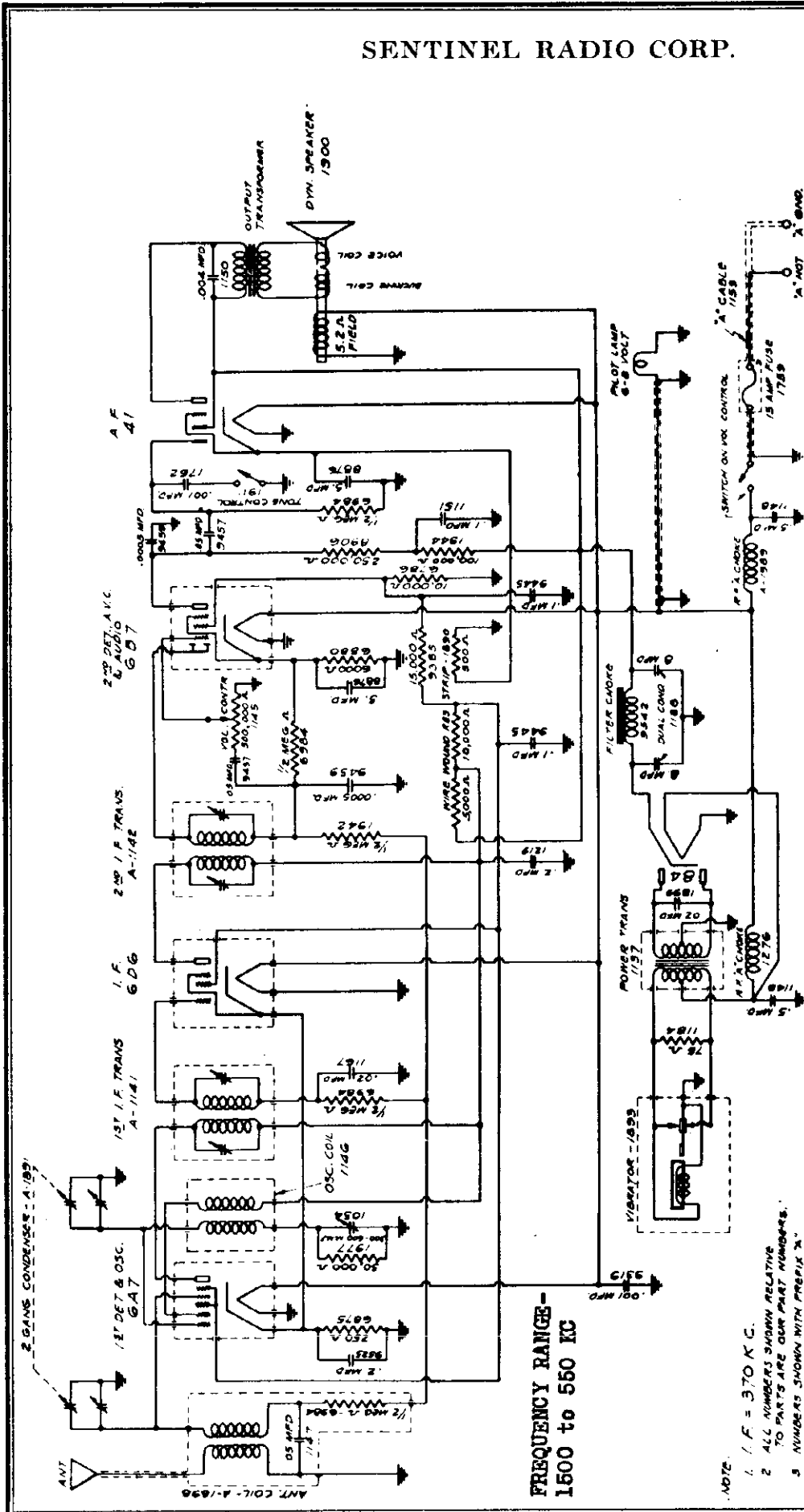
VOLTAGE TABLE

TUBE	POSITION OF TUBE	FILAMENT VOLTS	PLATE VOLTS	CATHODE VOLTS	SCREEN VOLTS	GRID NO. 1	GRID NO. 3 & 5
7	OSCILLATOR AND MODULATOR	6	180	3.6		180	75
6	INTERMEDIATE FREQUENCY	6	180	3.6			
7	2ND DETECTOR DIODE & AVC	6	32*	1.9	75		
1	OUTPUT	6	220	15	230		
4	RECTIFIER	6		230			

COMPARATIVE VOLTAGE ONLY. READ ALL VOLTAGES FROM SOCKET TO CHASSIS. TOTAL "A" CURRENT 5.9 AMPERES.

SENTINEL RADIO CORP.

MODEL 10M
Schematic, Voltage
Alignment



TUBE TYPE	TUBE POSITION	FILAMENT VOLTS	PLATE VOLTS	CATHODE VOLTS	SCREEN VOLTS	GRIDS	
6A7	OSC. & MOD.	6	180	3.6	180	75	
6D6	I-F	6	180	3.6	75	-	
6B7	2nd Det & AVC	6	32*	1.9	30*	-	
41	OUTPUT	6	220	15	230	-	
84	RECTIFIER	6	-	230	-	-	
						TOTAL "A" VOLTAGE	5.9 AMF

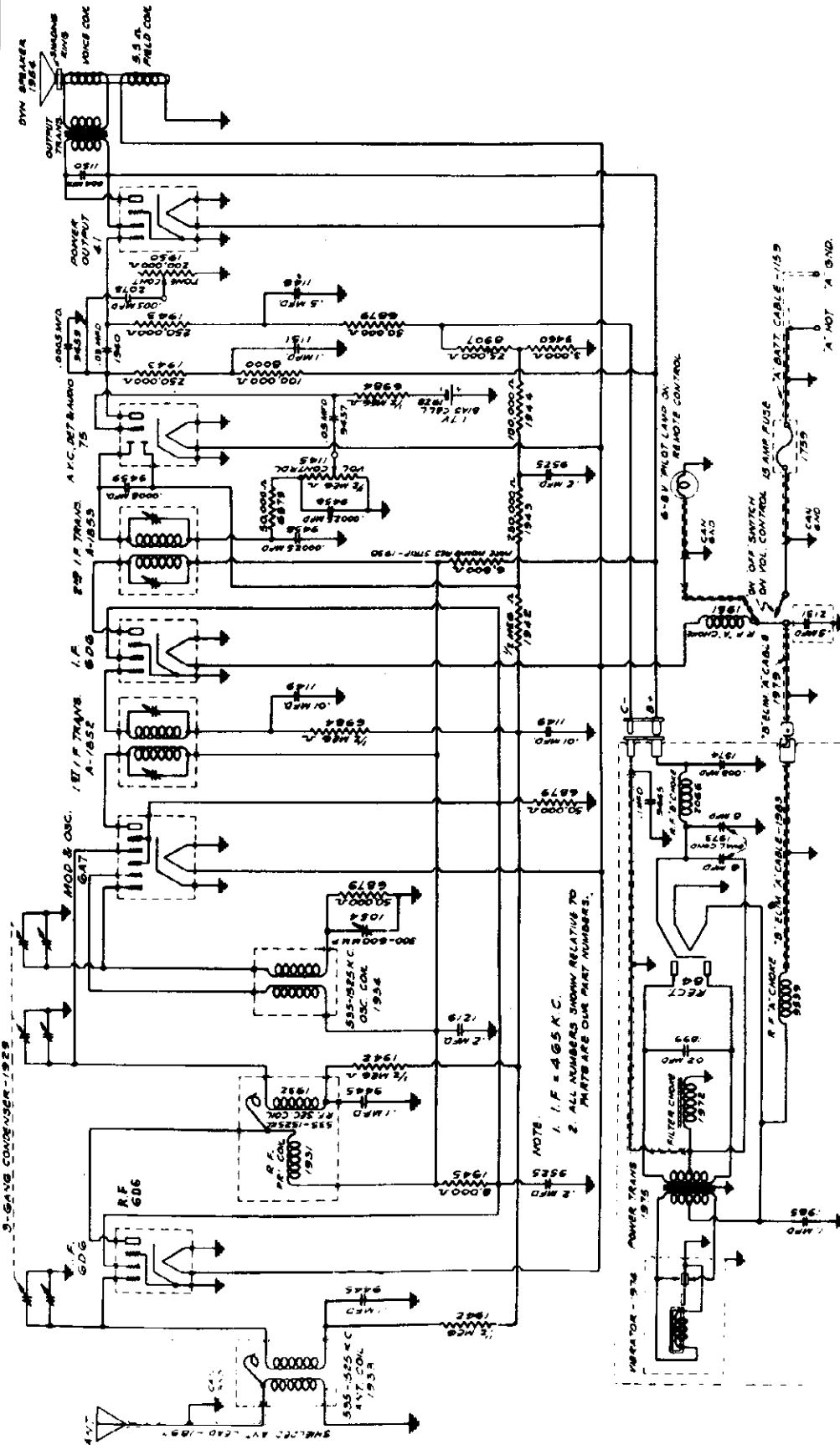
CONVENTIONAL ALIGNMENT (see special section)
ALSO, the alignment frequencies and procedure is the same as for MODEL 10 MF.
(See The Index.)

- NOTE:
1. I. F. = 370 KC.
 2. ALL NUMBERS SHOWN RELATIVE TO PARTS ARE OUR PART NUMBERS.
 3. NUMBERS SHOWN WITH PREFIX "A" ARE COMPLETE ASSEMBLIES.

MODEL 11M

Schematic, Voltage Alignment

SENTINEL RADIO CORP.



CONVENTIONAL ALIGNMENT-
(see special section)
ALSO SAME AS THE
MODEL 10-MF.
(SEE INDEX)

TUBE TYPE	POSITION	FIL. VOLTS	PLATE VOLTS	SCREEN VOLTS	GRID NO.1	GRIDS NOS. 3 & 5
6D6	RF	6	125	100	2	100
6A7	OSC. MOD.	6	125	60	2	100
6D6	IF	6	125	60	-	100
75	2nd Det. AVC	6	75*	-	-	ages from socket prong to the chassis.
41	OUTPUT	6	200	210	-	* Triode plate
84	RECTIFIER	6	-	210	-	comperative only.

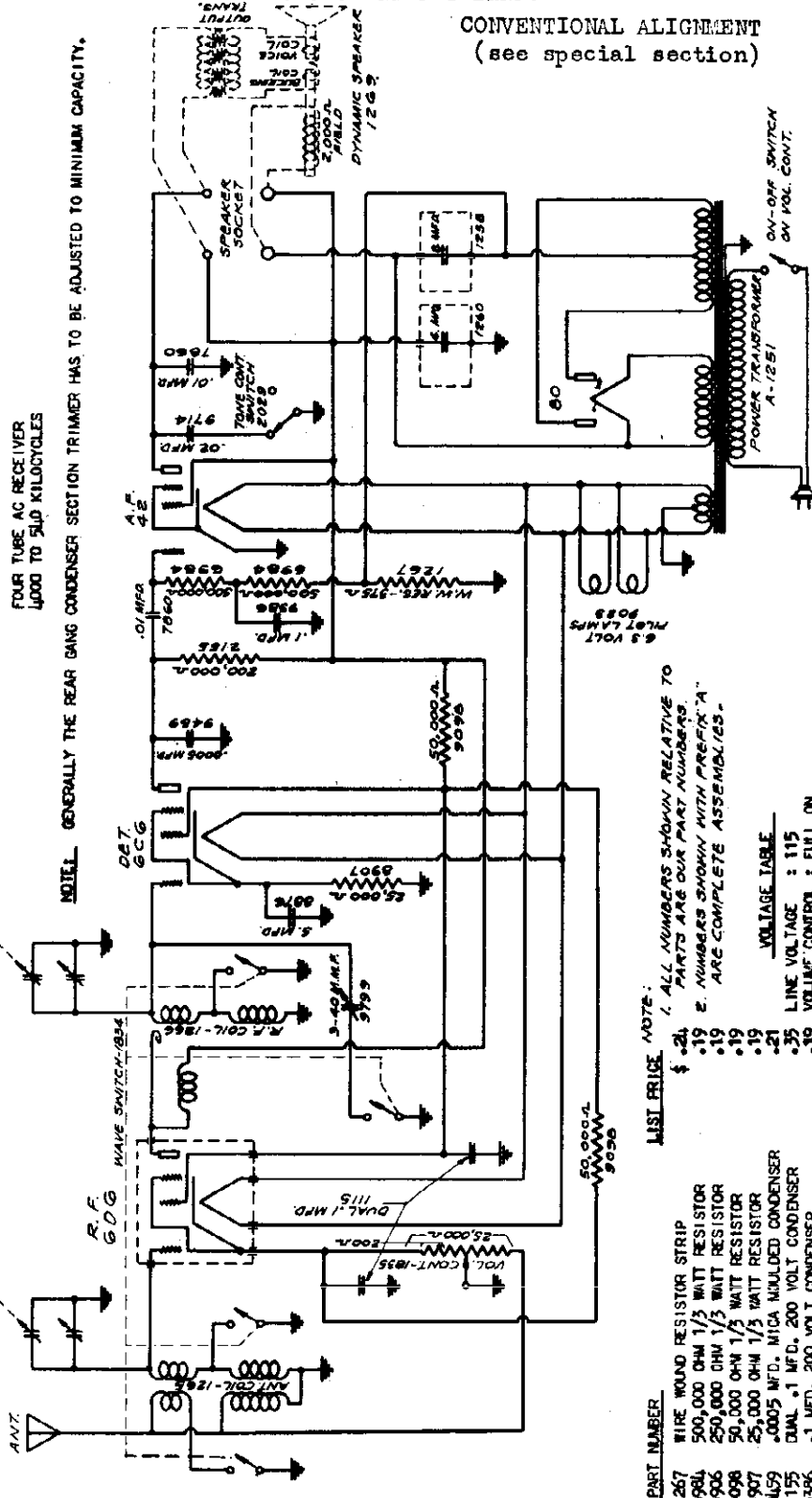
MODEL 30A
Schematic, Parts
Alignment, Voltage

SENTINEL RADIO CORP.

BAND SELECTOR SWITCH

THIS RECEIVER IS DESIGNED FOR TWO FREQUENCY BANDS. BROADCAST BAND FROM 1720 TO 540 KC. POLICE, AIRCRAFT AND AMATEUR BAND 1.5 MC. TO 4 MC. SWITCH TO LEFT POSITION FOR SHORT WAVE AND TO THE RIGHT FOR THE BROADCAST BAND.

CONVENTIONAL ALIGNMENT
(see special section)



FOUR TUBE AC RECEIVER
1000 TO 540 KILOCYCLES

NOTE: GENERALLY THE REAR GANG CONDENSER SECTION TRIMMER HAS TO BE ADJUSTED TO MINIMUM CAPACITY.

NOTE: 1. ALL NUMBERS SHOWN RELATIVE TO PARTS ARE OUR PART NUMBERS. 2. NUMBERS SHOWN WITH PREFIX 'A' ARE COMPLETE ASSEMBLIES.

VOLTAGE TABLE

LINE VOLTAGE	: 115
VOLUME CONTROL	: FULL ON
WAVE BAND	: BROADCAST
TUBE	
606	RADIO FREQUENCY
606	DETECTOR
L2	OUTPUT
80	RECTIFIER

READ ALL VOLTAGES FROM SOCKET PRONG TO GROUND UNLESS OTHERWISE SPECIFIED. (EXCEPT FILAMENT)
** READ FROM 375 OHM RESISTOR #1267 TO GROUND.

* COMPARATIVE VOLTAGE IS NOT TRUE VOLTAGE APPLIED.

TO ALIGN THE VARIABLE CONDENSER: IT IS IMPORTANT WHEN ALIGNING TO FOLLOW THE PROCEDURE CAREFULLY, OTHERWISE THE RECEIVER WILL LACK SENSITIVITY AND THE DIAL CALIBRATION WILL BE INCORRECT.

1. CONNECT THE HIGH OUTPUT SIDE OF THE OSCILLATOR TO THE RECEIVER ANTENNA LEAD AND THE GROUND TO THE CHASSIS.
2. PLACE THE BAND SELECTOR SWITCH FOR OPERATION ON THE BROADCAST BAND, TUNE THE RECEIVER TO EXACTLY 1000 KILOCYCLES ON THE DIAL AND SET THE TEST OSCILLATOR FREQUENCY TO 1000 KILOCYCLES. THEN BRING IN THE 1000 KILOCYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING THE TRIMMER CONDENSERS LOCATED ON TOP OF THE GANG CONDENSER.
3. SET THE BAND SELECTOR SWITCH FOR OPERATION ON THE SHORT WAVE BAND, TUNE THE RECEIVER DIAL TO EXACTLY 1.5 MEGACYCLES AND SET THE TEST OSCILLATOR TO THIS FREQUENCY. THEN ADJUST THE TRIMMER CONDENSER MOUNTED ON THE COIL LOCATED UNDERNEATH THE CHASSIS FOR MAXIMUM SENSITIVITY. RECK GANG CONDENSER WHEN MAKING THIS ADJUSTMENT.

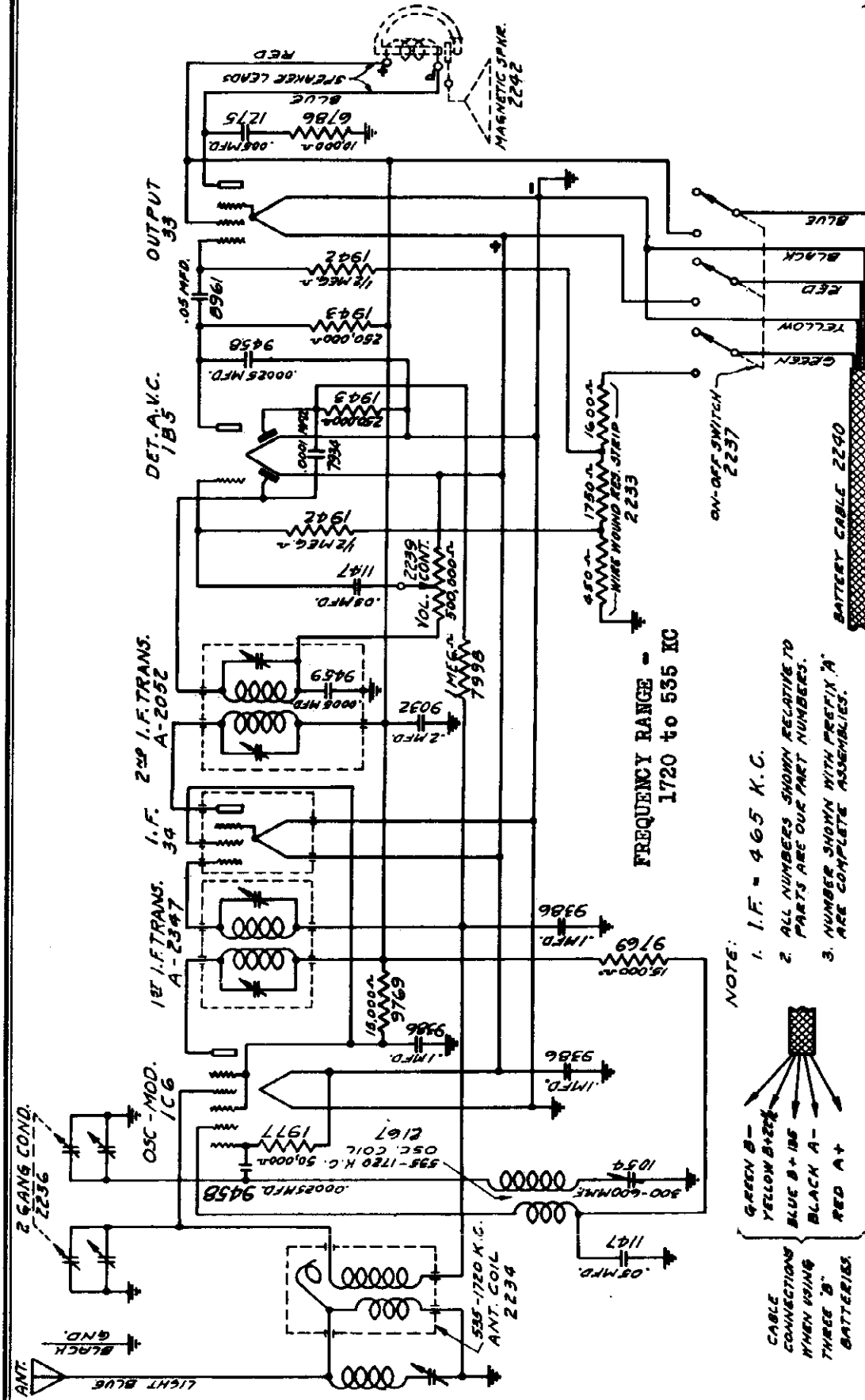
LIST PRICE

1267	WIRE WOUND RESISTOR STRIP	\$.20
698L	500,000 OHM 1/2 WATT RESISTOR	.19
6906	250,000 OHM 1/2 WATT RESISTOR	.19
9098	50,000 OHM 1/2 WATT RESISTOR	.19
8907	25,000 OHM 1/2 WATT RESISTOR	.19
9409	10005 MFD. 1 MICA MINULED CONDENSER	.21
1155	DUAL .1 MFD. 200 VOLT CONDENSER	.35
9386	.01 MFD. 200 VOLT CONDENSER	.17
7860	.01 MFD. 400 VOLT CONDENSER	.17
9774L	.02 MFD. 400 VOLT CONDENSER	.18
1740	15/16" KN0B	.22
1779	13/16" KN0B	.22
1269	DYNAMIC SPEAKER	5.25
1265	ANTENNA COIL	\$1.27
1266	R. F. COIL	1.27
2017	TWO GANG CONDENSER	2.25
9799	TRIMMER CONDENSER	.15
2105	DIAL ASSEMBLY (SPECIFY REQUIRED NAME)	2.00
1834	WAVE SWITCH	.47
9023	PILOT LIGHT LAMP BULB 6.3 VOLTS	.19
1251	POWER TRANSFORMER	3.20
1258	8 MFD. WET ELECTROLYTIC CONDENSER	1.16
1260	4 MFD. WET ELECTROLYTIC CONDENSER	1.02
8876	5 MFD. DRY ELECTROLYTIC CONDENSER	.85
1835	VOLUME CONTROL	1.15
2029	TRIMMER CONDENSER	.36

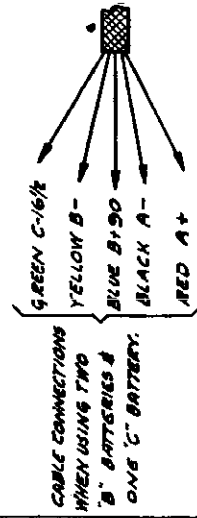
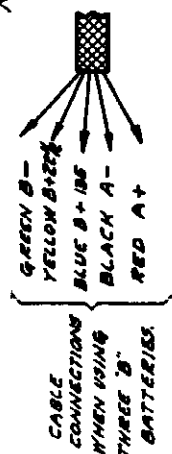
PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

SENTINEL RADIO CORP.

MODEL 32B
Schematic, Parts
Alignment



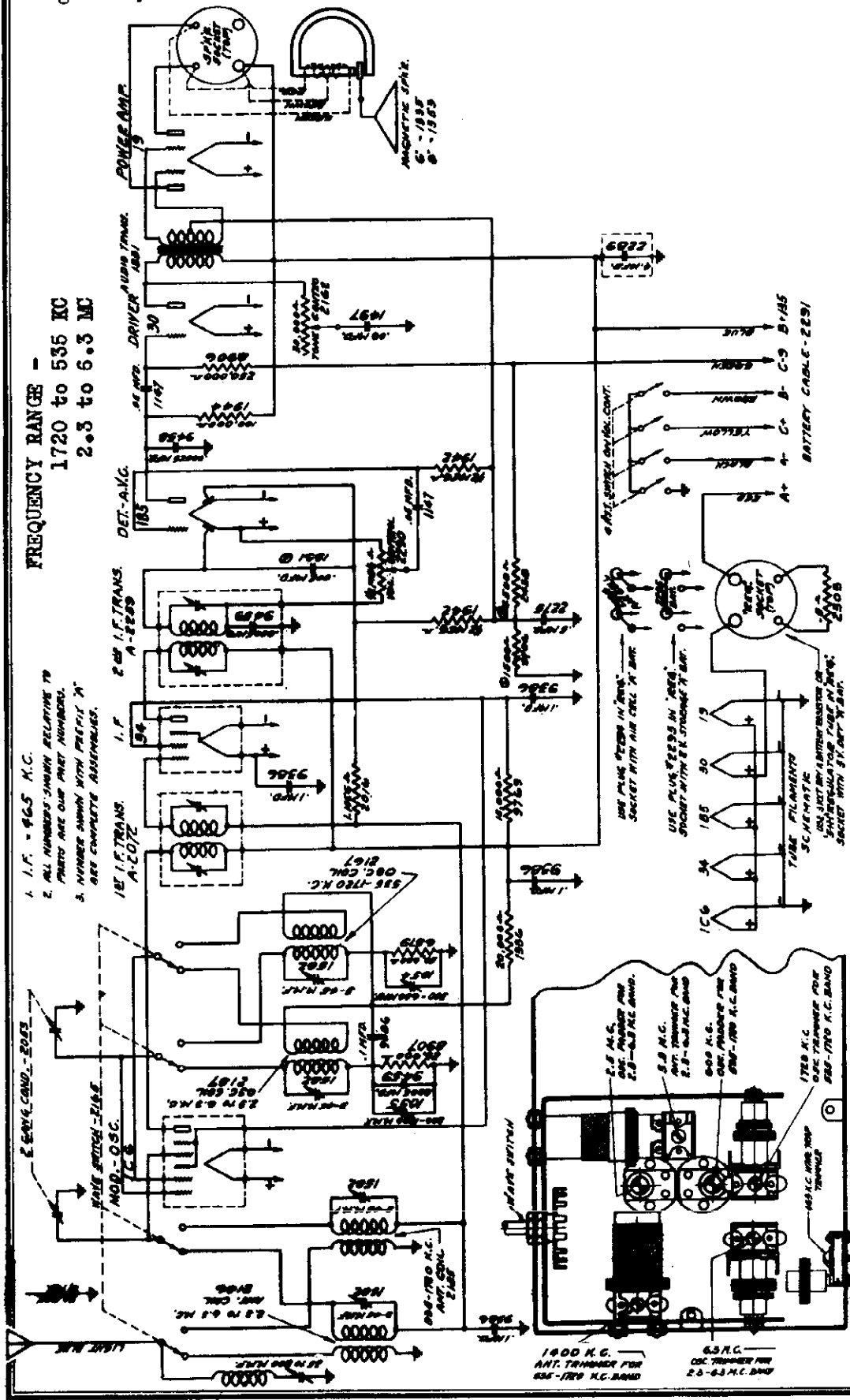
- NOTE:
1. I.F. = 465 K.C.
 2. ALL NUMBERS SHOWN RELATIVE TO PARTS ARE OUR PART NUMBERS.
 3. NUMBERS SHOWN WITH PREFIX 'A' ARE COMPLETE ASSEMBLIES.



CONVENTIONAL ALIGNMENT- See special section.
Align I-F trimmers at 465 KC. Dial and generator at 1720 KC, peak oscillator trimmer. Dial and generator at 1400 KC, peak antenna trimmer. Dial and generator to 600 KC, pad the oscillator trimmer to peak.

MODEL 33B
Schematic, Parts
Alignment, Trimmers

SENTINEL RADIO CORP



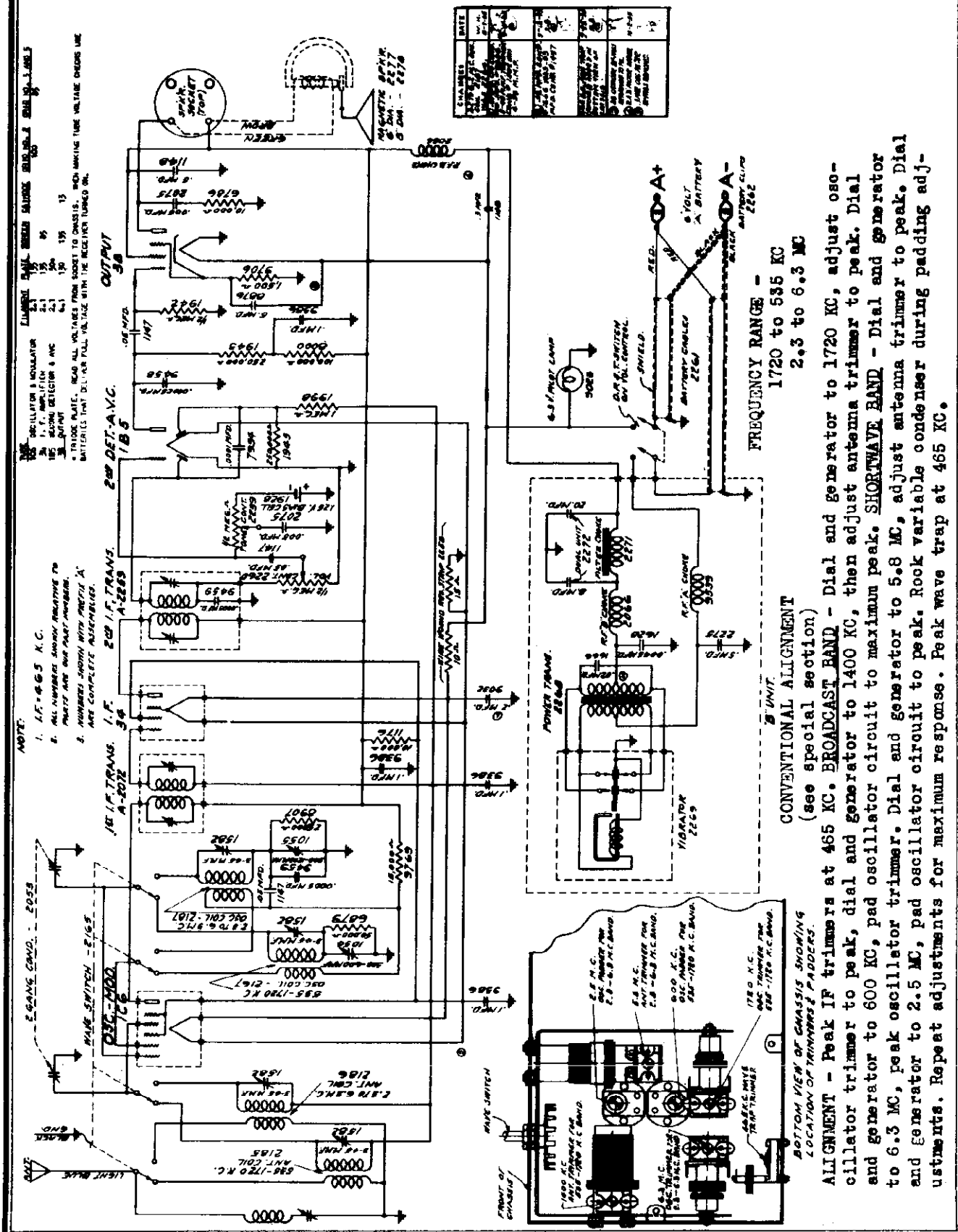
- 1. I.F. = 465 K.C.
- 2. ALL NUMBERS SHOWING RELATIVE TO PARTS ARE OUR PART NUMBERS.
- 3. NUMBERS SHOWN WITH PREFIX "X" ARE COMPLETE ASSEMBLIES.

FREQUENCY RANGE -
1720 to 535 KC
2.5 to 6.3 MC

CONVENTIONAL ALIGNMENT - (see special section)
ALIGNMENT - Peak IF trimmers at 465 KC. BROADCAST BAND-Dial and Generator at 1720 KC, adjust OSC trimmer to peak, shift generator to 1400 KC, then adjust antenna trimmer to peak. Dial and generator to 600 KC, pad oscillator circuit to maximum peak. SHORTWAVE BAND - Dial and generator 6.3 MC, peak oscillator trimmer, then dial and generator to 5.8 MC, adjust antenna trimmer to peak. Dial and generator to 2.5 MC, pad oscillator circuit to peak. Peak the wave trap to 465 KC. Rock variable condenser during the padding adjustments. Repeat adjustments.

SENTINEL RADIO CORP.

MODEL 34B
Schematic, Trimmers
Alignment, Parts
Changes



NOTE:
1. I.F. 465 K.C.
2. ALL NUMBERS SHOWING RELATIVE TO PARTS ARE OUR PART NUMBERING.
3. NUMBERS SHOWN WITH LETTER 'A' ARE COMPLETE ASSEMBLIES.

1. I.F. TRANS. 3-4 A-202
2. I.F. TRANS. 3-4 A-203
3. I.F. TRANS. 3-4 A-204
4. I.F. TRANS. 3-4 A-205
5. I.F. TRANS. 3-4 A-206

1. OSC. MOD. 2-163
2. TUNE SWITCH 2-162
3. 1000 K.C. ANT. COIL 2-161
4. 585-1700 K.C. ANT. COIL 2-155
5. 585-1700 K.C. ANT. COIL 2-156
6. 585-1700 K.C. ANT. COIL 2-157
7. 585-1700 K.C. ANT. COIL 2-158
8. 585-1700 K.C. ANT. COIL 2-159
9. 585-1700 K.C. ANT. COIL 2-160
10. 585-1700 K.C. ANT. COIL 2-164
11. 585-1700 K.C. ANT. COIL 2-165
12. 585-1700 K.C. ANT. COIL 2-166
13. 585-1700 K.C. ANT. COIL 2-167
14. 585-1700 K.C. ANT. COIL 2-168
15. 585-1700 K.C. ANT. COIL 2-169
16. 585-1700 K.C. ANT. COIL 2-170
17. 585-1700 K.C. ANT. COIL 2-171
18. 585-1700 K.C. ANT. COIL 2-172
19. 585-1700 K.C. ANT. COIL 2-173
20. 585-1700 K.C. ANT. COIL 2-174
21. 585-1700 K.C. ANT. COIL 2-175
22. 585-1700 K.C. ANT. COIL 2-176
23. 585-1700 K.C. ANT. COIL 2-177
24. 585-1700 K.C. ANT. COIL 2-178
25. 585-1700 K.C. ANT. COIL 2-179
26. 585-1700 K.C. ANT. COIL 2-180
27. 585-1700 K.C. ANT. COIL 2-181
28. 585-1700 K.C. ANT. COIL 2-182
29. 585-1700 K.C. ANT. COIL 2-183
30. 585-1700 K.C. ANT. COIL 2-184
31. 585-1700 K.C. ANT. COIL 2-185
32. 585-1700 K.C. ANT. COIL 2-186
33. 585-1700 K.C. ANT. COIL 2-187
34. 585-1700 K.C. ANT. COIL 2-188
35. 585-1700 K.C. ANT. COIL 2-189
36. 585-1700 K.C. ANT. COIL 2-190
37. 585-1700 K.C. ANT. COIL 2-191
38. 585-1700 K.C. ANT. COIL 2-192
39. 585-1700 K.C. ANT. COIL 2-193
40. 585-1700 K.C. ANT. COIL 2-194
41. 585-1700 K.C. ANT. COIL 2-195
42. 585-1700 K.C. ANT. COIL 2-196
43. 585-1700 K.C. ANT. COIL 2-197
44. 585-1700 K.C. ANT. COIL 2-198
45. 585-1700 K.C. ANT. COIL 2-199
46. 585-1700 K.C. ANT. COIL 2-200

1. I.F. TRANS. 3-4 A-202
2. I.F. TRANS. 3-4 A-203
3. I.F. TRANS. 3-4 A-204
4. I.F. TRANS. 3-4 A-205
5. I.F. TRANS. 3-4 A-206
6. OSC. MOD. 2-163
7. TUNE SWITCH 2-162
8. 1000 K.C. ANT. COIL 2-161
9. 585-1700 K.C. ANT. COIL 2-155
10. 585-1700 K.C. ANT. COIL 2-156
11. 585-1700 K.C. ANT. COIL 2-157
12. 585-1700 K.C. ANT. COIL 2-158
13. 585-1700 K.C. ANT. COIL 2-159
14. 585-1700 K.C. ANT. COIL 2-160
15. 585-1700 K.C. ANT. COIL 2-164
16. 585-1700 K.C. ANT. COIL 2-165
17. 585-1700 K.C. ANT. COIL 2-166
18. 585-1700 K.C. ANT. COIL 2-167
19. 585-1700 K.C. ANT. COIL 2-168
20. 585-1700 K.C. ANT. COIL 2-169
21. 585-1700 K.C. ANT. COIL 2-170
22. 585-1700 K.C. ANT. COIL 2-171
23. 585-1700 K.C. ANT. COIL 2-172
24. 585-1700 K.C. ANT. COIL 2-173
25. 585-1700 K.C. ANT. COIL 2-174
26. 585-1700 K.C. ANT. COIL 2-175
27. 585-1700 K.C. ANT. COIL 2-176
28. 585-1700 K.C. ANT. COIL 2-177
29. 585-1700 K.C. ANT. COIL 2-178
30. 585-1700 K.C. ANT. COIL 2-179
31. 585-1700 K.C. ANT. COIL 2-180
32. 585-1700 K.C. ANT. COIL 2-181
33. 585-1700 K.C. ANT. COIL 2-182
34. 585-1700 K.C. ANT. COIL 2-183
35. 585-1700 K.C. ANT. COIL 2-184
36. 585-1700 K.C. ANT. COIL 2-185
37. 585-1700 K.C. ANT. COIL 2-186
38. 585-1700 K.C. ANT. COIL 2-187
39. 585-1700 K.C. ANT. COIL 2-188
40. 585-1700 K.C. ANT. COIL 2-189
41. 585-1700 K.C. ANT. COIL 2-190
42. 585-1700 K.C. ANT. COIL 2-191
43. 585-1700 K.C. ANT. COIL 2-192
44. 585-1700 K.C. ANT. COIL 2-193
45. 585-1700 K.C. ANT. COIL 2-194
46. 585-1700 K.C. ANT. COIL 2-195
47. 585-1700 K.C. ANT. COIL 2-196
48. 585-1700 K.C. ANT. COIL 2-197
49. 585-1700 K.C. ANT. COIL 2-198
50. 585-1700 K.C. ANT. COIL 2-199
51. 585-1700 K.C. ANT. COIL 2-200

FREQUENCY RANGE -
1720 to 555 KC
2.3 to 6.3 MC

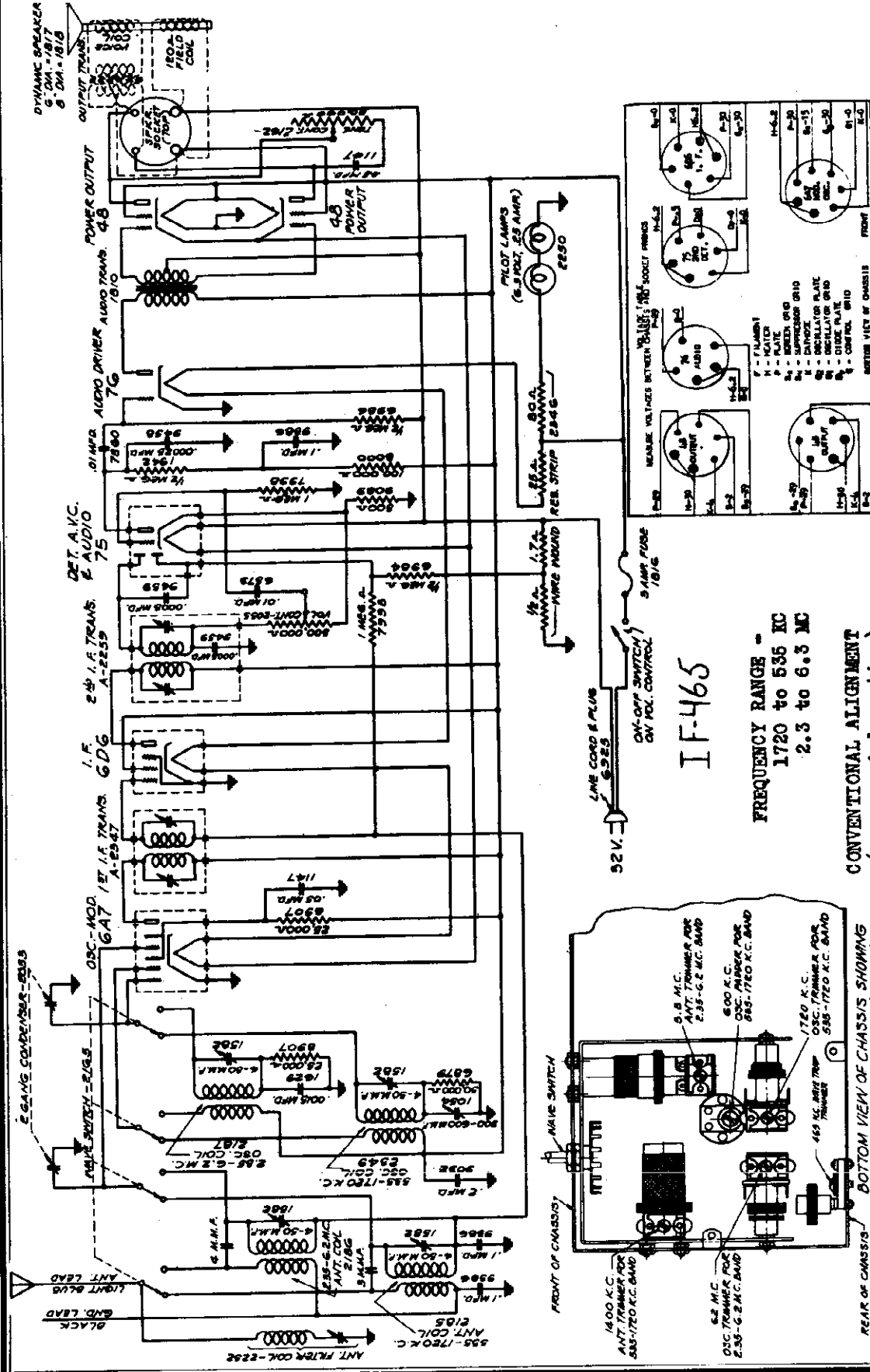
CONVENTIONAL ALIGNMENT
(see special section)

ALIGNMENT - Peak IF trimmers at 465 KC. BROADCAST BAND - Dial and generator to 1720 KC, adjust oscillator trimmer to peak, dial and generator to 1400 KC, then adjust antenna trimmer to peak. Dial and generator to 600 KC, pad oscillator circuit to maximum peak. SHORWAVE BAND - Dial and generator to 6.3 MC, peak oscillator trimmer. Dial and generator to 5.8 MC, adjust antenna trimmer to peak. Dial and generator to 2.5 MC, pad oscillator circuit to peak. Rock variable condenser during padding adjustments. Repeat adjustments for maximum response. Peak wave trap at 465 KC.

MODEL 36L

Schematic, Voltage Alignment, Trimmers Parts

SENTINEL RADIO CORP.

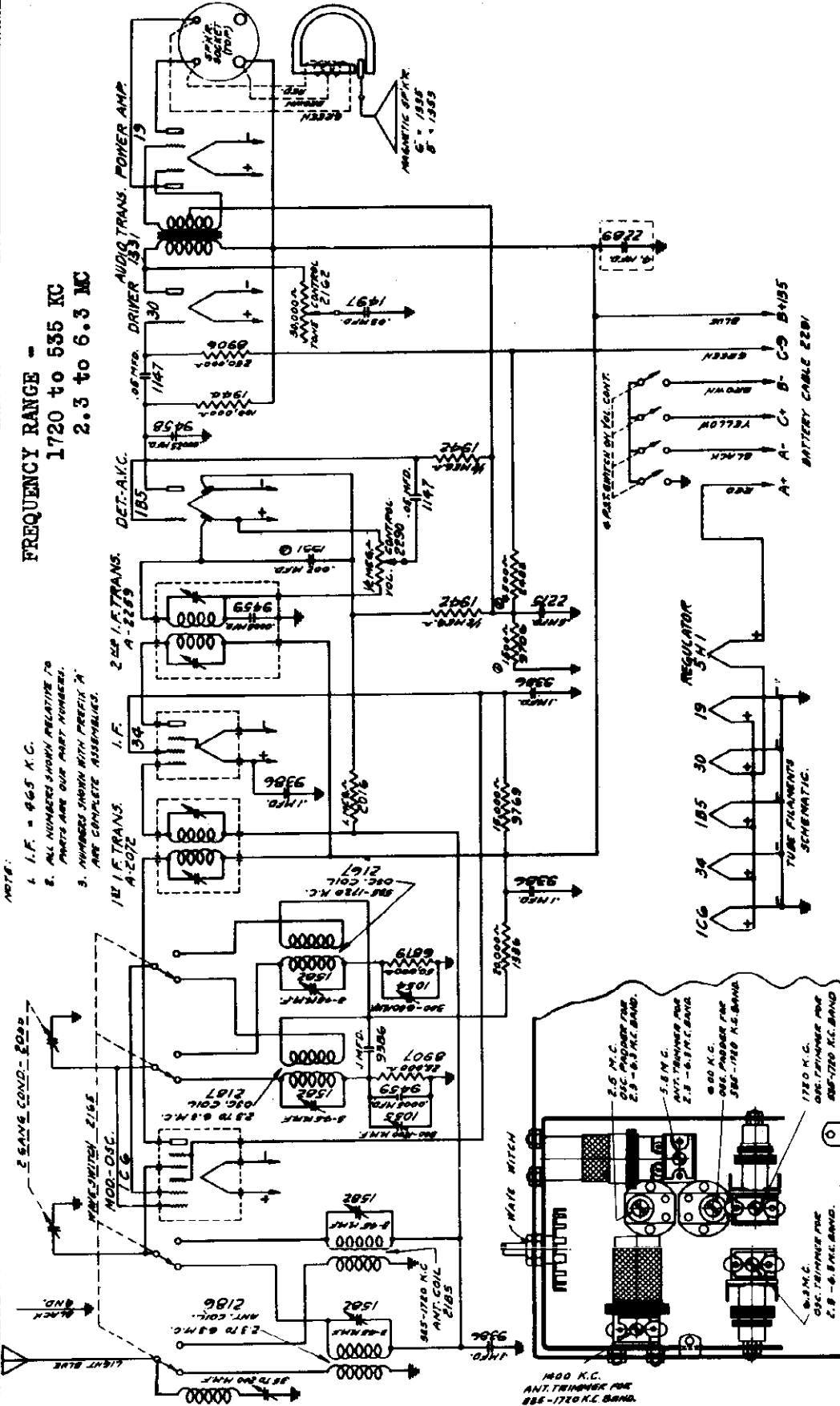


MODEL 38B

Schematic, Trimmers
Alignment, Parts

SENTINEL RADIO CORP.

FREQUENCY RANGE -
1720 to 535 KC
2.3 to 6.3 MC



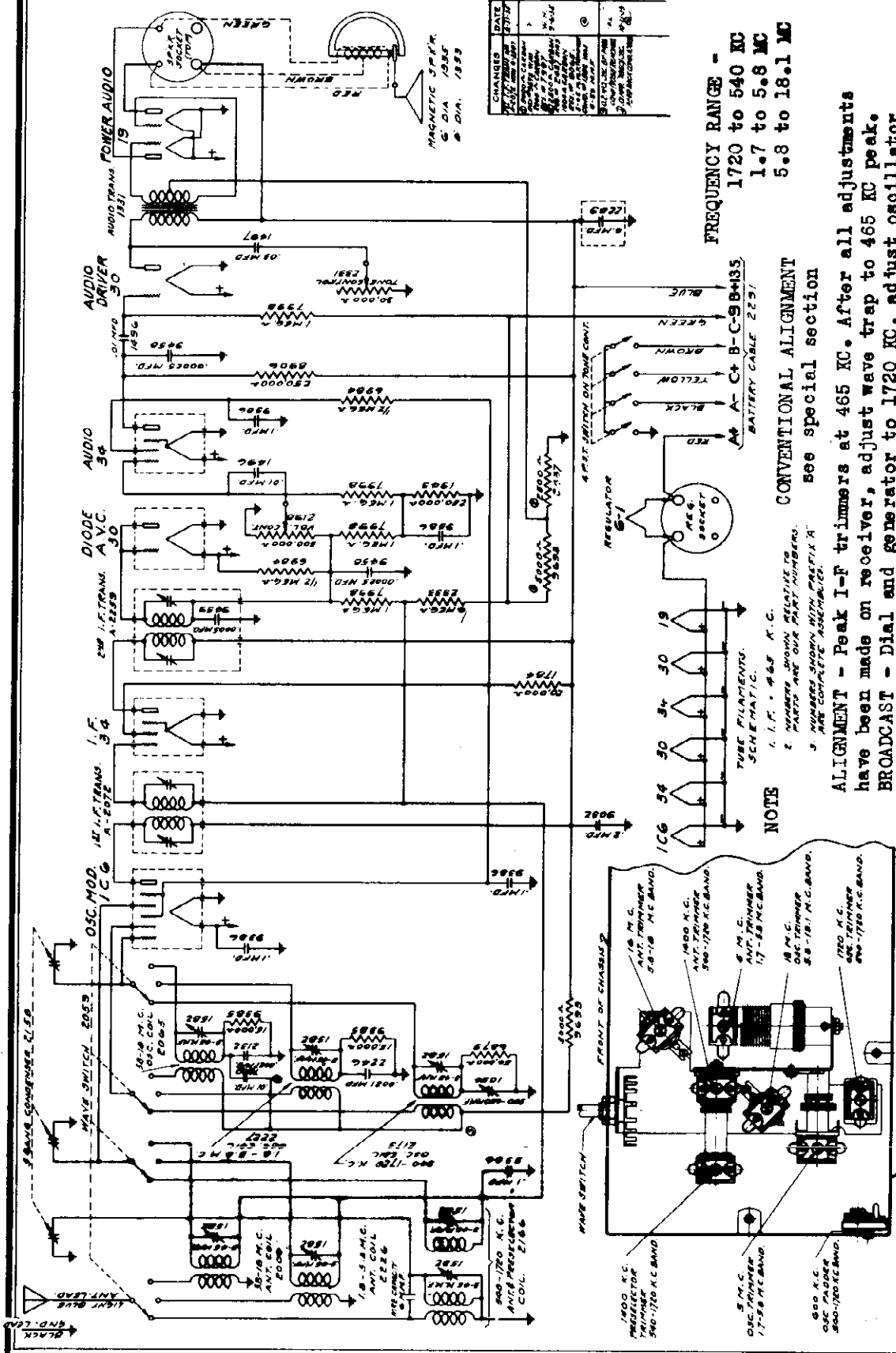
NOTE:
1. I.F. = 465 K.C.
2. ALL NUMBERS SHOWN RELATIVE TO PARTS AND OUR PART NUMBERS.
3. NUMBERS SHOWN WITH PREFIX "A" ARE COMPLETE ASSEMBLIES.

CONVENTIONAL ALIGNMENT - see special section

ALIGNMENT - Peak I-F transformer trimmers at 465 KC. After R-F adjustments, peak the wave trap at 465 KC. BROADCAST BAND - Dial and generator at 1720 KC, peak oscillator trimmer. Dial and generator at 1400 KC, adjust antenna trimmer to maximum peak. Dial and generator at 600 KC, pad oscillator circuit to maximum peak. SHORTWAVE BAND - Dial and generator at 6.3 MC, adjust antenna trimmer to maximum peak. The short wave oscillator circuit is then padded at 2.5 MC. While making padding adjustments, rock the variable condenser.

SENTINEL RADIO CORP.

MODEL 39B
Schematic, Trimmers
Alignment, Changes, Par



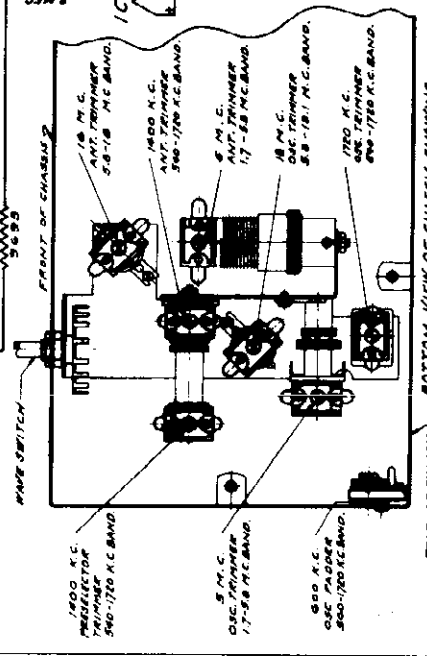
CHANGES	DATE
1. 250K OHM RES.	1/10/33
2. 100K OHM RES.	1/10/33
3. 50K OHM RES.	1/10/33
4. 25K OHM RES.	1/10/33
5. 10K OHM RES.	1/10/33
6. 5K OHM RES.	1/10/33
7. 2.5K OHM RES.	1/10/33
8. 1K OHM RES.	1/10/33
9. 500 OHM RES.	1/10/33
10. 250 OHM RES.	1/10/33
11. 100 OHM RES.	1/10/33
12. 50 OHM RES.	1/10/33
13. 25 OHM RES.	1/10/33
14. 10 OHM RES.	1/10/33
15. 5 OHM RES.	1/10/33
16. 2.5 OHM RES.	1/10/33
17. 1 OHM RES.	1/10/33
18. 500 OHM RES.	1/10/33
19. 250 OHM RES.	1/10/33
20. 100 OHM RES.	1/10/33
21. 50 OHM RES.	1/10/33
22. 25 OHM RES.	1/10/33
23. 10 OHM RES.	1/10/33
24. 5 OHM RES.	1/10/33
25. 2.5 OHM RES.	1/10/33
26. 1 OHM RES.	1/10/33
27. 500 OHM RES.	1/10/33
28. 250 OHM RES.	1/10/33
29. 100 OHM RES.	1/10/33
30. 50 OHM RES.	1/10/33
31. 25 OHM RES.	1/10/33
32. 10 OHM RES.	1/10/33
33. 5 OHM RES.	1/10/33
34. 2.5 OHM RES.	1/10/33
35. 1 OHM RES.	1/10/33
36. 500 OHM RES.	1/10/33
37. 250 OHM RES.	1/10/33
38. 100 OHM RES.	1/10/33
39. 50 OHM RES.	1/10/33
40. 25 OHM RES.	1/10/33
41. 10 OHM RES.	1/10/33
42. 5 OHM RES.	1/10/33
43. 2.5 OHM RES.	1/10/33
44. 1 OHM RES.	1/10/33
45. 500 OHM RES.	1/10/33
46. 250 OHM RES.	1/10/33
47. 100 OHM RES.	1/10/33
48. 50 OHM RES.	1/10/33
49. 25 OHM RES.	1/10/33
50. 10 OHM RES.	1/10/33
51. 5 OHM RES.	1/10/33
52. 2.5 OHM RES.	1/10/33
53. 1 OHM RES.	1/10/33
54. 500 OHM RES.	1/10/33
55. 250 OHM RES.	1/10/33
56. 100 OHM RES.	1/10/33
57. 50 OHM RES.	1/10/33
58. 25 OHM RES.	1/10/33
59. 10 OHM RES.	1/10/33
60. 5 OHM RES.	1/10/33
61. 2.5 OHM RES.	1/10/33
62. 1 OHM RES.	1/10/33
63. 500 OHM RES.	1/10/33
64. 250 OHM RES.	1/10/33
65. 100 OHM RES.	1/10/33
66. 50 OHM RES.	1/10/33
67. 25 OHM RES.	1/10/33
68. 10 OHM RES.	1/10/33
69. 5 OHM RES.	1/10/33
70. 2.5 OHM RES.	1/10/33
71. 1 OHM RES.	1/10/33
72. 500 OHM RES.	1/10/33
73. 250 OHM RES.	1/10/33
74. 100 OHM RES.	1/10/33
75. 50 OHM RES.	1/10/33
76. 25 OHM RES.	1/10/33
77. 10 OHM RES.	1/10/33
78. 5 OHM RES.	1/10/33
79. 2.5 OHM RES.	1/10/33
80. 1 OHM RES.	1/10/33
81. 500 OHM RES.	1/10/33
82. 250 OHM RES.	1/10/33
83. 100 OHM RES.	1/10/33
84. 50 OHM RES.	1/10/33
85. 25 OHM RES.	1/10/33
86. 10 OHM RES.	1/10/33
87. 5 OHM RES.	1/10/33
88. 2.5 OHM RES.	1/10/33
89. 1 OHM RES.	1/10/33
90. 500 OHM RES.	1/10/33
91. 250 OHM RES.	1/10/33
92. 100 OHM RES.	1/10/33
93. 50 OHM RES.	1/10/33
94. 25 OHM RES.	1/10/33
95. 10 OHM RES.	1/10/33
96. 5 OHM RES.	1/10/33
97. 2.5 OHM RES.	1/10/33
98. 1 OHM RES.	1/10/33
99. 500 OHM RES.	1/10/33
100. 250 OHM RES.	1/10/33

FREQUENCY RANGE -
1720 to 540 KC
1.7 to 5.8 MC
5.8 to 18.1 MC

CONVENTIONAL ALIGNMENT
see special section

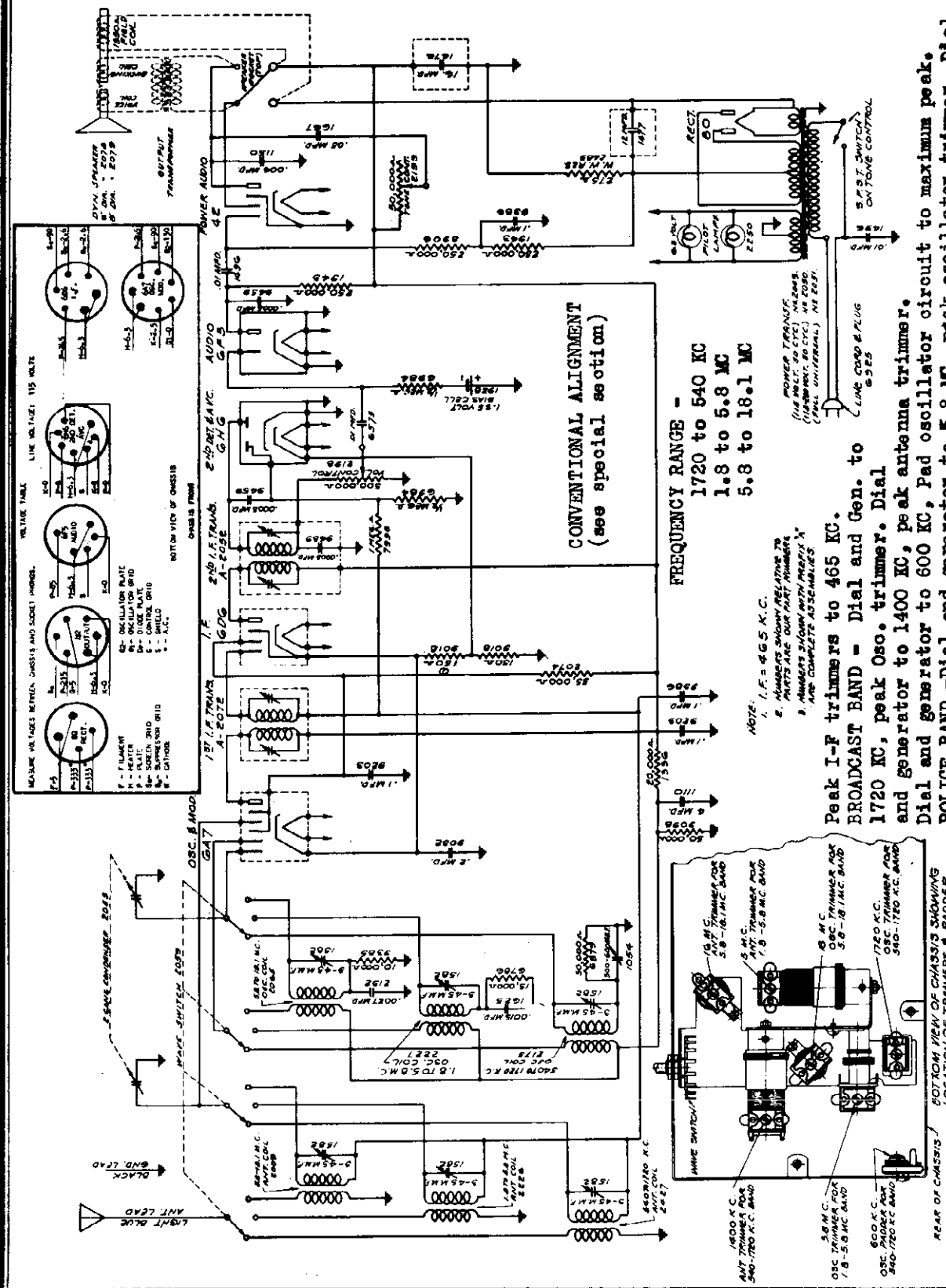
- NOTE
1. I.F. = 465 K.C.
 2. PARTS ARE OUR PART NUMBERS.
 3. NUMBERS SHOWN WITH PREFIX "R" ARE COMPLETE ASSEMBLIES.

ALIGNMENT - Peak I-F trimmers at 465 KC. After all adjustments have been made on receiver, adjust wave trap to 465 KC peak. BROADCAST - Dial and generator to 1720 KC, adjust oscillator trimmer to peak. Dial and generator to 1400 KC, adjust antenna trimmer to peak. Dial and generator to 600 KC, peak oscillator trimmer. Dial and generator to 5 MC, peak oscillator trimmer. SHORTWAVE FOREIGN BAND - Dial and generator to 18 MC, peak the oscillator trimmer, then shift dial and peak the antenna trimmer. NOTE - Rock the variable condenser during padding adjustment on broadcast band. No padding on broadcast band.



MODEL 40B
Schematic, Trimmers
Alignment, Parts
Voltage

SENTINEL RADIO CORP.



CONVENTIONAL ALIGNMENT
(see special section)

FREQUENCY RANGE -
1720 to 540 KC
1.8 to 5.8 MC
5.8 to 18.1 MC

NOTE:
1. I. F. = 465 K. C.
2. NUMBERS SHOW RELATIVE TO
3. PARTS ARE OUT-PART NUMBER X
4. AND COMPLETE ASSEMBLY

Peak I-F trimmers to 465 KC.
BROADCAST BAND - Dial and Gen. to
1720 KC, peak Osc. trimmer. Dial
and generator to 1400 KC, peak antenna trimmer.
Dial and generator to 600 KC, Pad oscillator circuit to maximum peak.
POLICE BAND - Dial and generator to 5.8 MC, peak oscillator trimmer. Dial
and generator to 16 MC, peak antenna trimmer. SHORTWAVE BAND - Generator to 18 MC, peak oscillator
trimmer. Dial and generator to 16 MC, adjust antenna trimmer to maximum peak. Rook variable condenser during
the BROADCAST BAND oscillator padding adjustment. No padding required on high frequency bands.

REAR VIEW OF CHASSIS SHOWING
LOCATION OF TRIMMERS & PADDERS

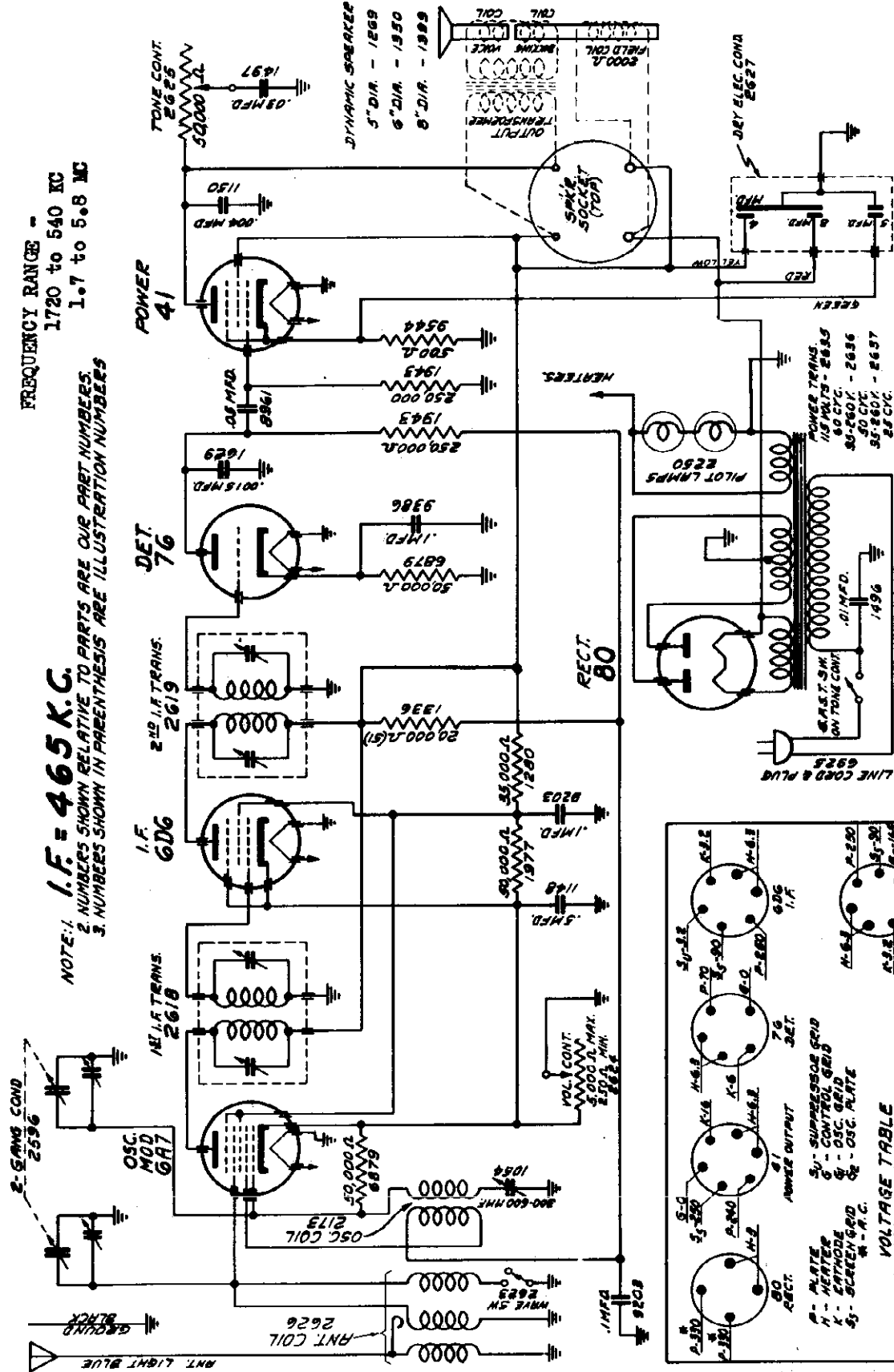
SENTINEL RADIO CORP.

MODEL 48A
Schematic, Volta
Alignment, Parts

FREQUENCY RANGE -
1720 to 540 KC
1.7 to 5.8 MC

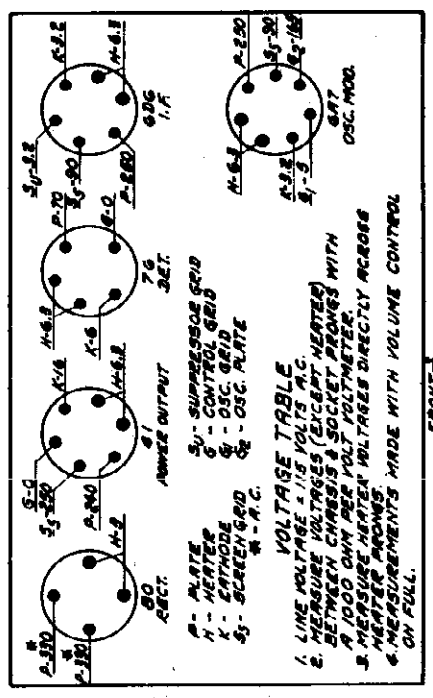
I.F. = 465 K.C.

NOTE: 1. NUMBERS SHOWN RELATIVE TO PARTS ARE OUR PART NUMBERS.
2. NUMBERS SHOWN IN PARENTHESES ARE ILLUSTRATION NUMBERS.
3. NUMBERS SHOWN IN PARENTHESES ARE ILLUSTRATION NUMBERS.



CONVENTIONAL ALIGNMENT - see special section.

Align IF transformers at 465 KC. Dial and generator at 1720 KC, peak oscillator trimmer, then dial and generator at 1400 KC, peak antenna trimmer. Dial and generator at 600 KC, peak oscillator circuit to peak. No adjustments required on the

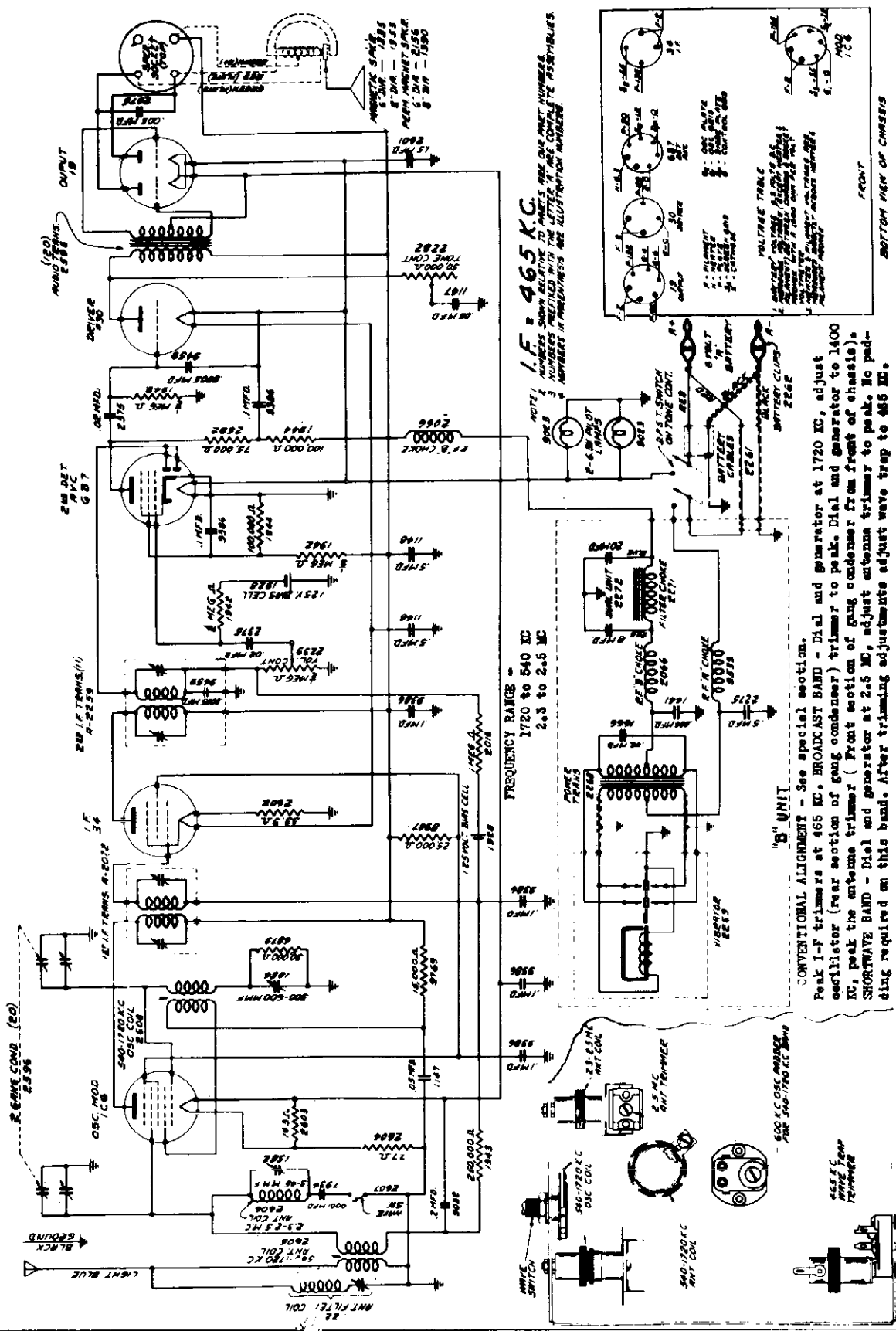


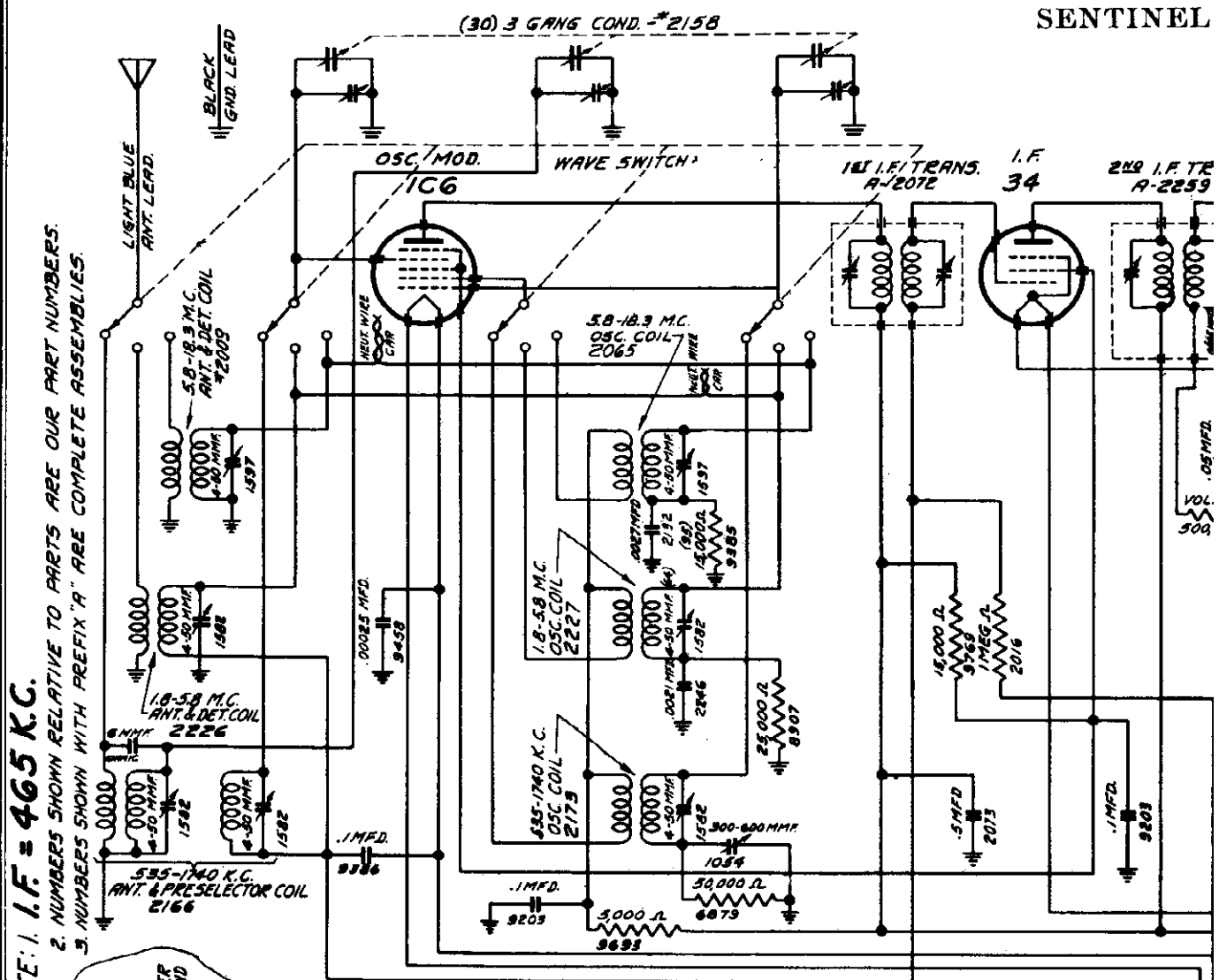
VOLTAGE TABLE
1. LINE VOLTAGE - 115 VOLTS A.C.
2. MEASURE VOLTAGES (EXCEPT HEATER) BETWEEN TERMINALS (EXCEPT HEATER) WITH 100 OHM HETER VOLTAGE TRIMMER.
3. MEASURE HEATER VOLTAGES DIRECTLY ACROSS HEATER TAPERS.
4. MEASUREMENTS MADE WITH VOLUME CONTROL ON FULL.

MODEL 49B

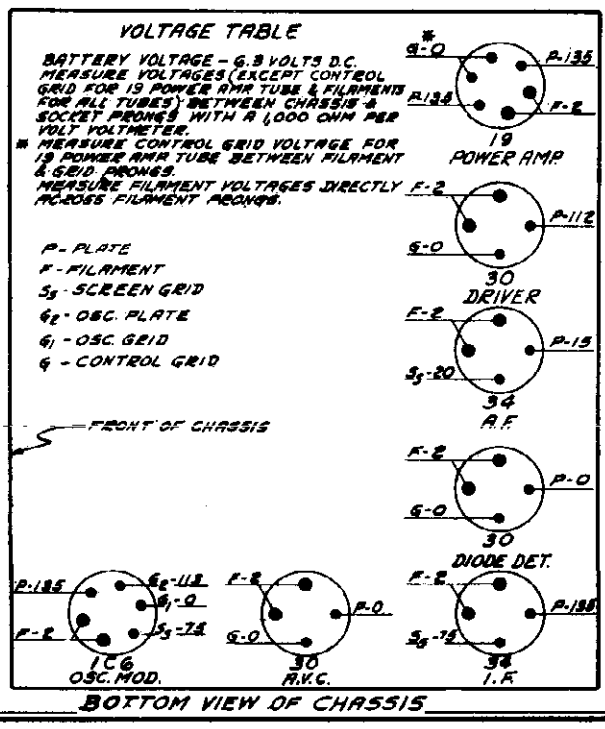
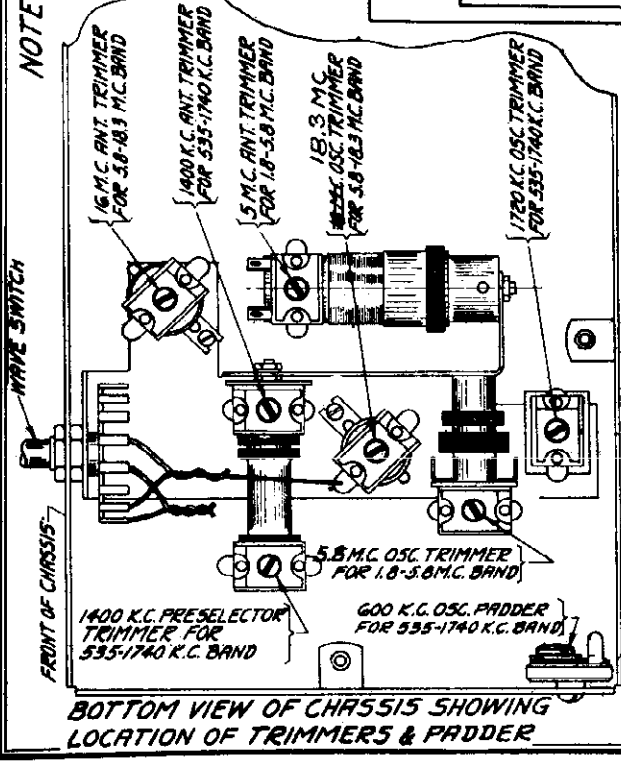
Schematic, Voltage Trimmers, Alignment Parts

SENTINEL RADIO CORP.





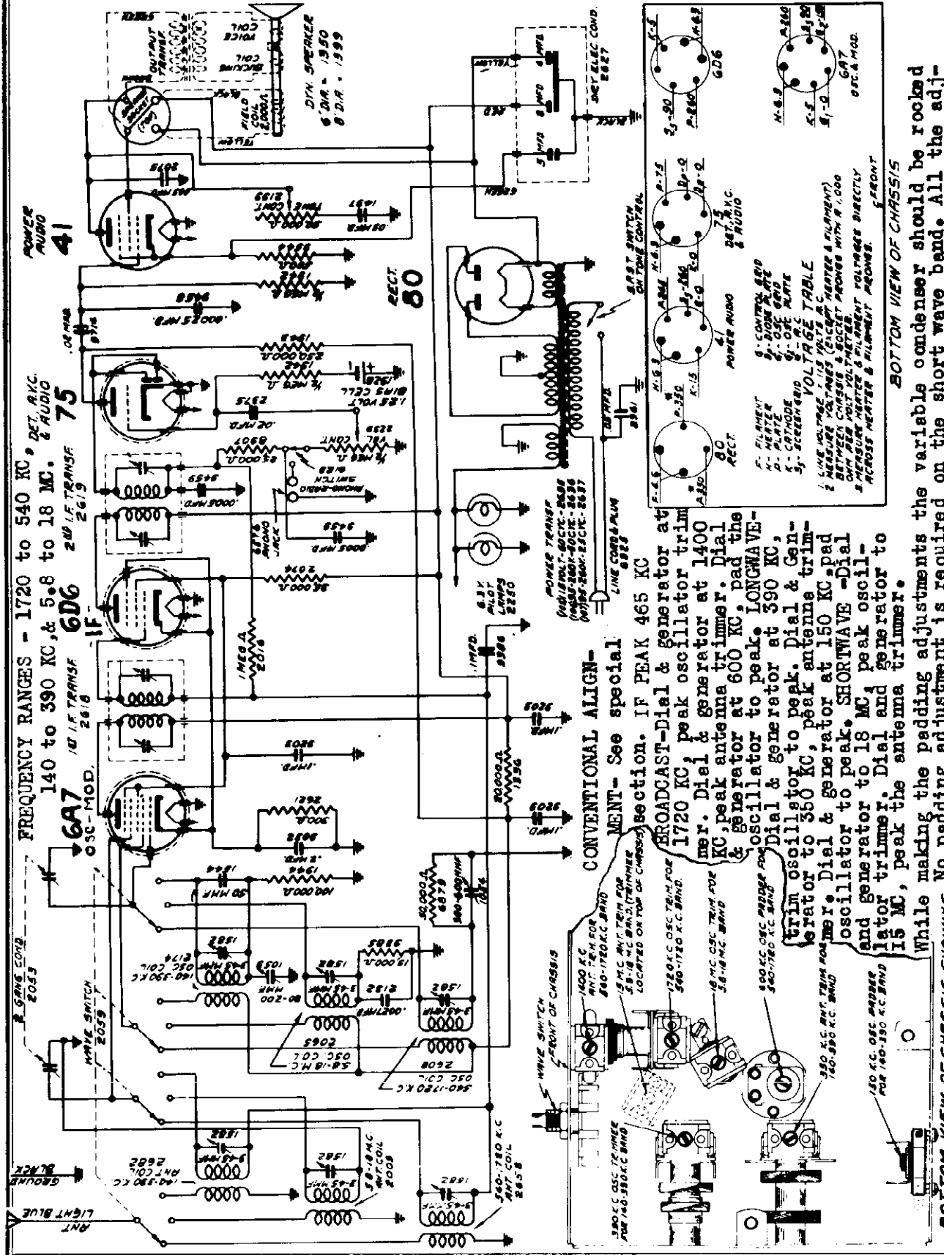
NOTE: I. F. = 465 K.C.
 2. NUMBERS SHOWN RELATIVE TO PARTS ARE OUR PART NUMBERS.
 3. NUMBERS SHOWN WITH PREFIX "A" ARE COMPLETE ASSEMBLIES.



SENTINEL RADIO CORP.

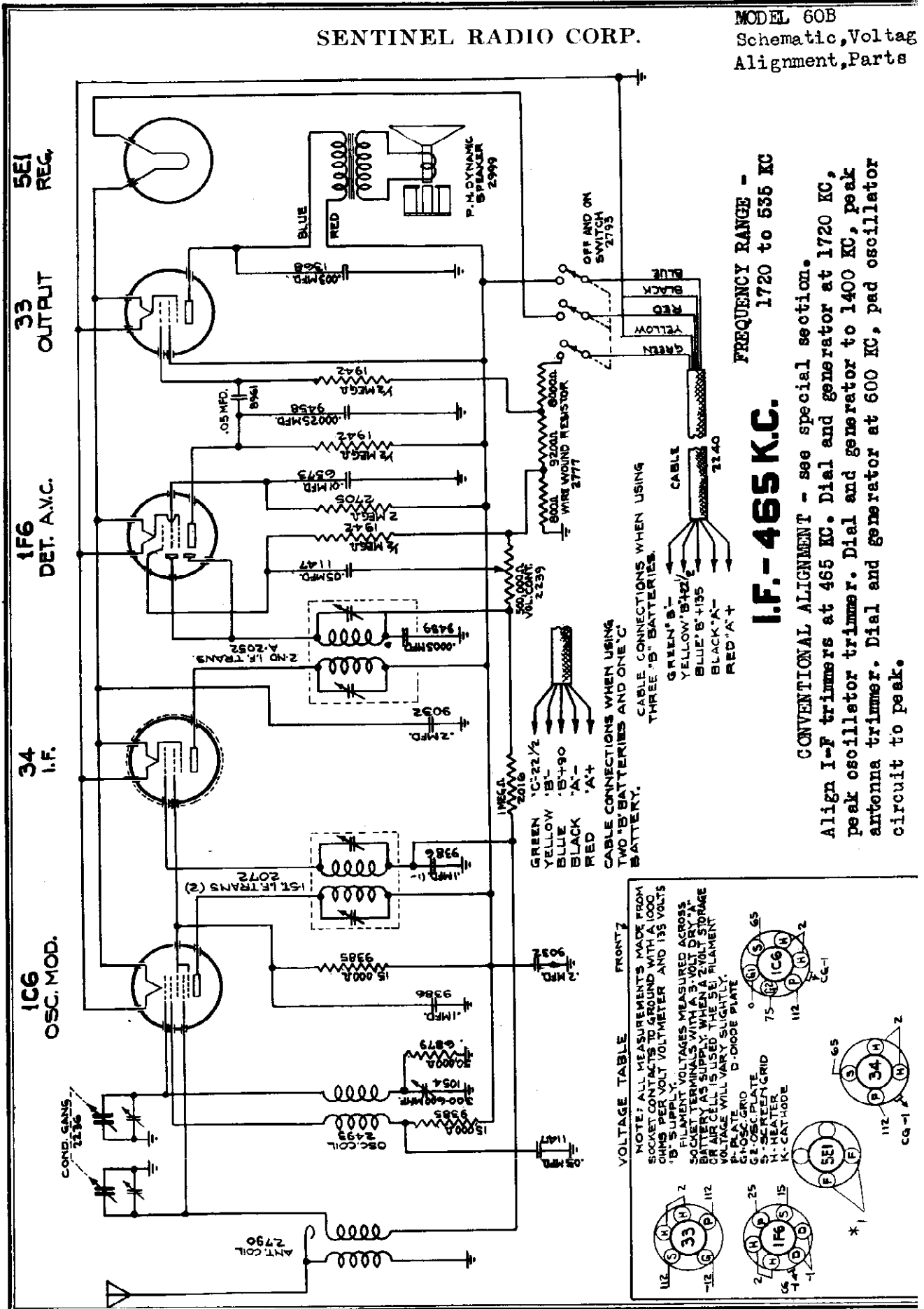
MODEL 54A

Schematic, Trim
Voltage, Alignme
Parts



SENTINEL RADIO CORP.

MODEL 60B
Schematic, Voltage
Alignment, Parts



FREQUENCY RANGE -
1720 to 535 KC

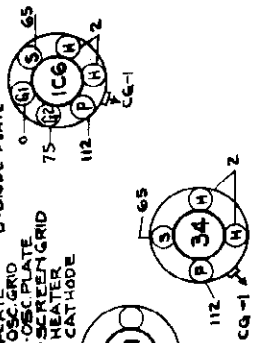
I.F. - 465 K.C.

CONVENTIONAL ALIGNMENT - see special section.

Align I-F trimmers at 465 KC. Dial and generator at 1720 KC, peak oscillator trimmer. Dial and generator at 1400 KC, peak antenna trimmer. Dial and generator at 600 KC, pad oscillator circuit to peak.

VOLTAGE TABLE FRONTZ

NOTE: ALL MEASUREMENTS MADE FROM SOCKET CONTACTS TO GROUND WITH A 100 OHMS PER VOLT VOLTMETER AND 195 VOLTS 'B' SUPPLY. VOLTAGES MEASURED ACROSS 50 FILAMENTALS WITH A 2-VOLT DRY 'A' BATTERY AS SUPPLY. WHEN A 2-VOLT STORAGE OR AIR CELL IS USED, THE 5E1 FILAMENT VOLTAGE WILL VARY SLIGHTLY.



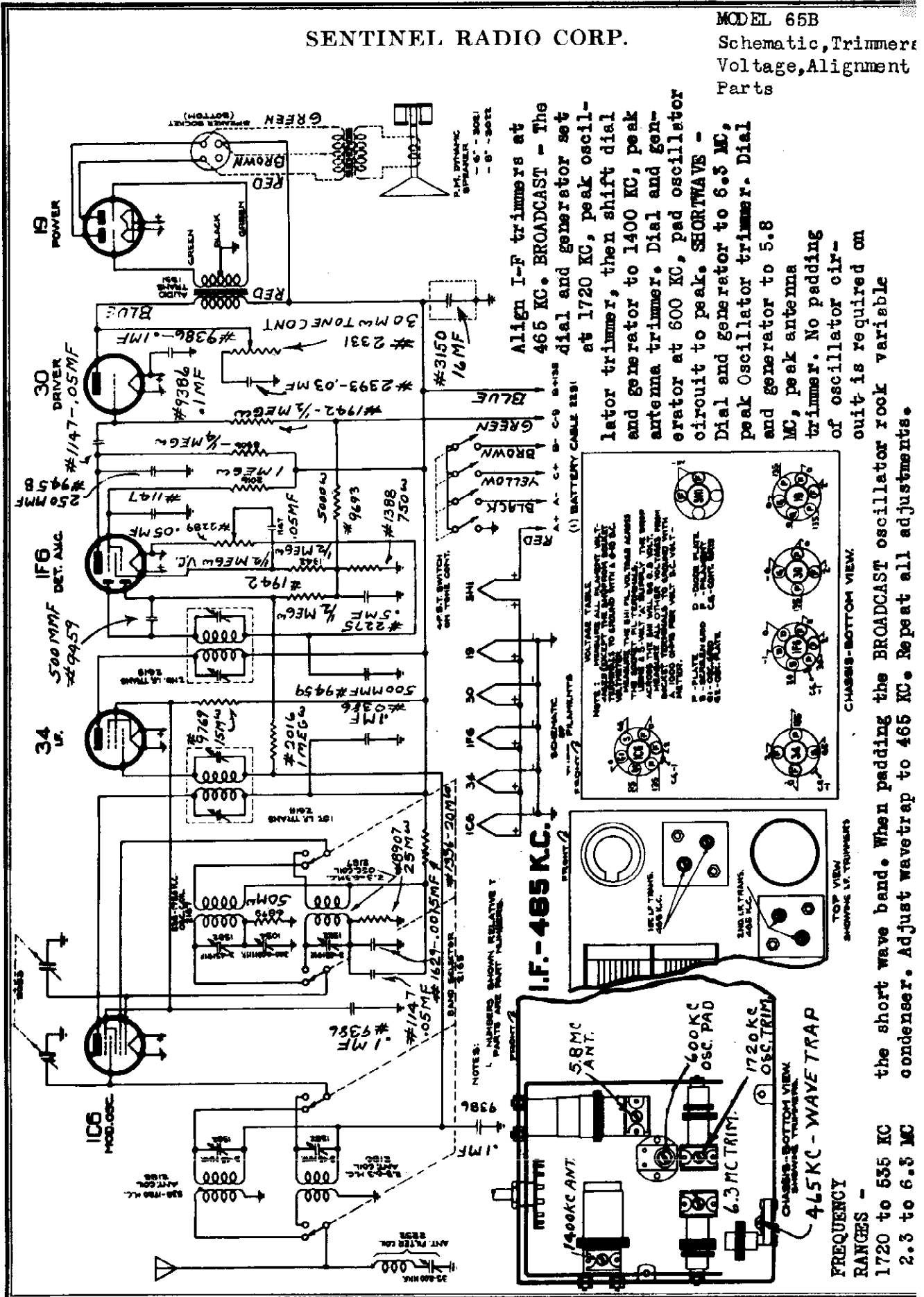
CABLE CONNECTIONS WHEN USING TWO 'B' BATTERIES AND ONE 'C' BATTERY.
GREEN 'C'-22 1/2
YELLOW 'B'-90
BLUE 'A'-112
BLACK 'A'-112
RED 'A'-112

CABLE CONNECTIONS WHEN USING THREE 'B' BATTERIES.
GREEN 'B'-
YELLOW 'B'-112
BLUE 'B'-112
BLACK 'A'-
RED 'A'-

SENTINEL RADIO CORP.

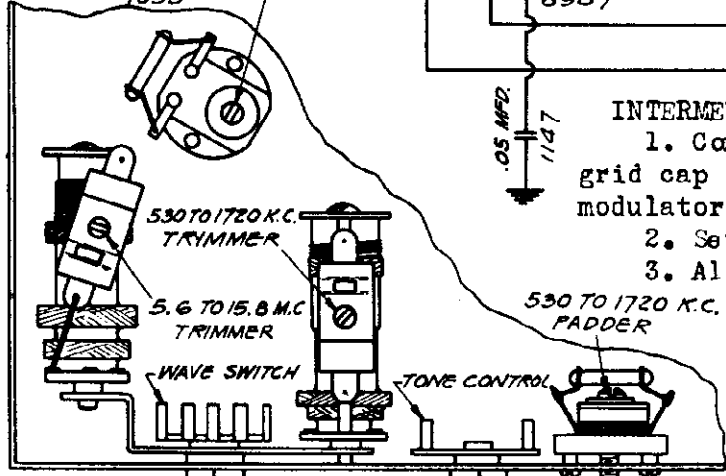
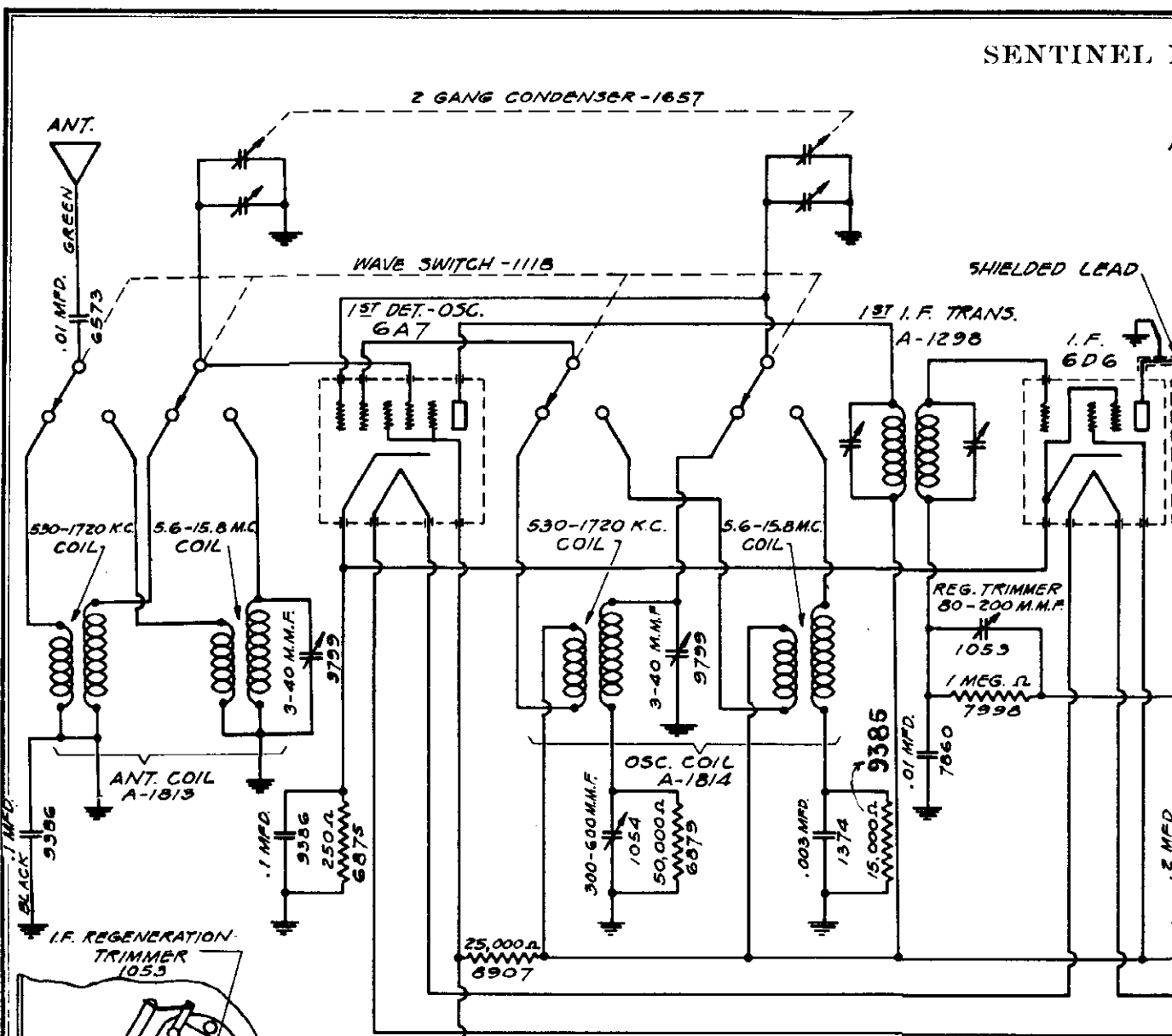
MODEL 65B

Schematic, Trimmer Voltage, Alignment Parts



Align I-F trimmers at 465 KC. BROADCAST - The dial and generator set at 1720 KC, peak oscillator trimmer, then shift dial and generator to 1400 KC, peak antenna trimmer. Dial and generator at 600 KC, pad oscillator circuit to peak. SHORTWAVE - Dial and generator to 6.5 MC, peak Oscillator trimmer. Dial and generator to 5.8 MC, peak antenna trimmer. No padding of oscillator circuit is required on

the short wave band. When padding the BROADCAST oscillator rock variable condenser. Adjust wavetrap to 465 KC. Repeat all adjustments.



LOCATION OF PADDERS & TRIMMERS IN LEFT HAND (FRONT) BOTTOM OF CHASSIS

INTERMEDIATE ALIGNMENT -

1. Connect generator output to control grid grid cap disconnected, then connect a 1 megohm r modulator grid to chassis ground.
 2. Set generator frequency to 465 KC 9 must
 3. Align 1st I-F transformer by adjusting ea
 4. Adjust 2nd I-F transformer in the
 5. Adjust the I-F regeneration trimme
- chassis for maximum 465 KC signal. If this trimmer causes receiver to oscil ust to point where oscillation just s 1/8 turn. ALIGNMENT OF VARIABLE CON

1. Connect generator thru 250 MMF condense lead and the ground to chassis.
2. Place band selector SW. on 15.8 to 5.6 receiver to exactly 14 MC. Then bring receiver to maximum output by adjusting trimm located on top of gang condenser (OSC section). When adjusting this trimmer, two p mental and image peak will be noticed. Care must be taken that the fundamental is u stment. Back trimmer to minimum capacity, next screw down until 1st peak (fundamen When fundamental peak is obtained adjust trimmer to maximum output at 14 MC.

DIO CORP.

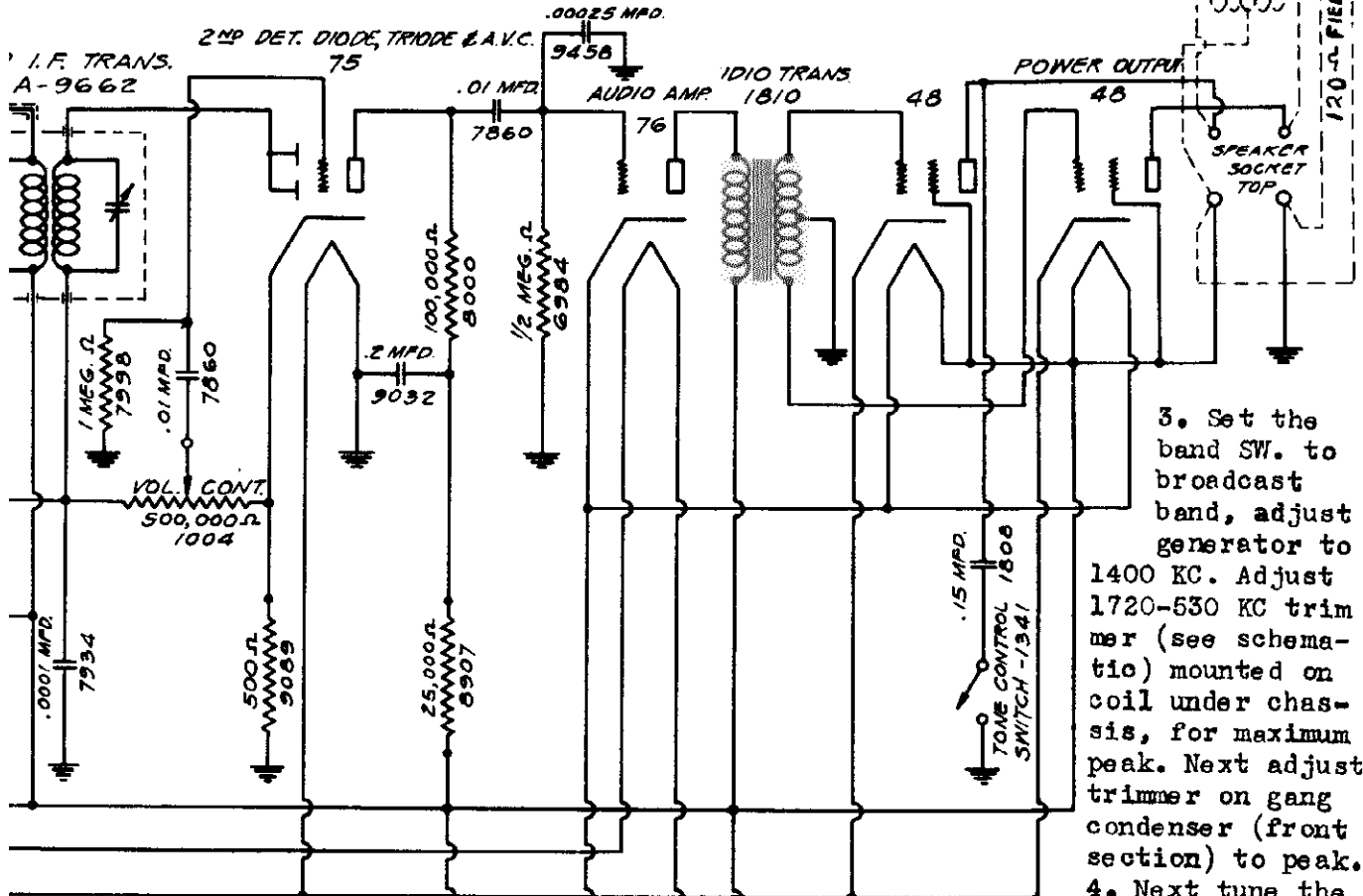
Trimmers, Alignment
Parts

MODEL 6900
Schematic, Voltage

ALL NOS. SHOWN RELATIVE TO PARTS
ARE OUR PART NUMBERS.
NUMBERS SHOWN WITH A PREFIX "A"
ARE COMPLETE ASSEMBLIES.
I. F. = 465 K.C.

FREQUENCY RANGE -
1720 to 530 KC
5.6 to 15.8 MC

DYNAMIC SPEAKER
6" DIA. = 1B17
8" DIA. = 1B18



3. Set the band SW. to broadcast band, adjust generator to 1400 KC. Adjust 1720-530 KC trimmer (see schematic) mounted on coil under chassis, for maximum peak. Next adjust trimmer on gang condenser (front section) to peak.
4. Next tune the receiver to the

generator at 600 KC, adjust padder trimmer located on, and accessible thru small hole at front of chassis.
5. Recheck 1400 KC signal setting.
6. Place band SW. on 15.8 to 5.6 MC band, generator frequency to 14 MC. While rocking the variable gang condenser adjust the 5.6 to 15.8 trimmer, mounted on one of the coils underneath the chassis.

the 6A7. Leave
generator from the
(accurate).
transformer.
manner.
located under
adjustment of
, always adj-
, then back
ER
set antenna
and, tune the
condenser
, the funda-
for the adj-
is obtained.

CONVENTIONAL ALIGNMENT
(see special section)

VOLTAGE TABLE

TUBE		Battery Voltage - 32 Volts					GRID NO. 3 & 5
		FILAMENT	PLATE	SCREEN	CATHODE	GRID NO. 2	
6A7	1st Detector & Oscillator	6	32		.5	32	15
6D6	I. F. Amplifier	6	32	32	.6		
75	2nd Detector & A.V.C	6	5*				
76	1st Audio	6	30				
48	Output	6	30	32	5		
48	Output	6	30	32	5		

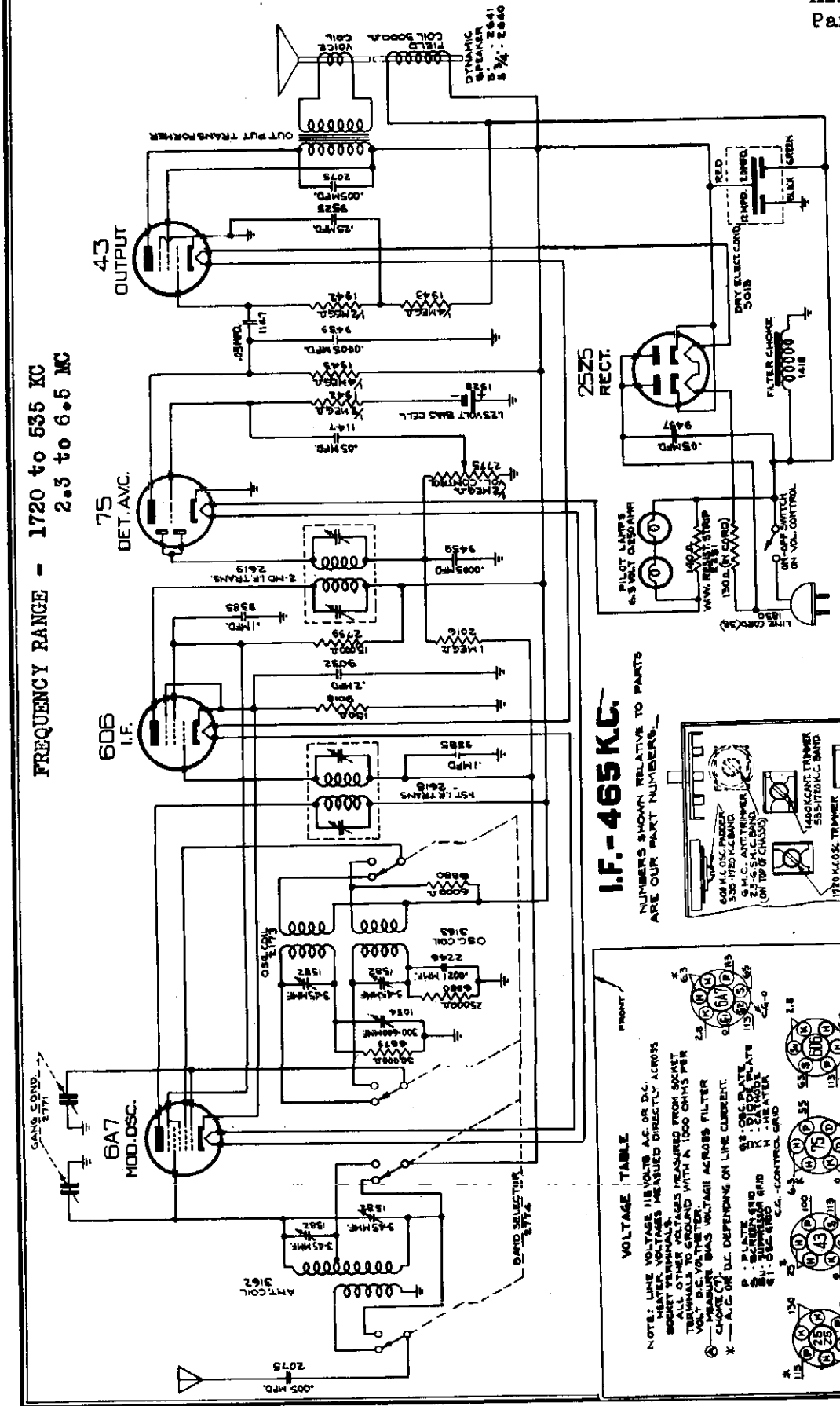
Triode plate comparative voltage only
Read all voltages from socket to chassis.

DIO CORP. MODEL 6900

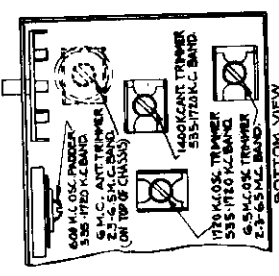
SENTINEL RADIO CORP.

MODEL 71U
Schematic, Voltage
Alignment, Trimmers
Parts

FREQUENCY RANGE - 1720 to 635 KC
2.3 to 6.5 MC



I.F. - 465 KC.
NUMBERS SHOWN RELATIVE TO PARTS
ARE OUR PART NUMBERS.



VOLTAGE TABLE

NOTE: LINE VOLTAGE 110 VOLTS AC OR DC.
HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET.
ALL OTHER VOLTAGES MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHMS PER VOLT D.C. VOLTMETER.
1 - MEASURE BIAS VOLTAGE ACROSS FILTER.
2 - A.C. OR D.C. DEPENDS ON LINE CURRENT.
3 - PLATE.
4 - SCREEN GRID.
5 - CONTROL GRID.
6 - 1ST. SUPPLY GRID.
7 - 2ND. SUPPLY GRID.
8 - HEATER.

Point	110V AC	110V DC	6A7	60B	75	43	25Z5	6.3V	1.90A
1	110	110	250	250	250	250	250	250	250
2	110	110	250	250	250	250	250	250	250
3	110	110	250	250	250	250	250	250	250
4	110	110	250	250	250	250	250	250	250
5	110	110	250	250	250	250	250	250	250
6	110	110	250	250	250	250	250	250	250
7	110	110	250	250	250	250	250	250	250
8	110	110	250	250	250	250	250	250	250
9	110	110	250	250	250	250	250	250	250
10	110	110	250	250	250	250	250	250	250
11	110	110	250	250	250	250	250	250	250
12	110	110	250	250	250	250	250	250	250
13	110	110	250	250	250	250	250	250	250
14	110	110	250	250	250	250	250	250	250
15	110	110	250	250	250	250	250	250	250
16	110	110	250	250	250	250	250	250	250
17	110	110	250	250	250	250	250	250	250
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19	110	110	250	250	250	250	250	250	250
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27	110	110	250	250	250	250	250	250	250
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29	110	110	250	250	250	250	250	250	250
30	110	110	250	250	250	250	250	250	250
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32	110	110	250	250	250	250	250	250	250
33	110	110	250	250	250	250	250	250	250
34	110	110	250	250	250	250	250	250	250
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36	110	110	250	250	250	250	250	250	250
37	110	110	250	250	250	250	250	250	250
38	110	110	250	250	250	250	250	250	250
39	110	110	250	250	250	250	250	250	250
40	110	110	250	250	250	250	250	250	250
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45	110	110	250	250	250	250	250	250	250
46	110	110	250	250	250	250	250	250	250
47	110	110	250	250	250	250	250	250	250
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93	110	110	250	250	250	250	250	250	250
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96	110	110	250	250	250	250	250	250	250
97	110	110	250	250	250	250	250	250	250
98	110	110	250	250	250	250	250	250	250
99	110	110	250	250	250	250	250	250	250
100	110	110	250	250	250	250	250	250	250

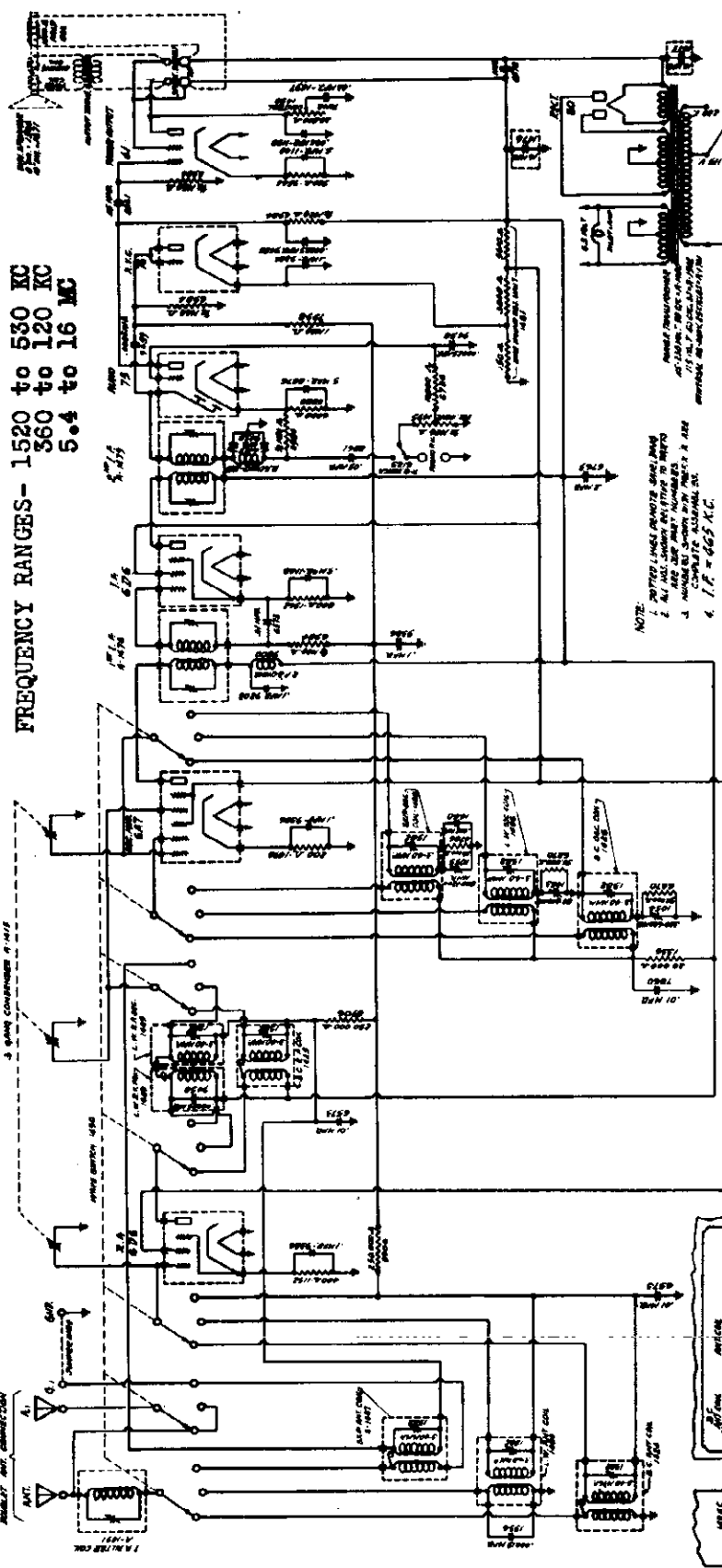
CONVENTIONAL ALIGNMENT - see special section.

Align I-F trimmers at 465 KC. BROADCAST - Dial and generator at 1720 KC, peak oscillator trimmer. Dial end generator at 1400 KC, peak the antenna trimmer. Dial and generator at 600 KC, pad the oscillator circuit while rocking the variable condenser. SHORTWAVE - Dial and generator at 6.5 MC, peak the oscillator trimmer to maximum, then dial and generator to 6 MC, peak the antenna trimmer. No padding adjustment required on this band.

MODEL 7200
Schematic, Voltage
Trimmers, Alignment
Parts

SENTINEL RADIO CORP.

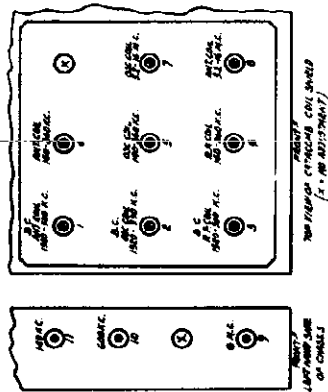
FREQUENCY RANGES - 1520 to 530 KC
360 to 120 KC
5.4 to 16 MC



Line Voltage : 115 volt 60 cycle
Volume Control : Full on
Wave Band : Broadcast

TUBE	FIL.	PLATE	SCREEN	CATHODE	GRID NO. 1	GRID NO. 2	GRID NO. 3 & 5
6A7	6.2	250	94	2.5	4.5	175	94
6D6	6.2	250	94	3.4			
6D5	6.2	250	94	3.2			
75	6.2	70 μ		1.2			
76	6.2	250	94	3.4			
41	6.2		80 H. A. Total Drain	15			
50	4.9						

NOTE:
1. DOTTED LINES INDICATE SHIELDING
2. ALL TUBES MUST BE WARMED UP TO TEMPERATURE OF 100°C. BEFORE ALIGNMENT
3. HOLD ALL TRIMMERS IN THE CENTER POSITION
4. I.F. = 465 K.C.



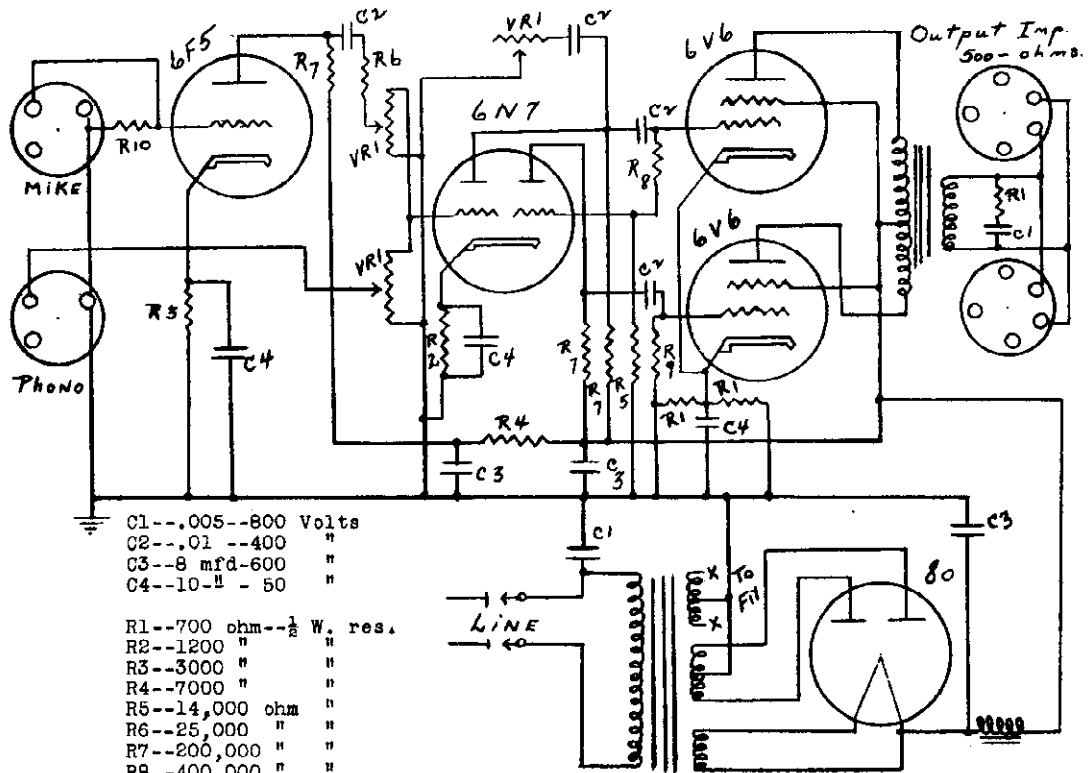
CONVENTIONAL ALIGNMENT
(see special section)

Align I-F transformer trimmers at 465 KC. BROADCAST - Dial and generator at 1400 KC, peak trimmers No. 2, then Nos. 1 and 3. Dial and generator at 600 KC, adjust trimmers No. 10 to maximum peak. LONG-WAVE - Dial and generator at 350 KC, adjust trimmers No. 5, then 4 and 6, to peak. Dial and generator at 150 KC, peak trimmer No. 11. SHORTWAVE - Dial and generator at 15 MC, peak trimmer No. 8, then trimmers Nos. 7 and 8. (Note - on first node from minimum). Dial and generator at 6 MC, peak trimmer No. 9. Adjust wave trap for minimum signal on 465 KC. Hook variable condenser during padding.

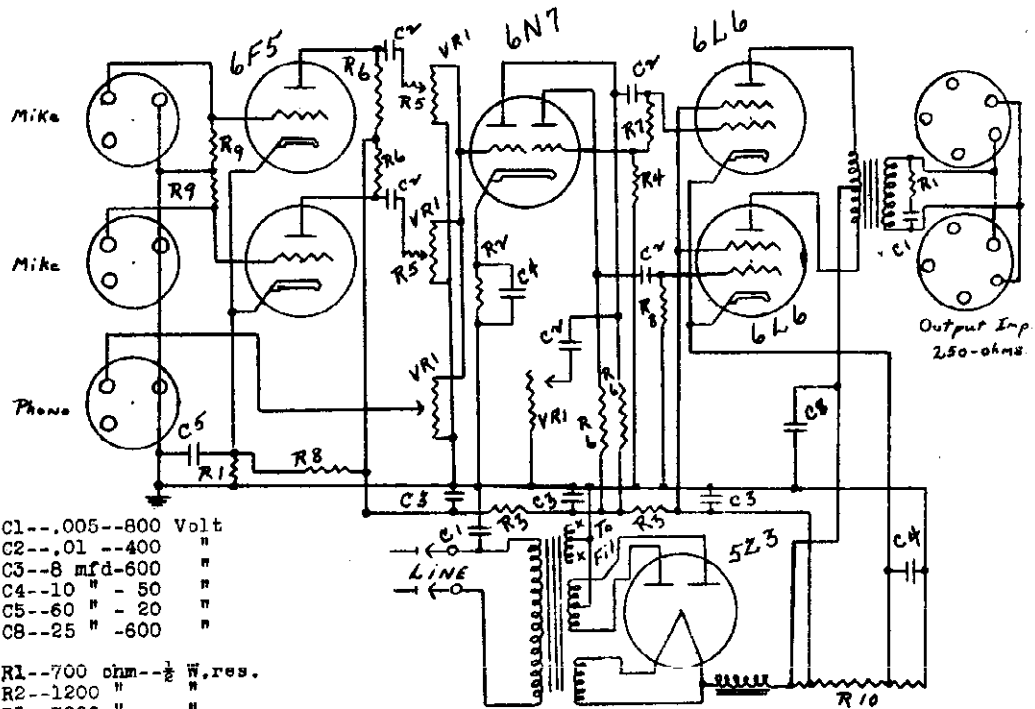
- Triode Plate
Read all voltages from socket to chassis with 1000 ohm per volt meter.

SETCHELL CARLSON, INC.

MODEL PA 13 Amplifier
 MODEL PA 25 Amplifier
 Schematics



- C1---.005--800 Volts
- C2---.01 --400 "
- C3--8 mfd-600 "
- C4--10-1 - 50 "
- R1--700 ohm-- $\frac{1}{2}$ W. res.
- R2--1200 " "
- R3--3000 " "
- R4--7000 " "
- R5--14,000 ohm "
- R6--25,000 " "
- R7--200,000 " "
- R8--400,000 " "
- R9--500,000 " "
- R10--1 meg. " "
- VR1-- $1\frac{1}{2}$ meg." Potentiometer



- C1---.005--800 Volt
- C2---.01 --400 "
- C3--8 mfd-600 "
- C4--10 " - 50 "
- C5--60 " - 20 "
- C8--25 " -600 "
- R1--700 ohm-- $\frac{1}{2}$ W. res.
- R2--1200 " "
- R3--7000 " "
- R4--14,000 ohm "
- R5--25,000 " "
- R6--200,000 " "
- R7--400,000 " "
- R8--500,000 " "
- R9--1 meg. " "

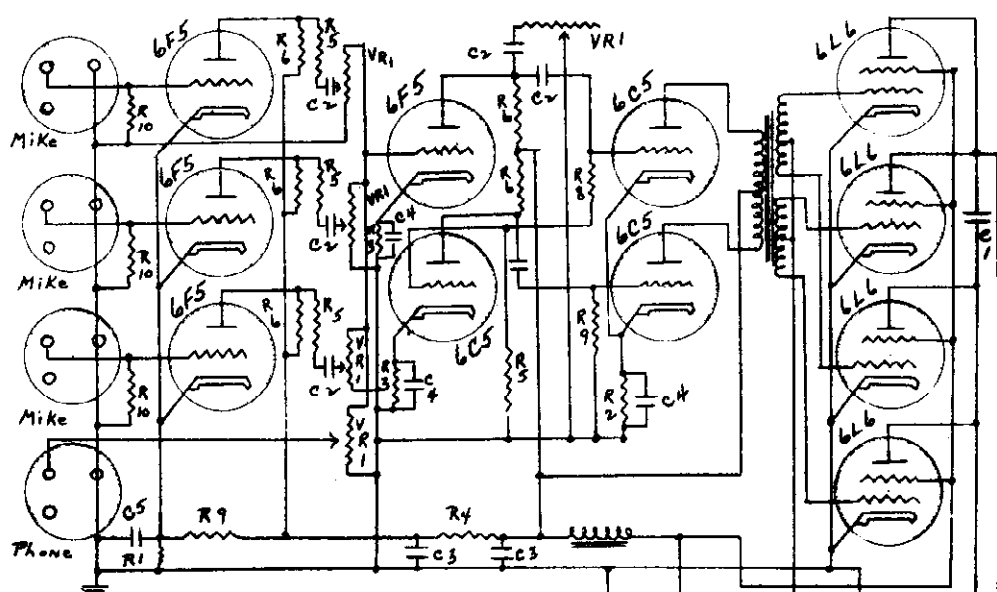
R10--6635 Ohm tapped 100 W.
 VR1-- $1\frac{1}{2}$ meg." Potentiometer

MODEL PA. 13

MODEL PA. 25

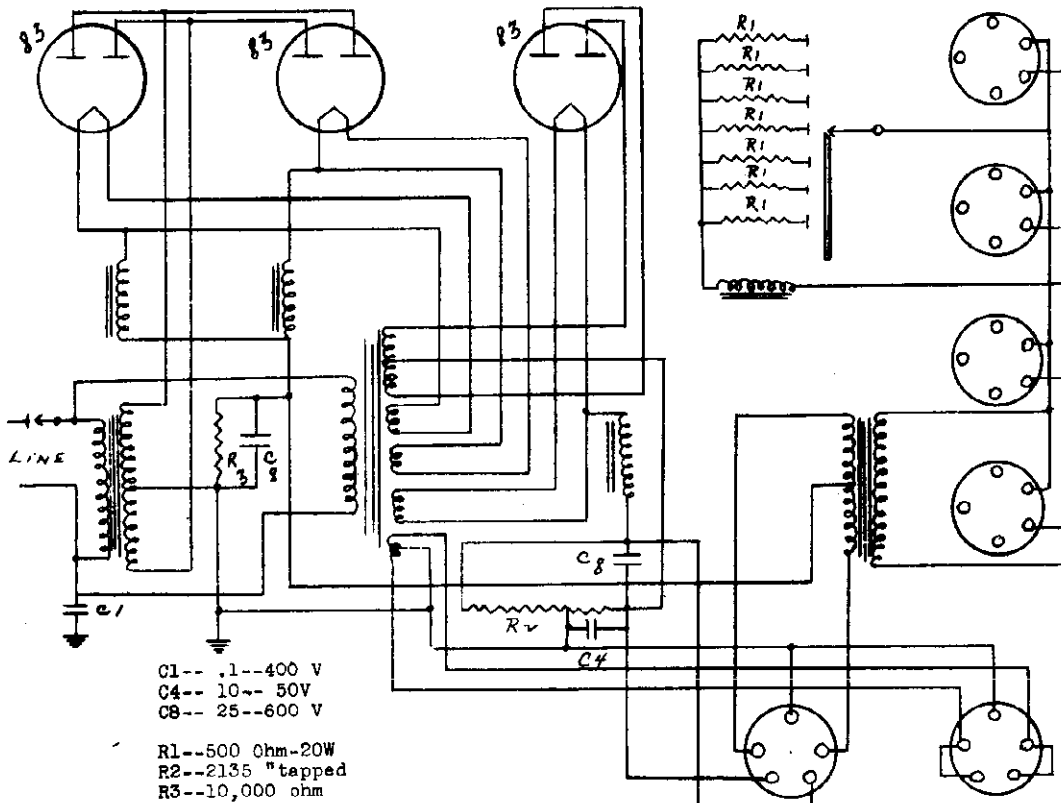
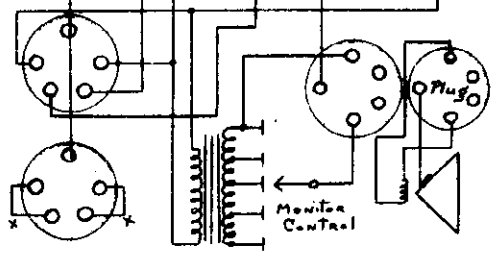
MODEL PA 115 Amplifier
Schematic

SETCHELL CARLSON, INC.



MODEL P.A. 115
MIXER AND AMPLIFIER CIRCUIT

- | | |
|------------------------------|---------------------------------|
| C1--.005--800V | R5--25,000 ohm- $\frac{1}{2}$ W |
| C2--.01--400V | R6--100,000 " " |
| C3--8--600V | R7--200,000 " " |
| C4--10--50V | R8--400,000 " " |
| C5--75--20V | R9--500,000 " " |
| R1--700 ohm- $\frac{1}{2}$ W | R10--1 meg. |
| R2--1290 " " | VR1-- $\frac{1}{2}$ " Potent. |
| R3--3000 " " | |
| R4--7000 " " | |

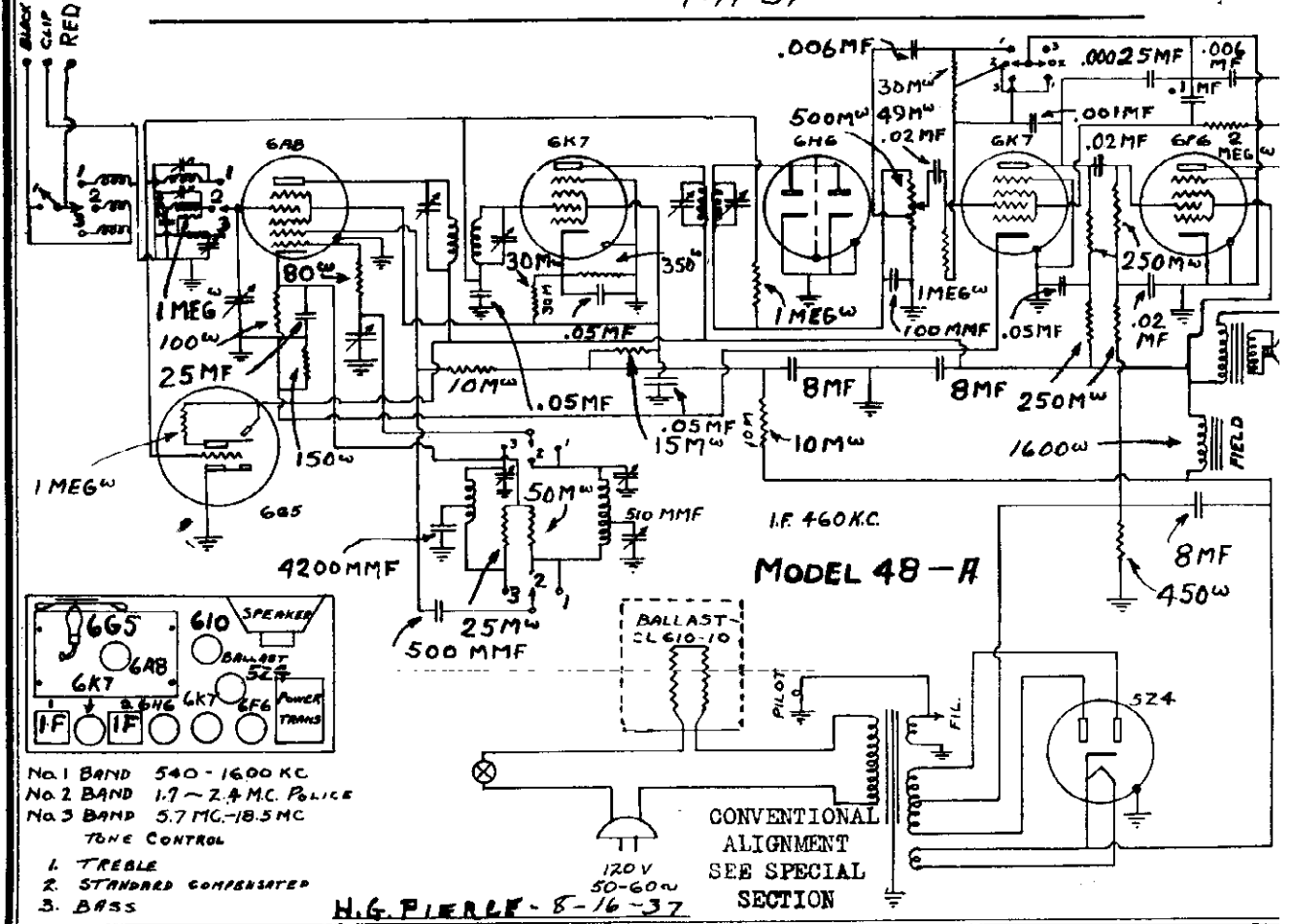
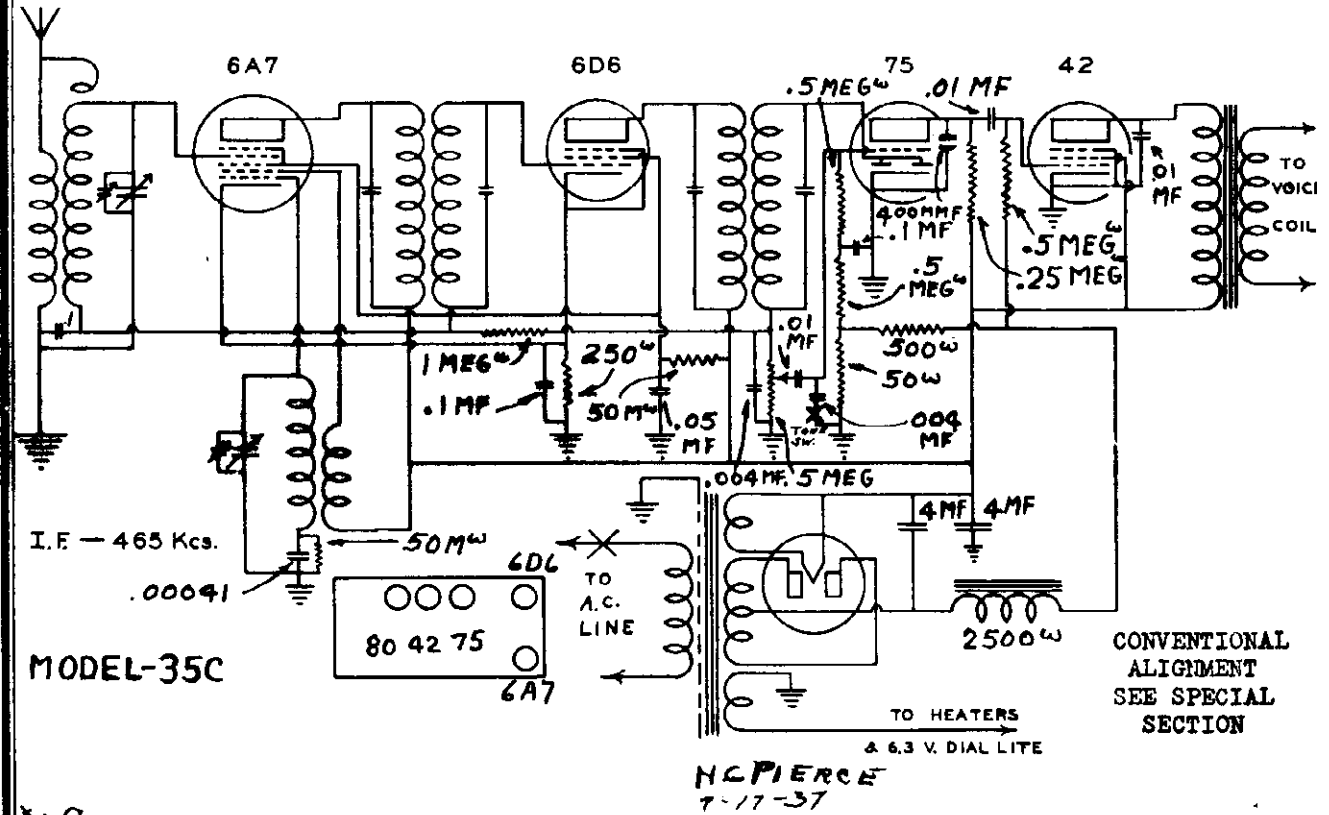


MODEL P.A. 115
POWER AND OUTPUT CIRCUIT

- | |
|-------------------------|
| C1--.1--400 V |
| C4-- 10-- 50V |
| C8-- 25--600 V |
| R1--500 Ohm-20W |
| R2--2135 " tapped |
| R3--10,000 ohm
20 W. |

SHELLEY RADIO CO.

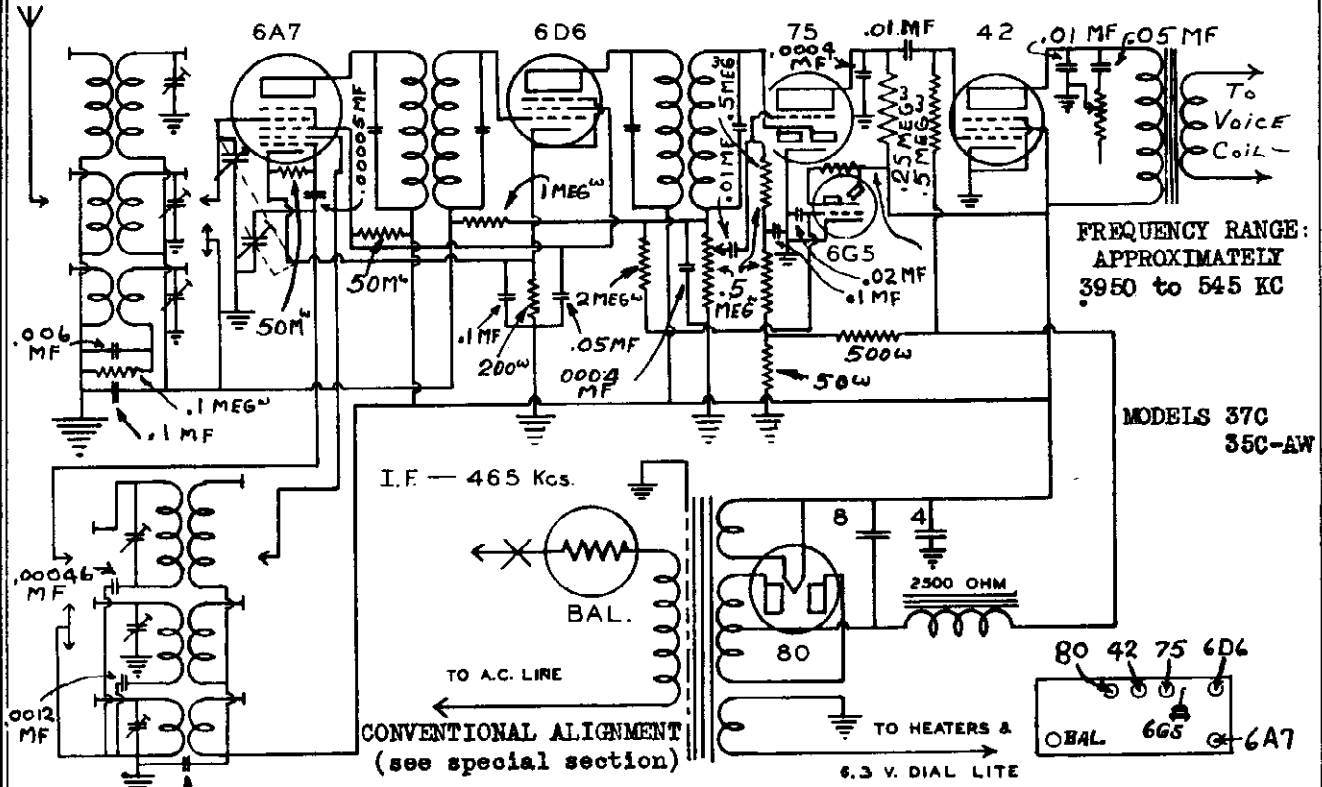
MODEL 35-C
 MODEL 48-A
 Schematics
 Socket



- No. 1 BAND 540-1600 KC
 No. 2 BAND 1.7-2.4 MC. POLICE
 No. 3 BAND 5.7 MC-18.5 MC
 TONE CONTROL
 1. TREBLE
 2. STANDARD COMPENSATED
 3. BASS

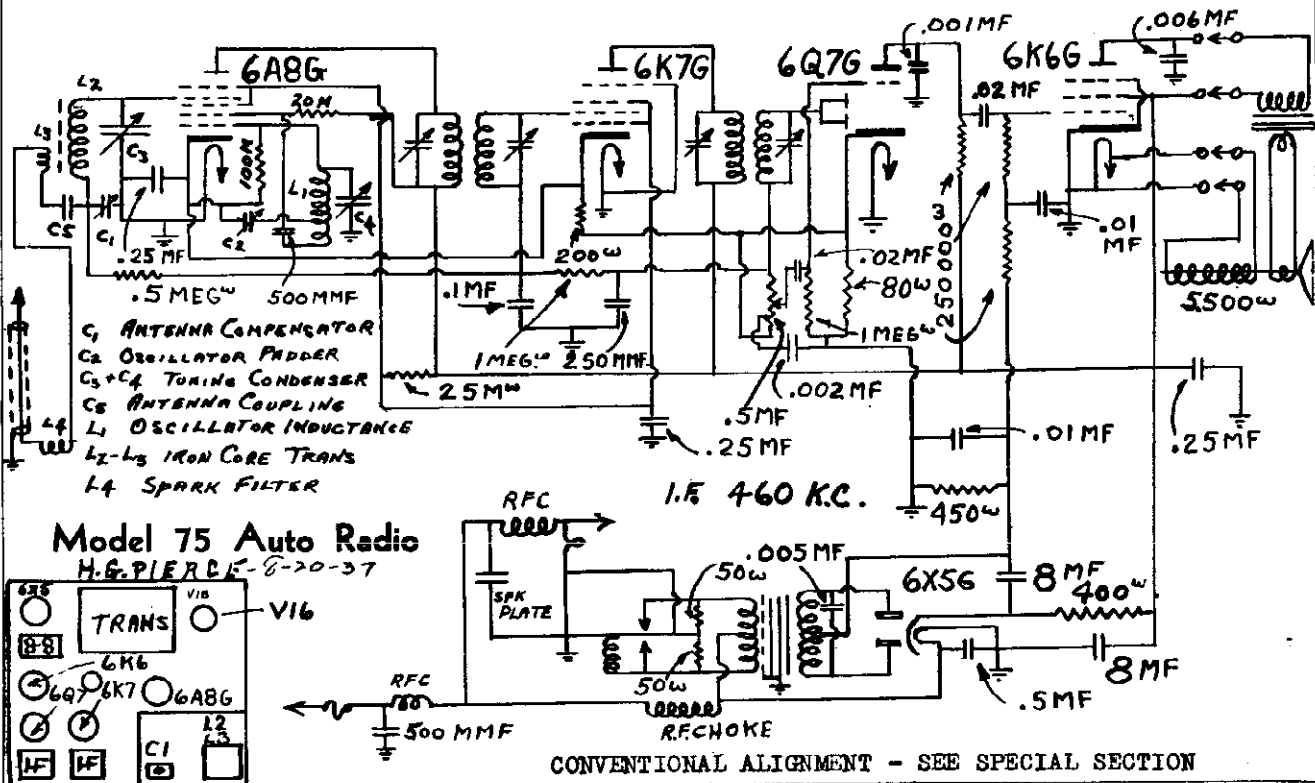
MODELS 35C-AW, 37-C
 MODEL 75 Auto
 Schematics, Socket
 Alignment

SHELLEY RADIO CO.

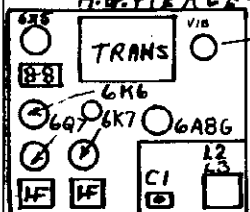


5/25/37
 Geo. Ellis

MODEL 35C-AW is the same as MODEL 37C with the exception that the 6G5 tuning tube, the 1 megohm target resistor, and the ballast tube are omitted.

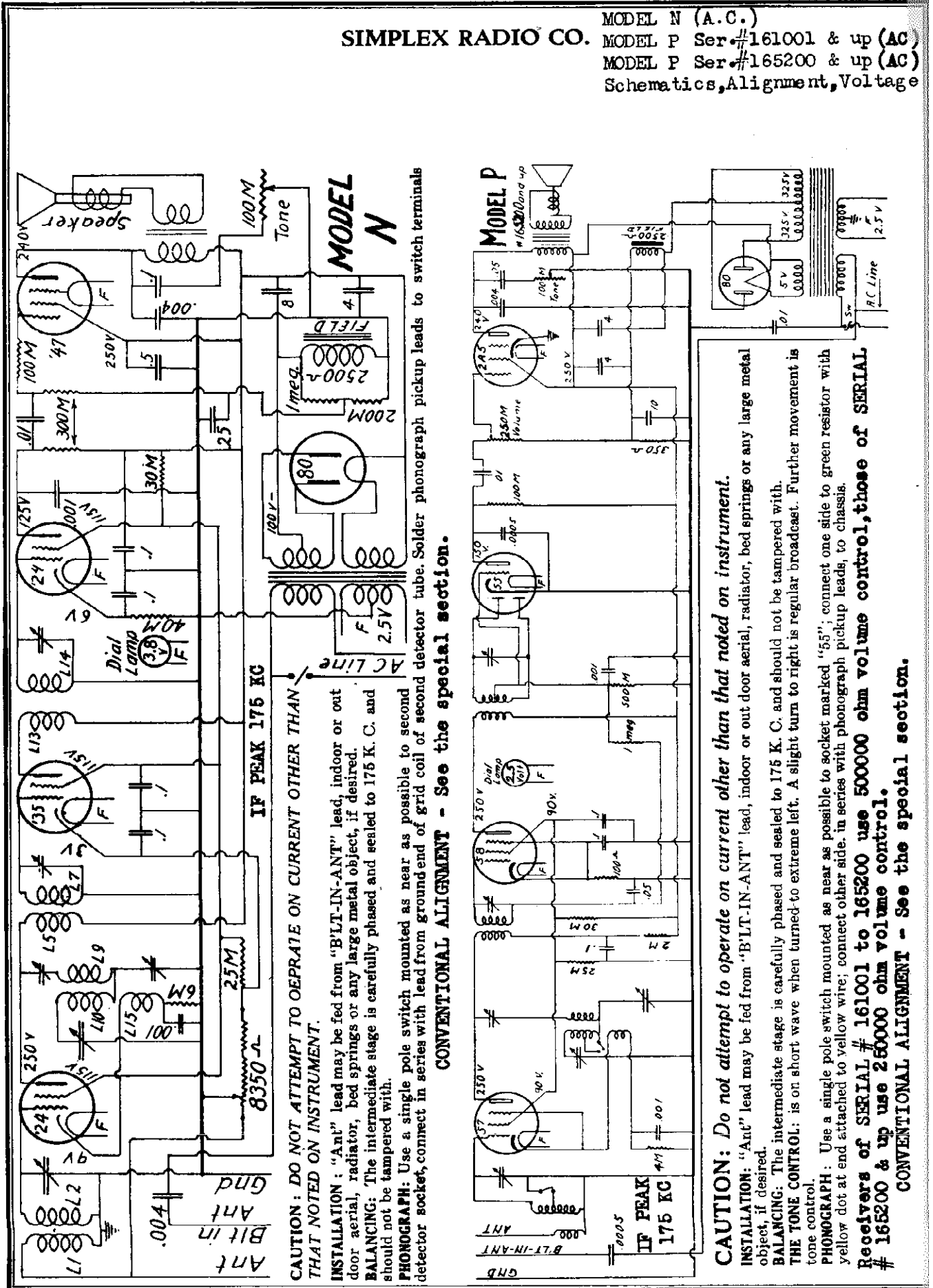


Model 75 Auto Radio
 H.G. PIERCE-G-20-37



CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION

SIMPLEX RADIO CO. MODEL N (A.C.)
 MODEL P Ser.#161001 & up (AC)
 MODEL P Ser.#165200 & up (AC)
 Schematics, Alignment, Voltage

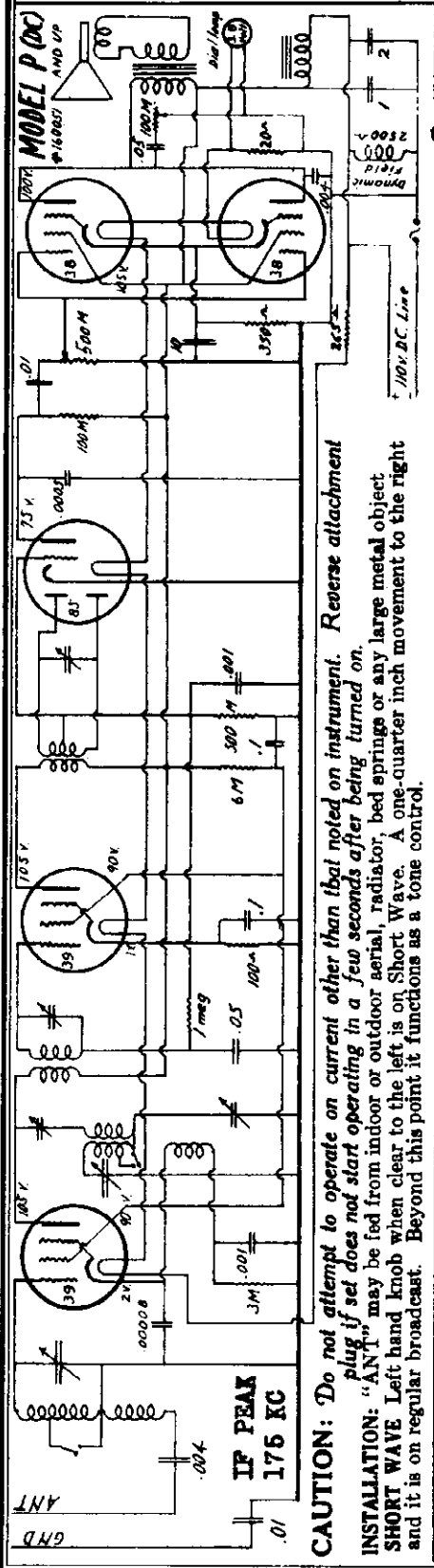


MODEL P(DC) Ser.#160051 & up
 MODEL R(DC) Ser.#150804 & up
 MODEL R(AC) Ser.#175001 & up
 Schematics, Voltage, Alignment

SIMPLEX RADIO CO.

THE ALIGNMENT OF THESE RECEIVERS IS CONVENTIONAL
 (SEE THE SPECIAL SECTION)

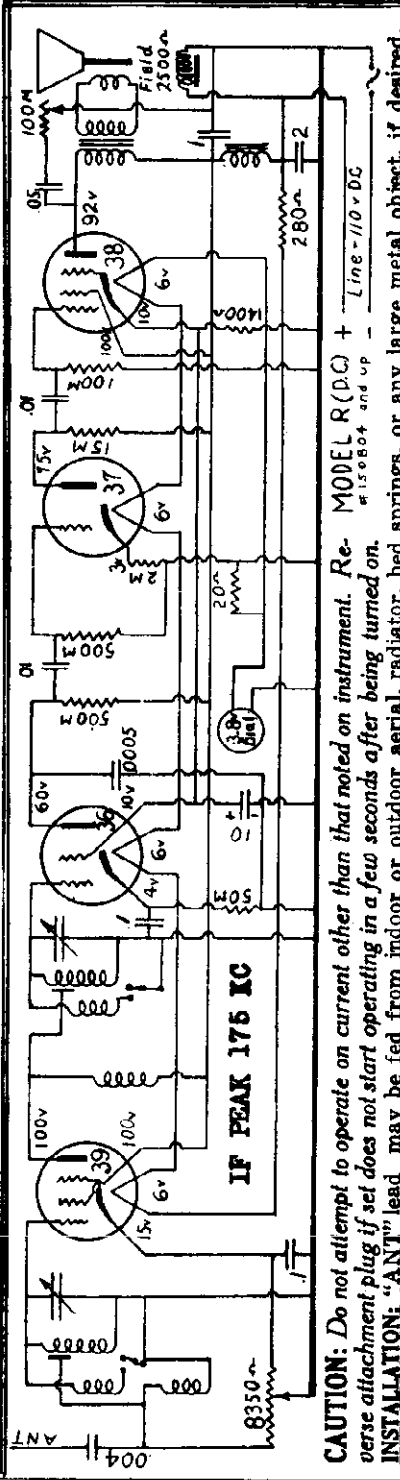
PHONOGRAPH: Use a single pole switch mounted as near as possible to the socket, marked "86"; connect one side to green resistor with yellow dot at end attached to yellow wire; connect other side, in series with phonograph pick-up leads, to chassis.



CAUTION: Do not attempt to operate on current other than that noted on instrument. Reverse attachment plug if set does not start operating in a few seconds after being turned on.

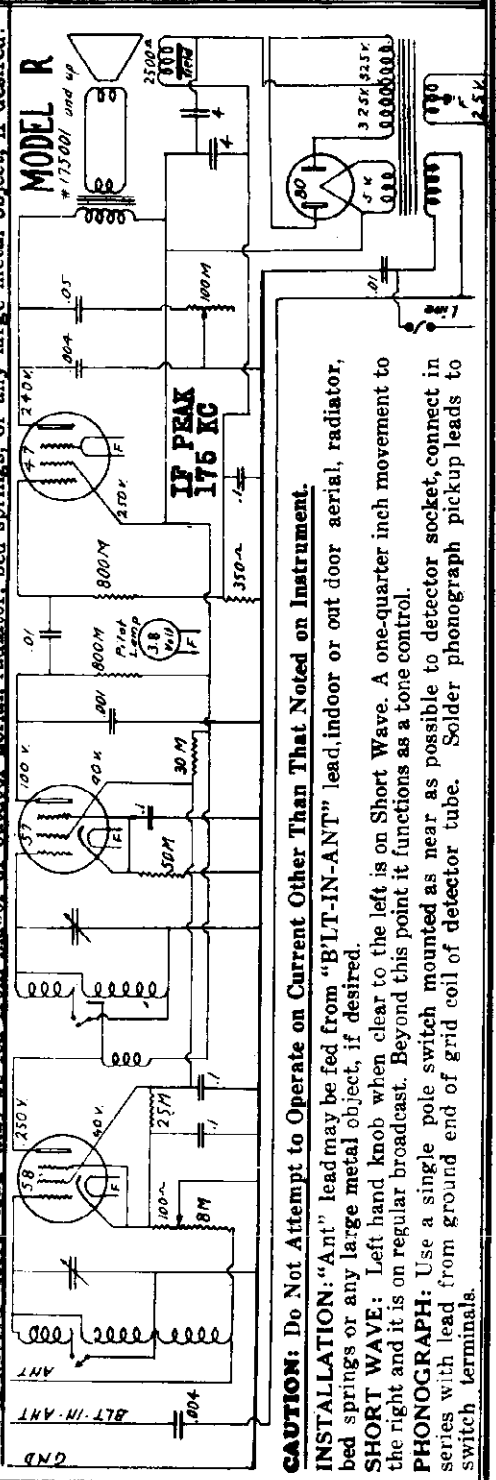
INSTALLATION: "ANT" may be fed from indoor or outdoor aerial, radiator, bed springs or any large metal object.

SHORT WAVE: Left hand knob when clear to the left is on Short Wave. A one-quarter inch movement to the right and it is on regular broadcast. Beyond this point it functions as a tone control.



CAUTION: Do not attempt to operate on current other than that noted on instrument. Reverse attachment plug if set does not start operating in a few seconds after being turned on.

INSTALLATION: "ANT" may be fed from indoor or outdoor aerial, radiator, bed springs, or any large metal object, if desired.



CAUTION: Do Not Attempt to Operate on Current Other Than That Noted on Instrument.

INSTALLATION: "Ant" lead may be fed from "BLT-IN-ANT" lead, indoor or out door aerial, radiator, bed springs or any large metal object, if desired.

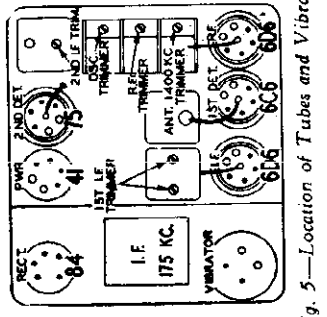
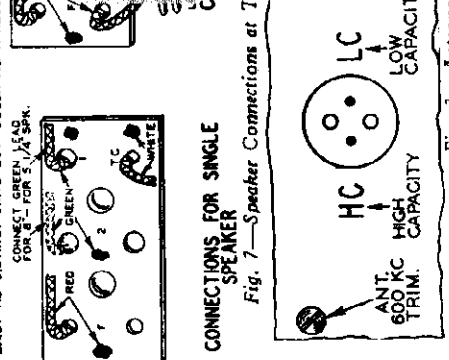
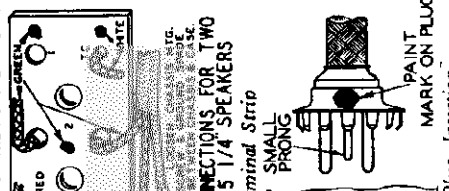
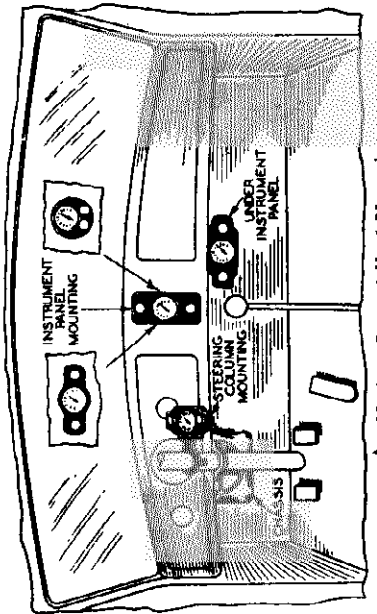
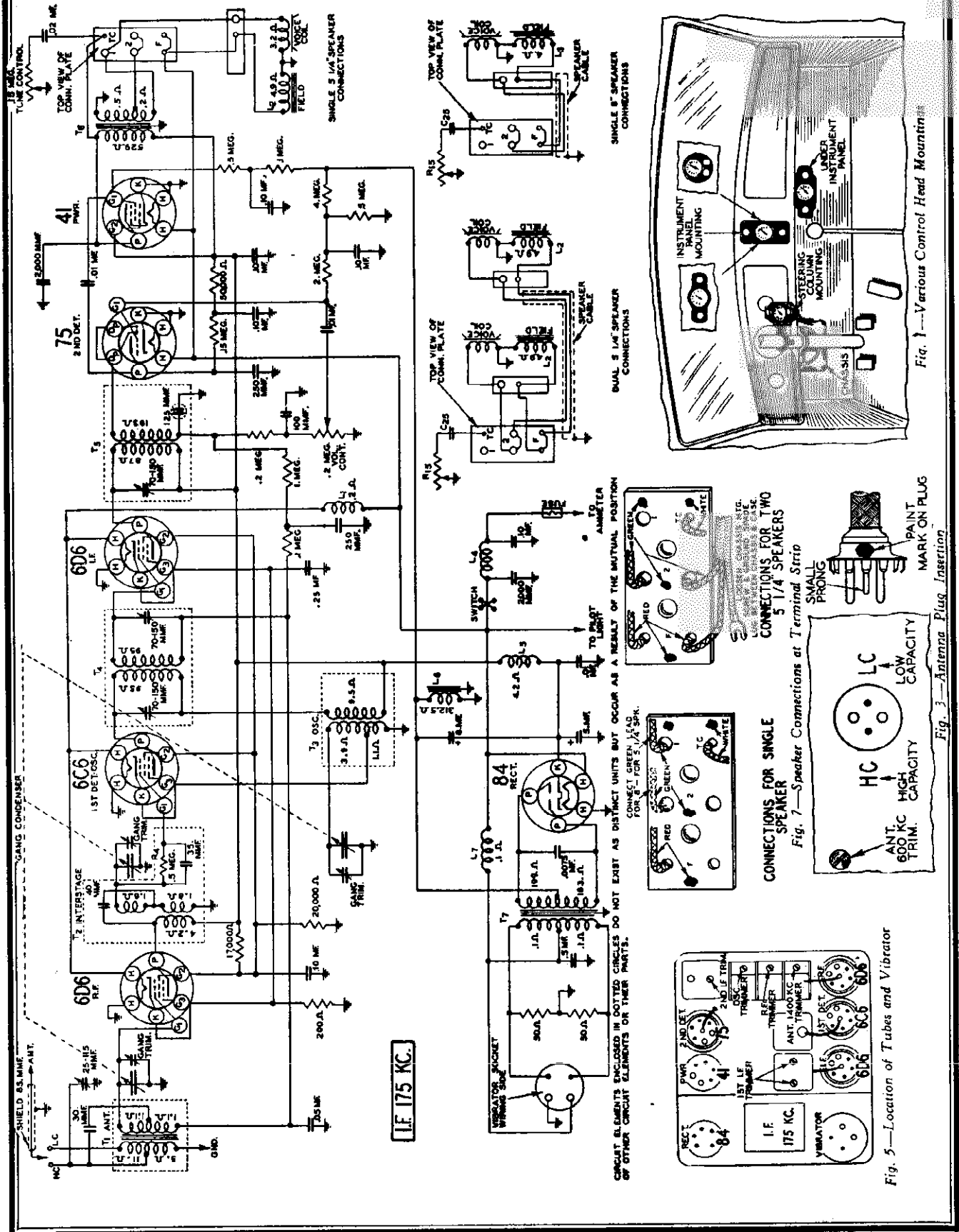
SHORT WAVE: Left hand knob when clear to the left is on Short Wave. A one-quarter inch movement to the right and it is on regular broadcast. Beyond this point it functions as a tone control.

PHONOGRAPH: Use a single pole switch mounted as near as possible to detector socket, connect in series with lead from ground end of grid coil of detector tube. Solder phonograph pickup leads to switch terminals.

SOBOL BROS.

MODEL 6C1 Auto Schematic, Socket Trimmers, Spkr. Data

Series 6C1 6 TUBE AUTOMOBILE RADIO



Set the signal generator for 175 KC and connect the output of the signal generator through a .05 mf. condenser to the stator of the R.F. interstage section of the tuning condenser. Set the volume control at maximum. The chassis should be in the case. Connect the ground lead of the signal generator to the chassis. Attenuate the signal from the signal generator to prevent the levelling off action of the AVC. Then adjust the three IF trimmers until maximum output is obtained—See Fig. 5.

Set the signal generator for 1581 KC. Turn the rotor of the tuning condenser to the full open position. Insert the antenna plug with the mark on the high capacity (HC) side. Connect the shielded antenna lead from the chassis through a 120 mmf. condenser to the antenna post of the signal generator. Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained.

Set the signal generator for 1400 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained. Adjust the R.F. interstage and antenna 1400 KC trimmers for maximum output. Do not change the setting of the oscillator trimmer.

Then set the signal generator for 600 KC. Tune in this signal and adjust the 600 KC antenna trimmer to maximum (See Fig. 3 for location of this trimmer).

After the alignment procedure is completed, the antenna plug may be withdrawn and reinserted on the LC side if a low capacity (70 mmf.) car antenna is used.

Adjusting Antenna 600 KC Trimmer

Tune in a weak signal at approximately 600 KC with the volume control about three-fourths on. Turn the adjusting screw of the antenna 600 KC trimmer up or down until maximum output is obtained. See Fig. 3 for location of this trimmer.

If the total capacity of the antenna and shielded lead is approximately 200 mmf., which would be the case in a running board or ordinary roof antenna (not metal roof), insert the antenna plug with the mark on the HC side—See Fig. 3.

If the total capacity of the antenna and shielded lead is approximately 70 mmf., such as may be the

case if a "fish pole" antenna is used, insert the antenna plug with the mark on the LC side.

Distributor Suppressor—Remove the high tension lead to the distributor. Insert a distributor suppressor and connect the wire to the other end of the suppressor (See Fig. 6). If this is not practical, cut the high tension lead *close to the distributor* and use a wood screw end type distributor suppressor in this line.

Generator Condenser—The generator condenser is installed at the cut-out as shown in Fig. 6. The lead from the condenser goes to the terminal on the cut-out.

In some of the new cars the cut-out relay is on the front of the dash or in some other location. It will be most convenient to mount this generator condenser at the relay.

Withdraw Antenna Cable Plug

Turn on the radio and start the engine.

If motor noise is heard, proceed as follows:

Shielding High Tension Lead—In some cars, when the coil is mounted on the dash, the high tension lead from the coil must be covered with braided shielding to within about four inches of the distributor and the shield grounded to the motor block or frame.

Bypass Condenser—Try a .25 or .5 mfd. condenser from the ammeter to ground. Try a condenser from the car fuse to ground, switch to ground, windshield wiper connections and various other 6 volt connections to ground, noting what effect these condensers have on the noise pick-up.

Try a .25 or .5 mfd. condenser from the "Hot" side of the coil primary to ground. In some cases this condenser may not help. It can be tried out, however, experimentally.

Spark Plug Suppressors—If motor noise persists, spark plug suppressors must be installed. One suppressor is put on each plug as shown in Fig. 6. These are not regularly supplied with the radio and must be purchased extra. Seventy percent of all cars will not require spark plug suppressors.

Care should be taken that a good mechanical and electrical connection is made between the spark plugs, suppressors and plug wires.

Instrument Panel Mounting Kits

Car	Year & Model	Kit No.	Car	Year & Model	Kit No.	Car	Year & Model	Kit No.
Buick	1937 40-60 Series	21A68	Ford	1937 DeLuxe	21A74	Plymouth	1937 DeLuxe	21A78
	80-90 Series	21A69		Standard	21A73		Standard	21A64
	1936	21A16		1936 Std. & DeLuxe	21A10		1936 DeLuxe	21A12
1937	21A70	1935 DeLuxe		21A32	1936-35 Standard		21A37	
Cadillac	1936	21A39	Standard	21A38	1935 DeLuxe	21A33		
	1937 All Models	21A58	1934	21A38	1934	21A49		
Chevrolet	1936-35 Standard & Master	21A11	1937	21A75	1937	21A79		
	1937 Royal	21A59	1936	21A77	1936-35 Standard-DeLuxe 6 & 8 Coupe	21A15		
Chrysler	1937 Imperial	21A71	1935	21A48	Studebaker	1937 Dictator	21A65	
	Airflow	21A72	1934	21A35		1937 Dictator	21A54	
	Six	21A19	LaFayette	1936-35	President	21A55		
	1936 Eight	21A30	LaSalle	1937	1936 Dictator	21A20		
	Airflow	21A31	Lincoln	Zephyr 1937	President	21A24		
DeSoto	1935-34 Except Imperial	21A47	Zephyr 1936	21A10	Terraplane	1937	21A80	
	1937	21A60	Nash	1937 Ambassador		1936	21A18	
	1936 Airflow & Airstream Custom	21A22	1936-35	21A36		1935	21A48	
	Airstream DeLuxe	21A26	Nash Laf. 400	1937		1934	21A35	
	1935 DeLuxe	21A46	Oldsmobile	1936	Steering column and Chromium under panel kit.	21A66		
1934	21A47	1935	21A34	Black	21A67			
Dodge	1937	21A61	Packard	Six	21A56	The mounting kit includes escutcheon plate, knobs, special mounting brackets and small items such as screws. The other items are shipped with the radio.		
	1936 DeLuxe	21A13		1937 120-C	21A57			
	1935	21A45		Super 8 & 12	21A77			
	1934	21A49		1936 120-B	21A21			
			1935 120	21A41				

SONORA

MODELS PR-101, PR-202

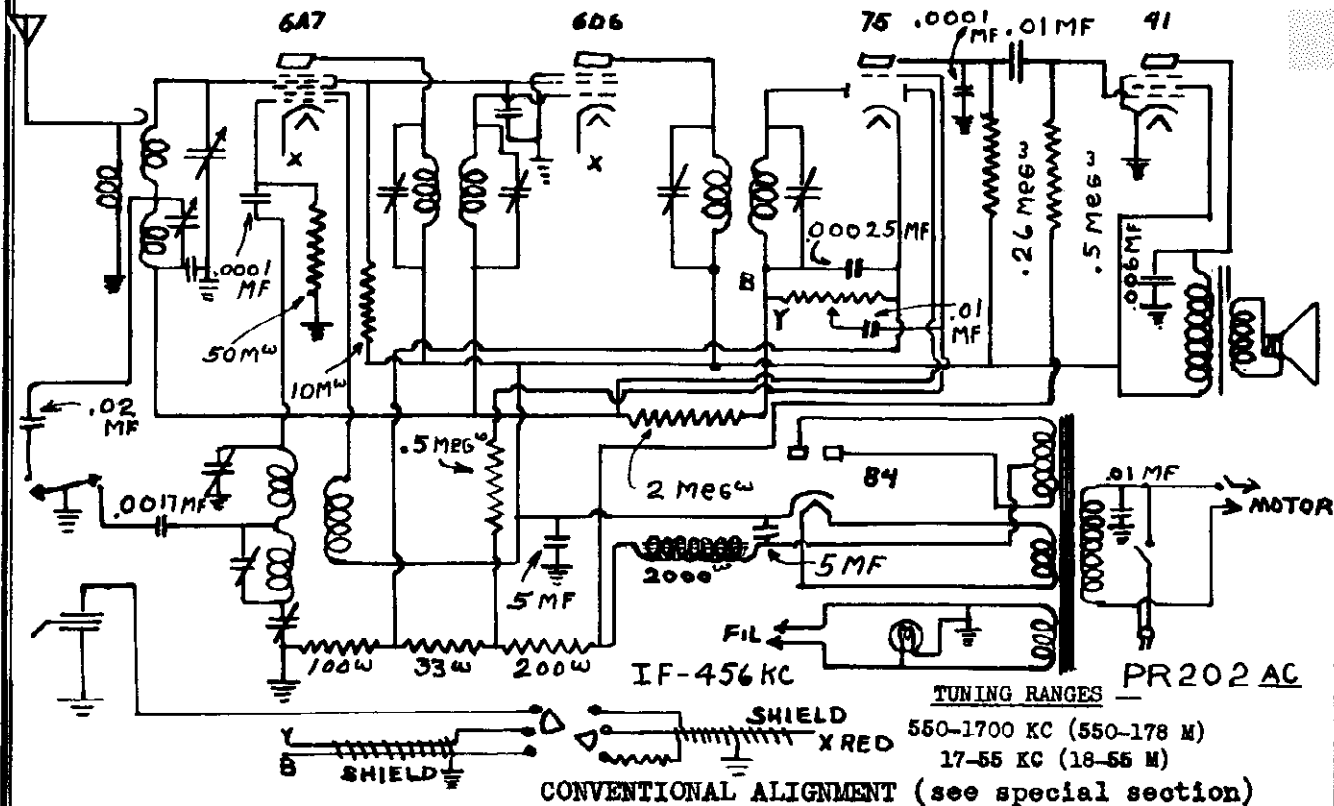
MODELS PR-101 AC-DC

PR-300 AC-DC

PR-400 AC-DC

MODELS PR-101 and PR-202

Schematics

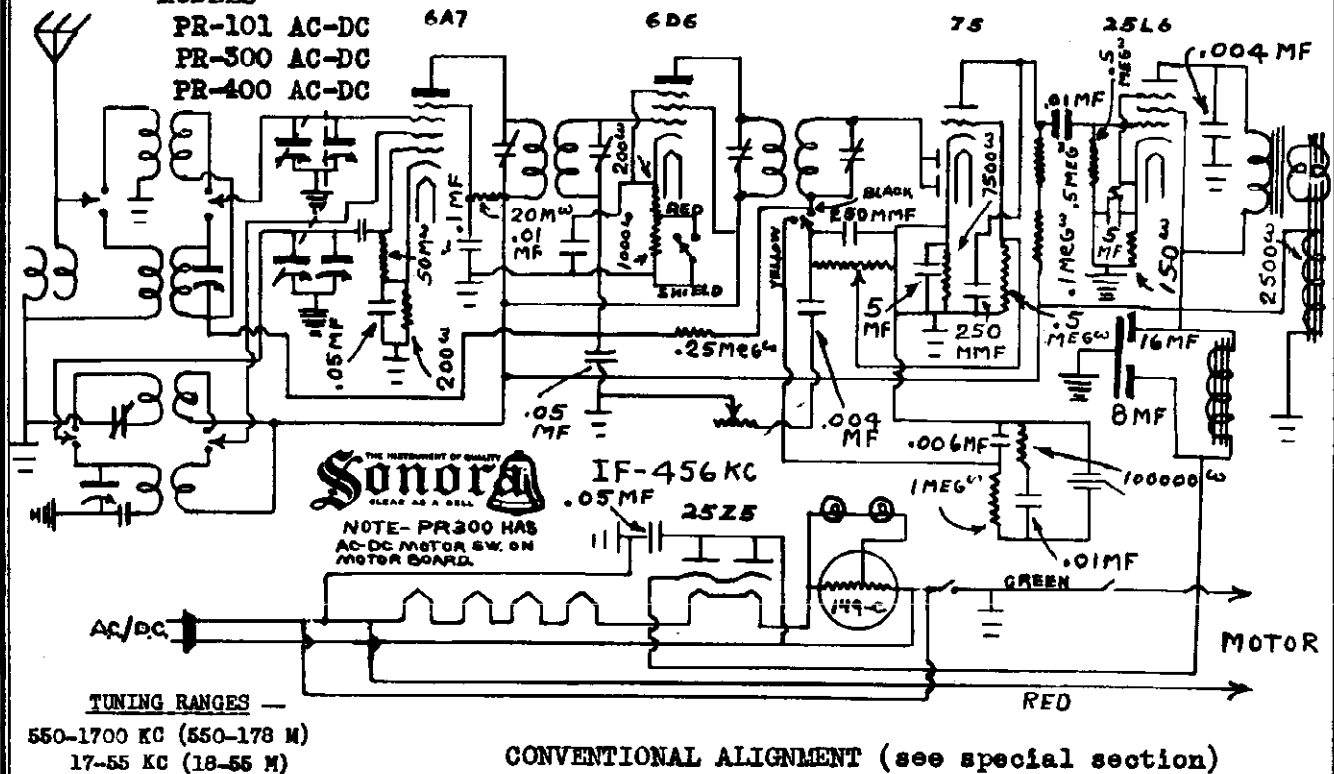


MODELS

PR-101 AC-DC

PR-300 AC-DC

PR-400 AC-DC



MODEL Playette, Data
 MODEL P-101 Amplifier
 MODEL P-300 Amplifier
 Schematics

SONORA

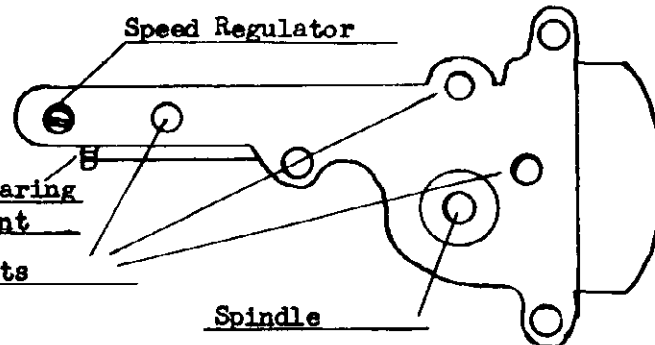
INSTRUCTIONS FOR SONORA PLAYETTE

Note - If a corrective load for records recorded at constant velocity above 250 CPS and constant amplitude below 250 cycles is desired, connect .1 meg ohm resistor and a .01 MFD condenser in series across pickup leads. The volume control on the PLAYETTE must be in the full-on position. The volume control of the radio set or amplifier should be used in this case.

Oil motor regularly, once a month. To oil motor lift turn table so that oil cups are exposed.

Use SAE10 automobile oil. Do not use the oils of the 3-in-1 variety or type, or else life of the bearing will be impaired.

Thrust Bearing Adjustment
 Oil Points



PLAYETTE AC 60-CYCLE MOTOR

PICKUP CONNECTIONS

1. Locate 1st AF tube
2. Locate grid connections in tube manuals or by reference to set manufacturers data.

CONNECT -

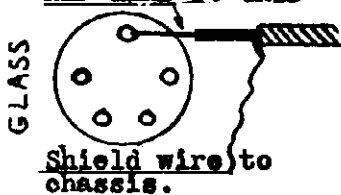
RED LEAD TO GAP OF TUBE



Shield wire to the chassis

CONNECT -

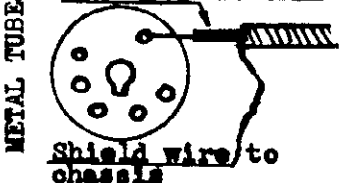
RED LEAD TO GRID



Shield wire to chassis.

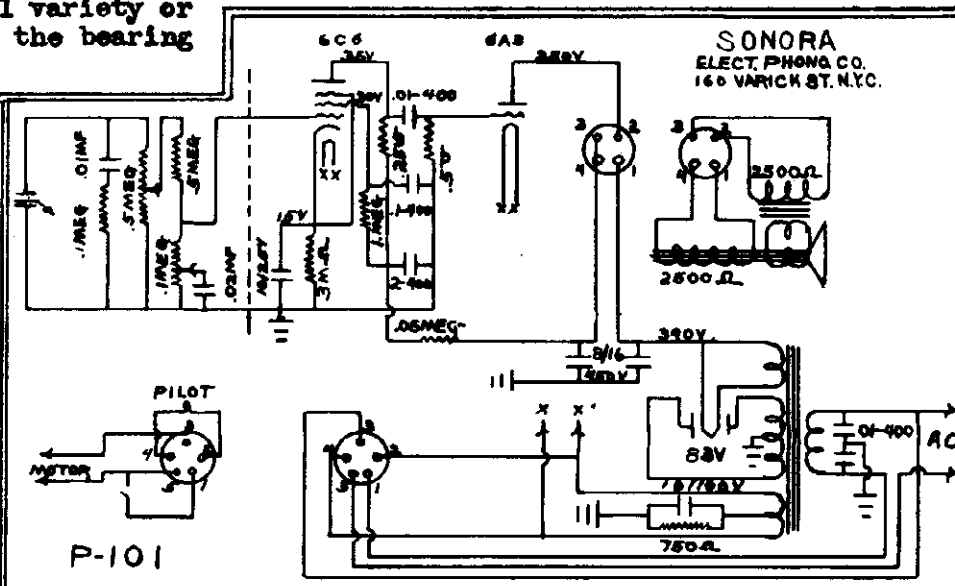
CONNECT *
 CONNECT-

RED LEAD TO GRID

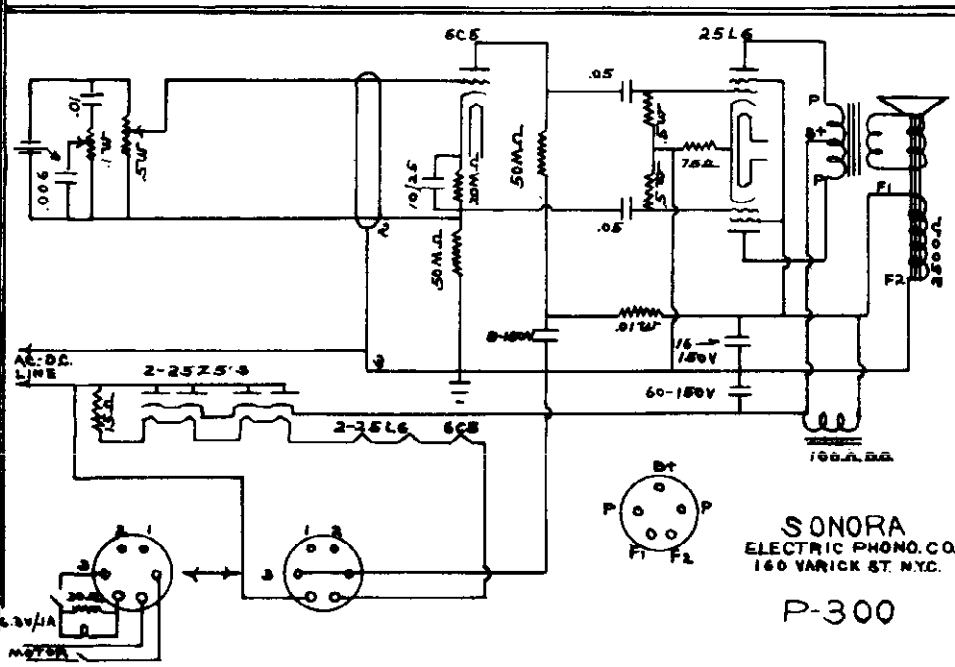


Shield wire to chassis

Be sure to connect radio antenna to ground so that radio signals will not mar phonograph reproductions



P-101

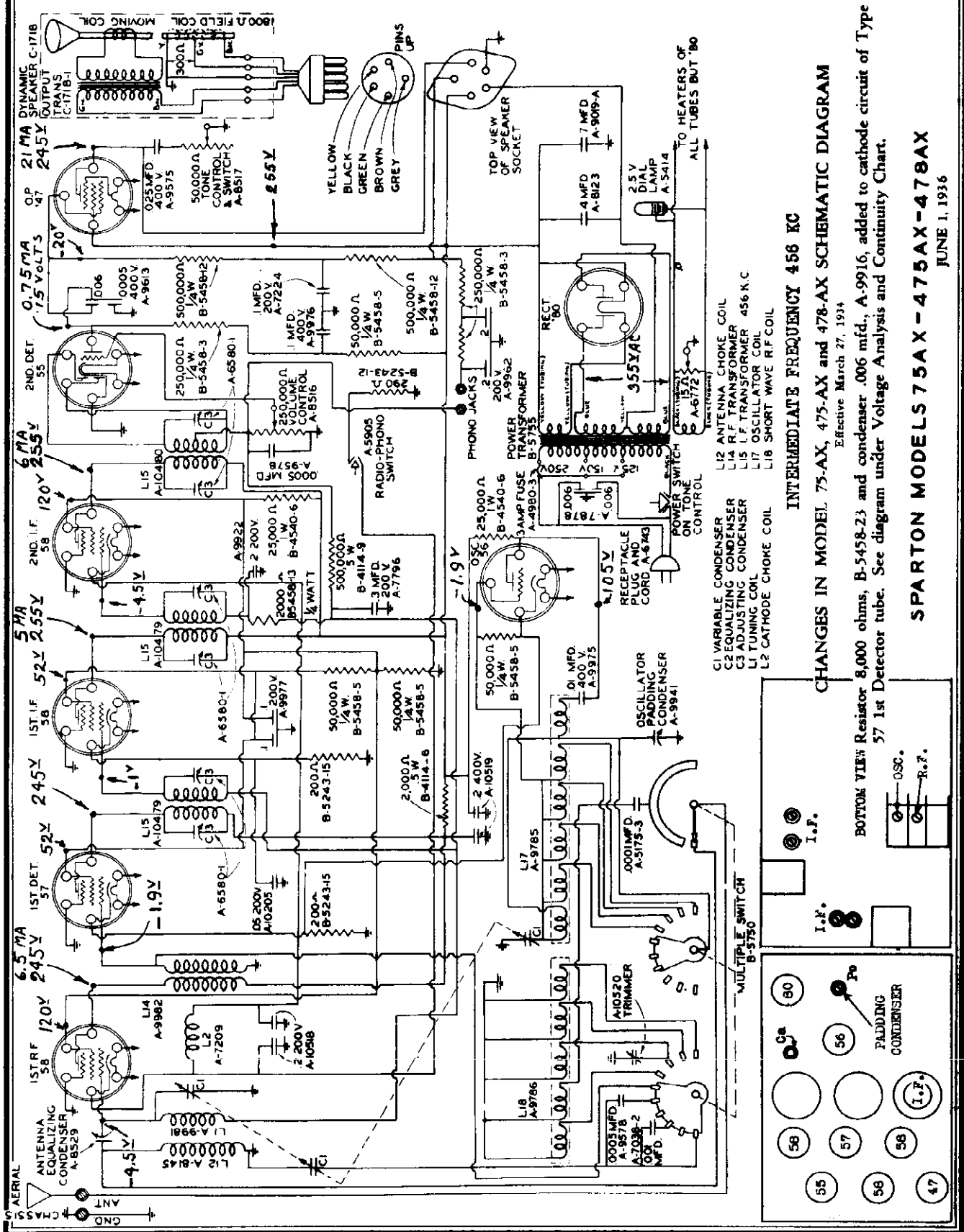


SONORA ELECTRIC PHONO. CO. 160 VARICK ST. N.Y.C.

P-300

SPARKS WITHINGTON CO.

MODELS 75AX, 475AX, 478AX
Schematic, Voltage, Socket
Trimmers, Changes, Parts



INTERMEDIATE FREQUENCY 456 KC

CHANGES IN MODEL 75-AX, 475-AX and 478-AX SCHEMATIC DIAGRAM

Effective March 27, 1934

BOTTOM VIEW Resistor 8,000 ohms, B-5458-23 and condenser .006 mfd., A-9916, added to cathode circuit of Type 57 1st Detector tube. See diagram under Voltage Analysis and Continuity Chart.

SPARTON MODELS 75AX - 475AX - 478AX
JUNE 1, 1936

MODELS 75A, 475A, 478A
MODELS 75AX, 475AX, 478AX

SPARKS WITHINGTON CO.

Alignment

(Lavender) and turn dial to receive a signal between 12.5 mc. and 14 mc.

12. Adjust No. 5 Padding Condenser (Op5).
13. Turn dial to receive a signal between 16 mc. and 24 mc.
14. Adjust No. 5 R-F Trimming Condenser (Op5).
15. Re-check all adjustments in order given above.

E. ALIGNING THE ANTENNA EQUALIZING CONDENSER, CA.

The antenna equalizing condenser should always be adjusted when the receiver is installed and with the regular aerial and ground connected. It is the purpose of this condenser to resonate the first tuned circuit with the antenna system to which the receiver is connected, thereby providing a maximum transfer of energy. The procedure of adjustment is as follows:

Turn in a weak distant station or oscillator signal between 1800 and 1400 kilocycles, turn the volume control on full, and rotate the inter-station noise suppressor control knob clockwise as far as it will go. Next, with a hex-socket insulated wrench, turn the hex-nut on the condenser to the position where the volume from the station "tuned-in" or the oscillator signal is the loudest. Once made, this adjustment need not be changed unless the antenna system is altered, the receiver is moved from one location to another, or the other condensers are re-adjusted.

NOTE: When antenna equalizing condenser is adjusted on oscillator signal, adjustment will not hold true when receiver is connected to aerial; this condenser must be aligned to antenna system.

F. INSTRUCTIONS FOR REPLACING DIAL LIGHTS IN MODEL 76, 154, 156.

NOTE: Dial Lights may be changed without removing the chassis.

1. Turn dial to 1600 kc.
2. Loosen set screw located directly over dial light shaft in front of the bevel gear parallel with the variable condenser plates.
3. Turn dial to 1200 kc.
4. Tighten set screw.
5. Turn dial to 1450 kc.
6. Hold dial drum to prevent turning and slide back the dial light ventilation cover.
7. Use a short length of 1/4 inch inside diameter rubber tubing slipped down over the bulb to remove or replace any dial lights.
8. Place dial light ventilation cover in original position.
9. Turn dial to 1200 kc.
10. Loosen set screw.
11. Turn to 1500 kc.
12. Tighten set screw.

to the right or left until the test oscillator harmonic is heard, and readjust for maximum deflection on the output meter.

6. It may be necessary to repeat the entire alignment procedure in order to be sure the adjustments are correct.

NOTE: Exercise great care in making all adjustments. The foregoing adjustments are made on Broadcast Band frequencies and the performance of the Models 75-A, 475-A, 478-A, 75-AX, 475-AX, 478-AX, especially the sensitivity and calibration on short-waves, depends entirely on the accuracy with which they are made.

G. ADJUSTMENT OF THE RADIO-FREQUENCY ADJUSTABLE CONDENSERS.

1. Connect test oscillator leads to Antenna and Ground Posts and adjust oscillator for 172.5 kc. Do not disturb position of control knob.
2. Turn station selector to 1590 kc., where the eighth harmonic of the oscillator should be heard.
3. Adjust the Antenna compensator by turning to the right or left until maximum deflection is obtained on the output meter.
4. Adjust R-F Trimmer condenser for maximum signal response.

D. ADJUSTMENT OF THE RADIO-FREQUENCY TRIMMING CONDENSERS, OSCILLATOR TRIMMING CONDENSER AND PADDING CONDENSERS FOR SHORT WAVE BANDS ON MODELS 76, 154, 156.

NOTE: In the following procedure the Broadcast Band (Green) will be considered as No. 1 Band, the 1.5 to 5.4 Megacycle Band (Red) as No. 2 Band, the 5.4 to 6.8 Megacycle Band (Yellow) as No. 3 Band, the 6.8 to 12.5 Megacycle Band (Orange) as No. 4 Band and the 12.5 to 24 Megacycle Band (Lavender) as No. 5 Band.

1. Set Band Selector Switch on No. 2 Band (Red) and turn dial to 1.75 mc. If test oscillator harmonic cannot be heard, disconnect leads and attach antenna and ground and tune in short-wave signal of approximately this frequency.
2. Adjust No. 2 padding condenser (Op2). (There is no R-F trimmer for this band.)
3. Set Band Selector Switch on No. 3 Band (Yellow) and turn dial to a short-wave signal between 6.0 mc. and 6.9 mc.
4. Adjust No. 3 R-F Trimming Condenser (Op3).
5. Turn dial to receive a signal between 5.4 mc. and 4.2 mc.
6. Adjust No. 5 Padding Condenser (Op5).
7. Set Band Selector Switch on No. 4 Band (Orange) and turn dial to receive a signal between 11 mc. and 12.5 mc.
8. Adjust No. 4 R-F Trimming Condenser (Op4).
9. Turn dial to receive a signal between 6.9 and 6.0 mc.
10. Adjust No. 4 Padding Condenser (Op4).
11. Set Band Selector Switch on No. 5 Band

4. ADJUSTMENT OF INTERMEDIATE FREQUENCY CONDENSERS.

1. Connect test oscillator leads to grid cap of 1st detector type 57 tube and ground. Adjust oscillator to 456 kc.
2. Allow to operate 15 minutes before making any adjustments.
3. Turn Band Selector to Broadcast Band, and rotate volume control, tone control and inter-station noise suppressor clockwise as far as they will go.
4. Turn on test oscillator and adjust attenuator for one-half to three-quarter scale deflection of the output meter.
5. Adjust each pair of intermediate-frequency condensers (three pairs) until maximum deflection of the output meter is obtained with a minimum of signal energy from the test oscillator.

NOTE: If the minimum signal of the oscillator is so great that accurate adjustment of the condensers becomes difficult, it is necessary to decrease the sensitivity of the receiver by turning the inter-station noise suppressor counter-clockwise. Do not turn the volume control knob.

In order to adjust the 1st stage intermediate-frequency condensers on Models 75-A, 475-A, 478-A, 75-AX, 475-AX, 478-AX, it is necessary to remove the copper shield over the I-F transformer (located nearest the Antenna Post) and replace it with a specially prepared shield (SPARTON Part A-7506), which has two holes drilled in the top. A bakelite or insulated screw driver may then be inserted through the holes to reach the condensers. Never attempt to adjust these condensers without this shield in place.

B. ADJUSTMENT OF THE OSCILLATOR TRIMMER AND PADDING CONDENSER.

1. Turn the Station Selector until the variable condenser rotor plates are fully meshed (up against the stop). The dial should now read exactly 540 kc. If it does not, loosen set screws on the rotor shaft and, keeping the rotor plates tight against the stop, turn the dial until the hair-line is exactly on the 540 kc. calibration mark.
2. With the test oscillator leads connected to the antenna and Ground Posts of the receiver, adjust the oscillator frequency to 172.5 kc. Then turn the Station Selector so that the hair-line is exactly on 1890 kc.
3. Turn the oscillator trimmer condenser, O0, to the right or left until the output meter deflection is greatest.

CAUTION: Do not move the Station Selector after it has been set at 1890 kc.

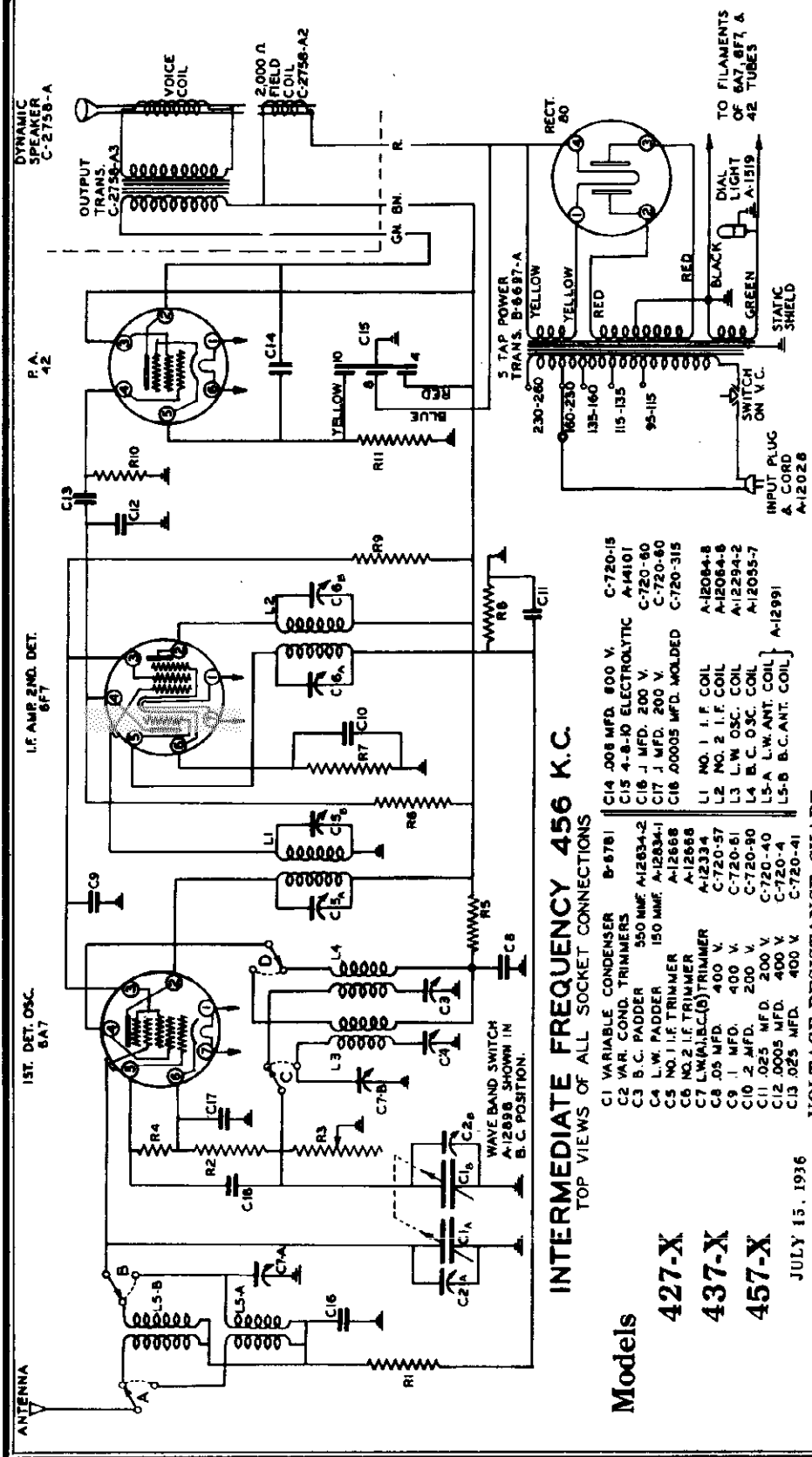
4. Turn the Station Selector so that the hair-line is exactly on 690 kc. This dial setting should bring in the fourth harmonic of the test oscillator. However, if the padding condenser is very much out of adjustment no signal will be heard.

CAUTION: Do not disturb the dial setting of 690 kc.

5. Adjust the padding condenser, P0, by turning

SPARKS-WITHINGTON CO.

MODELS 427X, 437X, 457X
Schematic, Resistance
Voltage, Trimmers, Parts



INTERMEDIATE FREQUENCY 456 K.C.

TOP VIEWS OF ALL SOCKET CONNECTIONS

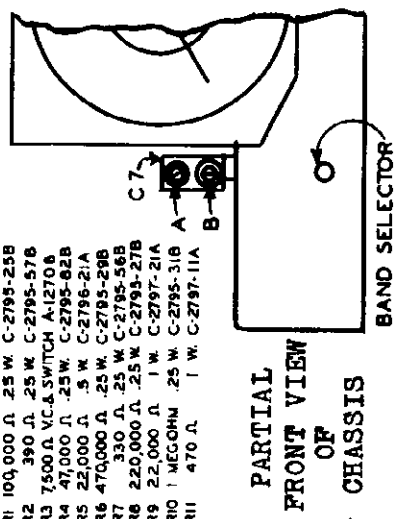
- C1 VARIABLE CONDENSER B-6781
- C2 VAR. COND. TRIMMERS 350 MMF. A-12634-2
- C3 B.C. PADDER 150 MMF. A-12634-1
- C4 L.W. PADDER 200 V. A-12668
- C5 NO. 1 I.F. TRIMMER A-12668
- C6 NO. 2 I.F. TRIMMER A-12334
- C7 L.W. (B.C.) TRIMMER A-12334
- C8 .05 MFD. 400 V. C-720-57
- C9 .1 MFD. 400 V. C-720-51
- C10 .2 MFD. 200 V. C-720-90
- C11 .025 MFD. 200 V. C-720-40
- C12 .0005 MFD. 400 V. C-720-4
- C13 .025 MFD. 400 V. C-720-41
- C14 .008 MFD. 800 V. C-720-15
- C15 4-8-10 ELECTROLYTIC A-14101
- C16 J. MFD. 200 V. C-720-80
- C17 J. MFD. 200 V. C-720-60
- C18 .00005 MFD. WOLDED C-720-315
- L1 NO. 1 I.F. COIL A-12084-8
- L2 NO. 2 I.F. COIL A-12084-8
- L3 L.W. OSC. COIL A-12294-2
- L4 B.C. OSC. COIL A-12035-7
- L5-A L.W. ANT. COIL A-12991
- L5-B B.C. ANT. COIL A-12028

VOLTAGE-RESISTANCE CHART

Position of Volume Control: Full with Antenna Disconnected
Position of Band Selector Switch: Broadcast
Line Voltage: 118 volts

Tube	Function	Voltage and Resistance of Each Socket Prong to Ground (See Prong Numbers on Schematic Diagram)							
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	
6A7	1st. Detector-Oscillator	0	250	165	235	0	0	0	300000
6B7	I-F Amp., 2nd. Det.	0	100000	120000	120000	59000	6000	0	0
42	Power Amplifier	0	48000	80000	750000	200000	500	0	0
80	Rectifier	0	385	325	0	0	0	0	0
		0	50000	50000	750000	400	0	0	0
		0	350	350	0	0	0	0	0
		390	390	390	0	0	0	0	0

Notes: Voltage and resistance readings are for schematic diagram shown on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All measurements made with Weston Selective Analyzer No. 6A5. Rev. 2.



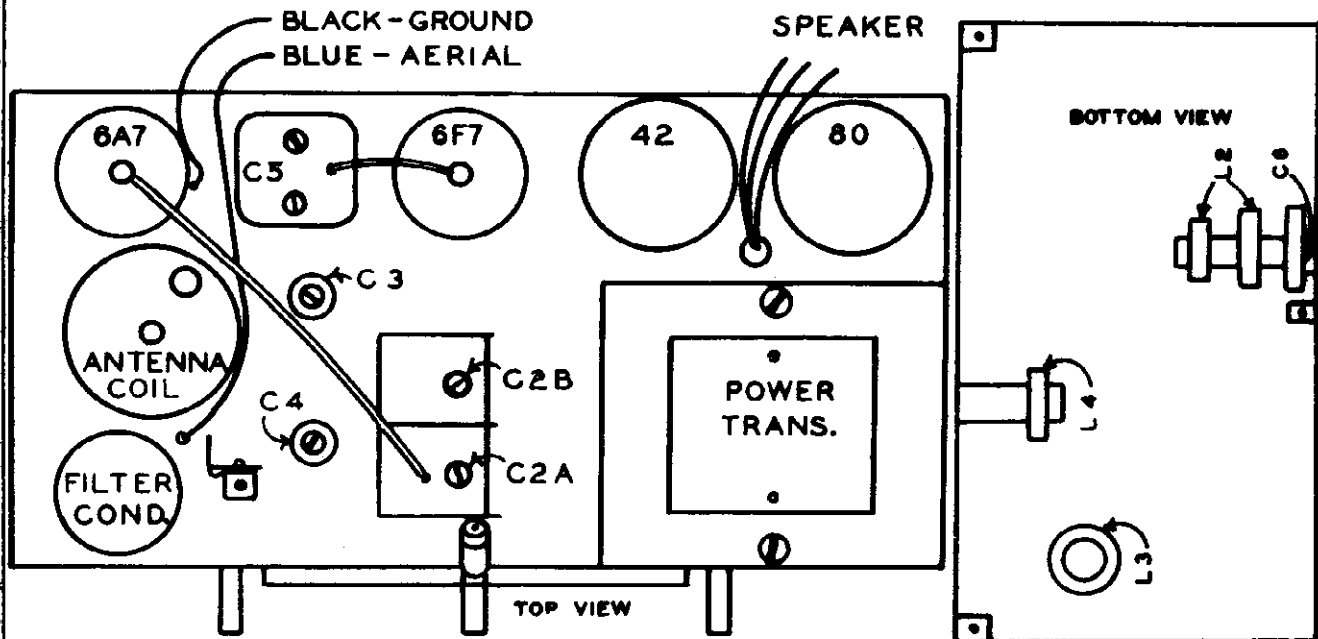
PARTIAL FRONT VIEW OF CHASSIS

MODELS 427X, 437X, 457X

Socket, Trimmers

Alignment

SPARKS WITHINGTON CO.



FOREWORD: The SPARTON Models 427-X, 457-X and 457-X (Export) are equipped with an adjustable power transformer for operation on various line voltages as indicated under the transformer terminal cover plate.

Before attempting to realign the circuits, be sure that the transformer tap is correctly adjusted for the line voltage to be used. Unless otherwise specified, the adjusting of any condenser consists of turning the adjusting screw or nut to the right or left until the output meter registers the greatest deflection.

Note: For proper alignment of these chassis, the procedure should be followed in the same order as given.

The dial pointer should be exactly parallel with the horizontal line of the dial scale when the condenser plates are fully meshed. If the pointer does not read correctly, remove the dial cover and move the pointer until it shows a correct reading.

A. Alignment of Intermediate-Frequency

1. Turn on receiver and test oscillator and allow both to operate several minutes before attempting to adjust any condenser.

2. Turn the band selector switch to the "Broadcast" position and turn the station selector knob until the rotor plates are completely out of mesh with the stator plates.

3. Connect antenna of test oscillator to grid cap of Type 6A7 1st detector-oscillator tube and ground of test oscillator to chassis frame of receiver. Connect output meter "high tap" from plate terminal of Type 42 tube to ground.

Note: It is advisable to read carefully the operating instructions included with the test oscillator.

4. Tune test oscillator to obtain a signal of 456 kilocycles.

5. Turn the volume control of receiver on full and adjust I-F condensers C5 and C6.

B. Alignment of Broadcast Band

1. Disconnect "antenna" lead of test oscillator from grid cap of Type 6A7 tube and connect it in series with a 150 muf. condenser dummy antenna to the antenna terminal of the chassis.

2. Tune test oscillator and receiver to a wave length of 200 meters (1500 kilocycles) and adjust condenser C2-B (oscillator trimmer) and condenser C2-A (antenna trimmer).

3. Tune test oscillator and receiver to 500 meters (600 kilocycles) and adjust condenser C4 (oscillator padder).

4. Retune test oscillator and receiver to 200 meters and check the adjustments of condensers C2-B and C2-A.

5. Calibration of the broadcast band should also be checked at 350 meters (300 kilocycles).

C. Alignment of Long-Wave Band

1. Turn the band selector switch to the "long-wave" band, tune test oscillator and receiver to a wave length of 870 meters (345 kilocycles) and adjust condenser C7-B (long-wave oscillator trimmer) and condenser C7-A (long-wave antenna trimmer).

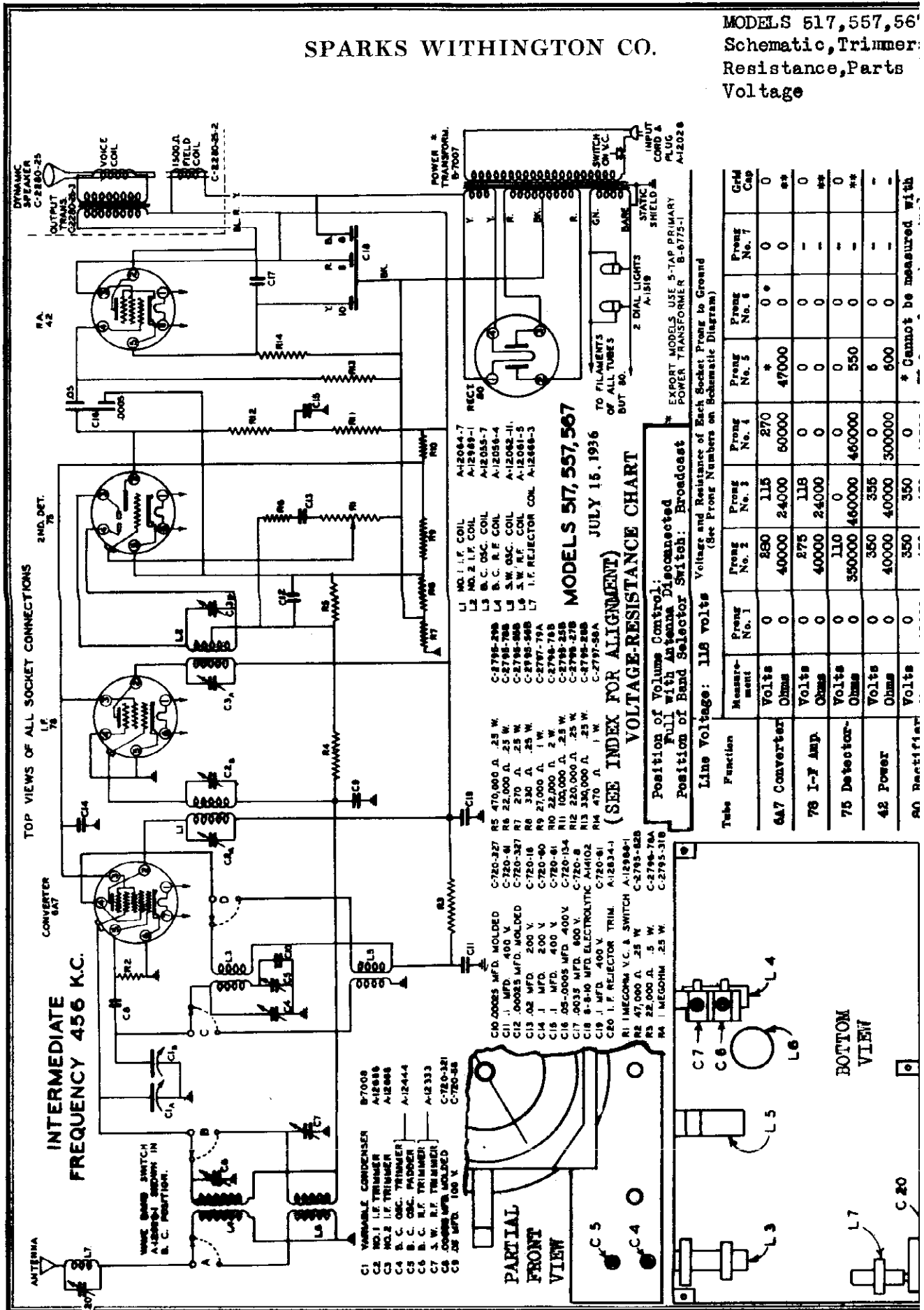
2. Tune test oscillator and receiver to a wave length of 2000 meters (150 kilocycles) and adjust condenser C8 (long-wave oscillator padder).

3. Retune test oscillator and receiver to 870 meters (345 kilocycles) and check the adjustment of condensers C7-B and C7-A.

Caution: All adjustments should be rechecked to assure accuracy and stability of adjustment and calibration.

SPARKS WITHINGTON CO.

MODELS 517, 557, 567
Schematic, Trimmer:
Resistance, Parts
Voltage



MODELS 517, 557, 567

Socket, Trimmers, Alignment SPARKS-WITHINGTON CO.

MODELS 537, 577

Alignment

ALIGNMENT FOR MODELS 517, 557, and 567

A. Alignment of Intermediate-Frequency Stages

1. Turn on receiver and test oscillator and allow both to operate several minutes before attempting to adjust any condensers.
2. Turn the band selector switch to the broadcast position and turn the station selector knob until the rotor plates are completely out of mesh with the stator plates.
3. Connect "antenna" of test oscillator to grid cap of Type 6A7 1st detector-oscillator tube and "ground" of test oscillator to chassis frame of receiver. Connect output meter "high tap" from plate of Type 42 tube to ground.

Note: It is advisable to read carefully the operating instructions included with the test oscillator being used in the alignment procedure.

4. Tune test oscillator to obtain a signal of 456 kilocycles.

5. Turn the volume control of receiver on full and adjust I-F condensers C2 and C3 which are reached from the top of the chassis.

Note: Care should be taken when adjusting the I-F stages in order to insure proper and accurate adjustment.

B. Alignment of Broadcast Band

1. Disconnect "antenna" lead of test oscillator from grid cap of 1st detector-oscillator tube Type 6A7 and connect it in series with a 150 mfd. condenser dummy antenna to the antenna terminal of the chassis.

2. Tune test oscillator to a frequency of 456 kilocycles and adjust condenser C20 (reached from back of the chassis) to a point where the output of the receiver is at an absolute minimum.

Note: This condenser is the adjustment for the code rejector circuit and must be very carefully adjusted if best performance of the receiver is to be expected.

3. Tune test oscillator and receiver to a frequency of 1500 kilocycles and adjust condensers C4 (broadcast band oscillator trimmer) and C6 (broadcast antenna trimmer) reached from the bottom of the chassis.

4. Tune test oscillator and receiver to 600 kilocycles and adjust condenser C5 (broadcast oscillator pecker) reached from the front of the chassis.

5. Retune test oscillator and receiver to 1500 kilocycles and check adjustments of condenser C4 and condenser C6. Calibration of the broadcast band should also be checked at 900 kilocycles and 600 kilocycles.

C. Alignment of Short-Wave Band

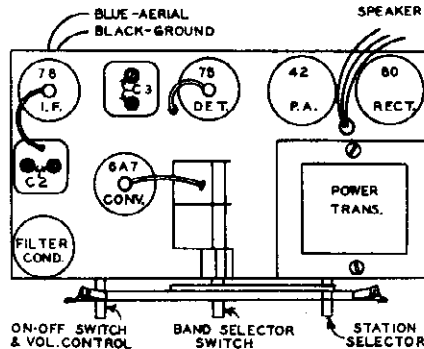
1. Turn the band selector switch to the short wave or "foreign" band.

2. Remove the 150 mfd. condenser from the test oscillator "antenna" lead and replace with a 400 ohm non-inductive resistor dummy antenna.

3. Tune test oscillator and receiver to a frequency of 15,000 kilocycles (15 megacycles) and adjust condenser C7 (short-wave antenna trimmer) reached from the bottom of the chassis.

Caution: On this band care must be taken to adjust this condenser to the fundamental of the 15 megacycle signal and not to the image. The image signal is equal to the fundamental minus twice the intermediate frequency of the receiver.

A set that is adjusted to the image frequency instead of to the fundamental may be



detected by tuning over the band and checking the sensitivity at various points. If a dead spot appears near the center of the band, the adjustable condenser for that band has probably been adjusted to the image instead of to the fundamental.

This type of mis-alignment may also be detected by tuning the test oscillator to a frequency of 15 megacycles and the station selector of the receiver to approximately 15,900 kilocycles. If a strong signal is found approximately at this frequency, it indicates that the band has been adjusted to the image frequency. The normal image frequency for 15,000 kilocycles would be 16,000 kilocycles minus twice 456 kilocycles or approximately 14,100 kilocycles. Therefore, a signal of this frequency may be found with the test oscillator generating a 15,000 kilocycle.

Note: There are no other trimmers for the short-wave or foreign band. However, it is advisable to check the receiver for sensitivity and calibration at both 15,000 kilocycles and 7,500 kilocycles.

Important: All adjustments should be rechecked to assure accuracy and stability of adjustment and calibration.

ALIGNMENT FOR MODELS 537 and 577

A. Alignment of Intermediate-Frequency Stages

1. Turn on receiver and test oscillator and allow both to operate several minutes before attempting to adjust any condensers.

2. Turn the band selector switch to the broadcast "B" position and turn the station selector knob until the rotor plates are completely out of mesh with the stator plates.

3. Connect "antenna" of test oscillator to grid cap of Type 6AG 1st detector-oscillator tube and "ground" of test oscillator to chassis frame of receiver. Connect output meter "high tap" from plate of Type 6FG tube to ground. Note: It is advisable to read carefully the operating instructions included with the test oscillator.

4. Tune test oscillator to obtain a signal of 456 KC.

5. Turn the volume control of receiver on full and adjust I.F. condensers C3 and C2. Note: The intermediate frequency circuits are

quite selective and care must be taken to insure proper adjustment.

6. Connect "antenna" of test oscillator to "A" post on chassis and "ground" of test oscillator to "G" post.

7. Tune test oscillator to 456 KC. and adjust condenser C4 for minimum output.

NOTE: This adjustment is in the code rejector circuit and proper adjustment of this condenser is essential to satisfactory operation of the receiver.

B. Alignment of Broadcast Band

1. Disconnect "antenna" lead of test oscillator from grid cap of first detector-oscillator tube and connect in series with a 150 mfd. condenser dummy antenna to the antenna terminal of the chassis.

2. Tune test oscillator and receiver to a frequency of 1500 KC., and without disturbing the setting of the test oscillator or the station selector, adjust condensers C6 and C5 in the order given.

3. Tune test oscillator and receiver to 600 KC. and adjust condenser C9.

4. Retune test oscillator and receiver to 1500 KC. and check the adjustments of condensers C6 and C5.

5. Calibration of the broadcast band should also be checked at 900 kilocycles and 600 kilocycles.

C. Alignment of Police Band

1. Turn the band selector switch to the Police Band "P".

2. Remove the 150 mfd. condenser from the "antenna" lead of test oscillator and replace with a 400 ohm non-inductive resistor dummy antenna.

3. Tune test oscillator and receiver to 4.5 MC. and adjust condenser C7.

NOTE: There are no other adjustments in this band.

D. Alignment of Foreign Band

1. Turn the band selector switch to the Foreign Band "F".

2. Tune test oscillator and receiver to 15 MC. and adjust condenser C6.

CAUTION: On this band care must be taken to adjust the condenser to the fundamental of the signal and not to the image. The image signal is equal to the fundamental minus twice the intermediate frequency of the receiver.

A set that is adjusted to the image frequency instead of to the fundamental may be detected by tuning over the band and checking the sensitivity at various points. If a dead spot appears near the center of the band, the adjustable condensers for that band have probably been adjusted to the image instead of the fundamental.

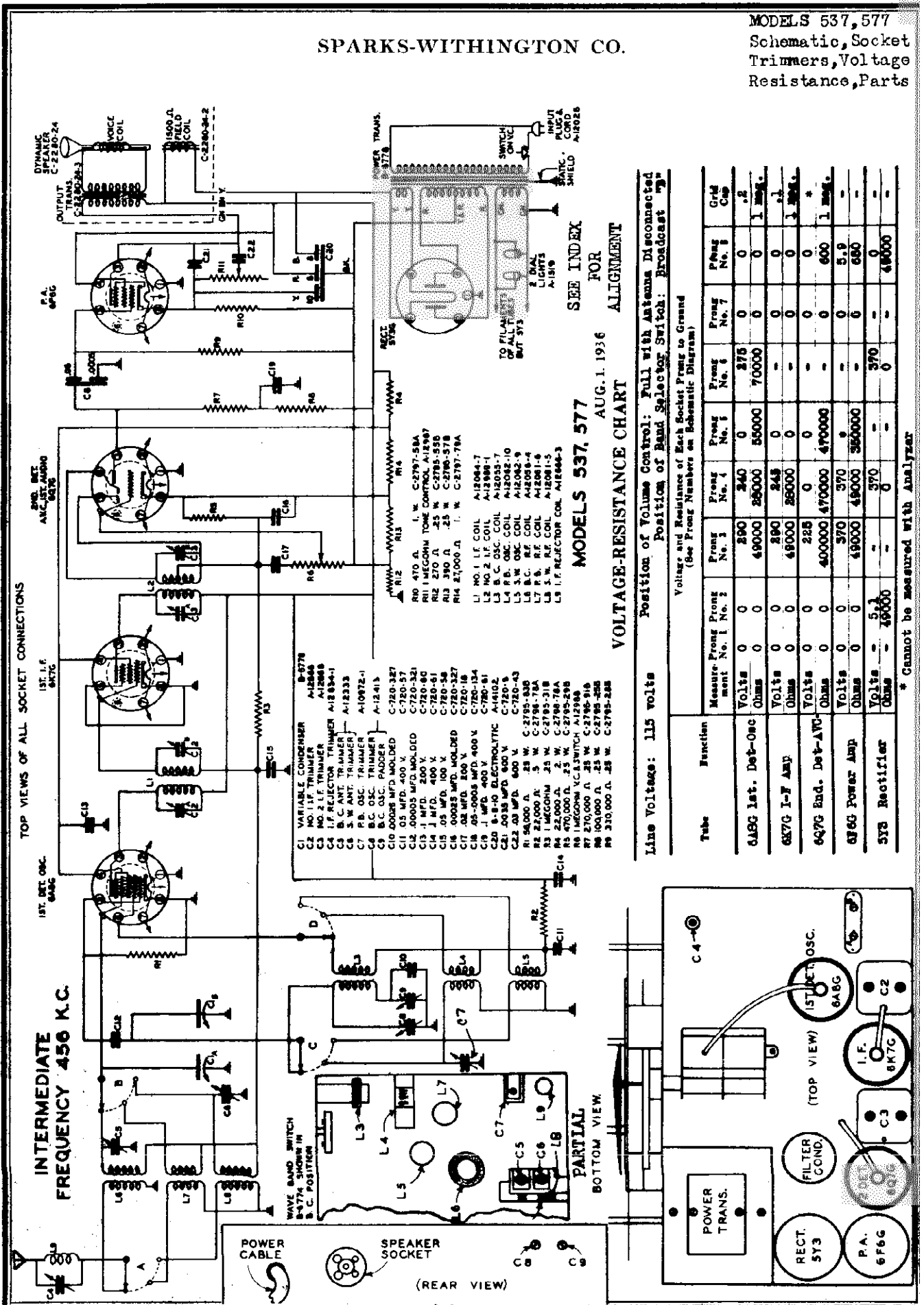
This type of mis-alignment may also be detected by tuning the test oscillator to a frequency of 15 megacycles and the station selector to approximately 15,900 KC. If a strong signal is found approximately at this frequency, it indicates that the band has been adjusted to the image frequency. The normal image frequency for 15,000 kilocycles would be 15,000 KC. minus twice 456 KC. or approximately 14,100 KC. Therefore a signal of this frequency may be found with the test oscillator generating a 15,000 KC. signal.

3. Retune the test oscillator and receiver to 7.5 MC. and check sensitivity and calibration. (There are no other adjustments for this band.)

CAUTION: All adjustments should be rechecked to assure accuracy and stability of adjustment and calibration.

SPARKS-WITHINGTON CO.

MODELS 537, 577
Schematic, Socket
Trimmers, Voltage
Resistance, Parts



INTERMEDIATE
FREQUENCY 456 K.C.

TOP VIEWS OF ALL SOCKET CONNECTIONS

SEE INDEX FOR ALIGNMENT

MODELS 537, 577

AUG. 1, 1936

VOLTAGE-RESISTANCE CHART

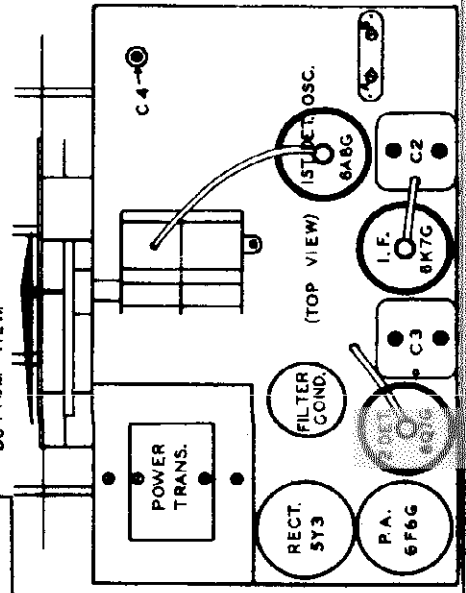
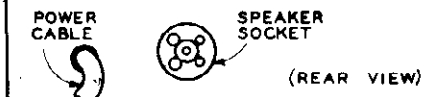
Line Voltage: 115 volts
Position of Volume Control: Full with Antenna Disconnected
Position of Band Selector Switch: Broadcast

Voltage and Resistance of Each Socket Prong to Ground
(See Prong Numbers on Schematic Diagram)

Tube	Function	Measure-ment No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8	Grid Cap
6AB6	1st. Det.-Osc.	0	0	250	340	0	375	0	0	0.2
6X7G	I-F AMP	0	0	49000	25000	55000	70000	0	0	1 meg.
6Q7G	2nd. Det.-AFC	0	0	250	245	0	-	0	0	0.1
6J6G	Power Amp	0	0	49000	470000	470000	-	0	0	1 meg.
5Y3	Rectifier	5.1	0	370	370	0	-	0	0	-
		49000	-	-	370	-	370	0	0	49000

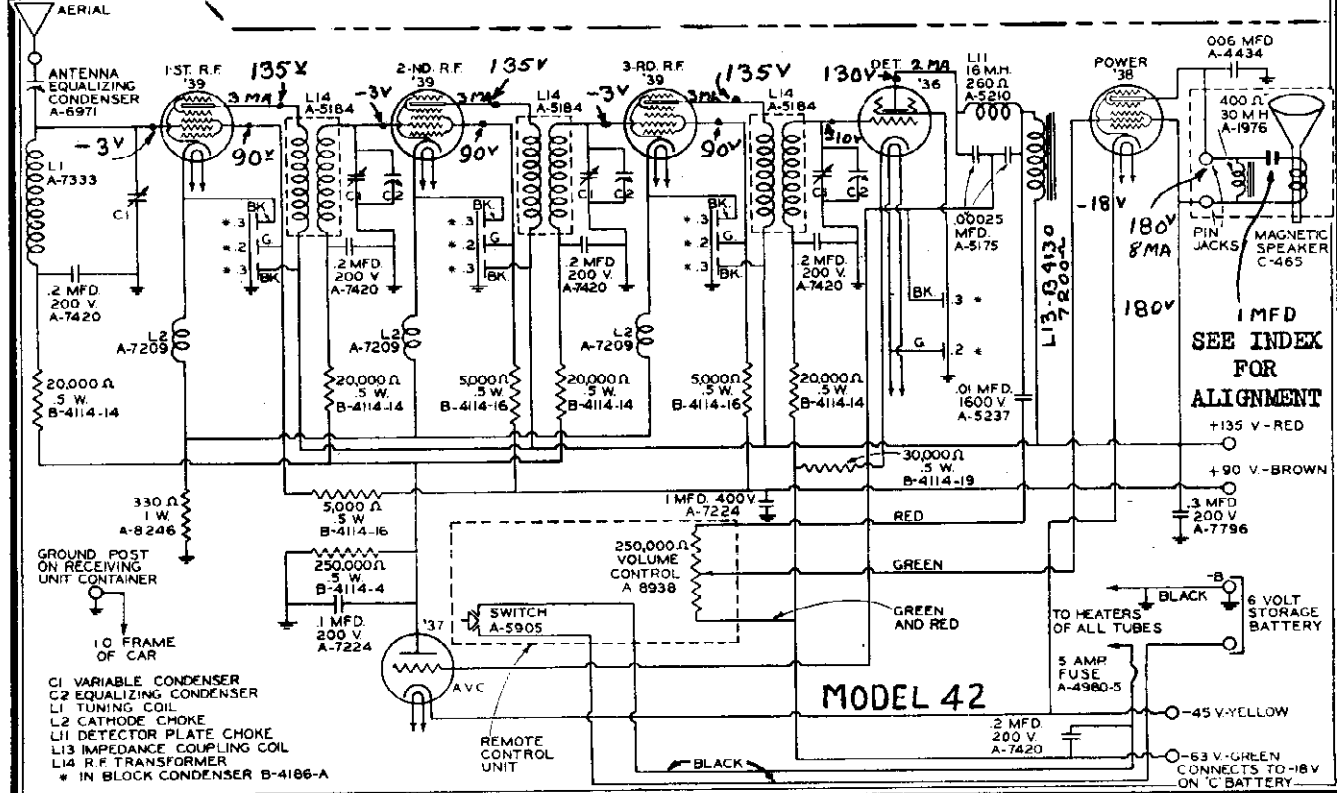
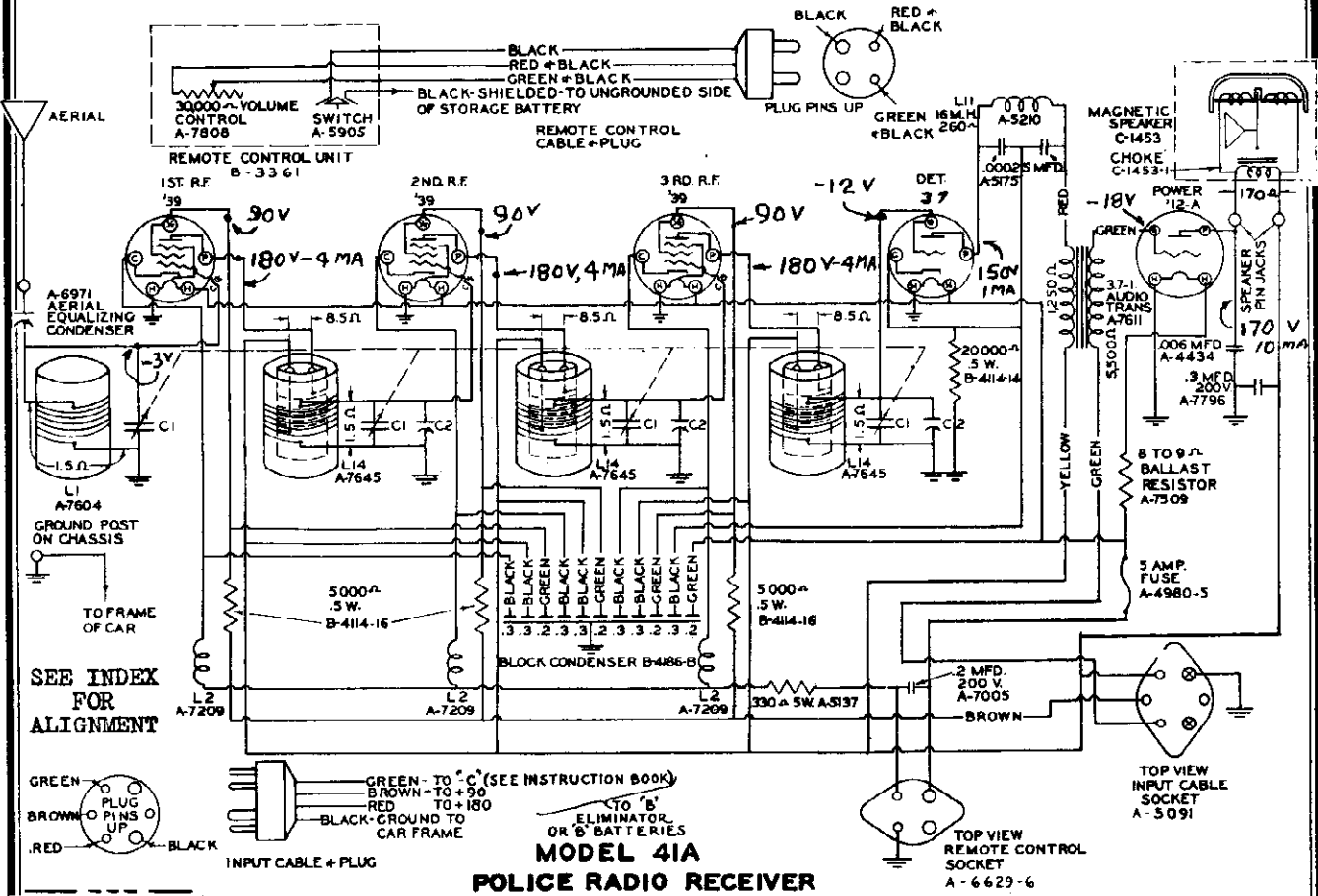
* Cannot be measured with Analyzer

- R0 470 Ω. 1/2 W. C-2797-58A
- R1 1MΩ. 1/2 W. CONTROL A-12697
- R2 270 Ω. 25 W. C-2795-225
- R3 390 Ω. 25 W. C-2795-378
- R4 21,000 Ω. 1/2 W. C-2797-78A
- L1 NO. 1 I.F. COIL A-12084-7
- L2 NO. 2 I.F. COIL A-12988-1
- L3 B.C. OSC. COIL A-12053-7
- L4 R.B. OSC. COIL A-12048-10
- L5 S.W. OSC. COIL A-12048-9
- L6 B.C. RF COIL A-12081-4
- L7 P.B. RF COIL A-12081-5
- L8 S.W. RF COIL A-12081-3
- L5 I.F. REFLECTOR COIL A-12685-3
- C1 VARIABLE CONDENSER B-8778
- C2 NO. 1 I.F. TRIMMER A-12544
- C3 NO. 2 I.F. TRIMMER A-12688
- C4 I.F. REFLECTOR TRIMMER A-12684-1
- C5 B.C. ANT. TRIMMER A-12333
- C6 S.W. ANT. TRIMMER A-10972-1
- C7 P.B. OSC. TRIMMER A-12413
- C8 B.C. OSC. TRIMMER A-12413
- C9 0.001 μF. MFD. C-720-327
- C10 0.001 μF. MFD. C-720-327
- C11 0.001 μF. MFD. C-720-327
- C12 0.0005 μF. MFD. C-720-321
- C13 0.0005 μF. MFD. C-720-321
- C14 0.0005 μF. MFD. C-720-321
- C15 0.0005 μF. MFD. C-720-321
- C16 0.0005 μF. MFD. C-720-327
- C17 0.0005 μF. MFD. C-720-327
- C18 0.0005 μF. MFD. C-720-327
- C19 0.0005 μF. MFD. C-720-327
- C20 0.0005 μF. MFD. C-720-327
- C21 0.0005 μF. MFD. C-720-327
- C22 0.0005 μF. MFD. C-720-327
- R 50,000 Ω. 25 W. C-2795-225
- R2 27,000 Ω. 25 W. C-2795-225
- R3 1MΩ. 1/2 W. C-2795-378
- R4 470,000 Ω. 25 W. C-2795-225
- R5 1MΩ. 1/2 W. C-2795-225
- R7 270,000 Ω. 25 W. C-2795-225
- R8 100,000 Ω. 25 W. C-2795-225
- R9 330,000 Ω. 25 W. C-2795-225



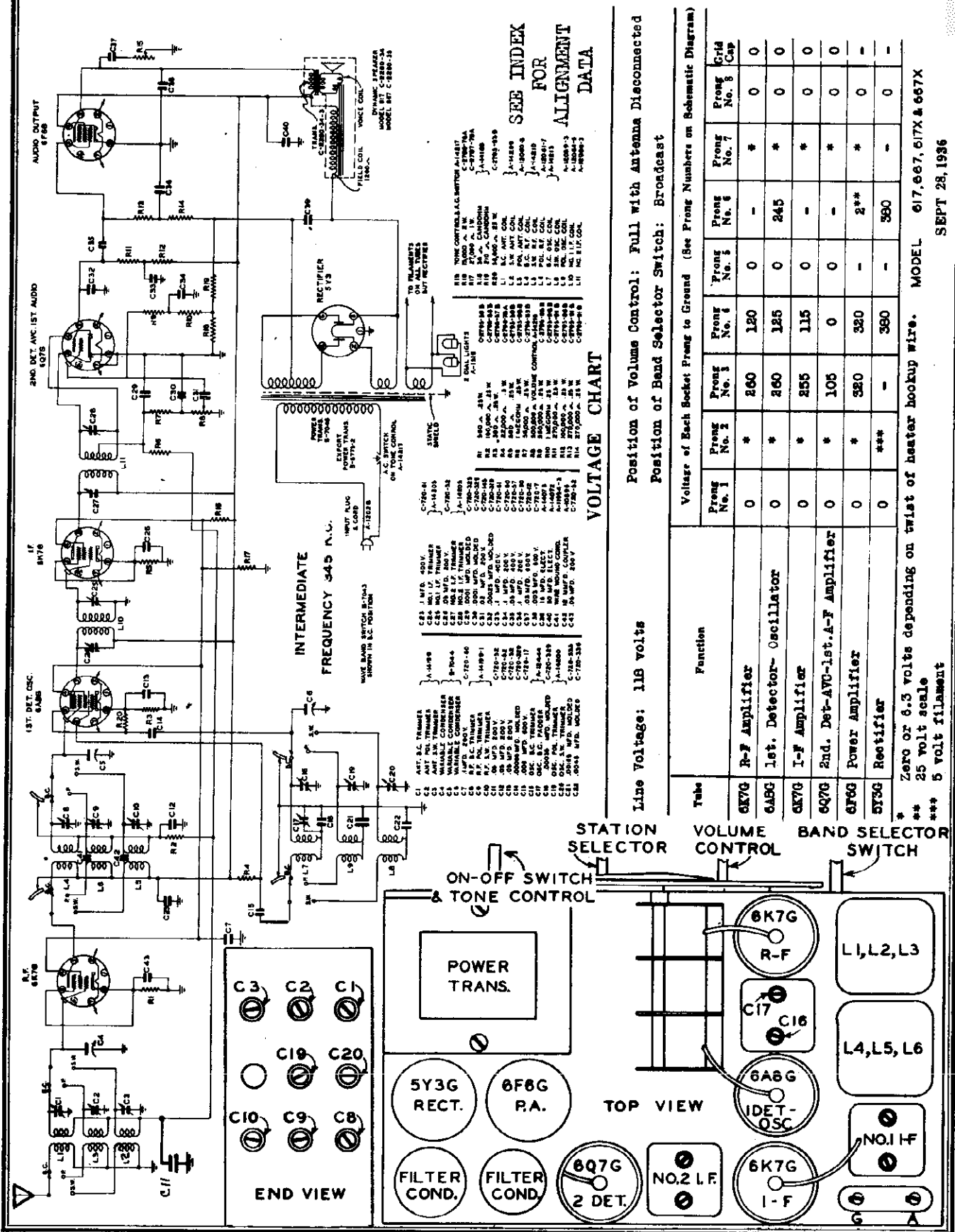
MODEL 41A
MODEL 42
Schematic
Voltage

SPARKS WITHINGTON CO.



SPARKS WITHINGTON CO.

MODELS 617, 667, 617X, 667X
Schematic, Socket, Voltage
Trimmers, Parts



SEE INDEX FOR ALIGNMENT DATA

VOLTAGE CHART

MODELS 617, 667, 617X, 667X

Alignment

SPARKS-WITHINGTON CO.

Foreword: The SPARTON Models 617-X and 667-X are equipped with an adjustable power transformer for operation on various line voltages as indicated under the transformer terminal cover plate.

1. EQUIPMENT REQUIRED

A. Modulated test oscillator (crystal controlled or accurately calibrated) capable of generating frequencies from 345 to 18,000 kilocycles.

B. Output meter.

C. Part A-5732 adjusting wrench.

D. Dummy antennas, consisting of a 200 mmf. condenser and a 100 ohm non-inductive resistor.

2. STEP BY STEP PROCEDURE

NOTE: For proper alignment of these chassis, the procedure should be followed in the same order as given.

With the condenser plates fully meshed, the dial pointer should point to the first calibration marks immediately to the right of the band identification letters "P", "B" and "F". Any necessary correction may be made simply by moving the pointer on the shaft.

A. Alignment of Intermediate-Frequency Stages

(1) Turn on receiver and test oscillator and allow both to operate several minutes before attempting to adjust any condensers.

(2) Turn the band selector switch to the broadcast "B" position and turn the station selector knob until the rotor plates are completely out of mesh with the stator plates.

(3) Connect "antenna" of test oscillator to grid cap of Type 6A8G 1st detector-oscillator tube and "ground" of test oscillator to chassis frame of receiver. Connect output meter "high tap" from plate of Type 6F6G tube to ground. NOTE: It is advisable to read carefully the operating instructions included with the test oscillator.

(4) Tune test oscillator to obtain a signal of 345 KC.

(5) Turn the volume control of receiver on full and adjust I.F. condensers. NOTE: The intermediate frequency circuits are quite selective and care must be taken to insure proper adjustment. (See diagram for I.F. transformer and trimmer locations.)

(6) Connect "antenna" of test oscillator to "A" post on chassis and "ground" of test oscillator to "G" post.

B. Alignment of Broadcast Band

(1) Disconnect "antenna" lead of test oscillator from grid cap of first detector-oscillator tube and connect in series with a 200 mmf. condenser dummy antenna to the antenna terminal of the chassis.

(2) Tune test oscillator and receiver to a frequency of 1500 KC., and without disturbing the setting of the test oscillator or the station selector, adjust condensers C16, C8 and C1 in the order given.

(3) Tune test oscillator and receiver to 600 KC. and adjust condenser C17.

(4) Retune test oscillator and receiver to 1500 KC. and check the adjustments of condensers C16, C8 and C1.

(5) Calibration of the broadcast band should also be checked at 900 kilocycles and 600 kilocycles.

C. Alignment of Police Band

(1) Turn the band selector switch to the Police Band "P".

(2) Remove the 200 mmf. condenser from the "antenna" lead of test oscillator and replace with a 100 ohm non-inductive resistor dummy antenna.

(3) Tune test oscillator and receiver to 4.5 MC. and adjust condensers C19, C9 and C2.

NOTE: There are no other adjustments in this band.

D. Alignment of Foreign Band

(1) Turn the band selector switch to the Foreign Band "F".

(2) Tune test oscillator and receiver to 18 MC. and adjust condensers C20, C10 and C5.

(3) When making these adjustments, the station selector should be moved slightly back and forth in order to obtain maximum gain.

CAUTION: On this band care must be taken to adjust the condensers to the fundamental of the signal and not to the image. The image signal is equal to the fundamental minus twice the intermediate frequency of the receiver.

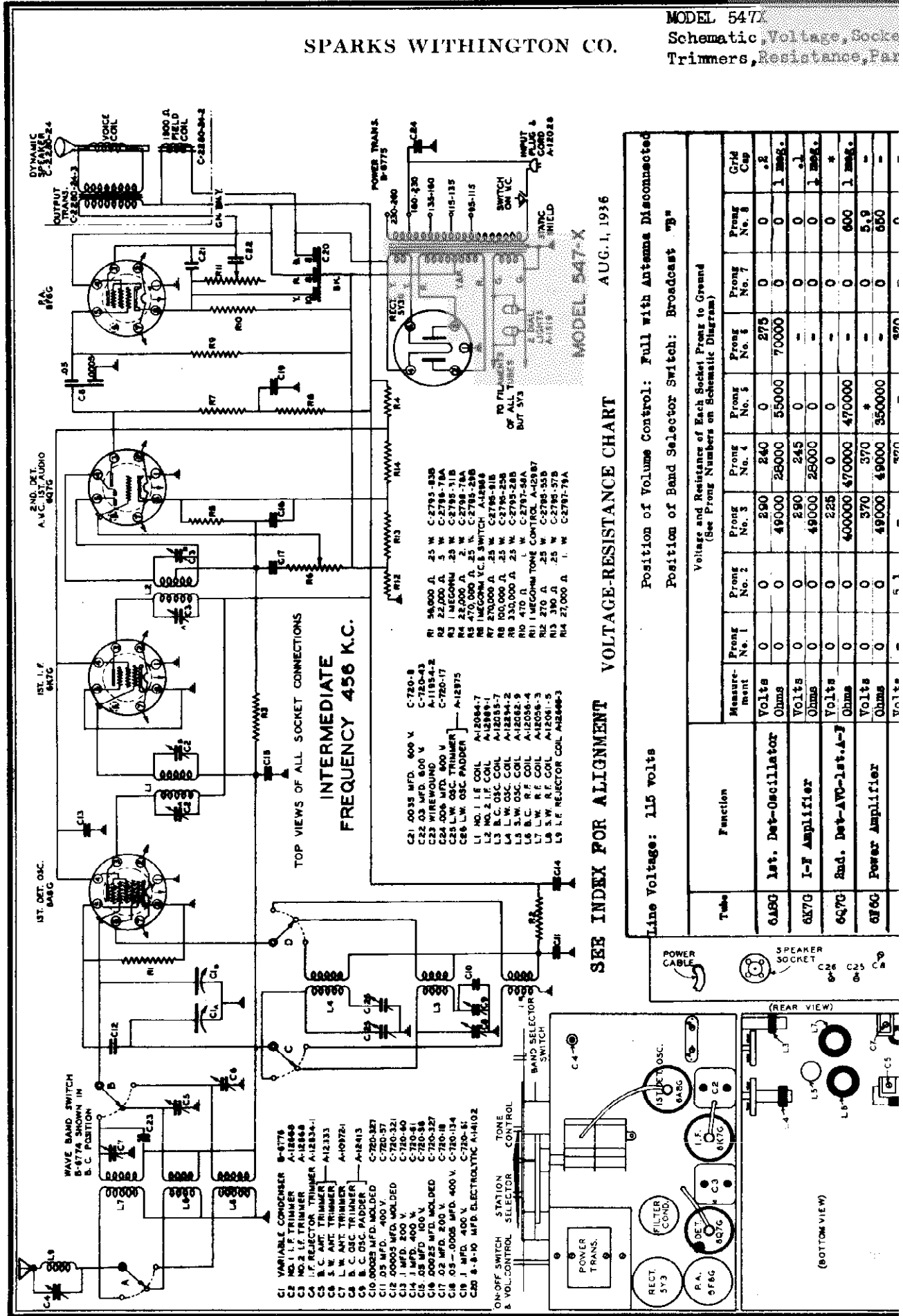
A set that is adjusted to the image frequency instead of to the fundamental may be detected by tuning over the band and checking the sensitivity at various points. If a dead spot appears near the center of the band, the adjustable condensers for that band have probably been adjusted to the image instead of the fundamental.

This type of mis-alignment may also be detected by tuning the test oscillator to a frequency of 15 megacycles and the station selector to approximately 15,700 KC. If a strong signal is found approximately at this frequency, it indicates that the band has been adjusted to the image frequency. The normal image frequency for 15,000 kilocycles would be 15,000 KC. minus twice 345 KC. or approximately 15,300 KC. Therefore a signal of this frequency may be found with the test oscillator generating a 15,000 KC. signal.

CAUTION: All adjustments should be rechecked to assure accuracy and stability of adjustment and calibration.

MODEL 547-X
Schematic, Voltage, Socket
Trimmers, Resistance, Part

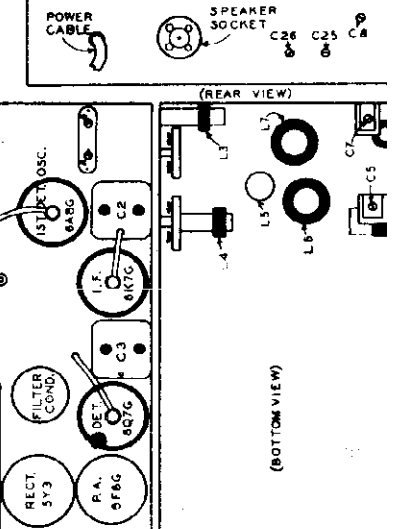
SPARKS WITHINGTON CO.



SEE INDEX FOR ALIGNMENT VOLTAGE-RESISTANCE CHART

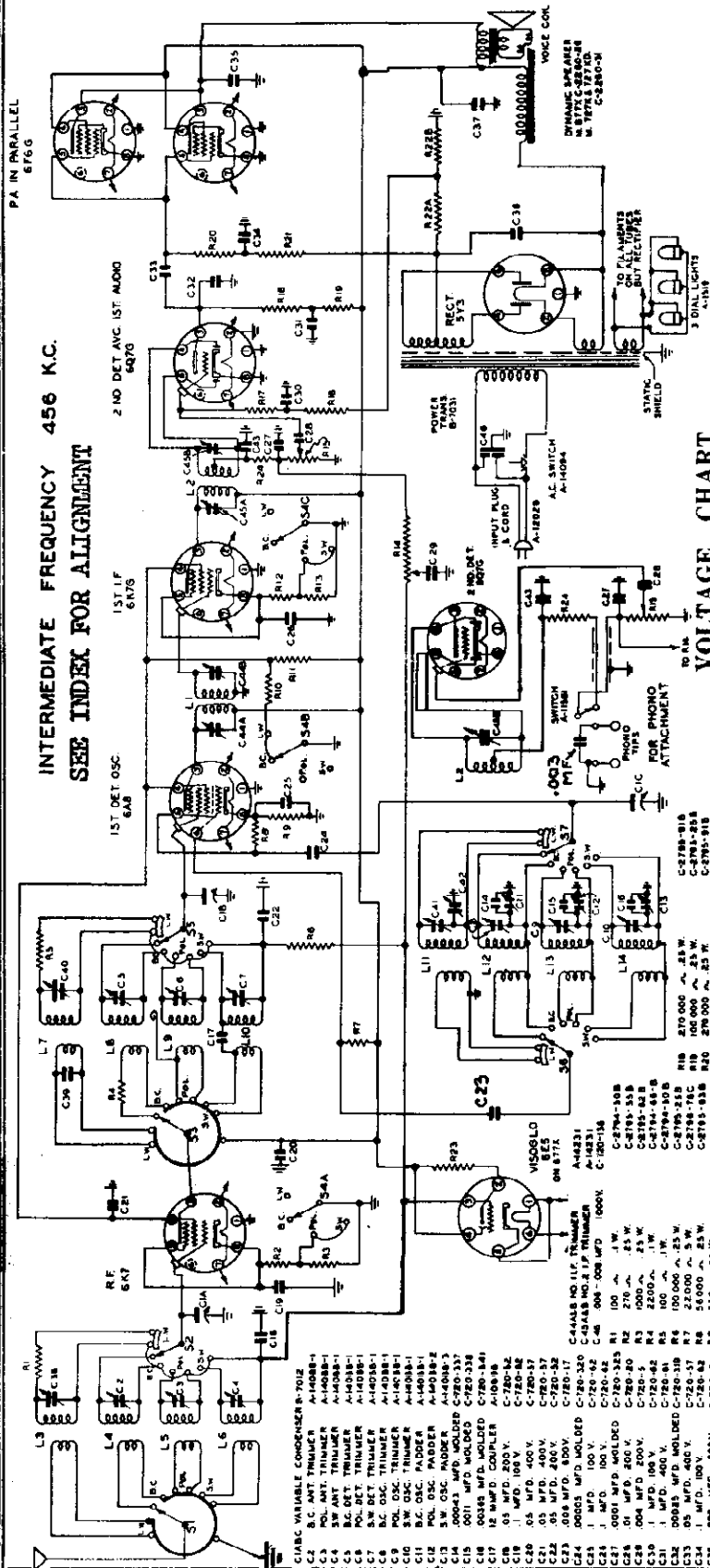
Position of Volume Control: Full with Antenna Disconnected
 Position of Band Selector Switch: Broadcast "B"

Tube	Function	Voltage and Resistance of Each Socket Prong to Ground (See Prong Numbers on Schematic Diagram)															
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8	Grid Cup							
6AR5	1st. Det.-Oscillator	0	0	290	240	0	275	0	0	0	0	0	0	0	0	0	0
6X7G	I-F Amplifier	0	0	49000	28000	55000	70000	0	0	0	0	0	0	0	0	0	0
6C7G	2nd. Det.-AFC-1st. A-F	0	0	225	0	0	0	0	0	0	0	0	0	0	0	0	0
6T6G	Power Amplifier	0	0	370	370	470000	470000	0	0	0	0	0	0	0	0	0	0
		0	0	49000	49000	350000	350000	0	0	0	0	0	0	0	0	0	0



MODELS 727X, 727XD, 877X
Schematic, Voltage, Parts
Socket, Trimmers

SPARKS-WITHINGTON CO.



VOLTAGE CHART

Position of Volume Control: Full with antenna disconnected
Position of Band Selector Switch: Broadcast Band
Voltage of Each Socket Prone to Ground

Tube	Function	Line Voltage: 112 volts	Prong Prong Prong Prong Prong Prong Grid No. 1 No. 2 No. 3 No. 4 No. 5 No. 6 No. 7 No. 8
6K7	R-F Amplifier	0	6.2 250 105 0 - 0 0 0
6AB	1st Det-Oscillator	0	6.2 250 105 0 235 0 0 0
6K7G	I-F Amplifier	0	6.2 250 130 0 - 0 0 0 0
6Q7G	2nd Det-AVC-1st A-F	0	6.2 30* 0 0 - 0 0 0 0
6F6G	Power Amplifier	0	6.2 260 260 5** - 0 0 0 -
6F6G	Power Amplifier	0	6.2 260 260 5** - 0 0 0 -
5Y3G	Rectifier	0	5.0 - 400 - 400 - 0 0 -
635	V180-G10	6.2 20***	0 250 0 0 - - -

50 volt scale ** 250 volt scale *** 100 volt scale

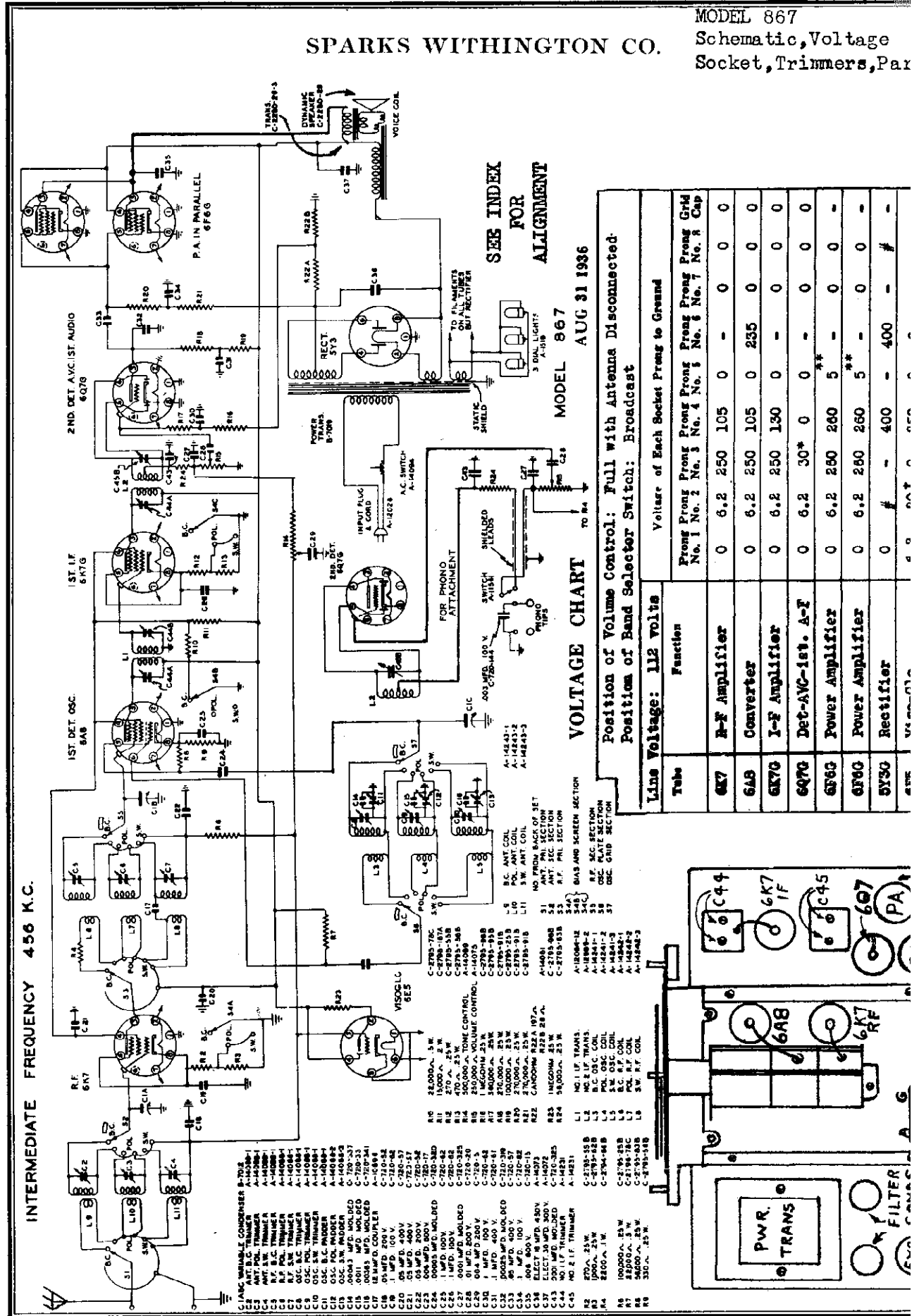
VOLTAGE CHART

NO. FROM BACK OF SET

Component	Value
L1	100 μH
L2	100 μH
L3	100 μH
L4	100 μH
L5	100 μH
L6	100 μH
L7	100 μH
L8	100 μH
L9	100 μH
L10	100 μH
L11	100 μH
L12	100 μH
L13	100 μH
L14	100 μH
C1	100 pF
C2	100 pF
C3	100 pF
C4	100 pF
C5	100 pF
C6	100 pF
C7	100 pF
C8	100 pF
C9	100 pF
C10	100 pF
C11	100 pF
C12	100 pF
C13	100 pF
C14	100 pF
C15	100 pF
C16	100 pF
C17	100 pF
C18	100 pF
C19	100 pF
C20	100 pF
C21	100 pF
C22	100 pF
C23	100 pF
C24	100 pF
C25	100 pF
C26	100 pF
C27	100 pF
C28	100 pF
C29	100 pF
C30	100 pF
C31	100 pF
C32	100 pF
C33	100 pF
C34	100 pF
C35	100 pF

MODEL - 877X,
727X & 727XD
SEPT 8, 1936

SPARKS WITHINGTON CO.



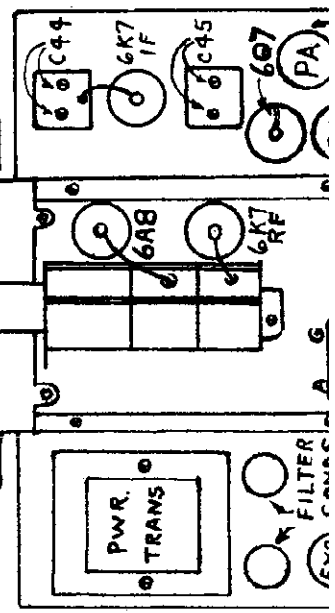
SEE INDEX FOR ALIGNMENT

MODEL 867 AUG 31 1936

VOLTAGE CHART

Position of Volume Control: Full with Antenna Disconnected.
Position of Band Selector Switch: Broadcast

Line Voltage: 112 volts		Voltage of Each Socket Prong to Ground						
Tube	Function	Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	
6K7	R-F Amplifier	0	6.2	250	105	0	0	0
6A8	Converter	0	6.2	250	105	0	255	0
6X7G	I-F Amplifier	0	6.2	250	130	0	0	0
6Q7G	Det-AVC-1st. A-F	0	6.2	30*	0	0	0	0
6F6G	Power Amplifier	0	6.2	260	260	5**	0	0
6F6G	Power Amplifier	0	6.2	260	260	5**	0	0
5Y3G	Rectifier	0	#	-	400	-	400	-



MODEL 547X
 MODELS 727X, 727XD, 877X
 MODELS 867

SPARKS-WITHINGTON CO MODEL 987

MODELS .827X, 827XD, 997X

MODEL 1167
 Alignment

ALIGNMENT
MODEL 547X

A. Alignment of Intermediate-Frequency Stages.

(1) Turn on receiver and test oscillator and allow both to operate several minutes before attempting to adjust any condensers.

(2) Turn the band selector switch to the Broadcast Band "B" position and turn the station selector knob until the rotor plates are completely out of mesh with the stator plates.

(3) Connect "antenna" of test oscillator in series with 150 muf. condenser dummy antenna to grid cap of Type 6A8G 1st detector-oscillator tube and "ground" of test oscillator to chassis frame of receiver. Connect output meter "high tap" from plate of Type 6F6G tube to ground. NOTE: It is advisable to read carefully the operating instructions included with the test oscillator.

(4) Tune test oscillator to obtain a signal of 456 kilocycles.

(5) Turn the volume control of receiver on full and adjust IF condensers C3 and C2. NOTE: The intermediate frequency circuits are quite selective and care must be taken to insure proper adjustment.

(6) Disconnect test oscillator "antenna" and 150 muf. condenser from grid cap of 6A8G tube, and connect oscillator "antenna" to antenna post of chassis.

(7) With the test oscillator generating a 456 KC. signal, adjust condenser C4 until a minimum of output is obtained. NOTE: This adjustment is in the code rejector circuit, and care should be taken to see that proper adjustment is made, otherwise the receiver will not operate with maximum efficiency.

B. Alignment of Long-Wave Band

(1) Insert the 150 muf. condenser in series with the "antenna" lead of test oscillator and the antenna terminal of the chassis.

(2) Turn the band selector switch to the long wave "L" position, tune test oscillator and receiver to a wave length of 870 meters (345 KC.) and without disturbing the setting of the test oscillator or the station selector, adjust condensers C25 and C7 in the order given.

(3) Tune test oscillator and receiver to 2000 meters (150 KC.) and adjust condenser C26.

(4) Retune test oscillator and receiver to 345 kilocycles and check the adjustments of condensers C25 and C7.

C. Alignment of Broadcast Band

(1) Turn band selector switch to the broadcast band "B" position.

(2) Tune test oscillator and receiver to a wave length of 200 meters (1500 kilocycles) and adjust condenser C8 (oscillator trimmer) and condenser C5 (antenna trimmer).

(3) Tune test oscillator and receiver to 500 meters (600 kilocycles) and adjust condenser C9 (oscillator padder).

(4) Retune test oscillator and receiver to 200 meters and check the adjustments of condensers C8 and C5.

D. Alignment of Short-Wave Band.

(1) Turn the band selector switch to the short wave band "S" position.

(2) Remove the 150 muf. condenser from "antenna" lead of test oscillator and replace with a 400 ohm non-inductive resistor dummy antenna.

(3) Tune test oscillator and receiver to 20 meters (15 megacycles) and adjust condenser C8.

CAUTION: On this band care must be taken to adjust the condenser to the fundamental of the signal and not to the image. The image signal is equal to the fundamental minus twice the intermediate frequency of the receiver.

A set that is adjusted to the image frequency instead of to the fundamental may be detected by tuning over the band and checking the sensitivity at various points. If a

dead spot appears near the center of the band, the adjustable condensers for that band have probably been adjusted to the image instead of the fundamental.

This type of mis-alignment may also be detected by tuning the test oscillator to a frequency of 15 megacycles and the station selector to approximately 15,900 kilocycles. If a strong signal is found approximately at this frequency, it indicates that the band has been adjusted to the image frequency. The normal image frequency for 15,000 kilocycles would be 15,000 kilocycles minus twice 456 kilocycles or approximately 14,100 kilocycles. Therefore a signal of this frequency may be found with the test oscillator generating a 15,000 kilocycle signal.

ALIGNMENT

MODELS 727X, 727XD, 827X, 827XD, 867, 877X, 987, 997X, and 1167.

A. Alignment of Intermediate-Frequency Stages

NOTE: All of the above models except the Model 1167 employ I-F transformers with two trimmers. The first I-F transformer of the Model 1167 is equipped with a third tuned circuit which results in three trimmers for this I-F stage.

(1) Turn on receiver and test oscillator and allow both to operate several minutes before attempting to adjust any condensers.

(2) Turn the band selector switch to the Broadcast position (with white diamond illuminated) and turn the station selector knob until the rotor plates are completely out of mesh with the stator plates.

(3) Connect "antenna" of test oscillator to the grid cap of a Type 6A8 converter tube and "ground" of test oscillator to chassis frame of receiver. Connect output meter "high tap" from plate of power output tube to ground. Note: It is advisable to read carefully the operating instructions included with the test oscillator.

(4) Tune test oscillator to obtain a signal of 456 kilocycles.

(5) Turn the volume control of receiver on full and adjust I-F trimmers C44, C45 (C41, C42 on Model 987; C59, C60 on Model 1167) which are reached from the top of the chassis. NOTE: The intermediate frequency circuits are quite selective and care must be taken to insure proper adjustment.

B. Alignment of Broadcast Band

(1) Disconnect "antenna" lead of test oscillator from grid cap of converter tube and connect in series with a 200 muf. condenser dummy antenna to the antenna terminal of the chassis.

(2) Tune receiver and test oscillator to a frequency of 1500 kilocycles and adjust condensers C8, C5 and C2 in the order given.

(3) Tune test oscillator and receiver to 600 kilocycles and adjust condenser C11.

(4) Retune test oscillator and receiver to 1500 kilocycles and check the adjustments of condensers C8, C5 and C2.

(5) Calibration of the broadcast band should also be checked at 900 kilocycles and 600 kilocycles.

C. Alignment of Long-Wave Band

(Except Models 867 and 987)

(1) Turn the band selector switch to the long-wave position (yellow diamond illuminated).

(2) Tune test oscillator and receiver to 345 kilocycles and adjust condensers C41, C40 and C38.

(3) Tune test oscillator and receiver to 150 kilocycles and adjust condenser C42.

(4) Retune test oscillator and receiver to 345 kilocycles and check the adjustments of condensers C41, C40 and C38.

D. Alignment of 1st. Short-Wave Band

(1) Turn band selector switch to the 1st short-wave band (red diamond illuminated).

(2) Tune test oscillator and receiver to 6 megacycles and adjust condensers C9, C6 and C5.

(3) Tune test oscillator and receiver to 1.95 megacycles and adjust condenser C12.

(4) Retune test oscillator and receiver to 6 megacycles and check the adjustments of condensers C9, C6 and C5.

E. Alignment of 2nd. Short-Wave Band

(1) Connect the 100 ohm non-inductive dummy antenna resistor in series with the 200 muf. condenser connected between the test oscillator "antenna" lead and the grid cap of the 6A8 converter tube.

(2) Turn the band selector switch to the 2nd short-wave band (blue diamond illuminated).

(3) Tune test oscillator and receiver to 18 megacycles and adjust condensers C10, C7 and C4.

(4) Tune test oscillator and receiver to 6 megacycles and adjust condenser C13.

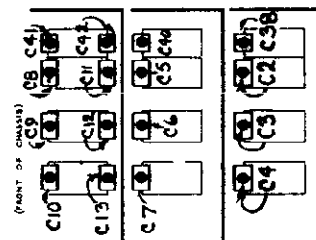
(5) Retune test oscillator and receiver to 18 megacycles and check adjustments of condensers C10, C7 and C4.

IMPORTANT: To obtain the best sensitivity at 18 megacycles on this band, the dial should be turned back and forth slightly while adjusting the antenna and R.F. trimmers.

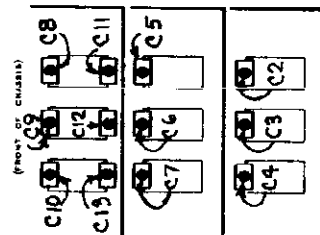
CAUTION: On this band care must be taken to adjust the various condensers to the fundamental of the signal and not to the image. The image signal is equal to the fundamental minus twice the intermediate frequency of the receiver. A set that is adjusted to the image frequency instead of to the fundamental may be detected by tuning over the band and checking the sensitivity at various points. If a dead spot appears near the center of the band, the adjustable condensers for that band have probably been adjusted to the image instead of the fundamental.

This type of mis-alignment may also be detected by tuning the test oscillator to a frequency of 15 megacycles and the station selector to approximately 15,900 kilocycles. If a strong signal is found approximately at this frequency, it indicates that the band has been adjusted to the image frequency. The normal image frequency for 15 megacycles or 15,000 kilocycles would be 15,000 kilocycles minus twice 456 kilocycles or approximately 14,100 kilocycles. Therefore a signal of this frequency may be found with the test oscillator generating a 15 megacycle signal.

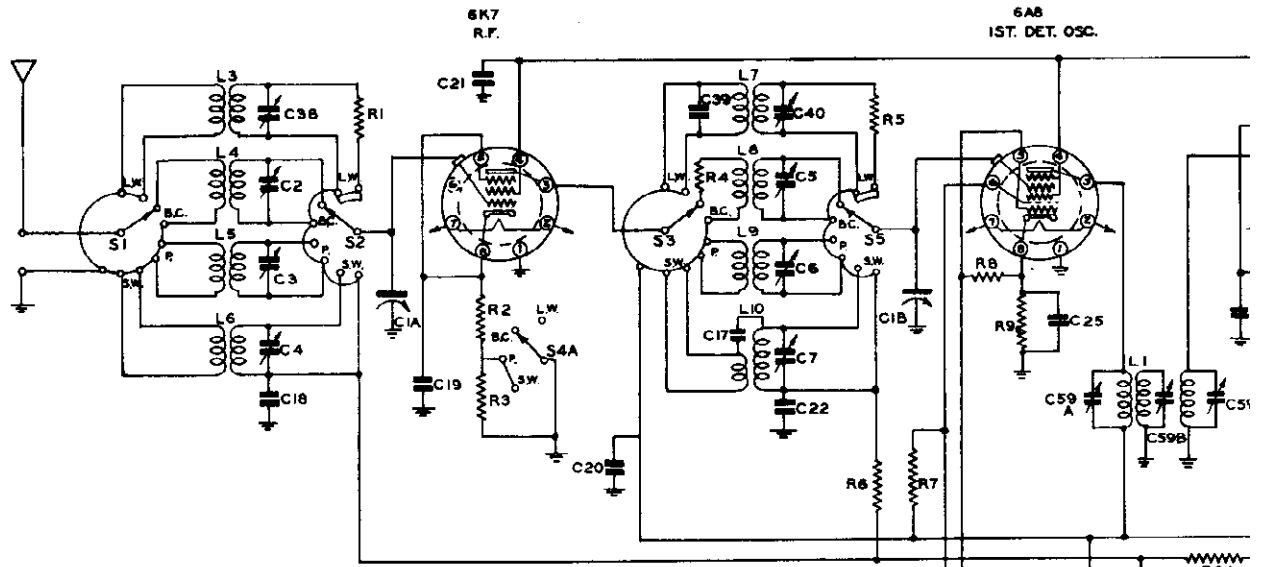
CAUTION: All adjustments should be checked to assure accuracy and stability of adjustment and calibration.



TRIMMER LOCATIONS
 MODELS 727-X, 727-XD, 827-X,
 867-XD, 877-X, 987-X, 997-X, 1167.

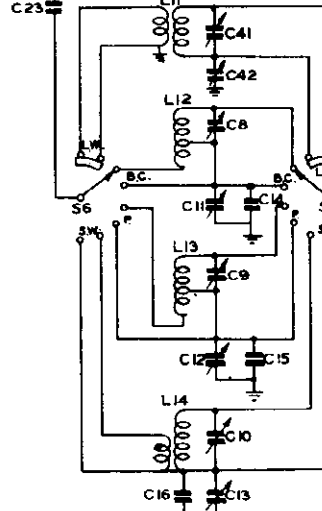


TRIMMER LOCATIONS
 MODELS 827-X and 827-XD



- C1A C. VARIABLE CONDENSER
- C2 ANT. B.C. TRIMMER
- C3 ANT. POL. TRIMMER
- C4 ANT. S.W. TRIMMER
- C5 R.F. B.C. TRIMMER
- C6 R.F. POL. TRIMMER
- C7 R.F. S.W. TRIMMER
- C8 OSC. B.C. TRIMMER
- C9 OSC. POL. TRIMMER
- C10 OSC. S.W. TRIMMER
- C11 OSC. B.C. PADDER
- C12 OSC. POL. PADDER
- C13 OSC. S.W. PADDER
- C14 .00045 MFD. MOLDED
- C15 .0011 MFD. MOLDED
- C16 .00365 MFD. MOLDED
- C17 COUPLER CONDENSER
- C18 .05 MFD. 200 V.
- C19 .1 MFD. 100 V.
- C20 .05 MFD. 400 V.
- C21 .05 MFD. 400 V.
- C22 .05 MFD. 200 V.
- C23 .008 MFD. 600 V.
- C24 .00009 MFD. MOLDED
- C25 .1 MFD. 100 V.
- C26 .1 MFD. 100 V.
- C27 .0001 MFD. MOLDED
- C28 .05 MFD. 400 V.
- C29 .00025 MFD. MOLDED
- C30 .1 MFD. 100 V.
- C31 .1 MFD. 600 V.
- C32 .00025 MFD. MOLDED
- C33 .05 MFD. 400 V.
- C34 .1 MFD. 100 V.
- C35 .15 MFD. 400 V. ELECT.
- C36 .15 MFD. 450 V. ELECT.
- C37 .15 MFD. 350 V. ELECT.
- C38 ANT. L.W. TRIMMER
- C39 .00025 MFD. MOLDED
- C40 R.F. L.W. TRIMMER
- C41 OSC. L.W. TRIMMER
- C42 OSC. L.W. PADDER
- C43 .05 MFD. 200 V.
- C44 .006 MFD. 600 V.
- C45 .3 MFD. 200 V.
- C46 .2 MFD. 200 V.
- C47 .5 MFD. 200 V.
- C48 .001 MFD. 400 V.
- C49 .01 MFD. 400 V.
- C50 .01 MFD. 200 V.
- C51 .2 MFD. 400 V.
- C52 .3 MFD. 200 V.
- C53 .006 .006 MFD. 600 V.
- C54 .01 MFD. 600 V.
- C55 .0025 MFD. MOLDED
- C56 .25 MFD. 250 V. ELECT.
- C57 .1 MFD. 400 V.
- C58A, B, C NO. 1 I.F. TRIMMER
- C60A, B, C NO. 2 I.F. TRIMMER

- B-7012
- A-14088-1
- A-14088-1
- A-14088-1
- A-14088-1
- A-14088-1
- A-14088-1
- A-14088-1
- A-14088-1
- A-14088-1
- A-14088-1
- A-14088-1
- A-14088-2
- A-14088-3
- C-720-344
- C-720-346
- C-720-341
- A-10896
- C-720-52
- C-720-62
- C-720-57
- C-720-57
- C-720-52
- C-720-17
- C-720-320
- C-720-62
- C-720-325
- C-720-57
- C-720-319
- C-720-62
- C-720-81
- C-720-329
- C-720-57
- C-720-62
- A-14136
- A-14073
- A-14139
- A-14088-1
- C-720-389
- A-10896-1
- A-14088-1
- A-14088-3
- C-720-52
- C-720-17
- C-720-91
- C-720-87
- C-720-106
- C-720-138
- C-720-25
- C-720-20
- C-720-88
- C-720-31
- C-720-150
- C-720-105
- C-720-319
- A-14184
- C-720-61
- A-14162
- A-14375



SEE INDEX FOR ALL

R1	100 Ω .1 W.	C-2794-50B	R22	470 000 Ω .25 W.	C-2795-94B
R2	270 Ω .25 W.	C-2795-55B	R23	1 MEGOHM .25 W.	C-2795-96B
R3	1000 Ω .25 W.	C-2795-62B	R24	1 MEGOHM .25 W.	C-2795-98B
R4	2200 Ω .1 W.	C-2794-86B	R25	470 000 Ω .25 W.	C-2795-94B
R5	100 Ω .1 W.	C-2794-50B	R26	56 000 Ω .25 W.	C-2795-83B
R6	100 000 Ω .25 W.	C-2795-25B	R27	680 000 Ω .25 W.	C-2795-96B
R7	22 000 Ω .5 W.	C-2798-76C	R28	120 000 Ω .25 W.	C-2795-87B
R8	56 000 Ω .25 W.	C-2795-83B	R29	82 00 Ω 1 W.	C-2797-101A
R9	330 Ω .25 W.	C-2795-56B	R30	2 400 Ω .5 W.	C-2796-188A
R10	22 000 Ω .5 W.	C-2796-76C	R31	27 OHMS .25 W.	C-2795-121B
R11	15 000 Ω 2 W.	C-2798-107A	R32	27 OHMS .25 W.	C-2795-121B
R12	270 Ω .25 W.	C-2795-55B	R33	100 000 Ω .25 W.	C-2795-25B
R13	470 Ω .25 W.	C-2795-38B	R34	470 000 Ω .25 W.	C-2795-94B
R14	TONE CONTROL & A.C. SWITCH	A-14137	R35	56 000 Ω .25 W.	C-2795-83B
R15	VOLUME CONTROL	A-14110	R36	27 000 Ω 1 W.	C-2797-79A
R16	56 000 Ω .25 W.	C-2795-83B	R37	750 OHMS .25 W.	C-2795-156B
R17	1 MEGOHM .25 W.	C-2795-98B	R38	27 000 Ω 2 W.	C-2796-193A
R18	270 000 Ω .25 W.	C-2795-91B	R39	27 000 Ω .25 W.	C-2795-79B
R19	100 000 Ω .25 W.	C-2795-25B	R40	470 000 Ω .25 W.	C-2795-94B
R20	1 MEGOHM .25 W.	C-2795-98B	R41	1 MEGOHM .25 W.	C-2795-96B
R21	270 000 Ω .25 W.	C-2795-91B	R42	910 OHM 2 W.	C-2796-158A

- L1 NO. 1 IF COIL
- L2 NO. 2 IF COIL
- L3 ANT. L.W. COIL
- L4 ANT. B.C. COIL
- L5 ANT. POL. COIL
- L6 ANT. S.W. COIL
- L7 R.F. L.W. COIL
- L8 R.F. B.C. COIL
- L9 R.F. POL. COIL
- L10 R.F. S.W. COIL
- L11 OSC. L.W. COIL
- L12 OSC. B.C. COIL
- L13 OSC. POL. COIL
- L14 OSC. S.W. COIL

- A-14149
- A-12989-2
- A-14243-4
- A-14243-1
- A-14243-2
- A-14243-3
- A-14242-4
- A-14242-1
- A-14242-2
- A-14242-3
- A-14241-4
- A-14241-1
- A-14241-2
- A-14241-3

- NO. FROM BACK OF SET
- S1 ANT. PRI. SECTION
- S2 ANT. SEC. SECTION
- S3 R.F. PRI. SECTION
- S4A R.F. BIAS SECTION
- S4B SCREEN SECTION
- S4C I.F. BIAS SECTION
- S5 R.F. SEC. SECTION
- S6 OSC. PRI. SECTION
- S7 OSC. SEC. SECTION

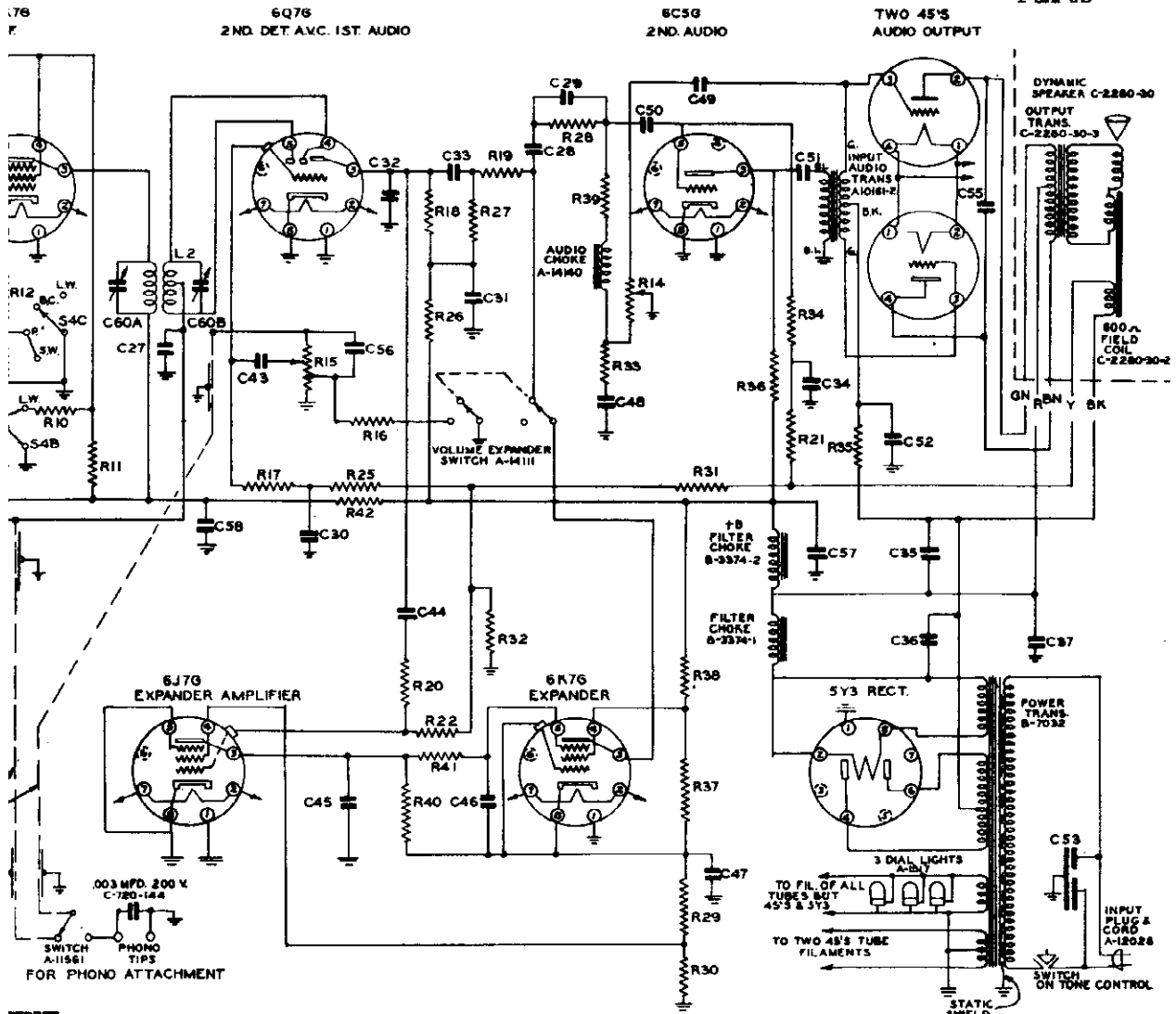
**SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MOD
INTERMEDIATE FREQUENCY 45**

* 250 volt
** 25 volt
*** Cannot be

† 100 vol.
‡ 50 vol.
†† 5 vol.

HINGTON CO.

MODEL 1167
Schematic, Voltage
Parts



VOLTAGE CHART

Line Voltage: 118 volts
Position of Volume Control: Full with Antenna Disconnected
Symphonic Expander Control: Off
Position of Band Selector Switch: Broadcast Band

Tube	Function	Voltage of Each Socket Prong to Ground (See Prong Numbers on Schematic Diagram)								
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8	Grid Cap
6K7	R-F Amplifier	0	0	240	100	0	-	6.1	0	0
6AB	1st. Det-Oscillator	0	0	250	115	0	225	6.1	0	0
6K7G	I-F Amplifier	0	6.1	245	100	0	-	0	0	0
6Q7G	2 Det-AVC-1st A-F Amplifier	0	0	105	0	0	0	6.1	0	0
6J7G	Expander Amplifier	0	0	25*	15**	0	-	6.1	0	0
6K7G	Symphonic Expander	0	0	0	74	4†	66	6.1	66	66
6C5G	2nd. A-F Amplifier	0	0	240	-	***	***	6.1	0	-
45	Power Amplifier	1.1	280	32††	1.1	-	-	-	-	-
45	Power Amplifier	1.1	280	32††	1.1	-	-	-	-	-
5Y3G	Rectifier	-	†††	-	370	-	370	-	†††	-
6E5	Viso-Glo	6.1	20†	0	250	0	0	-	-	-

Notes: Voltage readings are for schematic diagram. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits except as noted below. All measurements made with Weston Selective Analyzer No. 665, Type 2.

ENT

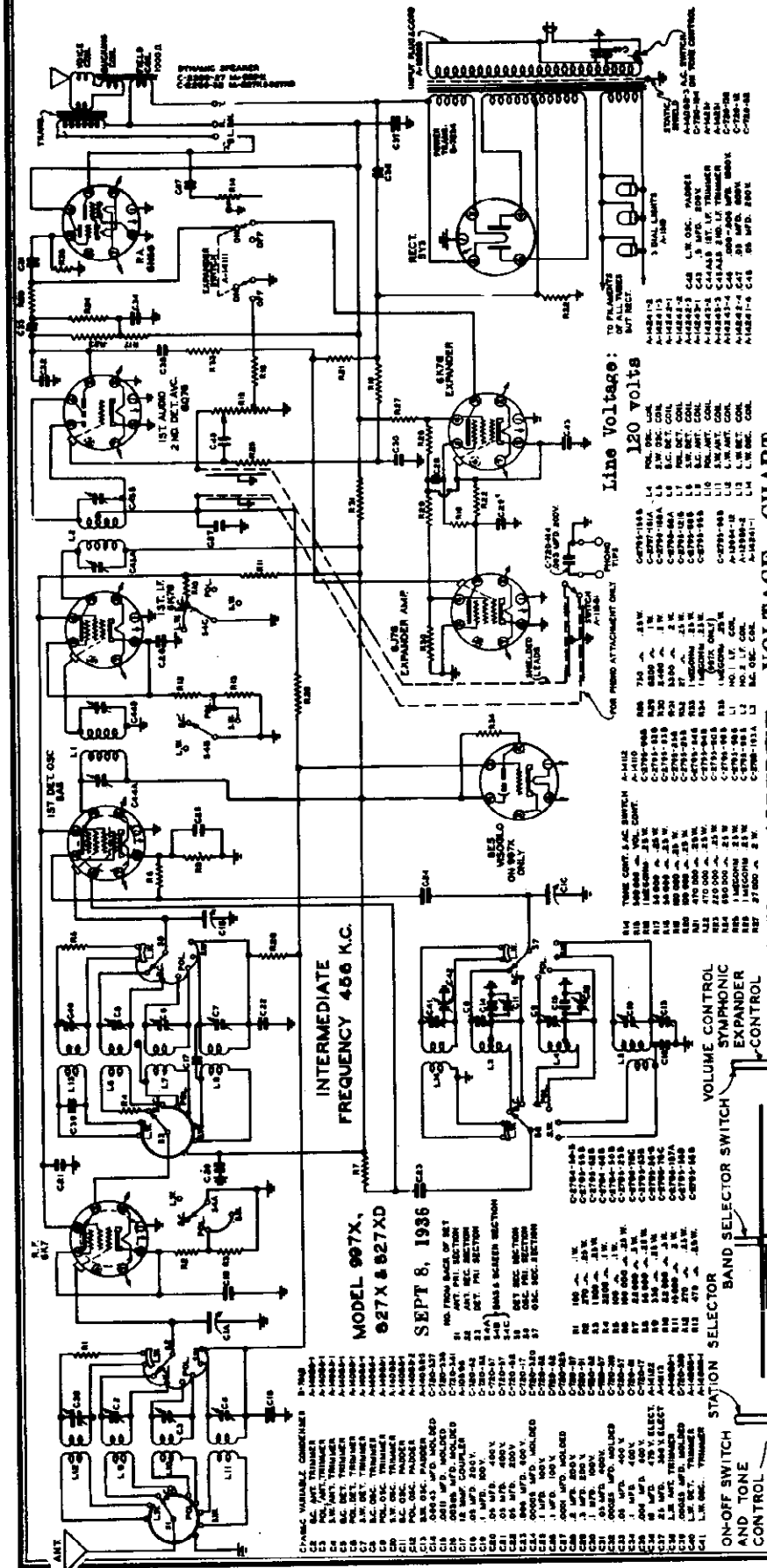
167
C.

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SPARKS-WITHINGTON CO.

MODELS 827X, 827XD, 997X
Schematic, Socket, Parts
Voltage, Trimmers



- STATION SELECTOR**
- 100 11K
 - 101 12K
 - 102 13K
 - 103 14K
 - 104 15K
 - 105 16K
 - 106 17K
 - 107 18K
 - 108 19K
 - 109 20K
 - 110 21K
 - 111 22K
 - 112 23K
 - 113 24K
 - 114 25K
 - 115 26K
 - 116 27K
 - 117 28K
 - 118 29K
 - 119 30K
 - 120 31K
 - 121 32K
 - 122 33K
 - 123 34K
 - 124 35K
 - 125 36K
 - 126 37K
 - 127 38K
 - 128 39K
 - 129 40K
 - 130 41K
 - 131 42K
 - 132 43K
 - 133 44K
 - 134 45K
 - 135 46K
 - 136 47K
 - 137 48K
 - 138 49K
 - 139 50K
 - 140 51K
 - 141 52K
 - 142 53K
 - 143 54K
 - 144 55K
 - 145 56K
 - 146 57K
 - 147 58K
 - 148 59K
 - 149 60K
 - 150 61K
 - 151 62K
 - 152 63K
 - 153 64K
 - 154 65K
 - 155 66K
 - 156 67K
 - 157 68K
 - 158 69K
 - 159 70K
 - 160 71K
 - 161 72K
 - 162 73K
 - 163 74K
 - 164 75K
 - 165 76K
 - 166 77K
 - 167 78K
 - 168 79K
 - 169 80K
 - 170 81K
 - 171 82K
 - 172 83K
 - 173 84K
 - 174 85K
 - 175 86K
 - 176 87K
 - 177 88K
 - 178 89K
 - 179 90K
 - 180 91K
 - 181 92K
 - 182 93K
 - 183 94K
 - 184 95K
 - 185 96K
 - 186 97K
 - 187 98K
 - 188 99K
 - 189 100K

VOLUME CONTROL SYMPHONIC EXPANDER CONTROL

SEE INDEX FOR ALIGNMENT

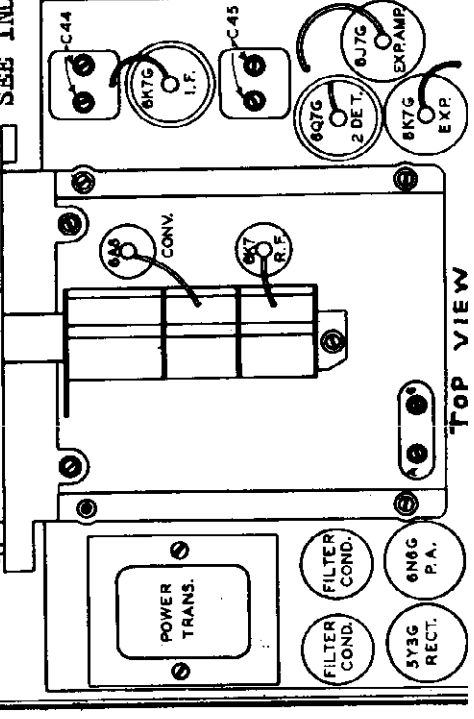
Line Voltage: 120 volts

Tube	#1	#2	#3	#4	#5	#6	#7	#8	CG
6K7 RF Amp	0	6.2	250	115	0	-	0	0	0
6A8 Conv.	0	6.2	230	145	0	205	00	0	0
6K7 IF Amp	0	6.2	240	115	0	-	0	0	0
6Q7 2nd Det	0	6.2	150	0	0	-	0	0	0
6J7 AVC, AF	0	6.2	0	0	0	-	0	0	0
6K7 Exp. Amp.	0	6.2	0	95	0	-	0	80	85
6N6 Pwr. Amp.	0	6.2	410	410	0	-	0	0	0
5Y3 Rect.	0	5.2	-	410	0	-	410	-	0
6E5 Visioflo	6.2	25	0	225	0	-	0	-	-

VOLUME CONTROL: Full with Antenna Disconnected
Position of Band Selector Switch: Broadcast Band

Voltage of Each Socket Prong to Ground

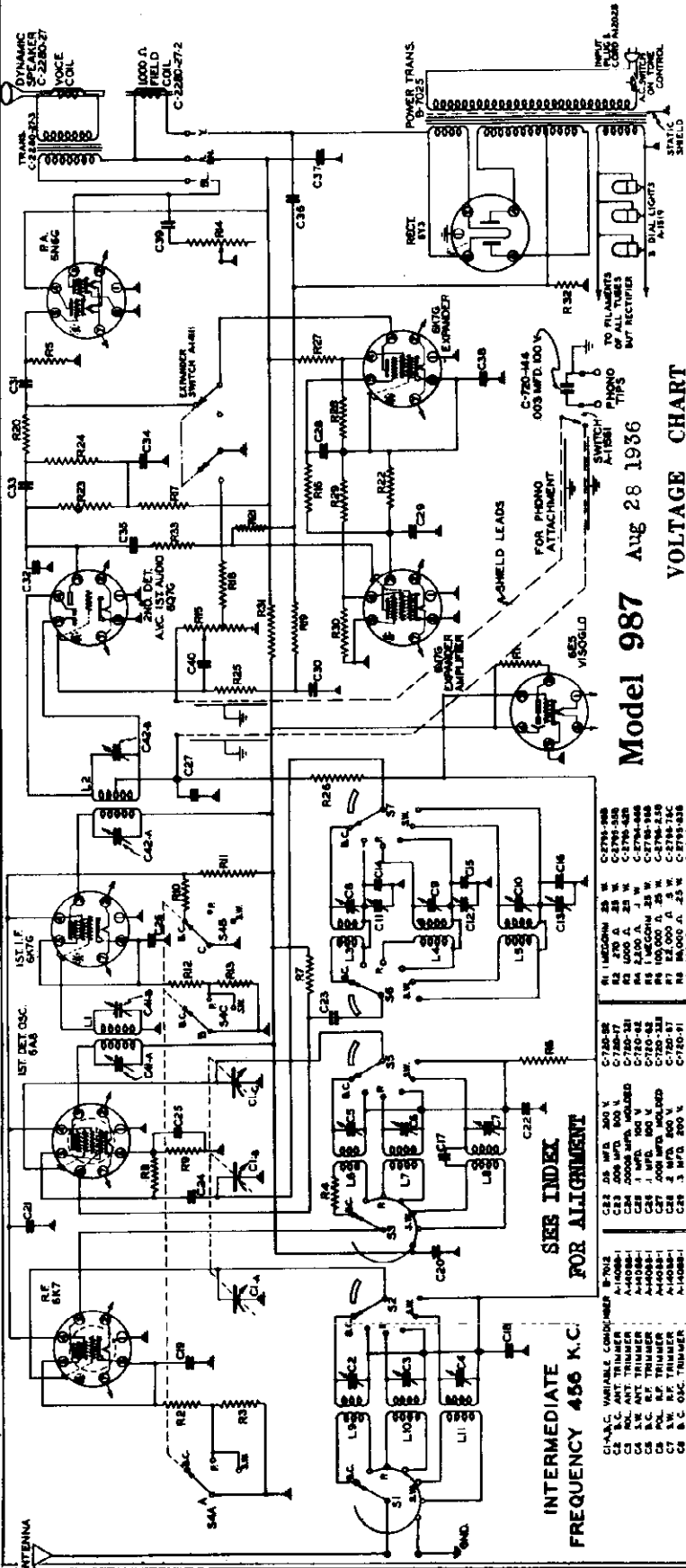
Tube	Function	#1	#2	#3	#4	#5	#6	#7	#8	CG
6K7	RF Amp	0	6.2	250	115	0	-	0	0	0
6A8	Conv.	0	6.2	230	145	0	205	00	0	0
6K7	IF Amp	0	6.2	240	115	0	-	0	0	0
6Q7	2nd Det	0	6.2	150	0	0	-	0	0	0
6J7	AVC, AF	0	6.2	0	0	0	-	0	0	0
6K7	Exp. Amp.	0	6.2	0	95	0	-	0	80	85
6N6	Pwr. Amp.	0	6.2	410	410	0	-	0	0	0
5Y3	Rect.	0	5.2	-	410	0	-	410	-	0
6E5	Visioflo	6.2	25	0	225	0	-	0	-	-



MODEL 987

Schematic, Socket, Parts
Trimmers, Voltage

SPARKS-WITHINGTON CO.



Model 987 AUG 28 1936

VOLTAGE CHART

Position of Volume Control: Full with Antenna Disconnected
Position of Band Selector Switch: Broadcast
Line Voltage: 115 volts

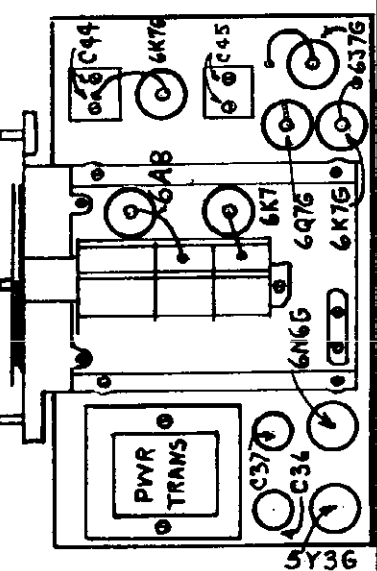
Tube	Function	Press Prong Prong Prong Prong Prong Grid No. 1 No. 2 No. 3 No. 4 No. 5 No. 6 No. 7 No. 8 Cap
6X7	I-F Amplifier	0 6.2 250 115 0 - 0 0 0 0
6A6	Converter	0 6.2 250 145 0 205 0 0 0 0
6K7G	I-F Amplifier	0 6.2 240 115 0 - 0 0 0 0
6Q7G	Det.-AVC-1st. A-F Amp.	0 6.2 150 0 0 - 0 0 0 0
6J7G	Expander Amplifier	0 6.2 * * * - 0 0 0 0
6K7G	Expander	0 6.2 0 95 * - 0 85 85
6F6G	Power Amplifier	0 6.2 410 410 0 - 0 0 -
6Y3G	Rectifier	0 5.0 - 410 - 410 - 0 -
6B5	V180-G10	6.2 25 0 225 0 0 - -

* Cannot be measured with Weston Selective Analyzer No. 605, Type 2.
** 100 volt scale.

INTERMEDIATE FREQUENCY 456 K.C.

SEE INDEX FOR ALIGNMENT

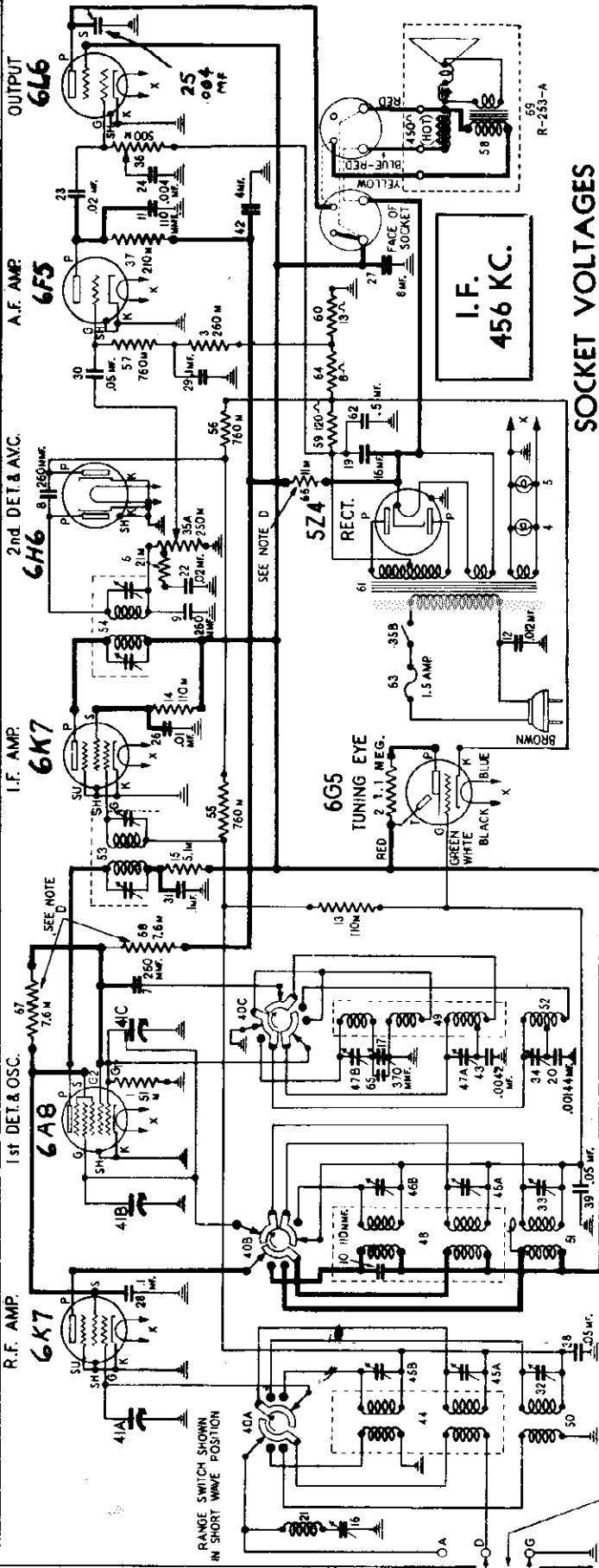
- 61 1.000000 25 W C-2794-268
- 62 270 A 25 W C-2794-268
- 63 1.000000 25 W C-2794-268
- 64 1.000000 25 W C-2794-268
- 65 1.000000 25 W C-2794-268
- 66 1.000000 25 W C-2794-268
- 67 1.000000 25 W C-2794-268
- 68 1.000000 25 W C-2794-268
- 69 1.000000 25 W C-2794-268
- 70 1.000000 25 W C-2794-268
- 71 1.000000 25 W C-2794-268
- 72 1.000000 25 W C-2794-268
- 73 1.000000 25 W C-2794-268
- 74 1.000000 25 W C-2794-268
- 75 1.000000 25 W C-2794-268
- 76 1.000000 25 W C-2794-268
- 77 1.000000 25 W C-2794-268
- 78 1.000000 25 W C-2794-268
- 79 1.000000 25 W C-2794-268
- 80 1.000000 25 W C-2794-268
- 81 1.000000 25 W C-2794-268
- 82 1.000000 25 W C-2794-268
- 83 1.000000 25 W C-2794-268
- 84 1.000000 25 W C-2794-268
- 85 1.000000 25 W C-2794-268
- 86 1.000000 25 W C-2794-268
- 87 1.000000 25 W C-2794-268
- 88 1.000000 25 W C-2794-268
- 89 1.000000 25 W C-2794-268
- 90 1.000000 25 W C-2794-268
- 91 1.000000 25 W C-2794-268
- 92 1.000000 25 W C-2794-268
- 93 1.000000 25 W C-2794-268
- 94 1.000000 25 W C-2794-268
- 95 1.000000 25 W C-2794-268
- 96 1.000000 25 W C-2794-268
- 97 1.000000 25 W C-2794-268
- 98 1.000000 25 W C-2794-268
- 99 1.000000 25 W C-2794-268
- 100 1.000000 25 W C-2794-268



STEWART-WARNER CORP.

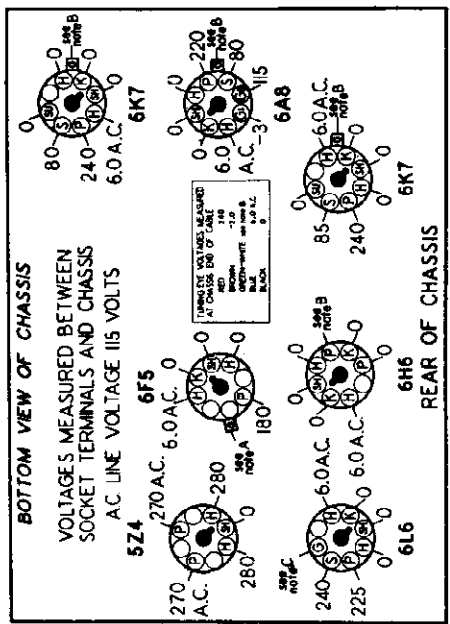
MODELS 1471 to 1474
Chassis R-147
Schematic, Socket

Trimmers, Voltage Change

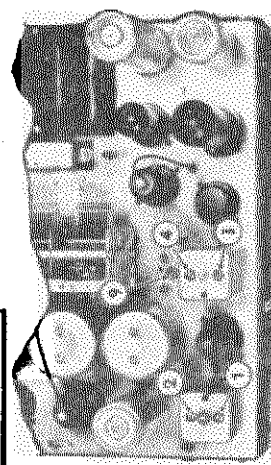


RANGE SWITCH ON BROADCAST POSITION DIAL TUNED TO 525 KC.
VOLUME CONTROL ON FULL ANTENNA GROUND

SOCKET VOLTAGES



IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt.
NOTE A: The grid bias for the 6F5 is -1.3 volts measured across resistor 60.
NOTE B: The grid bias for the 6A8, 6K7, and the anode voltage of the A.V.C.

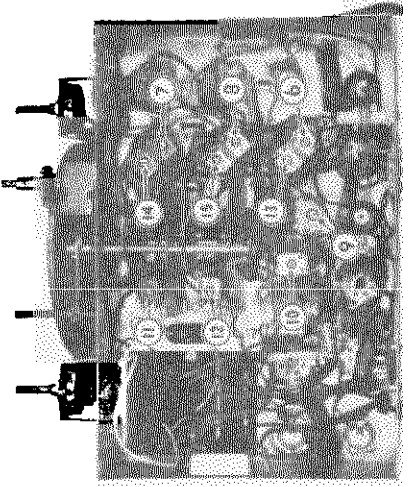


ALIGNMENT

Trimmer Number	Alignment Frequency
1	1st I.F. transformer trimmer..... 456 KC.
2	1st I.F. transformer trimmer..... 156 KC.
3	2nd I.F. transformer trimmer..... 156 KC.
4	2nd I.F. transformer trimmer..... 156 KC.
5	Wave trap trimmer..... 156 KC.
6	Broadcast oscillator shunt trimmer..... 1500 KC.
7	Broadcast antenna shunt trimmer..... 1500 KC.
8	Broadcast detector series trimmer..... 600 KC.
9	Police oscillator shunt trimmer..... 5 MC.
10	Police antenna shunt trimmer..... 5 MC.
11	Police detector shunt trimmer..... 5 MC.
12	Police detector shunt trimmer..... 5 MC.

In receivers having serial numbers below 351,736, resistor 67 is omitted, and the screen grids of the 6K7, R.F. amplifier and the 6A8 receive their current through a 31,000 ohm, 1 watt carbon resistor which is connected to the screen grid of the 6L6. In addition, resistor 66 has a rating of 30,000 ohms, 1 watt and resistor 68 has a rating of 16,000 ohms, 1/4 watt.

NOTE D:
CONNECTOR REMOVED WHEN DOUBLE ANT. IS USED.



MODELS 1471 to 1479
Chassis R-147
Alignment, Parts

STEWART-WARNER CORP.

MODEL
R-147

MODEL R-147 PARTS LIST

Diagram Number	Part Number	Description	List Price
1	83080	51,000 ohm 1/4 watt carbon resistor	.20
2	84235	1.1 megohm 1/4 watt carbon resistor	.12
3	83082	260,000 ohm 1/4 watt carbon resistor	.20
4-5	83278	Pilot lamp No. 40, 6-8 volts	.15
6	83286	21,000 ohm 1/4 watt carbon resistor	.20
7-8-9	83539	260 mmfd. mica condenser	.20
10-11	83783	110 mmfd. mica condenser	.35
12	83976	.012 mfd. 1000 V. paper condenser	.30
13-14	84193	110,000 ohms 1/4 watt carbon resistor	.12
15	84720	5100 ohms 1/4 watt carbon resistor	.40
16	85285	Wave trap condenser	.40
17	85285	Padding condenser	.01
18	85321	Ground connector	1.25
19	85431	.16 mfd. 400 V. Electrolytic condenser	.30
20	85562	.00144 mfd. mica condenser	.50
21	88014	Antenna trap coil	.30
22-23	88026	.02 mfd. 400 V. paper condenser	.30
24-25	88029	.004 mfd. 400 V. paper condenser	.30
26	88030	.01 mfd. 400 V. paper condenser	1.10
27	88033	.8 mfd. 350 V. electrolytic condenser	.30
28-29	88046	1 mfd. 150 V. paper condenser	.35
30	88189	.05 mfd. 200 V. paper condenser	.35
31	88191	.1 mfd. 300 V. paper condenser	.35
32-33-34	88477	Trimmer condenser	.12
35A	88487	Volume control (250,000 ohms)	1.25
35B		{ A. C. line switch }	
36	88488	Tone control (500,000 ohms)	.80
37	88532	210,000 ohms 1/4 watt carbon resistor	.12
38-39	88534	.05 mfd. 150 V. condenser (low loss)	.24
40A to C	88573	Range switch	2.50
41A to C	88574	Three range condenser	5.00
42	88576	4 mfd. 250 V. electrolytic condenser	.80
43	88587	.0042 mfd. mica condenser	.35
44	88592	Antenna coil and shield assem. (B.C.&S.W.) with trimmer	2.20
45A-45B		{ Trimmer condenser }	
46A-46B	88596	Trimmer condenser	.25
47A-47B		{ R. F. coil and shield assem. (B.C.&S.W.) with trimmer }	
48	88597	R. F. coil and shield assem. (B.C.&S.W.)	2.40
49	88599	Oscillator coil and shield assem.	2.20
50	88602	Antenna coil assem. (Police) with trimmer	.85
51	88604	R. F. coil assem. (Police) with trimmer	1.00
52	88605	Oscil. coil assem. (Police) with trimmer	.70
53	88606	1st I.F. transformer	2.50
54	88607	2nd I.F. transformer	2.50
55-56-57	88854	760,000 ohms 1/4 watt carbon resistor	.12
58	88870	Output transformer (on R-253 speaker)	2.50
59	88896	120 ohms 2 watt carbon resistor	.18
60	88897	13 ohms 1/2 watt carbon resistor	.12
61	88898	Power transformer, 115 volts-60 cycles	6.00
62	88990	5 mfd. 150 V. paper condenser	.35
63	89002	Fuse, 1.5 amperes	.10
64	89004	.8 ohms 1/2 watt wire wound resistor	.15
65	89523	.370 mmfd. mica condenser	.32
66	89751	11,000 ohm 1 watt carbon resistor	.12
67	89752	7,600 ohm 1/2 watt carbon resistor	.12
68	89754	7,600 ohm 1 watt carbon resistor	.12
69	R-253-A	12 inch dynamic speaker	11.50

MISCELLANEOUS PARTS

Part No.	DESCRIPTION	PRICE
67977	#14 x 1 1/4 chassis mtg. screw	\$0.03
77381	Flat steel washer	.01
84428	Rubber exhaust mtg. bushing	.08
85066	C.D.A. terminal strip	.20
85321	Ground connector	.01
88056	Fuse strip	.10
88057	Fuse cover	.12
88675	Speaker socket	.02
88831	Bracket for range selector shaft	.10
88832	Shaft for range selector knob	.10
88956	Eacutcheon with glass	1.65
88975	Link and lever assembly	.14
88982	Compression spring	.01
88985	Tuning knob, front section	.20
88986	Tuning knob, rear section	.25
88995	Eacutcheon for tuning eye	.30
88996	Knob, range switch	.15
89027	Spring washer (for planetary drive)	.01
89038	Knob, tone and volume controls	.20
89119	Tuning indicator cable and plug	1.50

TUNING DRIVE AND DIAL PARTS

Part No.	DESCRIPTION	PRICE
83278	Pilot lamp 240 6-8 volts	\$0.15
85902	Dual ratio planetary dial drive	.90
88835	Idle gear and pinion assembly	.25
88839	Tension spring (for idler gear)	.10
88840	Dial disc and bushing assembly	.40
88844	Dial ring bracket and shaft assembly (for edge lighting)	1.00
88900	Dial scale (for rear lighting)	2.00
88977	Band indicator and link assembly	.69
88998	Second pointer	.10
89001	Main pointer and stud assembly	.10
89144	Tension spring (for idler gear)	.10
89283	Pilot lamp socket	.10
89284	Pilot lamp shield	.02
89287	Dial scale (for edge lighting)	1.75
89288	Dial background (with edge lighting)	.12
89297	Bracket and light bracket assembly (for idler gear)	.30
89184	Dial ring bracket and shaft assembly (for rear lighting)	1.10

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

ALIGNING THE I. F. AMPLIFIER: Turn the volume control to maximum volume position and keep it in this position throughout the entire alignment procedure. Turn the range switch to the broadcast position (fully clockwise).

Connect the test oscillator output leads to the 6A8 control grid and chassis with a .1 mfd. condenser in series with the oscillator output. Set the oscillator to exactly 456 KC. Set the receiver dial at any point where it has no tuning effect on the oscillator signal.

Adjust the four I.F. trimmers, Nos. 1, 2, 3 and 4, for maximum output meter deflection, then repeat the trimmer adjustment.

WAVE-TRAP ADJUSTMENT: The wave-trap adjusting trimmer, No. 5, is located on the back of the chassis. Leave the test oscillator at 456 KC. Connect the oscillator output to the A and G terminals with a 400 ohm resistor in series with the A terminal and oscillator output. Then adjust the wave-trap trimmer No. 5 for minimum output. If some particular station with a frequency near 456 KC. causes code interference, it may be desirable to adjust the wave-trap on the actual frequency of the interfering station.

BROADCAST BAND CALIBRATION AND ALIGNMENT: With the gang condenser in full mesh, the dial pointer should be on the white horizontal line below 530 KC. on the dial scale. Leave the range switch in the extreme clockwise position, and leave the test oscillator connected to the A and G terminals of the receiver through a 400 ohm resistor.

Adjust the test oscillator to exactly 1500 KC. and turn the receiver dial pointer to 1500 KC. on the tuning dial. To calibrate the dial, adjust trimmer No. 6 for maximum output.

Carefully tune the receiver to the signal and adjust trimmers Nos. 7 and 8 for maximum output.

Adjust the test oscillator to 600 KC. and tune the receiver to the signal. Adjust trimmer No. 9 for maximum output. Then try to increase the output meter reading by detuning No. 9 slightly and retuning the receiver dial. If the output goes down, detune the trimmer in the opposite direction. Continue detuning the trimmer and retuning the receiver dial until maximum output meter deflection is secured. This operation is commonly known as "rocking" and when performed as described will give maximum selectivity and sensitivity even though the dial may be slightly off calibration at 600 KC.

BAND NO. 2 CALIBRATION AND ALIGNMENT: Turn the range switch to the center position.

Adjust the test oscillator to exactly 5.0 MC. and turn the receiver dial pointer to exactly 5.0 MC. on the tuning dial.

To calibrate the dial, adjust trimmer No. 10 for maximum output. If two peaks are found, the proper one is that with the trimmer screw farthest out.

Carefully tune the receiver to the signal and adjust trimmers Nos. 11 and 12 for maximum output. Then try to increase the output by detuning No. 12 slightly and retuning the receiver dial. Continue detuning No. 12 and retuning the dial until the output meter deflection is a maximum. Then readjust No. 11 for maximum output.

BAND NO. 3 CALIBRATION AND ALIGNMENT: Turn the range switch to the extreme counter-clockwise position. Be sure the D and G terminals on the antenna terminal strip are connected together.

Set the test oscillator to 16 MC. and turn the receiver dial pointer to exactly 16 MC. on the tuning dial.

To calibrate the dial, adjust trimmer No. 13 for maximum output. Check to see that it has been adjusted to the proper peak by tuning the receiver to approximately 15.1 MC. A repeat signal should be heard at this point. If none is present, even with greatly increased oscillator output, retune the receiver to 16 MC. and adjust trimmer No. 13 to the proper peak with the trimmer screw farther out.

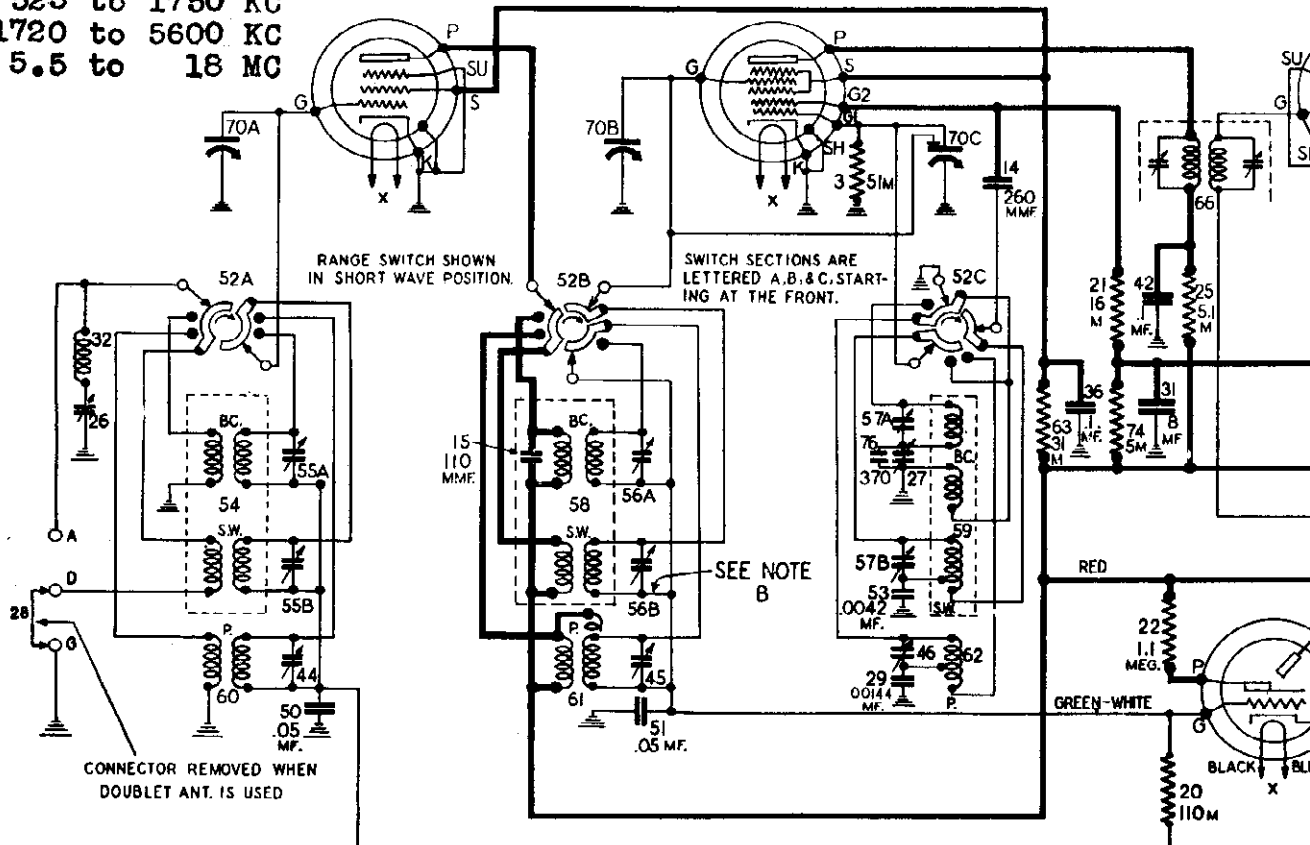
Carefully tune the receiver to the signal and adjust trimmers Nos. 14 and 15 to a peak. Then try to increase the output by detuning No. 15 slightly and retuning the dial until a maximum output meter deflection is secured. Then readjust No. 14 for maximum output. Check the adjustment by tuning the receiver to the image at about 15.1 MC. The image should be much weaker than the 16 MC. signal. If the signal at 15.1 MC. dial setting is equal to or stronger than the 16 MC. signal, trimmer No. 15 is not set to the proper peak. Turn the trimmer in a turn or so, then readjust as above.

FREQUENCY RANGE

525 to 1750 KC
1720 to 5600 KC
5.5 to 18 MC

6K7
R.F.

6A8
1st DET & OSC



IMPORTANT

In aligning this chassis it is absolutely essential to connect a .1 to .25 mfd. condenser in series with the oscillator output lead when aligning the I.F. trimmers. If no condenser is used, the oscillator may short out all bias on the 6A8 and 6K7 tubes which results in improper alignment.

In aligning all other trimmers but the I.F. trimmers, a 400 or 500 ohm carbon resistor must be connected in series with the oscillator output and receiver antenna terminal. Do not omit this resistor or the alignment will be incorrect.

NOTE B: I indicated doe through an 110,000 oh Negative en

ALIGNMENT

I.F. AMPLIFIER

- | | |
|-------------|------------------------------------|
| Trimmer No. | |
| 1 | } First I.F. transformer trimmers |
| 2 | |
| 3 | } Second I.F. transformer trimmers |
| 4 | |

WAVE TRAP

BAND No. 1 (BROADCAST) (527 to 1750 KC.)

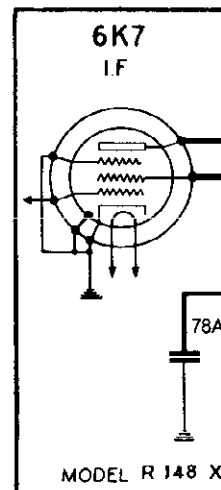
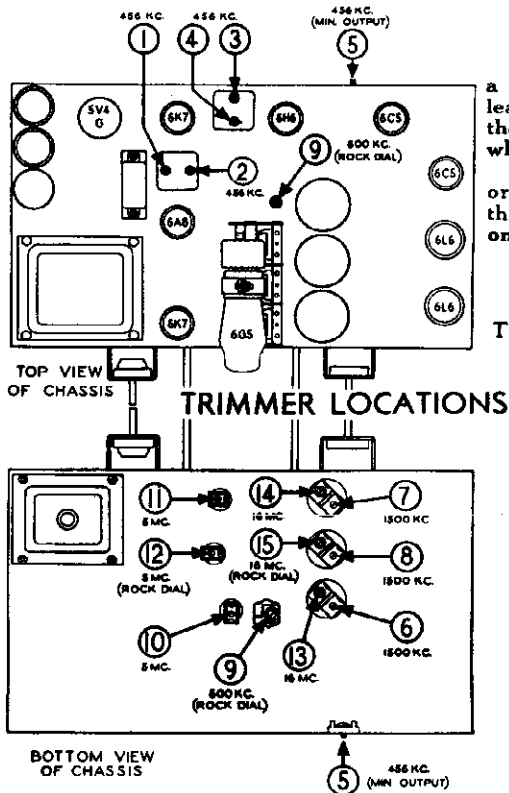
- | | |
|---|---|
| 6 | Broadcast band oscillator shunt trimmer |
| 7 | Broadcast band antenna shunt trimmer |
| 8 | Broadcast band detector shunt trimmer |
| 9 | Broadcast band oscillator series padder |

BAND No. 2 (1720 to 5600 KC.)

- | | |
|----|-------------------------------------|
| 10 | Band No. 2 oscillator shunt trimmer |
| 11 | Band No. 2 antenna shunt trimmer |
| 12 | Band No. 2 detector shunt trimmer |

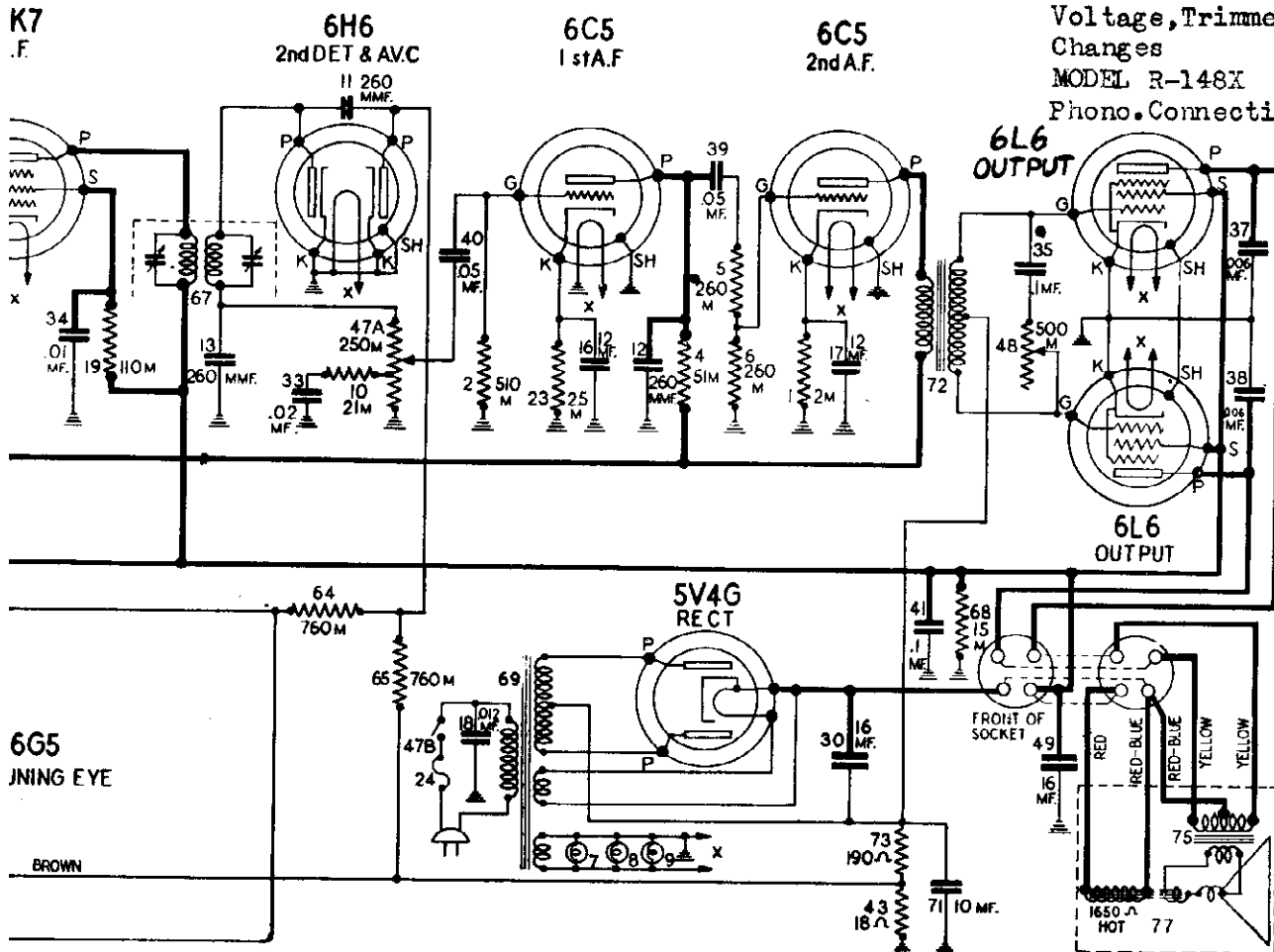
BAND No. 3 (5.5 to 18 MC.)

- | | |
|----|-------------------------------------|
| 13 | Band No. 3 oscillator shunt trimmer |
| 14 | Band No. 3 antenna shunt trimmer |
| 15 | Band No. 3 detector shunt trimmer |



RNER CORP.

MODELS 1481 to 1489
 Chassis R-148
 Schematic, Socket
 Voltage, Trimmers
 Changes
 MODEL R-148X
 Phono. Connections



6G5
 TUNING EYE

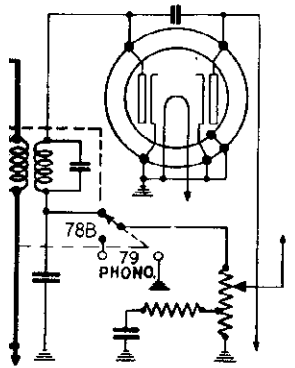
BROWN

Chassis stamped with the letter "H," the lead in- connect to A.V.C. but is by-passed to ground mfd. condenser and is connected through a resistor to a permanent bias of 1.8 volts at the resistor No. 43.

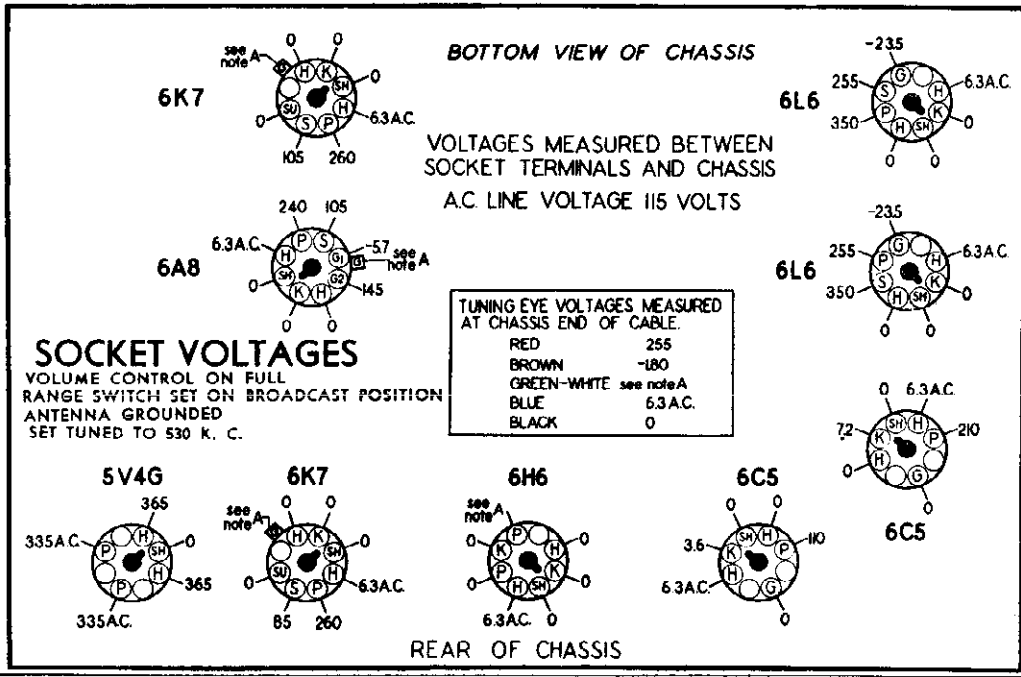
IMPORTANT: Use a high resistance voltmeter of 1,000 ohms per volt.
NOTE A: -1.8 volts measured across resistor 43.

FREQUENCY
 156 KC.

6H6
 2nd DET. & AVC.



PHONO CONNECTIONS



BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS
 A.C. LINE VOLTAGE 115 VOLTS

REAR OF CHASSIS

STEWART WARNER CORP.

MODELS 1481 to 1485
Chassis R-148
Alignment Parts

ALIGNMENT OF THE I.F. AMPLIFIER

1. (a) Turn the volume control to maximum volume position and keep it in this position throughout the entire alignment procedure.
- (b) Connect the test oscillator output leads to the 6A8 control grid and the chassis with a .1 or .25 mfd. condenser in series with the oscillator lead to the 6A8 grid.
- (c) Set the test oscillator to exactly 456 KC. Adjust the output of the test oscillator to give about half scale deflection on the output meter.
- (d) Turn the range switch to the extreme clockwise position and set the tuning dial to any point where there is no tuning effect on the oscillator signal.
- (e) Adjust the four I.F. transformer trimmers (trimmers No. 1, 2, 3, and 4) for maximum output meter deflection.
- (f) Repeat the four trimmer adjustments, since the adjustment of each trimmer has some effect on the others.

2. (a) Leave the test oscillator at 456 KC. but connect the oscillator output to the A and G terminals of the receiver with a 400 or 500 ohm carbon resistor in series with the oscillator output and the A terminal.
- (b) Adjust trimmer No. 5 for minimum output. Increase the oscillator output as necessary to obtain a clearly defined point of minimum output. If some particular station with a frequency slightly different than 456 KC. causes code interference, it may be advisable to adjust trimmer No. 5 on the actual frequency of the interfering station.

BAND NO. 1 (BROADCAST) CALIBRATION

3. (a) Check the position of the dial pointer on its shaft by turning the tuning knob until the rotor plates of the gang condenser are in full mesh. The slow-moving dial pointer should then coincide with the low frequency end of the dial scale. If it does not, hold the dial gear and turn the pointer to the correct position.
- (b) Turn the range switch control to the extreme right position. (Clockwise.)
- (c) Connect a 400 or 500 ohm carbon resistor in series with the test oscillator output and the receiver antenna terminal. (Note: This resistor should remain connected for all subsequent adjustments.)
- (d) Ground the receiver.
- (e) Adjust the test oscillator to exactly 1500 KC.
- (f) Tune in the 1500 KC. oscillator signal or a station above 1300 KC. on the dial and determine whether the dial calibration is correct at the high frequency end of the dial. If it is not correct, adjust trimmer No. 6 to give proper calibration. Do not adjust this trimmer if the dial calibration is correct at the high frequency end of the dial.

BAND NO. 1 (BROADCAST) ALIGNMENT

4. (a) With the test oscillator set at 1500 KC. tune the receiver to the signal for maximum output.
- (b) Adjust trimmers No. 7 and 8 for maximum output. Do not touch trimmer No. 6 as this will change the calibration.
- (c) Adjust the test oscillator to exactly 600 KC. and tune the receiver to the signal. Adjust trimmer No. 9 for maximum output. Then try to increase the output by detuning the trimmer and retuning the receiver dial. If this reduces the output, detune the trimmer on the opposite direction. Continue detuning the trimmer and retuning the dial until a maximum output meter deflection is secured. This operation is commonly known as "rocking." The object of this adjustment is to find the combination of trimmer adjustment and tuning condenser position which gives the maximum output. This adjustment should not be changed regardless of whether the dial reads exactly 600 KC. or slightly off 600 KC. for maximum output.
- (d) Check the adjustment of trimmers Nos. 6, 7 and 8 at 1500 KC.

BAND NO. 2 CALIBRATION

5. (a) Turn the range switch to the center position.
- (b) Adjust the test oscillator to exactly 5.0 MC.
- (c) Tune in the 5 MC. oscillator signal at or near 5 MC. on the receiver dial to determine whether the receiver dial calibration is correct at 5 MC. If it is, do not adjust trimmer No. 10. If the calibration is incorrect, set the dial pointer at 5 MC. on the dial, and adjust trimmer No. 10 until the oscillator signal comes in at this point. If there are two peaks, the proper one is that with the trimmer screw farthest out.

BAND NO. 2 ALIGNMENT

6. (a) With the test oscillator set at 5.0 MC., tune the receiver for maximum output.
- (b) Adjust trimmer No. 11 and 12 for maximum output. After this is done try to increase the output meter reading by detuning No. 12 slightly and retuning the receiver dial. If the output goes down, detune the trimmer in the opposite direction. Continue detuning No. 12 and retuning the set until maximum output meter deflection is secured. Then readjust No. 11.

BAND NO. 3 CALIBRATION

7. (a) Turn the range switch to the extreme left (counter clockwise.)
- (b) Be sure that the D and G terminals on the antenna terminal strip are connected together.
- (c) Adjust the test oscillator to exactly 16 megacycles.
- (d) Tune in the 16 MC. oscillator signal at or near 16 MC. on the receiver dial to determine whether the receiver dial calibration is correct at 16 MC. If it is, do not adjust trimmer No. 13. If the calibration is incorrect, set the receiver dial pointer exactly at 16 MC. and adjust trimmer No. 13 until the oscillator signal comes in at this point.
- (e) Check to see that trimmer No. 13 is adjusted to the proper peak by tuning the receiver to approximately 15.1 MC. If a repeat signal is not heard at this point, even with greatly increased oscillator output, retune the receiver to 16.0 MC. and adjust trimmer No. 13 to the proper peak with the trimmer screw farther out.

BAND NO. 3 ALIGNMENT

8. (a) With the test oscillator set at 16 MC. tune the receiver for maximum output.
- (b) Adjust trimmer No. 14 and 15 for maximum output. After this is done, try to increase the output meter deflection by detuning No. 15 slightly and retuning the receiver dial. If this causes the output to drop, detune the trimmer in the opposite direction. Continue detuning No. 15 and retuning the set until the output is at a maximum. Then readjust No. 14.
- (c) Check the adjustment of No. 15 by tuning the receiver to the image at 15.1 MC. and noting if the image is much weaker than the 16 MC. signal. If the signal at 15.1 MC. dial setting is equal to or stronger than the 16 MC. signal, trimmer No. 15 is not set to the proper peak. Turn the trimmer in a turn or so, then readjust as in 8 (b).

Diag. No.	Part No.	DESCRIPTION	List Price
1	67303	2000 ohm 1/4 watt carbon resistor.....	\$0.15
2	83072	510,000 ohm 1/4 watt carbon resistor.....	.12
3-4	83080	51,000 ohm 1/4 watt carbon resistor.....	.12
5-6	83082	260,000 ohm 1/4 watt carbon resistor.....	.12
7-8-9	83278	Pilot lamp (6-8 volt).....	.15
10	83286	21,000 ohm 1/4 watt carbon resistor.....	.12
11-12	83539	260 mmfd. mica condenser.....	.20
13-14			
15	83783	110 mmfd. mica condenser.....	.20
16-17	83803	12 mfd. 15V. electrolytic condenser.....	.80
18	83976	.012 mfd. 1000 V. shielded condenser.....	.49
19-20	84198	110,000 ohm 1/4 watt carbon resistor.....	.12
21	84199	16,000 ohm 1/4 watt carbon resistor.....	.12
22	84235	1.1 megohm 1/4 watt carbon resistor.....	.12
23	84236	2,500 ohm 1/4 watt carbon resistor.....	.12
24	84672	Fuse, 2 ampere, at carbon resistor.....	.12
25	84720	5,100 ohm 1/4 watt carbon resistor.....	.12
26	85285	Antenna trap condenser.....	.40
27	85288	Padding trimmer.....	.40
28	85321	Ground connector (on terminal strip).....	.01
29	85562	.001440 mfd. mica condenser.....	.25
30	85583	16 mfd. 450 V. electrolytic condenser.....	2.50
31	88007	8 mfd. 250 V. electrolytic condenser.....	1.00
32	88014	Antenna trap coil.....	.50
33	88026	.02 mfd. 400 V. paper condenser.....	.25
34	88030	.01 mfd. 400 V. paper condenser.....	.25
35-36	88046	.1 mfd. 150 V. paper condenser.....	.25
37-38	88188	.006 mfd. 600 V. paper condenser.....	.25
39-40	88189	.05 mfd. 200 V. paper condenser.....	.25
41-42	88191	.1 mfd. 300 V. paper condenser.....	.25
43	88584	18 ohm 1/4 watt wire wound resistor.....	.15
44			
45	88477	Trimmer condenser.....	.15
46			
47A		{Vol. control (250,000 ohm) Tap 50,000}	1.25
47B	88487	{ohms from ground and A.C. line switch }	
48	88488	Tone control (500,000 ohms).....	.80
49	88511	16 mfd. 300 V. electrolytic condenser.....	1.10
50-51	88534	.05 mfd. 150 V. condenser (low loss).....	.25
52A			
52B	88573	Range switch.....	2.50
52C			
53	88587	.0042 mfd. mica condenser.....	\$0.35
54	88592	Ant. coil & shield (B.C. & S.W.) with trimmer.....	2.70
55A-55B			
56A-56B	88596	Trimmer condenser.....	.30
57A-57B			
58	88597	R.F. coil & shield (B.C. & S.W.) with trimmer.....	3.10
59	88599	Oscillator coil & shield (B.C. & S.W.) with trimmer.....	2.50
60	88602	Antenna coil assembly (Folite) with trimmer.....	.85
61	88604	R.F. coil assembly (Folite) with trimmer.....	.90
62	88605	Oscillator coil assembly (Folite) with trimmer.....	.70
63	88852	31,000 ohm 1/4 watt carbon resistor.....	.15
64-65	88854	760,000 ohm 1/4 watt carbon resistor.....	.12
66	89005	1st I.F. transformer.....	2.50
67	89006	2nd I.F. transformer.....	2.40
68	89032	15,000 ohm bleeder resistor.....	.50
69	89035	Power transformer 115 V.—60 cycles (See Part No. 89473 for other voltages)	7.50
70A			
70B	89044	Variable gang condenser.....	5.20
70C			
71	89053	10 mfd. 25 V. electrolytic condenser.....	.92
72	89062	Push-pull input transformer.....	3.00
73	89065	190 ohm 3 watt wire wound resistor.....	.50
74	89285	5000 ohm 1 watt carbon resistor.....	.15
75	89293	Output transformer (R-254-A spkr.).....	3.25
76	89525	870 mmfd. mica condenser.....	.30
77	R-254-A	12" dynamic speaker.....	12.75

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODELS 1301 to 1309

Chassis R-130

STEWART WARNER CORP.

Trimmers, Alignment, Parts

MODEL R-130 CHASSIS (Receiver Models 1301 to 1309)

ALIGNING EQUIPMENT

Experience has definitely shown that a selective radio chassis such as the Stewart-Warner Model R130 cannot be properly aligned by ear or "on the air". An output meter and a high grade modulated service oscillator are absolutely essential.

The oscillator should be capable of generating the frequencies of 456 KC., 600 KC., 1400 KC., and a short wave range extending to 4000 K.C. or more.

When using your oscillator do not rely on calibration curves for frequency determination but check the frequencies by comparison with broadcast station signals.

PRELIMINARY STEPS

To align the R130 chassis proceed as follows:

1. Remove the chassis from the cabinet.
2. Connect the output meter across the primary of the output transformer on the dynamic speaker (red and yellow wires on terminal strip.)
3. Turn the volume control to maximum volume position.

ALIGNMENT OF THE I. F. AMPLIFIER

1. (a) Set the test oscillator to exactly 456 KC.
(b) Connect the output leads of the oscillator to the 6A7 control grid and ground.
(c) Set the range switch (right hand knob) to the broadcast position (fully clockwise). Make certain that no station is tuned in.
(d) Carefully adjust the I.F. transformer trimmers Nos. 1, 2, 3, and 4 for maximum output meter deflection.
(e) Repeat the four trimmer adjustments since the adjustment of each trimmer has some effect on the others.

BROADCAST RANGE CALIBRATION

1. Check the position of the pointer on the condenser shaft by turning the rotor plates of the gang condenser to full mesh by means of the tuning knob. The pointer should then coincide with the heavy horizontal line separating the broadcast and short-wave dial scales. If it does not, remove the dial glass and turn the pointer to the proper position, being careful not to break or bend the pointer.

2. Turn the range switch (right hand knob) to the maximum clockwise position, which is the broadcast setting.

3. To calibrate the set at the high frequency end, use a broadcast station signal between 1300 and 1420 KC. If no such station can be heard, you can use a 1400 KC. signal from your oscillator provided its calibration is accurately known.

- (a) Turn the set dial to the exact frequency setting of the signal (either a station or the oscillator).

- (b) Carefully adjust trimmer No. 5 (broadcast oscillator calibration trimmer) until the signal may be tuned in with maximum volume at its correct frequency setting.

BROADCAST RANGE ALIGNMENT

IMPORTANT

4. Connect a .0001 MICA CONDENSER in series with the test oscillator output and the blue receiver antenna lead. IT IS ABSOLUTELY ESSENTIAL THAT THIS CONDENSER REMAIN CONNECTED FOR ALL BROADCAST AND SHORT WAVE ADJUSTMENTS in order to secure proper alignment of the antenna stage. Do not connect any resistor in series with the .0001 mfd. condenser.

Ground the receiver chassis and connect the oscillator ground lead to the chassis.

5. (a) Set the test oscillator to approximately 1400 KC. and carefully tune the receiver to the signal.

- (b) Adjust trimmers No. 6 and No. 7 (broadcast detector shunt trimmer and broadcast pre-selector shunt trimmer respectively) for maximum output meter reading.

- (c) Retune the receiver and check the adjustments of trimmers No. 6 and No. 7. Do not touch trimmer No. 5 since this will change the calibration.

6. (a) Set the test oscillator to approximately 600 KC. and tune the receiver to the signal.

- (b) Adjust trimmer No. 8 (broadcast oscillator padding trimmer) to get maximum output meter deflection.

- (c) Retune the receiver dial to a peak and readjust trimmer No. 8:

- (d) Continue this procedure of adjusting the trimmer and retuning the set until the output meter reading cannot be increased. This procedure must be followed or the receiver will not be properly aligned.

7. Repeat 5 a, 5 b, and 5 c.

SHORT WAVE RANGE CALIBRATION

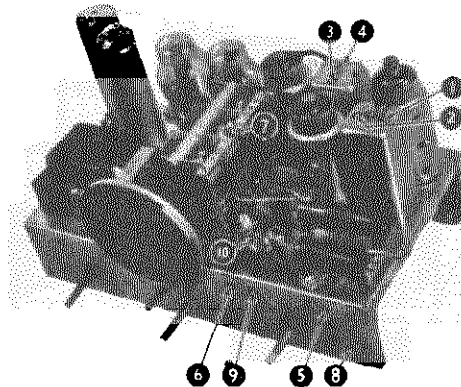
1. Turn the receiver range switch to the short wave band position (counter-clockwise).

2. Adjust the test oscillator to exactly 16,000 KC. If you

cannot obtain this frequency on your oscillator, you may use the second harmonic of 8000 KC., or the fourth harmonic of 4000 KC., either of which will give a 16,000 KC. signal.

3. (a) Set the receiver dial at 16.0 MC. on the dial scale and adjust trimmer No. 9 (shortwave oscillator calibration trimmer) until the signal may be tuned in at the correct dial setting with maximum volume. There will be two peaks. The proper one is that with the trimmer screw farthest out.

- (b) To be sure you have not adjusted trimmer No. 9 to the image frequency, check this point by setting the receiver dial to the image frequency, approximately 15.1 MC., and see if the image signal can be heard. (The image frequency is always the signal frequency minus twice the I.F. frequency or in this case $16,000 - 912 = 15,088$ KC. or approximately 15.1 MC.) If no signal can be heard at 15.1 MC. dial setting even with greatly increased test oscillator output, but can be heard at 16.9 MC dial setting, trimmer No. 9 is evidently improperly adjusted to the image frequency and so must be reset to the proper peak with the screw farther out. After readjusting trimmer No. 9, again check to see that the image comes in at 15.1 MC. dial setting and not at 16.9 MC dial setting.



SHORT WAVE RANGE ALIGNMENT

4. (a) Tune the set very carefully to the oscillator frequency, 16.0 MC for maximum output meter reading.

- (b) Adjust trimmer No. 10 (shortwave range detector shunt trimmer) to a peak. After this is done try to increase the output meter reading by detuning trimmer No. 10 slightly and retuning the receiver dial. Continue detuning trimmer No. 10 and retuning the set until maximum output meter deflection is secured.

NOTE: In some cases, the receiver will oscillate when trimmer No. 10 is set with the trimmer screw too far out. This oscillation which can be eliminated by correct adjustment, is normal when the detector circuit is tuned to the receiver oscillator frequency instead of to the correct signal frequency.

If the set seems to motorboat when making the short wave adjustments, reduce the output of the oscillator. This motorboating will stop when an antenna is connected to the set.

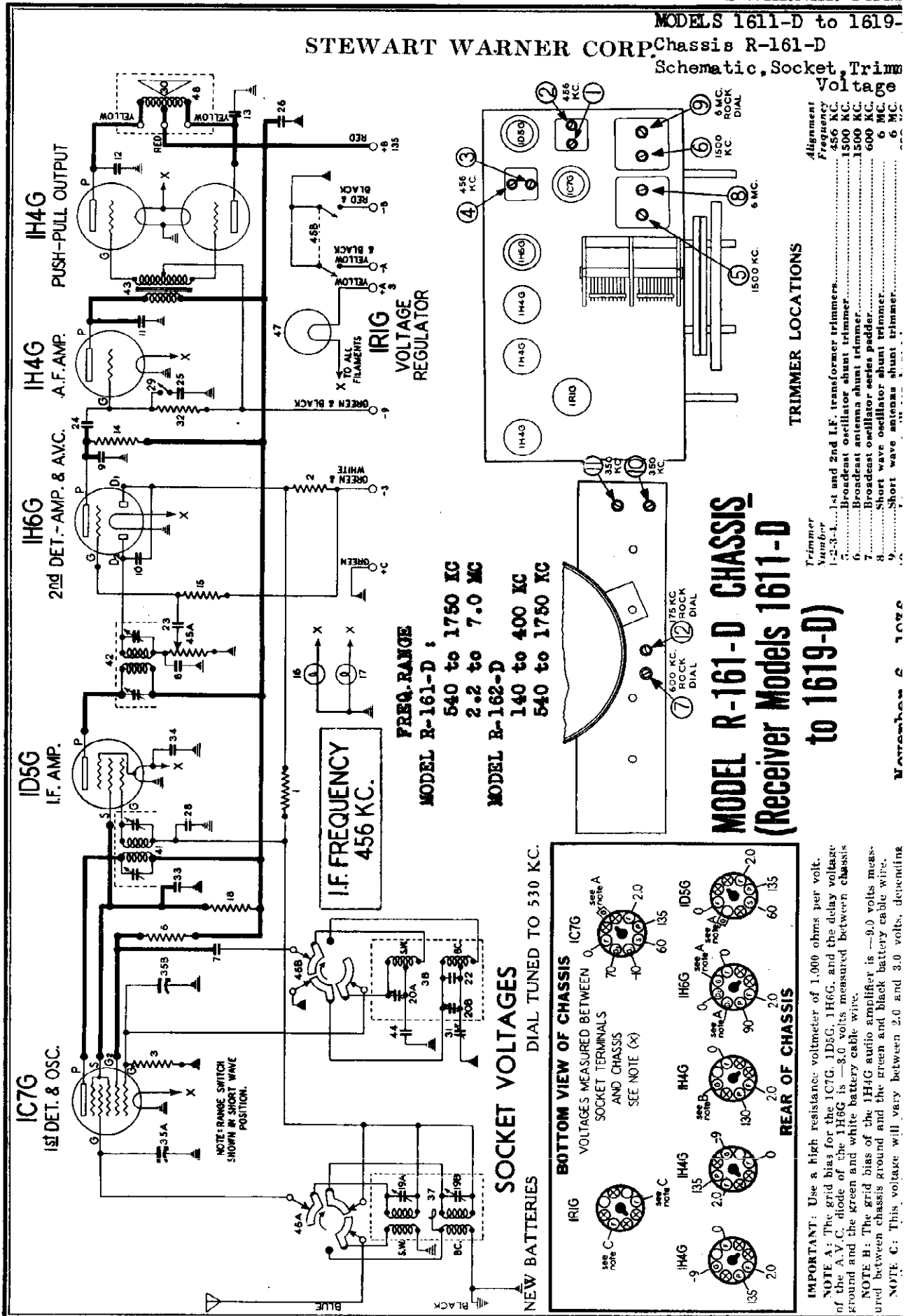
- (c) Check the adjustment of trimmer No. 10 by tuning the receiver to about 15.1 MC. and noting if the image signal at this point is much weaker than the 16 MC. signal. If the signal at the 15.1 MC. dial setting is equal to or stronger than the 16 MC. signal, trimmer No. 10 is not properly adjusted and must be re-adjusted in accordance with 4 (b) with the trimmer screw FARTHER IN.

MISCELLANEOUS PARTS NOT SHOWN ON DIAGRAM

67566	Embossed insulating washer for mtg. elect. condenser.....	.05
83660	Tube shield.....	.15
83668	Electrolytic condenser mtg. nut.....	.03
83718	Gang condenser mtg. cup washer.....	.03
84428	Rubber chassis mtg. washer.....	.03
84493	Chassis mounting screw (No. 10x1 1/4 self tapping).....	.03
84751	Dial mechanism.....	3.00
84752	Dial drive disc.....	.35
84753	Dial (Celluloid).....	.65
84754	Dial pointer.....	.30
84755	Dial gasket.....	.04
84756	Dial glass.....	.20
84757	Dial glass retainer ring.....	.04
84758	Dial light socket.....	.15
84794	Dial escutcheon.....	.50
84797	Knobs (R-1301 and R-1302).....	.15
84805	Felt knob washer.....	.01
84924	Dial escutcheon mtg. screw No. 1 x 3/8" oval H.W.S.....	.01
84935	Knobs (R-1305 only).....	.15

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODELS 1611-D to 1619-D
STEWART WARNER CORP. Chassis R-161-D
 Schematic, Socket, Trim



MODELS 1611-D to 1619-D

Chassis R-161-D

STEWART-WARNER CORP.

Alignment, Parts, Notes

CALIBRATION AND ALIGNMENT

ALIGNING EQUIPMENT: For proper alignment, an output meter and an accurately calibrated oscillator with a tuning range from 175 KC. to 6 MC. are required.

Connect the output meter across the plates of the output tubes. Convenient points to make the plate connections are the yellow wires on the speaker terminal strip.

ALIGNING THE I.F. AMPLIFIER: Turn the volume control to maximum volume position and keep it in this position throughout the entire alignment procedure. Turn the range switch to the broadcast position (center position).

Connect the test oscillator output leads to the 1C7G control grid and chassis with a .1 mfd. condenser in series with the oscillator output. Set the oscillator to exactly 456 KC. Set the receiver dial at any point where it has no tuning effect on the oscillator signal.

Adjust the four I.F. trimmers, Nos. 1, 2, 3 and 4, for maximum output meter deflection, then repeat the trimmer adjustment.

BROADCAST BAND CALIBRATION AND ALIGNMENT: With the gang condenser in full mesh, the dial pointer should be on the yellow horizontal line below 530 KC. on the dial scale.

Leave the range switch in the center position. Connect a 400 or 500 ohm carbon resistor in series with the oscillator output and the receiver antenna lead (blue wire in the back of the chassis). Connect the grounded oscillator output wire to the receiver ground lead (black wire in back of chassis).

Adjust the test oscillator to exactly 1500 KC. Tune in the 1500 KC. oscillator signal or a station above 1300 KC. on the dial and determine whether the dial calibration is correct at the high frequency end of the dial. If the calibration is correct, do not adjust the broadcast oscillator shunt trimmer No. 5. If the calibration is incorrect, adjust trimmer No. 5 to give proper calibration.

Carefully tune the receiver to the 1500 KC. oscillator signal and adjust trimmer No. 6 for maximum output.

Adjust the test oscillator to 600 KC. and tune the receiver to the signal. Adjust trimmer No. 7 for maximum output. Then try to increase the output meter reading by detuning No. 7 slightly and retuning the receiver dial. If the output goes down, detune the trimmer in the opposite direction. Continue detuning the trimmer and retuning the receiver dial until maximum output meter deflection is secured. This operation is commonly known as "rocking" and when performed as described will give maximum selectivity and sensitivity even though the dial may be slightly off calibration at 600 KC.

Repeat the adjustment of Nos. 5 and 6 at 1500 KC.

SHORT WAVE BAND CALIBRATION AND ALIGNMENT: Turn the range switch to the short wave band (maximum counter-clockwise position).

Adjust the test oscillator to exactly 6.0 MC.

Diagram Number	Part Number	Description	List Price
1, 2	83072	510,000 ohm 1/4 watt carbon resistor	\$0.12
3	83080	51,000 ohm 1/4 watt carbon resistor	.12
6	83286	21,000 ohm 1/4 watt carbon resistor	.12
7, 8, 9	83539	260 mmfd. mica condenser	.20
10	83783	110 mmfd. mica condenser	.20
11, 12, 13	83784	.0011 mfd. mica condenser	.25
14	84198	110,000 ohm 1/4 watt carbon resistor	.12
15, 32	84235	1.1 megohm 1/4 watt carbon resistor	.12
16, 17	84515	Dial lamps 2 volt .06 ampere	.25
18	84553	26,000 ohm 1/4 watt carbon resistor	.20
19A, 19B	85087	Dual trimmer condenser	.35
20A, 20B	85451	11 mmfd. Mica Condenser	.15
22	88020	.02 mfd. 400 volt paper condenser	.25
23, 24	88029	.004 mfd. 400 volt paper condenser	.25
26	88046	1 mfd. 150 volt paper condenser	.25
28	88189	.05 mfd. 200 volt paper condenser	.25
29	89331	Tone control switch	.75
30	88437	Diaphragm for R-234-D Speaker	\$1.00
31	88478	Variable padding condenser	.35
33, 34	88990	.5 mfd. 150 volt paper condenser	.35
35A, 35B, 89205		Gang Condenser	4.00
37	89207	Antenna coil & shield (B.C. & S.W.) with trimmers	1.90
38	89209	Oscillator coil & shield (B.C. & S.W.) with trimmers	3.00
41	89226	1st I.F. transformer & shield	2.50
42	89227	2nd I.F. transformer & shield	2.50
43	89228	Push pull input audio transformer	3.50
44	89275	.002 mfd. mica condenser	.40
45A	89330	{ Volume control 500,000 ohm	1.20
45B		{ 0Ω on switch	
29	89331	Tone control switch	.75
36A, 36B, 89334		Range switch	1.40
47		1R1G Voltage regulator tube	1.50
48	R-234-D	.6 inch Magnacite speaker	5.75

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Tune in the 6 MC. oscillator signal at or near 6 MC. on the receiver dial to determine whether the receiver dial calibration is correct at 6 MC. If it is, do not adjust the short wave band oscillator shunt trimmer No. 8. If the calibration is incorrect, set the dial pointer to 6 MC. on the dial, and adjust the oscillator shunt trimmer No. 8 until the oscillator signal comes in at this point. If there are two peaks, the proper one is that with the trimmer screw farthest out.

Carefully tune the receiver to the signal and adjust trimmer No. 9 for maximum output. Then try to increase the output by detuning No. 9 slightly and retuning the receiver. Continue detuning No. 9 and retuning the receiver until the output meter deflection is a maximum.

LONG WAVE BAND CALIBRATION AND ALIGNMENT: Turn the range switch to the long wave band position (maximum clockwise position) and adjust the test oscillator to exactly 350 KC.

Tune in the oscillator signal at or near 350 KC. on the receiver dial to determine whether the dial calibration is correct at this point. If it is, do not adjust trimmer No. 10. If the calibration is incorrect, set the receiver dial pointer to 350 KC. and adjust trimmer No. 10 for maximum output.

Carefully tune the receiver to the signal, then adjust trimmer No. 11 for maximum output.

Adjust the test oscillator to 175 KC. and tune in the signal at or near 175 KC. on the receiver dial. Adjust padder No. 12 for maximum output, then try to increase the output by detuning padder No. 12 and retuning the receiver dial.

Repeat the adjustment of trimmers Nos. 10 and 11 at 350 KC.

USE OF BALLAST PLUG

The Model R-162-D radio chassis is designed to operate with either a large 3 volt dry cell or a 2 1/4 volt Eveready Air Cell. This is possible because the 1R1G tube maintains the proper filament voltage for any battery voltage between 2 and 3 volts. The receiver is also designed to operate from a 2 volt storage cell. However, if this is done it is desirable to omit the 1R1G voltage regulator and insert a special plug in the 1R1G socket which carries our part number 89588 and has a list price of \$0.30.

USE OF B AND C BATTERY PACK

To convert the R-162-D chassis for operation with a plug-in B and C battery unit such as the Burgess No. C90 D6, a special cable terminating in a plug that fits the socket of the B and C pack must be substituted for the regular cable. This special cable carries our part number 89487 and has a list price of \$1.40. The color codes of the old and new cables are identical. There is no green C plus wire on the new cable since the connection is made in the B and C unit.

TUNING DRIVE AND DIAL PARTS

Part Number	Description	List Price
13923	Spring washer for tuning drive shaft	\$0.05
81068	Dial drive cord—per ft.	.05
81069	Dial cord tension spring	.10
88564	Dial pointer & stud assembly	.12
88956	Dial escutcheon with glass	1.65
89174	Dial bracket and ring assembly	1.20
89175	Drive shaft	.10
89176	Retaining ring for tuning drive shaft	.02
89283	Dial lamp socket	.10
89285	Dial background	.12
89298	Dial drum and bushing assembly	.60
89375	Dial scale	1.90
89489	Dial lamp shield	.12
89799	Dial scale retaining clip	.02

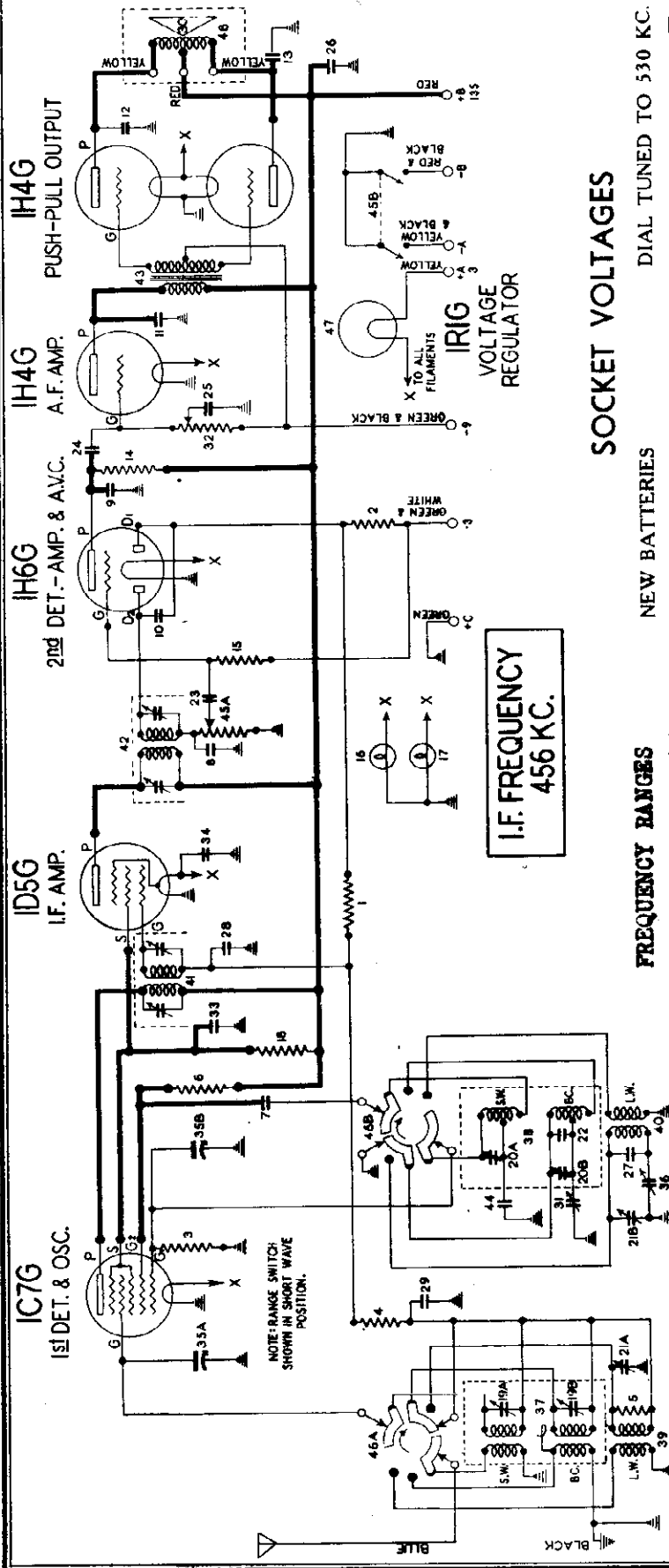
MISCELLANEOUS PARTS

Part Number	Description	List Price
67032	Felt washer for knob, per C.	\$0.35
67590	Flat steel mounting washer	.01
84428	Chassis mounting bumping (rubber)	.03
84493	No. 10 x 1 1/4 chassis mounting screw	.02
84805	Felt washer (used with chassis mtg. screw)	.08
88161	Tube shield	.06
88164	Tube shield cap—slotted	.01
88165	Tube shield cap—plain	.06
88436	Diaphragm gasket for R-234-D speaker	.15
88958	No. 2 x 3/8 R.H.W. Screw for escutcheon	.01
89347	Battery cable (for R-162-D)	.90
89460	Knob—for range switch	.30
89461	Knob—for range, tone, tuning & volume control	.25
89487	B & C battery cable and plug, complete (special used with B & C battery pack)	1.40
89501	Battery cable (for R-1625-D)	.80
89588	Ballast tube plug (used in place of 1R1G tube with 2 volt battery)	.30

In order to keep battery drain at a minimum, 60 milliampere dial light bulbs are used. In replacing these, be sure to use the correct type. Do not use ordinary 2.5 volt dial light bulbs as they will cause short life of the "A" battery.

Schematic, Socket, Trimmers
Voltage

MODELS 1621-D to 1629
STEWART-WARNER CORP. Chassis R-162-D

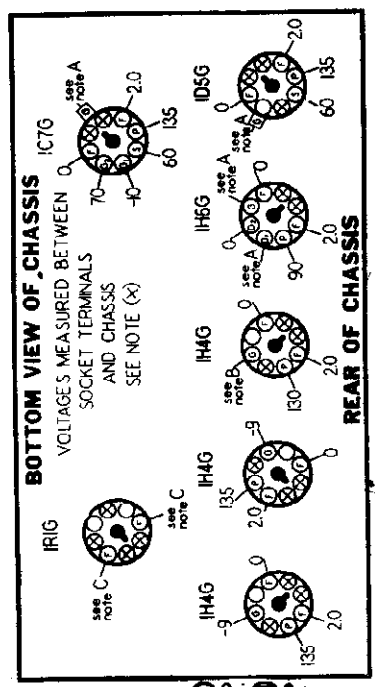


I.F. FREQUENCY
456 KC.

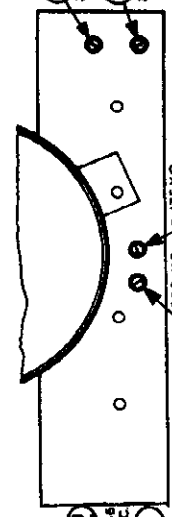
FREQUENCY RANGES
140 to 400 ... KC
540 to 1750 ... KC
2.2 to 7 ... MC

SOCKET VOLTAGES

NEW BATTERIES DIAL TUNED TO 530 KC.

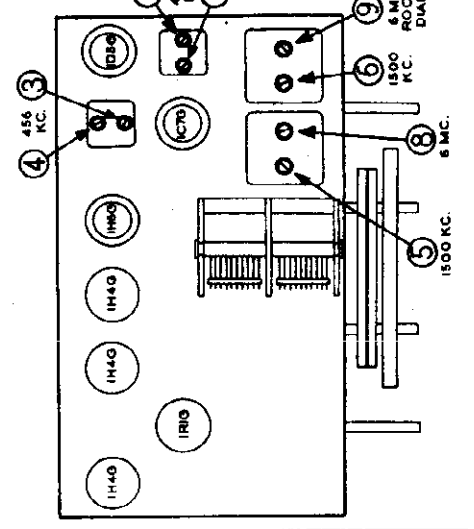


IMPORTANT: Use a high resistance voltmeter of 1,000 ohms per volt.
NOTE A: The Irid bias for the IC7G, ID5G, IH6G, and the delay voltage of the A.V.C. diode of the IH6G is -3.0 volts measured between chassis ground and the green and white cable wire.
NOTE B: The grid bias of the IH4G audio amplifier is -9.0 volts measured between chassis ground and the green and black battery cable wire.
NOTE C: This voltage will vary between 2.0 and 3.0 volts, depending upon the terminal voltage of the A battery.



ALIGNMENT

Trimmer Number	Frequency
1-2-3-4	1st and 2nd I.F. transformer trimmers... 456 KC.
5	Broadest oscillator shunt trimmer... 1500 KC.
6	Broadest antenna shunt trimmer... 1500 KC.
7	Broadest oscillator mesh trimmer... 600 KC.
8	Short wave oscillator shunt trimmer... 6 MC.
9	Short wave antenna shunt trimmer... 850 KC.
10	Long wave oscillator shunt trimmer... 200 KC.



MODELS 1621-D to 1629-D

Chassis R-162-D

Alignment, Parts, Notes

STEWART WARNER CORP

ALIGNING THE I.F. AMPLIFIER: Turn the volume control to maximum volume position and keep it in this position throughout the entire alignment procedure. Turn the range switch to the broadcast position (center position).

Connect the test oscillator output leads to the 1C7G control grid and chassis with a .1 mfd. condenser in series with the oscillator output. Set the oscillator to exactly 456 KC. Set the receiver dial at any point where it has no tuning effect or the oscillator signal.

Adjust the four I.F. trimmers, Nos. 1, 2, 3 and 4, for maximum output meter deflection, then repeat the trimmer adjustment.

BROADCAST BAND CALIBRATION AND ALIGNMENT:

With the gang condenser in full mesh, the dial pointer should be on the yellow horizontal line below 530 KC. on the dial scale.

Leave the range switch in the center position. Connect a 400 or 500 ohm carbon resistor in series with the oscillator output and the receiver antenna lead (blue wire in the back of the chassis). Connect the grounded oscillator output wire to the receiver ground lead (black wire in back of chassis).

Adjust the test oscillator to exactly 1500 KC. Tune in the 1500 KC. oscillator signal or a station above 1300 KC. on the dial and determine whether the dial calibration is correct at the high frequency end of the dial. If the calibration is correct, do not adjust the broadcast oscillator shunt trimmer No. 5. If the calibration is incorrect, adjust trimmer No. 5 to give proper calibration.

Carefully tune the receiver to the 1500 KC. oscillator signal and adjust trimmer No. 6 for maximum output.

Adjust the test oscillator to 600 KC. and tune the receiver to the signal. Adjust trimmer No. 7 for maximum output. Then try to increase the output meter reading by detuning No. 7 slightly and retuning the receiver dial. If the output goes down, detune the trimmer in the opposite direction. Continue detuning the trimmer and retuning the receiver dial until maximum output meter deflection is secured. This operation is commonly known as "rocking" and when performed as described will give maximum selectivity and sensitivity even though the dial may be slightly off calibration at 600 KC.

Repeat the adjustment of Nos. 5 and 6 at 1500 KC.

SHORT WAVE BAND CALIBRATION AND ALIGNMENT:

Turn the range switch to the short wave band (maximum counter-clockwise position).

Adjust the test oscillator to exactly 6.0 MC.

Tune in the 6 MC. oscillator signal at or near 6 MC. on the receiver dial to determine whether the receiver dial calibration is correct at 6 MC. If it is, do not adjust the short wave band oscillator shunt trimmer No. 8. If the calibration is incorrect, set the dial pointer to 6 MC. on the dial, and adjust the oscillator shunt trimmer No. 8 until the oscillator signal comes in at this point. If there are two peaks, the proper one is that with the trimmer screw farthest out.

Carefully tune the receiver to the signal and adjust trimmer No. 9 for maximum output. Then try to increase the output by detuning No. 9 slightly and retuning the receiver. Continue detuning No. 9 and retuning the receiver until the output meter deflection is a maximum.

LONG WAVE BAND CALIBRATION AND ALIGNMENT:

Turn the range switch to the long wave band position (maximum clockwise position) and adjust the test oscillator to exactly 350 KC.

Tune in the oscillator signal at or near 350 KC. on the receiver dial to determine whether the dial calibration is correct at this point. If it is, do not adjust trimmer No. 10. If the calibration is incorrect, set the receiver dial pointer to 350 KC. and adjust trimmer No. 10 for maximum output.

Carefully tune the receiver to the signal, then adjust trimmer No. 11 for maximum output.

Adjust the test oscillator to 175 KC. and tune in the signal at or near 175 KC. on the receiver dial. Adjust padder No. 12 for maximum output, then try to increase the output by detuning padder No. 12 and retuning the receiver dial.

Repeat the adjustment of trimmers Nos. 10 and 11 at 350 KC.

USE OF BALLAST PLUG

The Model R-162-D radio chassis is designed to operate with either a large 3 volt dry cell or a 2 1/4 volt Eveready Air Cell. This is possible because the 1R1G tube maintains the proper filament voltage for any battery voltage between 2 and 3 volts. The receiver is also designed to operate from a 2 volt storage cell. However, if this is done it is desirable to omit the 1R1G voltage regulator and insert a special plug in the 1R1G socket which carries our part number 89588 and has a list price of \$0.30.

USE OF B AND C BATTERY PACK

To convert the R-162-D chassis for operation with a plug-in B and C battery unit such as the Burgess No. G90 D6, a

special cable terminating in a plug that fits the socket of the B and C pack must be substituted for the regular cable. This special cable carries our part number 89487 and has a list price of \$1.40. The color codes of the old and new cables are identical. There is no green C plus wire on the new cable since the connection is made in the B and C unit.

Model R-162-D

PARTS LIST

Diagram Number	Part Number	Description	List Price
1, 2	83072	510,000 ohm 1/4 watt carbon resistor	\$0.12
3	83080	51,000 ohm 1/4 watt carbon resistor	.12
4, 5	83082	260,000 ohm 1/4 watt carbon resistor	.12
6	88286	21,000 ohm 1/4 watt carbon resistor	.12
7, 8, 9	83539	260 mmfd. mica condenser	.20
10	83783	110 mmfd. mica condenser	.20
11, 12, 13	83784	.0011 mfd. mica condenser	.25
14	84198	110,000 ohm 1/4 watt carbon resistor	.12
15	84235	1.1 megohm 1/4 watt carbon resistor	.12
16, 17	84515	Dial lamp 2 volt .06 ampere	.25
19A, 19B			
20A, 20B	85087	Dual trimmer condenser	.35
21A, 21B			
22	85454	.11 mmfd. Mica Condenser	.15
23, 24	88026	.02 mfd. 400 volt paper condenser	.25
25	88030	.01 mfd. 400 volt paper condenser	.25
26	88046	.1 mfd. 150 volt paper condenser	.25
27	88173	.50 mmfd. Mica Condenser	.20
28, 29	88189	.05 mfd. 200 volt paper condenser	.25
30	88437	Speaker diaphragm for R-234-D Speaker	1.00
	88459	Speaker diaphragm for R-235-D speaker	1.20
31	88478	Variable padding condenser	\$0.38
32	88488	Tone control—500,000 ohm	.80
33, 34	89990	.5 mfd. 150 volt paper condenser	.35
35A, 35B	89205	Gang Condenser	4.00
36	89206	Variable padding condenser	.45
37	89207	Antenna coil & shield (B.C. & S.W.) with trimmers	1.90
38	89209	Oscillator coil & shield (B.C. & S.W.) with trimmers	3.00
39	89211	Antenna coil (L.W.)	1.40
40	89212	Oscillator coil (L.W.)	1.00
41	89226	1st I.F. transformer & shield	2.50
42	89227	2nd I.F. transformer & shield	2.50
43	89228	Push pull input audio transformer	3.50
44	89275	.002 mfd. mica condenser	.10
45A		{Volume control 500,000 ohm}	
45B	89330	{Off-on line switch}	1.20
46A, 46D	89357	Range Switch	1.50
47		1R1G Voltage regulator tube	1.50
48		{R-234-D... 6 inch Magnetic speaker	5.75
		{R-235-D... 8 inch Magnetic speaker	6.50

TUNING DRIVE AND DIAL PARTS

Part Number	Description	List Price
13925	Spring washer for tuning drive shaft	\$0.05
81068	Dial drive cord—per ft.	.05
81069	Dial cord tension spring	.10
88563	Dial pointer & stud assembly	.12
88956	Dial escutcheon with glass	1.65
89174	Dial bracket and ring assembly	1.20
89175	Drive shaft	.10
89176	Retaining ring for tuning drive shaft	.02
89283	Dial lamp socket	.10
89285	Dial background	.12
89298	Dial drum and bushing assembly	.60
89353	Dial scale	1.80
89489	Dial lamp shield	.12
89799	Dial scale retaining clip	.02

MISCELLANEOUS PARTS

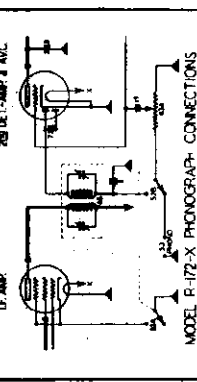
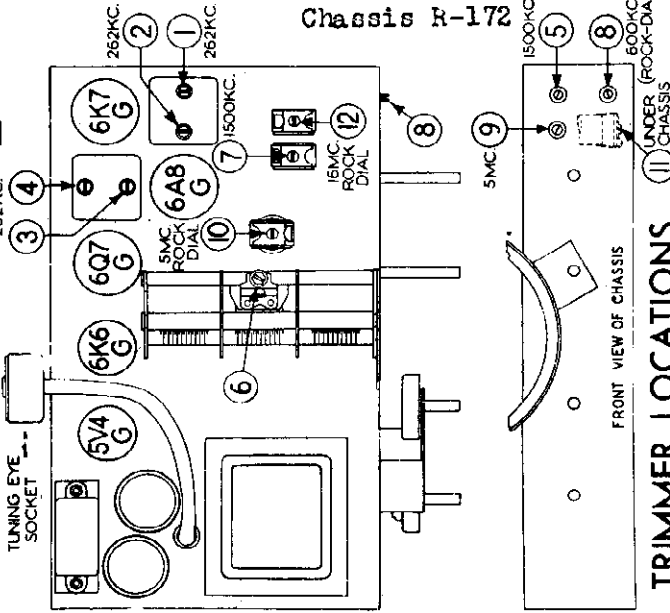
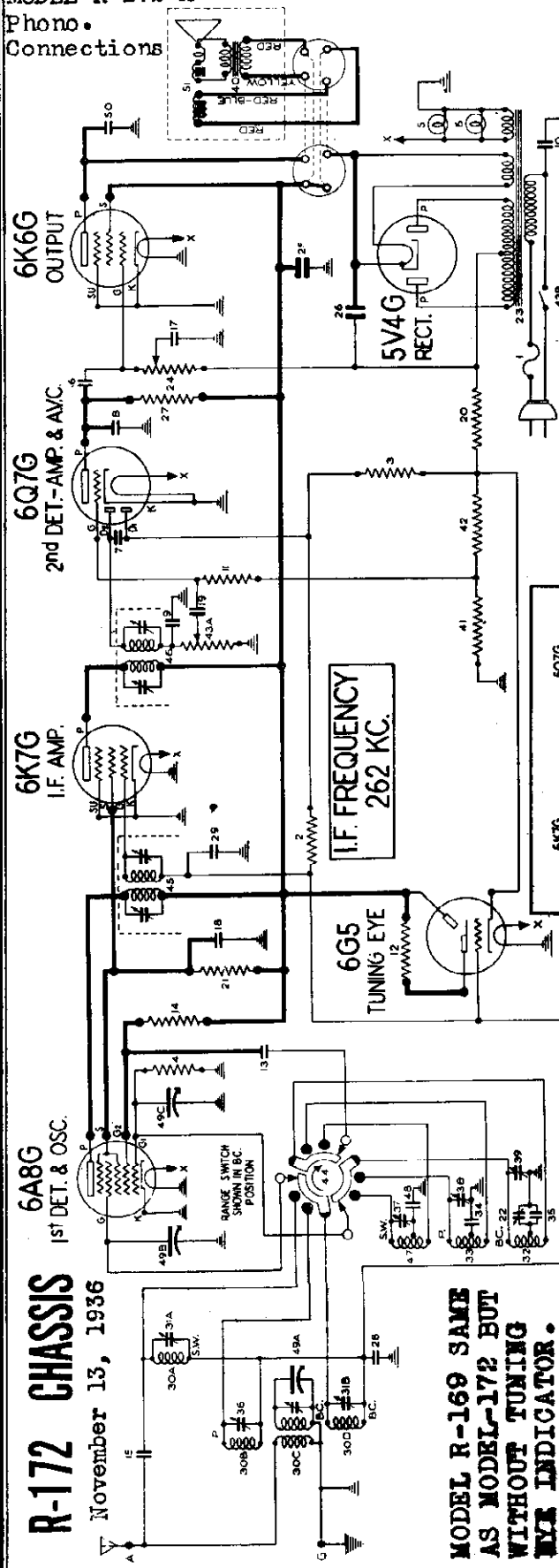
Part Number	Description	List Price
67032	Felt washer for knob, per C.	\$0.35
67590	Flat steel mounting washer	.01
84128	Chassis mounting bushing (rubber)	.05
84498	No. 10 x 1 1/4 chassis mounting screw	.02
84805	Felt washer (used with chassis mtg. screw)	.02
88161	Tube shield	.08
88164	Tube shield cap—slotted	.06
88165	Tube shield cap—plain	.06
88436	Diaphragm gasket for R-234-D speaker	.15
88928	No. 2 x 3/4 R.H.W. Screw for escutcheon	.01
89347	Battery cable (for R-1621-D)	.90
89460	Knob—for range switch	.30
89461	Knob—for range, tone, tuning & volume control	.25
89487	B & C battery cable and plug, complete (special used with B & C battery pack)	1.40
89501	Battery cable (for R-1625-D)	.80
89588	Ballast tube plug (used in place of 1R1G tube with 2 volt battery)	.30

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Schematic, Socket, Trimmers
Voltage, Notes
MODEL R-172-X
Phono.
Connections

STEWART-WARNER CORP.

MODELS 1691 to 1695
Chassis R-169
MODELS 1721 to 1729
Chassis R-172

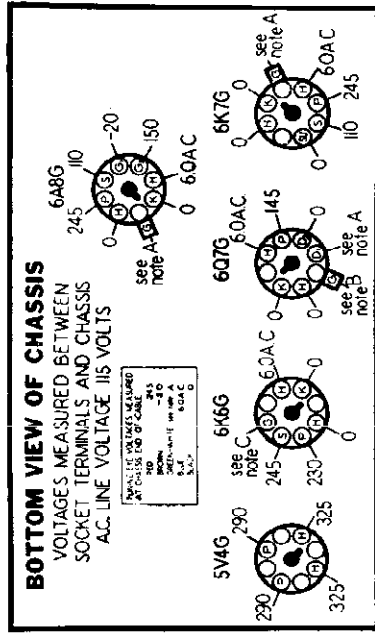


TUNING RANGE
525 KC to 18.1 MC

Trimmer Number	Alignment Frequency
1.	2nd I.F. transformer trimmer..... 262 KC.
2.	2nd I.F. transformer trimmer..... 262 KC.
3.	1st I.F. transformer trimmer..... 262 KC.
4.	1st I.F. transformer trimmer..... 262 KC.
5.	Broadcast oscillator shunt trimmer..... 1500 KC.
6.	Broadcast antenna shunt trimmer..... 1500 KC.
7.	Broadcast detector shunt trimmer..... 1500 KC.
8.	Broadcast oscillator series trimmer..... 600 KC.
9.	Police antenna shunt trimmer..... 5 MC.
10.	Police antenna shunt trimmer..... 5 MC.
11.	Short wave oscillator shunt trimmer..... 16 MC.

ALIGNMENT

SOCKET VOLTAGES
VOLUME CONTROL ON FULL RANGE SWITCH SET ON BROADCAST POSITION
ANTENNA GROUNDED
DIAL TUNED TO 530 KC.



MODEL R-169 SAME AS MODEL-172 BUT WITHOUT TUNING INDICATOR.

R-172 CHASSIS

November 13, 1936

REAR OF CHASSIS

IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt.
NOTE A: The grid bias for the 6A8G, 6K7G, and the anode voltage of the AVC section of the 6Q7G is —3 volts measured across resistors 41 and 42.
NOTE B: The grid bias for the audio section of the 6Q7G is —2 volts measured across resistor 41.
NOTE C: The grid bias for the 6K6G output tube is —18 volts meas.

MODELS 1691 to 1695
 Chassis R-169
 MODELS 1721 to 1729
 Chassis R-172
 Alignment, Parts

STEWART-WARNER CORP.

CALIBRATION AND ALIGNMENT

ALIGNING EQUIPMENT: For proper alignment, an output meter and an accurately calibrated oscillator with a tuning range from 262 KC. to 16 MC. are required.

Connect the output meter from the plate of the output tube to chassis. A convenient point to make the plate connection is to the yellow wire on the speaker socket.

ALIGNING THE I. F. AMPLIFIER: Turn the volume control to maximum volume position and keep it in this position throughout the entire alignment procedure. Turn the range switch to the broadcast position (fully clockwise).

Connect the test oscillator output leads to the 6A8 control grid and chassis with a .1 mfd. condenser in series with the oscillator output. Set the oscillator to exactly 262 KC. Set the receiver dial at any point where it has no tuning effect on the oscillator signal.

Adjust the four I.F. trimmers, Nos. 1, 2, 3 and 4, for maximum output meter deflection, then repeat the trimmer adjustment.

BROADCAST BAND CALIBRATION AND ALIGNMENT

With the gang condenser in full mesh, the dial pointer should be on the white horizontal line below 530 KC. on the dial scale. If it does not, hold the dial gear and turn the pointer to the correct position.

Turn the range switch to the extreme clockwise position and connect the test oscillator output to the A and C terminals of the receiver with a 400 ohm carbon resistor in series with the A terminal and the oscillator output.

Adjust the test oscillator to exactly 1500 KC.

Tune in the 1500 KC. oscillator signal or a station above 1300 KC. on the dial and determine whether the dial calibration is correct at the high frequency end of the dial. If the calibration is correct, do not adjust the broadcast oscillator shunt trimmer No. 5. If the calibration is incorrect, adjust trimmer No. 5 to give proper calibration.

Carefully tune the receiver to the signal and adjust trimmers Nos. 6 and 7 for maximum output.

Adjust the test oscillator to 600 KC. and tune the receiver to the signal. Adjust trimmer No. 8 for maximum output. Then try to increase the output meter reading by detuning No. 8 slightly and retuning the receiver dial. If the output goes down, detune the trimmer in the opposite direction. Continue detuning the trimmer and retuning the receiver dial until maximum output meter deflection is secured. This operation is commonly known as "rocking" and when performed as described will give maximum selectivity and sensitivity even though the dial may be slightly off calibration at 600 KC.

POLICE BAND CALIBRATION AND ALIGNMENT

Turn the range switch to the center position. Adjust the test oscillator to exactly 5.0 MC. Tune in the 5 MC. oscillator signal at or near 5 MC. on the receiver dial to determine whether the receiver dial calibration is correct at 5 MC. If it is, do not adjust police band oscillator shunt trimmer No. 9. If the calibration is incorrect, set the dial pointer to 5 MC. on the dial, and adjust the oscillator shunt trimmer No. 9 until the oscillator signal comes in at this point. If there are two peaks, the proper one is that with the trimmer screw farthest out.

Carefully tune the receiver to the signal and adjust trimmer No. 10 for maximum output. Then try to increase the output by detuning No. 10 slightly and retuning the receiver dial. Continue detuning No. 10 and retuning the dial until the output meter deflection is a maximum.

SHORT WAVE BAND CALIBRATION AND ALIGNMENT

Turn the range switch to the extreme counter-clockwise position. Set the test oscillator to 16 MC. Tune in the 16 MC. oscillator signal at 16 MC. on the receiver dial to determine whether the receiver dial calibration is correct at 16 MC. If it is, do not adjust the short wave band oscillator shunt trimmer No. 11. If the calibration is incorrect, set the receiver dial pointer exactly at 16 MC. and adjust the oscillator shunt trimmer No. 11 until the oscillator signal comes in at this point.

Check to see that it has been adjusted to the proper peak by tuning the receiver to approximately 15.5 MC. A repeat signal should be heard at this point. If none is present, even with greatly increased oscillator output, retune the receiver to 16 MC. and adjust trimmer No. 11 to the proper peak with the trimmer screw farther out.

Carefully tune the receiver to the signal and adjust trimmer No. 12 to a peak. Then try to increase the output by detuning the trimmer slightly and retuning the dial until a maximum output meter deflection is secured. Check the adjustment by tuning the receiver to the image at about 15.5 MC. The image should be much weaker than the 16 MC. signal. If the signal at 15.5 MC. dial setting is equal to or stronger than the 16 MC. signal, trimmer No. 12 is not set to the proper peak. Turn the trimmer in a turn or so, then readjust as above.

Diagram Number	Part Number	Description	List Price
1	38841	Fuse, 1 amp., 250 volt.	\$0.10
2-8	83072	510,000 ohm 1/4 watt carbon resistor.	.12
4	83080	51,000 ohm 1/4 watt carbon resistor.	.12
5-6	83278	Dial lamps	.15
7-8	83539	260 mmfd. mica condenser.	.20
9	83783	110 mmfd. mica condenser.	.20
10	83976	.012 mfd. 1000 volt shielded condenser.	.40
11-12	84235	1.1 megohm 1/4 watt carbon resistor.	.12
13	85061	51 mmfd. mica condenser.	.15
14	85142	21,000 ohm 1/4 watt carbon resistor.	.15
15	85454	11 mmfd. mica condenser.	.15
16	88026	.02 mfd. 400 volt paper condenser.	.25
17	88030	.01 mfd. 400 volt paper condenser.	.25
18	88046	1 mfd. 150 volt paper condenser.	.25
19	88189	.05 mfd. 200 volt paper condenser.	.25
20	88363	270 ohm 1 watt carbon resistor.	.15
21	88464	26,000 ohm 1 watt carbon resistor.	.15
22	88478	Padding condenser	.39
23	88481	Power transformer (115 volt-60 cycle)	5.00
24	88488	Tone control-500,000 ohm	.80
25	88511	16 mfd. 300 volt electrolytic condenser.	1.10
26	88512	16 mfd. 400 volt electrolytic condenser.	1.10
27	88532	210,000 ohm 1/4 watt carbon resistor.	.12
28, 29	88534	.05 mfd. 150 volt condenser (low loss)	.25
30A to D	88648	Antenna and preselector coil assembly	2.30
31A-31B	88653	Dual trimmer condenser	.30
32	88660	Oscillator coil (H.C.)	.60
33	88665	Oscillator coil (Police)	.58
34	88681	.00255 mfd. mica condenser	.30
35	88686	200 mmfd. mica condenser	\$0.14
36-7	88688	Trimmer condenser	.12
38-39	88796	Output transformer for R-248A spher.	2.50
40	88912	Output transformer for R-247-A spher.	2.00
41	88920	35 ohm 1/2 watt wire wound resistor.	.12
42	89116	20 ohm 1/2 watt wire wound resistor.	.12
43A	89606	Volume control-250,000 ohm	1.20
43B		A.C. line switch	
44	89607	Range switch	1.25
45	89608	1st I.F. transformer	2.40
46	89609	2nd I.F. transformer	2.25
47	89615	Oscillator coil (S.W.)	.75
48	89635	.00495 mfd. mica condenser	.50
49A to C	89649	Gang condenser	5.00
	89653	262 KC. wave trap (apl. for service only)	1.50
50	89826	.004 mfd. 750 volt paper condenser.	.24
51	R-247-A	8 inch dynamic speaker	9.90
51	R-248-A	12 inch dynamic speaker	11.50

MODEL R-172-X PARTS

52A & 52B	84404	Phonograph toggle switch	\$1.10
1	88055	Fuse, 1/2 amp., used for line voltages of 200 to 240 volts.	.12
23	89216	Power transformer (100-240 volts, 25-133 cycles)	11.50
33	89709	Phonograph terminal strip	.15

TUNING DRIVE AND DIAL PARTS

Part Number	Description	List Price
88564	Pointer and stud assembly	\$0.12
88743	Dial drive shaft	.15
88744	Dial drive shaft retainer spring	.05
88745	Dial ring and bracket assembly (for edge lighting)	.90
88748	Dial disc and backing assembly	1.65
88956	Escutcheon with glass	.10
89283	Dial lamp socket	.02
89284	Dial lamp shield	.02
89285	Dial background	.12
89600	Dial scale	1.90
89799	Dial scale retaining clip	.02

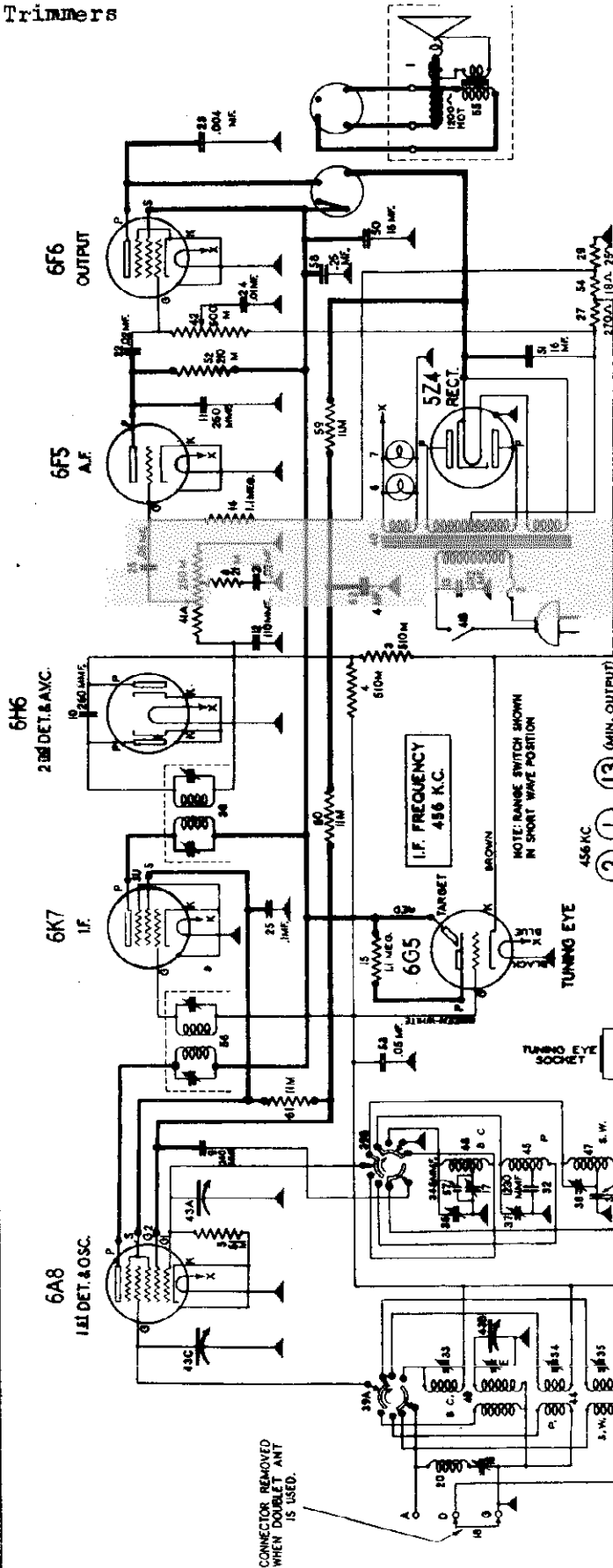
MISCELLANEOUS PARTS

Part Number	Description	List Price
67032	Felt washer for back of knob-per C.	\$0.35
67568	Embossed washer for 88512 electrolytic condenser.	.05
67598	Flat steel mounting washer	.01
84428	Rubber mounting backing for chassis	.05
84805	No. 10 x 1 1/2 chassis mounting screw	.01
84981	Felt washer (used with mounting screw)	.05
84982	Tube shield (plain section)	.08
84982	Tube shield (slotted section)	.08
84983	Spring ring for tube shields	.05
85785	Terminal strip (antenna and ground)	.15
89056	Fuse mounting strip	.08
89057	Fuse cover	.08
88631	Speaker cable plug	.06
88675	Speaker socket	.15
88622	Speaker mounting screw for 1691A (ornamental head)	.02
88958	No. 2 x 3/8 R.H.W. escutcheon screw	.01
88983	Knob (for tone, tuning and volume control)	.18
88984	Knob (for range switch)	.20

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

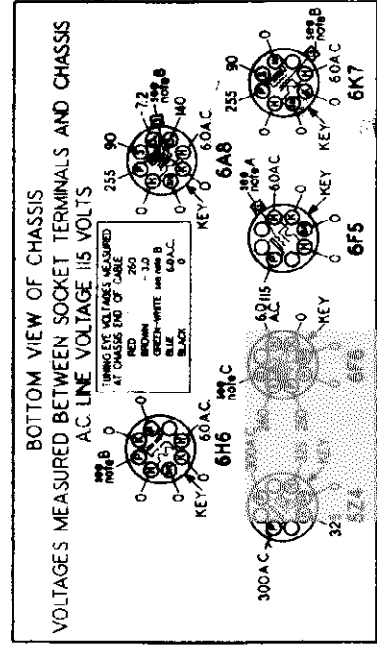
Schematic, Socket
Voltage
Trimmers

STEWART-WARNER CORP.

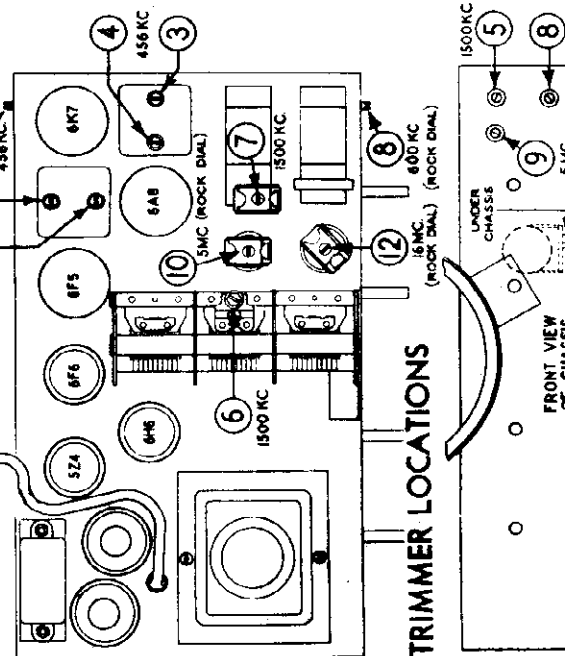


SOCKET VOLTAGES

VOLUME CONTROL ON FULL
RANGE SWITCH SET ON BROADCAST POSITION
ANTENNA GROUNDED
DIAL TUNED TO 530 KC.



NOTE A: The grid bias for the 6G5 is —1.3 volts measured across resistor 29.
NOTE B: The grid bias for the 6A8, 6F5, and the anode voltages of the A.V.C. section of the 6H6 is —3.0 volts measured across resistors 29 and 34.



ALIGNMENT

Trimmer Number	Description	Alignment Frequency
1.	2nd I.F. transformer trimmer	456 KC.
2.	2nd I.F. transformer trimmer	456 KC.
3.	1st I.F. transformer trimmer	456 KC.
4.	1st I.F. transformer trimmer	456 KC.
5.	Broadcast oscillator shunt trimmer	1500 KC.
6.	Broadcast antenna shunt trimmer	1500 KC.
7.	Broadcast detector shunt trimmer	1500 KC.
8.	Broadcast oscillator series padder	600 KC.
9.	Police oscillator shunt trimmer	5 MC.
10.	Police antenna shunt trimmer	5 MC.
11.	Short wave oscillator shunt trimmer	16 MC.
12.	Short wave antenna shunt trimmer	16 MC.
13.	Wave-trap trimmer	456 KC.

MODELS 1731 to 1739
Chassis R-173
Alignment, Parts

STEWART-WARNER CORP.

MODEL R-173-X
Phono. Connections, Parts

MODEL R-173 PARTS LIST

Diagram Number	Part Number	DESCRIPTION	List Price
1	(R-247-A)	8" Dynamic Speaker	\$9.00
2	(R-248-A)	12" Dynamic Speaker	11.50
3	38811	Fuse, 1 ampere	.10
3-1	83072	510,000 ohm 1/4 watt carbon resistor	.12
5	83080	51,000 ohm 1/4 watt carbon resistor	.12
6-7	83278	Pilot lamp, 6-0 volt	.15
8	83286	21,000 ohm 1/4 watt carbon resistor	.12
9-10-11	83539	260 mmfd. mica condenser	.20
12	83783	110 mmfd. mica condenser	.20
13	83976	.012 mfd. 1000 v. shielded condenser	.40
14-15	84235	1.1 megohm 1/4 watt carbon resistor	.12
16	85285	Wave trap trimmer	.40
17	85285	Padding trimmer	.40
18	85321	Ground connector	.01
20	88014	Wave trap coil	.50
21-22	88026	.02 mfd. 400 v. paper condenser	.50
23	89826	.004 mfd. 750 v. paper condenser	.24
24	88030	.01 mfd. 400 v. paper condenser	.30
25	88046	1 mfd. 150 v. paper condenser	.30
26	88189	.05 mfd. 200 v. paper condenser	.25
27	88463	.270 ohm 1 watt carbon resistor	.15
29	88465	.25 ohm 1/2 watt wire wound resistor	.15
56	88466	1st I.F. Transformer	2.40
30	88468	2nd I.F. Transformer	2.40
31	88472	3860 mmfd. mica condenser	.50
32	88473	1230 mmfd. mica condenser	.25
33-34-35 36-37-38	88477	Trimmer condenser	.12
39A & B	88480	Range switch	1.90
40	88481	Power transformer, 115 v. 60 cycle	5.00
41-A	88487	{ Volume control (250,000 ohm) }	1.25
41-B	88487	{ A. C. line switch }	
42	88488	Tone control (500,000 ohm)	.80
13A to C	89619	Three gang condenser	5.00
14	88499	Antenna coil (Police)	.85
15	88501	Oscillator coil (Police)	.65
16	88502	Antenna coil (S.W.)	.80
17	88504	Oscillator coil (S.W.)	.80
18	88506	Oscillator coil (B.C.)	.85
19	88507	Antenna coil (B.C.)	.85
20	88511	16 mfd. 300 v. electrolytic condenser	1.10
51	88512	16 mfd. 400 v. electrolytic condenser	1.10
52	88532	210,000 ohm 1/4 watt carbon resistor	.12
53	88534	.05 mfd. 150 v. condenser (low loss)	.25
54	88581	18 ohm 1/2 watt wire wound resistor	.15
55	88796	Output transformer (on R-248-A speaker)	2.50
56	88912	Output transformer (on R-247-A speaker)	2.00
57	89564	315 mmfd. mica condenser	.40
58	89643	.25 mfd. 300 volt paper condenser	.50
43A to C	89649	Three gang condenser	5.00
59-60	89751	11,000 ohm 1 watt carbon resistor	.12
61	89753	11,000 ohm 1/2 watt carbon resistor	.12
62	89755	4 mfd. 250 volt electrolytic condenser	1.00
23	89826	.004 mfd. 750 v. paper condenser	.24

ALIGNING THE I. F. AMPLIFIER: Turn the volume control to maximum volume position and keep it in this position throughout the entire alignment procedure. Turn the range switch to the broadcast position (fully clockwise).

Connect the test oscillator output leads to the 6A8 control grid and chassis with a .1 mfd. condenser in series with the oscillator output. Set the oscillator to exactly 456 KC. Set the receiver dial at any point where it has no tuning effect on the oscillator signal.

Adjust the four I.F. trimmers Nos. 1, 2, 3 and 4, for maximum output meter deflection, then repeat the trimmer adjustment.

BROADCAST BAND CALIBRATION AND ALIGNMENT:

With the gang condenser in full mesh, the dial pointer should be on the white horizontal line below 530 KC. on the dial scale.

Turn the range switch to the extreme clockwise position and connect the test oscillator output to the A and G terminals of the receiver with a 400 ohm carbon resistor in series with the A terminal and the oscillator output.

Adjust the test oscillator to exactly 1500 KC. and turn the receiver dial pointer to 1500 KC. on the tuning dial. To calibrate the dial, adjust trimmer No. 5 for maximum output.

Carefully tune the receiver to the signal and adjust trimmers Nos. 6 and 7 for maximum output.

Adjust the test oscillator to 600 KC. and tune the receiver to the signal. Adjust trimmer No. 8 for maximum output. Then try to increase the output meter reading by detuning No. 8 slightly and retuning the receiver dial. If the output goes down, detune the trimmer in the opposite direction. Continue detuning the trimmer and retuning the receiver dial until maximum output meter deflection is secured. This operation is commonly known as "rocking" and when performed as described will give maximum selectivity and sensitivity even though the dial may be slightly off calibration at 600 KC.

WAVE-TRAP ADJUSTMENT: The wave-trap adjusting trimmer, No. 13, is located on the back of the chassis. Leave the test oscillator connected to the A and G terminals through a 400 ohm resistor and set the oscillator at 456 KC. Then adjust the wave-trap trimmer No. 13 for minimum output. If some particular station with a frequency near 456 KC. causes code interference, it may be desirable to adjust the wave-trap on the actual frequency of the interfering station.

Check the adjustment of trimmers 5, 6, and 7 at 1500 KC.

BAND NO. 2 CALIBRATION AND ALIGNMENT: Turn the range switch to the center position.

Adjust the test oscillator to exactly 5.0 MC. and turn the receiver dial pointer to exactly 5.0 MC. on the tuning dial.

To calibrate the dial, adjust trimmer No. 9 for maximum output. If two peaks are found, the proper one is that with the trimmer screw farthest out.

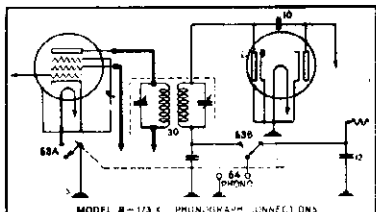
Carefully tune the receiver to the signal and adjust trimmer No. 10 for maximum output. Then try to increase the output by detuning No. 10 slightly and retuning the receiver dial. Continue detuning No. 10 and retuning the dial until the output meter deflection is a maximum.

BAND NO. 3 CALIBRATION AND ALIGNMENT: Turn the range switch to the extreme counter-clockwise position. Be sure the D and G terminals on the antenna terminal strip are connected together.

Set the test oscillator to 16 MC. and turn the receiver dial pointer to exactly 16 MC. on the tuning dial.

To calibrate the dial, adjust trimmer No. 11 for maximum output. Check to see that it has been adjusted to the proper peak by tuning the receiver to approximately 15.1 MC. A repeat signal should be heard at this point. If none is present, even with greatly increased oscillator output, retune the receiver to 16 MC. and adjust trimmer No. 11 to the proper peak with the trimmer screw farther out.

Carefully tune the receiver to the signal and adjust trimmer No. 12 to a peak. Then try to increase the output by detuning the trimmer slightly and retuning the dial until a maximum output meter deflection is secured. Check the adjustment by tuning the receiver to the image at about 15.1 MC. The image should be much weaker than the 16 MC. signal. If the signal at 15.1 MC. dial setting is equal to or stronger than the 16 MC. signal, trimmer No. 12 is not set to the proper peak. Turn the trimmer in a turn or so, then readjust as above.



R-173-X PARTS

63A & B	84104	Phonograph toggle switch	\$1.30
2	84053	Fuse, 1/2 amp. (Use on line voltages of 200 to 240)	.12
40	89216	Power transformer 100 to 240 volt, 25 to 133 cycles	11.50
64	89709	Phonograph terminal strip	.15

MISCELLANEOUS PARTS NOT SHOWN IN CIRCUIT DIAGRAM

Part Number	DESCRIPTION	List Price
67590	Flat steel mtg. washer	\$.01
67568	Embossed washer for 88512 electrolytic condenser	.05
84428	Rubber chassis mtg. bushing	.03
84493	No. 10 x 1 1/4 chassis mtg. screw	.02
84805	Felt washer (Used with chassis mtg. screw)	.01
89069	G.D.A. terminal strip	.20
88056	Fuse mounting	.08
88057	Fuse cover	.08
88675	Speaker socket	.15
88958	No. 2 x 3/8 wood screw for eusuthenon (each)	.01
89038	Knob, volume, tune & tuning control	.20
89119	Tuning eye cable and plug	1.50
89749	Knob, range switch	.20

TUNING DRIVE AND DIAL PARTS

Part Number	DESCRIPTION	List Price
81068	Dial drive cord (per ft.)	\$.05
81069	Tension spring for drive cord	.10
81145	Spring clip for pointer shaft	.10
88956	Eusuthenon with glass	1.65
88998	Second pointer	.05
89283	Pilot lamp socket	.10
89284	Pilot lamp shield	.02
89514	Dial drum bushing and gear	1.25
89660	Dial scale	1.80
89669	Dial ring bracket and shaft assembly	2.50
89675	Dial background	1.12
89693	Main pointer and second pointer shaft assembly	.50
89698	Pointer and stud	1.11

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**MODEL Firestone R-1431 Auto
Alignment, Parts**

STEWART-WARNER CORP.

The signal picked up by the antenna is carried to the receiver from the lead-in by means of a specially designed transmission line (No. 46 in the diagram). The effect of this transmission line when properly installed is to reduce ignition interference. It accomplishes this result by eliminating a large part of the car chassis from the receiver antenna circuit. **NOTE:** This antenna lead must not be cut, since cutting would destroy its effectiveness in minimizing ignition noise pickup in the antenna circuit.

The signal is fed through an antenna filter to the primary of the antenna transformer. The filter cut-off occurs at a frequency slightly above the broadcast band where it is most effective in removing any ignition interference picked up by the antenna.

The antenna transformer is wound on a special iron core, the effect of which is to diminish noise by increasing the signal to-noise ratio.

The signal is then tuned and amplified in an R. F. stage using a 6D6 tube. Further amplification and frequency conversion to 177.5 KC. take place in the 77 combination first detector and oscillator tube. The 177.5 KC. signal is amplified in the I.F. stage which uses a 6D6 tube and is then rectified in the diode section of the 75 second detector tube.

The rectified current produces a modulated D.C. voltage across the diode load resistor. (No. 4 in the circuit diagram). In order to obtain more quiet tuning between stations, a small detection delay or "squelch" is provided by returning the diode load resistor to the midpoint of the second detector bias resistance. This point is approximately 3/4 volt lower in potential than the cathode.

The audio component of the rectified voltage appears across the 500,000 ohm volume control resistor. Any part or all of this signal may be impressed on the triode section of the 75 tube where audio amplification takes place. The triode section of the 75 is resistance coupled to the 41 output tube. Bias for the 41 tube is obtained by grid return connection to the ungrounded end of the filter choke which is connected in the B-lead.

The modulated drop across resistor No. 4 is filtered and applied to the grid returns of the 6D6 R.F. and I.F. tubes to provide A.V.C.

CALIBRATION AND ALIGNMENT

A good modulated oscillator and a sensitive output meter are necessary for proper calibration and alignment of the R.F. and I.F. stages of this receiver. The output of the test oscillator must be adjustable to give a very weak signal which will not actuate the A.V.C. of the receiver. The output meter must be sensitive enough to give sufficient reading with such a weak signal.

The output meter may be conveniently connected between the chassis and the yellow lead terminal on pilot light and tone control lead socket. You will find that the yellow lead is connected through an .02 mfd. condenser to the plate of the 41 output tube. However, if the output meter is suitable, it should be connected across the speaker voice coil.

During all calibration and alignment adjustments, keep the volume control full on.

I. F. ALIGNMENT

The I.F. trimmers are located on top of the I.F. transformers which may be reached by removing the receiver top cover. Pull out the antenna plug. The test oscillator should be set to exactly 177.5 KC. and connected from the control grid of the 77 to ground. Adjust the test oscillator output to give about half-scale reading of the output meter. Tune the set to make certain that no station signal is tuned in, since this would affect the output meter reading. Adjust all three I.F. trimmers to give maximum output reading.

In adjusting the I.F. transformer trimmers, it is desirable to use a bakelite screw driver or one having only a small metal tip. After the I.F. trimmers have been aligned once, go back and repeat the procedure, since any adjustment of one will affect the others to some extent.

DIAL CALIBRATION

The dial of the control head is calibrated in kilocycles except that one zero is omitted. Sets using the steering column control head or the Ford dash control head are calibrated as follows:

Tune in a station of known frequency between 800 and 1100 KC. Loosen the set screw in the right hand knob and remove the knob. Loosen the set screw in the knob shaft, and by rotating the knob shaft, turn the pointer until it indicates the frequency of the station which has been tuned in. Then re-tighten the set screw and replace the knob.

If the set is used with a dash control head other than that for the Ford, calibrate as follows:

Turn the knob to the right as far as it will go, and then turn it to the end in the other direction. It is necessary

to continue to turn the knob after the dial pointer reaches the end stop, until the knob will turn no farther.

If the set is badly out of calibration, so that when the dial reads correctly at the low frequency end, it is off at the high frequency end, it will be necessary to adjust the oscillator shunt trimmer as explained below. The oscillator shunt trimmer is located on the oscillator section of the gang condenser which can be reached when the receiver bottom cover is removed. Connect a .00025 mfd. mica condenser in series with the output of the test oscillator and the antenna lead of the receiver. This condenser is essential to the proper adjustment of the antenna stage. Set the test oscillator to exactly 600 KC. Tune the receiver to maximum output. If the control head is of the steering column or Ford dash control type, calibrate at the low end of the dial by setting the pointer to read exactly 60 (600 KC.).

Set the test oscillator to exactly 1400 KC. Turn the gang condenser by means of the tuning knob until the dial pointer indicates 140 (1400 KC.). Adjust the oscillator shunt trimmer (on gang condenser section third from shaft end) for maximum output. Adjust the two trimmers nearest the shaft end as explained under R.F. alignment.

R. F. ALIGNMENT

With the test oscillator set to approximately 1400 KC., tune the set very carefully for maximum output.

Adjust the output of the test oscillator to the minimum value which will give sufficient output meter deflection. Adjust the two trimmers nearest to the shaft end of the gang condenser to give maximum output meter reading.

R-1431 PARTS LIST

Diag. No.	Part No.	DESCRIPTION	List Price
1	66023	60,000 ohm 1 watt carbon resistor.....	\$0.25
2	67303	2,000 ohm 1/4 watt carbon resistor.....	.25
3	83060	51,000 ohm 1/4 watt carbon resistor.....	.30
4	88082	260,000 ohm 1/4 watt carbon resistor.....	.20
5	83539	260 mmfd. mica condenser.....	.25
6	84198	110,000 ohm 1/4 watt carbon resistor.....	.30
7	84235	1.1 megohm 1/4 watt carbon resistor.....	.20
8	84238	11,000 ohm 1/4 watt carbon resistor.....	.20
9	84282	.001 mfd. mica condenser.....	.25
10	84835	70 mmfd. mica condenser.....	.20
11	88296	Pilot lamp 6-8 volt (bayonet base).....	.18
12	88026	.02 mfd. 400 volt paper condenser.....	.30
13	88156	Vibrator.....	3.50
14	88170	10 mfd. 25 volt electrolytic condenser.....	.80
15A)	88171	{Volume control 300.00 ohm}	1.20
15B)		{Line switch}	
16	88172	Antenna Filter.....	1.20
17	88173	50 mmfd. mica condenser.....	.20
18	88181	R. F. choke coil.....	.40
19	88183	R. F. choke coil (to vibrator).....	3.50
20	88185	.006 mfd. 600 volt paper condenser.....	.35
21	88187	.01 mfd. 1500 volt paper condenser.....	.40
22	88189	.05 mfd. 200 volt paper condenser.....	.35
23	88191	.1 mfd. 300 volt paper condenser.....	.35
24	88193	.25 mfd. 150 volt paper condenser.....	.35
25	88195	.5 mfd. 150 volt paper condenser.....	.50
26	88203	600 ohm 1/4 watt carbon resistor.....	.15
27	88204	210 ohm 1/2 watt carbon resistor.....	.15
28	88205	.0021 mfd. mica condenser.....	\$0.25
29	88210	Filter choke.....	1.25
30	88213	Power transformer.....	2.75
31	88222	1st I.F. transformer.....	2.60
32	88225	2nd I.F. transformer.....	2.60
33	88233	110 mmfd. mica condenser.....	.25
34	88234	Oscillator coil and shield assembly.....	1.50
35	88239	"A" filter.....	1.00
36	88250	R.F. coil and shield assembly.....	1.50
37A)	88256	{Electrolytic condenser 4 mfd. 350 volt}	2.40
37B)		{Electrolytic condenser 8 mfd. 350 volt}	
38	88257	9,500 ohm 1/4 watt carbon resistor.....	.15
39A to C)	88258	Three gang variable condenser.....	6.00
40	88274	Field coil and housing (for R-245-A spkr.).....	2.50
41	88276	Output transformer.....	2.00
42	88285	1.25 mfd. 150 volt paper condenser.....	.30
43	88289	R.F. choke (to filaments).....	.20
44	88298	.25 mfd. 150 volt paper condenser (low reactance).....	.40
45	88312	Antenna coil and shield assem. (iron core).....	3.00
46	88327	Antenna cable and plug.....	1.10
47	88328	Diaphragm and shell assem. (R-345-A spkr.).....	2.10
48	88339	Pilot light and tone control cable with plug.....	3.90
49	88364	Control head lens shell, knobs and shafts.....	3.50
50	88365	Fuse, 10 amperes.....	.05
	88777	Battery lead and fuse housing.....	.50
12412		Split lockwasher for receiver mounting.....	\$0.02
17166		Hex nut for receiver mounting 1/2" - 13.....	.08
84990		Receiver mounting plate.....	.60
88012		Receiver mounting bolt, 1/2" - 13 x 2".....	.06
88326		Complete accessories for installation.....	3.25
88335		Shakeproof lockwasher for receiver mounting.....	.04
88336		Large flat washer for receiver mounting.....	.04
88319		Fuse insulator tube.....	.02
88777		Battery lead and fuse housing.....	.50
88159		Vibrator shield.....	.35
88161		Tube shield half section (short).....	.08
88162		Tube shield half section (long).....	.08
88164		Tube shield cap (long).....	.06
88165		Tube shield cap (short).....	.06
88297		Speaker mounting screw #8 - 32 special head.....	.02
88319		Self tapping screw #8 x 1/4" for receiver cover mtg.....	.02
88321		Receiver case assembly (less covers).....	5.00
88327		Antenna cable.....	1.10
88330		Receiver case cover with tube location label.....	1.00
88350		Interference filter condenser with bracket, .5 mfd., 150 V.....	.70

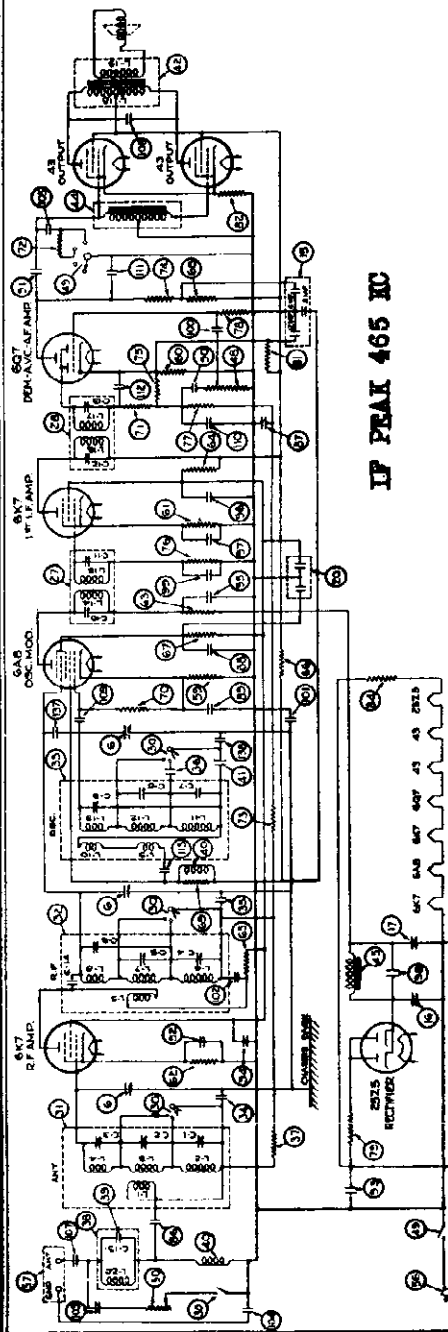
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STROMBERG-CARLSON TEL. MFG. CO. Schematic, Parts

MODELS 126H, 126L

Tuning Ranges ----- A—540 to 1500 Kc.; B—1450 to 3500 Kc.; C—5600 to 18,000 Kc.
 Number and Types of Tubes ----- 2 No. 6K7, 1 No. 6A8, 1 No. 6Q7, 2 No. 43, 1 No. 25Z5
 Power Supply Voltage ----- 105 to 125 Volts
 Power Supply Frequency (For AC Operation) ----- 50 to 60 Cycles
 Input Power Rating ----- 55 Watts
 Frequency of Intermediate Amplifier ----- 465 Kilocycles

No. 126-H...50 to 60 Cycles; P-26844 Chassis Assembly; P-26886 Loud Speaker
 No. 126-L...50 to 60 Cycles; P-26844 Chassis Assembly; P-26887 Loud Speaker



IP PEAK 465 KC

Item Number	Part	Quantity	Part Number
16	Dial Assembly	1	26837
17	Gang Tuning Capacitor Assembly	1	26838
18	Lamp Socket Assembly	1	26839
19	Bracket (Chassis Spacer)	1	26840
20	Pilot Lamp	1	26841
21	Electrolytic Capacitor Assembly, 4 Mf., 150 Volts; 4 Mf., 100 Volts; 10 Mf., 25 Volts	1	26842
22	Electrolytic Capacitor, 40 Mf.	1	26843
23	Electrolytic Capacitor, 40 Mf.	1	26844
24	1st I. F. Transformer	1	26845
25	End I. F. Transformer	1	26846
26	Range Switch	1	26847
27	Coil Assembly, Antenna	1	26848
28	Coil Assembly, R. F.	1	26849
29	Coil Assembly, Oscillator	1	26850
30	Capacitor, .005 Mf.	1	26851
31	Capacitor, .003 Mf.	1	26852
32	Resistor, Type "E", .1 Megohm	1	26853
33	Coil Assembly (Wave Trap)	1	26854
34	Capacitor, .005 Mf.	1	26855
35	Coil Assembly, R. F. Choke, 5 Millihenrys	1	26856
36	Transformer, Audio Output	1	26857
37	Transformer, Audio Input	1	26858
38	Choke Assembly (Filter of Rectifier)	1	26859
39	Potentiometer (Volume Control)	1	26860
40	Switch ("Off-On" and Tone Control)	1	26861
41	Potentiometer (Sensitivity Control)	1	26862
42	Knob (For Sensitivity Control)	1	26863
43	Socket, 8 Prong	1	26864
44	Socket, 8 Prong	1	26865
45	Cord, Power Supply	1	26866
46	Resistor, Type "E", 270 Ohms	1	26867
47	Resistor, Type "E", 500 Ohms	1	26868
48	Resistor, Type "E", 470 Ohms	1	26869
49	Resistor, Type "E", 680 Ohms	1	26870
50	Resistor, Type "E", 1000 Ohms	1	26871
51	Resistor, Type "E", 10,000 Ohms	1	26872
52	Resistor, Type "E", 10,000 Ohms	1	26873
53	Resistor, Type "E", 27,000 Ohms	1	26874
54	Resistor, Type "E", 47,000 Ohms	1	26875
55	Resistor, Type "E", 47,000 Ohms	1	26876
56	Resistor, Type "E", .1 Megohm	1	26877
57	Resistor, Type "E", .27 Megohm	1	26878
58	Resistor, Type "E", .47 Megohm	1	26879
59	Resistor, Type "E", .47 Megohm	1	26880
60	Resistor, Type "E", 1 Megohm	1	26881
61	Resistor, Type "E", 2.2 Megohms	1	26882
62	Resistor, Type "E", 50 Ohms	1	26883
63	Resistor, Type "C", 27,000 Ohms	1	26884
64	Resistor, Type "E", 310 Ohms	1	26885
65	Capacitor Assembly, .02 Mf.	1	26886
66	Capacitor Assembly, .02 Mf.	1	26887
67	Capacitor Assembly, .02 Mf.	1	26888
68	Capacitor Assembly, .02 Mf.	1	26889
69	Capacitor Assembly, .02 Mf.	1	26890
70	Capacitor Assembly, .02 Mf.	1	26891
71	Capacitor Assembly, .02 Mf.	1	26892
72	Capacitor Assembly, .02 Mf.	1	26893
73	Capacitor Assembly, .02 Mf.	1	26894
74	Capacitor Assembly, .02 Mf.	1	26895
75	Capacitor Assembly, .02 Mf.	1	26896
76	Capacitor Assembly, .02 Mf.	1	26897
77	Capacitor Assembly, .02 Mf.	1	26898
78	Capacitor Assembly, .02 Mf.	1	26899
79	Capacitor Assembly, .02 Mf.	1	26900
80	Capacitor Assembly, .02 Mf.	1	26901
81	Capacitor Assembly, .02 Mf.	1	26902
82	Capacitor Assembly, .02 Mf.	1	26903
83	Capacitor Assembly, .02 Mf.	1	26904
84	Capacitor Assembly, .02 Mf.	1	26905
85	Capacitor Assembly, .02 Mf.	1	26906
86	Capacitor Assembly, .02 Mf.	1	26907
87	Capacitor Assembly, .02 Mf.	1	26908
88	Capacitor Assembly, .02 Mf.	1	26909
89	Capacitor Assembly, .02 Mf.	1	26910
90	Capacitor Assembly, .02 Mf.	1	26911
91	Capacitor Assembly, .02 Mf.	1	26912
92	Capacitor Assembly, .02 Mf.	1	26913
93	Capacitor Assembly, .02 Mf.	1	26914
94	Capacitor Assembly, .02 Mf.	1	26915
95	Capacitor Assembly, .02 Mf.	1	26916
96	Capacitor Assembly, .02 Mf.	1	26917
97	Capacitor Assembly, .02 Mf.	1	26918
98	Capacitor Assembly, .02 Mf.	1	26919
99	Capacitor Assembly, .02 Mf.	1	26920
100	Capacitor Assembly, .02 Mf.	1	26921
101	Capacitor Assembly, .02 Mf.	1	26922
102	Capacitor Assembly, .02 Mf.	1	26923
103	Capacitor Assembly, .02 Mf.	1	26924
104	Capacitor Assembly, .02 Mf.	1	26925

MISCELLANEOUS PARTS
 Part Number
 Knob (For Volume Control) 26926
 Knob (For Range Switch) 26927
 Knob (For Off-On-Switch and Tone Control) 26928
 Knob (For Large Portion of Tuning Shaft) 26929
 Knob (For Vernier Portion of Tuning Shaft) 26930

MODELS 126H, 126L

Alignment, Voltage STROMBERG-CARLSON TEL. MFG. CO.

Intermediate Frequency Amplifier Adjustments

The intermediate frequency used in these receivers is 465 kilocycles. In making these I. F. circuit adjustments always align in the following order:

1. Secondary of 2nd I. F. Transformer (Capacitor C-13).
2. Primary of 2nd I. F. Transformer (Capacitor C-12).
3. Secondary of 1st I. F. Transformer (Capacitor C-11).
4. Primary of 1st I. F. Transformer (Capacitor C-10).

Radio Frequency Adjustments

The adjustments of the aligning capacitors used in the radio frequency circuits in this receiver should be very carefully made in the following order and at the frequencies specified below:

1. Oscillator's "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-9).
2. R. F. Interstage "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-6).
3. Antenna "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-3).
4. Oscillator's "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-8).
5. R. F. Interstage "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-5).
6. Antenna "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-2).
7. Oscillator's "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-7).
8. R. F. Interstage "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-4).
9. Antenna "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-1).
10. Oscillator's "A" Band Series Aligner at 0.6 Megacycles (Capacitor, Item No. 41).
11. Oscillator's "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-7).
12. R. F. Interstage "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-4).
13. Antenna "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-1).

NORMAL VOLTAGE READINGS

These voltage readings are obtained by measuring between the various tube socket contacts and the heavy bus wire with the tubes in their respective sockets. The receiver is, therefore, in operation when the measurements are made. The heavy bus wire, which is the negative side of the grid and plate voltages, is plainly marked on the schematic and wiring diagram shown on pages three and four. Figure 2 shows the terminal layout of the sockets with the proper terminal numbers.

Voltages are given for a line voltage of 120 volts, A. C. Allowance should be made for the difference when the line voltage is higher or lower.

IMPORTANT—If the receiver is operated from a direct current power supply circuit, the various voltages measured will be slightly lower than those listed in the table for A. C. operation. A meter having a resistance of 1000 ohms per volt should be used for measuring the D. C. voltages. Voltage values shown are those obtained on the lowest possible scale of a meter having the following ranges: 0-2.5, 0-10, 0-100, 0-250, 0-500, 0-1000 volts except when an asterisk appears after any given voltage value in which case the 1000 volt scale was used.

When the receiver is being operated from an alternating current power supply circuit, it will be necessary to have a high resistance A. C. voltmeter for checking the A. C. voltages.

Tube	Circuit	Cap	Terminals of Sockets								Heater Voltages Between Heater Terminals	
			1	2	3	4	5	6	7	8	Socket Terminal Numbers	Volts
6K7	R. F. Amp.	0	0	12.8	+42	+93	+3.7	0	6.4	+3.7	2-7	6.4
6A8	Mod.—Osc.	0	0	12.8	+100	+64	-4.8	+100	19.2	+1.6	2-7	6.4
6K7	I. F. Amp.	0	0	26	+102	+93	+3.1	0	19.6	+3.1	2-7	6.4
6Q7	Dem.—A.V.C.—Audio	0	0	0	+61*	0	0	+93	6.4	+1.1	2-7	6.4
43	Audio Output	—	26	+100	+103	0	+14.5	53			1-6	27
43	Audio Output	—	53.2	+100	+103	0	+14.5	80.2			1-6	27
25Z5	Rectifier	—	80	116	+108	+108	116	105			1-6	25
Voltage across pilot lamps—28.7 volts.												

A. C. voltages are indicated by italics; when the receiver is operated from a D. C. power supply, D. C. voltages will be obtained in place of the A. C. voltages.
Receiver tuned to 1000 kc., no signal.

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 126H, 126L
Socket, Trimmers
Chassis

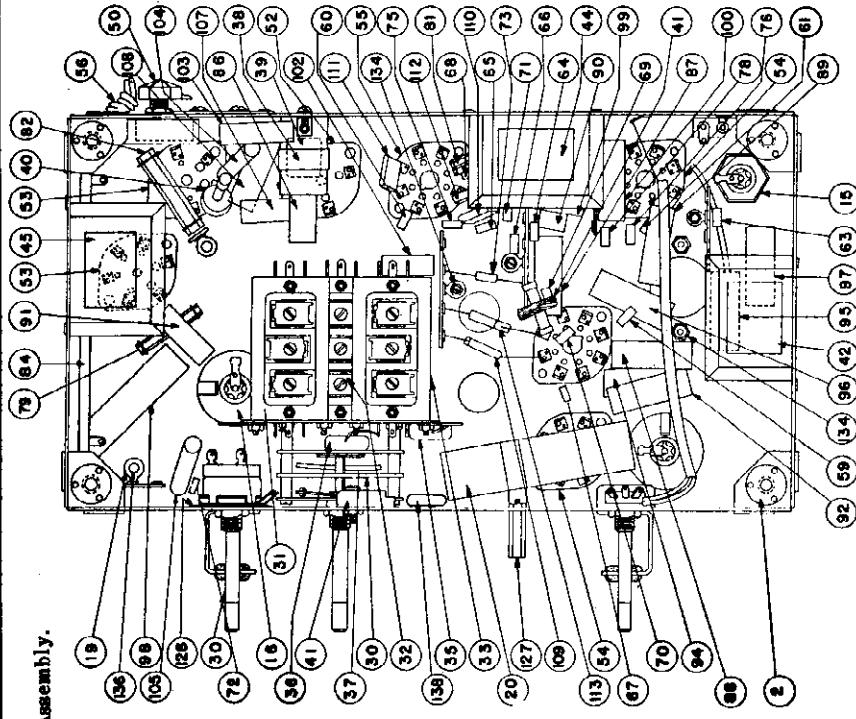


Figure 5. Chassis Assembly.

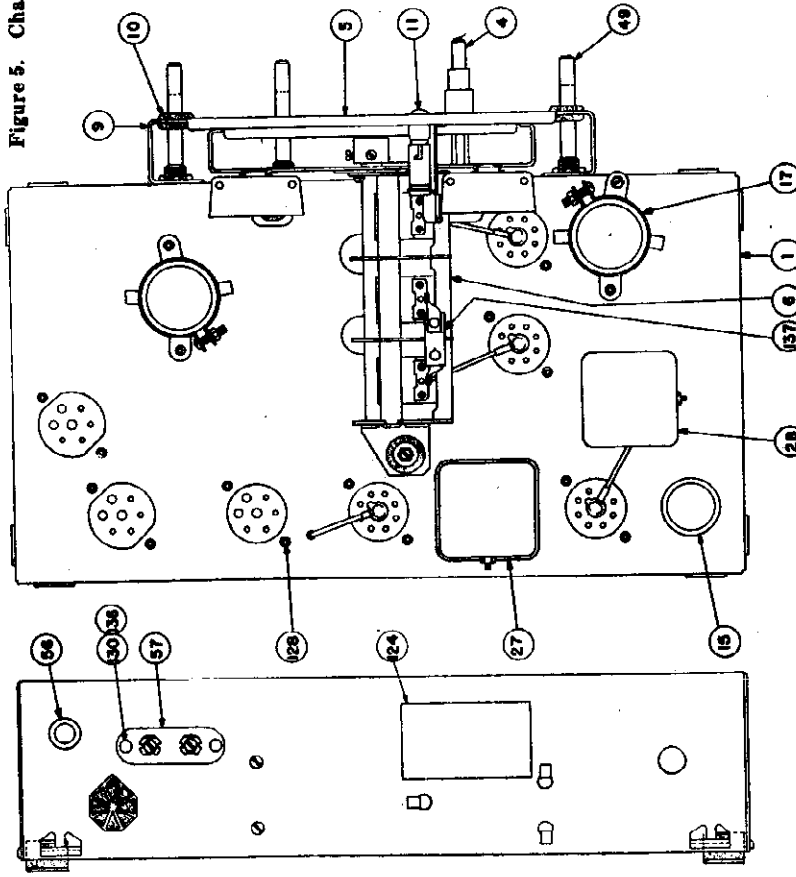


Figure 2. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

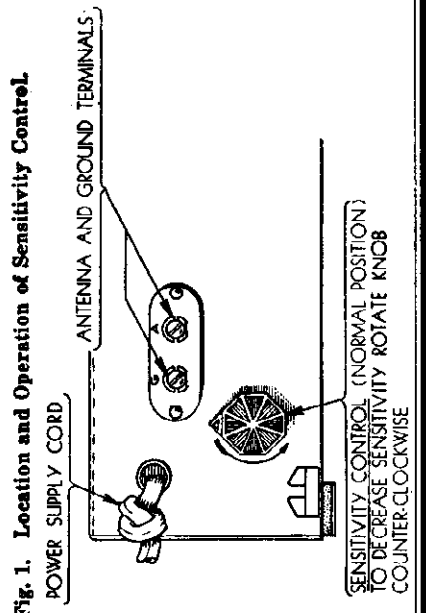
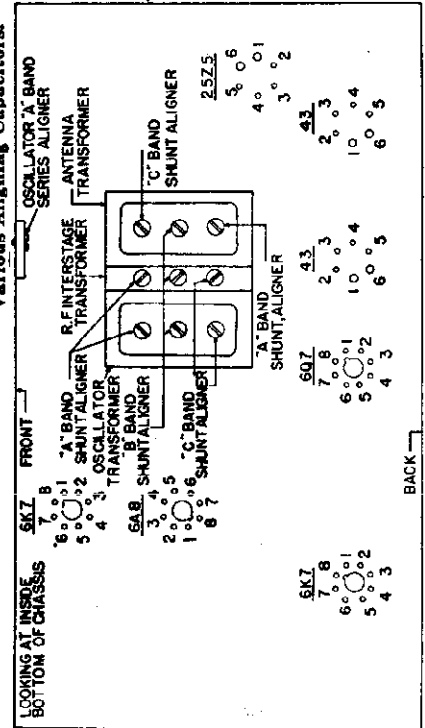
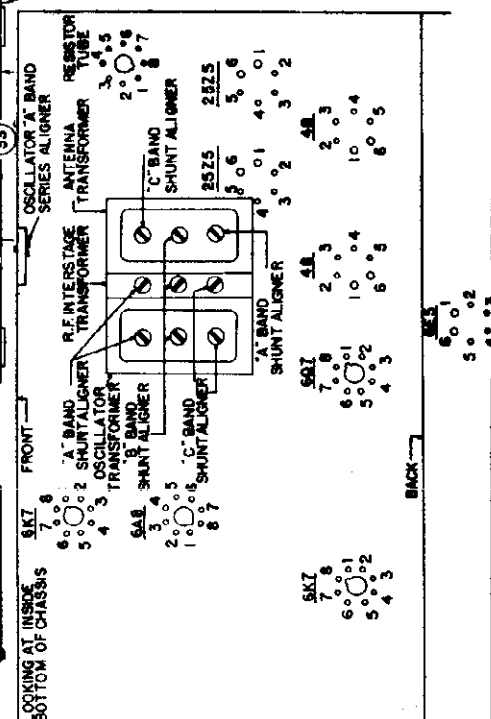
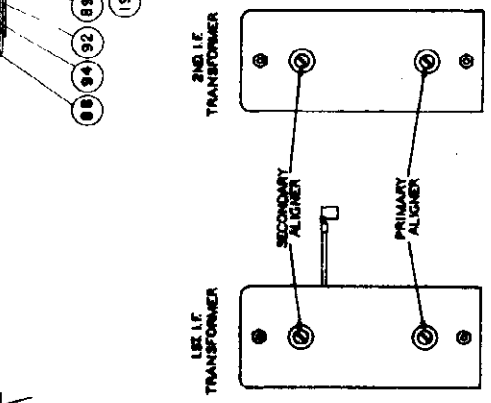
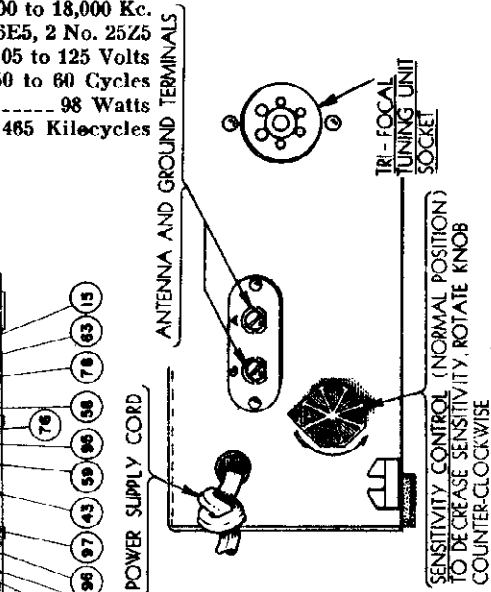
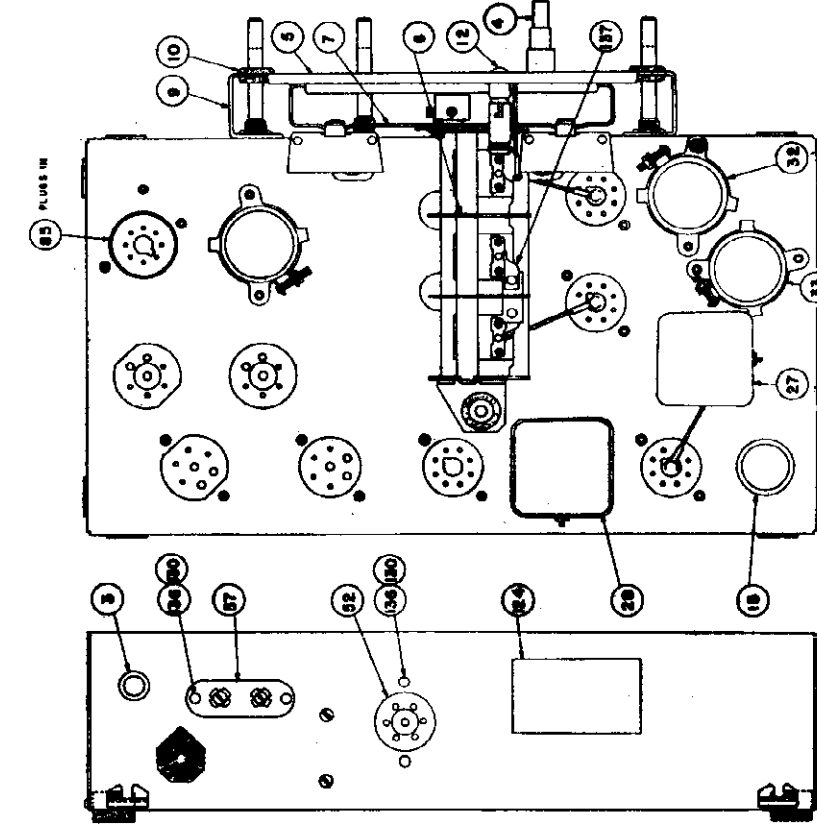
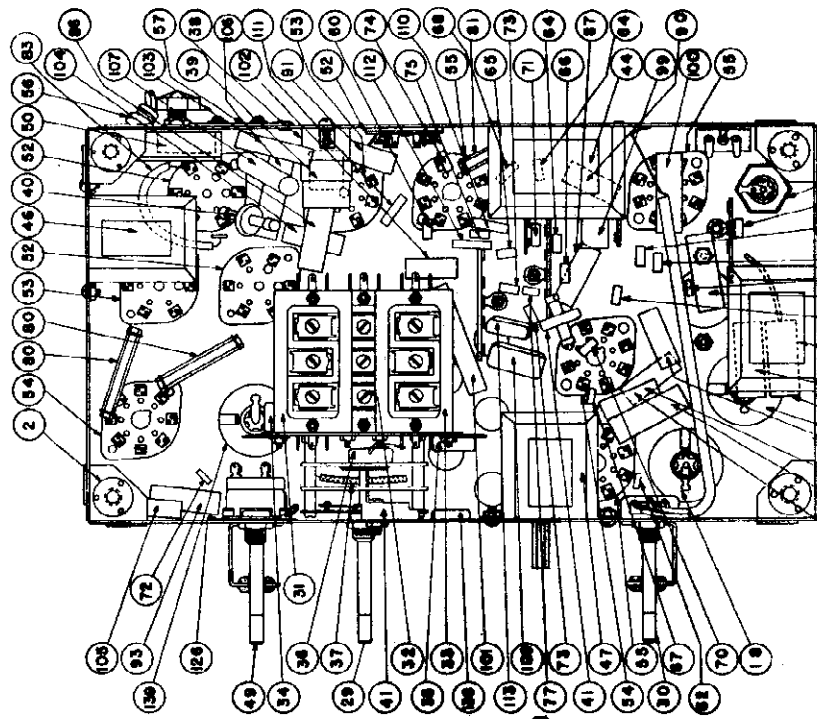


Figure 1. Location and Operation of Sensitivity Control.

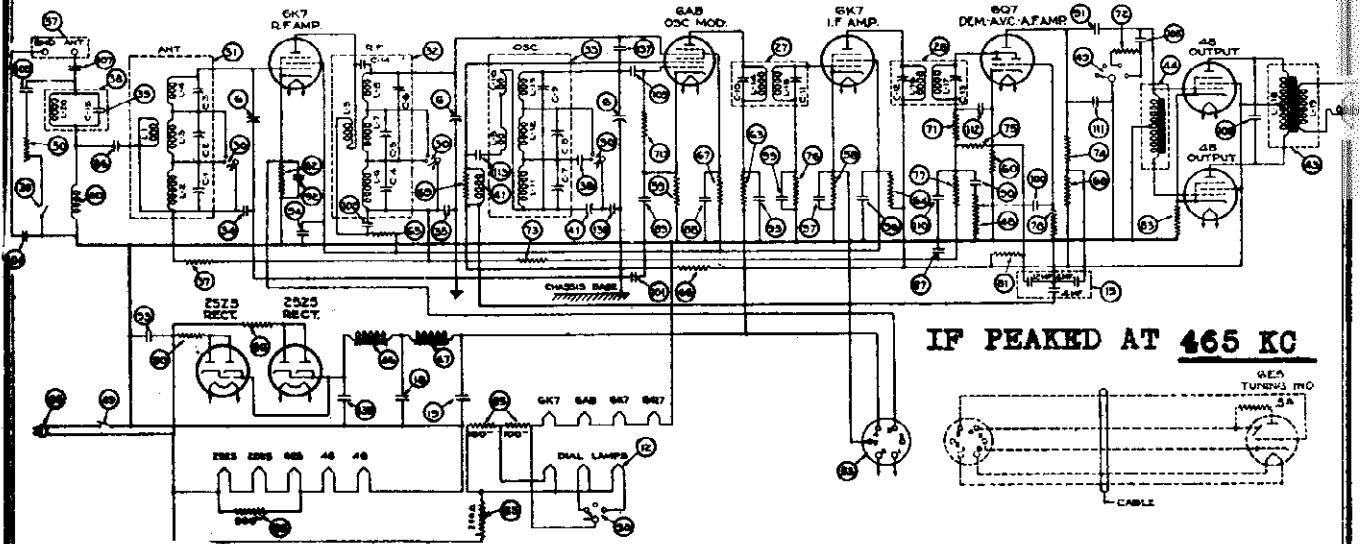
MODELS 127H, 127M
 Socket, Trimmers
 Chassis

STROMBERG-CARLSON TEL. MFG. CO.

Tuning Ranges..... A—540 to 1500 Kc.; B—1450 to 3500 Kc.; C—5600 to 18,000 Kc.
 Number and Types of Tubes... 2 No. 6K7, 1 No. 6A8, 1 No. 6Q7, 2 No. 48, 1 No. 6E5, 2 No. 25Z5
 Power Supply Voltage..... 105 to 125 Volts
 Power Supply Frequency (For A. C. operation)..... 50 to 60 Cycles
 Input Power Rating..... 98 Watts
 Frequency of Intermediate Amplifier..... 465 Kilocycles



STROMBERG-CARLSON TEL. MFG. CO. MODELS 127H, 127M Schematic, Parts



REPLACEMENT PARTS

Item Number	Piece Number	Part	Item Number	Piece Number	Part
5	20040	Dial Assembly	76	26365	Resistor, Type "E", .47 Megohm
6	20414	Gang Tuning Capacitor Assembly	77	26366	Resistor, Type "E", 1 Megohm
7	20000	Lamp Socket Assembly	78	26372	Resistor, Type "E", 2.2 Megohms
9	20000	Bracket (Chassis Spacer)	80	26011	Resistor, Type "B", 50 Ohms
12	20207	Pilot Lamp	81	26408	Resistor, Type "C", 27,000 Ohms
15	26164	Electrolytic Capacitor Assembly, 4 Mf., 150 Volts; 4 Mf., 150 Volts; 12 Mf., 25 Volts	83	26670	Resistor, Flexible, 155 Ohms
18	26162	Electrolytic Capacitor, 25 Mf.	85	26671	Resistor, "B" Voltage Divider
19	26162	Electrolytic Capacitor, 25 Mf.	86	25150	Capacitor Assembly, .02 Mf.
27	26141	1st I. F. Transformer	87	25150	Capacitor Assembly, .02 Mf.
28	25500	2nd I. F. Transformer	88	25150	Capacitor Assembly, .02 Mf.
30	20004	Range Switch	89	25150	Capacitor Assembly, .02 Mf.
31	25510	Coil Assembly, Antenna	90	25150	Capacitor Assembly, .02 Mf.
32	25511	Coil Assembly, R. F.	91	25150	Capacitor Assembly, .02 Mf.
33	25512	Coil Assembly, Oscillator	92	25150	Capacitor Assembly, .02 Mf.
34	25408	Capacitor, .002 Mf.	93	25150	Capacitor Assembly, .02 Mf.
35	25527	Capacitor, .0027 Mf.	94	24402	Capacitor Assembly, .1 Mf.
36	25409	Capacitor, .0025 Mf.	95	24402	Capacitor Assembly, .1 Mf.
37	26363	Resistor, Type "E", .1 Megohm	96	24402	Capacitor Assembly, .1 Mf.
38	25513	Coil Assembly (Wave Trap)	97	24402	Capacitor Assembly, .1 Mf.
39	25408	Capacitor, .002 Mf.	98	24405	Capacitor Assembly, .04 Mf.
40	25514	Coil Assembly, R. F. Choke, 5 Millihenrys	100	24405	Capacitor Assembly, .04 Mf.
41	20047	Capacitor, Oscillator Series Aligner	101	25500	Capacitor Assembly, .2 Mf.
43	20057	Transformer, Audio Output	102	24481	Capacitor Assembly, .002 Mf.
44	20005	Transformer, Audio Input	103	25149	Capacitor Assembly, .01 Mf.
46	20000	Choke Assembly (Filter of Rectifier)	104	25149	Capacitor Assembly, .01 Mf.
47	20061	Choke Assembly (Filter of Rectifier)	105	26151	Capacitor Assembly, .005 Mf.
48	26114	Potentiometer (Volume Control)	106	25149	Capacitor Assembly, .01 Mf.
49	20071	Switch ("Off-On" and Tone Control)	107	25533	Capacitor Assembly, .006 Mf.
50	20006	Potentiometer, Sensitivity Control	109	24530	Capacitor, Type "O", 100 Mmf.
51	20000	Knob (For Sensitivity Control)	110	24530	Capacitor, Type "O", 100 Mmf.
53	20074	Socket, 6 Prong	111	24530	Capacitor, Type "O", 100 Mmf.
55	25500	Socket, 5 Prong	112	24530	Capacitor, Type "O", 100 Mmf.
56	24208	Cord, Power Supply	113	26427	Capacitor, Type "W", .001 Mf.
58	20224	Resistor, Type "E", 100 Ohms	127	26417	Capacitor (Gimmick)
59	20226	Resistor, Type "E", 270 Ohms	128	26489	Capacitor, .00125 Mf.
60	20227	Resistor, Type "E", 330 Ohms	130	27014	Electrolytic Capacitor, 40 Mf.
62	20228	Resistor, Type "E", 680 Ohms			
63	20229	Resistor, Type "E", 1000 Ohms			
64	20230	Resistor, Type "E", 1000 Ohms			
65	20245	Resistor, Type "E", 10,000 Ohms			
66	20233	Resistor, Type "E", 1000 Ohms			
67	20245	Resistor, Type "E", 10,000 Ohms			
68	20245	Resistor, Type "E", 10,000 Ohms			
69	20000	Resistor, Type "E", 27,000 Ohms			
70	20001	Resistor, Type "E", 47,000 Ohms			
71	20002	Resistor, Type "E", 47,000 Ohms			
72	20003	Resistor, Type "E", 47,000 Ohms			
73	20007	Resistor, Type "E", .1 Megohm			
75	26365	Resistor, Type "E", .47 Megohm			

MISCELLANEOUS PARTS

Piece Number	Part
26491	Plug (For Tri-Focal Tuning Unit Cable)
26605	Resistor, Type "E", .47 Megohm (Used at Socket of No. 6E5 Tube)
26302	Knob (For Volume Control)
26305	Knob (For Range Switch)
26364	Knob (For Off-On-Tone Control)
26365	Knob (For Large Portion of Tuning Shaft)
26366	Knob (For Vernier Portion of Tuning Shaft)

MODELS 127H, 127M
Alignment, Voltage

STROMBERG-CARLSON TEL. MFG. CO.

Intermediate Frequency Amplifier Adjustments

The intermediate frequency used in these receivers is 465 kilocycles. In making these I. F. circuit adjustments always align in the following order:

1. Secondary of 2nd I. F. Transformer (Capacitor C-13).
2. Primary of 2nd I. F. Transformer (Capacitor C-12).
3. Secondary of 1st I. F. Transformer (Capacitor C-11).
4. Primary of 1st I. F. Transformer (Capacitor C-10).

Radio Frequency Adjustments

The adjustments of the aligning capacitors used in the radio frequency circuits in this receiver should be very carefully made in the following order and at the frequencies specified below:

1. Oscillator's "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-9).
2. R. F. Interstage "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-6).
3. Antenna "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-3).
4. Oscillator's "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-8).
5. R. F. Interstage "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-5).
6. Antenna "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-2).
7. Oscillator's "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-7).
8. R. F. Interstage "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-4).
9. Antenna "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-1).
10. Oscillator's "A" Band Series Aligner at 0.6 Megacycles (Capacitor, Item No. 41).
11. Oscillator's "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-7).
12. R. F. Interstage "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-4).
13. Antenna "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-1).

NORMAL VOLTAGE READINGS

These voltage readings are obtained by measuring between the various tube socket contacts and the heavy bus wire with the tubes in their respective sockets. The receiver is, therefore, in operation when the measurements are made. The heavy bus wire, which is the negative side of the grid and plate voltages, is plainly marked on the schematic and wiring diagram shown on pages three and five. Figure 2 shows the terminal layout of the sockets with the proper terminal numbers.

Voltages are given for a line voltage of 120 volts, A. C. Allowance should be made for the difference when the line voltage is higher or lower.

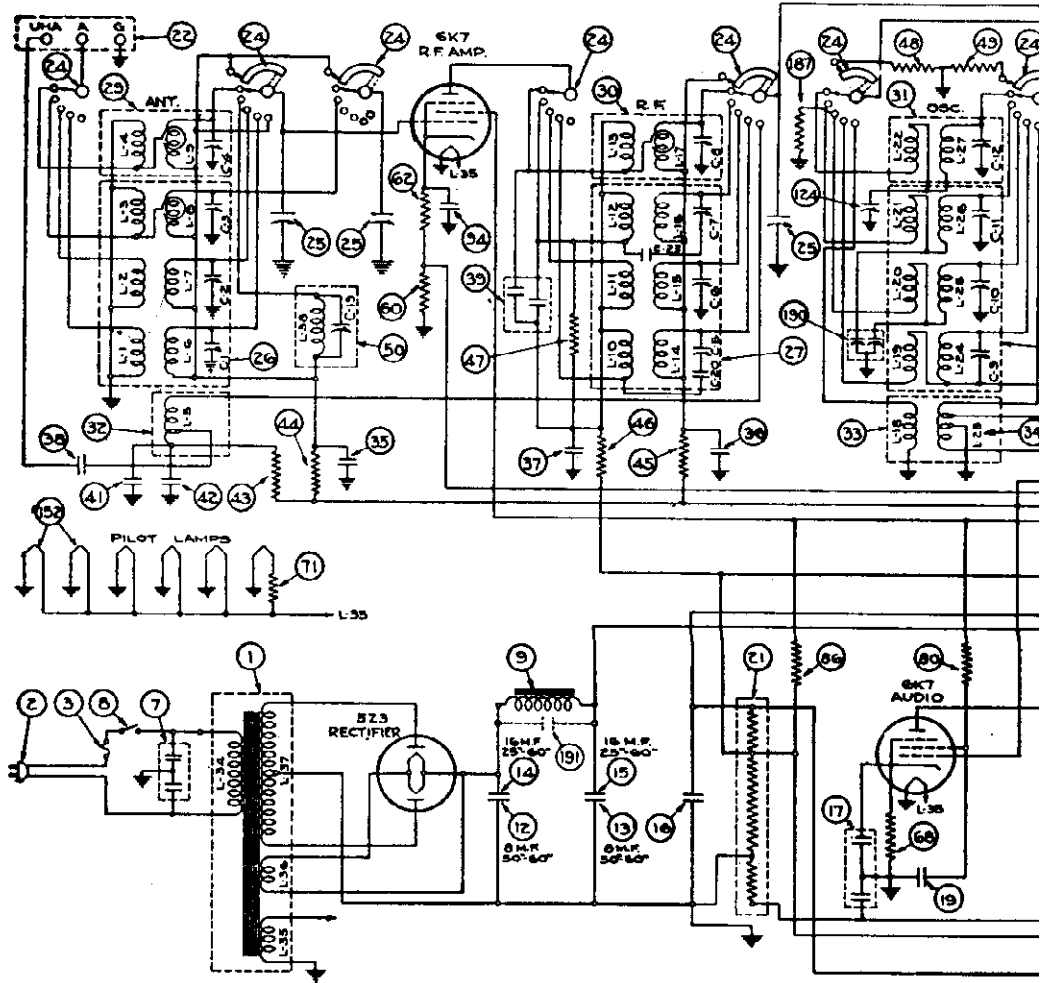
IMPORTANT—If the receiver is operated from a direct current power supply circuit, the various voltages measured will be slightly lower than those listed in the table for A. C. operation. A meter having a resistance of 1000 ohms per volt should be used for measuring the D. C. voltages. Voltage values shown are those obtained on the lowest possible scale of a meter having the following ranges: 0-2.5, 0-10, 0-100, 0-250, 0-500, 0-1000 volts except when an asterisk appears after any given voltage value in which case the 1000 volt scale was used.

When the receiver is being operated from an alternating current power supply circuit, it will be necessary to have a high resistance A. C. voltmeter for checking the A. C. voltages.

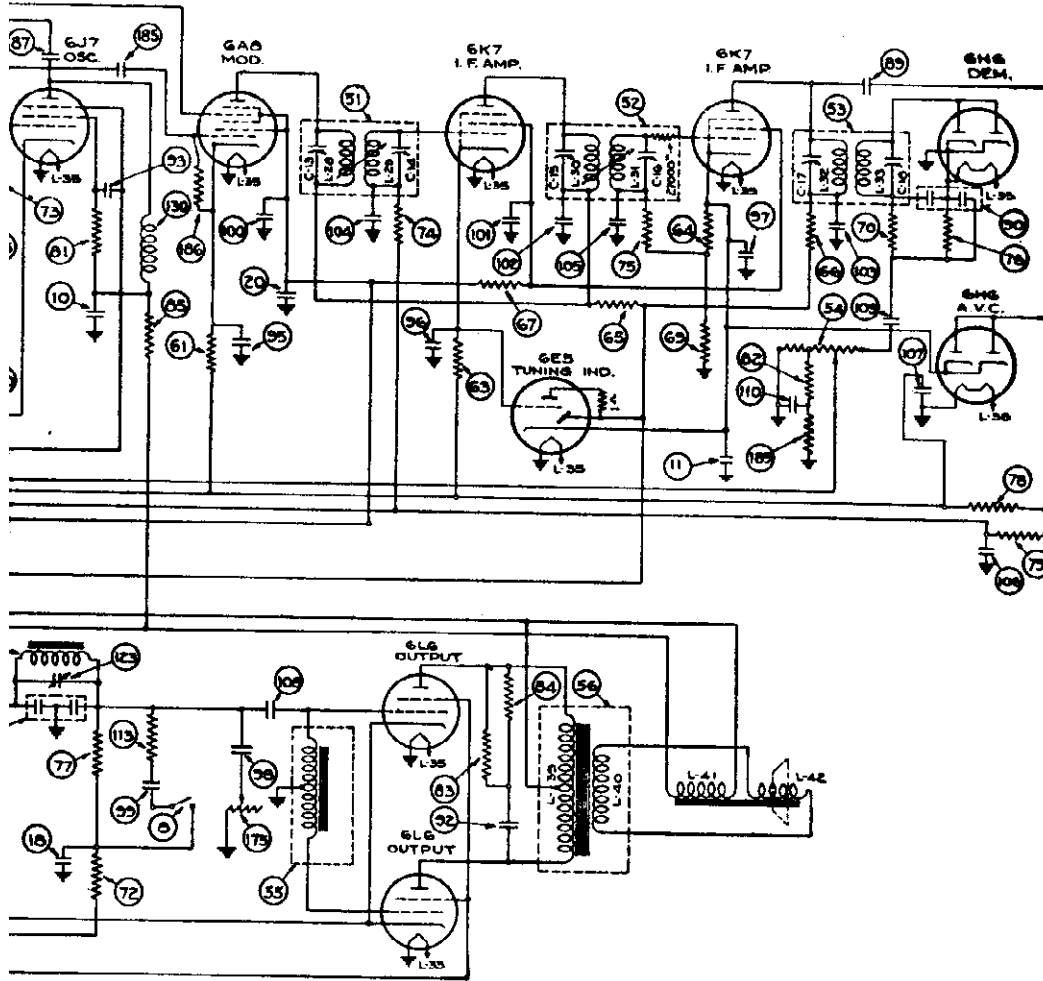
Tube	Circuit	Cap	Terminals of Sockets								Heater Voltages Between Heater Terminals	
			1	2	3	4	5	6	7	8	Socket Terminal Numbers	Volts
6K7	R. F. Amp.	0	0	18	+33	+88	+4	0	24	+4	2-7	6
6A8	Mod.—Osc.	0	0	18	+95	+60	-7	+95	12	+1.5	2-7	6
6K7	I. F. Amp.	0	0	6	+99	+88	+2	0	12	+2.2	2-7	6
6Q7	Dem.—A. V. C.— Audio Amp.	0	0	0	+50*	0	0	+88	6	+1	2-7	6
48	Audio Output	—	61	+106	+106	0	+17	31	—	—	1-6	30
48	Audio Output	—	0	+106	+106	0	+17	30	—	—	1-6	30
6E5	Tuning Ind.	—	61	+0.5	+3.9	+99	+2.2	67	—	—	1-6	6
25Z5	Rectifier	—	95	116	+112	+116	114	70	—	—	1-6	25
25Z5	Rectifier	—	120	116	+112	+112	116	95	—	—	1-6	25
Resistor	Voltage Divider	—	37	65	37	—	120	—	25	32	—	—

Voltage across pilot lamps—12 volts.

A. C. voltages are indicated by italics; when the receiver is operated from a D.C. power supply, D.C. voltages will be obtained in place of the A.C. voltages.
Receiver tuned to 1000 kc., no signal.



Item Number	Piece Number	Part	44	26557	Resistor, Type "E", .1 Megohm
1	26485	Power Transformer (50 to 60 Cycles Chassis)	45	26557	Resistor, Type "E", .1 Megohm
2	26486	Power Transformer (25 to 60 Cycles Chassis)	46	26333	Resistor, Type "E", 1000 Ohms
3	24268	Cord (Power Supply)	47	26853	Resistor, Type "E", 47,000 Ohms
4	23234	Fuse, 2 1/4 Amperes	48	26521	Resistor, Type "E", 1000 Ohms
7	21835	Capacitor Assembly (2--.01 Mf. Capacitors)	49	26821	Resistor, Type "E", 100 Ohms
8	26061	Switch ("On-On" and Bass Control)	50	26474	Coil Assembly (Hi-Resonator)
9	26704	Choke Assembly (Filter of Rectifier)	51	26481	1st I. F. Transformer
10	25788	Electrolytic Capacitor, 1 Mf., 450 Volts	52	26482	2nd I. F. Transformer
11	24207	Electrolytic Capacitor, 12 Mf., 25 Volts	53	26243	3rd I. F. Transformer
12	22757	Electrolytic Capacitor, 8 Mf., 500 Volts	54	26077	Potentiometer (Volume Control)
13	22757	Electrolytic Capacitor, 8 Mf., 500 Volts	55	26700	Transformer Assembly, Audio Input
14	26510	Electrolytic Capacitor, 16 Mf., 500 Volts	56	26702	Transformer Assembly, Audio Output
15	26510	Electrolytic Capacitor, 16 Mf., 500 Volts	57	22948	Socket, 4 Prong
16	26773	Electrolytic Capacitor, 16 Mf., 350 Volts	58	23517	Socket, 7 Prong
17	25498	Electrolytic Capacitor (2--10 Mf.), 25 Volts	59	26539	Socket, 8 Prong
18	24580	Electrolytic Capacitor, 4 Mf., 450 Volts	60	26324	Resistor, Type "E", 180 Ohms
19	26608	Electrolytic Capacitor, 4 Mf., 350 Volts	61	26326	Resistor, Type "E", 270 Ohms
20	26693	Electrolytic Capacitor, 4 Mf., 350 Volts	62	26328	Resistor, Type "E", 390 Ohms
21	26736	Resistor, "B" Voltage Divider	63	26330	Resistor, Type "E", 560 Ohms
24	26746	Range Switch Assembly	64	26330	Resistor, Type "E", 560 Ohms
25	26444	Gang Tuning Capacitor Assembly	65	26330	Resistor, Type "E", 560 Ohms
26	26446	Coil Assembly, Antenna ("A", "B" and "C" Ranges)	66	26333	Resistor, Type "E", 1000 Ohms
27	26447	Coil Assembly, R. F. ("A", "B" and "C" Ranges)	67	26333	Resistor, Type "E", 1000 Ohms
28	26448	Coil Assembly, Oscillator ("A", "B" and "C" Ranges)	68	26338	Resistor, Type "E", 2700 Ohms
29	26507	Coil Assembly, Antenna ("X" Range)	69	26328	Resistor, Type "E", 390 Ohms
30	26508	Coil Assembly, E. F. ("X" Range)	70	26345	Resistor, Type "E", 16,000 Ohms
31	26509	Coil Assembly, Oscillator ("X" Range)	71	26780	Resistor, Flexible, 3.5 Ohms (Pilot Lamp)
32	26758	Coil Assembly, Antenna ("D" Range)	72	26353	Resistor, Type "E", 47,000 Ohms
33	26787	Oscillator Primary Coil ("D" Range)	73	26853	Resistor, Type "E", 47,000 Ohms
34	26765	Oscillator Secondary Coil ("D" Range)	74	20357	Resistor, Type "E", .1 Megohm
35	24405	Capacitor Assembly, .04 Mf.	75	26357	Resistor, Type "E", .1 Megohm
36	24405	Capacitor Assembly, .04 Mf.	76	26857	Resistor, Type "E", .1 Megohm
37	24904	Capacitor Assembly, .05 Mf.	77	26357	Resistor, Type "E", .1 Megohm
39	26513	Capacitor (2--200 Mmf.)	78	26369	Resistor, Type "E", 1 Megohm
40	26844	Capacitor, .004 Mf.	79	26369	Resistor, Type "E", 1 Megohm
41	24837	Capacitor, .0017 Mf.	80	26369	Resistor, Type "E", 1 Megohm
42	24837	Capacitor, .0017 Mf.	81	26349	Resistor, Type "E", 1 Megohm
43	26357	Resistor, Type "E", .1 Megohm	82	26341	Resistor, Type "E", 4700 Ohms
			83	26775	Resistor, Type "F", 20,000 Ohms
			84	26775	Resistor, Type "F", 20,000 Ohms
			85	26776	Resistor, Type "F", 12,000 Ohms
			86	25526	Resistor, Type "F", 15,000 Ohms



IF PEAK 465 KC

87	25487	Capacitor, Type "W", .001 Mf.	140	26672	Drive Cord Assembly (Volume Indicator Disc)
88	24560	Capacitor, Type "O", 50 Mmf.	141	26683	Cord Assembly (Dial Elevator)
89	24560	Capacitor, Type "O", 50 Mmf.	142	26226	Spring
90	26512	Capacitor, Type "W", 2-100 Mmf.	143	26525	Volume Indicator Disc Assembly
91	26512	Capacitor, Type "W", 2-100 Mmf.	144	26686	Fidelity Indicator Disc Assembly
92	25535	Capacitor, Type 3L, .008 Mf.	145	26572	Bracket Assembly
93	25535	Capacitor, Type 3L, .008 Mf.	146	26683	Reel Assembly (Range Switch)
94	24402	Capacitor Assembly, .1 Mf.	147	26687	Reel Assembly (Tone-Fidelity Control)
95	24402	Capacitor Assembly, .1 Mf.	148	26686	Reel Assembly (Volume Control)
96	24402	Capacitor Assembly, .1 Mf.	149	26580	Front Dial Plate Assembly
97	24402	Capacitor Assembly, .1 Mf.	150	26147	Lamp Socket
98	25149	Capacitor Assembly, .01 Mf.	151	26257	Lamp Shades
99	25149	Capacitor Assembly, .01 Mf.	152	26287	Pilot Lamp
100	24994	Capacitor Assembly, .05 Mf.	153	26497	Cable Assembly, Tri-Focal Indicator
101	24994	Capacitor Assembly, .05 Mf.	154	26492	Lamp Socket Assembly
102	24994	Capacitor Assembly, .05 Mf.	155	26489	Potentiometer
103	24994	Capacitor Assembly, .05 Mf.	156	26673	Drive Cord Assembly (Fidelity Indicator Disc)
104	24405	Capacitor Assembly, .04 Mf.	157	24560	Capacitor, Type "O", 50 Mmf.
105	24405	Capacitor Assembly, .04 Mf.	158	26357	Resistor, Type "E", .1 Megohm
106	24405	Capacitor Assembly, .04 Mf.	159	26341	Resistor, Type "E", 4700 Ohms
107	24405	Capacitor Assembly, .04 Mf.	160	26345	Resistor, Type "E", 10,000 Ohms
108	24405	Capacitor Assembly, .04 Mf.	190	26564	Capacitor Assembly, Oscillator Series Aligners ("A" and "B" Ranges)
109	24405	Capacitor Assembly, .04 Mf.	191	26775	Capacitor Assembly, .3 Mf.
110	24405	Capacitor Assembly, .04 Mf.			
111	26249	Resistor, Type "E", 22,000 Ohms			
112	26668	Adjustable Capacitor (High Frequency Cut-Off Filter)			
113	26668	Adjustable Capacitor (High Frequency Cut-Off Filter)			
114	26569	Capacitor (Oscillator Series Aligner, "X" Range)			
115	26485	Potentiometer and Bracket Assembly (Tone Control and High Fidelity)			
116	26515	Coil Assembly (High Frequency Cut Off Filter)			
117	26814	Choke Assembly, 5 Millihenrys			
118	26519	Drive Disc Assembly			
119	26670	Dial Bracket Assembly			
120	26534	Bar Assembly (Pulley)			
121	26211	Pulley			
122	26515	Gear Assembly			
123	26220	Drive Shaft Assembly			
124	26530	Dial Assembly (Secondary)			
125	26694	Dial Assembly (Main)			
126	26250	Part			
127	26043	Cone Assembly (For P-26170 Speaker)			
128	26909	Plug (For Loud Speaker Cable)			
129	26302	Resistor, Type "E", 1 Megohm (Used at Socket of No. 6E5 Tube)			
130	26290	Knob (For "Volume" Control)			
131	26305	Knob (For "Tone-Fidelity" Control)			
132	26306	Knob (For "Stations" Selector Control Shaft)			
133	26301	Knob (For "Vernier" Stations Selector Control Shaft)			
134	26301	Knob (For "Range" Switch)			
135	26300	Knob (For "Off-On-Bass" Control)			

MISCELLANEOUS PARTS

Part	Part
Cone Assembly (For P-26170 Speaker)	Part
Plug (For Loud Speaker Cable)	Part
Resistor, Type "E", 1 Megohm (Used at Socket of No. 6E5 Tube)	Part
Knob (For "Volume" Control)	Part
Knob (For "Tone-Fidelity" Control)	Part
Knob (For "Stations" Selector Control Shaft)	Part
Knob (For "Vernier" Stations Selector Control Shaft)	Part
Knob (For "Range" Switch)	Part
Knob (For "Off-On-Bass" Control)	Part

MODELS 150L, 150LB
Socket, Trimmers
Chassis .

STROMBERG-CARLSON TEL. MFG. CO.

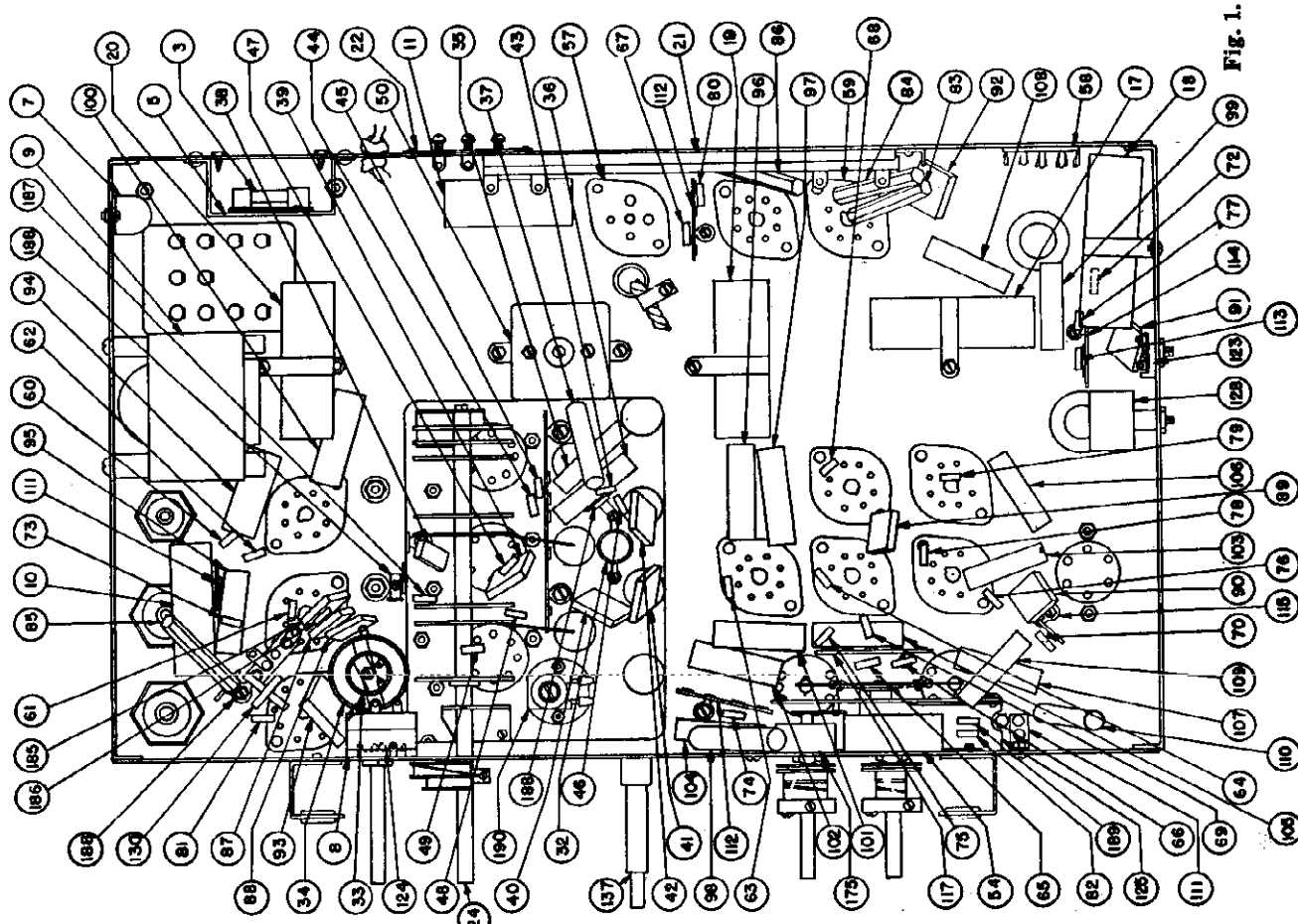
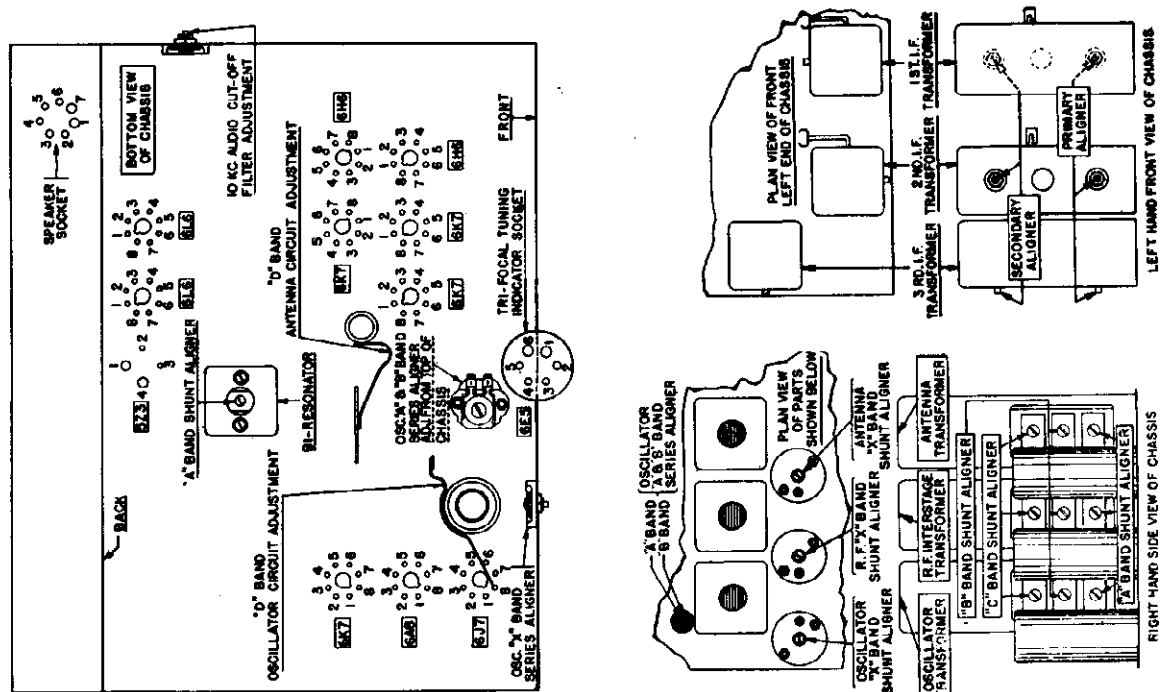


Fig. 1. Terminal Layout for Voltage Measurement Capacitors and Location of the Various Aligning Capacitors.

MODELS 150L, 150LB
Alignment, Voltage
MODELS 160L, 160LB
160P, 160PB

STROMBERG-CARLSON TEL. MFG. CO.

Alignment

NORMAL VOLTAGE READINGS

The various values of voltages listed in the following table are obtained by measuring between the various tube socket contacts and the chassis base, with the tubes in their respective sockets. The receiver is, therefore, in operation when the measurements are made. Figure 1 shows the terminal layout of the sockets with the proper terminal numbers.

Voltages are given for a line voltage of 120 volts, and allowance should be made for differences when the line voltage is higher or lower. A meter having a resistance of 1000 ohms per volt should be used for measuring the D. C. voltages. Voltage values shown are those obtained on the lowest possible scale of a meter having the following ranges: 0-2.5, 0-10, 0-100, 0-250, 0-500, 0-1000 volts except when an asterisk appears after any given voltage value in which case the 1000 volt scale was used.

Table with columns: Tube, Circuit, Cap, Terminals of Sockets (1-8), Heater Voltages Between Heater Terminals (Socket Terminal Number, Volts). Rows include R. F. Amp., Modulator, Oscillator, 1st I. F. Amp., 2nd I. F. Amp., Demodulator, A. V. C., Audio Amp., Audio Output, Tuning Ind., Rectifier, and Speaker.

Voltage across vernier dial pilot lamp—5.3 volts
Receiver tuned to 1000 Kc., no signal. A. C. voltages are indicated by italics.

IMPORTANT—The knob marked "Stations" comes in two parts; the large knurled portion which is used for rapid tuning, and a small knob which is used for the vernier adjustment of the tuning shaft. The large knob marked "Stations" should be placed on the large portion of the tuning shaft so that when the "set" screw of this knob is tightened it will rest on the flat portion of the shaft. Also, do not place this large portion of the knob too tightly against the felt washer and cabinet; place it on the shaft so that there is some degree of freedom between the knob and felt washer and the cabinet. The small (or vernier) portion of this knob should then be pushed on the shaft in the same manner as the other four control knobs. Care should again be taken that this small knob is not forced too tightly against the large tuning knob, as this will cause improper action of the tuning mechanism.

Replacing Fuses If at any time the radio receiver fails to operate (dial lamps fail to light when the "Off-On" switch is turned to the "On" position), first, make sure that the power supply cord has not been removed from the power outlet. Then, if the plug has not been removed, the fuse located in the chassis should be examined. The chassis fuse is located in the inside, rear portion of the base. It is readily accessible by simply removing the rectangular metal cover located on the outside front of the base. Caution: Before removing the "fuse cover" make sure that the "Power Supply Plug" is disconnected from the house current supply. In replacing this fuse see that a fuse of the correct amperage rating is used. The No. 150 Receivers use the Stromberg-Carlson, P.C. 23254 fuse, having a rating of 2 1/2 amperes.

ALIGNMENT DATA FOR MODELS 150 AND 160

All alignment adjustments are accurately made at the factory on this receiver, and ordinarily no readjustments are necessary. However, should it become necessary to make any readjustments, this alignment procedure should be carefully followed.

In making any alignment adjustments always adjust the signal generator's output to the minimum value where a good alignment may still be obtained. Never attempt to make any alignment adjustments using a strong signal. Figure 1 shows the location of all the aligning capacitors used in this receiver.

Intermediate Frequency Amplifier Adjustments

Because of the necessity of obtaining the proper shape of resonance curve of these stages in a high fidelity receiver, it is recommended that unless it is absolutely necessary, no adjustments be made in the factory times adjusters. For this reason, it is best to have these adjustments made at the factory. However, in the case where this cannot be done, the following procedure should be followed.

- Operate the range switch of the receiver to the "A" range position. Set the tuning dial at its extreme low frequency position, and operate the "Tone-Fidelity" control knob so that the receiver is adjusted for the standard facility position as indicated by the fidelity indicator located on the front panel of the receiver. Never attempt to align the I. F. circuits of this receiver with the "Tone-Fidelity" control set at any position other than the standard facility. The I. F. circuits may then be checked for alignment by adjusting the aligning capacitors in the exact order as follows:

- 1. Secondary of 3rd I. F. Trans. (Capacitor C-18).
- 2. Primary of 3rd I. F. Trans. (Capacitor C-17).
- 3. Secondary of 2nd I. F. Trans. (Capacitor C-16).
- 4. Primary of 2nd I. F. Trans. (Capacitor C-15).
- 5. Secondary of 1st I. F. Trans. (Capacitor C-14).
- 6. Primary of 1st I. F. Trans. (Capacitor C-13).

Radio Frequency Adjustments

The alignment of the radio frequency circuits for the various ranges in this receiver should be very carefully made in the order that no instructions are given for aligning the receiver at other than two frequencies for any range. Each receiver is given an exacting check for "tracking" at various frequencies in each range before leaving the factory. It is felt by the manufacturers that should any receiver through accident require a check on the "tracking", it should be returned to the factory, where this may be easily and accurately done.

Alignment of Long-Wave-Weather Range (Also Referred to as "X" Band) Circuits

- 1. Oscillator's "X" Band Shunt Aligning Capacitor at 350 Kilocycles (Capacitor C-12).
- 2. R. F. Interstage "X" Band Shunt Aligning Capacitor at 350 Kilocycles (Capacitor C-8).
- 3. Antenna "X" Band Shunt Aligning Capacitor at 350 Kilocycles (Capacitor C-4).
- 4. Oscillator "X" Band Series Aligning Capacitor at 150 Kilocycles (Capacitor Item 124). When operation No. 4 has been completed repeat operations 1, 2, and 3 again and in the exact order given.

Alignment of Standard Broadcast Range (Also Referred to as "A" Band) Circuits

- 1. Oscillator's "A" Band Shunt Aligning Capacitor at 1500 Kilocycles (Capacitor C-11).
- 2. R. F. Interstage "A" Band Shunt Aligning Capacitor at 1500 Kilocycles (Capacitor C-7).
- 3. Antenna "A" Band Shunt Aligning Capacitor at 1500 Kilocycles (Capacitor C-3).
- 4. "A" Band R. F. Bi-resonator Shunt Aligning Capacitor at 1500 Kilocycles (Capacitor C-19).
- 5. Oscillator "A" Band Series Aligning Capacitor at 500 Kilocycles (Capacitor with screw adjustment. Item 190). When operation No. 5 has been completed repeat operations 1, 2, 3, and 4 again and in the exact order given.

Alignment of Amateur, Police, and Aircraft Range (Also Referred to as "B" Band) Circuits

- 1. Oscillator's "B" Band Shunt Aligning Capacitor at 5 Megacycles (Capacitor C-10).
- 2. R. F. Interstage "B" Band Shunt Aligning Capacitor at 5 Megacycles (Capacitor C-6).
- 3. Antenna "B" Band Shunt Aligning Capacitor at 5 Megacycles (Capacitor C-2).
- 4. Oscillator "B" Band Series Aligning Capacitor at 1.8 Megacycles (Capacitor with nut adjustment. Item 190). When operation No. 4 has been completed repeat operations 1, 2, and 3 again and in the exact order given.

Alignment of Short-Wave-Foreign Range (Also Referred to as "C" Band) Circuits

- 1. Oscillator's "C" Band Shunt Aligning Capacitor at 16 Megacycles (Capacitor C-9).
- 2. R. F. Interstage "C" Band Shunt Aligning Capacitor at 16 Megacycles (Capacitor C-5).
- 3. Antenna "C" Band Shunt Aligning Capacitor at 16 Megacycles (Capacitor C-1).

Alignment of Ultra Short-Wave Range (Also Referred to as "D" Band) Circuits

- 1. The only adjustment which it is necessary to make for bringing the "D" Band Oscillator's circuit into alignment is accomplished by bending the ground loop (shown in Figure 1 as "D" Band Oscillator Circuit Adjustment) either closer to the coil or farther away from the coil. This adjustment should be made with the signal generator set to a frequency of 20 megacycles.
- 2. The only adjustment which it is necessary to make for bringing the "D" Band Antenna's circuit into alignment is accomplished by bending the grid lead loop (shown in Figure 1 as "D" Band Antenna Circuit Adjustment) so as to form either a smaller or larger loop. This adjustment should also be made with the signal generator set to a frequency of 20 megacycles.

Adjustment of 10 Kilocycle Audio Cut-Off Filter

The adjustment of this filter is correctly made at the factory and no additional adjustment is required.

Chassis

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 160L, 160L1, 160P, 160P1

Socket, Trimmers

No. 160-L 50 to 60 Cycles; P-26637 Chassis Assembly; P-26170 Loud Speaker
 No. 160-LB 25 to 60 Cycles; P-26638 Chassis Assembly; P-26170 Loud Speaker
 No. 160-P 60 Cycles Only; P-26639 Chassis Assembly; P-26170 Loud Speaker; P-26728 Phonograph Unit
 No. 160-PB 25 Cycles Only; P-26640 Chassis Assembly; P-26170 Loud Speaker; P-26729 Phonograph Unit

For Alignment, see Index

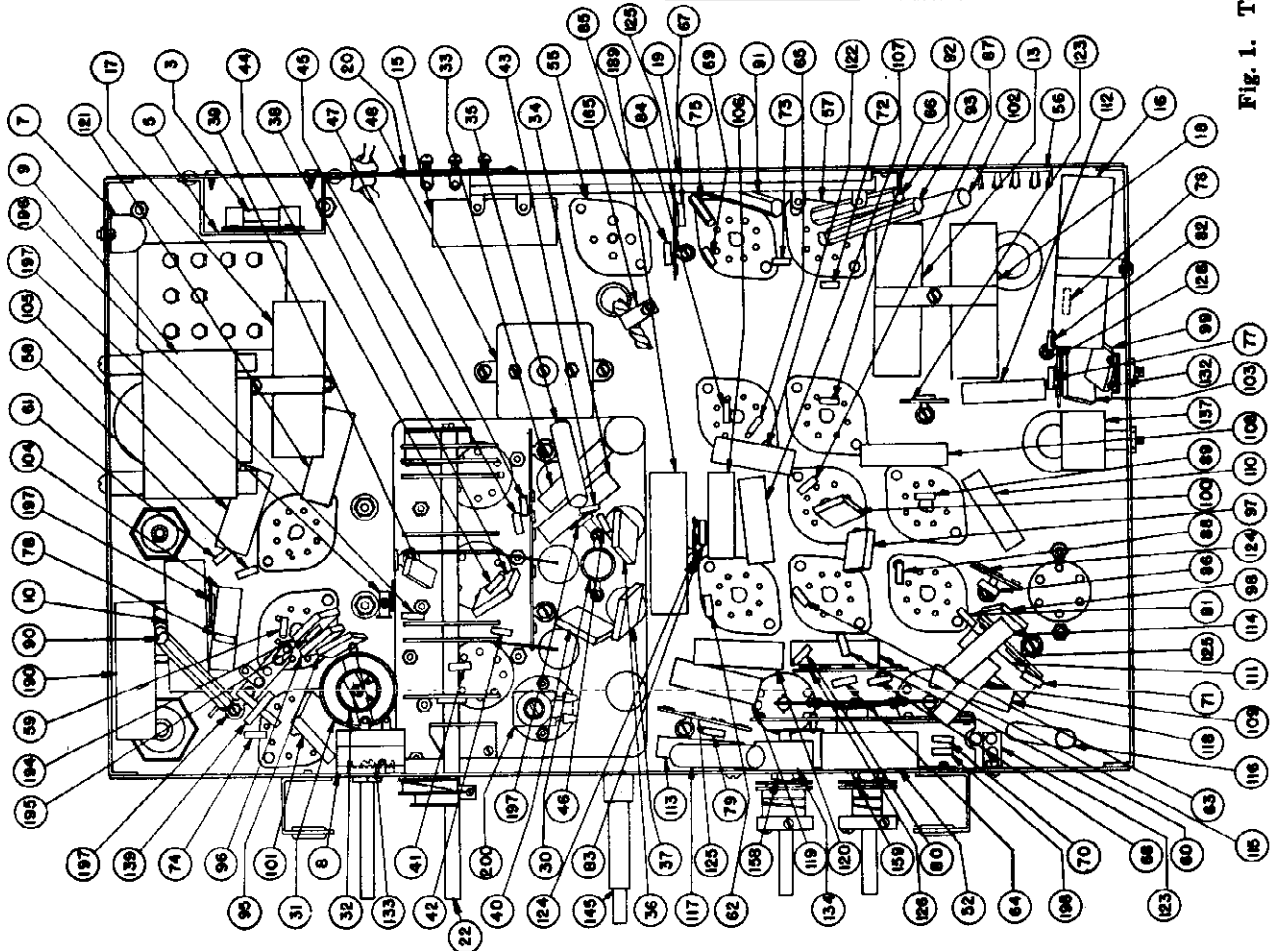
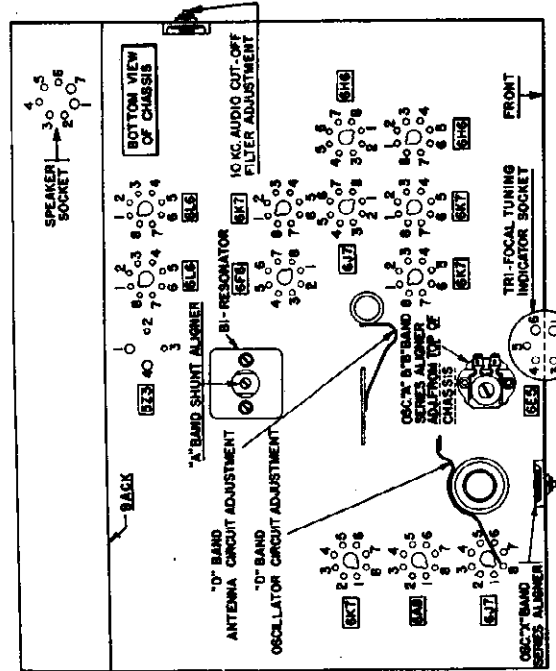
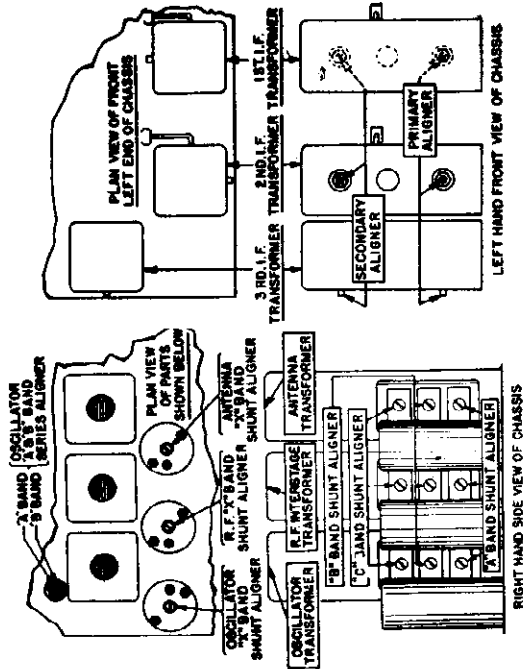
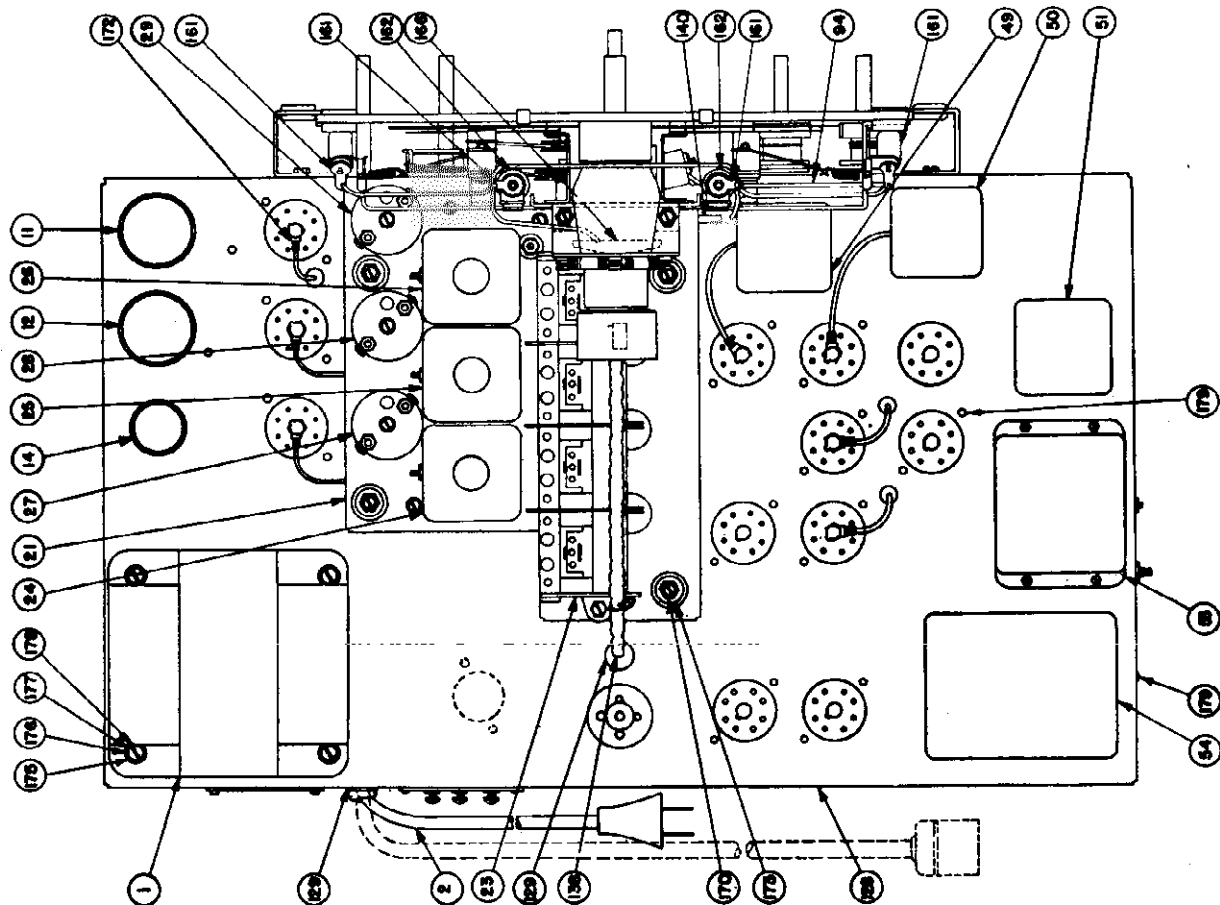


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

MODELS 16CL, 16CLB
 16OP, 16OPB STROMBERG-CARLSON TEL. MFG. CO.
 Voltage, Chassis

TUBE	CIRCUIT	CAP	TERMINALS OF SOCKETS								Heater Voltages Between Heater Terminals	
			1	2	3	4	5	6	7	8	Socket Terminal Numbers	Volts
6K7	R. F. Amp.	0	0	0	+230	+82	+5.2	—	6.2	+5.2	2-7	6.2
6A8	Modulator	0	0	0	+230	+82	-40	+80	6.2	0	2-7	6.2
6J7	Oscillator	-75	0	0	+225	+125	0	0	6.2	0	2-7	6.2
6K7	1st I. F. Amp.	0	0	0	+230	+76	+5.3	+3	6.2	+5.3	2-7	6.2
6K7	2nd I. F. Amp.	0	0	0	+230	+76	+5.2	+2.2	6.2	+5.2	2-7	6.2
6H6	Demodulator	—	0	0	-.25	0	-.25	+3	6.2	0	2-7	6.2
6H6	A. V. C.	—	0	0	0	+5	0	0	6.2	+5	2-7	6.2
6J7	Auto. Tone Cont.	0	0	0	+40*	+20	+2.3	0	6.2	+2.3	2-7	6.2
6K7	1st Audio Amp.	0	0	0	+170*	+15*	+0.6	+78	6.2	+0.6	2-7	6.2
6F6	2nd Audio Amp.	—	0	0	+235	+235	0	—	6.2	+19	2-7	6.2
6L6's	Audio Output	—	0	0	+400	+250	0	0	6.2	+20	2-7	6.2
6E5	Tuning Ind.	—	6.2	+10*	+5	+230	+4.8	0			1-6	6.2
5Z3	Rectifier	—	+410	400	400	+410					1-4	4.8

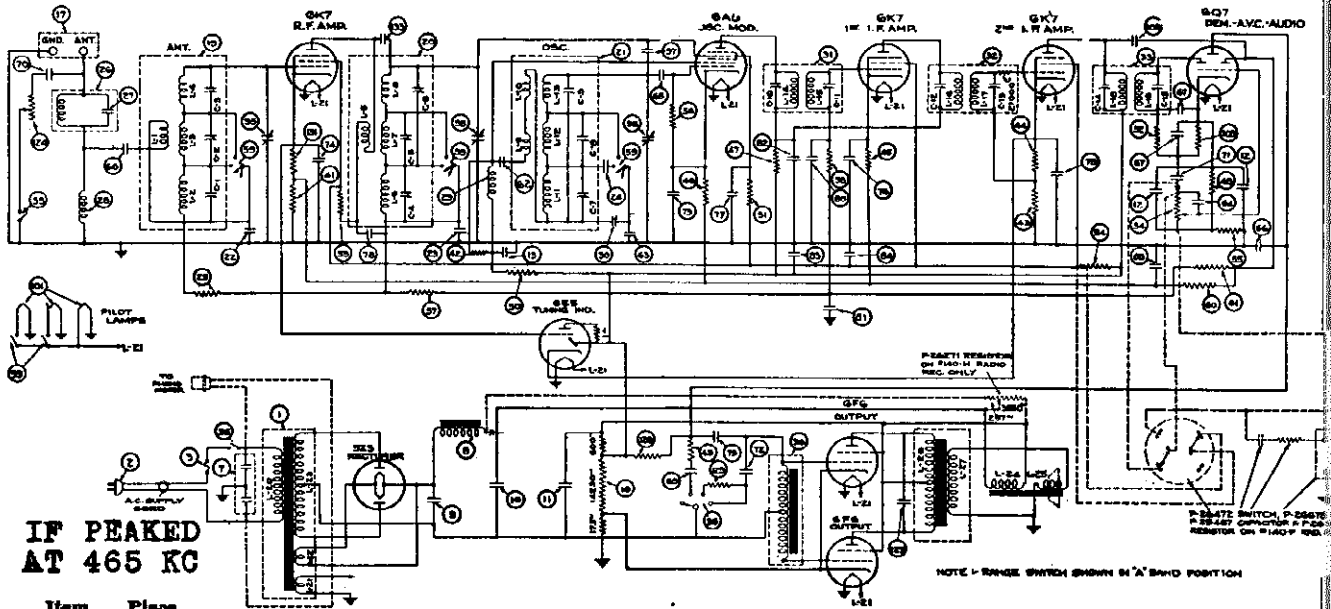
Voltage across vernier dial pilot lamp 5.3 volts. Receiver tuned to 1000 Kc., no signal.
 A. C. voltages are indicated by italics.



140LB, 140P, 140PB
Schematic, Parts

STROMBERG-CARLSON TEL. MFG. CO. 140K, 140L, 140KB

MODELS 140H, 140HB



IF PEAKED
AT 465 KC

Item Number	Piece Number	Part			
1	25434	Power Transformer (50 to 60 Cycles Chassis)	52	26345	Resistor, Type "E", 10,000 Ohms
1	25435	Power Transformer (25 to 60 Cycles Chassis)	53	26345	Resistor, Type "E", 10,000 Ohms
2	24245	Cord (A. C. Power Supply)	54	25526	Resistor, Type "E", 15,000 Ohms
3	23150	Fuse (2 Amperes)	55	26353	Resistor, Type "E", 47,000 Ohms
7	21535	Capacitor Assembly (2—.01 Capacitors)	56	26353	Resistor, Type "E", 47,000 Ohms
8	26260	Choke Assembly (Rectifier Filter)	57	26357	Resistor, Type "E", .1 Megohm
9	22757	Electrolytic Capacitor (50 to 60 Cycles Chassis)	58	26367	Resistor, Type "E", .1 Megohm
9	26510	Electrolytic Capacitor (25 to 60 Cycles Chassis)	59	26204	Range Switch
10	22759	Electrolytic Capacitor (50 to 60 Cycles Chassis)	60	26369	Resistor, Type "E", 1 Megohm
10	26511	Electrolytic Capacitor (25 to 60 Cycles Chassis)	61	26369	Resistor, Type "E", 1 Megohm
11	25458	Electrolytic Capacitor, 16 Mf.	62	25487	Capacitor, .001 Mf.
12	26045	Electrolytic Capacitor, Dual, 10 Mf.	63	25489	Capacitor, .00125 Mf.
13	25788	Electrolytic Capacitor, 1 Mf.	64	24166	Capacitor, 25 Mmf.
14	26069	Bracket (Chassis Spacer)	65	24559	Capacitor, 100 Mmf.
16	25437	Resistor, "B" Voltage Divider	66	24559	Capacitor, 100 Mmf.
19	25510	Coil Assembly, Antenna	67	26512	Capacitor, 2-100 Mmf.
20	25511	Coil Assembly, R. F.	68	25150	Capacitor Assembly, .08 Mf.
21	25512	Coil Assembly, Oscillator	69	25149	Capacitor Assembly, .01 Mf.
22	25488	Capacitor, .002 Mf.	70	25149	Capacitor Assembly, .01 Mf.
23	25527	Capacitor, .0027 Mf.	71	25150	Capacitor Assembly, .02 Mf.
24	25490	Capacitor, .0038 Mf.	72	25150	Capacitor Assembly, .02 Mf.
25	26353	Resistor, Type "E1", .1 Megohm	73	25150	Capacitor Assembly, .02 Mf.
26	25513	Coil Assembly, Wave Trap	74	25150	Capacitor Assembly, .02 Mf.
27	25488	Capacitor, .002 Mf.	75	25483	Capacitor Assembly, .1 Mf.
28	25814	Coil Assembly, R. F. Choke Coil	76	25483	Capacitor Assembly, .1 Mf.
29	25814	Coil Assembly, R. F. Choke Coil	77	25483	Capacitor Assembly, .1 Mf.
30	26047	Oscillator Series Aligning Capacitor	78	25481	Capacitor Assembly, .002 Mf.
31	26266	1st I. F. Transformer Assembly	79	24405	Capacitor Assembly, .04 Mf.
32	26269	2nd I. F. Transformer Assembly	80	24405	Capacitor Assembly, .04 Mf.
33	26270	3rd I. F. Transformer Assembly	81	24994	Capacitor Assembly, .05 Mf.
34	26114	Potentiometer (Volume Control)	82	24994	Capacitor Assembly, .05 Mf.
35	26404	Switch ("Off-On" and Tone Control)	83	24994	Capacitor Assembly, .05 Mf.
36	26272	Transformer Assembly, Audio	84	24994	Capacitor Assembly, .05 Mf.
37	26274	Transformer Assembly, Output	85	24994	Capacitor Assembly, .05 Mf.
38	22988	Socket, 4 Prong	95	26276	Gang Tuning Capacitor
39	23517	Socket, 7 Prong	97	26417	Capacitor Assembly (Gimmick)
40	25639	Socket, 8 Prong	101	26287	Pilot Lamp
41	26324	Resistor, Type "E", 180 Ohms	108	24560	Capacitor, 50 Mmf.
42	26350	Resistor, Type "E", 27,000 Ohms	100	26362	Resistor, Type "E", 270,000 Ohms
43	26325	Resistor, Type "E", 390 Ohms	124	26095	Potentiometer (Sensitivity Control)
44	26329	Resistor, Type "E", 470 Ohms	126	26499	Knob (For Sensitivity Control)
45	26329	Resistor, Type "E", 470 Ohms	127	24401	Capacitor, .004 Mf.
46	26330	Resistor, Type "E", 560 Ohms	128	26357	Resistor, Type "E", .1 Megohm
47	26350	Resistor, Type "E", 560 Ohms	129	26241	Resistor, Type "E", 4700 Ohms
48	26340	Resistor, Type "E", 3,900 Ohms	131	26329	Resistor, Type "E", 470 Ohms
49	26350	Resistor, Type "E", 27,000 Ohms			
50	26350	Resistor, Type "E", 27,000 Ohms			
51	26345	Resistor, Type "E", 10,000 Ohms			

MISCELLANEOUS PARTS

Piece Number	Part
26350	Cone Assembly (For P-26170 Speaker)
25492	Cone Assembly (For P-26171 Speaker)
26043	Plug (For Loud Speaker Cable)
26369	Resistor, Type "E", 1 Megohm (Used as Socket of No. 6E5 Tube)

MODELS 140H, 140HB
140K, 140KB, 140L
140LB, 140P, 140PB

STROMBERG-CARLSON TEL. MFG. CO.

Voltage, Alignment
Trimmers

Tube	Circuit	Cap	Terminals of Sockets								Heater Voltages Between Heater Terminals	
			1	2	3	4	5	6	7	8	Socket Terminal Numbers	Volts
6K7	R. F. Amp.	0	0	0	+ 52	+ 93	+ 6	—	<i>6.3</i>	+ 6	2-7	<i>6.3</i>
6A8	Mod.-Osc.	0	0	0	+242	+ 69	-0.7	+150	<i>6.3</i>	+6.9	2-7	<i>6.3</i>
6K7	1st I. F. Amp.	0	0	0	+242	+ 90	+6.2	+3.5	<i>6.3</i>	+6.2	2-7	<i>6.3</i>
6K7	2nd I. F. Amp.	0	0	0	+242	+ 90	+5.6	+2.6	<i>6.3</i>	+5.6	2-7	<i>6.3</i>
6Q7	Dem.—A. V. C.— Audio Amp.	0	0	0	+148	0	+20*	+3.5	<i>6.3</i>	+ 23	2-7	<i>6.3</i>
6F6	Audio Output		0	0	+258	+265	0	—	<i>6.3</i>	+ 17	2-7	<i>6.3</i>
5Z3	Rectifier		+445	400	400	+445	—	—	—	—	1-4	<i>4.8</i>
6E5	Tuning Indicator		<i>6.3</i>	+0.6	+ 6	+240	+5.6	0	—	—	1-6	<i>6.3</i>
Speaker Socket				+262	0	0	+445	+445	—	+425		

Receiver tuned to 1000 Kc., no signal. A. C. voltages are indicated by italics.

Intermediate Frequency Amplifier Adjustments

The intermediate frequency used in these receivers is 465 kilocycles. In making these I. F. circuit adjustments always align in the following order:

1. Secondary of 3rd I. F. Transformer (Capacitor C-15).
2. Primary of 3rd I. F. Transformer (Capacitor C-14).
3. Secondary of 2nd I. F. Transformer (Capacitor C-13).
4. Primary of 2nd I. F. Transformer (Capacitor C-12).
5. Secondary of 1st I. F. Transformer (Capacitor C-11).
6. Primary of 1st I. F. Transformer (Capacitor C-10).

Radio Frequency Adjustments

The adjustments of the aligning capacitors used in the radio frequency circuits in this receiver should be very carefully made in the following order and at the frequencies specified below:

1. Oscillator's "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-9).
2. R. F. Interstage "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-6).
3. Antenna "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-3).
4. Oscillator's "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-8).
5. R. F. Interstage "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-5).
6. Antenna "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-2).
7. Oscillator's "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-7).
8. R. F. Interstage "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-4).
9. Antenna "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-1).
10. Oscillator's "A" Band Series Aligner at 0.6 Megacycles (Capacitor C-10).
11. Oscillator's "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-7).
12. R. F. Interstage "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-4).
13. Antenna "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-1).

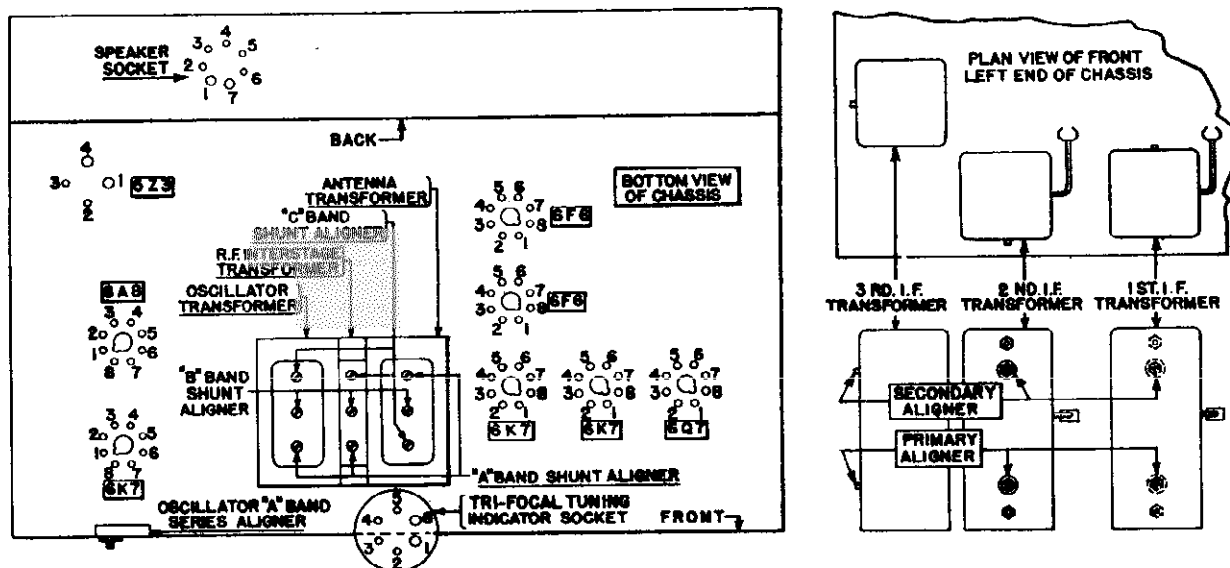


Fig. 2. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

Socket, Trimmers
Chassis, Notes

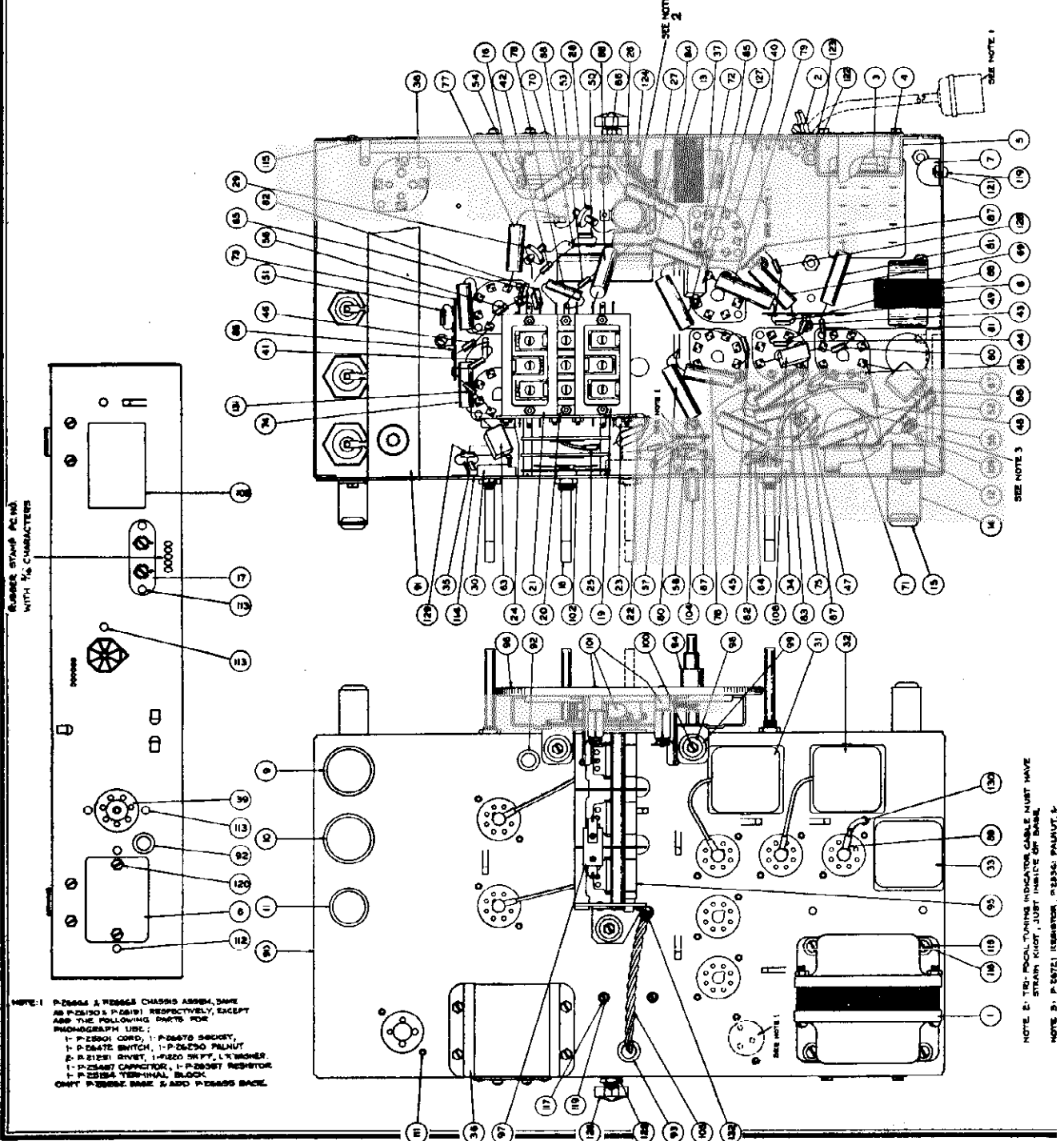
STROMBERG-CARLSON TEL. MFG. CO. MODELS 140H, 140K, 140L, 140KB, 140LB, 140PB, 140OL

The No. 140-H Receiver is furnished with a highly efficient Stromberg-Carlson dynamic speaker and the exclusive "Patent Applied For" Stromberg-Carlson "Tri-Focal Tuning System."

The Nos. 140-K, 140-L, and 140-P Receivers differ from the No. 140-H Receiver in that they are of a fixed high fidelity type. In these receivers the same chassis is used as in the No. 140-H Receiver, including the "Tri-Focal Tuning System" and Selectorlite dial arrangement. In addition to these features the Nos. 140-K, 140-L, and 140-P Receivers are equipped with a Carpinchoe high fidelity dynamic speaker in place of the standard broadcast speaker which is furnished in the No. 140-H Receiver. Audio reproduction is further improved in these three models by employing sound diffusing vanes in front of the loud speaker opening, which distribute the higher pitched tones, thereby providing excellent reproduction in all parts of the room by spreading out these directional frequencies.

In the Nos. 140-L and 140-P Receivers inclusion is made of the exclusive Stromberg-Carlson Acoustical Laboratories' revolutionary new development, the Acoustical Labyrinth. This new device extends the bass response, provides reproduction only from the front of the cabinet, and eliminates all cabinet resonance.

In addition to all of the above features, the No. 140-P Receiver is equipped with a highly efficient single record playing phonograph unit which has an entirely new type of pick-up suspension device.



MODELS 180L, 180LB

Socket, Trimmers

STROMBERG-CARLSON TEL. MFG. CO.

Chassis

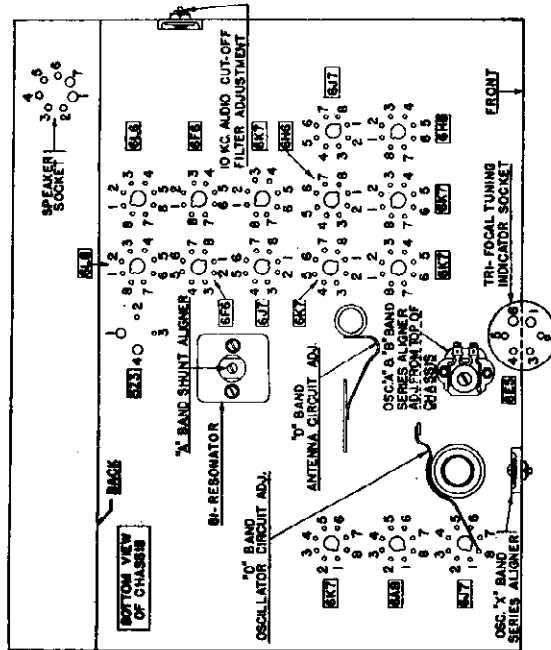
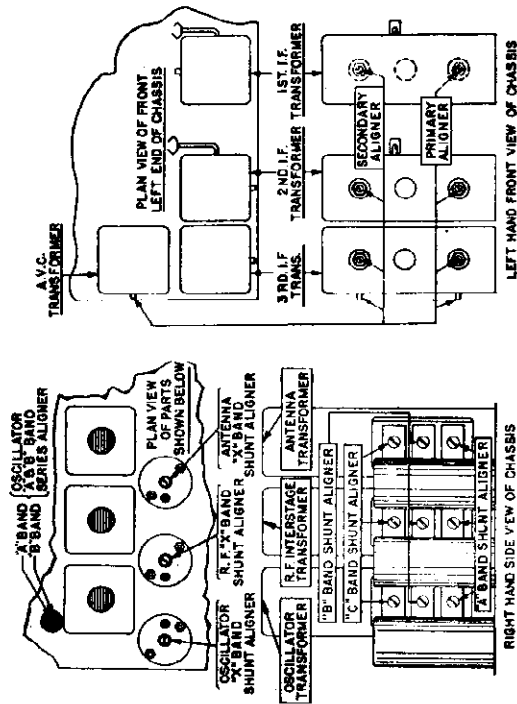
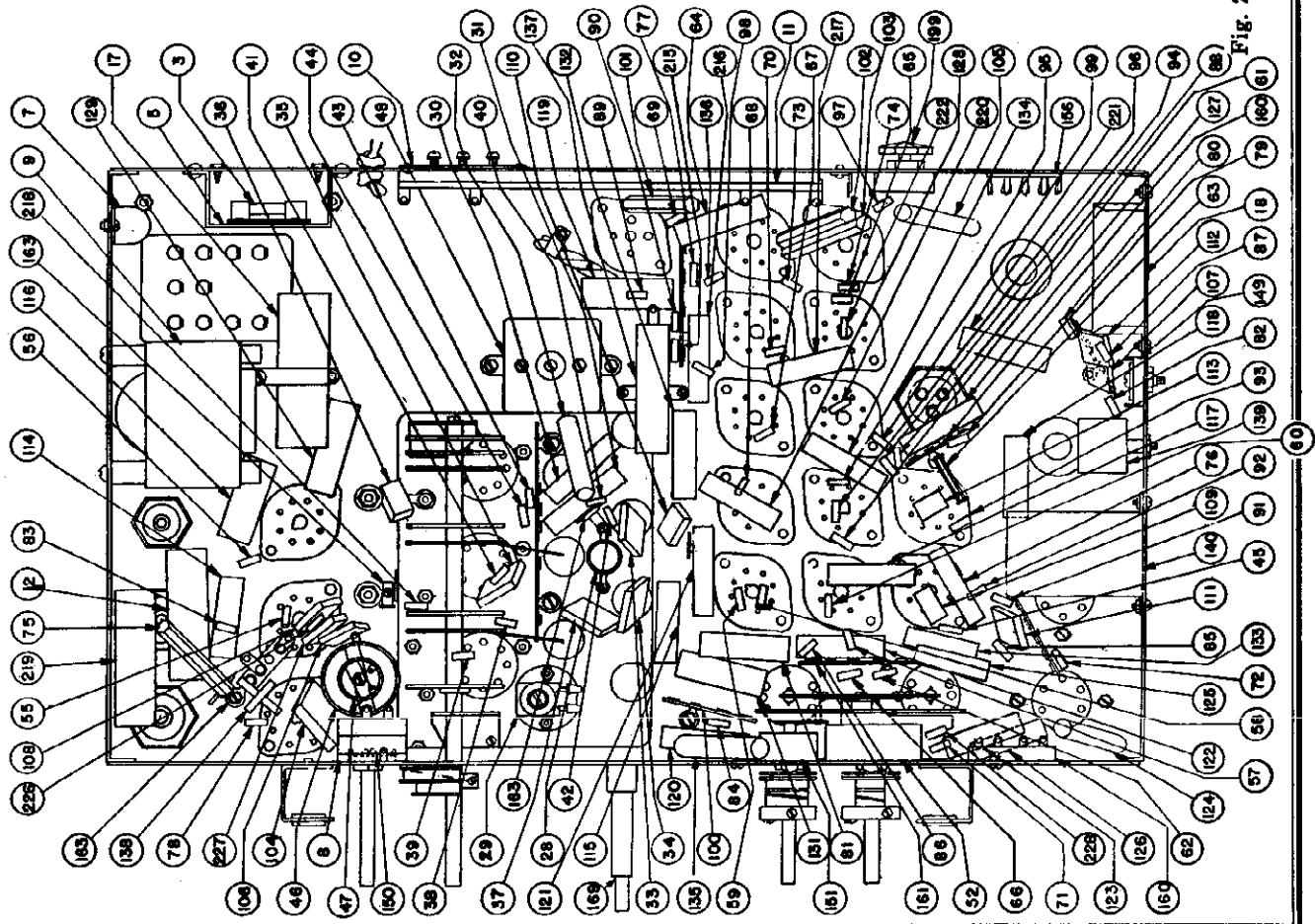
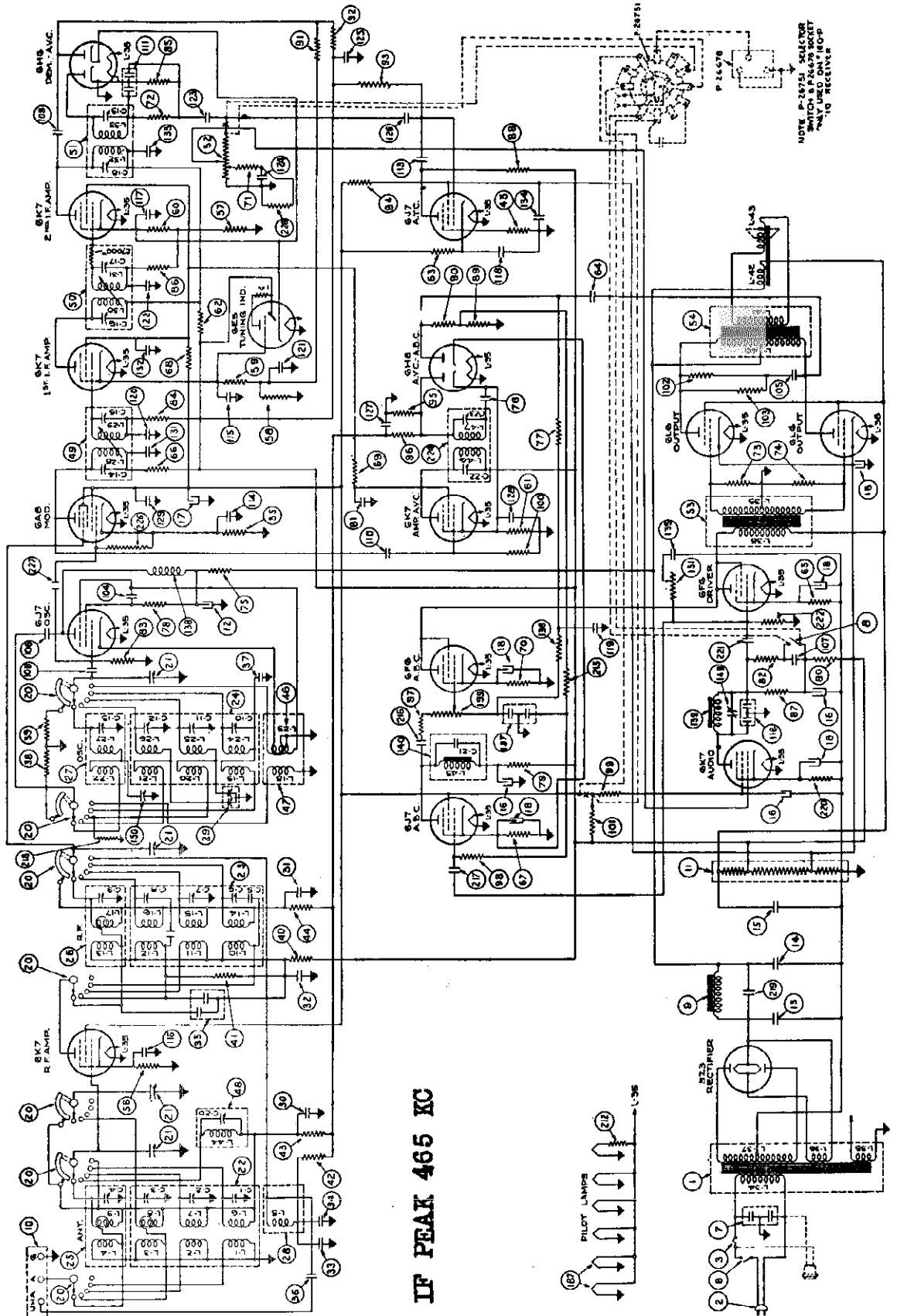


Fig. 2. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

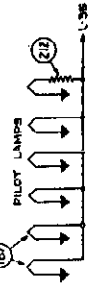


STROMBERG-CARLSON TEL. MFG. CO. Schematic



NOTE: P-2575 SELECTOR SWITCH & P-2576 SOCKET MAY BE USED ONLY IF EQUIPPED TO RECEIVER

IF PEAK 465 KC



MODELS 18OL, 18OLB
Alignment, Voltage

STROMBERG-CARLSON TEL. MFG. CO.

ALIGNMENT OF THE AMPLIFIED AUTOMATIC VOLUME CONTROL CIRCUIT

The alignment adjustments for this circuit should only be made after the circuits of the intermediate and radio frequency amplifiers have been aligned. Never align the amplified automatic volume control circuit until the intermediate and radio frequency circuits have been aligned. In making the alignment adjustment of this circuit, the volume control potentiometer should be turned in on the receiver. The strength of this signal should be on the order of approximately 2000 microvolts. The potentiometer is correctly tuned in, the aligning capacitor C-23 and C-22 should be adjusted to the position where a minimum value of signal is obtained from the output of the receiver. These two adjustments should be made in the order given.

Adjustment of 10 Kilocycle Audio Cut-Off Filter

The adjustment of this filter is correctly made at the factory and no additional adjustment is required.

NORMAL VOLTAGE READINGS

The various values of voltages listed in the following table are obtained by measuring between the various tube socket contacts and the chassis base, with the tubes in their respective sockets. The receiver is, therefore, in operation when the measurements are made. Figure 2 shows the terminal layouts of the sockets with the proper terminal numbers.

Voltages are given for a line voltage of 120 volts, and allowances should be made for differences when the line voltage is higher or lower. A meter having a resistance of 1600 ohms per volt should be used for measuring the D. C. voltages. Voltage values shown are those obtained on the lowest possible scale of a meter having the following ranges: 0-2.5, 0-10, 0-100, 0-250, 0-500, 0-1000 volts except when an asterisk appears after any given voltage value in which case the 1000 volt scale was used.

Tube	Circuit	Cap	Terminals of Sockets								Heater Voltages Between Heater Terminals	
			1	2	3	4	5	6	7	8	Socket Terminal Numbers	Volts
6K7	R. F. Amp.	0	0	0	+237	+98	+2.7	—	6.2	+2.7	2-7	6.2
6A8	Modulator	0	0	0	+242	+98	-42	+1.6	6.2	+1.6	2-7	6.2
6I7	Oscillator	-73	0	0	+212	+120	0	0	6.2	0	2-7	6.2
6K7	1st I. F. Amp.	0	0	0	+240	+90	+6.5	+4	6.2	+6.5	2-7	6.2
6K7	2nd I. F. Amp.	0	0	0	+237	+90	+5.5	-2.1	6.2	+5.5	2-7	6.2
6H6	Dem.—A. V. C.	—	0	0	0	0	0	0	6.2	+5.5	2-7	6.2
6H6	Amp. A. V. C. and Auto. Bass Control	—	0	0	0	+2.6	0	0	6.2	+2.8	2-7	6.2
6K7	Amp. A. V. C.	0	0	0	+242	+88	+2.8	+80	6.2	+2.8	2-7	6.2
6I7	Auto. Bass Control	0	0	0	+93	+93	+2.6	0	6.2	+2.6	2-7	6.2
6I7	Auto. Tone Control	0	0	0	+65*	+15*	+2.3	0	6.2	+2.3	2-7	6.2
6F6	Auto Bass Control	—	0	0	+235	+235	0	—	6.2	+19	2-7	6.2
6K7	1st Audio Amp.	0	0	0	+130	+15*	+7	—	6.2	+7	2-7	6.2
6F8	Audio Driver	—	0	0	+232	+232	0	0	6.2	+22	2-7	6.2
6L6	Audio Output	—	0	0	+405	+265	0	0	6.2	+21	2-7	6.2
6E5	Tuning Ind.	—	6.2	+6	+6.3	+242	+5.5	0	—	—	1-6	6.2
5Z3	Rectifier	—	+415	400	400	+415	—	—	—	—	1-4	4.7
Speaker		—	+405	0	0	+415	+415	0	+256	—	—	—

Voltage across vernier dial pilot lamp—5.3 volts.
Receiver tuned to 1000 Kc., no signal. A. C. voltages are indicated by italics.

ALIGNMENT DATA

All alignment adjustments are accurately made at the factory on this receiver, and ordinarily no readjustments are necessary. Should it become necessary to make any readjustments, this alignment procedure should be carefully followed.

In making any alignment adjustments always adjust the signal generator's output to the minimum value where a good alignment may still be obtained. Never attempt to make any alignment adjustments using a strong signal.

Figure 3 shows the location of all the aligning capacitors used in this receiver.

Intermediate Frequency Amplifier Adjustments

Because of the necessity of obtaining the proper shape of resonance curve of these stages in a high fidelity receiver, it is recommended that unless it is absolutely essential, these I. F. adjustments be untouched. In the factory these adjustments are made using a special system which allows in operation the lowest amplifier and the resonance curve to be obtained. However, in the case where this cannot be done, the following procedure should be followed.

Operate the range switch of the receiver in the "A" range position. Set the tuning dial at its extreme low frequency position, and operate the receiver at the frequency indicated on the front panel of the receiver. Never attempt to align the I. F. circuits of this receiver with the "Tone-Fidelity" control set at any position other than the standard fidelity. The I. F. circuits may then be checked for alignment by adjusting the aligning capacitors in the exact order as follows:

1. Secondary of 3rd I. F. Trans. (Capacitor C-19).
2. Primary of 3rd I. F. Trans. (Capacitor C-18).
3. Secondary of 2nd I. F. Trans. (Capacitor C-17).
4. Primary of 2nd I. F. Trans. (Capacitor C-16).
5. Secondary of 1st I. F. Trans. (Capacitor C-15).
6. Primary of 1st I. F. Trans. (Capacitor C-14).

Radio Frequency Adjustments

The alignment of the radio frequency circuits for the various ranges in this receiver should be very carefully made in the order and at the frequencies specified.

It will be noted that no instructions are given for aligning the receiver at other than two frequencies for any range. Each receiver is given an exacting check for accuracy at these two frequencies. Through accident or carelessness (leaving the receiver in the "A" range position) it should be returned to the factory, where this may be easily and accurately done.

ALIGNMENT OF LONG-WAVE-WEATHER RANGE (ALSO REFERRED TO AS "X" BAND) CIRCUITS

1. Oscillator's "X" Band Shunt Aligning Capacitor at 350 Kilocycles (Capacitor C-13).
2. R. F. Interstage "X" Band Shunt Aligning Capacitor at 350 Kilocycles (Capacitor C-9).
3. Antenna "X" Band Shunt Aligning Capacitor at 350 Kilocycles (Capacitor C-4).
4. Oscillator "X" Band Series Aligning Capacitor at 150 Kilocycles (Capacitor Item 150). When operation No. 4 has been completed repeat operations 1, 2, and 3 again and in the exact order given.

ALIGNMENT OF STANDARD BROADCAST RANGE (ALSO REFERRED TO AS "A" BAND) CIRCUITS

1. Oscillator's "A" Band Shunt Aligning Capacitor at 1500 Kilocycles (Capacitor C-12).
2. R. F. Interstage "A" Band Shunt Aligning Capacitor at 1500 Kilocycles (Capacitor C-8).
3. Antenna "A" Band Shunt Aligning Capacitor at 1500 Kilocycles (Capacitor C-3).
4. "A" Band, R. F. Bi-resonator Shunt Aligning Capacitor at 1500 Kilocycles (Capacitor C-30).
5. Oscillator "A" Band Series Aligning Capacitor at 600 Kilocycles (Capacitor with screw adjustment, Item 29). When operation No. 5 has been completed repeat operations 1, 2, 3, and 4 again and in the exact order given.

ALIGNMENT OF AMATEUR, POLICE, AND AIRCRAFT RANGE (ALSO REFERRED TO AS "B" BAND) CIRCUITS

1. Oscillator's "B" Band Shunt Aligning Capacitor at 5 Megacycles (Capacitor C-11).
2. R. F. Interstage "B" Band Shunt Aligning Capacitor at 5 Megacycles (Capacitor C-7).
3. Antenna "B" Band Shunt Aligning Capacitor at 5 Megacycles (Capacitor C-2).
4. Oscillator "B" Band Series Aligning Capacitor at 1.8 Megacycles (Capacitor with nut adjustment, Item 29). When operation No. 4 has been completed repeat operations 1, 2, and 3 again and in the exact order given.

ALIGNMENT OF SHORT-WAVE-FOREIGN RANGE (ALSO REFERRED TO AS "C" BAND) CIRCUITS

1. Oscillator's "C" Band Shunt Aligning Capacitor at 16 Megacycles (Capacitor C-10).
2. R. F. Interstage "C" Band Shunt Aligning Capacitor at 16 Megacycles (Capacitor C-6).
3. Antenna "C" Band Shunt Aligning Capacitor at 16 Megacycles (Capacitor C-4).

ALIGNMENT OF ULTRA SHORT-WAVE RANGE (ALSO REFERRED TO AS "D" BAND) CIRCUITS

1. The only adjustment which it is necessary to make for bringing the "D" Band Oscillator's circuit into alignment is accomplished by bending the ground loop (shown in Figure 2 as "D" Band Oscillator Circuit Adjustment) either closer to the coil or farther away from the coil. This adjustment should be made with the signal generator set to a frequency of 20 megacycles.
2. The only adjustment which it is necessary to make for bringing the "D" Band Antenna's circuit into alignment is accomplished by bending the grid lead loop (shown in Figure 2 as "D" Band Antenna Circuit Adjustment) so as to form either a smaller or larger loop. This adjustment should also be made with the signal generator set to a frequency of 20 megacycles.

STROMBERG-CARLSON TEL. MFG. CO. Parts List

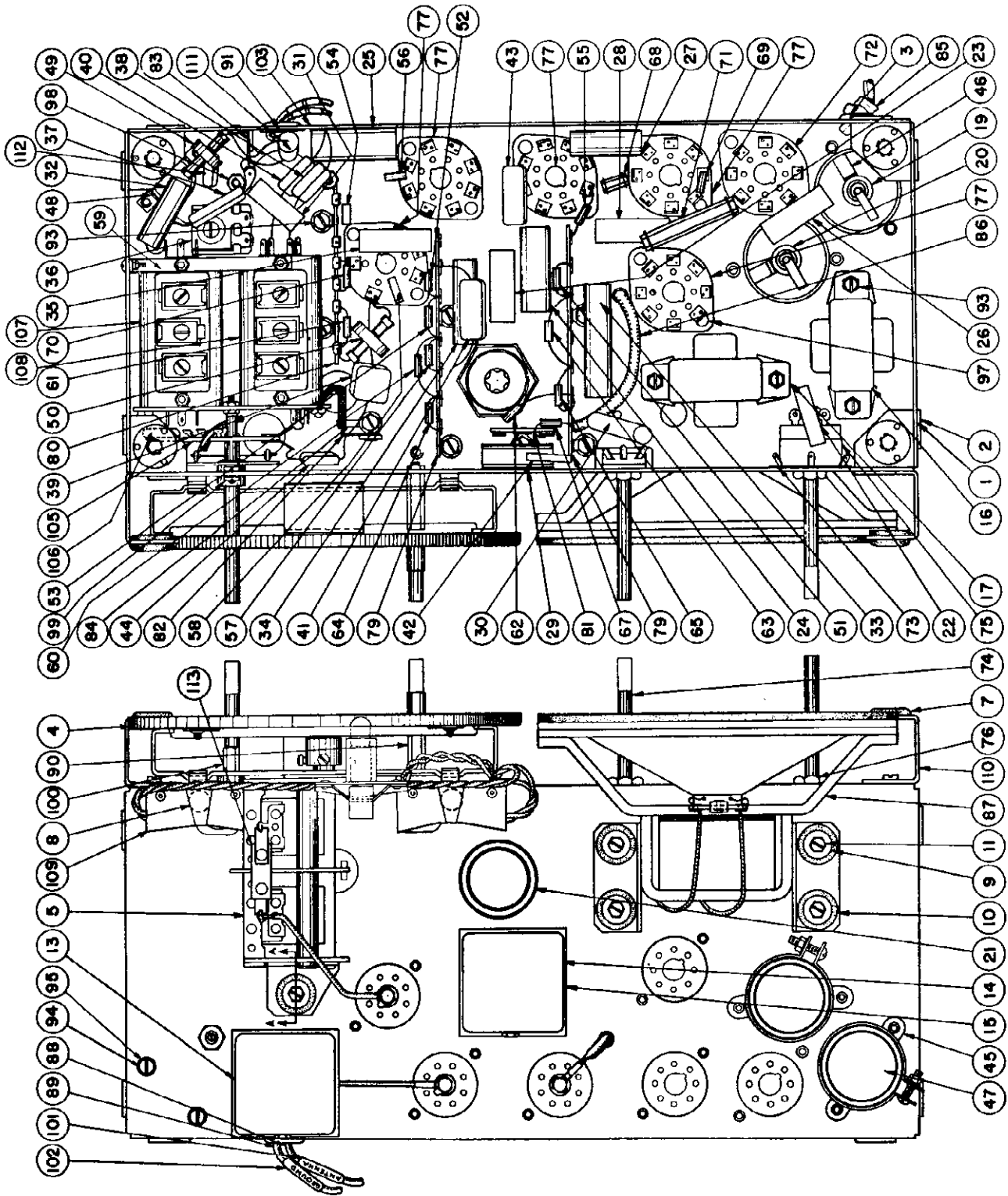
Item Number	Piece Number	Part	Item Number	Piece Number	Part
1	26782	Power Transformer (50 to 60 Cycles Chassis)	100	26373	Resistor, Type "E", 2.2 Megohm
1	26783	Power Transformer (25 to 60 Cycles Chassis)	101	26062	Resistor, Type "E", 10,000 Ohms
3	23234	Fuse, 2 1/2 Amperes	102	26775	Resistor, Type "E", 20,000 Ohms
4	21984	Fuse Block Assembly	103	26775	Resistor, Type "E", 20,000 Ohms
7	21535	Capacitor Assembly (2—.01 Mf. Capacitors)	104	25535	Capacitor, Type "W", .001 Mf.
8	26061	Switch ("Off-On" and Bass Control)	105	26932	Capacitor, Type "W", .001 Mf.
9	26704	Choke Assembly (Filter of Rectifier)	106	25487	Capacitor, Type "W", .001 Mf.
11	26792	Resistor, "B" Voltage Divider	107	25487	Capacitor, Type "W", .001 Mf.
12	25788	Electrolytic Capacitor, 1 Mf., 450 Volts	108	24560	Capacitor, Type "O", 50 Mmf.
13	22757	Electrolytic Capacitor, 8 Mf., 500 Volts (50 to 60 Cycles Chassis)	109	24560	Capacitor, Type "O", 50 Mmf.
13	26510	Electrolytic Capacitor, 16 Mf., 500 Volts (25 to 60 Cycles Chassis)	110	24560	Capacitor, Type "O", 50 Mmf.
14	22757	Electrolytic Capacitor, 8 Mf., 500 Volts (50 to 60 Cycles Chassis)	111	26512	Capacitor, Type "W", 2—100 Mmf.
14	26510	Electrolytic Capacitor, 16 Mf., 500 Volts (25 to 60 Cycles Chassis)	112	26512	Capacitor, Type "W", 2—100 Mmf.
15	26773	Electrolytic Capacitor, 16 Mf., 350 Volts	113	24559	Capacitor, Type "O", 100 Mmf.
16	22759	Capacitor Assembly, (3—4 Mf.)	114	24402	Capacitor Assembly, .1 Mf.
17	26693	Electrolytic Capacitor, 4 Mf., 350 Volts	115	24402	Capacitor Assembly, .1 Mf.
18	26797	Capacitor Assembly, 2—12 Mf., 2—10 Mf. 1—30 Mf.	116	24402	Capacitor Assembly, .1 Mf.
20	26746	Range Switch Assembly	117	24402	Capacitor Assembly, .1 Mf.
21	26144	Gang Tuning Capacitor Assembly	118	24402	Capacitor Assembly, .1 Mf.
22	26446	Coil Assembly, Antenna ("A", "B" and "C" Ranges)	119	24402	Capacitor Assembly, .1 Mf.
23	26447	Coil Assembly, R. F. ("A", "B", and "C" Ranges)	120	24405	Capacitor Assembly, .04 Mf.
24	26448	Coil Assembly, Oscillator ("A", "B" and "C" Ranges)	121	24405	Capacitor Assembly, .04 Mf.
25	26507	Coil Assembly, Antenna ("X" Range)	122	24405	Capacitor Assembly, .04 Mf.
26	26508	Coil Assembly, R. F. ("X" Range)	123	24405	Capacitor Assembly, .04 Mf.
27	26509	Coil Assembly, Oscillator ("X" Range)	124	24405	Capacitor Assembly, .04 Mf.
28	26758	Coil Assembly, Antenna ("D" Range)	125	24405	Capacitor Assembly, .04 Mf.
29	26504	Capacitor Assembly, Series Aligners ("A" and "B" Ranges)	126	24405	Capacitor Assembly, .04 Mf.
30	24405	Capacitor Assembly, .04 Mf.	127	24405	Capacitor Assembly, .04 Mf.
31	24405	Capacitor Assembly, .04 Mf.	128	24405	Capacitor Assembly, .04 Mf.
32	24994	Capacitor Assembly, .05 Mf.	129	24994	Capacitor Assembly, .05 Mf.
33	24637	Capacitor, Type "W", .0017 Mf.	131	24994	Capacitor Assembly, .05 Mf.
34	24637	Capacitor, Type "W", .0017 Mf.	132	24994	Capacitor Assembly, .05 Mf.
35	26513	Capacitor Assembly, (2—200 Mmf.)	133	24994	Capacitor Assembly, .05 Mf.
36	24559	Capacitor, Type "O", 100 Mmf.	134	24994	Capacitor Assembly, .05 Mf.
37	26944	Capacitor, Type "W", .004 Mf.	135	25149	Capacitor Assembly, .01 Mf.
38	26321	Resistor, Type "E", 100 Ohms	136	26365	Resistor, Type "E", 470,000 Ohms
39	26321	Resistor, Type "E", 100 Ohms	137	23101	Capacitor Assembly, 2—.5 Mf.
40	26333	Resistor, Type "E", 1000 Ohms	138	25814	Choke Assembly, 5 Millihenrys
41	26333	Resistor, Type "E", 1000 Ohms	139	26515	Coil Assembly (High Frequency Cut-Off Filter)
42	26357	Resistor, Type "E", 47,000 Ohms	140	26794	Filter Assembly (Auto. Bass Control)
43	26357	Resistor, Type "E", 1 Megohm	149	26568	Adjustable Capacitor (High Frequency Cut-Off Filter)
44	26357	Resistor, Type "E", 1 Megohm	150	26569	Capacitor (Oscillator Series Aligner, "X" Range)
45	26331	Resistor, Type "E", 680 Ohms	151	26485	Potentiometer and Bracket Assembly (Tone Control and High Fidelity)
46	26705	Oscillator Secondary Coil ("D" Range)	154	26497	Cable Assembly, Tri-Focal Tuning Indicator
47	26787	Oscillator Primary Coil ("D" Range)	155	22985	Socket, 4 Prong
48	26474	Coil Assembly (Bi-Resonator)	156	23517	Socket, 5 Prong
49	26481	1st I. F. Transformer	157	25539	Socket, 8 Prong
50	26482	2nd I. F. Transformer	164	26519	Drive Disc Assembly
51	26243	3rd I. F. Transformer	165	26570	Dial Bracket Assembly
52	26077	Potentiometer (Volume Control)	167	26211	Pulley
53	26706	Transformer Assembly, Audio Input	168	26518	Gear Assembly
54	26708	Transformer Assembly, Audio Output	169	26220	Drive Shaft Assembly
55	26326	Resistor, Type "E", 270 Ohms	170	26520	Dial Assembly (Vernier)
56	26328	Resistor, Type "E", 390 Ohms	171	26694	Dial Assembly (Main)
57	26328	Resistor, Type "E", 390 Ohms	172	26672	Drive Cord Assembly (Volume Indicator Disc)
58	26332	Resistor, Type "E", 820 Ohms	173	26673	Drive Cord Assembly (Fidelity Indicator Disc)
59	26330	Resistor, Type "E", 560 Ohms	174	26683	Cord Assembly (Dial Elevator)
60	26330	Resistor, Type "E", 560 Ohms	175	26226	Spring
61	26330	Resistor, Type "E", 560 Ohms	176	26555	Volume Indicator Disc Assembly
62	26330	Resistor, Type "E", 560 Ohms	177	26698	Fidelity Indicator Disc Assembly
63	21593	Resistor, Type "E", 20,000 Ohms	178	26672	Bracket Assembly (Tri-Focal Tuning Indicator)
64	26932	Capacitor Assembly, .008 Mf.	179	26682	Reel Assembly (Range Switch)
65	26332	Resistor, Type "E", 820 Ohms	180	26667	Reel Assembly (Tone-Fidelity Control)
66	26333	Resistor, Type "E", 1000 Ohms	181	26666	Reel Assembly (Volume Control)
67	26333	Resistor, Type "E", 1000 Ohms	185	26147	Lamp Socket
68	26333	Resistor, Type "E", 1000 Ohms	186	26357	Lamp Shades
69	26333	Resistor, Type "E", 1000 Ohms	187	26287	Pilot Lamp
70	26337	Resistor, Type "E", 2200 Ohms	190	26692	Lamp Socket Assembly
71	26341	Resistor, Type "E", 4700 Ohms	199	26798	Potentiometer (Automatic Bass Control)
72	26345	Resistor, Type "E", 10,000 Ohms	200	26499	Knob (For Automatic Bass Control Potentiometer)
73	26345	Resistor, Type "E", 10,000 Ohms	212	26780	Resistor, Flexible, 3.5 Ohms (Pilot Lamp)
74	26345	Resistor, Type "E", 10,000 Ohms	215	26365	Resistor, Type "E", 470,000 Ohms
75	26776	Resistor, Type "E", 12,000 Ohms	216	24405	Capacitor Assembly, .04 Mf.
76	25150	Capacitor, .02 Mf.	217	24405	Capacitor Assembly, .04 Mf.
77	26365	Resistor, Type "E", 470,000 Ohms	218	26341	Resistor, Type "E", 4700 Ohms
78	26349	Resistor, Type "E", 22,000 Ohms	219	22775	Capacitor, 4 Mf.
79	26353	Resistor, Type "E", 47,000 Ohms	220	26338	Resistor, Type "E", 2700 Ohms
80	26353	Resistor, Type "E", 47,000 Ohms	221	24405	Capacitor Assembly, .04 Mf.
81	24994	Capacitor Assembly, .05 Mf.	222	26365	Resistor, Type "E", 470,000 Ohms
82	26356	Resistor, Type "E", 82,000 Ohms	224	26954	Amp. A. V. C. Transformer
83	26353	Resistor, Type "E", 47,000 Ohms	226	26357	Resistor, Type "E", 1 Megohm
84	26357	Resistor, Type "E", 1 Megohm	227	24560	Capacitor, Type "O", 50 Mmf.
85	26357	Resistor, Type "E", 1 Megohm	228	26345	Resistor, Type "E", 10,000 Ohms
86	26357	Resistor, Type "E", 1 Megohm			
87	26362	Resistor, Type "E", 27 Megohm			
88	26365	Resistor, Type "E", 47 Megohm			
89	26365	Resistor, Type "E", 47 Megohm			
90	26365	Resistor, Type "E", 47 Megohm			
91	26369	Resistor, Type "E", 1 Megohm			
92	26369	Resistor, Type "E", 1 Megohm			
93	26369	Resistor, Type "E", 1 Megohm			
94	26369	Resistor, Type "E", 1 Megohm			
95	26369	Resistor, Type "E", 1 Megohm			
96	26369	Resistor, Type "E", 1 Megohm			
97	26369	Resistor, Type "E", 1 Megohm			
98	26369	Resistor, Type "E", 1 Megohm			
99	26369	Resistor, Type "E", 1 Megohm			

MISCELLANEOUS PARTS

Piece Number	Part
26250	Cone Assembly (For P-26170 Speaker)
26043	Plug (For Loud Speaker Cable)
26369	Resistor, Type "E", 1 Megohm (Used at Socket of No. 6E5 Tube)
26302	Knob (For "Volume" Control)
26290	Knob (For "Tone-Fidelity" Control)
26305	Knob (For "Stations" Selector Control Shaft)
26306	Knob (For "Vernier" Stations Selector Control Shaft)
26301	Knob (For "Range" Switch)
26300	Knob (For "Off-On" Switch and Bass Control)

MODEL 225 AC-DC
Socket, Chassis

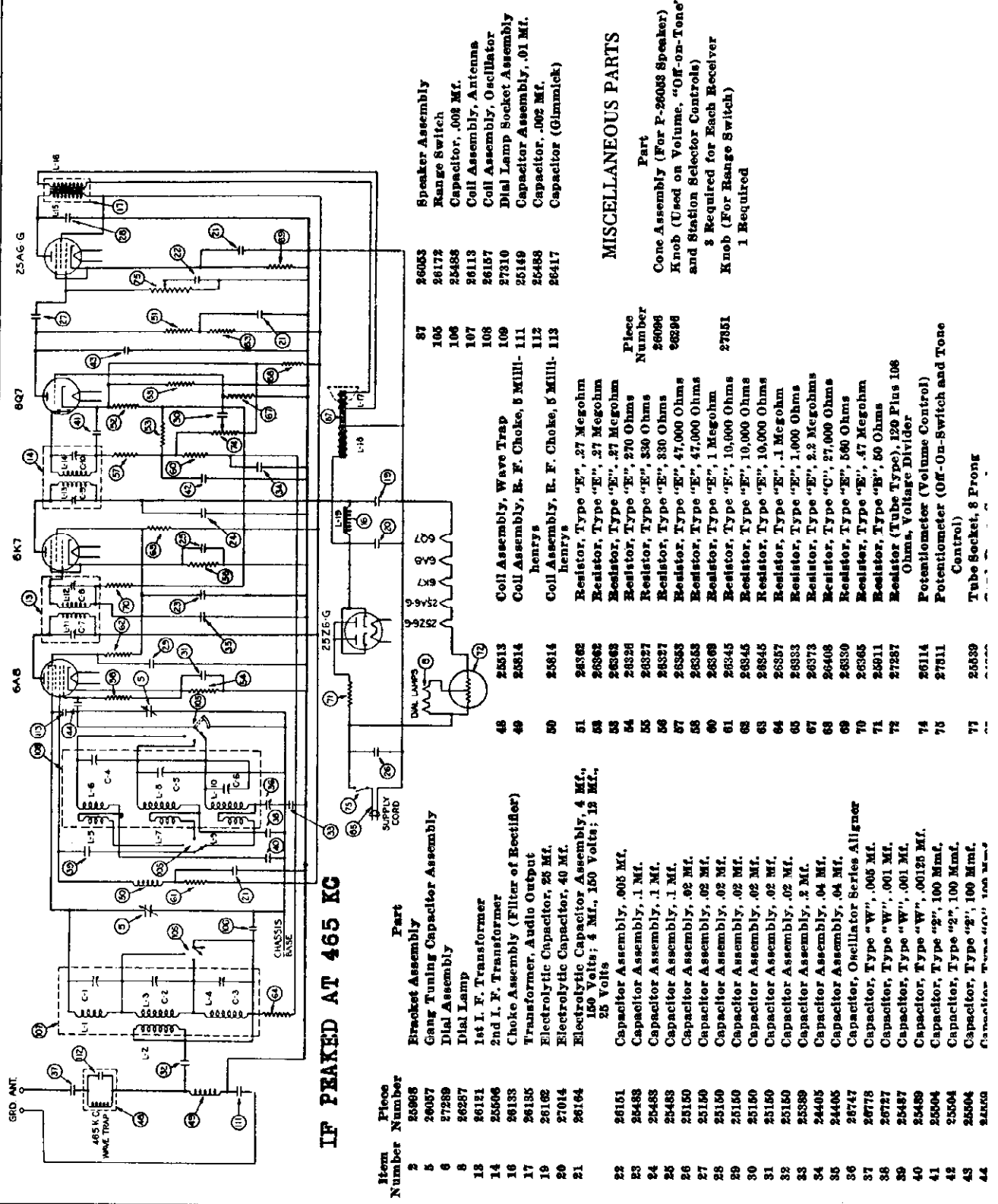
STROMBERG-CARLSON TEL. MFG. CO.



No. 225 Receiver.....50 to 60 Cycles (For AC Operation).....P-27285 Chassis Assembly

CIRCUIT DESCRIPTION

This triple range, superheterodyne receiver has five tubes and may be operated on a power supply circuit of either alternating or direct current at the voltages and frequency (for A. C. operation) specified above.



IF PEAKED AT 465 KC

Item Number	Part	Piece Number
2	Bracket Assembly	26058
5	Gang Tuning Capacitor Assembly	26057
6	Dial Assembly	27289
8	Dial Lamp	26287
13	1st I. F. Transformer	26121
14	2nd I. F. Transformer	25506
16	Choke Assembly (Filter of Rectifier)	26135
17	Transformer, Audio Output	26135
19	Electrolytic Capacitor, 25 Mf.	26102
20	Electrolytic Capacitor, 40 Mf.	27014
21	Electrolytic Capacitor Assembly, 4 Mf., 150 Volts; 4 Mf., 150 Volts; 15 Mf., 25 Volts	26104
22	Capacitor Assembly, .005 Mf.	26151
23	Capacitor Assembly, .1 Mf.	26488
24	Capacitor Assembly, .1 Mf.	26488
25	Capacitor Assembly, .1 Mf.	26488
26	Capacitor Assembly, .02 Mf.	25150
27	Capacitor Assembly, .02 Mf.	25150
28	Capacitor Assembly, .02 Mf.	25150
29	Capacitor Assembly, .02 Mf.	25150
30	Capacitor Assembly, .02 Mf.	25150
31	Capacitor Assembly, .02 Mf.	25150
32	Capacitor Assembly, .02 Mf.	25150
33	Capacitor Assembly, .02 Mf.	25150
34	Capacitor Assembly, .04 Mf.	24405
35	Capacitor Assembly, .04 Mf.	24405
36	Capacitor, Oscillator Series Aligner	26747
37	Capacitor, Type "W", .005 Mf.	26778
38	Capacitor, Type "W", .001 Mf.	26727
39	Capacitor, Type "W", .001 Mf.	26487
40	Capacitor, Type "W", .00120 Mf.	25489
41	Capacitor, Type "2", 100 Mmf.	25504
42	Capacitor, Type "2", 100 Mmf.	25504
43	Capacitor, Type "2", 100 Mmf.	25504
44	Capacitor, Type "2", 100 Mmf.	25504
45	Capacitor, Type "2", 100 Mmf.	25504
46	Capacitor, Type "2", 100 Mmf.	25504
47	Capacitor, Type "2", 100 Mmf.	25504
48	465 K.C. Wave Trap	25513
49	Coll Assembly, Wave Trap	25814
50	Coll Assembly, R. F. Choke, 5 Millihenrys	25814
51	Resistor, Type "E", .27 Megohm	26362
52	Resistor, Type "E", .27 Megohm	26362
53	Resistor, Type "E", .27 Megohm	26363
54	Resistor, Type "E", 270 Ohms	26324
55	Resistor, Type "E", 330 Ohms	26327
56	Resistor, Type "E", 330 Ohms	26327
57	Resistor, Type "E", 47,000 Ohms	26353
58	Resistor, Type "E", 47,000 Ohms	26353
59	Resistor, Type "E", 10,000 Ohms	26369
60	Resistor, Type "E", 10,000 Ohms	26345
61	Resistor, Type "E", 10,000 Ohms	26345
62	Resistor, Type "E", 10,000 Ohms	26345
63	Resistor, Type "E", 10,000 Ohms	26345
64	Resistor, Type "E", 1 Megohm	26357
65	Resistor, Type "E", 1,000 Ohms	26333
66	Resistor, Type "E", 5.3 Megohms	26373
67	Resistor, Type "C", 27,000 Ohms	26408
68	Resistor, Type "E", 560 Ohms	26330
69	Resistor, Type "E", 47 Megohm	26365
70	Resistor, Type "B", 50 Ohms	26311
71	Resistor (Tube Type), 120 Plus 106 Ohms, Voltage Divider	26311
72	Potentiometer (Off-On-Switch and Tone Control)	27287
73	Potentiometer (Volume Control)	26114
74	Potentiometer (Volume Control)	27311
75	Potentiometer (Off-On-Switch and Tone Control)	25839
76	Tube Socket, 8 Prong	25839
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300	Tube Socket, 8 Prong	

MODEL 225 AC-DC
Voltage, Alignment
Trimmers, Notes

STROMBERG-CARLSON TEL. MFG. CO.

Voltages are given for a line voltage of 120 volts, A. C. Allowance should be made for the difference when the line voltage is higher or lower.

IMPORTANT—If the receiver is operated from a direct current power supply circuit, the various voltages measured will be slightly lower than those listed in the table for A. C. operation. A meter having a resistance of 1000 ohms per volt should be used for measuring the D. C. voltages. Voltage values shown are those obtained on the lowest possible scale of a meter having the following ranges: 0-2.5, 0-10, 0-100, 0-250, 0-500, 0-1000 volts except when an asterisk appears after any given voltage value in which case the 1000 volt scale was used.

When the receiver is being operated from an alternating current power supply circuit, it will be necessary to have a high resistance A. C. voltmeter for checking the A. C. voltages.

Tube	Circuit	Cap	Terminals of Sockets								Heater Voltages Between Heater Terminals	
			1	2	3	4	5	6	7	8	Socket Terminal Numbers	Volts
6A8	Mod.—Osc.	0	0	13	+97	+65	-7	+59	6	+1.5	2-7	6.4
6K7	I. F. Amp.	0	0	12.8	+94	+85	+2.5	—	19	+2.5	2-7	6.4
6Q7	Dem.—A.V.C.— Audio	0	0	0	+40	0	0	—	6	+1	2-7	6
25A6-G	Audio Output	—	0	45	+93	+99	0	—	19	+14	2-7	26
25Z6-G	Rectifier	—	0	73	115	+105	115	—	47	+105	2-7	26
Resistor	Voltage Divider	—	—	—	73	120	—	—	120	107		
Voltage across pilot lamps			13 volts									

A. C. voltages are indicated by italics; when the receiver is operated from a D. C. power supply, D. C. voltages will be obtained in place of the A. C. voltages.
Receiver tuned to 1000 kc., no signal.

Intermediate Frequency Adjustments

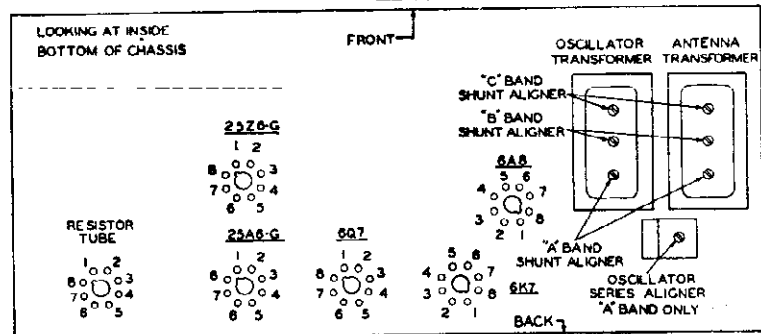
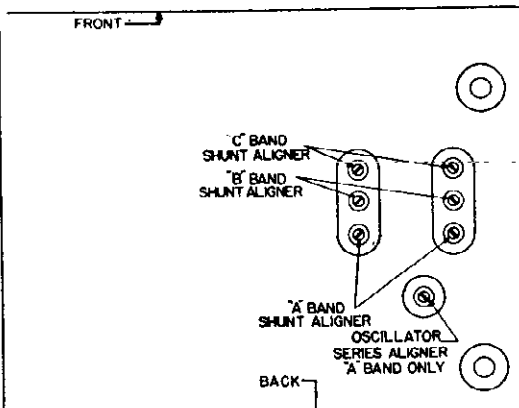
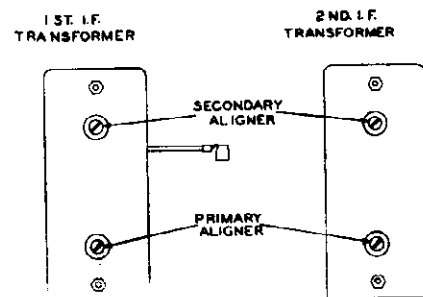
The intermediate frequency used in these receivers is 465 kilocycles. In making these I. F. circuit adjustments always align in the following order:

1. Secondary of 2nd I. F. Transformer (Capacitor C-10).
2. Primary of 2nd I. F. Transformer (Capacitor C-9).
3. Secondary of 1st I. F. Transformer (Capacitor C-8).
4. Primary of 1st I. F. Transformer (Capacitor C-7).

Radio Frequency Adjustments

The adjustments of the aligning capacitors used in the radio frequency circuits in this receiver should be very carefully made in the following order and at the frequencies specified below:

1. Oscillator's "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-4).
2. Antenna "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-1).
3. Oscillator's "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-5).
4. Antenna "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-2).
5. Oscillator's "A" Band Shunt Aligner at 1400 Kilocycles (Capacitor C-6).
6. Antenna "A" Band Shunt Aligner at 1400 Kilocycles (Capacitor C-3).
7. Oscillator's "A" Band Series Aligner at 600 Kilocycles (Capacitor (36)).
8. Oscillator's "A" Band Shunt Aligner at 1400 Kilocycles (Capacitor C-6).
9. Antenna "A" Band Shunt Aligner at 1400 Kilocycles (Capacitor C-3).



STROMBERG-CARLSON TEL. MFG. CO.

MODELS 228L, 228H,
228H, 228H
Schematic, Socket
Trimmers

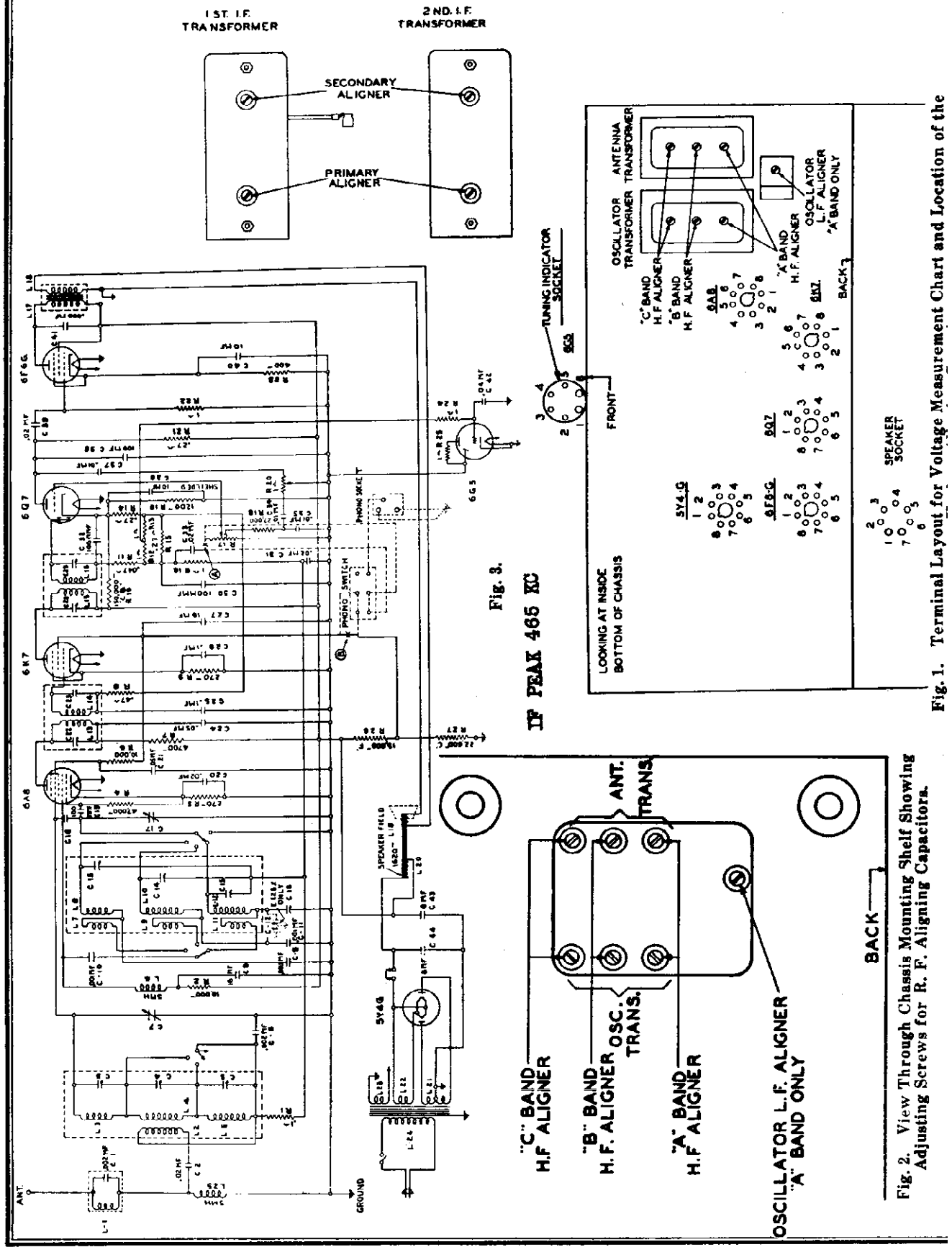


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the

Fig. 2. View Through Chassis Mounting Shelf Showing Adjusting Screws for R. F. Aligning Capacitors.

MODELS 228L, 228LB
228H, 228HB
Voltage, Alignment
Parts
STROMBERG-CARLSON TEL. MFG. CO.

Radio Frequency Adjustments

The alignment of the radio frequency circuits of the various ranges in these receivers should be very carefully made and in the order specified.

Alignment of Short Wave Range (Also Referred to as "C" Band)

In aligning the radio frequency circuits for this range, replace the 0.1-microfarad capacitor which was placed in series with the test oscillator's output lead for the I. F. alignments, with a 400-ohm carbon type resistor. This lead should then be connected to the antenna binding post located on the rear of the receiver chassis. The ground terminal (or low side) of the test oscillator should be connected to the ground binding post on the receiver.

1. Operate the Range Switch on the receiver chassis to the "C" range position, and set the test oscillator's frequency and the receiver's tuning dial to 17 megacycles.
2. Adjust the oscillator's "C" band high frequency aligner for maximum output.
3. Adjust the antenna's "C" band high frequency aligner for maximum output, at the same time rotate the gang tuning capacitor back and forth through resonance until maximum output is obtained.

Alignment of Aircraft, Amateur, and Police Range (Also Referred to as "B" Band)

In aligning the radio frequency circuits for this range, use the same artificial antenna (400-ohm carbon type resistor) in series with the output terminal of the test oscillator as was used for aligning the short-wave range.

1. Operate the Range Switch on the receiver chassis to the "B" range position, and set the test oscillator's frequency and the receiver's tuning dial to 3.4 megacycles.
2. Adjust the oscillator's "B" band high frequency aligner for maximum output.
3. Adjust the antenna's "B" band high frequency aligner for maximum output, and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum output is obtained.

Alignment of Standard Broadcast Range (Also Referred to as "A" Band)

In aligning the radio frequency circuits for this range, replace the 400-ohm carbon type resistor in series with the test oscillator's output lead with a 200-micro-microfarad capacitor and align these circuits as follows:

1. Operate the Range Switch to the "A" range position and set the test oscillator's frequency and the receiver's tuning dial to 1.4 megacycles.
2. Adjust the oscillator's "A" band high frequency aligner for maximum output.
3. Adjust the antenna's "A" band high frequency aligner for maximum output.
4. Set the test oscillator's frequency and the receiver's tuning dial to 0.6 megacycles.
5. Adjust the oscillator's "A" band low frequency aligner (series aligner) for maximum output, and at the same time rotate the gang tuning capacitor slightly back and forth through resonance until maximum output is obtained.
6. Reset both the test oscillator's frequency and receiver's tuning dial to 1.4 megacycles and repeat operations Nos. 2 and 3.

REPLACEMENT PARTS

Part Number	Schematic Circuit Designation	Part
2287	R27	Resistor, Type "C", 25,000 Ohms
2287		Tube Socket, 7 Prong
24200		Cord, Power Supply
24200	C25, C26	Capacitor, .1 Mfd.
24200	C27	Capacitor, .04 Mfd.
24200	C28, C29	Capacitor, Type "O", 100 Mmf.
24200	C31, C34	Capacitor, .05 Mfd.
24200	C34, C35, C37	Capacitor, .01 Mfd.
24200	C37, C38, C39	Capacitor, .02 Mfd.
24200	C41, C42	Capacitor, Type "W", .001 Mfd.
24200	C43	Capacitor, Type "W", .002 Mfd.
24200	C44	Resistor, Type "W", .00125 Mfd.
24200	R30	Resistor, Flameless Type, 400 Ohms
24200	C19, C20	Capacitor, Type "T", 100 Mmf.
24200	L14, L15	Coil Assembly, Wave Trap
24200	L1	Resistor, Type "F", 10,000 Ohms
24200	C41	Capacitor, .005 Mfd.
24200		Tube Socket, 8 Prong
24200		Coil Assembly, E. F. Choke
24200	C23, C24, C25, C29	Aligning Capacitors, I. F. Transformers
24200	C3, C4, C5	Aligning Capacitors, Antenna Transformer Assembly
24200	C7, C11	Gang Tuning Capacitors
24200	L1, L2, L3, L4	Coil Assembly, Antenna Transformer
24200	L12, L13	1st I. F. Transformer
24200	L7, L8, L9, L10, L11, L12	Coil Assembly, Oscillator Transformer
24200	C13, C14, C15	Aligning Capacitors, Oscillator Transformer Assembly
24200		Range Switch
24200		Dial Assembly
24200	R2, R3	Resistor, Type "E", 210 Ohms
24200	R10	Resistor, Type "E", 1200 Ohms
24200	R7	Resistor, Type "E", 4700 Ohms
24200	R2, R9	Resistor, Type "E", 14,000 Ohms
24200	R2, R11	Resistor, Type "E", 47,000 Ohms
24200	R1	Resistor, Type "E", 1 Megohm
24200	R14, R15, R21	Resistor, Type "E", .17 Megohm
24200	R2	Resistor, Type "E", .47 Megohm
24200	R17, R18, R19, R22, R24	Resistor, Type "E", 1 Megohm
24200	C18	Capacitor, Restraining
24200	C11	Capacitor, Type "W", .001 Mfd., Oscillator "B" Range I. F. Pad
24200	C10	Capacitor, Oscillator "A" Range I. F. Aligner
24200		7 Pin Lamp Socket
24200		Dial Assembly
24200		Tuning Indicator Socket and Cable
24200	L17, L18	Transformer Assembly, Audio Output
24200	C22, C24	Electrolytic Capacitor, 8 Mfd., 300 Volts, and 2 Mfd., 500 Volts
24200	C2	Electrolytic Capacitor, 18 Mfd., 500 Volts
24200	C7	Electrolytic Capacitor, 16 Mfd., 100 Volts
24200	L21, L22, L23, L24	Power Transformer (15 to 40 Cycle Choke)
24200	L21, L22, L23, L24	Power Transformer (25 to 60 Cycle Choke)
24200	R19	Volume Control
24200	R25	Resistor, Type "E", 27,000 Ohms
24200	C26, C28	Electrolytic Capacitors, 10 Mfd., 25 Volts and 10 Mfd., 50 Volts
24200		7 Pin Lamp Socket
24200		On-Off Switch and Tone Control
24200	R10	Resistor, Type "E", 100,000 Ohms

NORMAL VOLTAGE READINGS

The various values of voltages listed in the following table are obtained by measuring between the various tube socket contacts and the chassis base, with the tubes in their respective sockets. The receiver is, therefore, in operation when the measurements are made. Figure 1, shows the terminal layout of the sockets with the proper terminal numbers.

Voltages are given for a line voltage of 120 volts, and allowance should be made for differences when the line voltage is higher or lower. A meter having a resistance of 1000 ohms per volt should be used for measuring the D. C. voltages. All voltages shown are those obtained on the lowest possible scale of a meter having the 0-500 scale. Voltages of 1000 volts except when an asterisk appears after any given voltage value in which case the 250 volt scale was used.

Tube	Circuit	Terminals of Sockets									
		1	2	3	4	5	6	7	8		
6A8	Mod.—Osc.	0	0	-210	+65	-20	+180	6.1	+1.8	2-7	6.1
6K7	I. F. Amp.	0	0	+220	+90	+2.5	—	6.1	+2.5	2-7	6.1
6Q7	Dem.—A. V. C.—Audio	0	0	+100	0	+100	0	6.1	+1.6	2-7	6.1
6F6G	Audio Output	—	0	-210	+220	0	0	6.1	+13	2-7	6.1
6G5	Tuning Ind.	—	0	-2.4*	0	+220	6.1	—	—	1-6	6.1
5Y4G	Rectifier	—	0	0	385	—	335	—	+340	7-8	4.9
Speaker Socket		—	+340	0	0	+340	+340	—	+220		

Receiver tuned to 1000 Kc., no signal. A. C. voltages are indicated by italics.

In making any alignment adjustments, always adjust the test oscillator's output voltage to the minimum value. A. C. voltage should be measured across the test oscillator's output terminals. Before connecting the test oscillator to any circuit, be sure that the "On-Off" control knob is set for maximum treble response (position where knob is rotated from its maximum counter-clockwise position, slightly clockwise to position where set turns "on"). Figure 1, shows the location of all the aligning capacitors in these receivers.

In making any alignment adjustments on these receivers, it will not be necessary to remove the chassis from the cabinet. The aligning capacitors for the intermediate frequency circuits of these receivers are easily accessible from the rear of the receiver, and the aligning capacitors for the radio frequency circuits are accessible either through the bottom of the cabinet or through the bottom of the cabinet shell depending upon the style of cabinet. See Figure 2.

Dial Adjustment

Before aligning the circuits of any of these receivers, the tuning dial must be properly aligned to track with the gang tuning capacitors. To check whether the dial is set correctly with respect to the gang tuning capacitor, rotate the "Station Selector" knob in a clockwise direction so that the gang tuning capacitor is set to its maximum value. Then, rotate the "Station Selector" knob so that the dial pointer lines up with the vertical middle vertical line located on the three vertical lines located on the glass dial and the vertical lines located on the metal panel of the dial frame. Now, rotate the "Station Selector" knob so that the dial pointer lines up with the horizontal lines located on the metal panel of the dial frame; with the pointer in this position the two horizontal center marks of the glass dial (located at approximately 3.4 megacycles on the right hand scale and 2.16 megacycles on the left hand scale) should be aligned with the vertical lines on the metal panel of the dial frame. Loosen the four clamps which hold the glass dial to the dial pan by slightly loosening the four screws, and shift the glass dial so that a good alignment between the dial pointer, the glass dial, and alignment marks located on the metal pan of the dial frame is obtained for both the horizontal and vertical position of the dial pointer.

Intermediate Frequency Adjustments

The intermediate frequency used in these receivers is 465 kilocycles. In making these circuit adjustments always align the circuits in the order given in these instructions.

1. Operate the "Range" switch of the receiver to the "A" range position. Set the receiver's tuning dial at its extreme low frequency position, and operate the Tone Control knob to the "Normal" position. Rotate the Volume Control knob to its maximum clockwise position (maximum volume).
2. Apply between the chassis base (or ground binding post) of the receiver and the grid of the No. 6A9 modulator-oscillator tube, a modulated signal of 465 kilocycles from the test oscillator, using a 0.1 microfarad capacitor in series with the connection between the output terminal of the test oscillator (or low side) terminal and the grid of the modulator-oscillator tube. The next step should be to connect the chassis base (or ground binding post) terminal of the test oscillator to the ground binding post terminal of the receiver.
3. Now, noting Figure 1, the aligning capacitors for the first and second I. F. transformers, align the I. F. circuits in the following manner:
 Primary of second I. F. transformer.
 Secondary of second I. F. transformer.
 Primary of first I. F. transformer.
 Secondary of first I. F. transformer.
 Adjust the capacitors to obtain maximum reading on the output meter, reducing the output of the test oscillator as required.

STROMBERG-CARLSON TEL. MFG. CO. MODEL 229P Schematic, Socket Trimmer

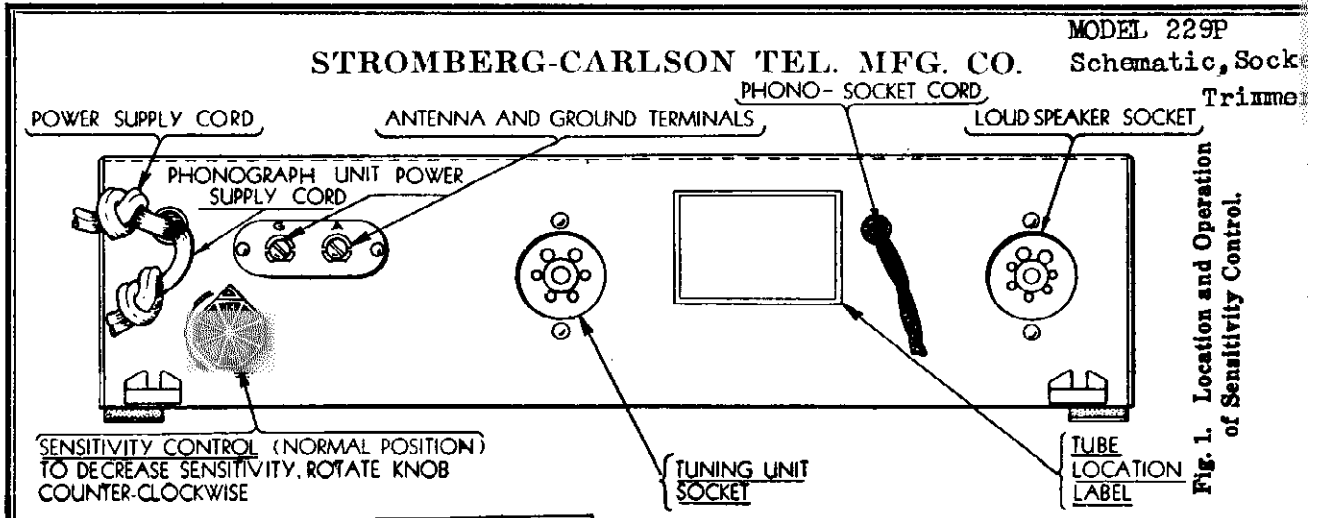


Fig. 1. Location and Operation of Sensitivity Control.

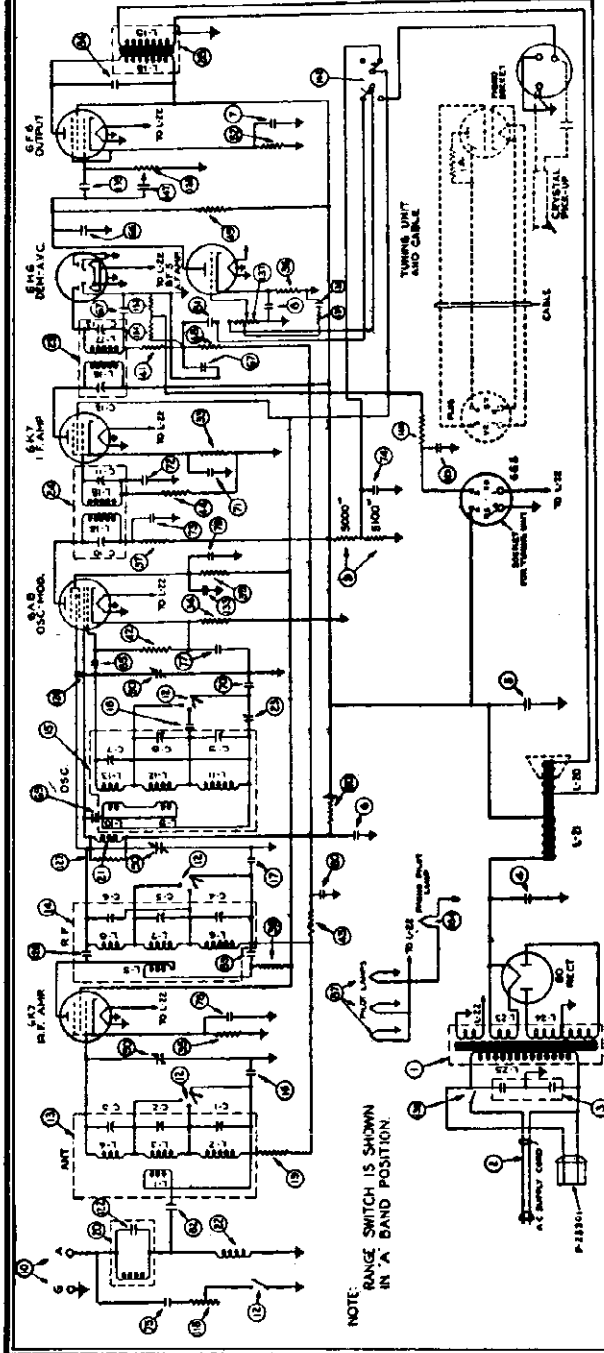


Fig. 3. Schematic Circuit of Receiver.

IF PEAK 465 KC

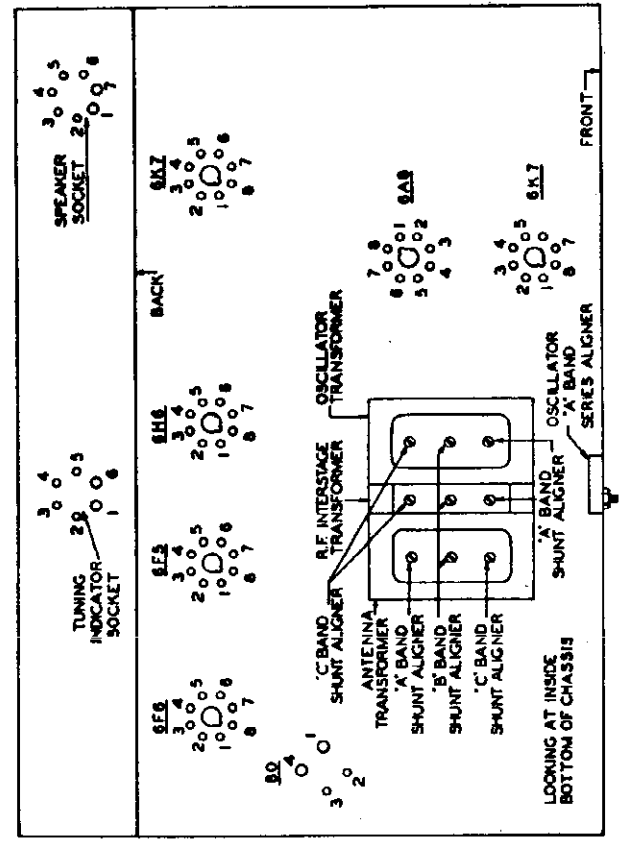


Fig. 2. Terminal Layout for Voltage Measurement Chart and Location of the

MODEL 229P

Voltage, Alignment STROMBERG-CARLSON TEL. MFG. CO.

NORMAL VOLTAGE READINGS

The various values of voltages listed in the following table are obtained by measuring between the various tube socket contacts and the chassis base, with the tubes in their respective sockets. The receiver is, therefore, in operation when the measurements are made. Figure 2 shows the terminal layout of the sockets with the proper terminal numbers.

Voltages are given for a line voltage of 120 volts, and allowance should be made for differences when the line voltage is higher or lower. A meter having a resistance of 1000 ohms per volt should be used for measuring the D. C. voltages. Voltage values shown are those obtained on the lowest possible scale of a meter having the following ranges: 0-2.5, 0-10, 0-100, 0-250, 0-500, 0-1000 volts except when an asterisk appears after any given voltage value in which case the 1000 volt scale was used.

Tube	Circuit	Cap	Terminals of Sockets								Heater Voltages Between Heater Terminals	
			1	2	3	4	5	6	7	8	Socket Terminal Numbers	Volts
6K7	R. F. Amp.	0	0	0	+54	+96	+7.6	+4.5	6.3	+7.6	2-7	6.3
6A8	Osc.-Mod.	0	0	0	+222	+72	-1.0	+143	6.3	+6.1	2-7	6.3
6K7	I. F. Amp.	0	0	0	+240	+96	+7.4	+4.5	6.3	+7.4	2-7	6.3
6H6	Dem.—A.V.C.	—	0	0	0	0	0	—	6.3	+4.5	2-7	6.3
6F5	Audio Amp.	0	0	0	—	+122*	—	—	6.3	+ .75	2-7	6.3
6F6	Audio Output	—	0	0	+226	+237	0	0	6.3	+15	2-7	6.3
80	Rectifier	—	+330	325	325	+330	—	—	—	—	1-4	4.8
Tuning Indicator Plug's Socket			6.3	0	+7.6	+235	+7.8	0	—	—	1-6	6.3
Speaker Socket			+327	0	0	+327	+327	0	+237	—	—	—

Receiver tuned to 1000 Kc., no signal. A. C. voltages are indicated by italics.

ALIGNMENT DATA

All alignment adjustments are accurately made at the factory on these receivers and ordinarily no readjustments are necessary. However, should it become necessary to make any readjustments, this alignment procedure should be carefully followed.

In making any alignment adjustments always adjust the signal generator's output to the minimum value where a good alignment may still be obtained. Never attempt to make any alignment adjustments using a strong signal.

Figure 2 shows the location of all the aligning capacitors used in this receiver.

Intermediate Frequency Amplifier Adjustments

The intermediate frequency used in these receivers is 465 kilocycles. In making these I. F. circuit adjustments always align in the following order:

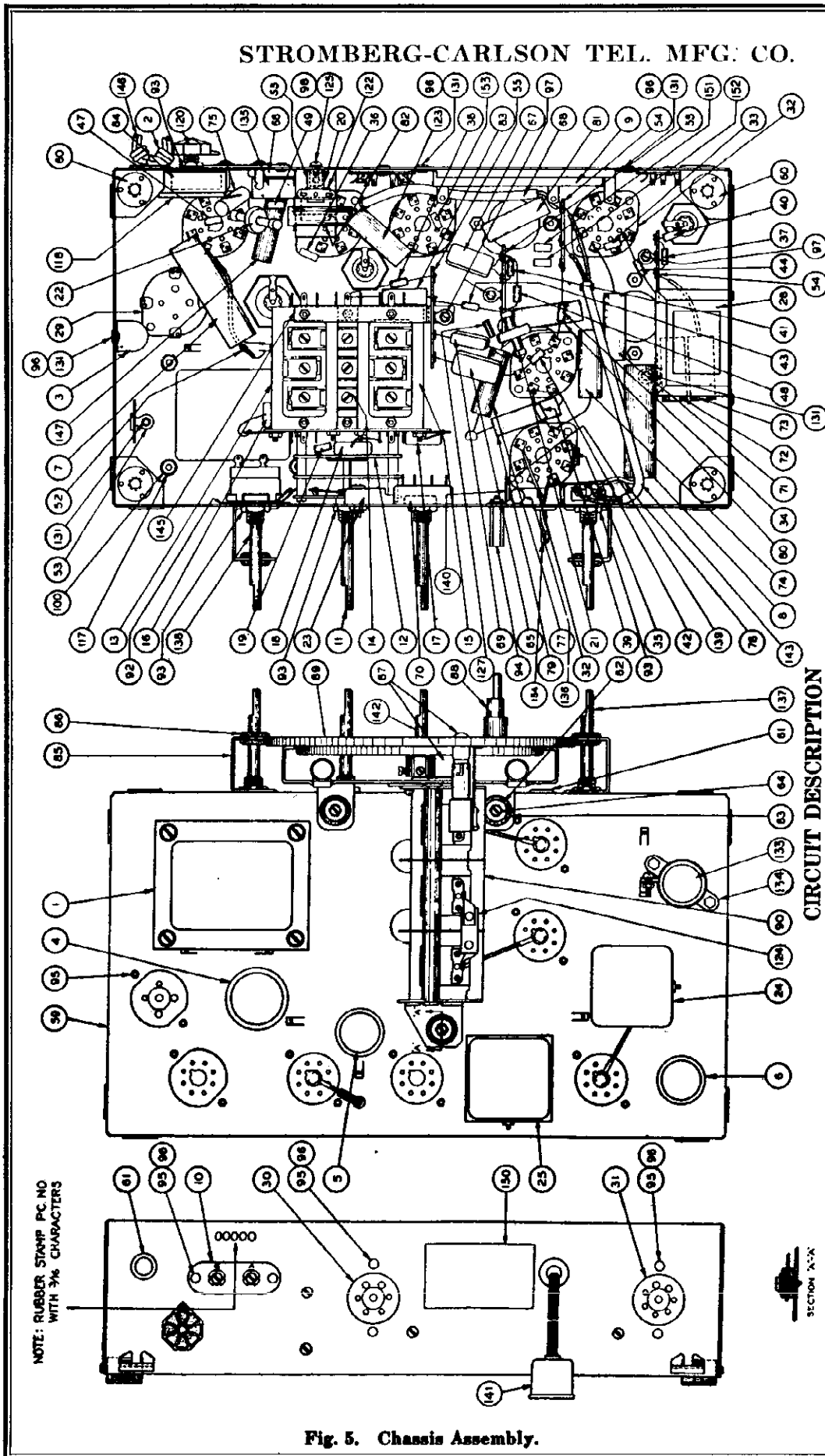
1. Secondary of 2nd I. F. Transformer (Capacitor C-13).
2. Primary of 2nd I. F. Transformer (Capacitor C-12).
3. Secondary of 1st I. F. Transformer (Capacitor C-11).
4. Primary of 1st I. F. Transformer (Capacitor C-10).

Radio Frequency Adjustments

The adjustments of the aligning capacitors used in the radio frequency circuits in this receiver should be very carefully made in the following order and at the frequencies specified below:

1. Oscillator's "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-7).
2. R. F. Interstage "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-6).
3. Antenna "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-3).
4. Oscillator's "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-8).
5. R. F. Interstage "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-5).
6. Antenna "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-2).
7. Oscillator's "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-9).
8. R. F. Interstage "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-4).
9. Antenna "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-1).
10. Oscillator's "A" Band Series Aligner at 0.8 Megacycles (Capacitor C-23).
11. Oscillator's "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-9).
12. R. F. Interstage "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-4).
13. Antenna "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-1).

STROMBERG-CARLSON TEL. MFG. CO.



CIRCUIT DESCRIPTION

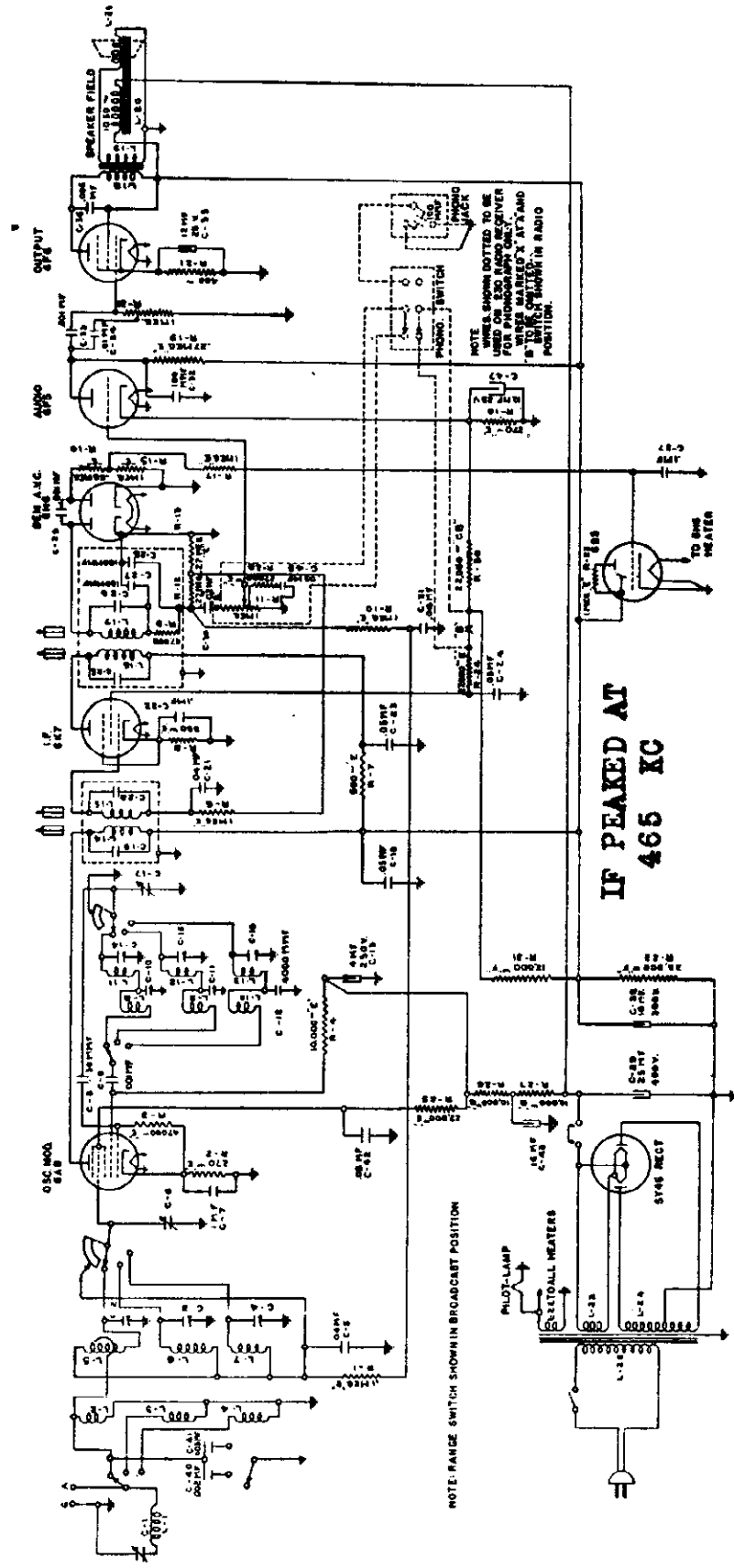
The Stromberg-Carlson No. 229-P Radio Receivers are eight tube, superheterodyne receivers employing metal tubes and a highly efficient dynamic speaker. These receivers have three tuning ranges which are quickly interchangeable by means of a rotary switch, the control knob of which is located on the control panel. Ease and convenience of operation are assured by the vernier drive with its associated double knob. Resonance with a signal is indicated by means of the tuning indicator tube which operates on the cathode-ray principle. The strength of a received signal may be determined by observing the size of the aperture appearing on the target of the tuning indicator tube, the stronger a received signal the greater the reduction in the size of the aperture. A low level bass frequency compensating circuit is also provided in the volume control circuit of these receivers, which operates to give balanced reproduction at any setting of the volume control.

These receivers are also equipped with a single record playing mechanism unit which uses a crystal turn

Fig. 5. Chassis Assembly.

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 230H, 230H
230L, 230LB, 231F
231FB, 231R, 231RB
231P, 231PB
Schematic



NOTE: RANGE SWITCH SHOWN IN BROADCAST POSITION

NOTE: LINES SHOWN DOTTED TO BE USED FOR PHONOGRAPH AMPLIFIER WHEN MARKED "X" AT "AND B" IN RANGE SWITCH IN RADIO POSITION.

IF PEAKED AT
465 KC

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 230H, 230H
230L, 230LB, 231F
231FB, 231R, 231RB
231P, 231PB
Trimmers

ELECTRICAL SPECIFICATIONS

Type of Circuit	-----	Superheterodyn
Tuning Ranges	-----	A—530 to 1700 Kc.; B—1700 to 5600 Kc.; C—5600 to 18,000 Kc.
Number and Type of Tubes	-----	1 No. 6A8, 1 No. 6K7, 1 No. 6H6, 1 No. 6F5, 1 No. 6F6, 1 No. 6G5, 1 No. 5Y4
Voltage Rating	-----	105 to 125 Volt
Frequency Rating	-----	25 to 60 Cycles and 50 to 60 Cycle
Input Power Rating	-----	65 Watt
Frequency of Intermediate Amplifier	-----	465 Kilocycle

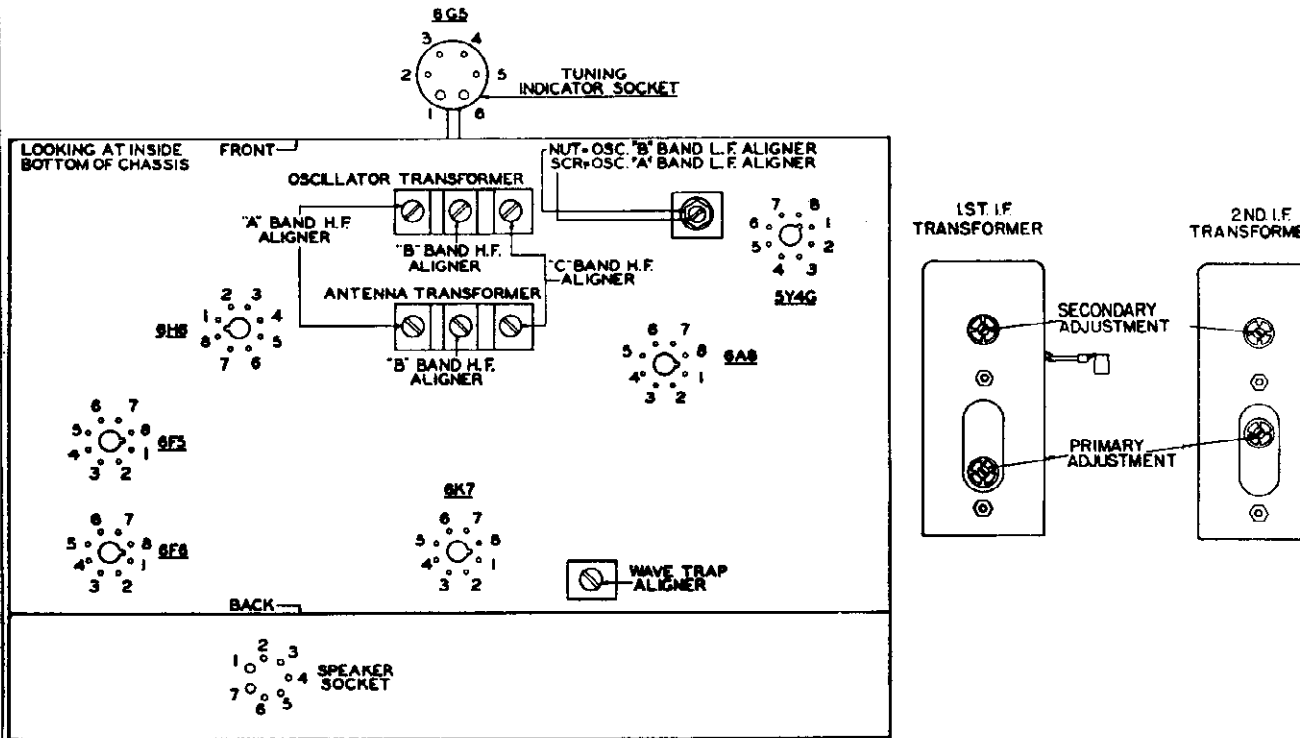


Fig. 1.—Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

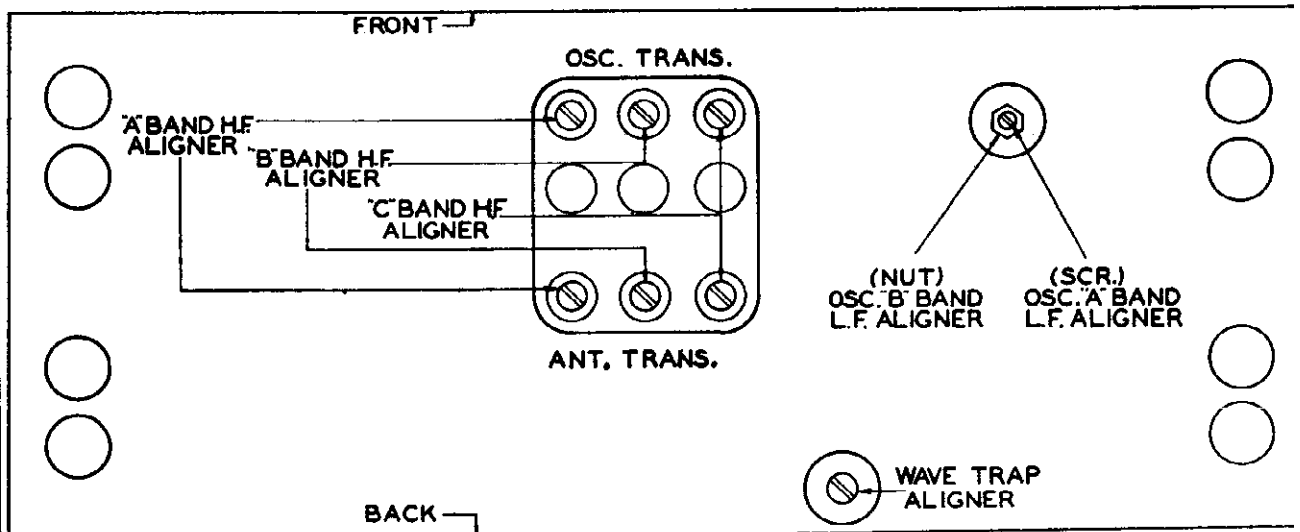


Fig. 2. View Through Chassis Mounting Shelf Showing Adjusting Screws for R. F. Aligning Capacitors.

MODELS 230H, 230HB
230CL, 230LB, 231F STROMBERG-CARLSON TEL. MFG. CO.
231FB, 231R, 231RB
231P, 231PB

Alignment, Voltage

exactly centered over the dial alignment lines (black lines) which are located at the extreme low frequency and high frequency ends of the dial. If the alignment lines are not centered over the dial, the tuning dial should be rotated until the illuminated dial indicator line is centered over the illuminated dial indicator line. The two set screws of the dial hub should then be securely tightened.

Intermediate Frequency Adjustments

The intermediate frequency used in these receivers is 465 kilocycles. In making these circuit adjustments always align the circuits in the order given in these instructions.

1. Operate the "range" switch of the receiver to the "A" range position. Set the receiver's tuning dial at its extreme low frequency end. Rotate the tuning dial to the "C" range position. Rotate the Volume Control knob to its maximum clockwise position (maximum volume).
2. Apply between the chassis base (or ground binding post) of the receiver and the grid of the No. 6A8 modulator oscillator tube, a modulated signal of 465 kilocycles from the test oscillator, using a 0.1-microfarad capacitor in series with the connection between the output terminal of the test oscillator and the grid of the No. 6A8 tube. Do not remove the chassis grid lead connecting to this tube. The ground (or low side) terminal of the test oscillator should be connected to either the chassis base or the ground binding post terminal.
3. Now, noting from Figure 1 the aligning adjustments for the first and second I. F. transformers, align the I. F. circuits in the following manner:

- Secondary of second I. F. transformer.
- Primary of second I. F. transformer.
- Secondary of first I. F. transformer.
- Primary of first I. F. transformer.

Adjusting the circuits to obtain maximum reading on the output meter, reducing the output of the test oscillator as required.

Radio Frequency Adjustments

The alignment of the radio frequency circuits of the various ranges in these receivers should be very carefully made and in the order specified.

Alignment of Short Wave Range (Also Referred to as "C" Band)

In aligning the radio frequency circuits for this range, replace the 0.1-microfarad capacitor which was placed in series with the test oscillator lead by a 200-microfarad capacitor. This lead should then be connected to the antenna binding post located on the rear of the receiver chassis. The ground terminal (or low side) of the test oscillator should be connected to the ground binding post on the receiver.

1. Operate the Range Switch on the receiver chassis to the "C" range position, and set the test oscillator's frequency and the receiver's tuning dial to 17 megacycles.
2. Adjust the oscillator's "C" band high frequency aligner for maximum output.
3. Adjust the antenna's "C" band high frequency aligner for maximum output, at the same time rotate the gang tuning capacitor back and forth through resonance until maximum output is obtained.

Alignment of Aircraft, Amateur, and Police Range (Also Referred to as "B" Band)

In aligning the radio frequency circuits for this range, use the same artificial antenna (400-ohm carbon type resistor) in series with the output terminal of the test oscillator as was used for aligning the short-wave range.

1. Operate the Range Switch on the receiver chassis to the "B" range position, and set the test oscillator's frequency and the receiver's tuning dial to five megacycles.
2. Adjust the oscillator's "B" band high frequency aligner for maximum output.
3. Adjust the antenna's "B" band high frequency aligner for maximum output, and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum output is obtained.
4. Set the test oscillator's frequency and the receiver's tuning dial to 1.5 megacycles.
5. Adjust the oscillator's "B" band low frequency aligner (series aligner), and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum output is obtained.
6. Repeat both the test oscillator's frequency and the receiver's tuning dial to 5 megacycles, and repeat operations Nos. 2 and 3.

Alignment of Standard Broadcast Range (Also Referred to as "A" Band)

In aligning the radio frequency circuits for this range, replace the 400-ohm carbon type resistor in series with the test oscillator's output lead with a 200-microfarad capacitor and align these circuits as follows:

1. Operate the Range Switch to the "A" range position and set the test oscillator's frequency and the receiver's tuning dial to 1.4 megacycles.
2. Adjust the oscillator's "A" band high frequency aligner for maximum output.
3. Adjust the antenna's "A" band high frequency aligner for maximum output.
4. Set the test oscillator's frequency and the receiver's tuning dial to 0.6 megacycles.
5. Adjust the oscillator's "A" band low frequency aligner (series aligner) for maximum output, and at the same time rotate the gang tuning capacitor slightly back and forth through resonance until maximum output is obtained.
6. Repeat both the test oscillator's frequency and receiver's tuning dial to 1.4 megacycles and repeat operations Nos. 2 and 3.

Wave Trap Adjustment

In adjusting the wave trap circuit, the "Signal Admission Control" should be set for the most sensitive position (shaft rotated in the most counter-clockwise direction). Set the Range Switch of the receiver to the "A" range position and the tuning dial to 1000 kilocycles. Connect a 200-microfarad capacitor in series with the antenna binding post on the receiver chassis. The ground terminal of the test oscillator should be connected to the ground binding post on the receiver. Then, with the modulated test oscillator set at the frequency of the intermediate amplifier, 465 kilocycles, supply a fairly strong signal to the receiver and adjust the wave trap amplifier until a minimum indication is obtained on the output meter.

In order to obtain maximum performance on the Standard Broadcast Range ("A" Band) of these receivers, a "signal admission control switch" is provided. This control is located on the inside face of the tuning dial base, and has a slotted shaft which protrudes through the base so that it may be adjusted by the use of a screw driver. When either the "B" or "C" ranges are in operation, this signal admission control is automatically cut out of the circuit, allowing the receiver to function at its maximum sensitivity on these two ranges. When operating in the Standard Broadcast Range, maximum sensitivity is obtained when the slotted shaft of this control is in the "signal admission" position, and when in the "wave trap" position, the signal admission control, placed in the receiver in operation, and then adjust this control so that the signal admission control should be made in the event if best results are to be obtained.

The volume control circuit in these receivers is arranged to give balanced reproduction at any setting of the volume control by means of a low level bias frequency compensating network.

A metal guard frame is furnished on these receivers to prevent damage to the chassis components and also to facilitate ease of servicing should this become necessary. Do not turn the chassis over on its guard frame without first removing the tuning indicator unit which is secured to the metal guard frame. To remove the tuning indicator unit from the guard frame, first unscrew the knurled screw which holds the tuning indicator's clamp to the metal guard frame, which will then allow the tuning indicator unit to be removed from the guard frame.

The chassis used in the No. 230 Receivers differ from the chassis used in the No. 231 Receivers only in the type of electrolytic filter capacitors which are used. Two wiring diagrams are, therefore, shown in this book, one for the No. 230 Receiver Chassis, and one for the No. 231 Receiver Chassis.

NORMAL VOLTAGE READINGS

The various values of voltages listed in the following table are obtained by measuring between the various tube socket contacts and the chassis base with the tubes in their respective sockets. The receiver is, therefore, in operation when the measurements are made. Figure 1 shows the terminal layouts of the sockets with the proper terminal numbers.

Voltages are given for a line voltage of 120 volts, and an allowance should be made for differences when the line voltage is higher or lower. A meter having a resistance of 1000 ohms per volt should be used for measuring the D. C. voltages. The following ranges are obtainable on the lowest scale of a meter having the following ranges: 0-25, 0-50, 0-100, 0-250, 0-500, 0-1000 volts.

Tube	Circuit	Terminals of Sockets										
		Cap	1	2	3	4	5	6	7	8	Grid Terminal Terminals	
6A8	Mod.—Osc.	0	0	0	-245	+100	-8	+155	6.1	+2.5	2-7	6.1
6K7	I. F. Amp.	0	0	0	-245	+100	+3	+160	6.1	+3	2-7	6.1
6H6	Dem.—A. V. C.	—	0	0	0	0	0	0	6.1	0	2-7	6.1
6F5	Audio Amp.	0	0	0	-250	+115	+150	+150	6.1	+1.7	2-7	6.1
6F6	Audio Output	—	0	0	+280	+255	0	0	6.1	+16	2-7	6.1
6G5	Tuning Ind.	—	0	+2.4	0	+250	0	6.1	1-6	6.1		
5Y4G	Rectifier	—	0	0	350	0	350	0	+330	+330	7-8	4.8
Speaker Socket		—	+330	0	0	+330	+330	—	+255			

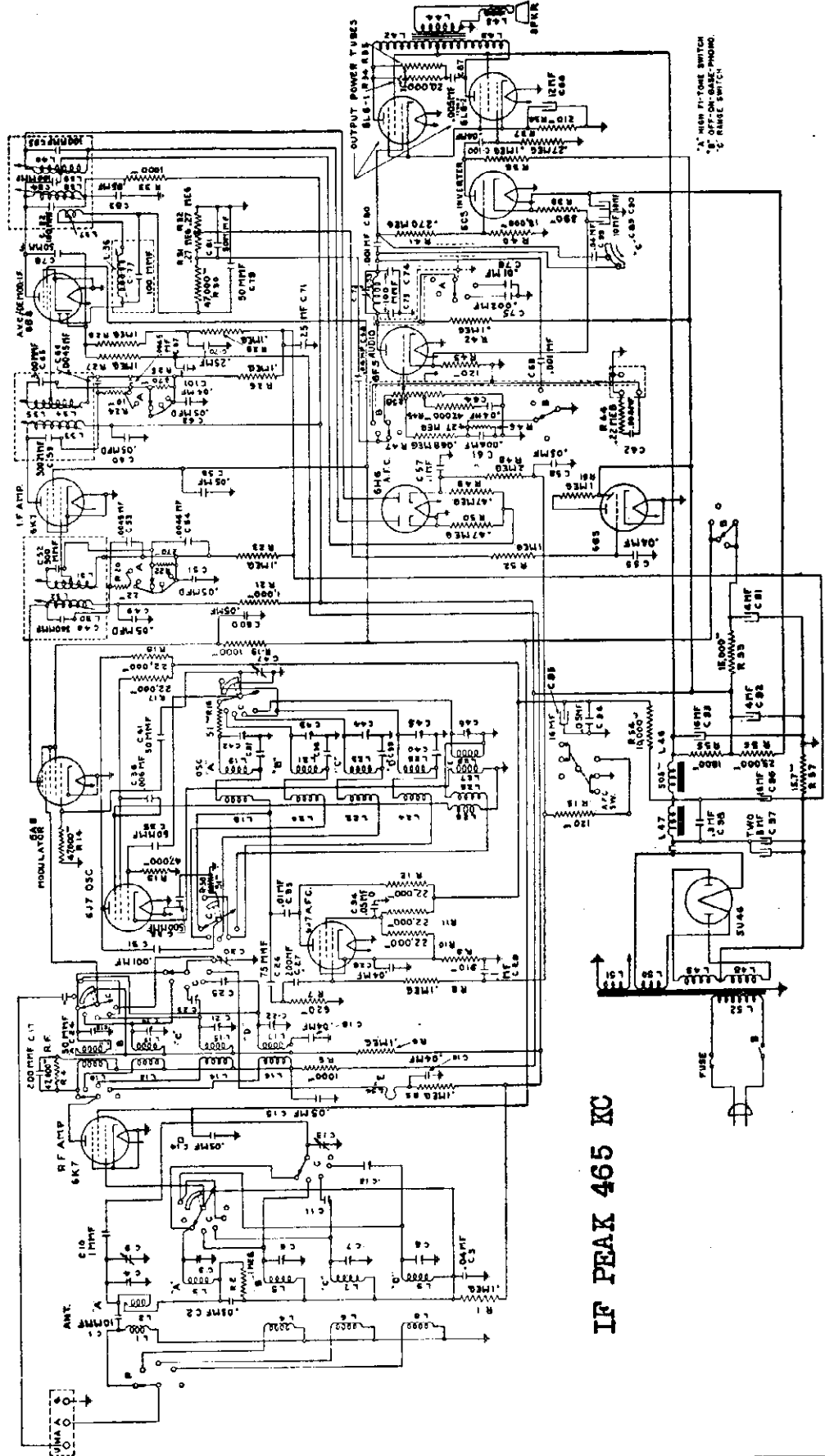
A. C. voltages are indicated by italics. Receiver tuned to 1000 kc., no signal. In making any alignment adjustments, always adjust the test oscillator's output voltage to the minimum value where a good alignment may still be obtained. Never attempt to make any alignment adjustments using a signal admission control switch. The position where such a switch is located from its minimum counter-clockwise position, slightly clockwise to position where set turns "on". Figure 1 shows the location of all the aligning capacitors or adjustments for this receiver.

Except in the case of making any aligning adjustments of the radio frequency circuits in the No. 231-P Receivers, it will not be necessary to remove the chassis in these receivers from their cabinets in order to make any alignment adjustments. If it is necessary to remove the chassis from the cabinet, the radio frequency circuits in the No. 231-P Receivers should be removed from the chassis in the cabinet by means of the chassis removal key. In making any radio frequency circuit alignment adjustments in the No. 231-P Receivers, the chassis should be set at approximately the same position which it occupies when in the cabinet. With the exception of the Nos. 231-F and 231-R Receivers, the alignment adjustments for the intermediate frequency circuits are accessible from the rear of the receiver, and the adjustments for the radio frequency circuits are accessible through the apertures located in the bottom metal base plate of the chassis; these apertures are easily accessible either through the top of the chassis or through the bottom of the chassis. In the No. 231-F and 231-R Receivers, the adjustments for the intermediate frequency circuits are accessible through the bottom of the cabinet while the adjustments for the radio frequency circuits are not accessible until the backs of the cabinets are removed. See Figure 2. Never align any of these receivers without having the metal base plate fastened to the chassis base. In the Nos. 231-F and 231-R Receivers, it is important that the final alignment be made with the chassis mounted in the cabinet.

Dial Adjustment

Before aligning the circuits of these receivers, the tuning dial must be properly aligned to "track" with the gang tuning capacitor. To check whether the dial is set correctly with respect to the gang tuning capacitor, the tuning dial should be rotated until the illuminated dial indicator line shows maximum capacity position. Then, with the receiver turned "on", the illuminated dial indicator line should be

STROMBERG-CARLSON TEL. MFG. CO. Schematic



IF PEAK 465 KC

MODEL S 250L, 250LB

Voltage Trimmers STROMBERG-CARLSON TEL. MFG. CO.

Phono. Data

NORMAL VOLTAGE READINGS

The various values of voltages listed in the following table are obtained by measuring between the various tube socket contacts and the chassis base, with the tubes in their respective sockets. The receiver is, therefore, in operation when the measurements are made. Figure 1, shows the terminal layout of the sockets with the proper terminal numbers.

Voltages are given for a line voltage of 120 volts, and allowance should be made for differences when the line voltage is higher or lower. A meter having a resistance of 1000 ohms per volt should be used for measuring the D. C. voltages. Voltage values shown are those obtained on the lowest possible scale of a meter having the following ranges: 0-2.5, 0-10, 0-250, 0-500, 0-1000 volts except when an asterisk appears after any given voltage value in which case the 250 volt scale was used.

Tube	Circuit	Cap	Terminals of Sockets										Heater Voltages Between Heater Terminals	
			1	2	3	4	5	6	7	8	Socket Terminal Numbers	Volts		
6K7	R. F. Amp.	0	0	0	+230	+90	0	+80	6.1	0	2-7	6.1		
6A8	Modulator	0	0	0	+230	+80	-2.0	+80	6.1	0	2-7	6.1		
6J7	Oscillator	0	0	6.1	+60	+180	0	0	0	0	2-7	6.1		
6J7	Oscillator Control	0	0	0	+190	+110	+5.8	0	6.1	+5.8	2-7	6.1		
6K7	I. F. Amp.	0	0	0	+235	+90	0	0	6.1	0	2-7	6.1		
6B8	I. F. Amp. Dem.—A. V. C.	0	0	6.1	+225	-0.1	-0.1	+90	0	0	2-7	6.1		
6H6	A. F. C. Discriminator	—	0	0	-0.25	0	-0.2	-0.2	6.1	0	2-7	6.1		
6F5	Audio Amp.	0	0	0	+135	+135	0	0	6.1	+1.3	2-7	6.1		
6C5	Audio Amp.	—	0	0	+100	+135	0	+1.3	6.1	+5.2	2-7	6.1		
6L6 No. 1	Audio Output	—	0	0	+300	+305	0	0	6.1	+22	2-7	6.1		
6L6 No. 2	Audio Output	—	0	0	+300	+305	0	0	6.1	+22	2-7	6.1		
6C5	Tuning Indicator	—	6.1	+0.5	-0.2*	+245	0	0	—	—	1-6	6.1		
5U4G	Rectifier	—	0	+430	—	395	—	395	—	+430	2-8	4.8		
Speaker Socket		—	+420	0	0	0	+430	+430	0	+320	—	—		

A. C. voltages are indicated by italics. Receiver tuned to 1000 kc., no signal.

PROCEDURE FOR OBTAINING REPRODUCTION FROM PHONOGRAPH RECORDS

A socket having three contacts is provided on the rear of the chassis base, and is wired to the "Off-On-Bass-Phonograph" switch assembly located on the front of the receiver. A three prong plug is also inserted in the socket so that if at any time it is desired to use an electric pick-up and phonograph unit in conjunction with this receiver, it may readily be accomplished.

In order to obtain the best quality of phonograph reproduction from this receiver, a Stromberg-Carlson No. 10 Record Player is recommended. This record player is equipped with a correctly designed single record playing motor unit, and uses a crystal type pick-up in conjunction with a specially equalized circuit. To attach this instrument to No. 250 Receiver, it is only necessary to remove the three-prong plug furnished with the receiver and insert the three-prong plug which comes with the unit into the three-prong socket located on the rear of the chassis base. Then, the power supply lug of the phonograph unit should be inserted into a suitable power supply receptacle, and the unit will be ready for use.

If the Stromberg-Carlson No. 10 Record Player is not used and the electric pick-up to be used is of the high impedance type, it will be necessary to connect a low capacity shielded cable between the three-prong plug furnished with the receiver and the pick-up. This shielded cable should be of the low capacity type, in order to prevent the excessive cutting of high frequencies which is caused when a shielded cable having high capacity is used. The length of the shielded cable used should be kept as short as possible. If a pick-up of the low impedance type is used, it will be necessary to connect a "matching transformer" between the three-prong plug and the pick-up. The transformer should be located as near to the receiver as possible, in which case it will not be necessary to use a shielded cable.

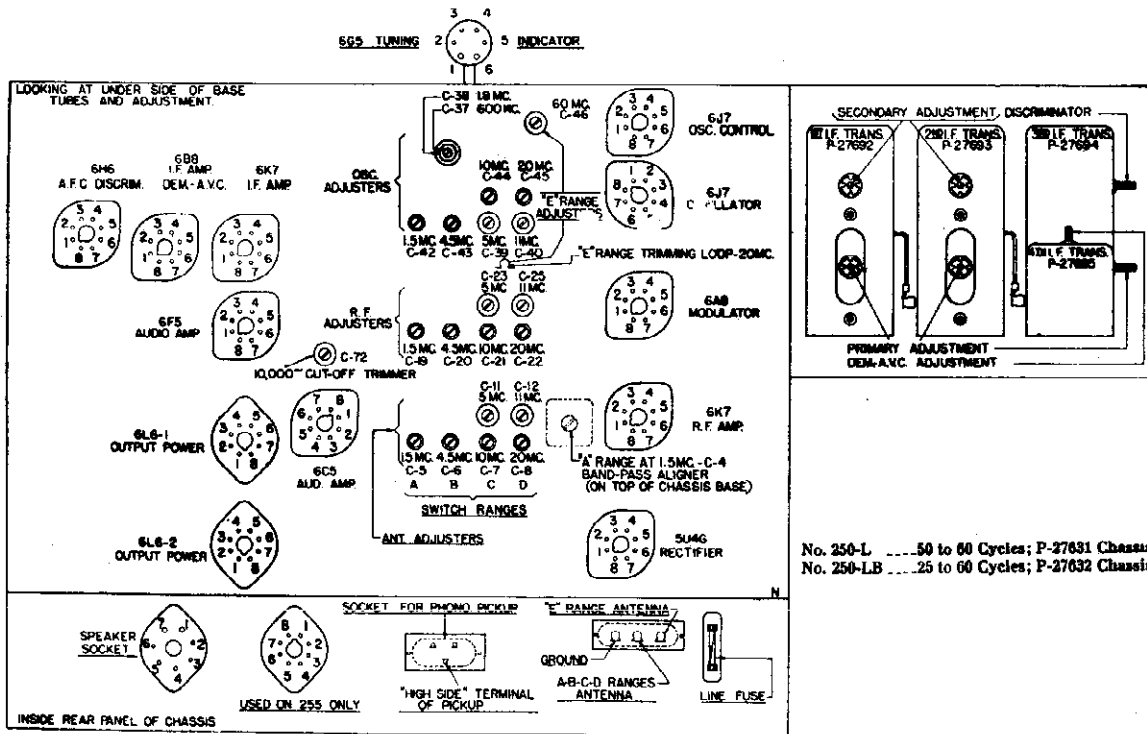


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Adjustments.

No. 250-L 50 to 60 Cycles; P-27631 Chassis
 No. 250-LB 25 to 60 Cycles; P-27632 Chassis

STROMBERG-CARLSON TEL. MFG. CO. Alignment

Dial Adjustment

When aligning the circuits of these receivers, the tuning dial must be properly aligned to "track" with the... the illuminated dial indicator line. These two set screws of the dial knob should then be securely tightened.

Intermediate Frequency and A. F. C. Circuit Adjustments

The intermediate frequency system employed in this receiver is a complex circuit. The first I. F. amplifier is coupled through the pentode section of the No. 6B7 tube. The second and third I. F. transformers are... the A. F. C. Control knob set at its "On" position.

The intermediate frequency used in these receivers is 465 kilocycles. Because of the necessity of obtaining the proper shape of resonance curve of these stages in a high fidelity receiver, it is recommended that unless it is absolutely essential, these I. F. adjustments be untouched. In the factory these adjustments are made using a visual system which allows the operator to see the exact shape of the resonance curve. For this reason, it is... procedure should be followed:

- 1. Operate the Range Switch of the receiver to the "A" range position, and set the tuning dial to its extreme low frequency position. Set the Fidelity Control to its "Normal" position, the Automatic Frequency Control to its "Off" position, and the F. F. Control to its "On" position... 2. Apply between the chassis base (or ground binding post) of the receiver and the grid of the No. 6A8 modulator tube, a modulated signal of 465 kilocycles from the signal generator, using a 0.1 Mfd. capacitor in series with the connection between the output terminal of the signal generator and the grid of the No. 6A8 tube. Do not remove the chassis grid lead connecting to this tube. The ground (or shield) post terminal of a signal generator should be connected to either the chassis base or the ground binding post terminal.

3. Note, making from Figures 1, the alignment adjustments for the First, Second, Third, and Fourth I. F. Transformers, and the I. F. circuits in the following manner:

- Adjust the third I. F. transformer primary circuit for maximum output.
Adjust the fourth I. F. transformer "Discriminator" circuit midway between the peaks where maximum output is obtained.
Adjust the second I. F. transformer secondary circuit for maximum output.
Adjust the second I. F. primary circuit for maximum output.
Adjust the first I. F. secondary circuit for maximum output.
Adjust the first I. F. primary circuit for maximum output.

Carefully make all the above adjustments, watching carefully the output meter and reduce the output of the test oscillator as required.

To make the final adjustment of the "Discriminator" circuit proceed as follows: This circuit adjustment is made by the A. F. C. control knob which should be set to the "off" position. Before making this adjustment be sure that the I. F. Amplifier is tuned exactly to 465 kilocycles. With the signal generator set to 465 kilocycles, the A. F. C. Control knob is fed into the No. 6A8 Modulator tube. Now observe the reading of the milliammeter which is connected in series with the cathode of the No. 6A7 oscillator control tube. Rotate the A. F. C. Control knob to the "on" position and observe whether there is any difference in the reading of the milliammeter. If the reading is not exactly the same, the alignment of the discriminator is off. If there is any difference in the milliammeter reading while rotating the Automatic Frequency Control knob to the "off" and "on" position, at a rate of about two cycles per second, adjust the "Discriminator" circuit by means of the screw adjustment located on the third I. F. Transformer until the meter reading has the same value regardless of whether the A. F. C. Control knob is set to "off" position. When this condition is obtained the "Discriminator" circuit of these receivers is properly adjusted.

Radio Frequency Adjustments

The alignment of the radio frequency circuits in these receivers should be very carefully made and in the order specified.

When making any aligning adjustments of these circuits, the A. F. C. Control knob should be related to the "off" position, the Fidelity Control knob should be set for "Normal" operation, and the "Off-On-Bass-Photo-graph" Control knob should also be set for "Normal" operation.

Alignment of Ultra-Short Wave Range (Also referred to as "B" Band)

In order to align the circuits of this range, it is desirable to have a signal generator whose high frequency range will go to 60 megacycles. Such equipment, however, is rare and costly, and in most cases it will be necessary to make use of a signal generator whose high frequency range does not extend beyond 20 megacycles, using harmonics of 20 megacycles for aligning this range on 60 megacycles.

In aligning the radio frequency circuits for this range, replace the 0.1 mfd. capacitor which was placed in series with the signal generator's output lead for the I. F. alignment with a 400-ohm carbon type resistor. This lead should then be connected to the antenna binding post marked "U. H. A." located on the rear of the receiver chassis. The antenna terminal (or low bay) of the signal generator should be connected to the ground binding post on the receiver.

1. Operate the Range Switch on the receiver chassis to the "E" range position and set the signal generator's frequency and the receiver's tuning dial to 60 megacycles.

2. Adjust the aligning capacitor C-48 until maximum voltage output is obtained on the output meter.

3. Set the signal generator's frequency and the receiver's tuning dial to 20 megacycles, and adjust the aligning capacitor C-48 until maximum voltage output is obtained on the output meter. The adjustment of this knob is made by disturbing its normally circular shape until it offers the correct inductive effect. If the oscillator does not track with the tuning dial scale at this frequency, it will be necessary to also adjust the oscillator's tuning loop.

4. Reset both the signal generator's frequency and the receiver's tuning dial to 60 megacycles and repeat operation No. 2.

Alignment of Short-Wave Range (Also referred to as "D" Band)

In aligning the radio frequency circuits for this range use the same artificial antenna (400-ohm carbon type) as was used for aligning the "E" range. The receiver's tuning dial should be set to the Ultra-Short Wave Range. Connect the lead to the antenna binding post marked "A," located on the rear of the receiver chassis, and align as follows:

- 1. Operate the Range Switch on the receiver chassis to the "D" range position and set the signal generator's frequency and the receiver's tuning dial to 20 megacycles.
2. Adjust aligning capacitor C-45, C-22, and C-5 respectively, and at the same time rotate the gang tuning capacitor slightly back and forth through resonance until maximum voltage output is obtained on the output meter.
3. Set the signal generator's frequency and the receiver's tuning dial to 11 megacycles and adjust aligning capacitors C-44, C-24, and C-12 respectively, and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.
4. Reset both the signal generator's frequency and the receiver's tuning dial to 20 megacycles and repeat operation No. 2.

Alignment of Short-Wave Range (Also referred to as "C" Band)

In aligning the radio frequency circuits for this range use the same artificial antenna and binding post on the receiver chassis as was used for aligning the "D" range.

- 1. Operate the Range Switch on the receiver chassis to the "C" range position and set the signal generator's frequency and the receiver's tuning dial to 10 megacycles.
2. Adjust the aligning capacitors C-44, C-24, and C-7 respectively, and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.
3. Set the signal generator's frequency and the receiver's tuning dial to 5 megacycles and adjust the aligning capacitors C-39, C-23, and C-11 respectively, and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.
4. Reset both the signal generator's frequency and the receiver's tuning dial to 10 megacycles and repeat operation No. 2.

Alignment of Aircraft Range (Also referred to as "B" Band)

In aligning the radio frequency circuits for this range, use the same artificial antenna and antenna binding post as was used for aligning the "C" range, and align this range as follows:

- 1. Operate the Range Switch on the receiver chassis to the "B" range position and set the signal generator's frequency and the receiver's tuning dial to 4.5 megacycles.
2. Adjust the aligning capacitors C-43, C-20, and C-6 respectively, and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.
3. Set the signal generator's frequency and the receiver's tuning dial to 1.8 megacycles and adjust the aligning capacitor C-38 and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.
4. Reset both the signal generator's frequency and the receiver's tuning dial to 4.5 megacycles and repeat operation No. 2.

Alignment of Standard Broadcast Range (Also referred to as "A" Band)

In aligning the radio frequency circuits for this range, replace the 400-ohm resistor in series with the signal generator's output with a 200-ohm microfarad capacitor and align this range as follows:

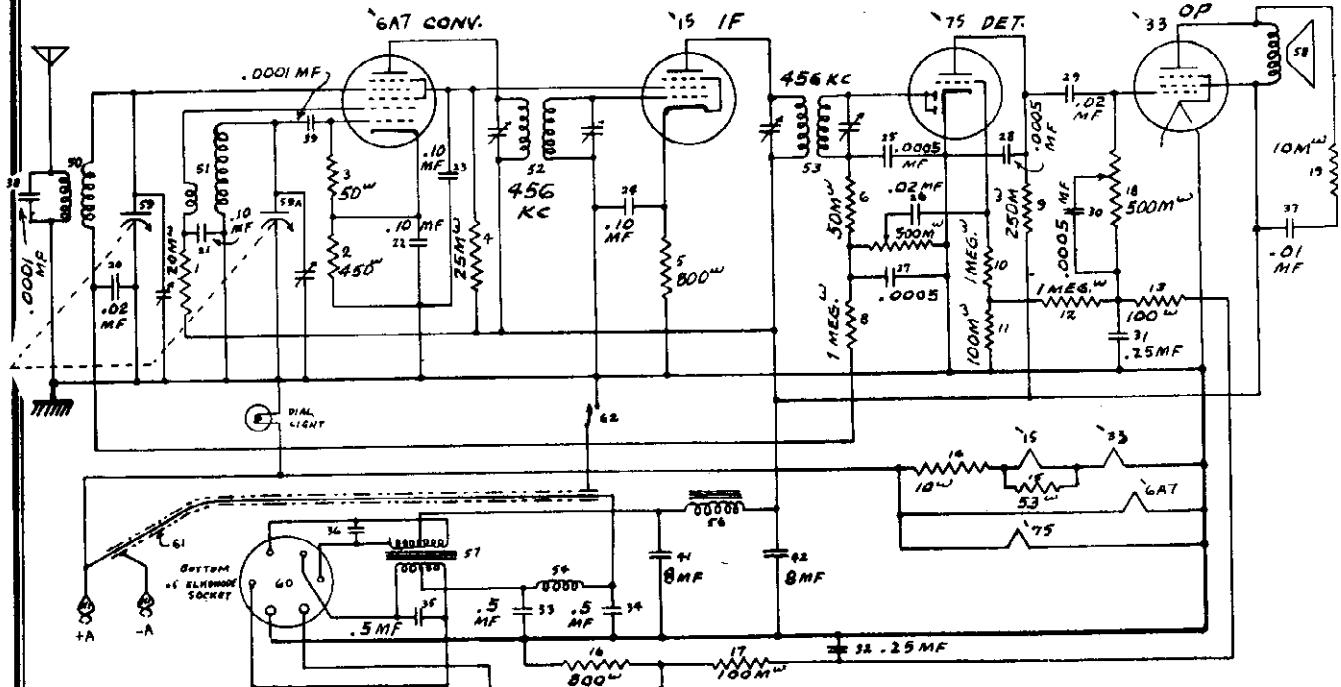
- 1. Operate the Range Switch to the "A" range position and set the signal generator's frequency and the receiver's tuning dial to 15 megacycles (15M kilocycles).
2. Adjust the aligning capacitors C-42, C-19, C-4, and C-5 respectively, and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.
3. Set the signal generator's frequency and the receiver's tuning dial to 0.6 megacycles (606 kilocycles) and adjust the aligning capacitor C-37, and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.
4. Reset both the signal generator's frequency and the receiver's tuning dial to 1.5 megacycles and repeat operation No. 2.

Adjustment of 10 Kilocycle Audio Cut-Off Filter

The adjustment of this filter is correctly made at the factory and no additional adjustment is required.

L. TATRO PRODUCTS CO.

MODEL M-4616
Schematic, Voltage
Alignment



Normal voltage readings from points indicated to chassis:

TUBE	USE	(a) CATHODE	(b) SCREEN	(b) PLATE
6A7	Converter	2.25 V.	60 V.	115 V. *80 V.
15	I.F. Ampl.	1.75 V.	60 V.	115 V.
75	Detector	0		52.5 V.
33	Output Tube		115 V.	110 V.

- (a) Measured with a voltmeter having a resistance of 30M ohms.
- (b) Measured with a voltmeter having a resistance of 300M ohms.
- (*) 6A7 anode grid volts.

All readings taken with volume control full open and zero signal input to receiver.

"L'TATRO" MODEL M-4616 ALIGNMENT PROCEDURE

ALIGNMENT MUST BE DONE WITH THE AID OF A CORRECTLY CALIBRATED SIGNAL GENERATOR OF RELIABLE MAKE USED IN CONJUNCTION WITH A HIGH RESISTANCE OUTPUT METER. THE LATTER IN SERIES WITH A LARGE PAPER DIELECTRIC CONDENSER SHALL BE CONNECTED FROM PLATE TO SCREEN OF THE OUTPUT TUBE.

I. F. ADJUSTMENT: Connect the ground side of the signal generator to the receiver chassis and the other side through a .005 mfd. condenser to the I.F. tube grid clip. Set the generator at 456 K.C. Using as low an input as possible adjust the trimmer screws on item 53 for maximum response. Next connect the .005 condenser to the 6A7 grid clip and adjust the trimmers on item 52 for maximum output. If double peaks or high output and overloading occur reduce the signal input. SLIGHTLY HIGHER GAIN MAY BE OBTAINED BY NOW READJUSTING THE TRIMMERS ON ITEM 53. THIS SHOULD NOT BE DONE UNLESS ABSOLUTELY NECESSARY AS SOME REGENERATION IS INTRODUCED AND MAY CAUSE EXCESSIVE HISS WHEN A CARRIER IS TUNED IN.

R.F. ADJUSTMENT: Connect the ground side of the signal generator to the receiver chassis and the other side through a .0002 mfd. condenser to the antenna lead. Set receiver dial and signal generator at 1400 K.C. and adjust the trimmer screws on item 51 and 59A for maximum response.

When the above procedure is completed the receiver is correctly aligned and should operate satisfactorily on the air.

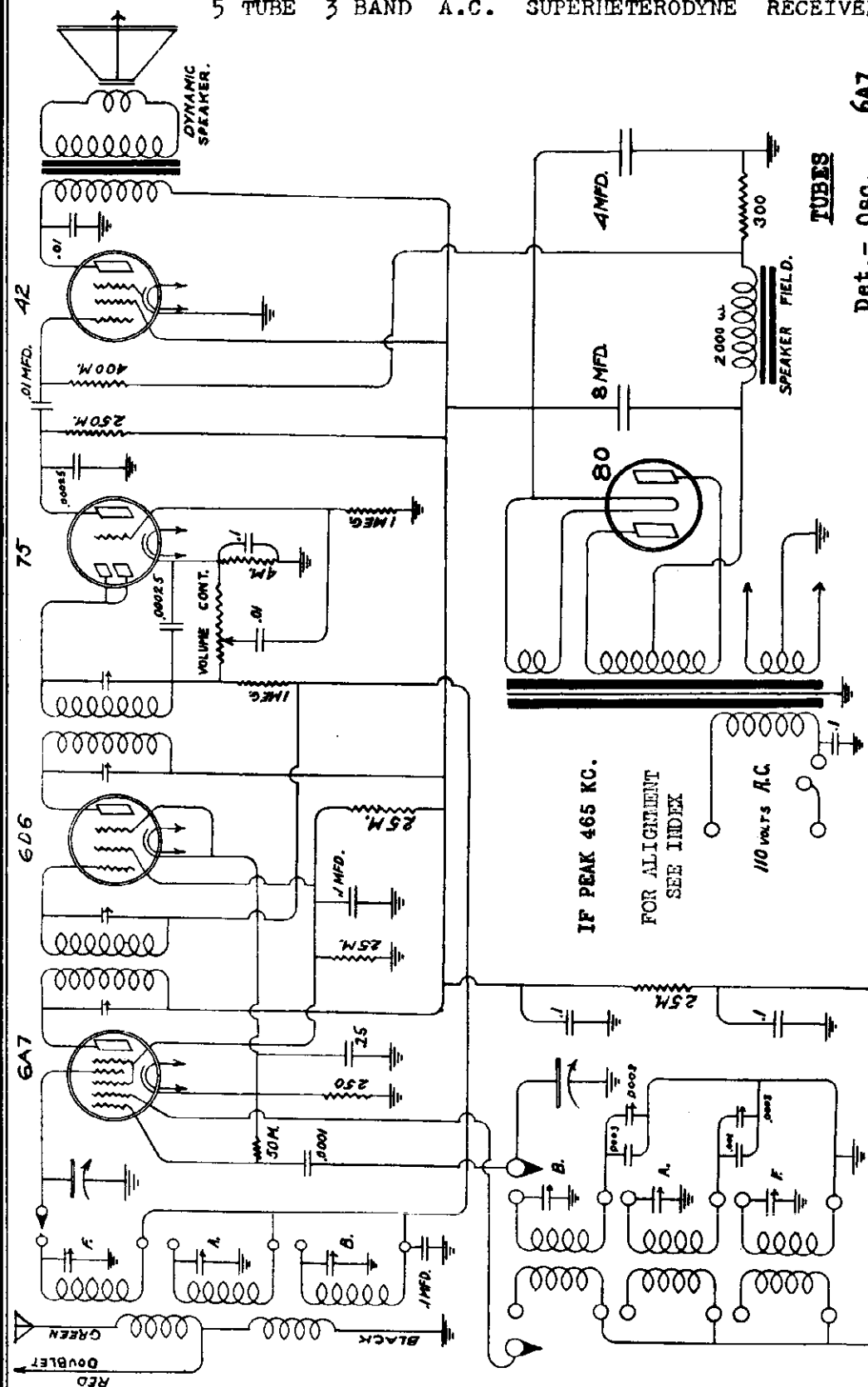
Under normal circumstances the use of a single wire antenna 100 feet long, with lead-in at one end is recommended.

IN ALL ABOVE ALIGNMENT PROCEDURE THE VOLUME AND TONE CONTROLS MUST BE AT MAXIMUM POSITION.

TRANSFORMER CORP. OF AMER.

MODEL TC-6
Schematic, Socket

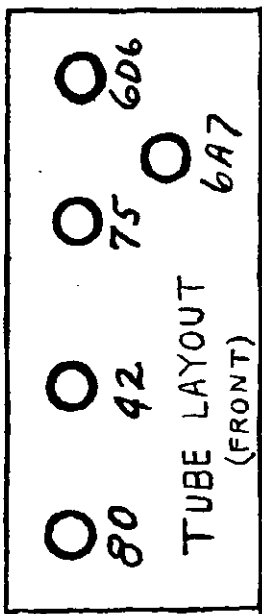
CLARION MODEL TC - 6 5 TUBE 3 BAND A.C. SUPERHETERODYNE RECEIVER



TUBES

- 6A7 - 1st Osc.
- 6D6 - 1st I.F. Amp.
- 75 - Diode Det. and 1st Audio
- 42 - Audio Output
- 80 - Rectifier

TRANSF. CORP. OF AMERICA
100-6th AVE., N.Y.C.



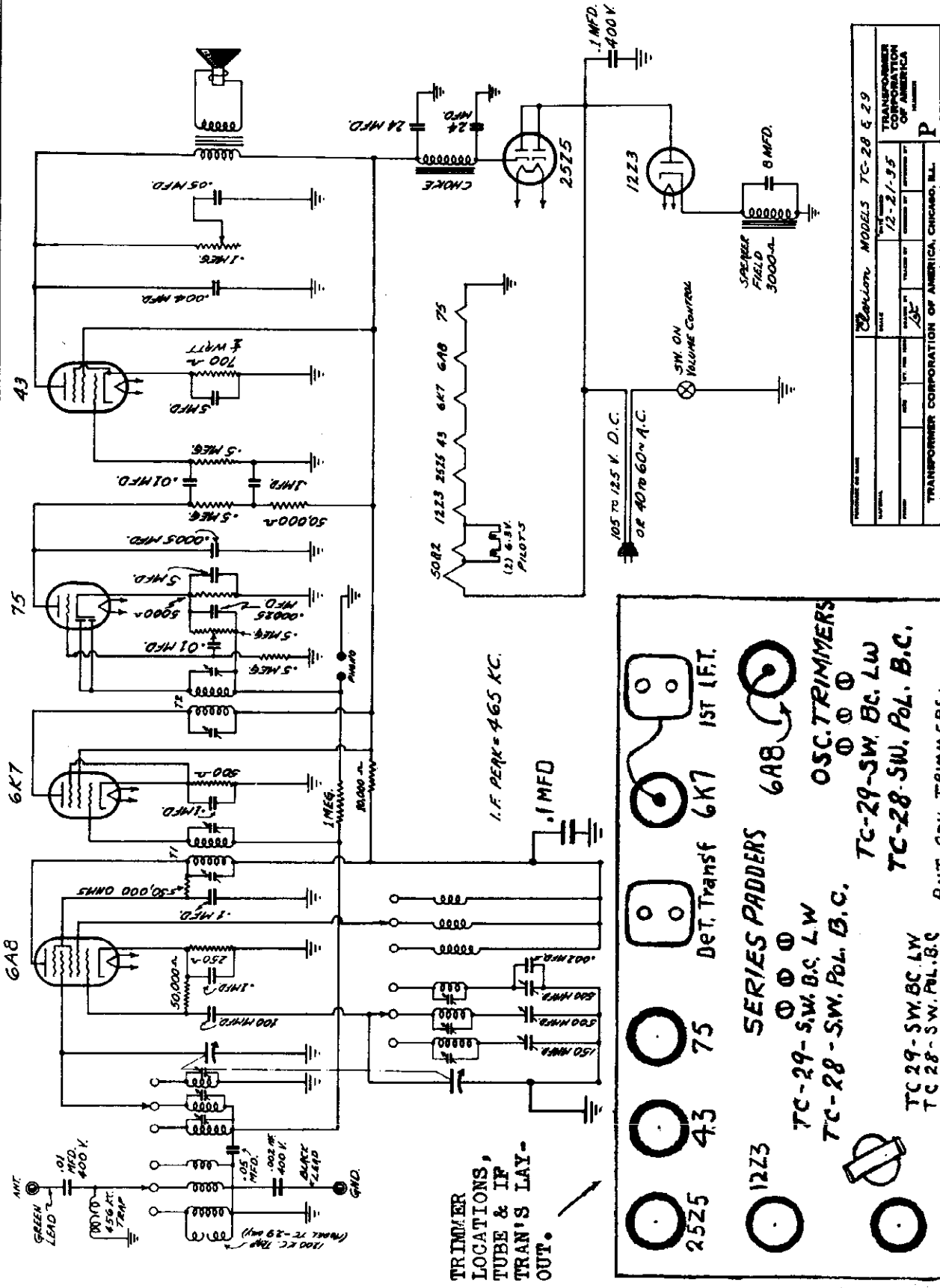
IF PEAK 465 KC.
FOR ALIGNMENT
SEE INDEX

BAND	FREQUENCY RANGE
B - BROADCAST	540 KC. - 1700 KC.
A - AMATEUR	1700 KC. - 5500 KC.
F - FOREIGN	5.5 MEG. - 16.5 MEG.

ENGINEERING DEPARTMENT
1-18-36

MODELS TC-28, TC-29
Schematic, Socket
Trimmers

TRANSFORMER CORP. OF AMER.



Transformer Models TC-28 & 29	
TYPE	72-21-95
DATE	
DESIGNED BY	
CHECKED BY	
APPROVED BY	
TRANSFORMER CORPORATION OF AMERICA	
CHICAGO, ILL.	

TRANSFORMER CORP. OF AMER.

MODEL TC-6
Alignment
MODELS TC-28, TC-29
Voltage, Alignment

SERVICE NOTES FOR THE CLARION MODELS TC-28 & TC-29
SEVEN TUBE THREE BAND A.C.-D.C. SUPERHETERODYNE RECEIVERS

ALIGNMENT PROCEDURE

Realignment of this receiver should not be attempted except by an experienced service man, and then only after all possible causes of faulty operation have been thoroughly investigated. An accurately calibrated signal generator which will cover the various bands and a suitable output meter for indicating the effects of adjustments are required.

I.F. ADJUSTMENT - The signal generator is set at 465 kc. and its output connected between the control grid of the first detector (6A5) tube and the ground post of the receiver. The oscillator (rear) section of the tuning condenser is short-circuited and the volume control set at maximum. The signal generator output is attenuated as much as possible and the i.f. trimmers adjusted for maximum gain. These trimmers are found in the right hand rear corner of the chassis, on top of the i.f. shield cans.

1400 KC. ADJUSTMENT - The signal generator is set at 1400 kc. and its output connected between the aerial and ground posts of the receiver. It is extremely important that a weak signal be used in order to prevent the a.v.c. action from nullifying the effect of adjustments. The receiver dial is set at the same frequency and with the volume control at maximum, the 1400 kc. trimmer is adjusted for greatest gain. The series padder for this band should now be adjusted by setting the signal generator at 600 kc. and tuning the signal in on the receiver dial. This padder should be adjusted for maximum response while the tuning condenser is rocked slightly back and forth. The 1400 kc. adjustment should then be rechecked.

The location of all the r.f. trimmers are shown on the accompanying sketch.

SHORT WAVE BAND ADJUSTMENT - For this band the oscillator and antenna coil trimmers should be adjusted at 16 megacycles in the manner described above and the series padder adjustment made at 5.7 megacycles.

LONG WAVE BAND ADJUSTMENT - This adjustment is for the model TC-29 only. The oscillator and antenna coil trimmers should be adjusted at 375 kc. as outlined above, and the series padder at 150 kc.

POLICE BAND ADJUSTMENT - This adjustment is for the model TC-28 only. The oscillator and antenna coil trimmers should be adjusted at 3500 kc. and the series padders at 1600 kc.

VOLTAGE TABLE

TUBE	FUNCTION	H.T. 1A	PLATE	SCR. GR.	SUPPR. GR.	GATH.	OSC. PL.
6A5	det -osc.	5.0	90.8	50.0	---	1.0	98.0
6K7	i.f. amplifier	5.0	120.0	120.0	4.2	4.2	---
75	2nd det.	5.2	60.0	---	---	---	---
43	audio out-	---	---	---	---	---	---
	put	28.5	120.0	120.0	---	18.0	---
25Z5	rectifier	22.5	120.0	---	---	120.0	---
12Z3	spkr. rect.	10.1	120.0	---	---	120.0	---

All voltages are measured between socket terminals and chassis; set in operation; volume control "full on"; antenna disconnected. Voltmeter sensitivity - 1000-ohms-per-volt. Line voltage measured - 115.0

SERVICE NOTES FOR THE CLARION MODEL TC-6
FIVE TUBE THREE BAND A.C. SUPERHETERODYNE RECEIVER

ALIGNMENT PROCEDURE

Realignment of this receiver should not be attempted unless all other possible causes of faulty operation have been thoroughly investigated, and then only by an experienced service man. An accurately calibrated signal generator which will cover the necessary wave-bands and an output meter for indicating the effect of adjustments are required.

It is essential that in all the following tests the signal generator output be attenuated as much as possible at all times and that the receiver volume control be always set at maximum.

I.F. ALIGNMENT - The signal generator is set at 456 kc. and is connected to the grid of the first detector (6A7) tube. With the oscillator section of the tuning condenser short-circuited the i.f. trimmers are adjusted for maximum output. These may be found on top of the i.f. transformer shield cans in the right hand rear corner of the chassis.

FOREIGN BAND ADJUSTMENT - The high side of the signal generator is connected to the antenna post of the receiver and the low side of the signal generator is connected to the ground post. The receiver and the signal are both tuned to a frequency of 16 mc. with the selector switch in position for this band. The oscillator trimmer is adjusted for maximum receiver output. This trimmer is located on the oscillator coil on the under side of the chassis. It is the right hand one of the three trimmers found here. The antenna preselector for this band is then adjusted in the same manner. This is found on the preselector coil on the top side of the chassis and is the right hand one of the three found here.

AMATEUR BAND ADJUSTMENT - With the band selector switch in position for operation on this band, and the receiver and signal generator both set at 5.4 mc., the procedure outlined above is repeated. The oscillator trimmer for this band is found on the oscillator coil on the under side of the chassis and is the center one of the three. The preselector trimmer is found on the preselector coil on top of the chassis and is the center one of the three.

The signal generator should then be set at 1.7 mc. and the signal tuned in on the dial. The series padder for this band should be adjusted for maximum output while the receiver dial is rocked slightly back and forth. The 5.4 mc. setting should then be rechecked. The padder is located on the right side of the front chassis skirt and is the left hand one of the two located here.

BROADCAST BAND ADJUSTMENT - With the band selector switch in position for operation on this band and the receiver and signal generator both set at 1400 kc. the procedure outlined above is repeated. The oscillator and preselector trimmers are found on the tops of their respective coils and are on the extreme left in each case.

The signal generator should then be set at 600 kc. and the signal tuned in on the dial. The series padder for this band should be adjusted for maximum output while the receiver dial is rocked slightly back and forth. The 1400 kc. adjustment should then be rechecked. The subsequent adjustments have a detuning effect on this circuit. This padder is located on the right hand side of the front chassis skirt and is the right hand one of the two located here.

MODELS TC-42, TC-43, TC-44

Alignment

MODEL TC-65

Voltage, Alignment

TRANSFORMER CORP. OF AMER.

SERVICE NOTES FOR THE CLARION MODEL TC-42, 43, 44
TO TUBE 4 BAND A.C. SUPERHETERODYNE RECEIVER

ALIGNMENT PROCEDURE

I.F. ADJUSTMENT - The signal generator is set at 456 kc. and is connected to the grid of the first detector (6A7). With the oscillator section of the tuning condenser short-circuited and the receiver volume control at its maximum position, the i.f. trimmers are adjusted for maximum output. These trimmers may be found on the i.f. transformer shield cans in the rear of the chassis.

16 MEGACYCLE ADJUSTMENT - The high side of the signal generator is connected to the antenna post of the receiver and the low side to the ground post. The receiver and the signal are both tuned to a frequency of 16 mc. with the selector switch in position for band no. 1. The oscillator trimmer condenser is adjusted for maximum receiver output, with the volume control on full and the signal generator adjusted for minimum input. The antenna preselector and first detector trimmers are then adjusted in the order named. These trimmers are located on the tops of the shield cans at the left side of the chassis; reading from front to back, these coils are as follows: - 1. antenna preselector; 2. first detector; 3. oscillator. It will be noted that there are four trimmers on each of these coils. The adjustment screw for the trimmer in the front left hand corner of each is painted red. This denotes the trimmer for the no. 1 band.

5.2 MC. ADJUSTMENT - With the band selector switch in position for operation on band no. 2, and the receiver and signal generator both set at 5.2 mc. the procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can, and is located to the right of the red painted trimmer. The antenna preselector and intermediate coil trimmers are located in the same positions on the corresponding shield cans.

The signal generator is set at 1.7 mc. and the signal tuned in on the dial. The paddler condenser for this band is adjusted for maximum gain while the gang tuning condenser is rocked slightly to the right and left. The 5.2 mc. adjustment should then be rechecked. The 1.7 mc. paddler is located on the sub-base on which the gang tuning condenser is mounted and is the left hand one of the group of three found here.

1400 KC. ADJUSTMENT - The band selector switch is set in position for operation on the no. 3 band. The receiver and signal generator are both set at 1400 kc. and the procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can, and is located diagonally opposite the red painted trimmer. The other trimmers for this band are located in similar positions on the corresponding coil cans.

The signal generator is set at 600 kc. and the signal tuned in on the dial. The paddler condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 1400 kc. adjustment should then be rechecked. The 600 kc. paddler is located on the sub-panel on which the gang tuning condenser is mounted and is the center of the three located at this point.

140 KC. ADJUSTMENT - The band selector switch is set in position for operation on band no. 4. The receiver and generator are both tuned to 140 kc. and the procedure outlined above is repeated. The oscillator trimmer is located on the rear coil can. It is the one directly behind the trimmer marked in red. The other trimmers for this band are located in similar positions on the corresponding shield cans.

The signal generator is set at 140 kc. and the signal is tuned in on the dial. The paddler condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 140 kc. adjustment should then be rechecked. The 140 kc. paddler is located on the sub-panel on which the tuning condenser is mounted and is the right hand one of this group.

SERVICE NOTES FOR THE CLARION MODEL TC-65
TO TUBE 4 BAND A.C. SUPERHETERODYNE RECEIVER

ALIGNMENT PROCEDURE

I.F. ADJUSTMENT - The signal generator is set at 456 kc. and is connected to the grid of the first detector (6A7). With the oscillator section of the tuning condenser short-circuited and the receiver volume control at its maximum position, the i.f. trimmers are adjusted for maximum output. These trimmers may be found on the i.f. transformer shield cans in the rear of the chassis.

16 MEGACYCLE ADJUSTMENT - The high side of the signal generator is connected to the antenna post of the receiver and the low side to the ground post. The receiver and the signal are both tuned to a frequency of 16 mc. with the selector switch in position for band no. 1. The oscillator trimmer condenser is adjusted for maximum receiver output, with the volume control on full and the signal generator adjusted for minimum input. The antenna preselector and first detector trimmers are then adjusted in the order named. These trimmers are located on the tops of the shield cans at the left side of the chassis; reading from front to back, these coils are as follows: - 1. antenna preselector; 2. first detector; 3. oscillator. It will be noted that there are four trimmers on each of these coils. The adjustment screw for the trimmer in the front left hand corner of each is painted red. This denotes the trimmer for the no. 1 band.

5.2 MC. ADJUSTMENT - With the band selector switch in position for operation on band no. 2, and the receiver and signal generator both set at 5.2 mc. the procedure outlined above is repeated. The oscillator or trimmer is found on the rear coil can, and is located to the right of the red painted trimmer. The antenna preselector and intermediate coil trimmers are located in the same positions on the corresponding shield cans.

The signal generator is set at 1.7 mc. and the signal tuned in on the dial. The paddler condenser for this band is adjusted for maximum gain while the gang tuning condenser is rocked slightly to the right and left. The 5.2 mc. adjustment should then be rechecked. The 1.7 mc. paddler is located on the sub-base on which the gang tuning condenser is mounted and is the left hand one of the group of three found here.

1400 KC. ADJUSTMENT - The band selector switch is set in position for operation on the no. 3 band. The receiver and signal generator are both set at 1400 kc. and the procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can, and is located diagonally opposite the red painted trimmer. The other trimmers for this band are located in similar positions on the corresponding coil cans.

The signal generator is set at 600 kc. and the signal tuned in on the dial. The paddler condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 1400 kc. adjustment should then be rechecked. The 600 kc. paddler is located on the sub-panel on which the gang tuning condenser is mounted and is the center of the three located at this point.

140 KC. ADJUSTMENT - The band selector switch is set in position for operation on band no. 4. The receiver and generator are both tuned to 140 kc. and the procedure outlined above is repeated. The oscillator trimmer is located on the rear coil can. It is the one directly behind the trimmer marked in red. The other trimmers for this band are located in similar positions on the corresponding shield cans.

The signal generator is set at 140 kc. and the signal is tuned in on the dial. The paddler condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 140 kc. adjustment should then be rechecked. The 140 kc. paddler is located on the sub-panel on which the tuning condenser is mounted and is the right hand one of this group.

VOLTAGE TABLE OF MODEL TC-65

TUBE	FUNCTION	HEATER	SOR.	SUPPR.	OSC. PL.	CATH.	PLATE
6A7	Preselector	5.1	98.0	1.2		1.0	98.0
6A7	det. - osc.			100.0	78.0	3.0	196.0
6A7	1st. i.f.		187.0	8.0		1.0	187.0
6X5	det. audio	2.0				1.0	35.0
6X3	audio output	21.0	98.0	14.0		14.0	120.0
5Z5	rectifiers	24.0					112.0

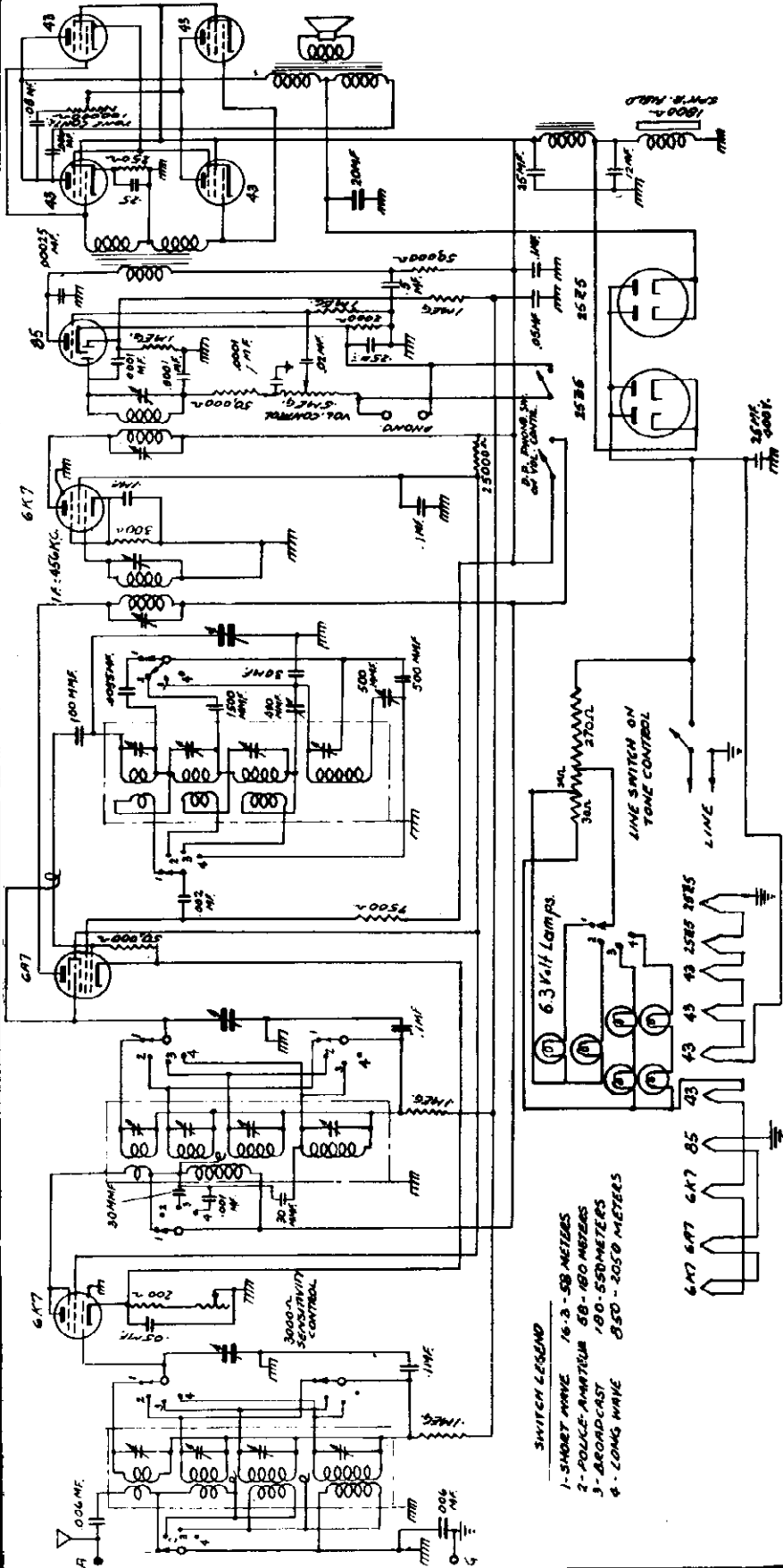
ALL VOLTAGES ARE MEASURED FROM THE SOCKET TERMINALS TO THE CHASSIS, WHILE SET IS IN OPERATION, AND WITH THE VOLUME CONTROL FULL ON.

FREQUENCY BANDS

BAND 1- SH. WAVE, AIRCRAFT	-5.2 to 18 MC
BAND 2- POLICE, AMATEUR, AIRCRAFT	-1.6 to 5.2 MC
BAND 3- BROADCAST	-540 to 1600 KC
BAND 4- LONG WAVE	-343 to 142 KC

MODEL TC-65
Schematic
Socket

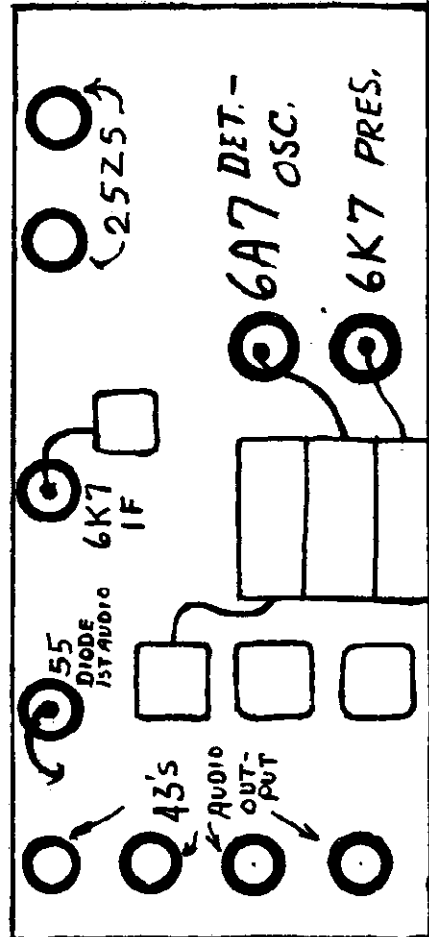
TRANSFORMER CORP. OF AMER.



SWITCH LEGEND
1 - SHORT WAVE 16.2 - 58 METERS
2 - POLICE-AIRMAIL 58 - 160 METERS
3 - BROADCAST 160 - 550 METERS
4 - LONG WAVE 350 - 5050 METERS

SEE INDEX FOR VOLTAGE AND ALIGNMENT

Claron
MODEL - TC-65
10 TUBE 4 BAND A.C.-D.C. SUPERHET
TRANSFORMER CORPORATION OF AMERICA
100 SIXTH AVE, NEW YORK, N.Y.
DRAWN BY *BJ* DATE - 12-19-35



IF PEAK 456 KC

TUBE AND CHASSIS LAY-OUT

MODEL TC 39

Voltage Alignment **TRANSFORMER CORP. OF AMER.**
Parts

Now, remove the oscillator clip from the 6A7 grid and connect it to the antenna terminal marked A₁. Terminals A₂ and G must be connected together by jumper. Set the oscillator to 1406 k.c. (Three tall round cans located to the right of the tuning condenser are as follows: antenna coil, intermediate RF, and Oscillator coil looking from front to rear of chassis.) If the received signal does not come in exactly at this frequency adjust the broadcast oscillator trimmer (trimmer projects through the upper hole in the side of the oscillator can) so that it does. Next adjust the trimmers on the antenna coil and the interstage RF coil (trimmers project through upper hole on right hand side of the antenna and RF coil cans) for maximum output as before. Now set the oscillator to 600 k.c., and tune this in on the receiver. Check for alignment by rotating the padding condenser screw (screw projects through the chassis directly to the left of the oscillator coil can) at the same time rocking the tuning condenser so as to obtain maximum output. Leave this padding set for maximum signal.

SHORT WAVE BAND: Turn the wave band switch to the left. If a short wave oscillator is not available, set the regular broadcast oscillator to 1000 k.c. If the harmonics are sufficiently powerful it should be possible to pick up a signal at points all along the dial one megacycle apart, as for example 6 m.c., 7 m.c., 8 m.c. and 9 m.c.

Tune in signal at approximately 14 m.c. and very carefully adjust the short wave trimmers on the antenna and RF coils (lower openings on right side of front and middle cans) for maximum output. Carefully retune the signal as a re-adjustment of the trimmers may shift the signal slightly on the dial.

NOTE: In all the above adjustments it is imperative that the volume control be set near maximum and that the oscillator be reduced sufficiently so that no more than 15 volts output is obtained. If necessary set the oscillator some distance away and pick up the signal by means of a wire placed near it and connected to the receiver.

REPLACEMENT PART LIST

Description	Each List Price
Antenna Coupling Transformer	\$2.12
RF Transformer	2.12
Oscillator	2.08
12 Mfd. Wet Electrolytic Filter Condenser	1.52
Three Gang Tuning Condenser	4.28
Combination Volume Control and Switch	1.76
Tone Control	1.18
Power Transformer	7.52
Any Socket - Give tube Number	.10
Any Tubular Condenser - Give Value	.40
Any Moulded Condenser - Give Value	.18
Any Carbon Resistor - Give Value	.14
Band Selector Switch - Three gang	2.12
Dynamic Speaker	8.25
Padding Condenser - Single	.44

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

Clarion MODEL T C 39

Seven Tube Superheterodyne Receiver

A.C. 105 to 240 Volts, 40 to 60 Cycles

Short Wave	Broadcast Wave
17.5 - 53 Meters	190 - 560 Meters
17000 - 5600 Kilocycles	1580 - 535 Kilocycles

DESCRIPTION:

The Clarion 7 Tube Short Wave and Broadcast A.C. Receiver is adapted for use on A.C. 105 to 240 Volts, 40 to 60 Cycles.

***THIS RECEIVER IS PROVIDED WITH A TAPPED-PRIMARY POWER TRANSFORMER FOR USE ON EITHER 105 TO 125 OR 220 TO 240 VOLTS. BEFORE OPERATING THIS RECEIVER MAKE CERTAIN THAT THE FLEXIBLE LEAD, EXTENDING FROM THE TOP OF THE POWER TRANSFORMER, IS CONNECTED TO THE CORRECT BINDING POST. IF THIS PRECAUTION IS NOT TAKEN POSSIBLE DAMAGE TO THE TRANSFORMER MAY RESULT.**

The tube complement included: 1 - 6D6 as R.F. Amplifier, 1 - 6A7 as First Detector and Oscillator, 1 - 6D6 as I.F. Amplifier, 1 - 76 as Diode Detector and AVC, 1 - 6D6 as A.F. Amplifier, 1 - 42 as Power Output Tube and 1 - 80 Rectifier.

VOLTAGE READINGS:

Readings should be taken with the Volume Control fully on. Use a D.C. Voltmeter having a resistance of 1000 ohms per volt.

	Plate to Ground	Screen to Ground	Cathode to Ground	Suppressor to Ground
6D6 RF Amp.	235	155	3	3
6A7 Det. Osc.	230	155	3	
6D6 IF Amp.	250	155	6	6
76 Second Det.	50	12	0.2	0.2
42 Output	228	234	23	
80 Rectifier	Filament to Ground	250 volts.		
Power Drawn by Receiver	57 Watts.			

ALIGNMENT OF T C 39

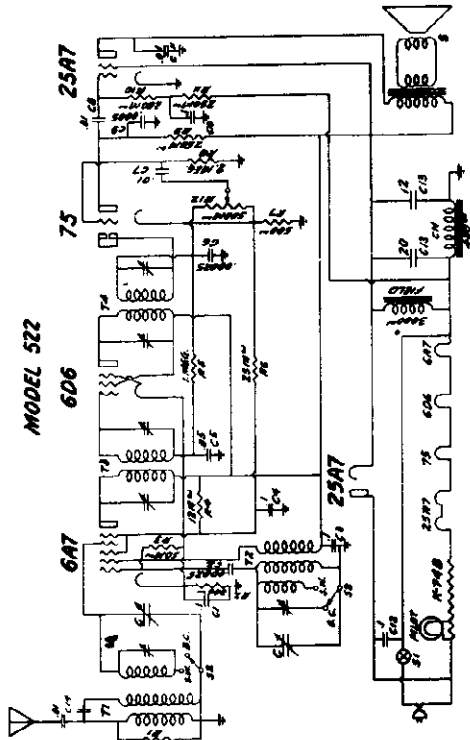
With the wave band switch in the broadcast position (right) connect the oscillator, set at 456 k.c. to the grid of the 6A7 tube (with the grid cap in place) and to the chassis. The volume control should be set at maximum and the oscillator output reduced so as to obtain about 15 volts reading on an output meter (4000 to 8000 ohms) connected across the loud speaker transformer primary (plate and screen prongs of the 42 tube).

Carefully rotate the screws on the tops of the IF transformers (square cans) until the maximum reading is obtained on the output meter. If the output is considerably in excess of 15 volts reduce the oscillator output further.

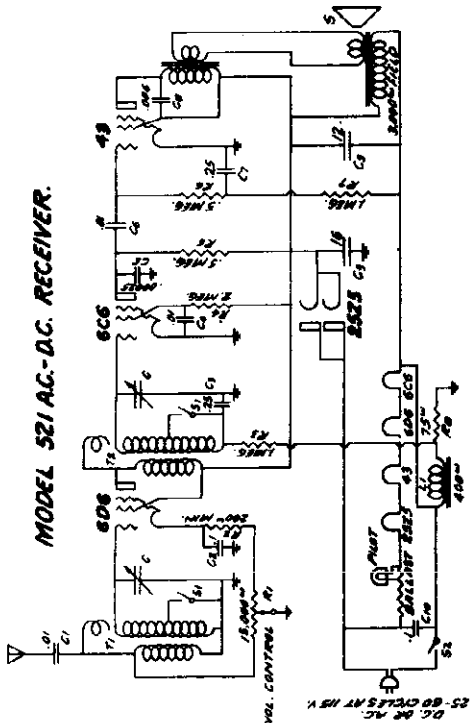
The object of this is to operate at such a low level that the automatic volume control; the purpose of which is to maintain the signal level constant, does not operate; otherwise this adjustment will appear very broad and it will be impossible to obtain a true alignment of the IF transformers.

TRAV-LER RADIO & TELEV. CORP.

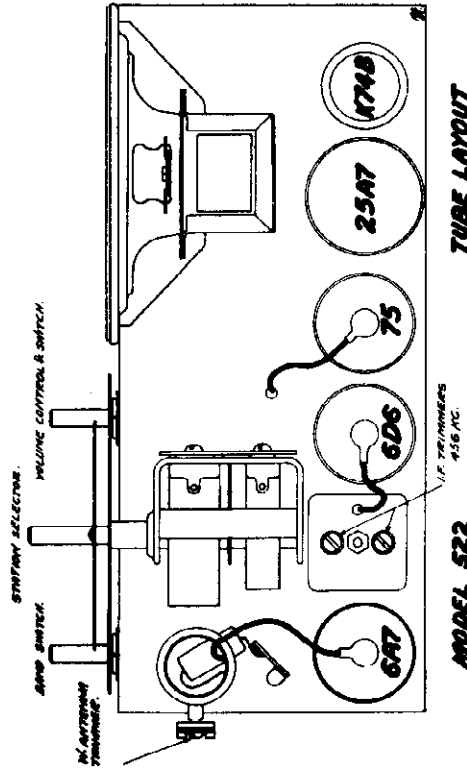
MODEL 521
 MODEL 522
 Schematics, Socket



MODEL 522

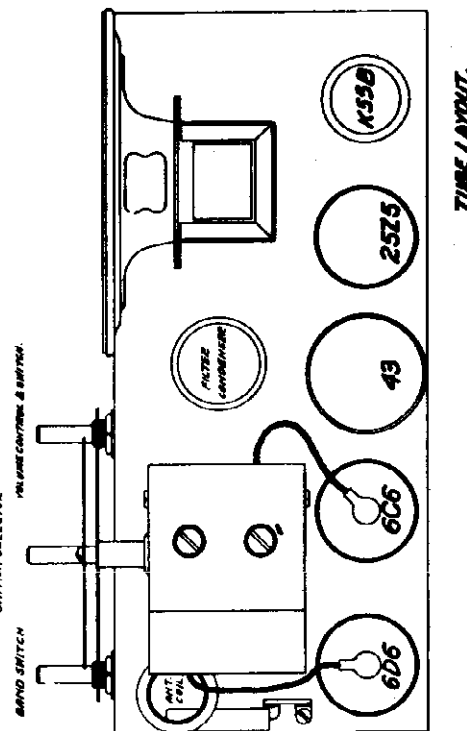


MODEL 521 AC-DC RECEIVER.



TUBE LAYOUT

MODEL 522



TUBE LAYOUT.

OPERATING INSTRUCTIONS

5-TUBE AC-DC Superheterodyne Receiver

This radio is a five-tube Superheterodyne type which operates on AC or DC at 110 volts. It covers two wave bands, as follows:

Standard broadcast and police band -- 540-1750 kc.
 Police, Amateur, American and Foreign
 short wave band -----2400-6300 kc.

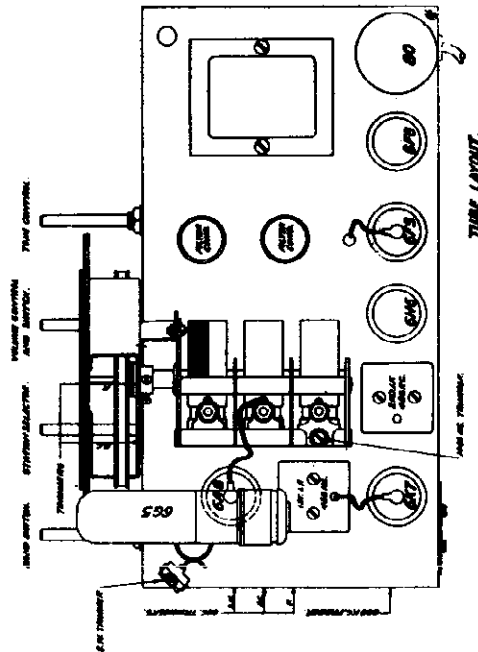
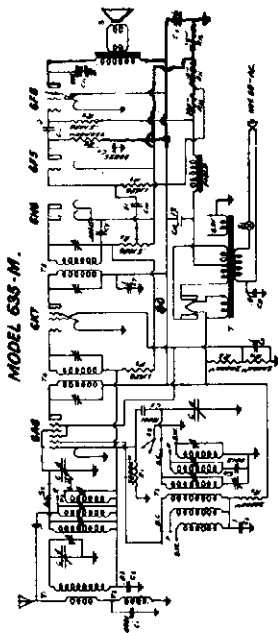
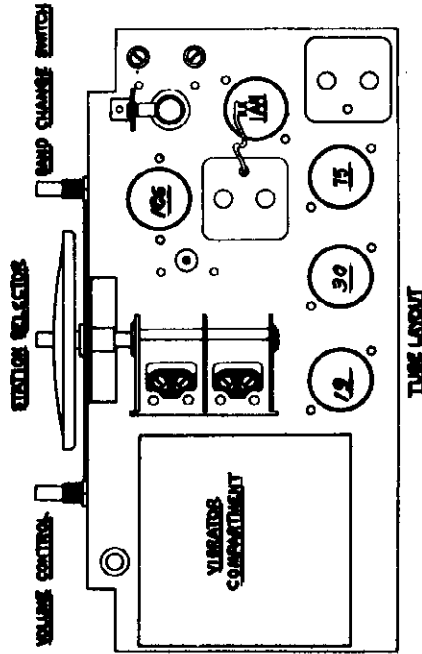
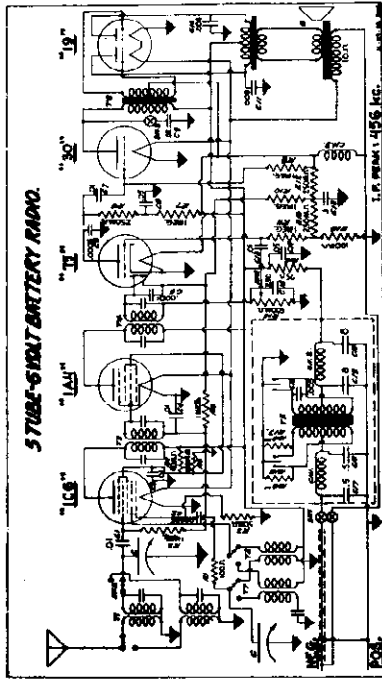
OPERATING INSTRUCTIONS

5-TUBE AC-DC RECEIVER

For Use on 110-115 Volts AC or DC Current Only

This receiver is a five tube tuned-radio-frequency type which operates on either AC or DC current. It will provide very satisfactory entertainment for those who desire a small set.

MODEL 635M
 MODEL 5-Tube Batt. TRAV-LER RADIO & TELEV. CORP.
 Schematics, Socket



OPERATING INSTRUCTIONS

6-Tube Superheterodyne AC Receiver
 For use on 110 volts AC only

This radio is a six-tube Superheterodyne type which operates ON AC CURRENT ONLY at a frequency of 60 cycles and at 110 volts. It covers three wave bands, as follows:

- Standard Broadcast band - 540-1750 kc.
- Police and Amateur band - 1660-6600 kc.
- Short wave, American & Foreign - 18-5.5 meg.

6-Volt Storage Battery Receiver

This radio is designed to operate from a 6-volt storage battery. No "B" or "C" batteries are required.

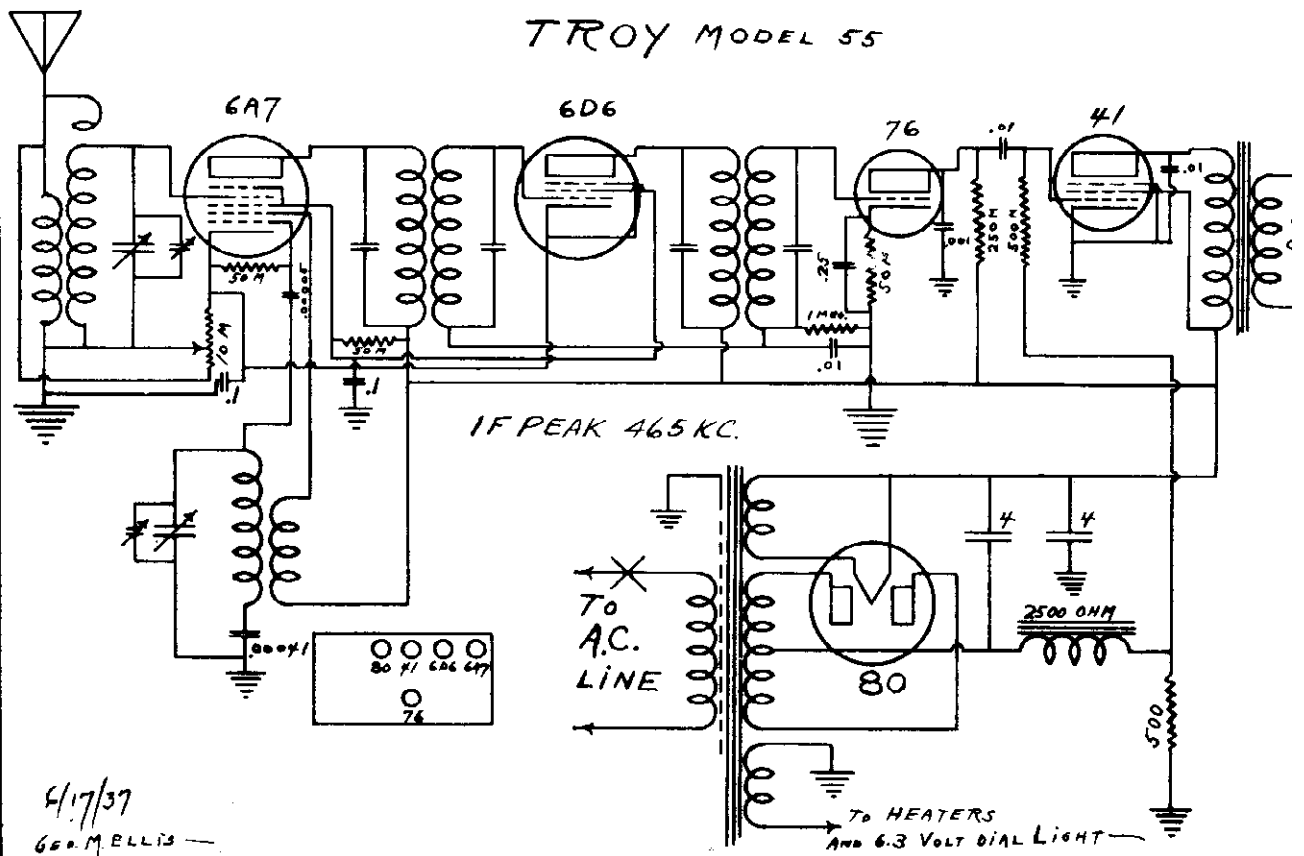
It has two wave bands, having the following coverage:

- Standard broadcast - 540 to 1750 kilocycles
- Foreign short wave - 5.7 to 17 megacycles

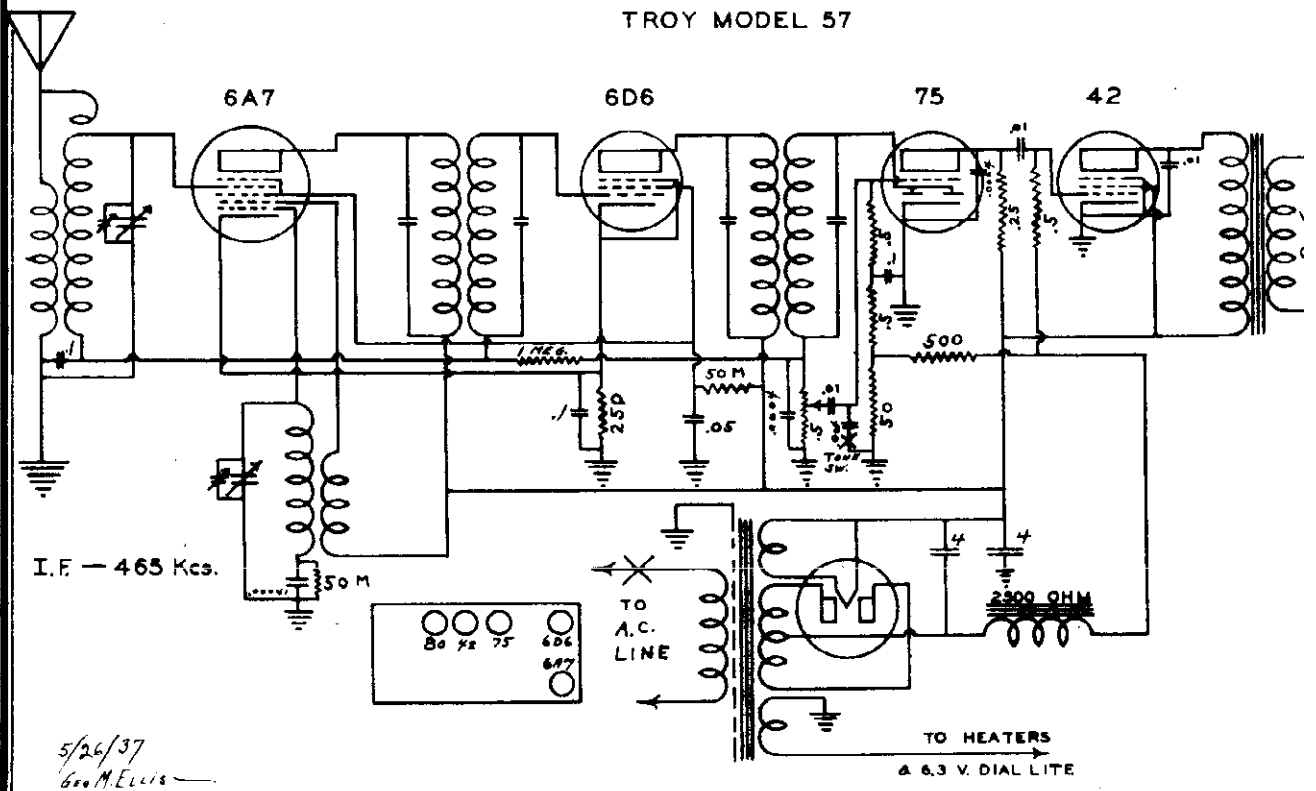
TROY RADIO & TELEV. CO.

MODEL 55
MODEL 57
Schematics, Socket

TROY MODEL 55



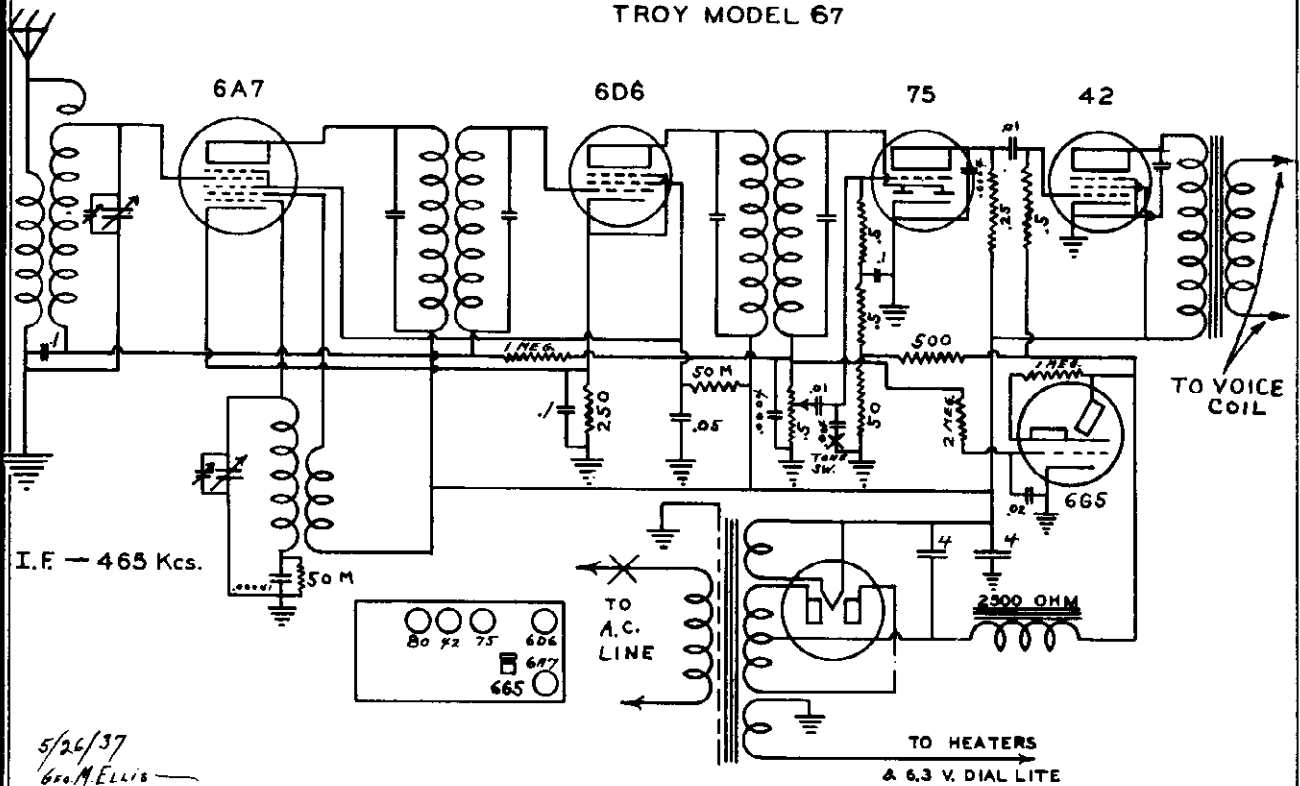
TROY MODEL 57



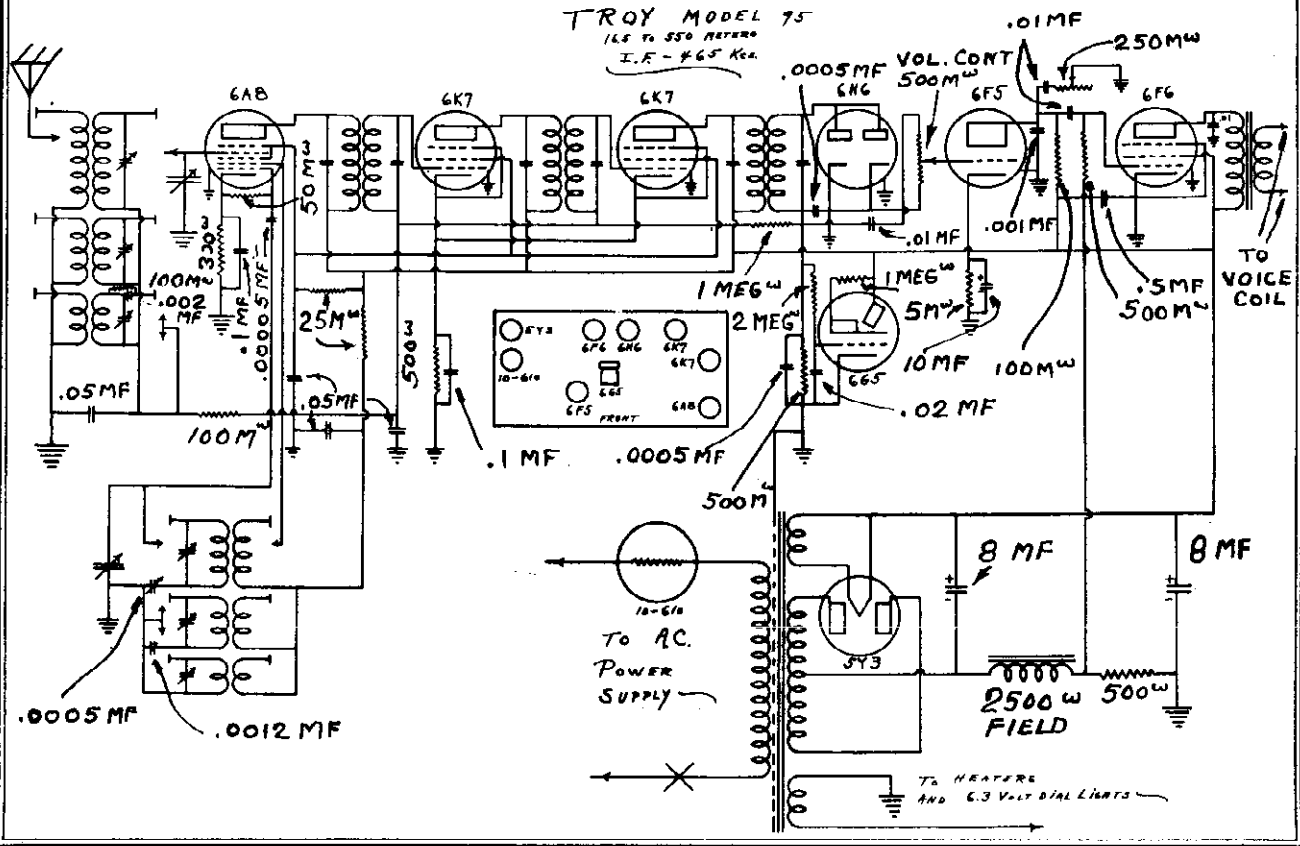
TROY RADIO & TELEV. CO.

MODEL 67
MODEL 95
Schematics
Socket

TROY MODEL 67



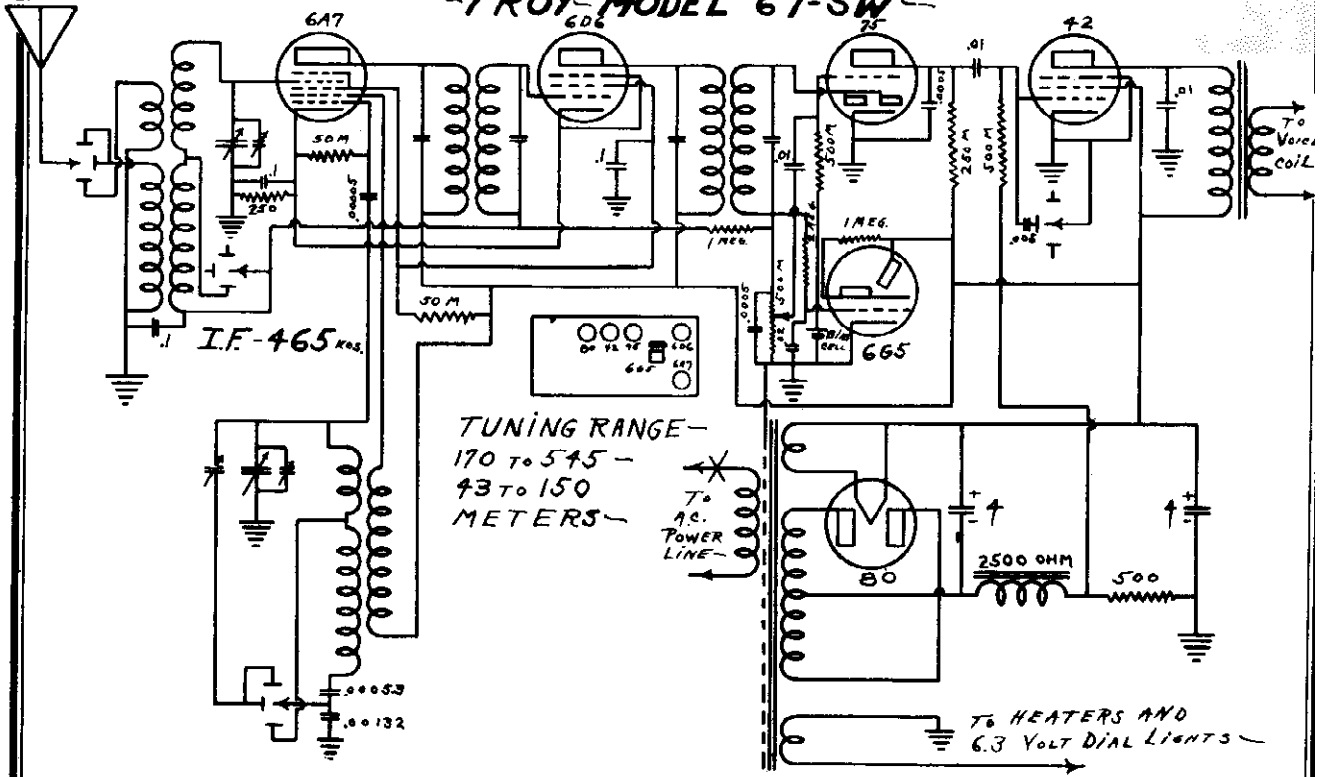
TROY MODEL 75
1LS TO 850 REVERB
I.F. - 465 Kcs.



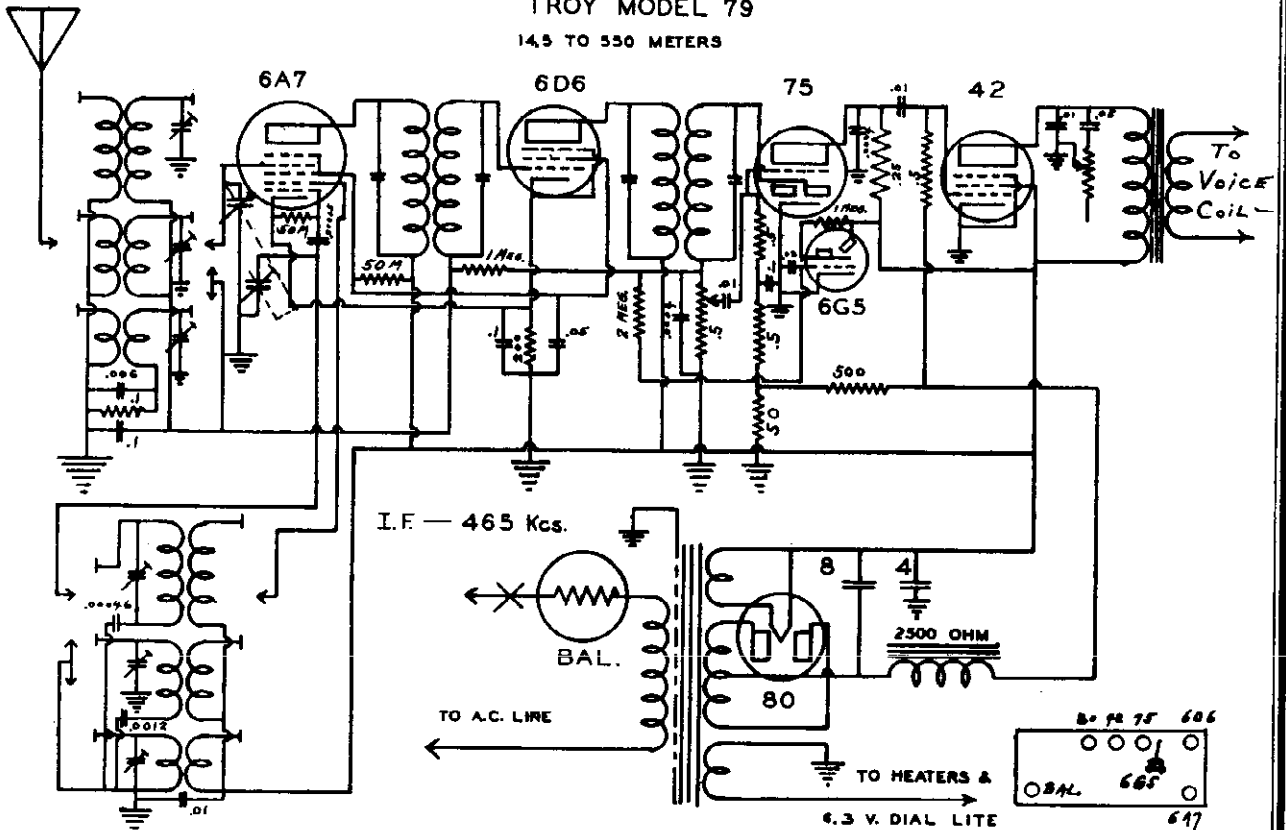
TROY RADIO & TELEV. CO.

MODEL 67SW
 MODEL 79
 Schematics
 Socket

-TROY MODEL 67-SW-



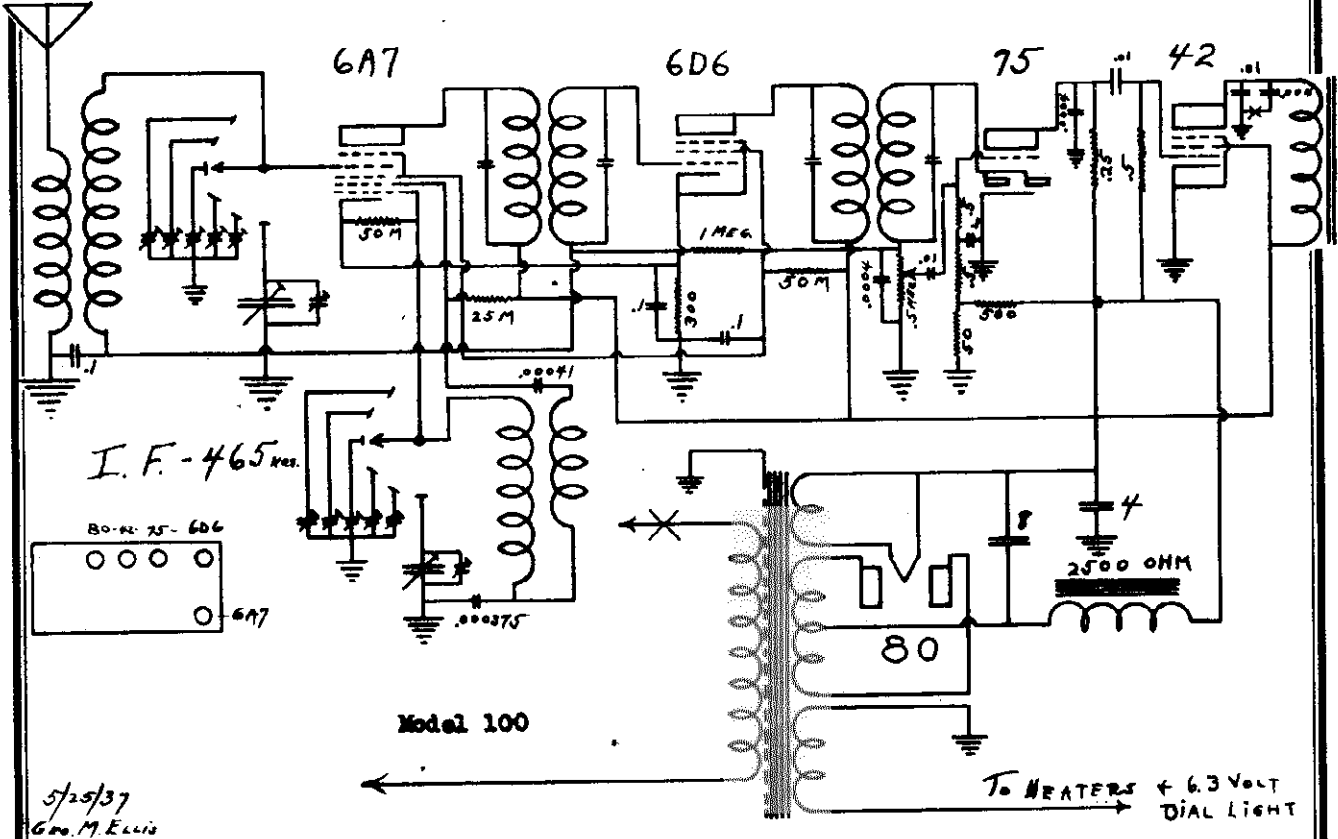
TROY MODEL 79
 145 TO 550 METERS



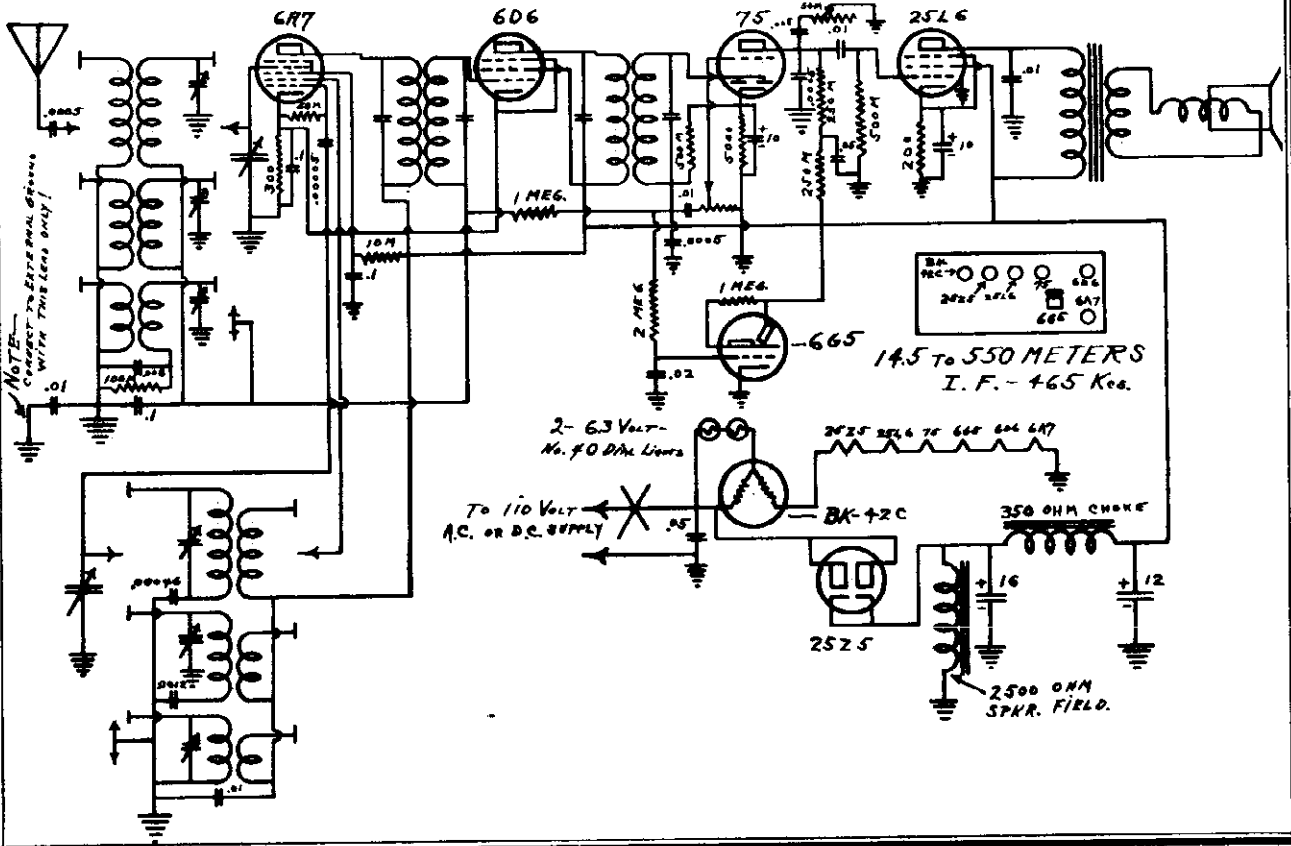
5/25/37
 Geo. W. Ellis

MODEL 100
MODEL 179
Schematics Socket

TROY RADIO & TELEV. CO.

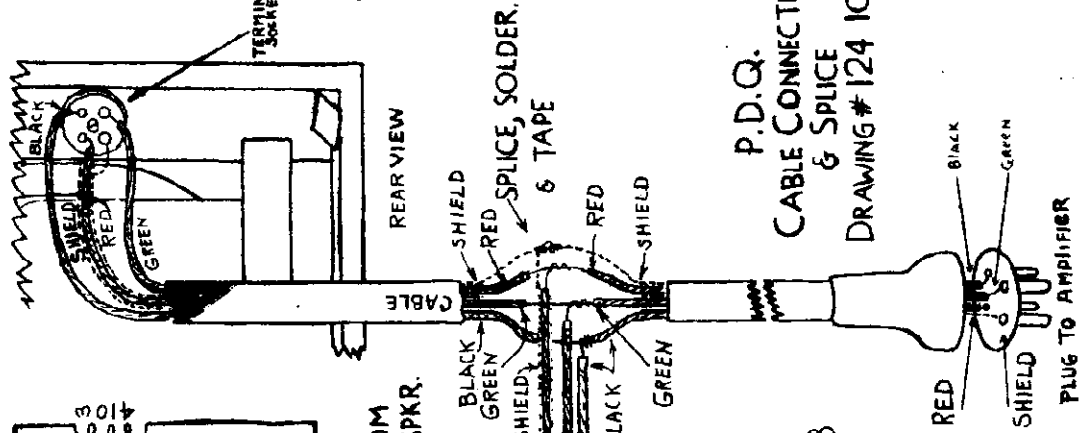


TROY MODEL 179

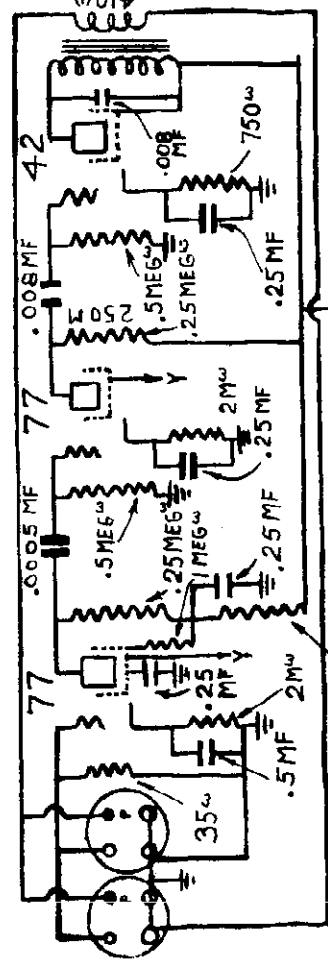


TURNER CO.

P. D. Q.
AUTOMATIC CENTRAL INTER-OFFICE
B-5 SERIES A

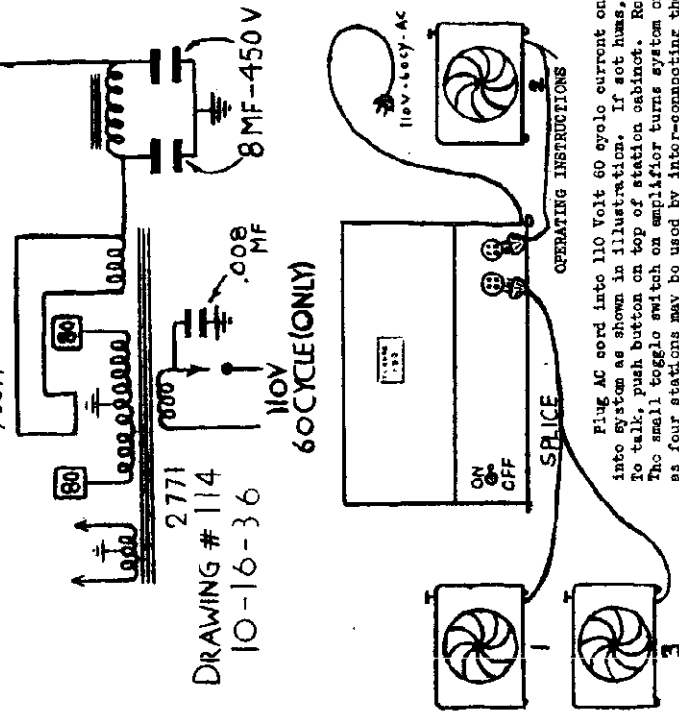


P. D. Q.
CABLE CONNECTIONS
& SPICE
DRAWING # 124 10-23-36



CABLE FROM
ADDITIONAL SPKR.

DRAWING # 118
10-17-36



Plug AC cord into 110 Volt 60 cycle current only. Plug station into system as shown in illustrations. If set hums, reverse AC plug. To talk, push button on top of station cabinet. Release to receive. The small toggle switch on amplifier turns system on or off. As many as four stations may be used by inter-connecting the stations.

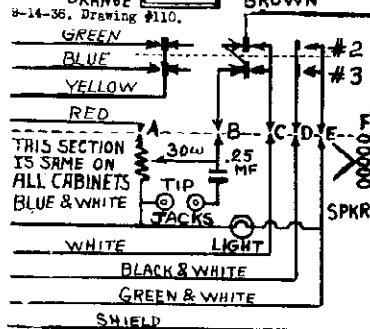
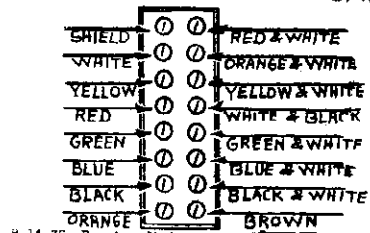
The third and fourth stations may be paralleled on the cable.

MODELS 3S5, 3S9
Automatic Central

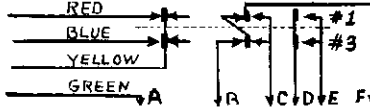
TURNER CO.

Station Cable & Switch
Connections & Color Code

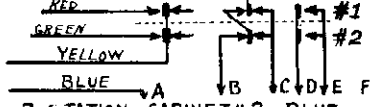
CABLE & SWITCH CONNECTIONS



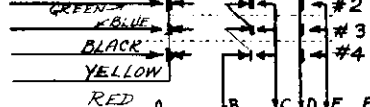
3-STATION - CABINET #1 - RED



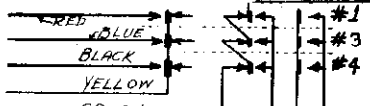
3-STATION - CABINET #2 - GREEN



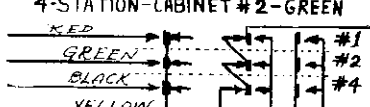
3-STATION - CABINET #3 - BLUE



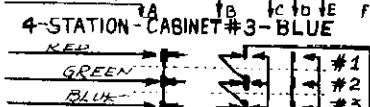
4-STATION - CABINET #1 - RED



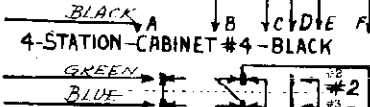
4-STATION - CABINET #2 - GREEN



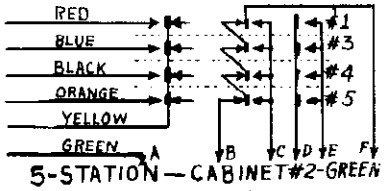
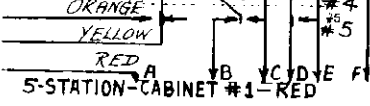
4-STATION - CABINET #3 - BLUE



4-STATION - CABINET #4 - BLACK



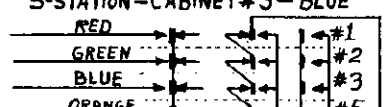
5-STATION - CABINET #1 - RED



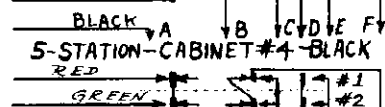
5-STATION - CABINET #2 - GREEN



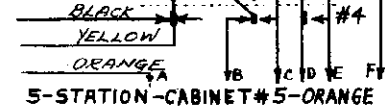
5-STATION - CABINET #3 - BLUE



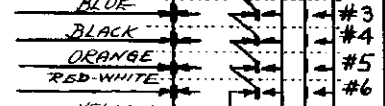
5-STATION - CABINET #4 - BLACK



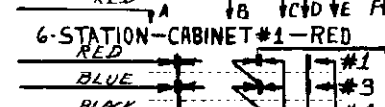
5-STATION - CABINET #5 - ORANGE



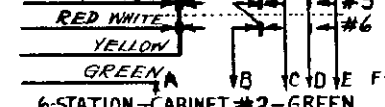
6-STATION - CABINET #1 - RED



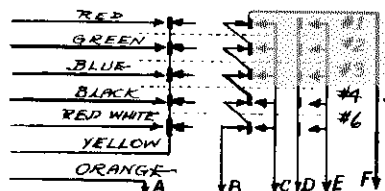
6-STATION - CABINET #2 - GREEN



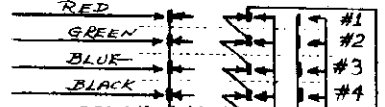
6-STATION - CABINET #3 - BLUE



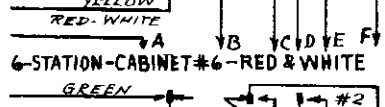
6-STATION - CABINET #4 - BLACK



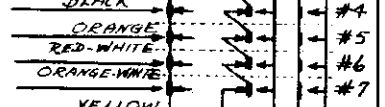
6-STATION - CABINET #3 - ORANGE



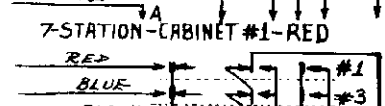
6-STATION - CABINET #6 - RED & WHITE



7-STATION - CABINET #1 - RED



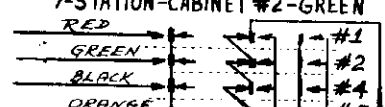
7-STATION - CABINET #2 - GREEN



7-STATION - CABINET #3 - BLUE



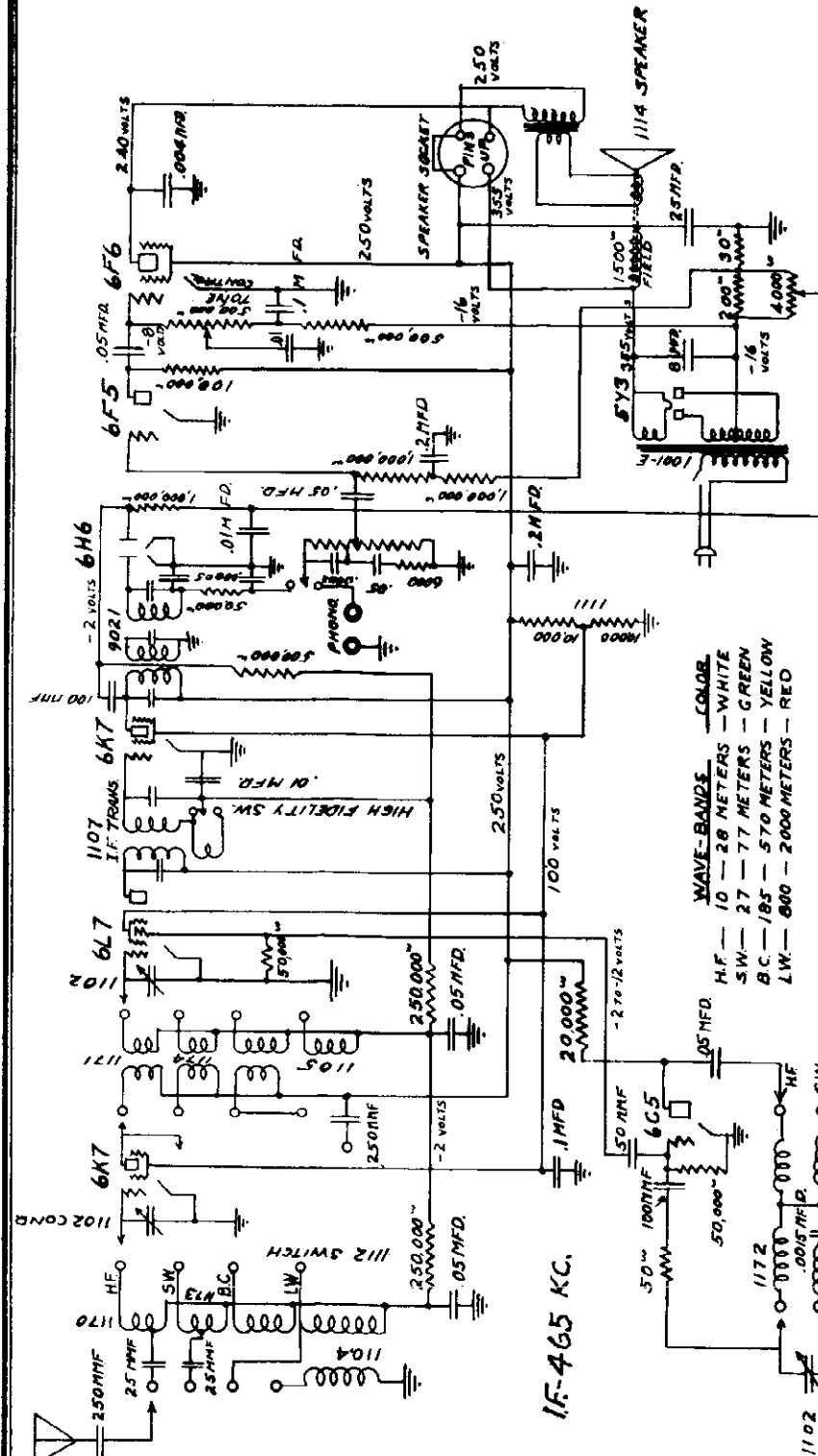
7-STATION - CABINET #4 - BLACK



7-STATION - CABINET #5 - ORANGE

ULTRAMAR MFG. CORP.

MODELS 801, 802
Schematic, Voltage
Parts

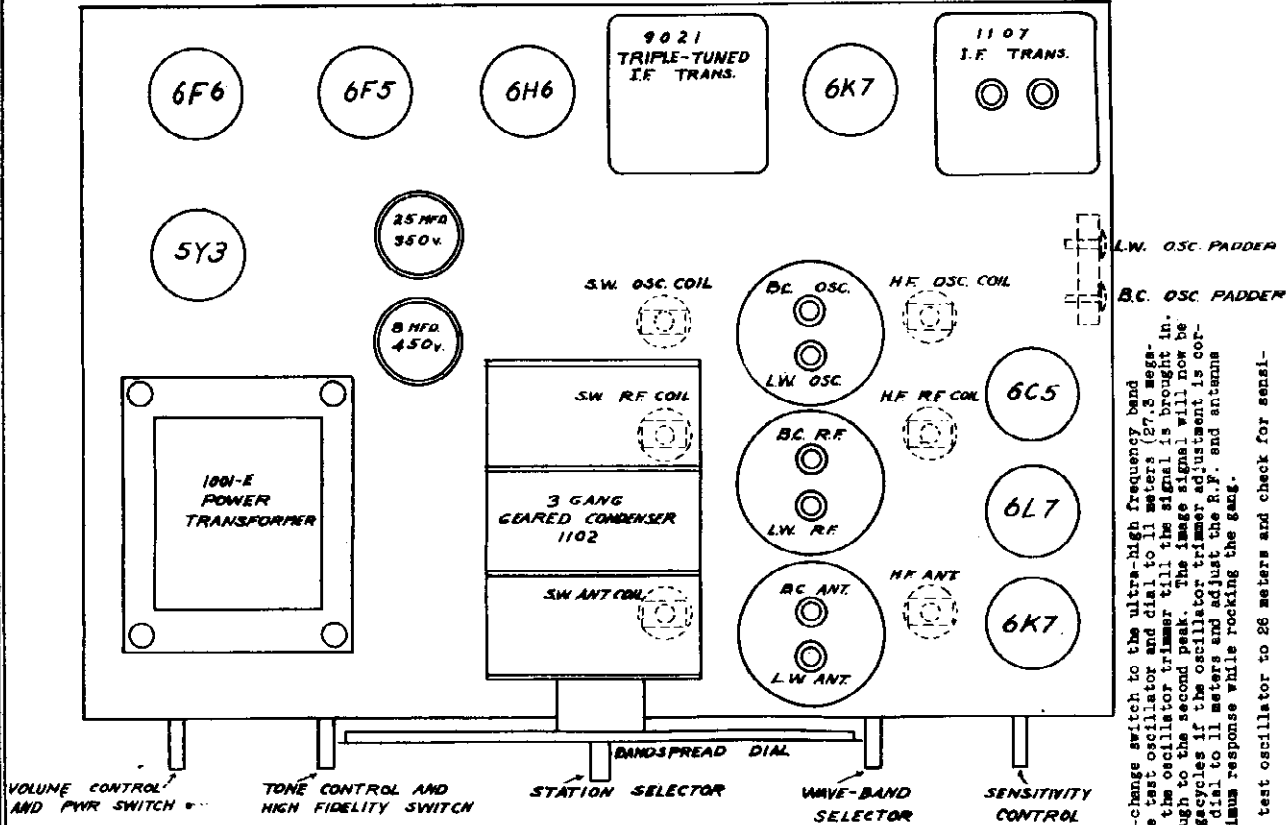


NOTE LONG-WAVE BAND IS OMITTED IN MODEL 801
VOLTAGE READINGS TAKEN WITH 1000 OHM-PER-VOLT VOLTMETER.

PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
1001-E	Universal Transformer	1110	Volume Control and switch
*1102	3 Gang Geared Condenser	1114-A	Sensitivity Control
*1104	B.C. & L.W. Antenna Coil	1084	Phono-radio switch
*1105	B.C. & L.W. R.F. Coils	1111	Candohm Resistor
*1106	B.C. & L.W. Oscillator Coils	1112	5 Gang Switch
1107	Iron Core Expanded I.F.	1113	Band Indicator
9021	Triple tuned Output I.F.	1114	8-1/2 inch Dynamic Speaker Mics
*1108	6-1/2 inch dial assembly	Condensers	25 MFD 350V wet electrolytic Condensers
*802-4	4 Band Translucent Scale	Condensers	8 MFD 450V wet electrolytic condenser
*8021	Dual Padder Condenser	Condensers	2/10 400V Cub Condenser
1064	Isolentite Trimmer	Condensers	2/10 200V Cub Condenser
1170	H.F. Antenna Coil (10 to 28 meters)	Resistors	1/10 400V Cub Condenser
1171	H.F. R.F. Coil (10-28 meters)	Resistors	1/10 200V Cub Condenser
1172	H.F. Oscillator Coil (10-28 meters)	Resistors	1/10 200V Cub Condenser
1173	S.W. Antenna Coil (27-77 meters)	Resistors	.01 400V Cub Condenser
1174	S.W. R.F. Coil (27-77 meters)	Resistors	.01 400V Cub Condenser
1175	S.W. Oscillator Coil (27-77 meters)	Resistors	.004 800V Cub Condenser
1109	Tone Control and S.P. D.T. Switch	Resistors	1 megohm 1/3 watt
1183	B.C. Antenna Coil	Resistors	500,000 ohm 1/3 watt
1184	B.C. R.F. Coil		
1185	B.C. Oscillator Coil		
1088-C	300-600 M.M.F. padder condenser		
801-3	3-band translucent scale		

MODELS 801, 802
Socket, Trimmers
Alignment

ULTRAMAR MFG. CORP.



TOP VIEW
OF CHASSIS
MODELS 801-802

10. Set the wave-change switch to the ultra-high frequency band (White). Set the test oscillator and dial to 11 meters (27.3 megacycles). Adjust the oscillator trimmer till the signal is brought in. Continue on through to the second peak. The image signal will now be found at 26.5 megacycles if the oscillator trimmer adjustment is correct. Reset the dial to 11 meters and adjust the R.F. and antenna trimmers for maximum response while rocking the gang.

Set the dial and test oscillator to 26 meters and check for sensitivity.

ALIGNMENT PROCEDURE

Realignment of this receiver should never be necessary unless one of the coils has been changed. Lack of sensitivity, selectivity, and poor tone quality may be due to defective tubes, speaker or condensers, insufficient or excessive antenna, open or grounded resistors, etc. If an I.F. tube is replaced, it is necessary to realign the I.F. transformers.

A calibrated oscillator such as Model 180, covering the ranges from 20 to 2,000 meters and an output meter (connected between plate and screen prongs of the 6B6 tube) will be required. Use low values of output to prevent false readings due to the operation of the automatic volume control while aligning.

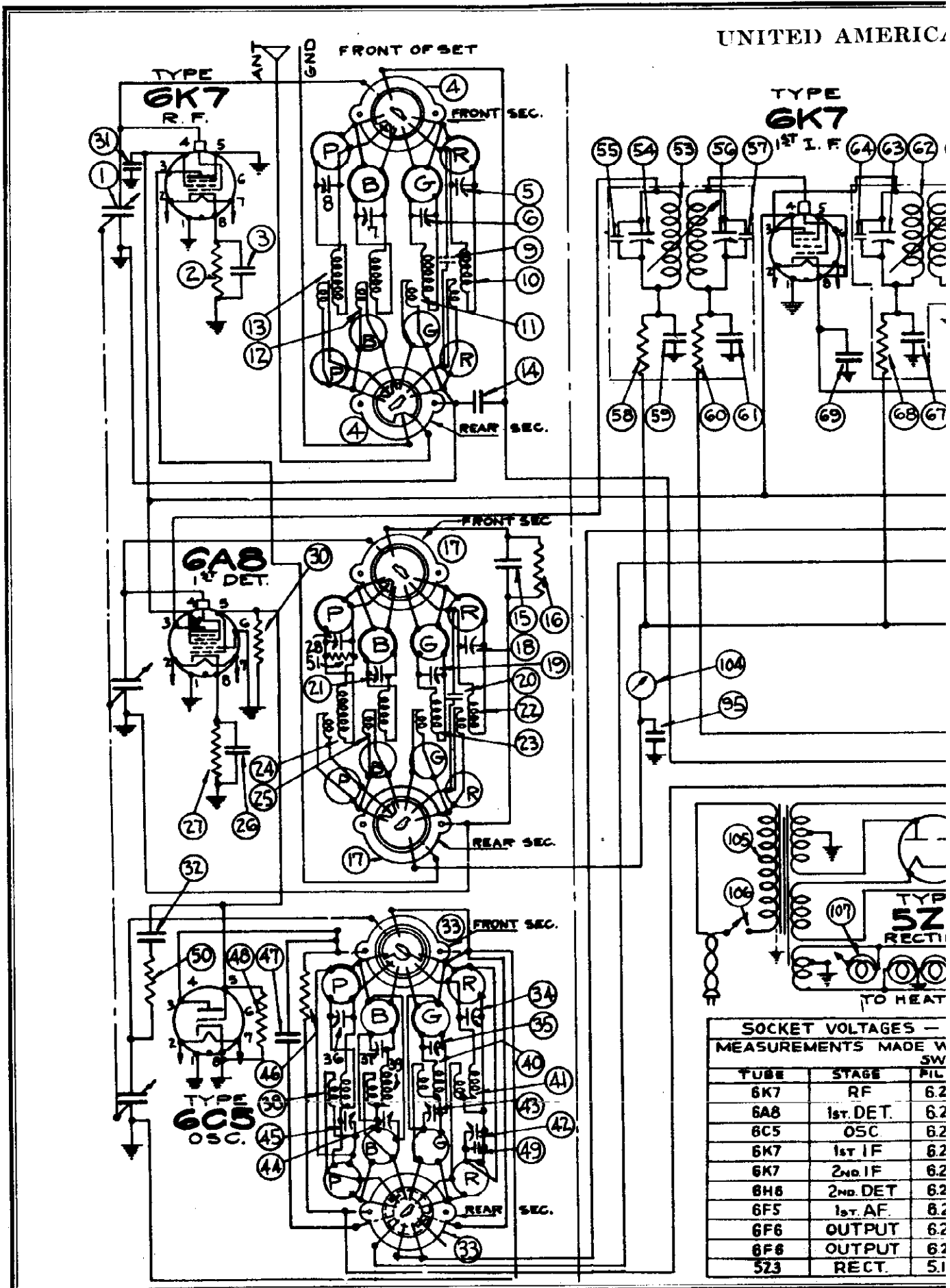
The output meter may also be connected across the two small prongs of the speaker plug.

INTERMEDIATE STAGE ALIGNMENT

1. Connect the output of the test oscillator to the grid of the 6L7 converter tube and connect a 1 megohm resistor from this grid to the chassis. Connect the ground side of the oscillator (the shielding) to the receiver chassis.
2. Set the test oscillator to 485 K.C. Refer to Curve B on the Calibration chart to obtain the proper setting of the test oscillator.
3. Set the tone control to the left. Align the output intermediate frequency transformer by turning the top screw at the rear of the output I.F. transformer until maximum response is obtained on the output meter. Adjust the other trimmer screws in the same manner.
4. Adjust the input intermediate frequency transformer in the same manner.

ALIGNMENT OF TUNING CIRCUITS

5. Connect the output of the test oscillator to the antenna lead of the receiver through a .00025 M.F.D. condenser and connect the ground side (shielding) to the chassis.
6. Set the wave change switch to the long-wave position (Red). Set the dial and test oscillator to 900 meters. Adjust the long-wave oscillator trimmer until the signal is brought in. If no signal is heard, then adjust the long-wave padder. See diagram of chassis for location of trimmer and padder condensers.
7. Then adjust the long-wave antenna and R.F. trimmers for maximum response. Set the dial and test oscillator to 1800 meters and adjust the long-wave padder for maximum response while rocking the gang condenser. By rocking the gang is meant tuning to a point just above and just below the test oscillator frequency while making some other adjustment. Return to 900 meters and repeat the entire procedure.
8. Set the wave change switch to the broadest position (Yellow). Set the dial and test oscillator to 214 meters (1400 K.C.) and adjust the E.C. oscillator, R.F. and antenna trimmers till maximum response is obtained. Set the dial and test oscillator to 600 K.C. and adjust the E.C. padder condenser while rocking the gang till maximum response is obtained.
9. Set the wave change switch to the high frequency band (Short-wave Green). Substitute a 400 ohm resistor for the .00025 M.F.D. condenser in the antenna circuit. Set the dial and test oscillator to 30 meters (10 megacycles). Start the receiver on end and adjust the 50 meter oscillator coil (located to the right of switch when viewed from bottom) till the signal is brought in. Stop at the first peak. Screwing the trimmer down still more will give another peak which is the image and must not be used. To make certain the set is not tuned to the image, set the test oscillator to 11 megacycles and if another signal is received, then the set is correctly tuned. Reset the test oscillator to 30 meters and adjust the R.F. and antenna trimmers for maximum response, while rocking the gang. Set the dial and test oscillator to 75 meters and check for sensitivity.

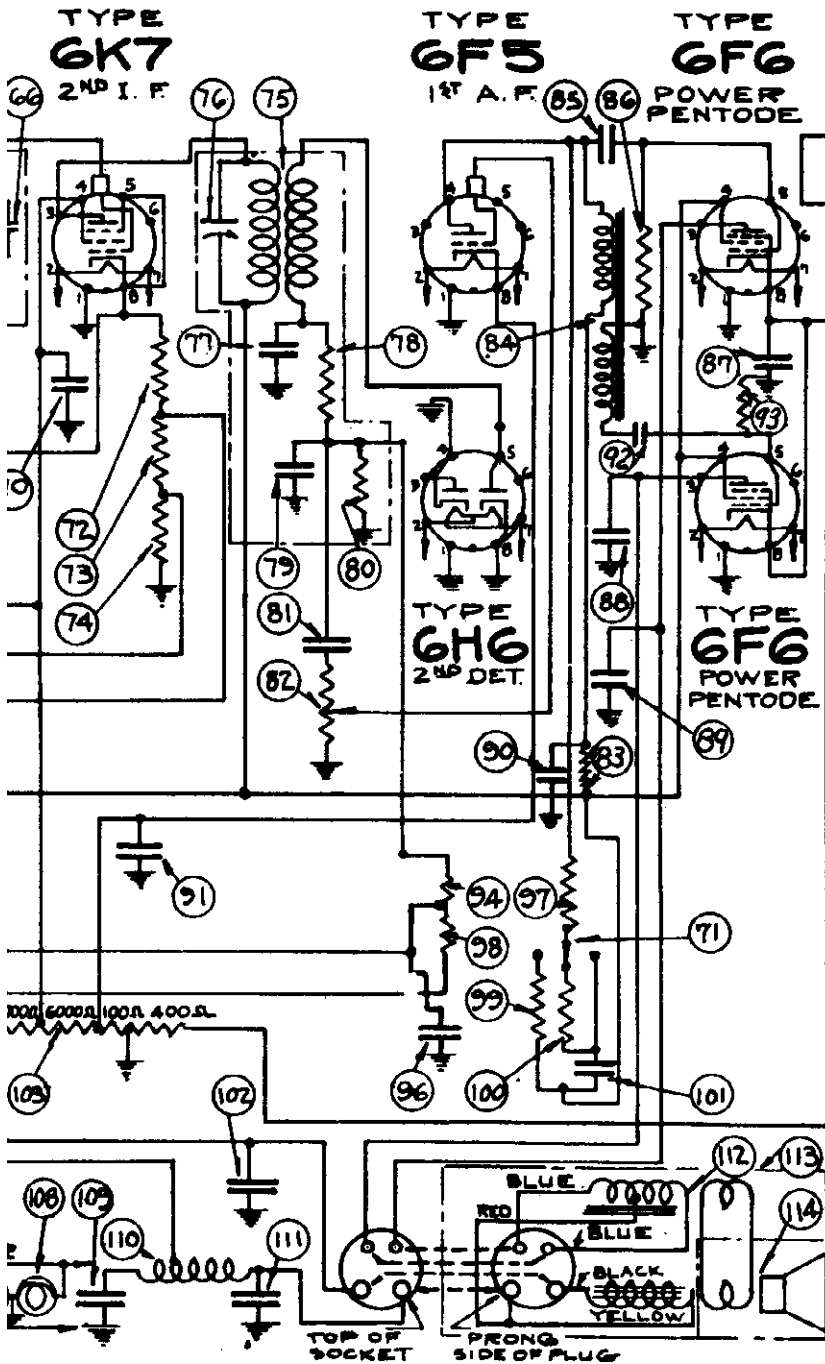


SOCKET VOLTAGES —
MEASUREMENTS MADE W/ SW

TUBE	STAGE	FIL. SW
6K7	RF	6.2
6A8	1st DET.	6.2
6C5	OSC.	6.2
6K7	1st IF	6.2
6K7	2nd IF	6.2
6H8	2nd DET.	6.2
6F5	1st AF.	8.2
6F6	OUTPUT	6.2
6F8	OUTPUT	6.2
5Z3	RECT.	5.1

BOSCH CORP.

MODEL 306
Schematic, Voltage
Resistance



INT. FREQ. 465K.C.

D.C. RESISTANCE			
MEASURED WITH WAVE-CHANGE SWITCH IN CORRESPONDING BAND POSITION			
COIL	DIA. N ^o	PRIM.	SEC.
P-ANT.	13	130 Ω	25 Ω
P-RF.	24	38 Ω	25 Ω
P-OSC.	38	8.0 Ω	13.5 Ω
B-ANT.	12	22 Ω	4 Ω
B-RF.	25	.5 Ω	4.5 Ω
B-OSC.	39	1.5 Ω	3 Ω
G-ANT.	11	32 Ω	1 Ω
G-RF.	23	1.5 Ω	1 Ω
G-OSC.	40	.5 Ω	1 Ω
R-ANT.	10	1 Ω	.4 Ω
R-RF.	22	2 Ω	.4 Ω
R-OSC.	41	.5 Ω	.4 Ω
1st. IF	53	3.5 Ω	3.5 Ω
2nd. IF	62	3.5 Ω	3.5 Ω
3rd. IF	75	11.5 Ω	11.5 Ω
CHOKE	110	350 Ω	
1st. AF TRANS.	84	3200 Ω	3800 Ω
OUTPUT TRANS.	112	265 Ω	.03 Ω
SPKR. FIELD		1900 Ω	
VOICE COIL	114	2.6 Ω	

= 115 VOLTS TAKEN FROM BOTTOM OF SOCKETS
A 1000 OHMS PER VOLT VOLTMETER AND WITH WAVE-CHANGE IN BROADCAST BAND POSITION

PIN NOS.	PLATE	PIN NOS.	SCREEN	PIN NOS.	CATHODE	PIN NOS.
2-7	245	3-1	100	4-1	2.5	1-8
2-7	240	3-1	100	4-1	2.2	1-8
2-7	200	3-1				
2-7	240	3-1	100	4-1	8.0	1-8
2-7	255	3-1	100	4-1	8.0	1-8
2-7						
2-7	250	4-1			1.75	1-8
2-7	350	3-1	255	4-1	19.5	1-8
2-7	350	3-1	255	4-1	19.5	1-8
	720					

UNITED AMERICAN BOSCH CORP.

MODEL 306
Circuit Data,
Socket Trimmers
Chassis

GENERAL DESCRIPTION

This model is a ten tube, four band superheterodyne receiver designed for world wide reception including the U.S. Weather Band and employs the new all-metal tubes.

The circuit employs a high frequency amplifier using the new type 6K7 tube. This is followed by the first detector circuit employing a 6AG tube and a separate oscillator (type 6G5). These tubes with their associated circuits (coils, variable condensers, trim condensers for R.F. and detector stages, and trim and lag condensers for the oscillators) comprise a complete assembly in compact form separately cushioned from the main chassis. This assembly is known as the "Precision Tuner". In addition the set includes a new and novel development of intermediate frequency circuits which allows the adjustment of the band width of the amplifier to be varied over a wide range. At one end of the range is the most selective condition which allows single channel reception even under the influence of powerful nearby stations. At the other end the transmission characteristic of the amplifier is so changed as to allow transmission without attenuation of frequencies up to 7000 cycles on either side of the carrier. As a matter of fact, the amplifier is overcoupled to such a degree that frequencies in the neighborhood of five thousand cycles on either side of the carrier are transmitted at greater efficiency than frequencies close to the carrier. This design is necessary since radio frequency circuits give rise to some side band attenuation, which must be compensated for in the I.F. amplifier. The net result is a smooth transmission curve over the entire band.

From the oscillator the energy passes thru a variable selector I.F. transformer and to a 6K7 amplifier tube. Then thru another variable selector I.F. transformer and to an additional 6K7 amplifier tube. From here further selection takes place in the 3rd I.F. transformer where the energy is passed on to the 2nd detector and A.V.C. diode (type 6H6). After detection there follows a first audio amplifier (type 6G5) and by means of an audio transformer the energy is sent to the power output stage comprising two 6V6 pentodes in push-pull. A 6X5 rectifier supplies the necessary direct current for the tubes.

REMOVING INDIVIDUAL COIL AND SWITCH SECTIONS OF "PRECISION TUNER"

If a component part located underneath the switch and coil assemblies of the "Precision Tuner" has to be replaced or a section of the unit has to be removed for inspection, each section can easily be removed separately. To do this proceed with care as follows:

1. Remove the three coil shields.
2. Remove the two self-tapping screws which fasten the mounting plate of the wave-change switch shaft to the chassis frame. Pull switch shaft straight out.
3. Unsolder the stator and rotor leads from the gang condenser.
4. The fastening screws for the switch-sections are located on top of the "Precision Tuner" and are indicated by 7, 11, and 13 in Figure #8. Remove the corresponding screw.
5. Each individual section can then be pulled out straight.

Note: On the R.F. section, the plate lead from the 6K7 socket will have to be unsoldered from the switch terminal before the section can be removed.

On the oscillator section, the plate lead will have to be unsoldered from the 6G5 socket.

6. After repairs have been made resolder the plate leads mentioned above and replace the section being careful to observe that the slotted holes in the switch bracket line up with the round guide pins on the base plate of the "Precision Tuner". This is IMPORTANT as the switch shaft cannot be inserted if the switch brackets do not line up.
7. Replace the section fastening screw.
8. Resolder the stator and rotor leads on gang condenser.
9. Replace the switch shaft and the mounting fastening screws. When inserting the switch shaft, be careful that all the switch discs are in the same position. Otherwise the switch shaft will not slide in. NEVER force the shaft into the switch discs. If shaft does not slide in freely, examine the position of the slot in each switch disc.
10. Before replacing the coil shields, it might be advisable to bend the shields slightly to assure that positive contact is made. To do this hold the shield with your two hands using the thumbs and first two fingers as shown in Figure #1. Pull out the ends of the shield slightly and at the same time apply a little pressure on the sides of the shield as indicated by the arrows in the drawing. Then replace the shields and observe that they fit tightly. In addition to assuring positive contacts, this will also prevent the contacts from rattling.

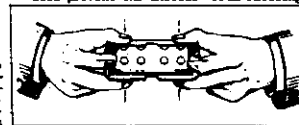
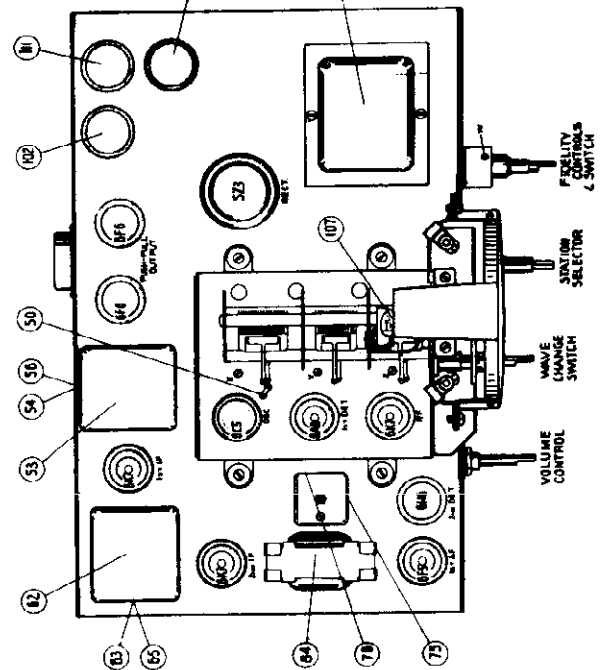
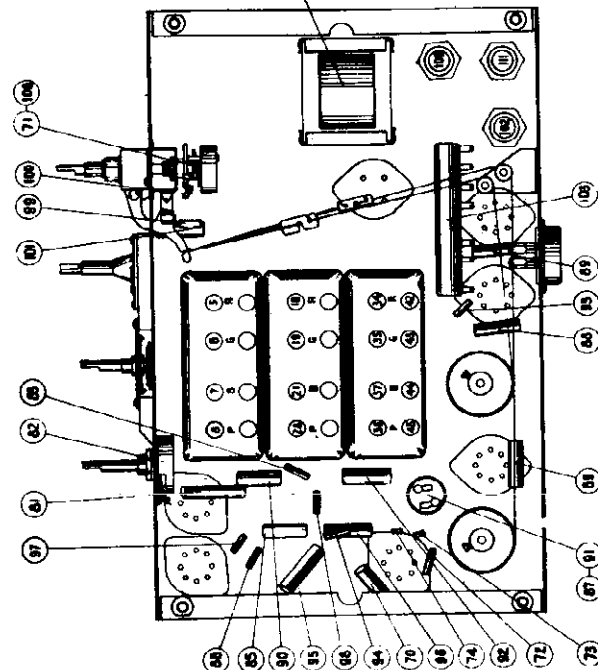
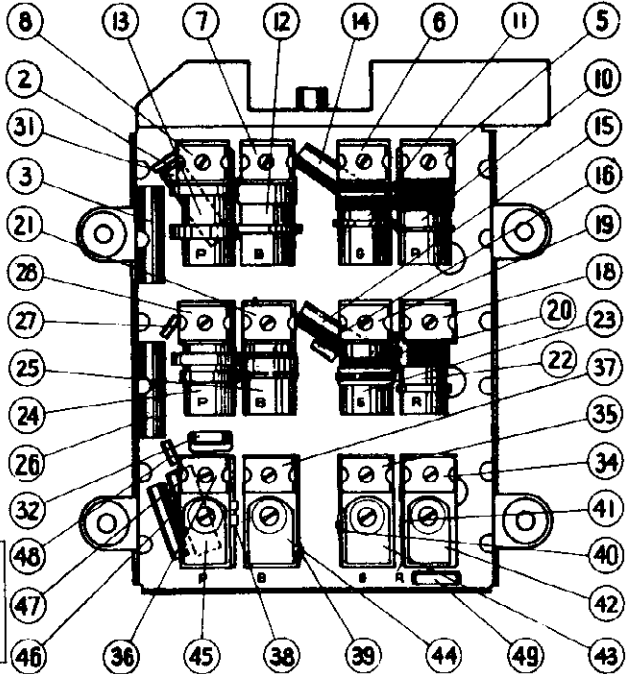


Figure No. 1

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes	596K7, 126A5, 126C5, 126B5, 126A6, 126B6, 126C6, 126D5 - Total 10
Power Supply	105 to 125 volts, 50 to 60 cycles
Power Consumption	90 Watts
Maximum Undistorted Output	8 Watts
Maximum Output	10 Watts
Tuning Ranges	(Purple Band 120 K.C. to 350 K.C.) (White Band 340 K.C. to 1250 K.C.) (Green Band 1800 K.C. to 5000 K.C.) (Red Band 8000 K.C. to 18000 K.C.)
Line-Up Frequencies	I.F. 455K.C., 360K.C., 120K.C., 1800K.C., 5700K.C., 5300 K.C., 15000 K.C., 17000K.C. and 5000 K.C.



MODEL 306 Alignment Parts

UNITED AMERICAN BOSCH CORP.

Table listing parts for MODEL 306, including part numbers, descriptions, and prices. Columns include Part No., Description, and Price.

SERVICE PARTS LIST

Table with columns for Part No., Description, and Price, listing various electronic components like resistors and capacitors.

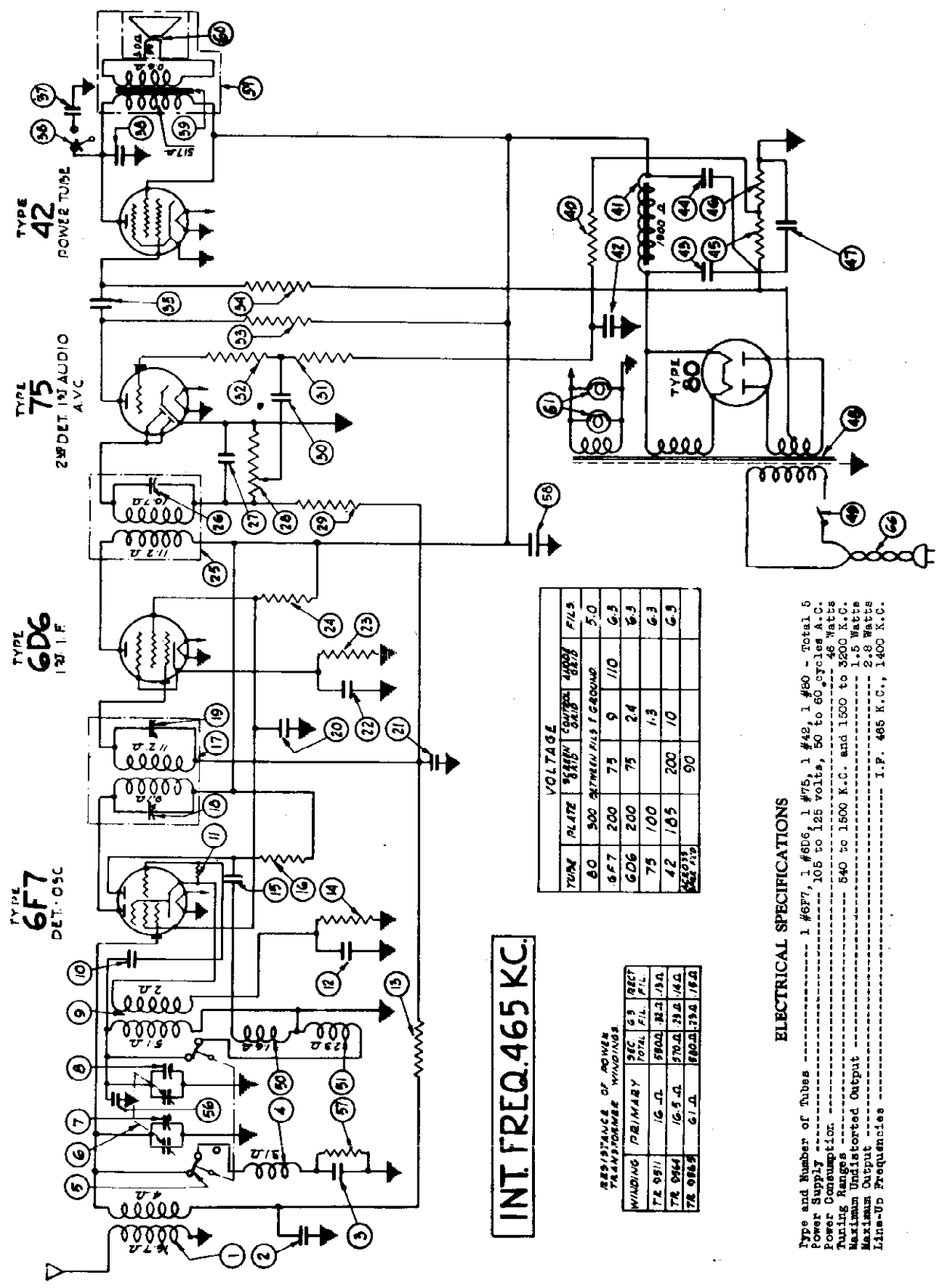
Before (adj) set output #64, set #65 to 0. After the above I.P. adjustments have been made, replace the discriminator to original position.

LINE-UP CAPACITOR ADJUSTMENTS CAPTION: TO SET INSTRUMENT WITH THE I.P. ADJUSTMENTS... ADJUSTMENT OF LINE-UP CAPACITORS... ADJUSTMENT OF LINE-UP CAPACITORS...

REVISIONS ARE SO DESIGNATED BY THE LETTERS A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, AK, AL, AM, AN, AO, AP, AQ, AR, AS, AT, AU, AV, AW, AX, AY, AZ, BA, BB, BC, BD, BE, BF, BG, BH, BI, BJ, BK, BL, BM, BN, BO, BP, BQ, BR, BS, BT, BU, BV, BW, BX, BY, BZ, CA, CB, CC, CD, CE, CF, CG, CH, CI, CJ, CK, CL, CM, CN, CO, CP, CQ, CR, CS, CT, CU, CV, CW, CX, CY, CZ, DA, DB, DC, DD, DE, DF, DG, DH, DI, DJ, DK, DL, DM, DN, DO, DP, DQ, DR, DS, DT, DU, DV, DW, DX, DY, DZ, EA, EB, EC, ED, EE, EF, EG, EH, EI, EJ, EK, EL, EM, EN, EO, EP, EQ, ER, ES, ET, EU, EV, EW, EX, EY, EZ, FA, FB, FC, FD, FE, FF, FG, FH, FI, FJ, FK, FL, FM, FN, FO, FP, FQ, FR, FS, FT, FU, FV, FW, FX, FY, FZ, GA, GB, GC, GD, GE, GF, GG, GH, GI, GJ, GK, GL, GM, GN, GO, GP, GQ, GR, GS, GT, GU, GV, GW, GX, GY, GZ, HA, HB, HC, HD, HE, HF, HG, HH, HI, HJ, HK, HL, HM, HN, HO, HP, HQ, HR, HS, HT, HU, HV, HW, HX, HY, HZ, IA, IB, IC, ID, IE, IF, IG, IH, II, IJ, IK, IL, IM, IN, IO, IP, IQ, IR, IS, IT, IU, IV, IW, IX, IY, IZ, JA, JB, JC, JD, JE, JF, JG, JH, JI, JJ, JK, JL, JM, JN, JO, JP, JQ, JR, JS, JT, JU, JV, JW, JX, JY, JZ, KA, KB, KC, KD, KE, KF, KG, KH, KI, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV, KW, KX, KY, KZ, LA, LB, LC, LD, LE, LF, LG, LH, LI, LJ, LK, LL, LM, LN, LO, LP, LQ, LR, LS, LT, LU, LV, LW, LX, LY, LZ, MA, MB, MC, MD, ME, MF, MG, MH, MI, MJ, MK, ML, MM, MN, MO, MP, MQ, MR, MS, MT, MU, MV, MW, MX, MY, MZ, NA, NB, NC, ND, NE, NF, NG, NH, NI, NJ, NK, NL, NM, NN, NO, NP, NQ, NR, NS, NT, NU, NV, NW, NX, NY, NZ, OA, OB, OC, OD, OE, OF, OG, OH, OI, OJ, OK, OL, OM, ON, OO, OP, OQ, OR, OS, OT, OU, OV, OW, OX, OY, OZ, PA, PB, PC, PD, PE, PF, PG, PH, PI, PJ, PK, PL, PM, PN, PO, PP, PQ, PR, PS, PT, PU, PV, PW, PX, PY, PZ, QA, QB, QC, QD, QE, QF, QG, QH, QI, QJ, QK, QL, QM, QN, QO, QP, QQ, QR, QS, QT, QU, QV, QW, QX, QY, QZ, RA, RB, RC, RD, RE, RF, RG, RH, RI, RJ, RK, RL, RM, RN, RO, RP, RQ, RR, RS, RT, RU, RV, RW, RX, RY, RZ, SA, SB, SC, SD, SE, SF, SG, SH, SI, SJ, SK, SL, SM, SN, SO, SP, SQ, SR, SS, ST, SU, SV, SW, SX, SY, SZ, TA, TB, TC, TD, TE, TF, TG, TH, TI, TJ, TK, TL, TM, TN, TO, TP, TQ, TR, TS, TT, TU, TV, TW, TX, TY, TZ, UA, UB, UC, UD, UE, UF, UG, UH, UI, UJ, UK, UL, UM, UN, UO, UP, UQ, UR, US, UT, UY, UZ, VA, VB, VC, VD, VE, VF, VG, VH, VI, VJ, VK, VL, VM, VN, VO, VP, VQ, VR, VS, VT, VU, VV, VW, VX, VY, VZ, WA, WB, WC, WD, WE, WF, WG, WH, WI, WJ, WK, WL, WM, WN, WO, WP, WQ, WR, WS, WT, WY, WZ, XA, XB, XC, XD, XE, XF, XG, XH, XI, XJ, XK, XL, XM, XN, XO, XP, XQ, XR, XS, XT, XU, XV, XW, XX, XY, XZ, YA, YB, YC, YD, YE, YF, YG, YH, YI, YJ, YK, YL, YM, YN, YO, YP, YQ, YR, YS, YT, YU, YV, YW, YX, YZ, ZA, ZB, ZC, ZD, ZE, ZF, ZG, ZH, ZI, ZJ, ZK, ZL, ZM, ZN, ZO, ZP, ZQ, ZR, ZS, ZT, ZU, ZV, ZW, ZX, ZY, ZZ.

UNITED AMERICAN BOSCH CORP.

MODEL 51
Schematic
Voltage



INT. FREQ. 465 KC.

TUBE	PLATE	SCREEN	CONTROL	GRID	BIAS	FILE
60	300					5.0
6F7	200	75	9	110		6.3
6D6	200	75	24			6.3
75	100		1.5			6.3
42	165	200	70			6.3
56						90

WINDING	PRIMARY	SEC	IS	RECT
72 9211	16.0	5000	2.3	79.0
72 9244	16.5	570	2.3	78.0
72 9245	6.1	1800	2.3	78.0

ELECTRICAL SPECIFICATIONS

- Type and Number of Tubes ----- 1 #6F7, 1 #6D6, 1 #75, 1 #42, 1 #80 - Total 5
- Power Supply ----- 105 to 125 Volts, 50 to 60 cycles A.C.
- Tuning Ranges ----- 540 to 1600 K.C. and 1500 to 3200 K.C.
- Maximum Undistorted Output ----- 1.5 Watts
- Maximum Output ----- 2.8 Watts
- Line-Up Frequencies ----- I.F. 465 K.C., 1400 K.C.

MODEL 515
Socket, Trimmers
Chassis, Alignment
Notes, Parts

UNITED AMERICAN BOSCH CORP.

ADJUSTMENT OF BROADCAST BAND

1. Leave test signal on grid of 6B7 tube and set the test oscillator to 1400 K.C.
2. Turn the gang condenser to the maximum position. Adjust dial indicator until horizontal lines on the dial scale. Then set dial indicator to 1400 K.C.
3. Adjust trimmer #8 to maximum output.
4. Apply test signal to antenna of set and adjust trimmer #8 to maximum output.

ADJUSTMENT OF POLICE BAND

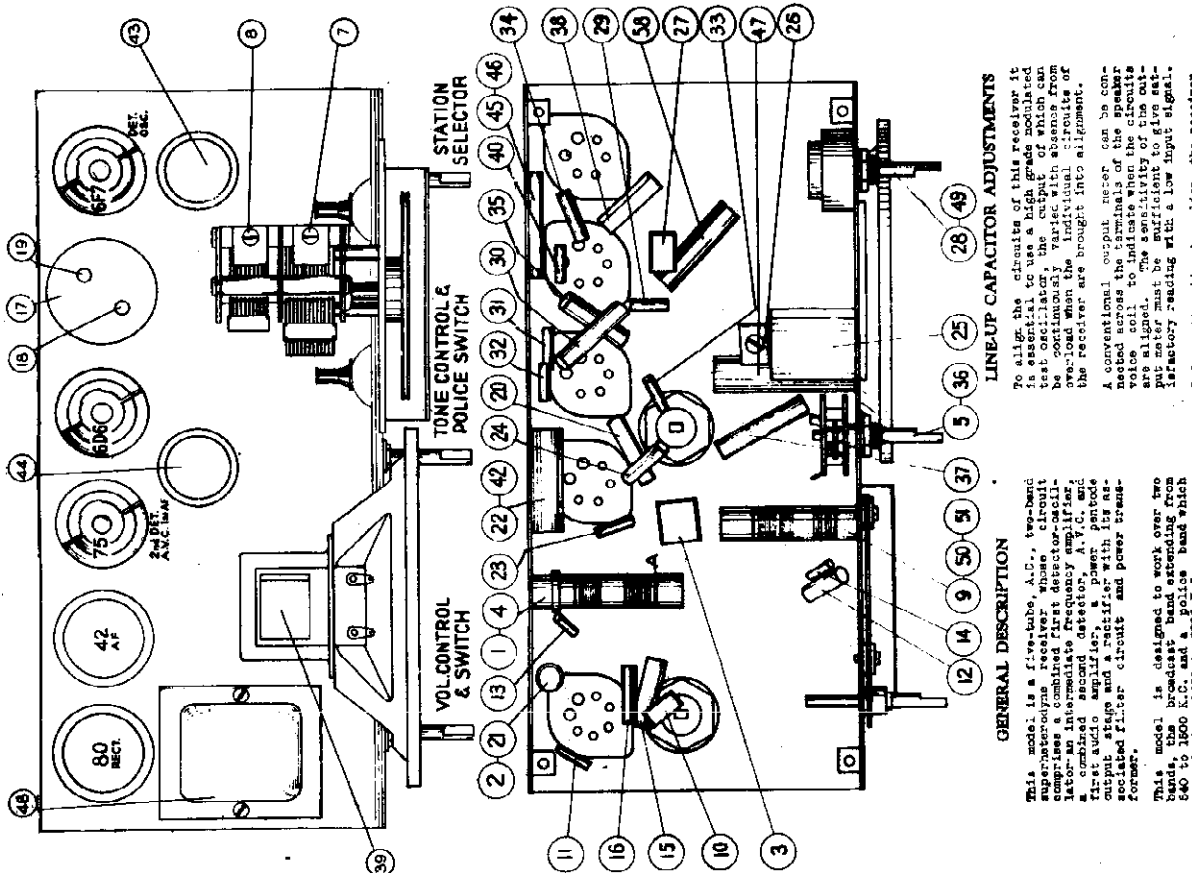
When adjustments are outlined under the broadcast band are completed, the police band requires no adjustment unless the coil had been changed. In this event, set test oscillator and station indicator to police band frequency and adjust trimmer #10. The police band winding is indicated by "A" in Fig. #2. Adjust the position of this winding by sliding it back and forth on the core until maximum output is obtained. The unit maximum output readings should then be secured in place by applying a thin coat of coil cement.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Part #	Description of Parts	List Price
1	Antenna coil assembly - part of SA 105327 (chassis)	1.30
2	400 mfd. mica condenser	.80
3	Police pre-selector coil - part of RC 9588	.86
4	Switch assembly	.86
5	Variable gang condenser - part of C3 9522	2.48
6	Trimmer condenser - part of C3 9522	
7	Oscillator coil assembly	.95
8	100 mfd. mica condenser	.80
9	50,000 ohm, 1/4 W. resistor	.15
10	250,000 ohm, 1/4 W. resistor	.15
11	1800 ohm, 1/4 W. resistor	.15
12	.01 mfd., 400 V. condenser	.15
13	150,000 ohm, 1/2 W. resistor (485 K.C.)	.15
14	I.P. trimmer condenser - part of IC 9533	1.75
15	I.P. trimmer condenser - part of IC 9532	
16	.1 mfd., 400 V. condenser - part of IC 9533	.15
17	.05 mfd., 200 V. condenser - part of SA 105327 (chassis)	.30
18	500 ohm, 1/4 W. resistor	.15
19	75,000 ohm, 1/2 W. resistor	.15
20	2nd I.P. transformer (485 K.C.)	1.10
21	I.P. transformer	.50
22	Volume control and line switch - (500,000 ohm)	1.25
23	1 meg. 1/4 W. resistor	.15
24	.02 mfd., 400 V. condenser	.15
25	100,000 ohm, 1/4 W. resistor	.15
26	100,000 ohm, 1/4 W. resistor	.15
27	250,000 ohm, 1/4 W. resistor	.15
28	250,000 ohm, 1/2 W. resistor	.15
29	.02 mfd., 400 V. condenser	.15
30	100,000 ohm, 1/4 W. resistor	.15
31	100,000 ohm, 1/4 W. resistor	.15
32	100,000 ohm, 1/4 W. resistor	.15
33	250,000 ohm, 1/4 W. resistor	.15
34	.02 mfd., 400 V. condenser	.15
35	100,000 ohm, 1/4 W. resistor	.15
36	100,000 ohm, 1/4 W. resistor	.15
37	100,000 ohm, 1/4 W. resistor	.15
38	250,000 ohm, 1/4 W. resistor	.15
39	250,000 ohm, 1/4 W. resistor	.15
40	250,000 ohm, 1/4 W. resistor	.15
41	250,000 ohm, 1/4 W. resistor	.15
42	250,000 ohm, 1/4 W. resistor	.15
43	250,000 ohm, 1/4 W. resistor	.15
44	250,000 ohm, 1/4 W. resistor	.15
45	250,000 ohm, 1/4 W. resistor	.15
46	250,000 ohm, 1/4 W. resistor	.15
47	250,000 ohm, 1/4 W. resistor	.15
48	250,000 ohm, 1/4 W. resistor	.15
49	250,000 ohm, 1/4 W. resistor	.15
50	250,000 ohm, 1/4 W. resistor	.15
51	250,000 ohm, 1/4 W. resistor	.15
52	250,000 ohm, 1/4 W. resistor	.15
53	250,000 ohm, 1/4 W. resistor	.15
54	250,000 ohm, 1/4 W. resistor	.15
55	250,000 ohm, 1/4 W. resistor	.15
56	250,000 ohm, 1/4 W. resistor	.15
57	250,000 ohm, 1/4 W. resistor	.15
58	250,000 ohm, 1/4 W. resistor	.15
59	250,000 ohm, 1/4 W. resistor	.15
60	250,000 ohm, 1/4 W. resistor	.15
61	250,000 ohm, 1/4 W. resistor	.15
62	250,000 ohm, 1/4 W. resistor	.15
63	250,000 ohm, 1/4 W. resistor	.15
64	250,000 ohm, 1/4 W. resistor	.15
65	250,000 ohm, 1/4 W. resistor	.15
66	250,000 ohm, 1/4 W. resistor	.15

ADJUSTMENT OF I.P. (485 K.C.)

1. Set volume control on full, turn tone control knob to the right hand position. Set wave-change switch on the broadcast position and the dial indicator at approximately 600 K.C.
2. Connect output meter across voice coil of speaker.
3. Adjust oscillator to 485 K.C. and adjust its output to produce a measurable reading on output meter when test signal is applied to the grid of the 6B6 tube thru a .5 mfd. blocking condenser.
4. Adjust #28 (see Fig. #2) to maximum output reducing output of test oscillator as required.
5. Apply test signal to grid of 6B7 tube and adjust trimmer #10 to maximum output.
6. With test signal still on the grid of 6B7 tube, repeat the above adjustments for greatest sensitivity.



GENERAL DESCRIPTION

This model is a five-tube, A.C., two-band superheterodyne receiver whose circuit comprises a combined first detector-oscillator-an intermediate frequency amplifier-first audio amplifier-a detector power pentode output stage and a rectifier with its associated filter circuit and power transformer.

This model is designed to work over two bands, the broadcast band extending from 540 to 1800 K.C. and a police band which extends from 1400 to 3600 K.C.

LINE-UP CAPACITOR ADJUSTMENTS

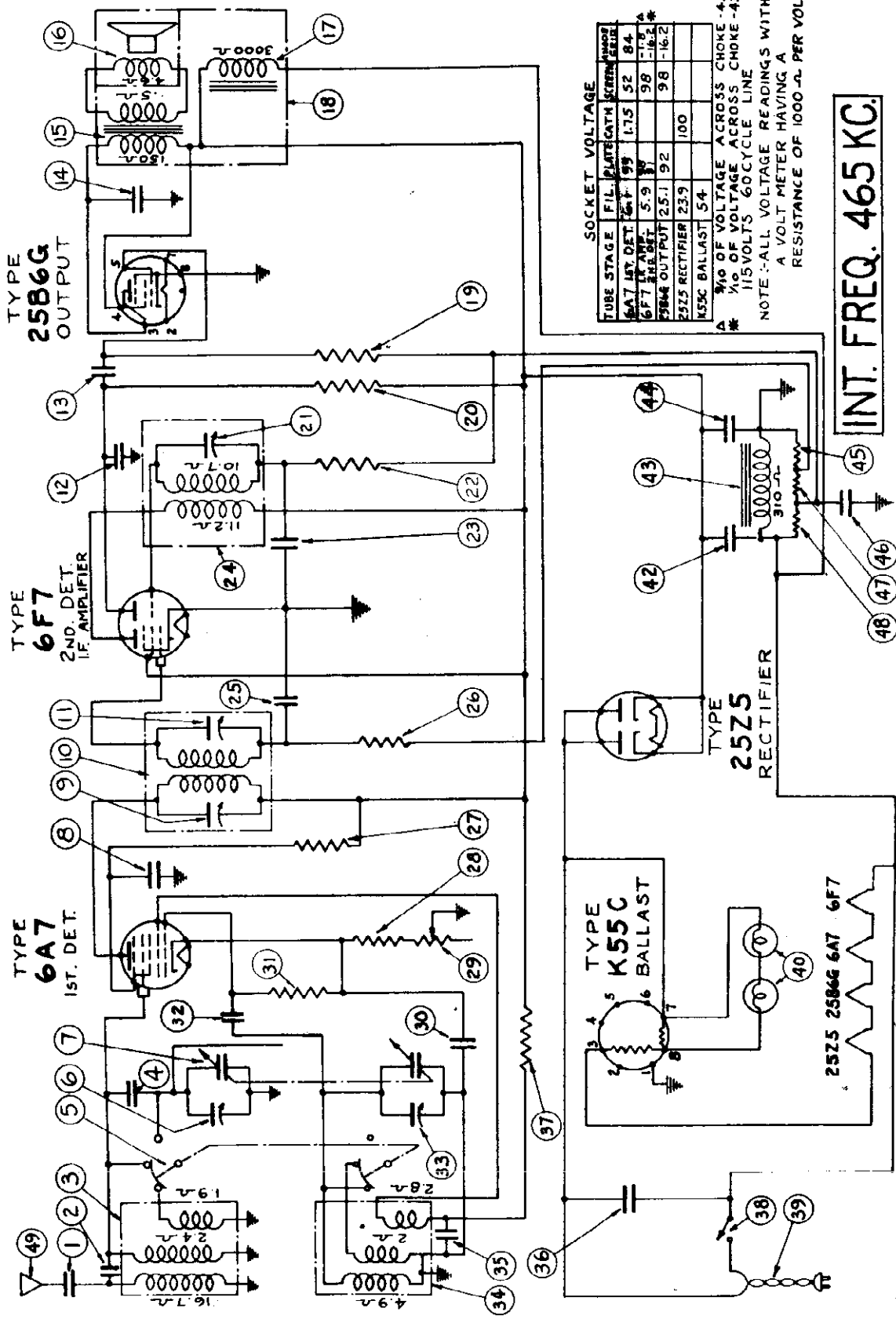
To align the elements of this receiver it is essential to use a high grade modulated test oscillator, the output of which can be continuously varied with absence from overload when the individual trimmers of the receiver are brought into alignment.

A conventional output meter can be connected across the terminals of the speaker voice coil to indicate the sensitivity of the output meter. The output meter must be sufficient to give satisfactory readings with a low input signal.

Before attempting to align the receiver,

UNITED AMERICAN BOSCH CORP.

AMERICAN-BOSCH RADIO MODEL 604B



MODEL 604B
Socket, Trimmers
Chassis, Parts
Alignment

UNITED AMERICAN BOSCH CORP.

ELECTRICAL SPECIFICATIONS

Power Supply Characterization 105 to 125 volts, 50 to 60 cycle A.C. or D.C.
 Power Consumption 1.5 to 2.5 Watts
 Tuning Range 530 to 1555 KC., 1500 to 3000 KC.
 Maximum Output 1.5 Watts
 Maximum Condenser Output

GENERAL DESCRIPTION

This model is a five-tube, A.C.-D.C. superheterodyne receiver whose circuits consist of a combined first detector-oscillator stage, a second detector, a power output stage and a rectifier.

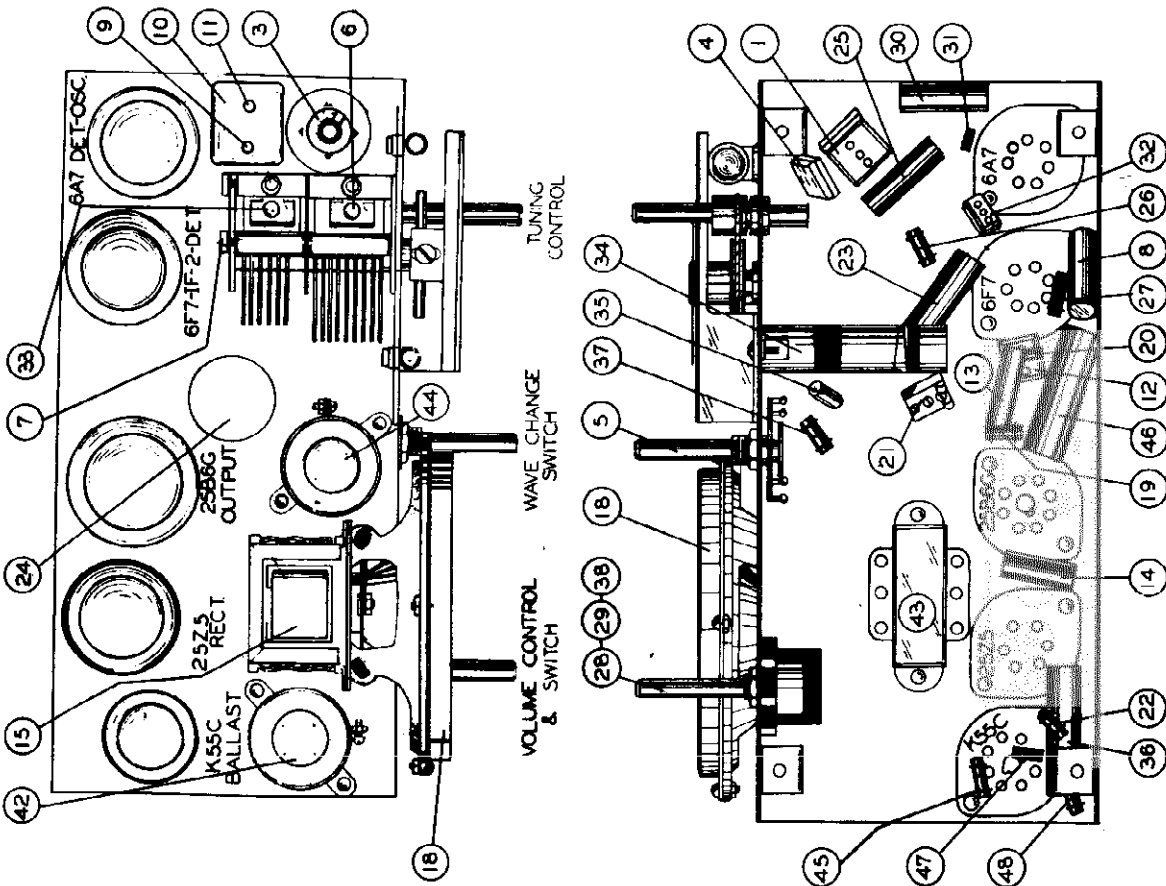
LINE-UP CAPACITOR ADJUSTMENTS

To align this model, it is essential to use a high grade modulated oscillator and sensitive output meter. The R.F. signal it will produce in the very weak or making correct alignment impossible. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low signal.

Before attempting to align a receiver, the service man should familiarize himself with the general layout of the chassis, alignment condensers, top and bottom views of the chassis are shown in Figures #1 and #2, and should be carefully studied before the actual work is started.

I.F. ADJUSTMENT (465 KC.)

NOTE: The signal generator or alignment oscillator should be connected to the antenna terminal, either to the power line and the low potential output



1. Connect the output meter across the voice coil of speaker.
2. Set volume control at maximum.
3. Set the test oscillator to 465 KC., and connect the antenna lead to the grid of the 6F7 tube through a .05 mfd. condenser.
4. Adjust second I.F. alignment condenser #21 to maximum output.
5. Apply the test signal to the grid of the 6A7 first detector-oscillator tube.
6. Adjust alignment condensers #9 and #11 to maximum output.

OSCILLATOR AND R.F. ADJUSTMENT

1. Set the test oscillator and 441 inductor to 1500 KC., and apply the test signal to the antenna of the receiver through an .05 mfd. condenser.
2. Adjust the oscillator and antenna alignment condensers #33 and #6 to maximum output.
3. Check sensitivity over scale.
4. Check sensitivity on short-wave band.

Description of Parts

Part #	Description of Parts	List Price
1	6A7, 6.3 v. triode	.80
2	6F7, 6.3 v. diode	.80
3	6A7, 6.3 v. triode	.80
4	6F7, 6.3 v. diode	.80
5	6A7, 6.3 v. triode	.80
6	6F7, 6.3 v. diode	.80
7	6A7, 6.3 v. triode	.80
8	6F7, 6.3 v. diode	.80
9	6A7, 6.3 v. triode	.80
10	6F7, 6.3 v. diode	.80
11	6A7, 6.3 v. triode	.80
12	6F7, 6.3 v. diode	.80
13	6A7, 6.3 v. triode	.80
14	6F7, 6.3 v. diode	.80
15	6A7, 6.3 v. triode	.80
16	6F7, 6.3 v. diode	.80
17	6A7, 6.3 v. triode	.80
18	6F7, 6.3 v. diode	.80
19	6A7, 6.3 v. triode	.80
20	6F7, 6.3 v. diode	.80
21	6A7, 6.3 v. triode	.80
22	6F7, 6.3 v. diode	.80
23	6A7, 6.3 v. triode	.80
24	6F7, 6.3 v. diode	.80
25	6A7, 6.3 v. triode	.80
26	6F7, 6.3 v. diode	.80
27	6A7, 6.3 v. triode	.80
28	6F7, 6.3 v. diode	.80
29	6A7, 6.3 v. triode	.80
30	6F7, 6.3 v. diode	.80
31	6A7, 6.3 v. triode	.80
32	6F7, 6.3 v. diode	.80
33	6A7, 6.3 v. triode	.80
34	6F7, 6.3 v. diode	.80
35	6A7, 6.3 v. triode	.80
36	6F7, 6.3 v. diode	.80
37	6A7, 6.3 v. triode	.80
38	6F7, 6.3 v. diode	.80
39	6A7, 6.3 v. triode	.80
40	6F7, 6.3 v. diode	.80
41	6A7, 6.3 v. triode	.80
42	6F7, 6.3 v. diode	.80
43	6A7, 6.3 v. triode	.80
44	6F7, 6.3 v. diode	.80
45	6A7, 6.3 v. triode	.80
46	6F7, 6.3 v. diode	.80
47	6A7, 6.3 v. triode	.80
48	6F7, 6.3 v. diode	.80

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

UNITED MOTORS SERVICE

MODEL 66
Schematic, Voltage

Battery Terminal Volts	5.5	6.3	7.5	* Measured with 300,000 ohm meter.
B+ to B- (Volts)	216	261	322	All voltages measured with no input signal.
B+ to Ground (Volts)	184	218	257	All voltages to ground from socket unless otherwise stated.
Total Battery Drain (Amps)	6.15	7.25	8.50	

RESISTORS

CONDENSERS		RESISTORS	
C1 - .05	C16 - .25	R1 - 300,000	R20 - 10,000
C2 - .03	C17 - .02	R2 - 250	R21 - 200,000
C3 - .01	C18 - .01	R3 - 300,000	R22 - 250,000
C4 - .1	C19 - .01	R4 - 100	R23 - 250,000
C5 - .25	C20 - .0005	R5 - 300,000	R24 - 50,000
C6 - .25	C21 - .0005	R6 - 100,000	R25 - 300,000
C7 - .25	C22 - .00025	R7 - 200,000	R26 - 500,000 GLOBAR
C8 - .03	C23 - .0005	R8 - 2500	R27 - 50,000
C9 - .0005	C24 - .1	R9 - 10,000	R28 - 1,000,000
C10 - .03	C25 - .0005		
C11 - .0005	C26 - .0005		
C12 - .01	C27 - .1		
C13 - .25	C28 - .15		
C14 - .25	C29 - .15		
C15 - .03	C30 - .5		

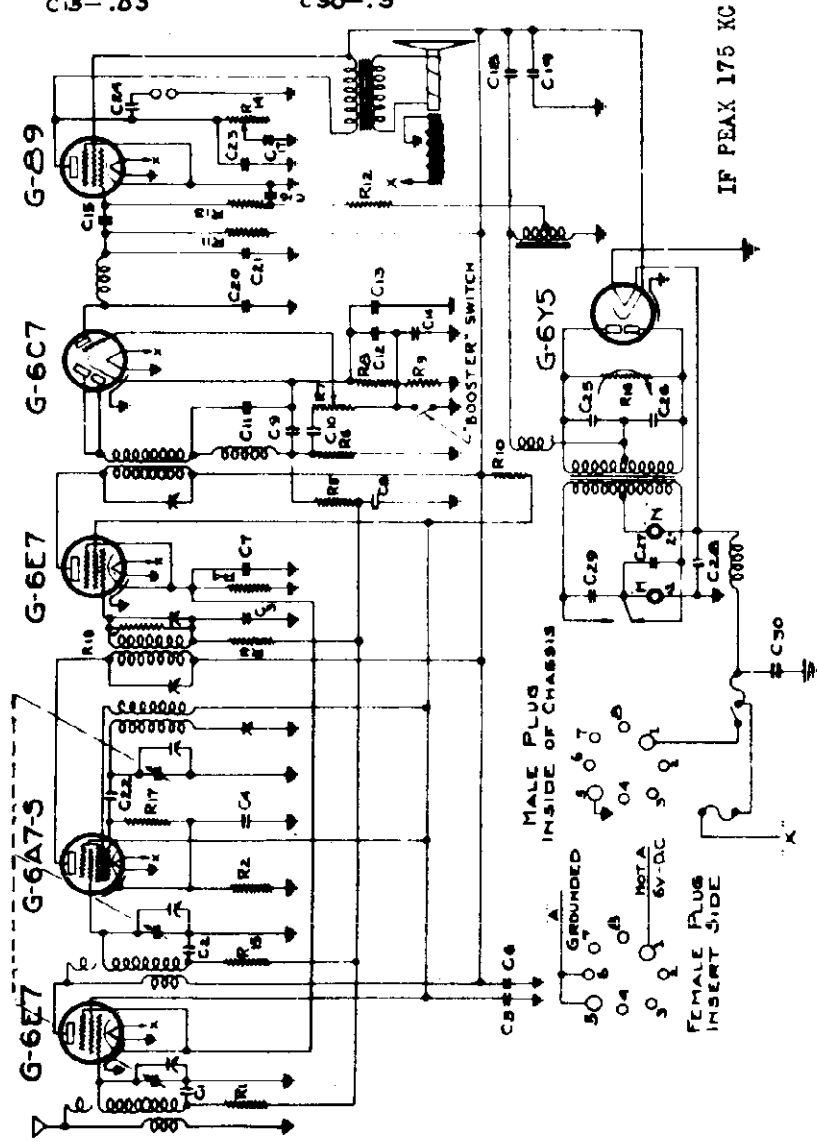
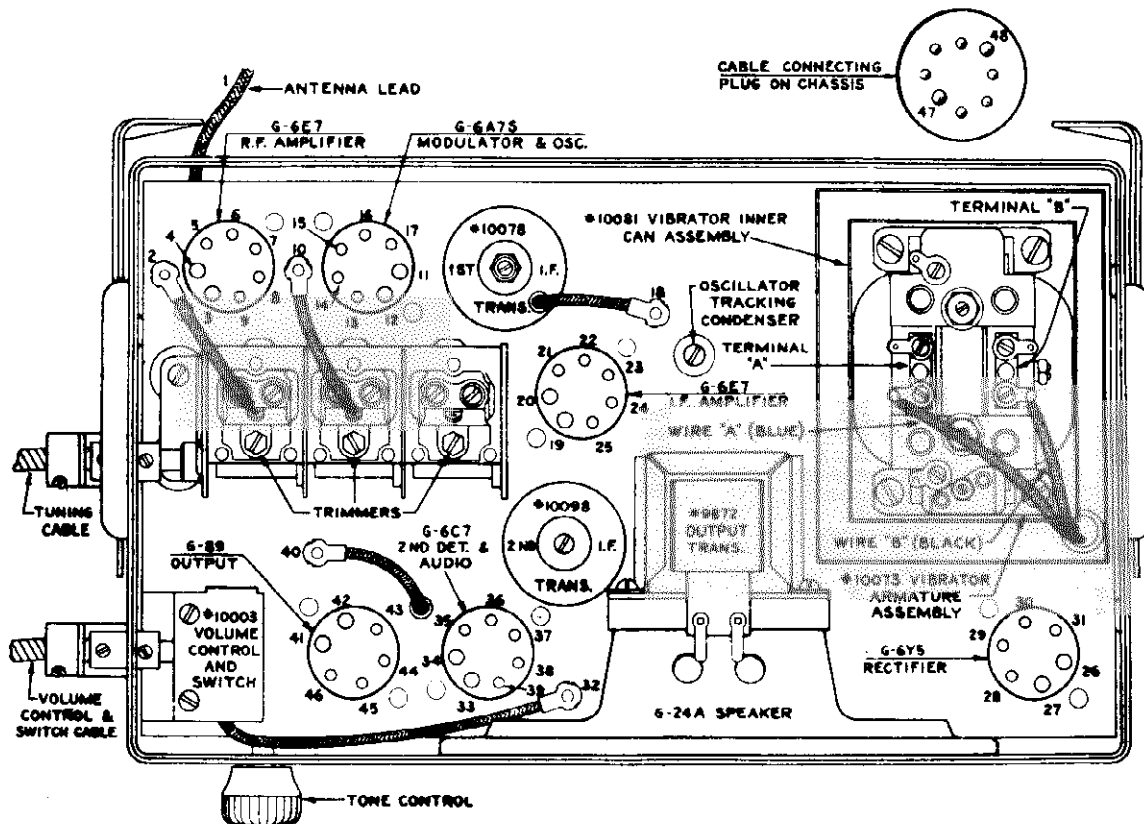


	PLATE VOLTS	SCREEN VOLTS	CATHODE VOLTS	GRID VOLTS
Battery Terminal	5.5	6.3	7.5	7.5
R. F. (G-6E7)	182	99	12.5	8.0
G-6A7S	182	88	4.2	2.7
	88	88	7.0*	8.0*
I. F. (G-6E7)	182	99	12.5	8.0
Audio (G-6C7)	51	-	9.5	1.8
Output (G-6B9)	177	218	-	23.0
	209	257	-	27.0
	248	-	-	35.0

MODEL 66
Socket, Trimmers
Resistance

UNITED MOTORS SERVICE



MODEL 66 RESISTANCE CHART

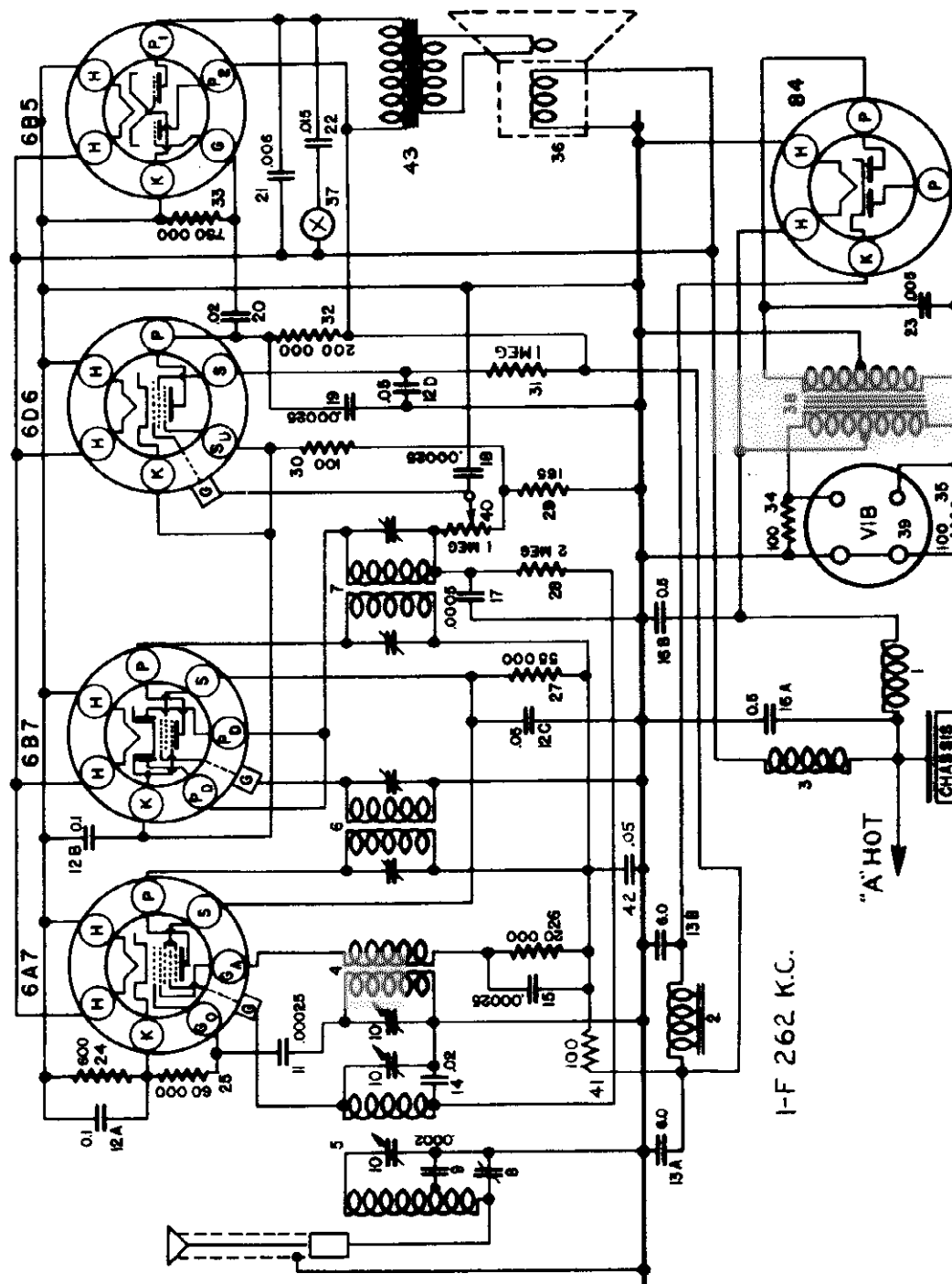
All readings are taken from designated points to ground except those marked with an asterisk (*) which are taken to terminal No. 29, with all tubes removed from their sockets, volume control turned to maximum clockwise position, and the speaker connected in the circuit.

TERMINAL NUMBER	RESISTANCE IN OHMS	IF RESISTANCE DIFFERS GREATLY FROM VALUE SHOWN, CHECK THE FOLLOWING:
1	21	Primary of antenna coil
2	700,000	Secondary of antenna coil, R-1, C-1, R-5, C-6 and R-6
3	0	Ground connection
4	.135	Primary of vibrator trans., Field Coil, C-30, C-28, C-27 and C-29
5	400	R-4 and C-7
6	0	Ground connection
7	Same as #5	
8	10,000	R-10
9	112	Primary of R.F. transformer
10	700,000	Secondary of R.F. transformer, C-2 and R-15
11	Same as #4	
12	0	Ground connection
13	250	R-2 and C-4
14	50,250	Secondary of oscillator coil and R-10
15	10,000	
16	Same as #5	
17	88	Primary of 1st I.F. transformer
18	700,000	Secondary of 1st I.F. transformer, C-3, and R-3
19	0	Ground connection
20	Same as #5	
21	0	Ground connection
22	Same as #5	
23	Same as #5	
24	Same as #5	
25	Same as #5	
26	155	Primary of 2nd I.F. transformer
27	0	Ground connection
28	1250	Secondary of vibrator trans., C-26, C-25, R.F. buzzer choke, and #3 filter choke C-16, C-19, C-5 and C-6
29	0	Ground connection
30	Same as #28	
31	0	Ground connection
32	210,000	C-10, R-7, R-9, C-14 and C-13
33	Same as #4	
34	0	Ground connection
35	12,500	R-8, R-9, C-12, C-13, C-14 and C-10
36	100,254	Secondary of 2nd I.F. trans., R.F.C., R-6, C-11, C-9 and C-10
37	Same as #36	
38	0	Ground connection
39	200,035	C-20, C-21, R.P.C., C-15 and R-11
40	500,450	R-13, R-12, C-16 and #3 filter choke
41	Same as #4	
42	0	Ground connection
43	0	Ground connection
44	Same as #43	
45	0	Connections
46	43C	Primary of output transformer
47	0	Ground connection
48	Same as #4	

Due to manufacturing tolerances on carbon resistors, the values given above may be expected to differ plus or minus 15 per cent.

UNITED MOTORS SERVICE

MODEL 631
Schematic
Voltage



I-F 262 K.C.

Delco Model 631

Date: 3-11-36

TUBE SOCKET VOLTAGES

Tube	Function	H	P	B	P2	GA	IK
6A7	Osc.-Mod.	6	240	90		150	6.0
6B7	I-F Amp.	6	240	90			4.0
6D6	A-F Amp.	6	70	30			4.0
6B5	Output	6	240		220		0
84	Rectifier	6	*				240

Above readings taken with a meter having a resistance of 1000 ohms per volt, using the scale on which the largest deflection could be obtained.

Amperes drain--6.5 amperes at 6 volts.

* A.C. voltage measured from plate to plate of 84 tube socket with tube removed should be 550 volts.

MODEL 631

Socket, Trimmers
Chassis, Alignment

UNITED MOTORS SERVICE

CIRCUIT ALIGNMENT

1. Aligning the I-F Stages at 262 K.C.
 - (a) Feed a test oscillator signal of 262 K.C. into the control grid of the 6B7 tube (leave grid clip in place) through a .25 mfd. condenser and adjust the I-F trimmers on the 2nd I-F coil (illus. #7 on Fig. 3). Care should be taken to keep the test oscillator leads well away from the grid leads of other tubes in the receiver to avoid inaccurate adjustments.
 - (b) Remove the test oscillator lead from the grid of the 6B7 tube and connect it to the grid of the 6A7 tube (leaving grid clip in place) and adjust the trimmers on the 1st I-F coil (illus. #5 Fig. 3) carefully for maximum output.
 - (c) The preceding adjustments should be repeated as given for test results. Do not align the two stages together by feeding a signal into the grid of the 6A7 tube.
2. Aligning the B-F Stages
 - (a) Change the test oscillator setting to 1560 K.C. and feed this signal into the antenna connection on the chassis through a .0002 mfd. condenser. Turn the condenser rotor plates until they are completely out of mesh and rest against the high frequency stop. Adjust the parallel trimmer for the oscillator section (middle) of the gang condenser.
 - (b) Change test oscillator setting to 1400 K.C. and turn condenser rotor plates until this signal is tuned in. Then adjust the trimmers for the other two sections of the condenser gang.
 - (c) Change test oscillator setting to 600 K.C. and turn condenser rotor plates until this signal is tuned in. Adjust the antenna compensating condenser (illus. #6, Fig. 4), while rocking the condenser gang plates back and forth through the signal until maximum output is obtained. It will be necessary to readjust this trimmer to the car antenna upon installation.

(d) Recheck alignment of the antenna section of the gang condenser (illus. #10, Fig. 3) for maximum output at 1400 K.C.

NOTE: Each of the trimmers on the gang condenser should be carefully sealed with Duco Household Cement to prevent any change in adjustment. In using this cement care should be taken to see that it is placed only between the top blade of the trimmer condenser and its adjusting screw.

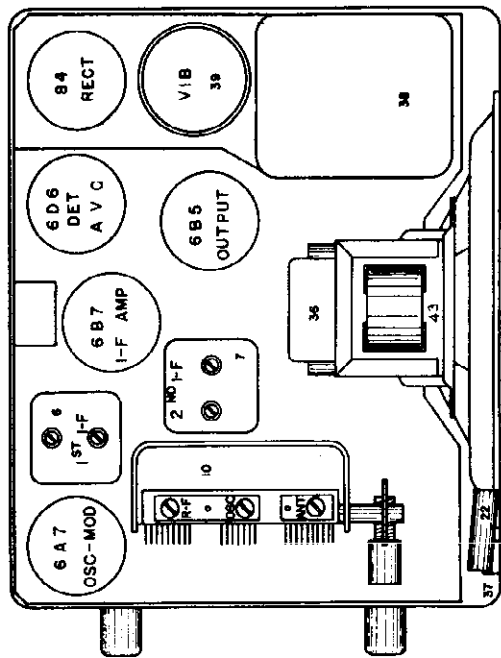


FIG. 3--PARTS LAYOUT--Top View

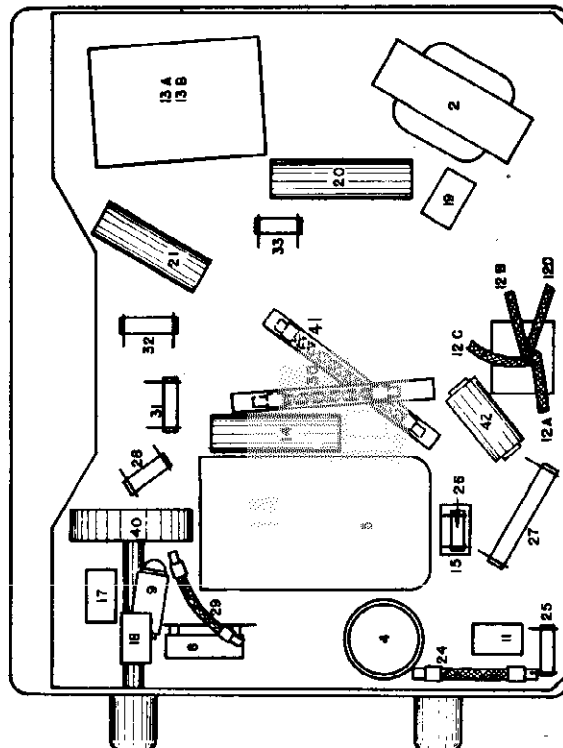


FIG. 4--PARTS LAYOUT--Bottom View

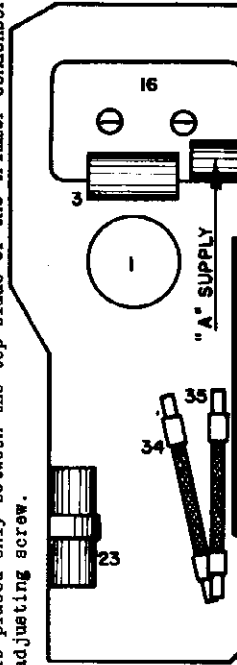


FIG. 1--PARTS LAYOUT--Vibrator Filter

MODEL 631-A
Socket, Trimmers
Alignment

UNITED MOTORS SERVICE

CIRCUIT ALIGNMENT

If alignment is found necessary--make all adjustments for maximum output with chassis in its case and use a calibrated test oscillator and output meter.

1. Aligning I-F Stages at 262 K.C.

Feed a test oscillator signal of 262 K.C. into the control grid of the 6A7 tube (leave grid clip in place) through a .25 mfd. condenser and adjust the trimmers on the I-F coils (illus. 7 & 8, Fig. 4) for maximum output. (Case should be taken to keep the test oscillator leads well away from the grid leads of other tubes to avoid inaccurate adjustments.)

2. Aligning R-F Stages

(a) Change the test oscillator setting to 1560 K.C. and feed this signal into the antenna connection on the chassis through a .0002 mfd. (mica) condenser. Turn the condenser rotor plates until they are completely out of mesh and rest against the high frequency stop. Adjust the parallel trimmer for the oscillator section (middle) of the gang condenser. (illus. #9 Fig. 4)

(b) Change test oscillator setting to 1400 K.C. and turn condenser rotor plates until this signal is tuned in. Then adjust the trimmers for the other two sections of the condenser gang.

(c) Change test oscillator setting to 600 K.C. and turn condenser rotor plates until this signal is tuned in. Adjust the antenna compensating condenser, (illus. #10 Fig. 3) while rocking the condenser plates back and forth through the signal until maximum output is obtained. It will be necessary to readjust this trimmer to the car antenna upon installation.

(d) Recheck Alignment of the antenna section of the gang condenser (illus. 9, Fig. 3) for maximum output at 1400 K.C.

NOTE: Each of the trimmers on the gang condenser should be carefully sealed with Deco Household Cement to prevent any change in adjustment. In using this cement care should be taken to see that it is placed only between the top blade of the trimmer condenser and its adjusting screw.

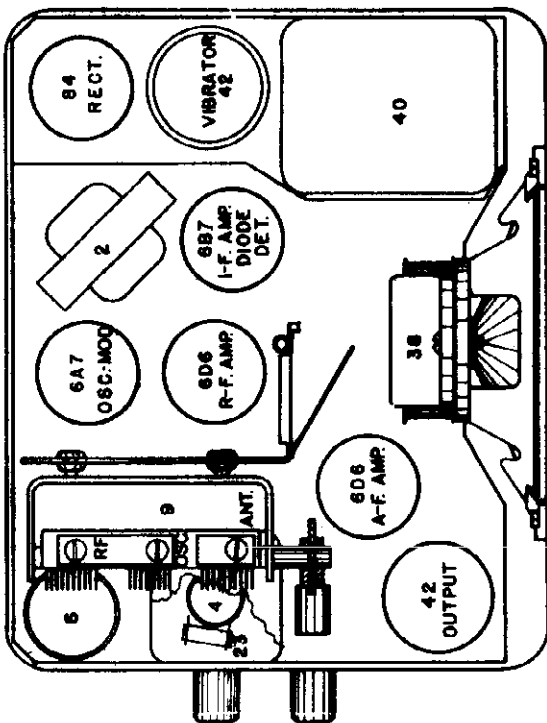


FIG. 3--PARTS LAYOUT--Top View

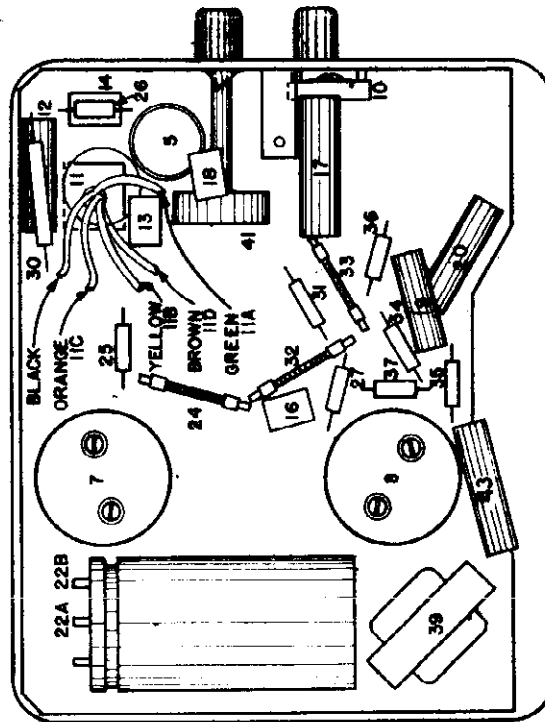


FIG. 4--PARTS LAYOUT--Bottom View

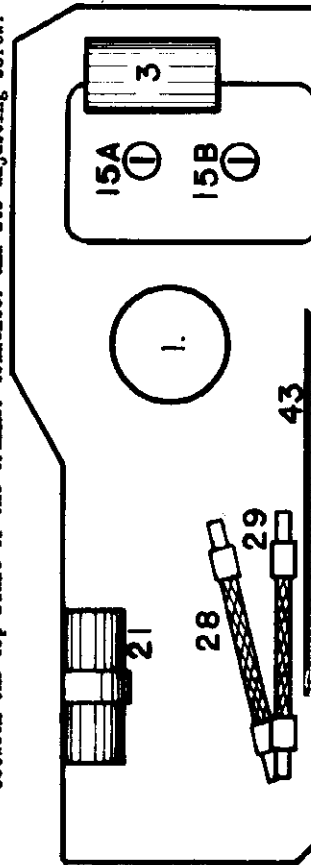


FIG. 1 - - PARTS LAYOUT - - Vibrator filter

MODEL 632

Socket, Trimmers
Alignment

UNITED MOTORS SERVICE

GENERAL: The Delco Model 632 is a six tube, single unit auto radio with tone and sensitivity controls, dust-proof speaker and a primary type vibrator. This receiver is supplied with a wide variety of tuning controls and adapter packages making it possible to obtain "custom built" installation in most any make car.

CIRCUIT ALIGNMENT

If alignment is found necessary--make all adjustments for maximum output with chassis in its case and use a calibrated test oscillator and output meter.

1. Aligning the I-F Stages at 262 K.C.
Feed a test oscillator signal of 262 K.C. into the control grid of the 6A7 tube (leave grid clip in place) through a .25 mfd. condenser and adjust the trimmers on the I-F coils (illus. 7 & 8, Fig. 4) for maximum output. (Care should be taken to keep the test oscillator leads well away from the grid leads of other tubes to avoid inaccurate adjustments)
2. Aligning the R-F Stages
(a) Change the test oscillator setting to 1560 K.C. and feed this signal into the antenna connection on the chassis through a .002 mfd. condenser. Turn the condenser rotor plates until they are completely out of mesh and rest against the high frequency stop. Adjust the parallel trimmer for the oscillator section (middle) of the gang condenser.
(b) Change test oscillator setting to 1400 K.C. and turn condenser rotor plates until this signal is tuned in. Then adjust the trimmers for the other two sections of the condenser gang.

- (c) Change test oscillator setting to 600 K.C. and turn condenser rotor plates until this signal is tuned in. Adjust the antenna compensating condenser, while rocking the condenser plates back and forth through the signal until maximum output was obtained. It will be necessary to readjust this trimmer to the car antenna upon installation.
(d) Recheck alignment of the antenna section of the gang condenser (illus. 10, Fig. 5) for maximum output at 1400 K.C.

NOTE: Each of the trimmers on the gang condenser should be carefully sealed with Ducc Household Cement to prevent any change in adjustment. In using this cement care should be taken to see that it is placed only between the top blade of the trimmer condenser and its adjusting screw.

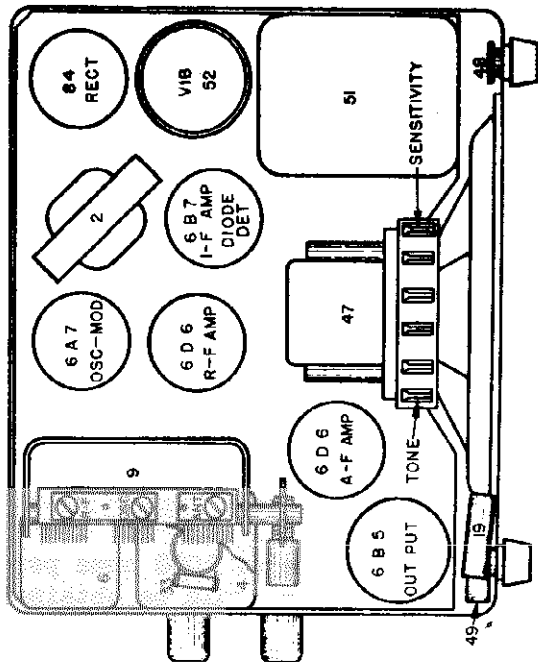


FIG. 3--PARTS LAYOUT--Top View

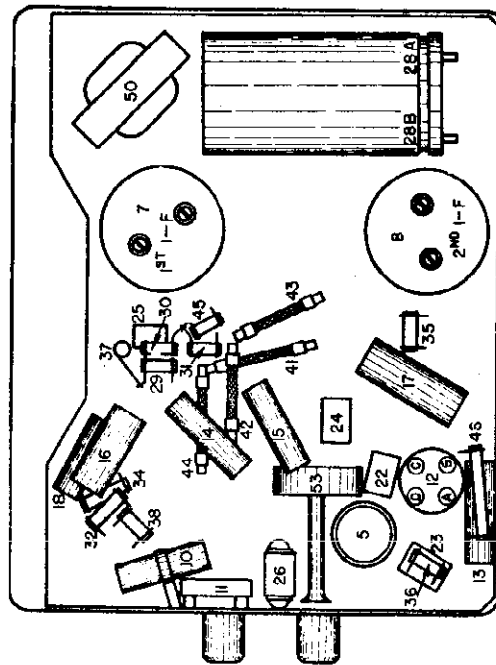


FIG. 4--PARTS LAYOUT--Bottom View

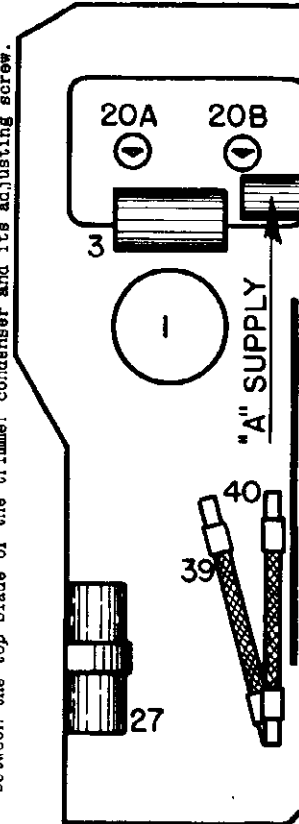


FIG. 1--PARTS LAYOUT--Vibrator Filter

MODEL 633

Socket, Trimmers Alignment

UNITED MOTORS SERVICE

GENERAL: The Delco Model 633 is a six tube, header speaker auto radio, with tone and sensitivity controls, dust-proof speaker and a primary type vibrator. This receiver is supplied with a wide variety of tuning controls and adapter packages making it possible to obtain "custom built" installation in most any make car.

CIRCUIT ALIGNMENT

1. Aligning the I-F Stages at 262 K.C.

(a) Feed a test oscillator signal of 262 K.C. into the control grid of the 6A7 tube (have grid clip in place) through a .25 mfd. condenser and adjust the trimmers on the I-F coils (illus. 7 & 8, Fig. 4) for maximum output. Care should be taken to keep the test oscillator leads well away from the grid leads of other tubes to avoid inaccurate adjustments.

(b) Repeat above adjustments until no further increase in output can be obtained.

2. Aligning the R-F Stages

(a) Change the test oscillator setting to 1560 K.C. and feed this signal into the antenna connection on the chassis through a .0002 mfd. condenser. Turn the condenser rotor plates until they are completely out of mesh and rest against the high frequency stop. Adjust the parallel trimmer for the oscillator section (middle) of the gang condenser.

(b) Change test oscillator setting to 1400 K.C. and turn condenser rotor plates until this signal is tuned in. Then adjust the trimmers for the other two sections of the condenser gang.

(c) Change test oscillator setting to 600 K.C. and turn condenser rotor plates until this signal is tuned in. Adjust the antenna compensating condenser, (illus. #11, Fig. 4) while rocking the condenser plates back and forth through the signal until maximum output is obtained. It will be necessary to readjust this trimmer to the car antenna upon installation.

(d) Recheck alignment of the antenna section of the gang condenser (illus. #9, Fig. 3).

NOTE: Each of the trimmers on the gang condenser should be carefully sealed with Ducc Household Cement to prevent any change in adjustment. In using this cement care should be taken to see that it is placed only between the top blade of the trimmer condenser and its adjusting screw.

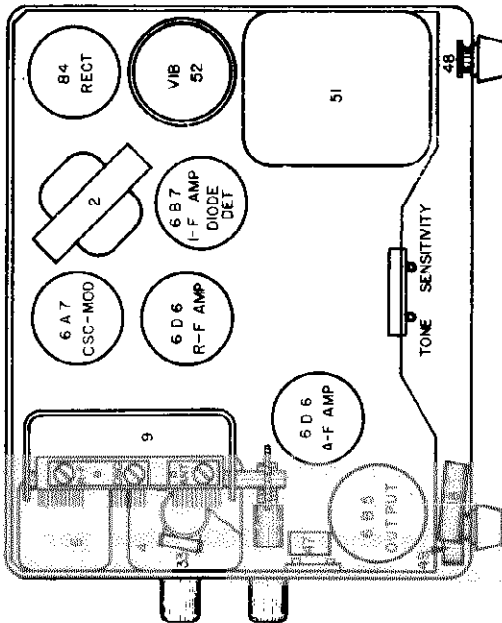


FIG. 3--PARTS LAYOUT--Top View

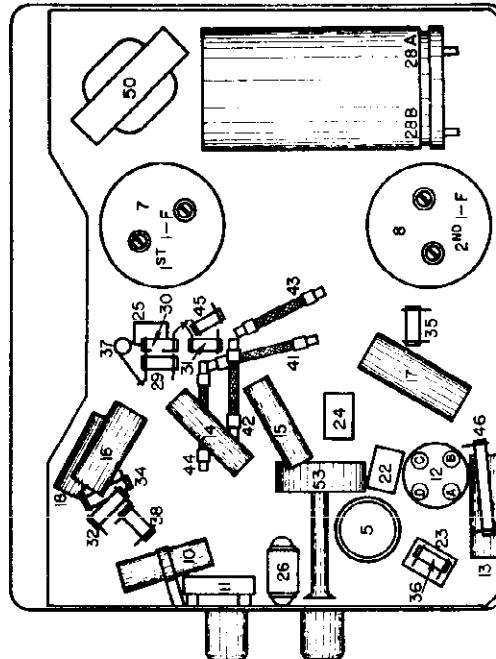


FIG. 4--PARTS LAYOUT--Bottom View

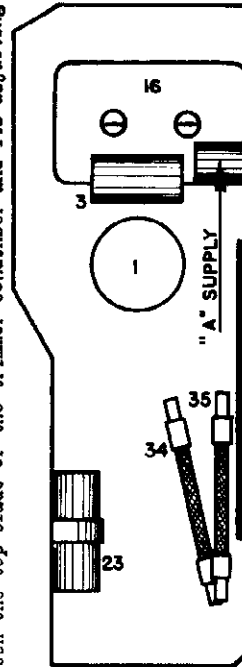


FIG. 1--PARTS LAYOUT--Vibrator Filter

MODEL 634
Socket, Trimmers
Alignment

UNITED MOTORS SERVICE

1. Aligning the I-F Stages at 262 K.C.

(a) Feed a test oscillator signal of 262 K.C. into the control grid of the 6A7 tube (leave grid clip in place) through a .25 mfd. condenser and adjust the trimmers on the I-F coils (Illus. 7 & 8, Fig. 2) for maximum output. Care should be taken to keep the test oscillator leads well away from the grid leads of other tubes to avoid inaccurate adjustments.

(b) Repeat above adjustments until no further increase in output can be obtained.

2. Aligning the R-F Stages

(a) Change the test oscillator setting to 1560 K.C. and feed this signal into the antenna connection on the chassis through a .0002 mfd. condenser. Turn the condenser rotor plates until they are completely out of mesh and rest against the high frequency stop. Adjust the parallel trimmer for the oscillator section (middle) of the gang condenser.

(b) Change test oscillator setting to 1400 K.C. and turn condenser rotor plates until this signal is tuned in. Then adjust the trimmers for the other two sections of the condenser gang.

(c) Change test oscillator setting to 600 K.C. and turn condenser rotor plates until this signal is tuned in. Adjust the antenna compensating condenser, (Illus. #10, Fig. 3) while rocking the condenser plates back and forth through the signal until maximum output is obtained. It will be necessary to readjust this trimmer to the car antenna upon installation.

(d) Recheck alignment of the antenna section of the gang condenser (Illus. #12, Fig. 2) for maximum output at 1400 K.C.

1st I-F COIL PART NUMBER

In certain production series of the Model 634 receiver, the part number applying to the 1st I-F coil assembly was incorrectly stamped on its shield case as #1210699. The correct number is 1210969 as listed in the parts list of this Bulletin and any orders for this part should be placed under this number.

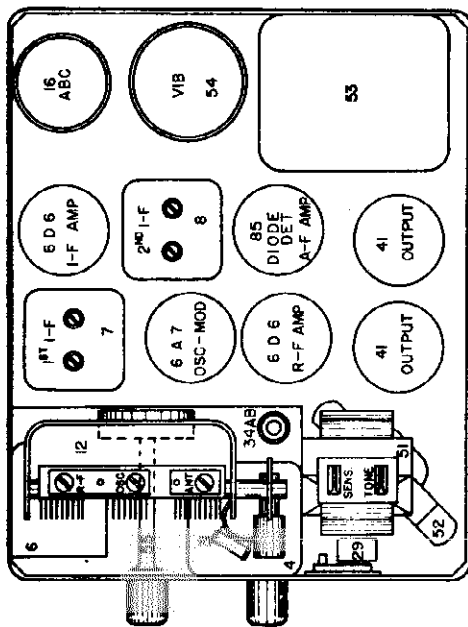


FIG. 2--PARTS LAYOUT--Top View

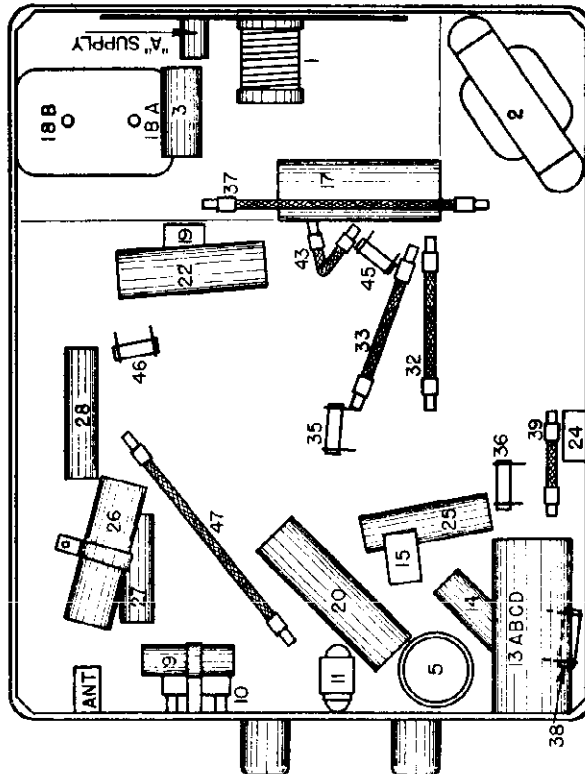
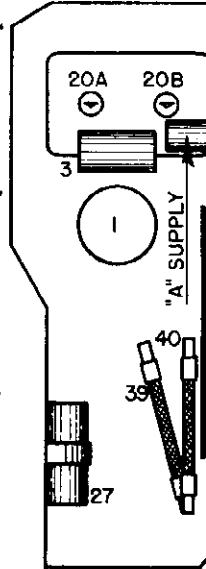


FIG. 3--PARTS LAYOUT--Bottom View



MODEL 635
Socket, Trimmers
Alignment

UNITED MOTORS SERVICE

GENERAL: The Delco Model 635 is a six tube, combination "dash" and "header" speaker auto radio, with sensitivity control, bass compensation control, speaker selector switch, synchronous vibrator and metal type (6F6) power tubes. This receiver is supplied with a wide variety of tuning controls and header speaker adapters, making it possible to obtain "custom built" installation in most any car.

CIRCUIT ALIGNMENT

If re-alignment of the receiver circuits is found necessary--make all adjustments for maximum output with the receiver chassis in its case and use a calibrated test oscillator and output meter.

1. Aligning the I-F Stages at 262 K.C.

(a) Feed a test oscillator signal of 262 K.C. into the control grid of the 6A7 tube (leave grid clip in place) through a .25 mfd. condenser and adjust the trimmers on the I-F coils (illus. #7 and 8, Fig. 2) for maximum output. Care should be taken to keep the test oscillator leads well away from the grid leads of other tubes to avoid inaccurate adjustments.

(b) Repeat above adjustments until no further increase in output can be obtained.

2. Aligning the R-F Stages

(a) Change the test oscillator setting to 1650 K.C. and feed this signal into the antenna connection on the chassis through a .0002 mfd. condenser. Turn the condenser rotor plates until they are completely out of mesh and rest against the high frequency stop. Adjust the parallel trimmer for the oscillator section (middle) of the gang condenser.

(b) Change test oscillator setting to 1400 K.C. and turn condenser rotor plates until this signal is tuned in. Then adjust the trimmers for the other two sections of the condenser gang.

(c) Change test oscillator setting to 600 K.C. and turn condenser rotor plates until this signal is tuned in. Adjust the antenna compensating condenser, (illus. #10, Fig. 3) while rocking the condenser plates back and forth through the signal until maximum output is obtained. It will be necessary to readjust this trimmer to the car antenna upon installation.

(d) Recheck alignment of the antenna section of the gang condenser (illus. 12, Fig. 2) for maximum output at 1400 K.C.

NOTE: Each of the trimmers on the gang condenser should be carefully sealed with Duco Household Cement to prevent any change in adjustment. In using this cement care should be taken to see that it is placed only between the top blade of the trimmer condenser and its adjusting screw.

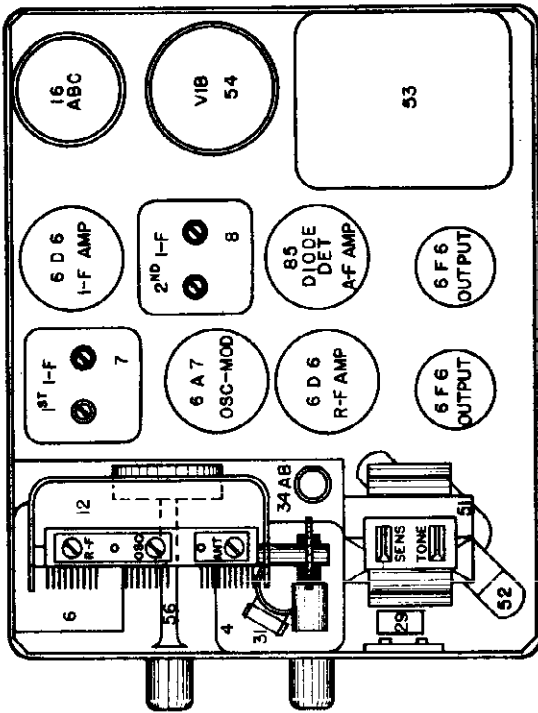


FIG. 2--PARTS LAYOUT--Top View

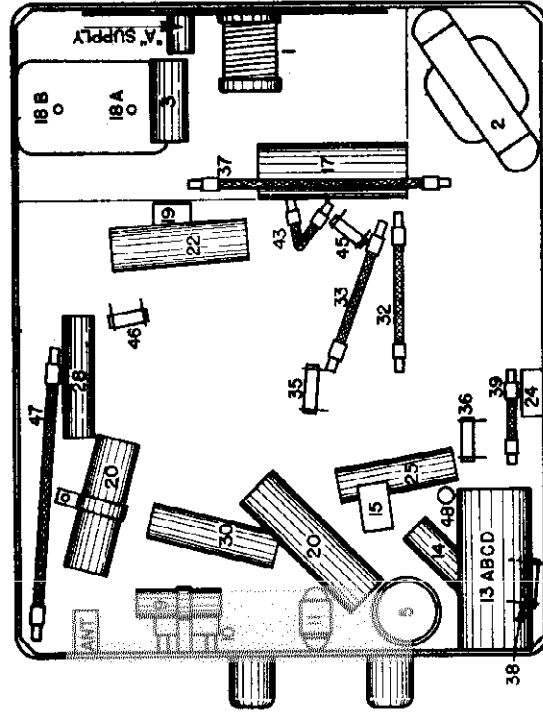


FIG. 3--PARTS LAYOUT--Bottom View

MODEL S 544246 Buick-Pontiac

393885 Olds

UNITED MOTORS SERVICE

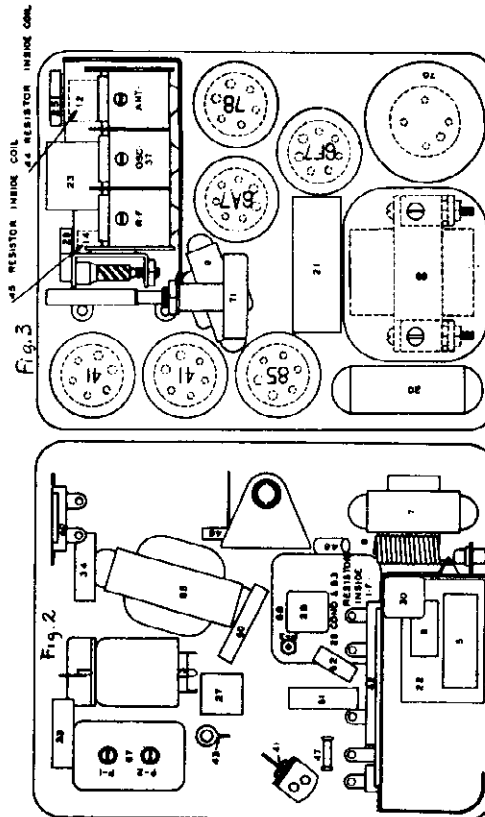
1291344 Buick

Socket, Trimmers, Changes
Alignment

CIRCUIT CHANGES

A number of the early receivers have a 1 mfd. tubular condenser mounted above the candohm resistor, illustration #42 on Figure 2 and connected in parallel with the 85 tube cathode by-pass section and connected in parallel with the 85 tube cathode by-pass section 20D of the #1209144 electrolytic condenser block. The use of the tubular condenser was necessary in production to reduce the R.F. resistance of the 85 cathode by-pass. A change has been made in the design of the condenser block, making the use of the tubular condenser unnecessary. All of the service parts replacement stock of #1209144 electrolytics are of the new design and it is immaterial whether or not the tubular condenser is left in the receiver when replacing the electrolytic condenser block.

It may be noted on some of the earlier receivers that there is a small condenser in a metal case mounted below the candohm resistor, illus. #42, Fig. 2, with two terminals that are not connected. This condenser was originally placed in the set to filter vibrator interference, but it was found after production started that two small condensers mounted in the vibrator unit were more effective and the external condenser was simply disconnected.



Peaking I.F. Stages at 268 K.C.

- (a) Connect the ground lead of the test oscillator to the chassis frame. Connect a 1 mfd. condenser in series with the other lead and connect this lead to the grid cap of the 6A7 tube leaving the grid clip in place. The 1 mfd. condenser is necessary to prevent the oscillator circuit of the receiver from affecting the I.F. adjustments.
- (b) Set the test oscillator on 268 kilocycles.
- (c) Turn the volume control of the receiver on full.
- (d) Peak the I.F. trimmer P-3 located on the 2nd I.F. coil shown on Figure 2.
- (e) Then peak trimmers P-2 and P-1 located on the first I.F. coil also shown on Figure 2.
- (f) In order to insure accurate settings of the I.F. trimmers the above adjustments should be repeated using the lowest oscillator output that will give a reasonable deflection of the output meter pointer. Make all adjustments for maximum output.

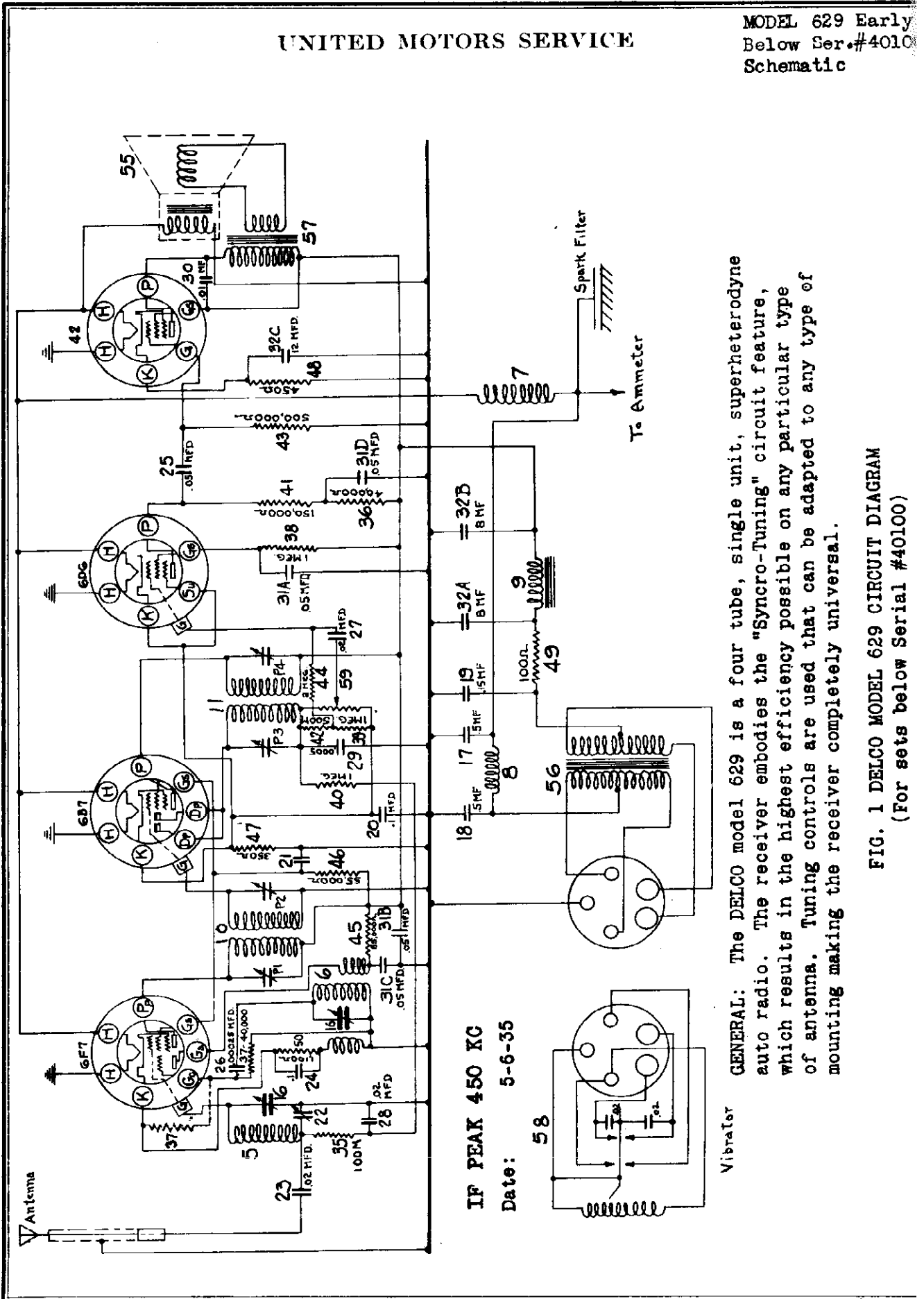
Peaking Gang Condenser at 1530 and 1400 K.C.

- (a) Connect the output of the test oscillator to the antenna connection of the receiver and to the chassis ground. Do not use the 1 mfd. condenser that was required in aligning the I.F. stages.
- (b) Turn the rotor plates of the gang condenser until they are COMPLETELY OUT OF MESH.
- (c) Set the test oscillator on 1530 kilocycles.
- (d) Adjust the trimmer condenser for the oscillator section (middle section) of the gang condenser CAREFULLY for maximum output. Then adjust the trimmers for the "R.F." and "ANT" sections of the gang condenser.
- (e) Set the test oscillator on 1400 kilocycles.
- (f) Turn the condenser rotor plates until the 1400 K.C. signal from the test oscillator is turned in with maximum output. (No calibration blocks should be used as the oscillator circuit is adjusted at 1530 K.C. on this set.)
- (g) Readjust the parallel trimmers for the "R.F." and "ANT" sections of the gang condenser for maximum output. DO NOT disturb the oscillator trimmer (middle section) as this is adjusted at 1530 K.C. only and any further adjustments at this point will affect both the tuning range of the receiver and the tracking of its circuits.

CAUTION: Always use the lowest possible test oscillator output that will give a reasonable deflection of the output meter pointer, in order to prevent the A.V.C. from leveling out the output as the adjustments are made.

UNITED MOTORS SERVICE

MODEL 629 Early
Below Ser.#4010
Schematic



GENERAL: The DELCO model 629 is a four tube, single unit, superheterodyne auto radio. The receiver embodies the "Synco-Tuning" circuit feature, which results in the highest efficiency possible on any particular type of antenna. Tuning controls are used that can be adapted to any type of mounting making the receiver completely universal.

FIG. 1 DELCO MODEL 629 CIRCUIT DIAGRAM
(For sets below Serial #40100)

MODEL 629 Early
 Below Ser.# 40100
 Socket, Trimmers
 Chassis, Voltage

UNITED MOTORS SERVICE

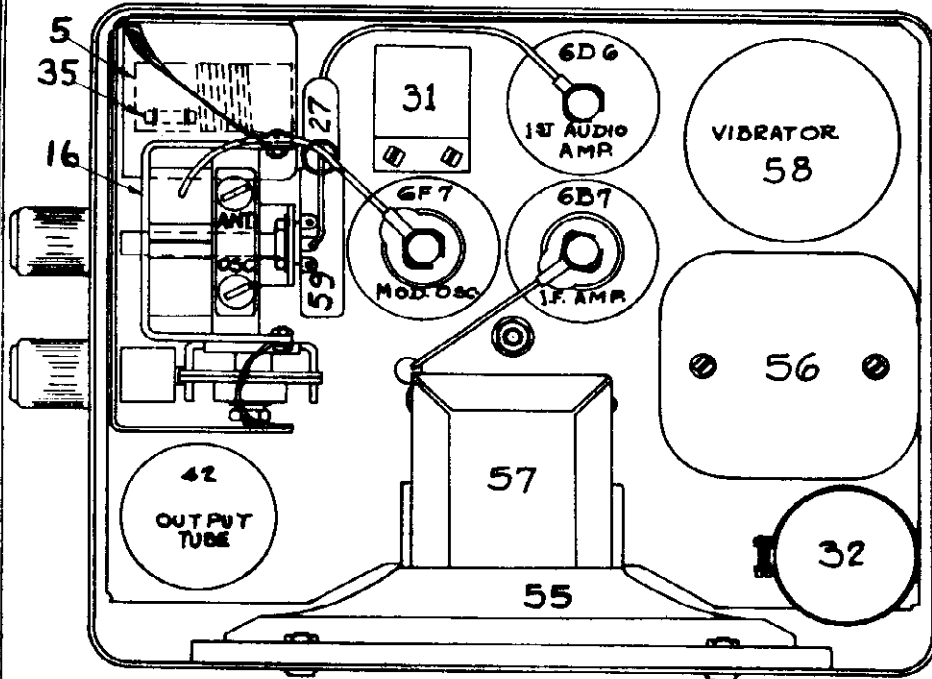


FIG. 2 PARTS LAYOUT--Top View
 (Below Ser. #40100)

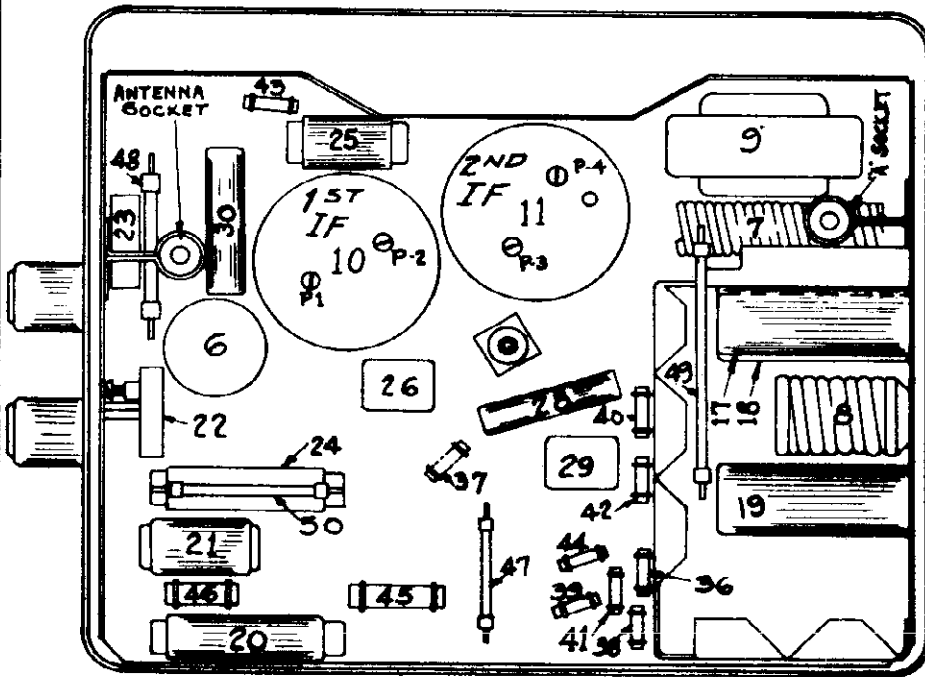


FIG. 3 PARTS LAYOUT--Bottom View
 (Below Ser. #40100)

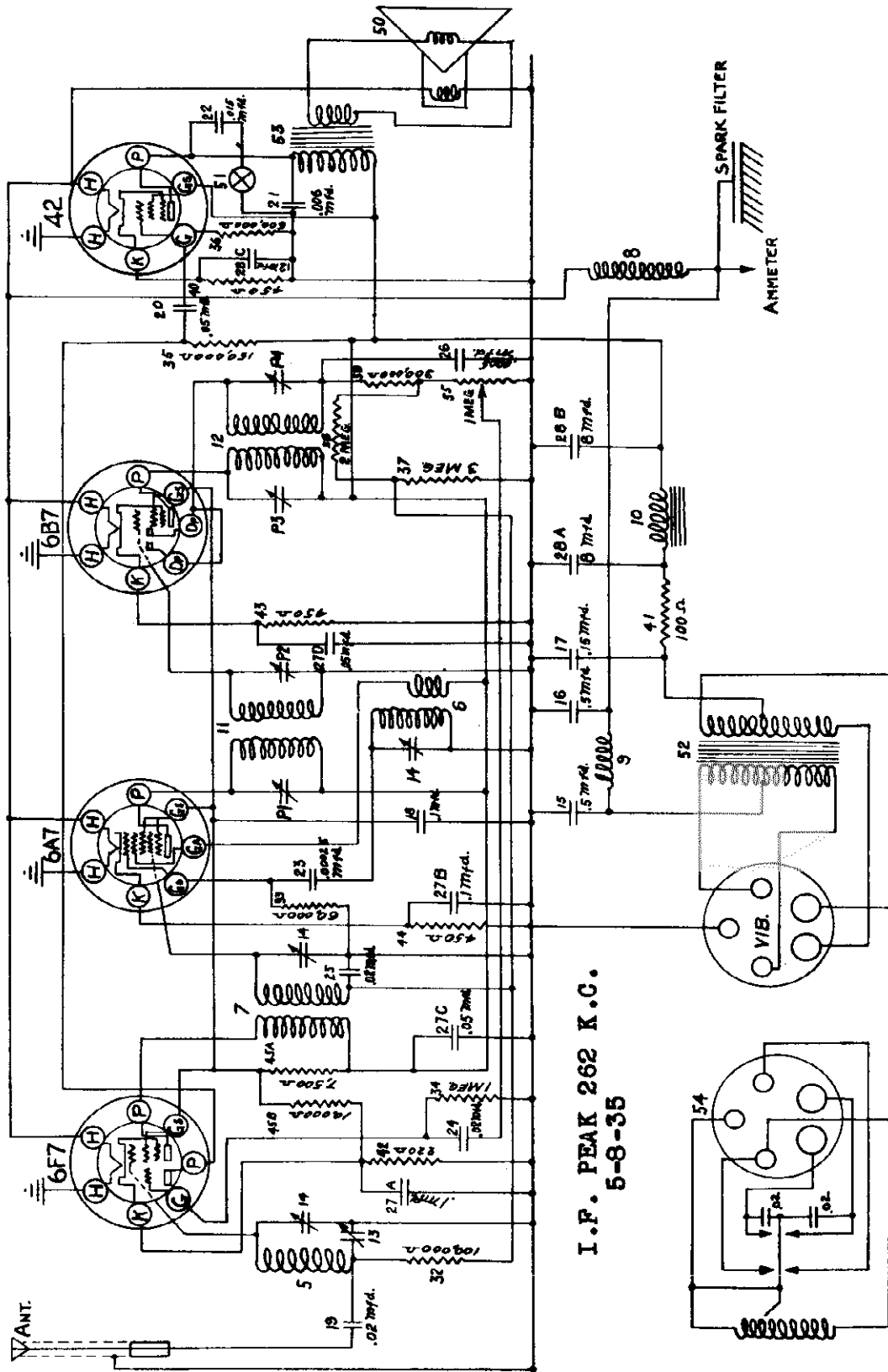
VOLTAGE CHART

Type	Function	H	P	Gs	Ga	Go	Su	K
6F7	Det.--Osc.	6	225	100	60	0	-	8
6B7	I.F. Amp.--Det.--AVC	6	225	100	-	-	-	3.5
6D6	1st Audio	6	55	20	-	-	3.5	3.5
42	Output	6	215	225	-	-	-	15

NOTE: Ampere drain of set at six volts is 5.8 amperes. Milliampere drain from B supply is 55 M. A.

UNITED MOTORS SERVICE

MODEL 629 Late
Above Ser.# 4010
Schematic



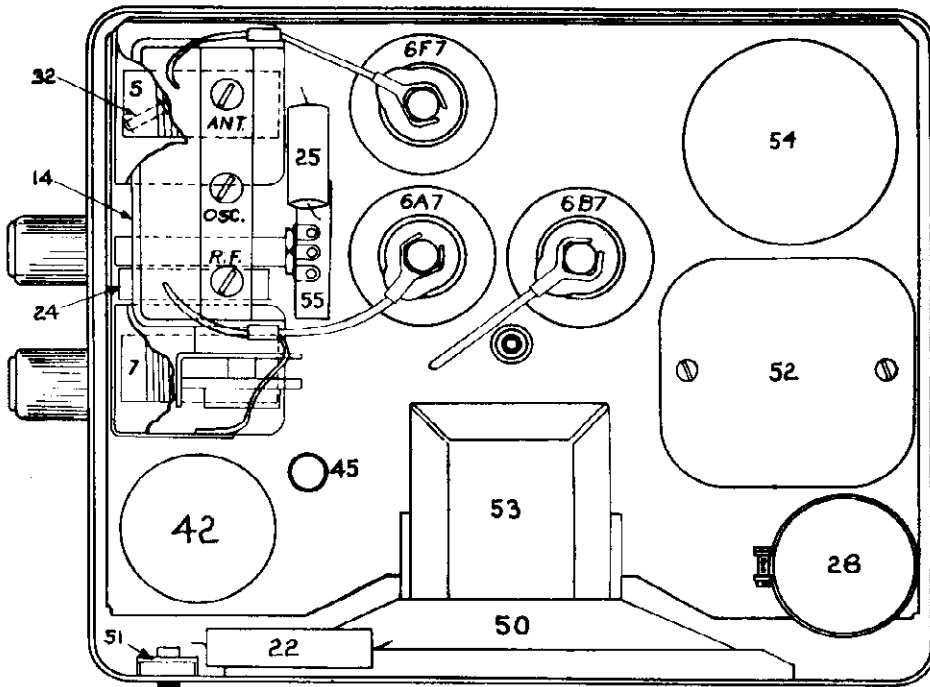
I. F. PEAK 262 K.C.
5-8-35

GENERAL: The DELCO model 629 is a four tube, single unit, superheterodyne auto radio with tone control. The receiver embodies the "Syncro-Tuning" circuit feature, which results in the highest efficiency possible on any particular type of antenna. Tuning controls are used that can be adapted to any type of mounting making the receiver completely universal.

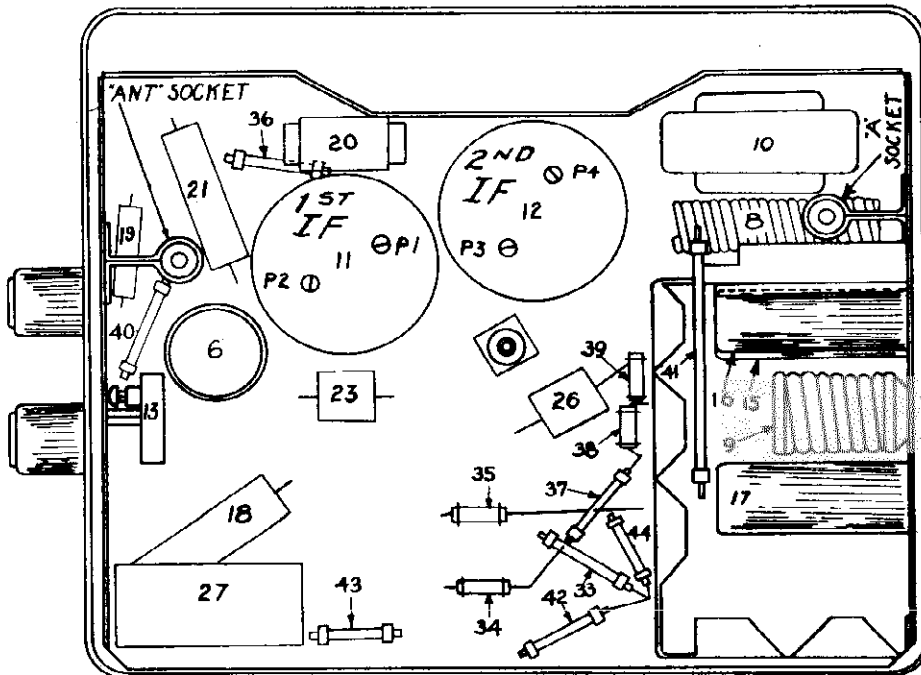
DELCO MODEL 629 CIRCUIT DIAGRAM--ABOVE SERIAL #40100

MODEL 629 Late
 Above Ser # 40100
 Socket, Trimmers
 Chassis, Voltage

UNITED MOTORS SERVICE



PARTS LAYOUT--Top View
 (Above Ser. #40100)



PARTS LAYOUT--Bottom View
 (Above Ser. #40100)

VOLTAGE CHART

Type	Function	H	P	Pt	Gs	Ga	Co	G	K
6F7	R.F.--1st Aud.	6	230	72	112	-	0	0	4.0
6A7	Det.--Osc.	6	228	-	112	228	0	0	4.8
6B7	I.F. Amp.--Det.	6	228	-	112	-	0	0	3.1
42	Output	6	226	-	235	-	0	0	15.5

NOTE: Ampere drain of set at six volts is 6.5 amperes.
 Milliampere drain from B supply is 55 M. A.

UNITED MOTORS SERVICE, INC. Alignment
 MODELS 629, Early & Late

Peaking I.F. Stages at 262 K.C.

(a) Connect the ground lead of the test oscillator to the chassis frame. Connect a .5 mfd. condenser in series with the other lead and connect this lead to the grid cap of the 6F7 tube, leaving the tube's grid clip in place. (The .5 mfd. condenser Peaking I.F. Stages

is necessary to prevent the oscillator circuit of the receiver from affecting the I.F. adjustments.)

(b) Set the test oscillator

(c) Turn the volume control of the receiver on full.

(d) Peak each of the I.F. trimmers on the 2nd I.F. coil.

(e) Then peak each of the trimmers on the 1st I.F. coil,

(f) In order to insure accurate settings of the I.F. trimmers the above adjustments should be repeated using the lowest oscillator output that will give a reasonable output meter scale deflection. Make all adjustments for maximum output.

2. Peaking Oscillator Section of Gang Condenser at 1540 K.C.

(a) Connect the output of the test oscillator to the antenna connection of the receiver and to the chassis ground. (Do not use the .5 mfd. condenser that was required in aligning the I.F. stages.)

(b) Turn the rotor plates of the gang condenser until they are COMPLETELY OUT OF MESH.

(c) Set the test oscillator on exactly 1540 kilocycles.

(d) Adjust the parallel trimmer for the "OSC." section (middle section) CAREFULLY for maximum output. Then adjust the trimmers for the other two sections of the gang condenser also for maximum output.

3. Tracking "Syncro-Tuning" Circuit

(a) Set the test oscillator on 1400 kilocycles. (Leave test oscillator connected to ant. and Gnd. of receiver.)

(b) Turn the condenser rotor plates until the 1400 K.C. signal from the test oscillator is tuned in with maximum output.

Tracking "Syncro-Tuning" Circuit--Cont'd.

(c) Readjust the parallel trimmers for the "ANT." and "R.F." sections of the gang condenser (shown on Fig. 2) for maximum output. DO NOT DISTURB the setting of the oscillator trimmer as this is adjusted at the 1540 K.C. only and adjustment at this point will affect both the tuning range of the receiver and the tracking of its circuits.

NOTE: In order to accurately set the "ANT." trimmer of the condenser gang at 1400 K.C. it will be necessary to make a preliminary adjustment of the "antenna compensating condenser" before installing the receiver on a car.

(d) Then set the test oscillator on 600 kilocycles.

(e) Turn the condenser rotor plates until the 600 K.C. signal from the test oscillator is tuned in with maximum output.

(f) Peak the antenna compensating condenser for maximum output. Re-tune the gang condenser for maximum output. Repeat these operations alternately until no further improvement in output can be obtained.

(g) Reset the test oscillator on 1400 kilocycles.

(h) Turn the condenser rotor plates until the 1400 K.C. signal is tuned in with maximum output.

(i) Adjust the trimmer for the "ANT." section of the gang condenser CAREFULLY for maximum output.

4. Adjusting Compensating Condenser to Car Antenna

After the "ANT." trimmer of the gang condenser has been correctly set according to the preceding information, it will require no further adjustment. It will be necessary, however, to reset the "antenna capacity compensating condenser" to the car antenna when installing the receiver in a car in order to compensate for the wide range of antenna capacities being used. This is done in the following manner:

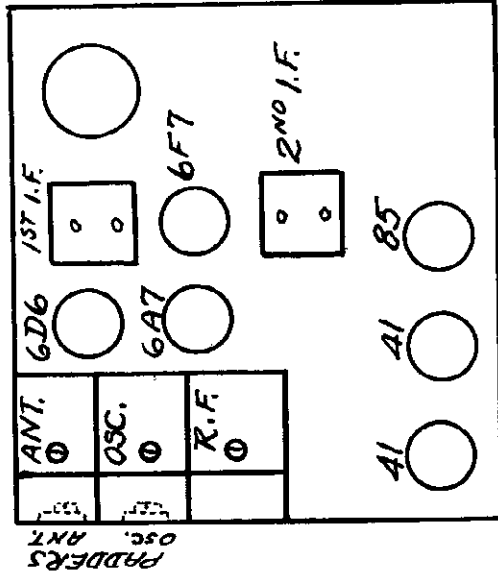
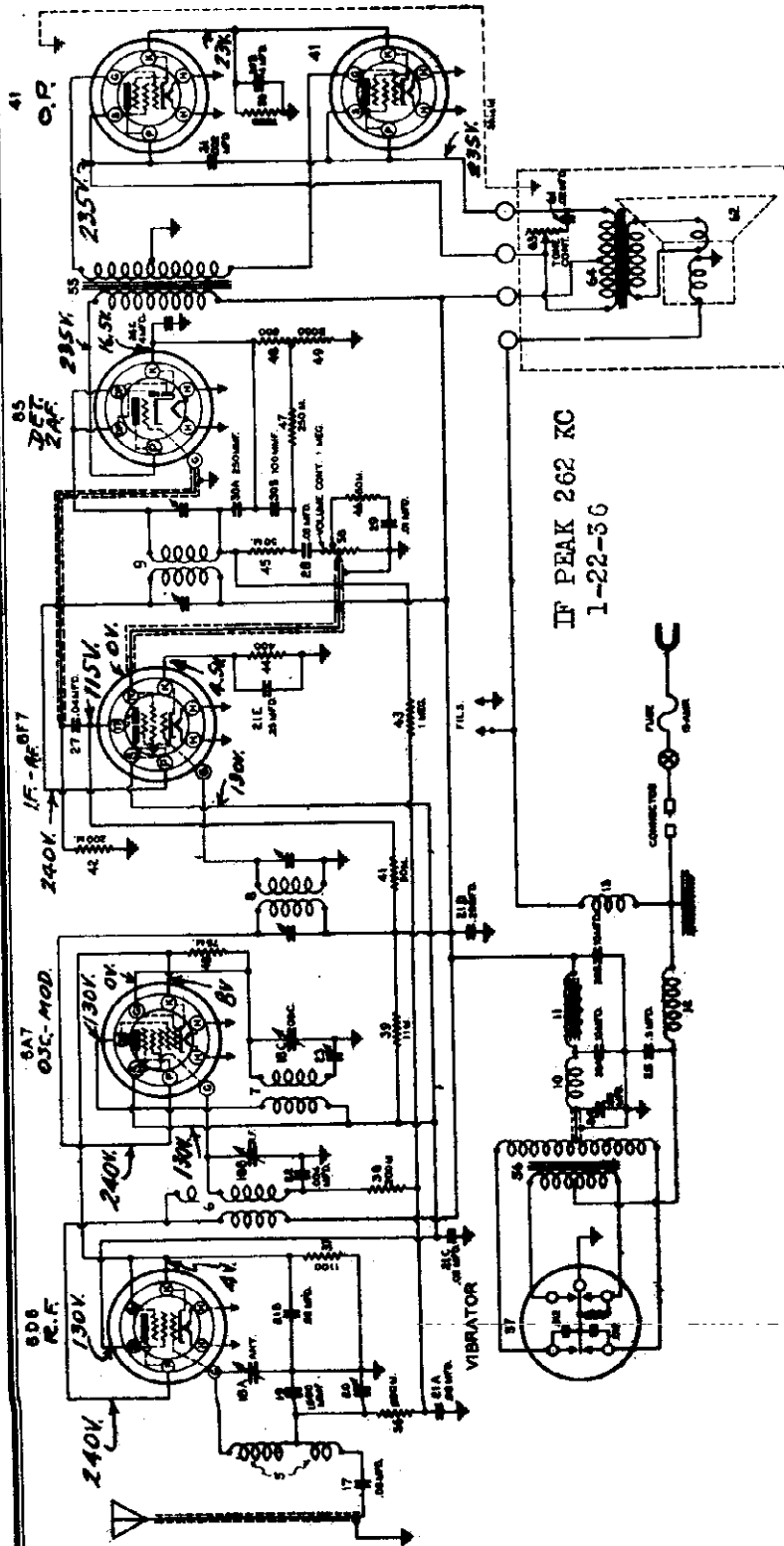
(a) Tune the receiver to a weak broadcast station between 570 to 540 K.C.

(b) Peak the compensating condenser for maximum output, rocking the receiver dial and adjusting the compensating condenser alternately until no further improvement in output can be obtained.

CAUTION: Do not touch the adjustment of the parallel trimmer for the "ANT." section of the gang condenser after the receiver is installed on a car.

MODEL 601814 Chevrolet
Schematic, Voltage
Socket, Trimmers
Alignment

UNITED MOTORS SERVICE



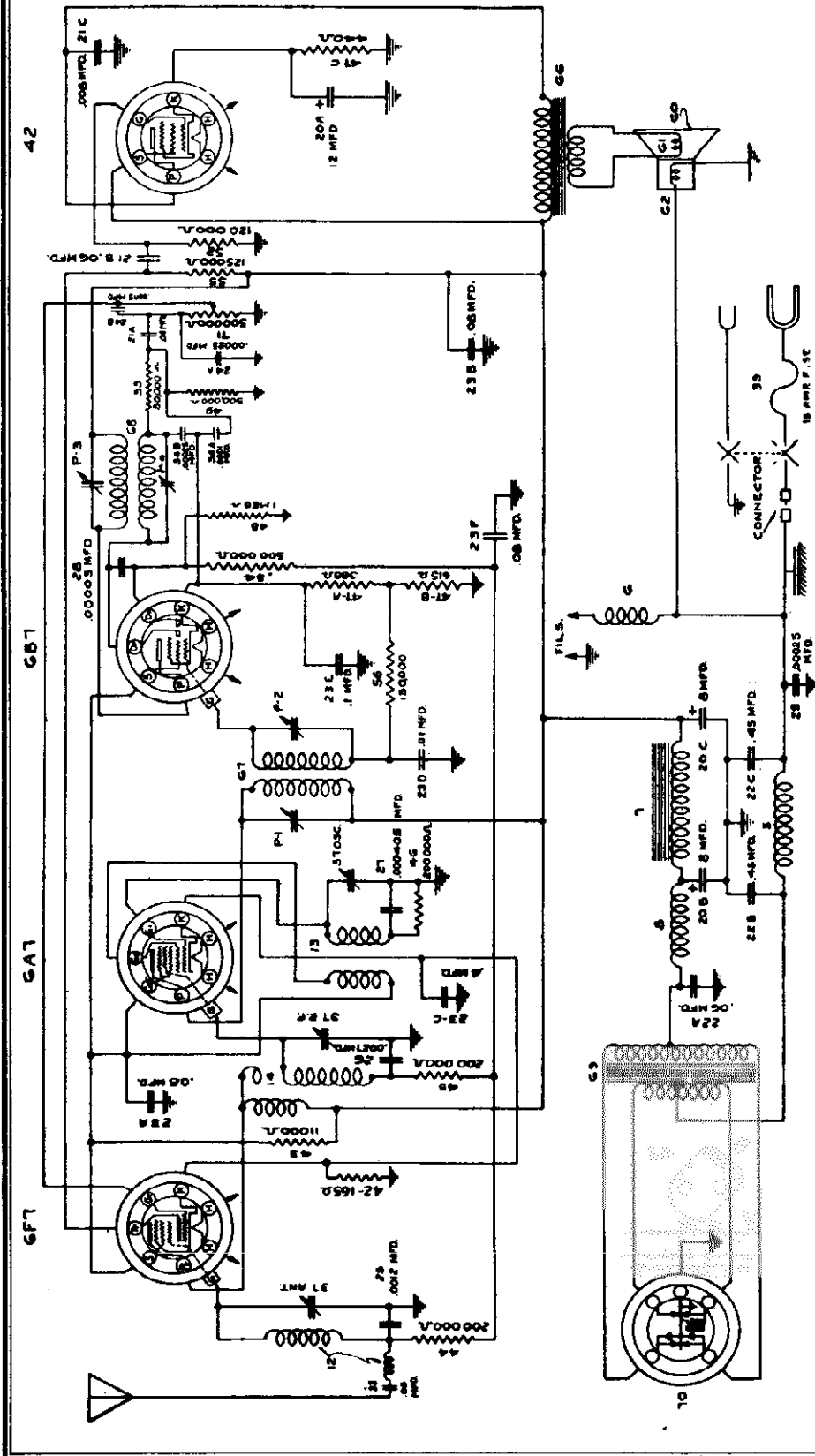
ALIGNMENT:
Set signal generator at 262 kc and connect through a dummy of .1 mf to grid cap of 6A7, leaving grid cap in place. Adjust i-f trimmers for maximum output.
Set signal generator to 1610 kc and connect to antenna post through a .00025 mf dummy. Gang condenser unmeshed. Adjust the trimmers on gang condensers in this order: Oscillator, R-F, and Antenna, for maximum output.
Set signal generator and dial to 1400 kc and adjust R-F and Ant. trimmers for maximum output. Do not disturb Oscillator trimmer adjustment.
Set signal generator and dial to 600 kc and adjust Oscillator and Antenna padders (under side of chassis) for maximum output while rocking the gang condenser.

MODEL 601586 Chevrolet
Schematic, Voltage

MODEL 405046 Olds
MODELS 544267, 544289
Pontiac

UNITED MOTORS SERVICE, INC.

FIG. 1 CIRCUIT DIAGRAM--Pontiac Model #544267, Olds Model 405046
Note: These receivers are all above Serial #1791092.



Pontiac Model 544289, above
Serial #1750000

VOLTAGE CHART

Type	Function	H	Pp	S	Tp	Gt	G	G1	G2	G3,5	K
6F7	R.F.	6	250	135	80	0	0	-	-	-	6.2
6A7	Det-Osc.	6	250	-	-	0	0	120	135	-	6.2
6B7	2nd Det-AVC	6	250	135	-	-	-	-	-	-	8.5
42	Output	6	240	250	-	-	-	-	-	-	16.0

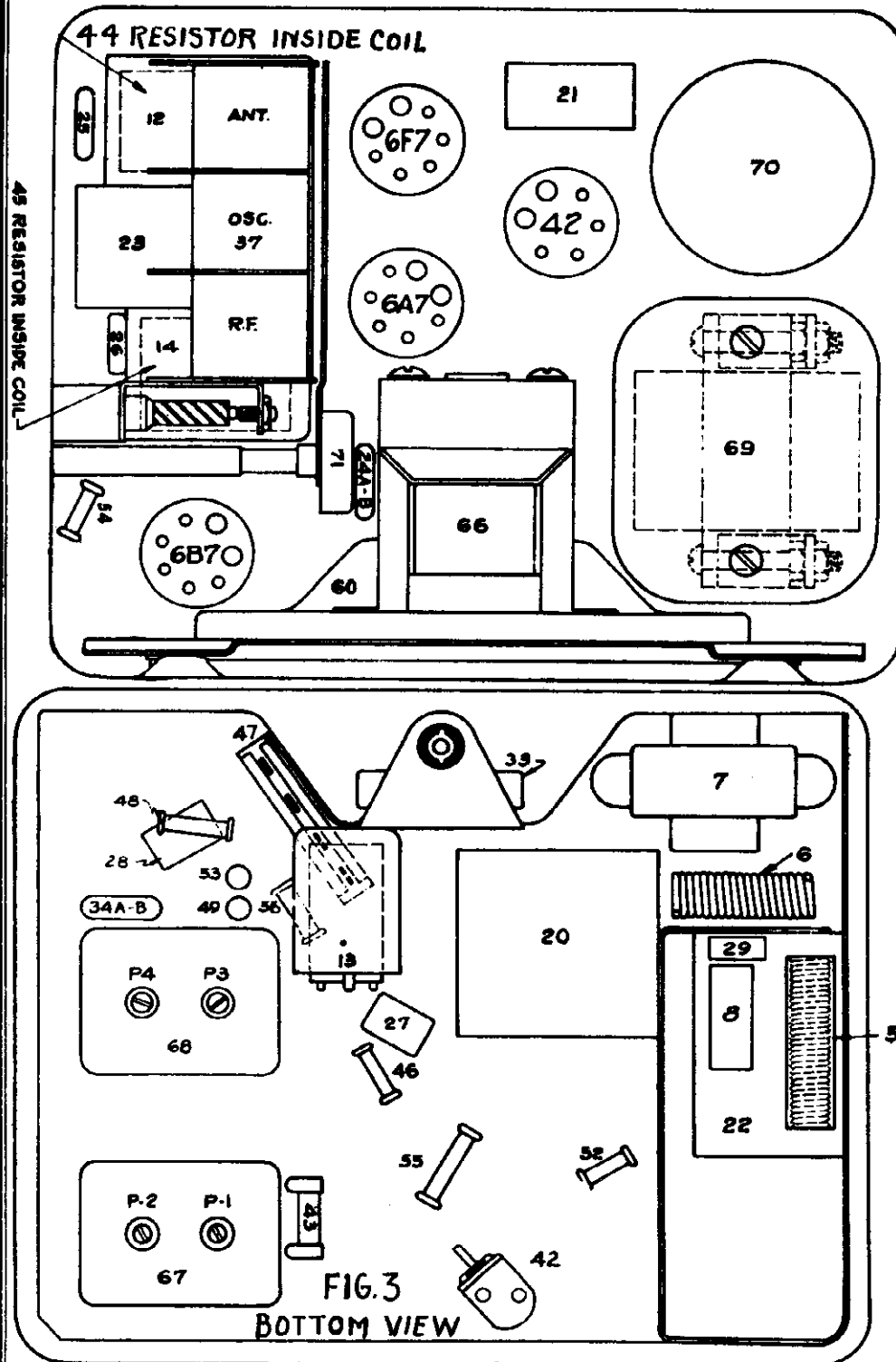
NOTE: Ampere drain of set at 6 volts is 6.2 amperes

IF PEAK 262 KC
DATE : 1-21-35

MODEL 405046 Olds
 MODELS 544267, 544289
 Pontiac

UNITED MOTORS SERVICE, INC.

MODEL 601586 Chevrolet
 Socket, Trimmers, Chassis
 Alignment, Changes



CIRCUIT CHANGES

CONVENTIONAL ALIGNMENT-SEE SPECIAL SECTION

Generator at 262 KC, connected to grid of 6A7 tube thru .5 MF condenser, grid clip not disturbed. Generator also grounded to chassis. Peak trimmers P3, then P2 and P1. Generator at 1530 KC, connected direct to antenna lead. Rotor plates completely out of mesh. Peak middle section of variable condenser (OSC) then front and rear sections. Generator then set to 1400 KC, then realign front and rear sections, after having tuned in the signal. Middle section of variable condenser should not be disturbed. No oscillator padding required. Antenna trimmer should be peaked between 550 to 700 KC, after installation.

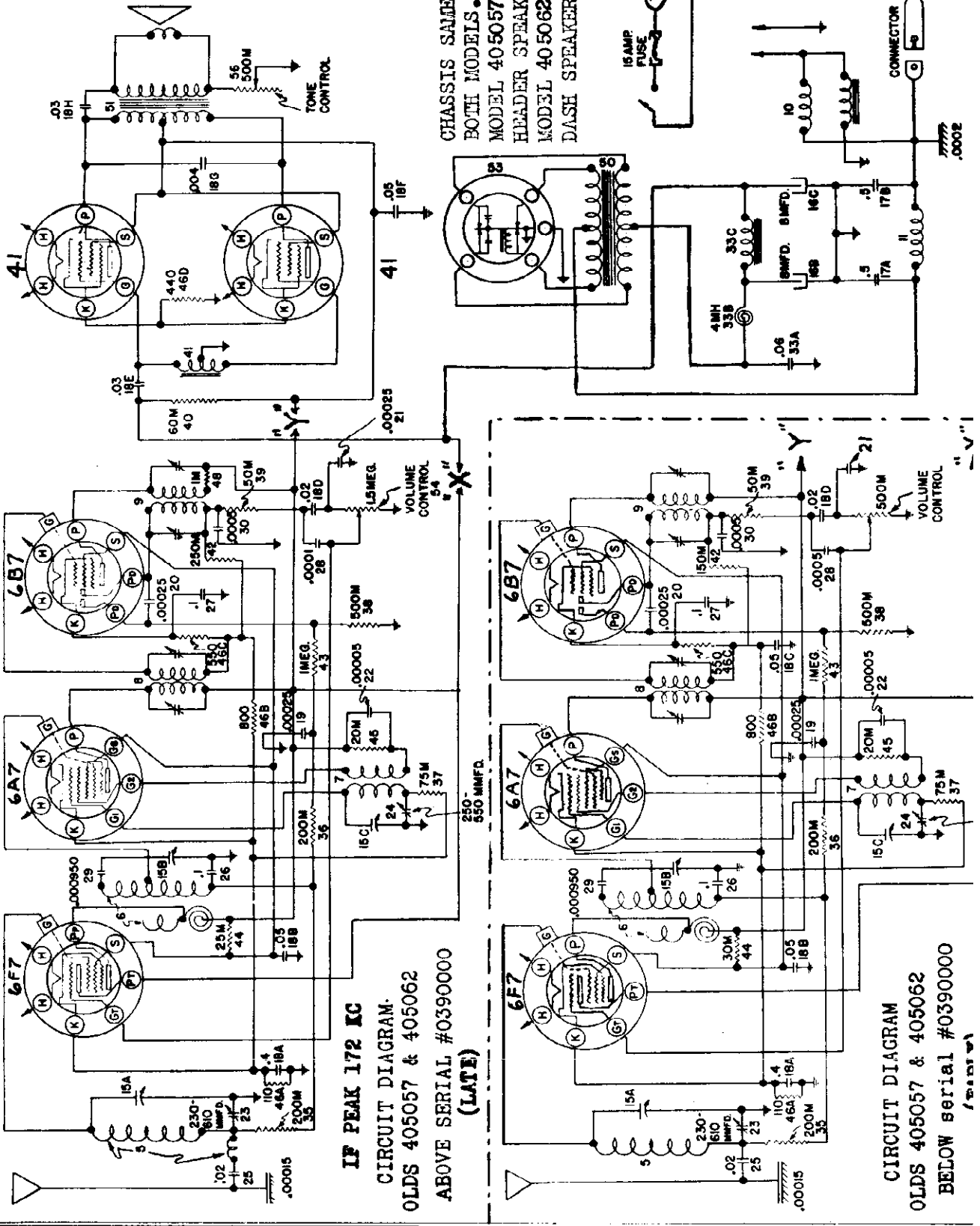
A number of .05 mfd. tubular condensers were used at the factory in place of the .06 mfd. condenser part #1209213 condenser shown on figure 2 as illustration #33. For Service Replacement purposes of any defective .05 mfd. condensers--use part #1209213 condenser.

UNITED MOTORS SERVICE, INC.

Pontiac receivers have serial numbers with 0 as the first digit

MODELS 405057, 405062
Olds (Early & Late)
MODELS 544290, 544297
544297, 544298
Pontiac Schematic

CHASSIS SAME FOR BOTH MODELS. MODEL 405057 USES HEADER SPEAKER. MODEL 405062 USES DASH SPEAKER.



IF PEAK 172 KC
CIRCUIT DIAGRAM.
OLDS 405057 & 405062
ABOVE SERIAL #0390000
(LATE)

CIRCUIT DIAGRAM
OLDS 405057 & 405062
BELOW SERIAL #0390000
(EARLY)

MODELS 405057, 405062

Olds (Early & Late) UNITED MOTORS SERVICE, INC.

MODELS 544290, 544291

Pontiac 544297, 544298

Socket, Trimmers
Voltage, Chassis
Alignment

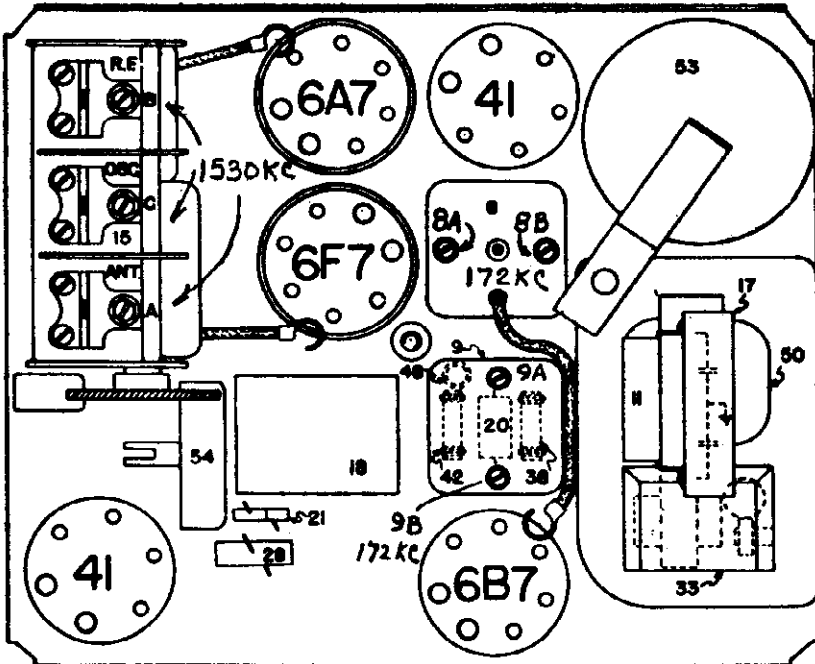


FIG. 2--PARTS LAYOUT--Top View

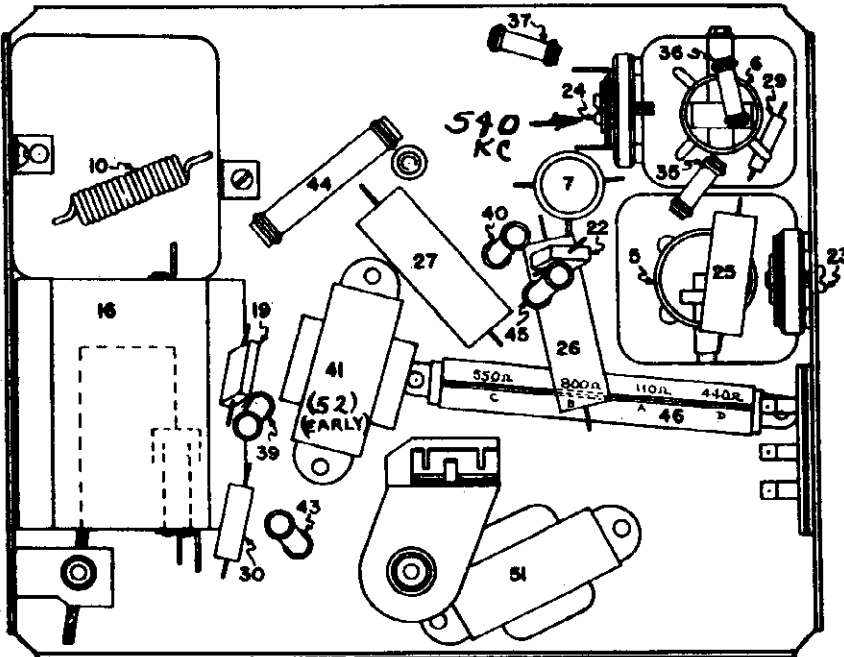


FIG. 3--PARTS LAYOUT--Bottom View

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION

Generator at 172 KC, grounded to chassis, and connected thru .5 MF condenser to grid cap of 6A7, leaving grid clip on tube. Align trimmers 9A, 9B, 8A and 8B to a maximum peak.
Generator now connected direct to antenna lead, frequency to 1530 KC, rotor plates of variable condenser out of mesh, adjust trimmers 15C, 15B & 15A to peak.
Generator at 540 KC, rotor of variable condenser completely in mesh, pad the oscillator circuit to maximum peak with trimmer 24 (Fig. 3)
Generator at 1400 KC, variable condenser rotated until signal is maximum, realign trimmers 15B and 15A to maximum peak.
After installation in car, tune in a station between 550 and 700 KC. Peak the antenna trimmer # 23 (Fig. 3)

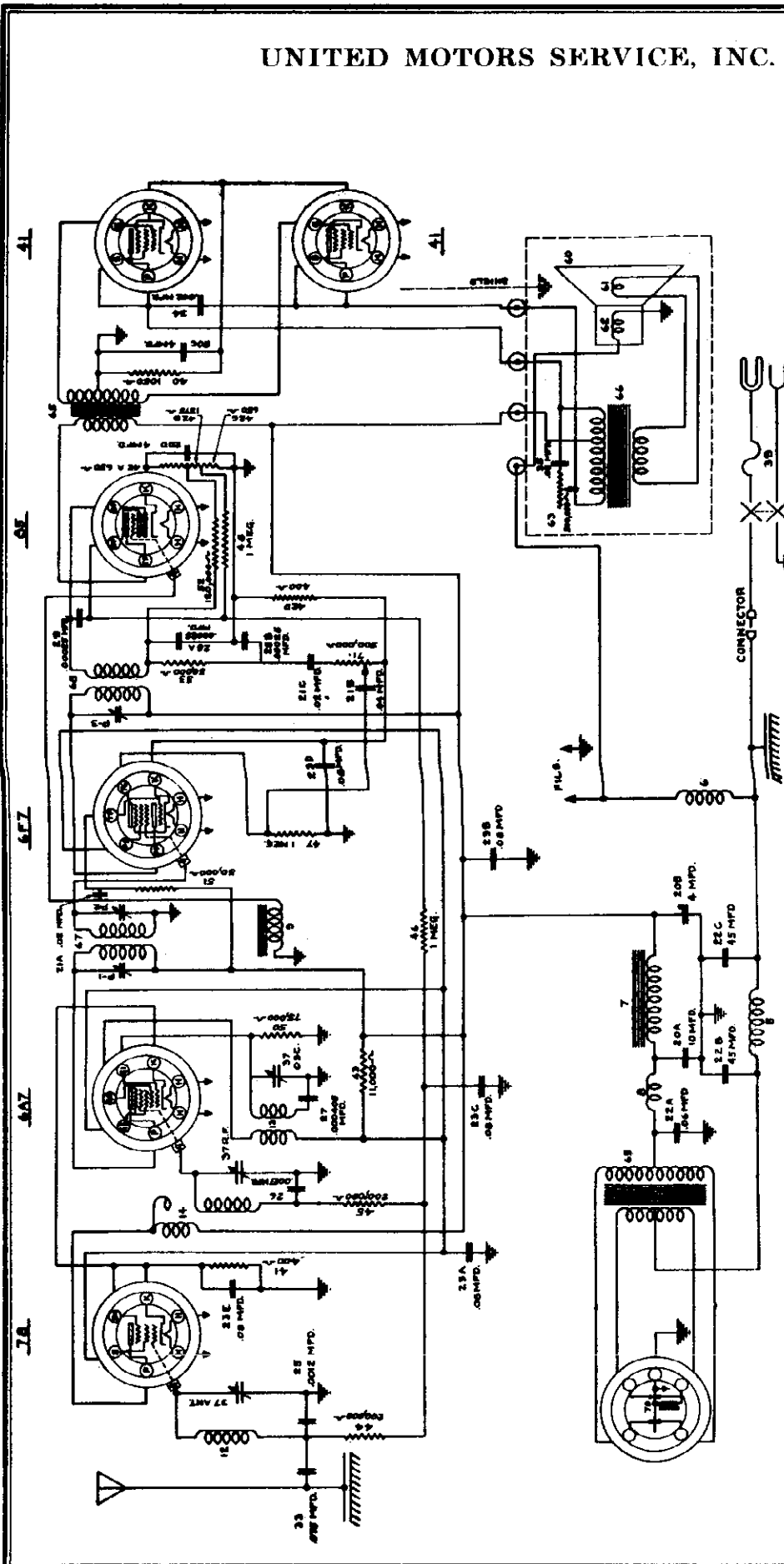
VOLTAGE TABLE

Type	Function	H	P	S	PT	G1	G2	G3	W
6F7	R.F.	6	225	90	85	0	-	-	2.5
6A7	Det-Osc.	6	225	90	-	-	0	145	2.5
6B7	I.F.--2nd Det-AVC	6	225	90	-	-	-	-	10.0
41	Output	6	220	225	-	-	-	-	16.0
41	Output	6	220	225	-	-	-	-	16.0

NOTE: Ampere drain of set at 6 volts is 5.8 amperes
Milliampere drain from "B" supply is approximately 55 M.A.

UNITED MOTORS SERVICE, INC.

MODELS 601525, 6011
Chevrolet
Schematic, Voltage



MODEL 601525 SAME AS MODEL 601176, BUT HAS DIFFERENT TYPE OF VOLUME CONTROL AND VARIABLE GANG CONDENSER

VOLTAGE CHART

TYPE	FUNCTION	H	Pp	S	Tp	Gt	G	G1	G2	G3,5	K
78	R.F.	6	240	130	-	-	0	-	-	-	8.0
6A7	Det-Osc.	6	240	130	-	-	0	0	130	130	8.0
6F7	I.F.-AF	6	240	130	115	0	0	-	-	-	4.5
85	Det-2nd AF	6	-	-	235	0	0	-	-	-	16.5
41	Output	6	240	240	-	-	-	-	-	-	23.0

Date: _____

MODELS 601525, 601176

Chevrolet

UNITED MOTORS SERVICE, INC.

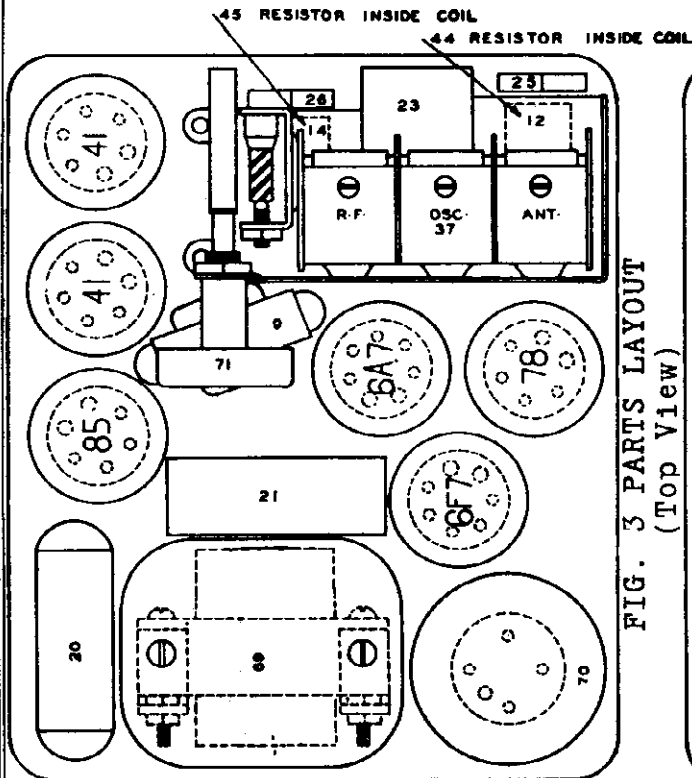
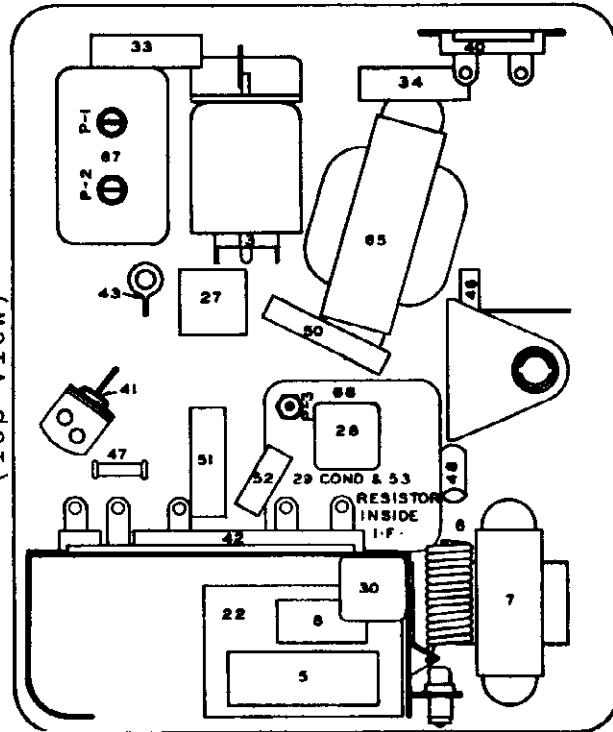
Socket, Trimmers, Chassis
Alignment, ChangesFIG. 3 PARTS LAYOUT
(Top View)

FIG. 2 PARTS LAYOUT (Bottom View)

CIRCUIT CHANGES

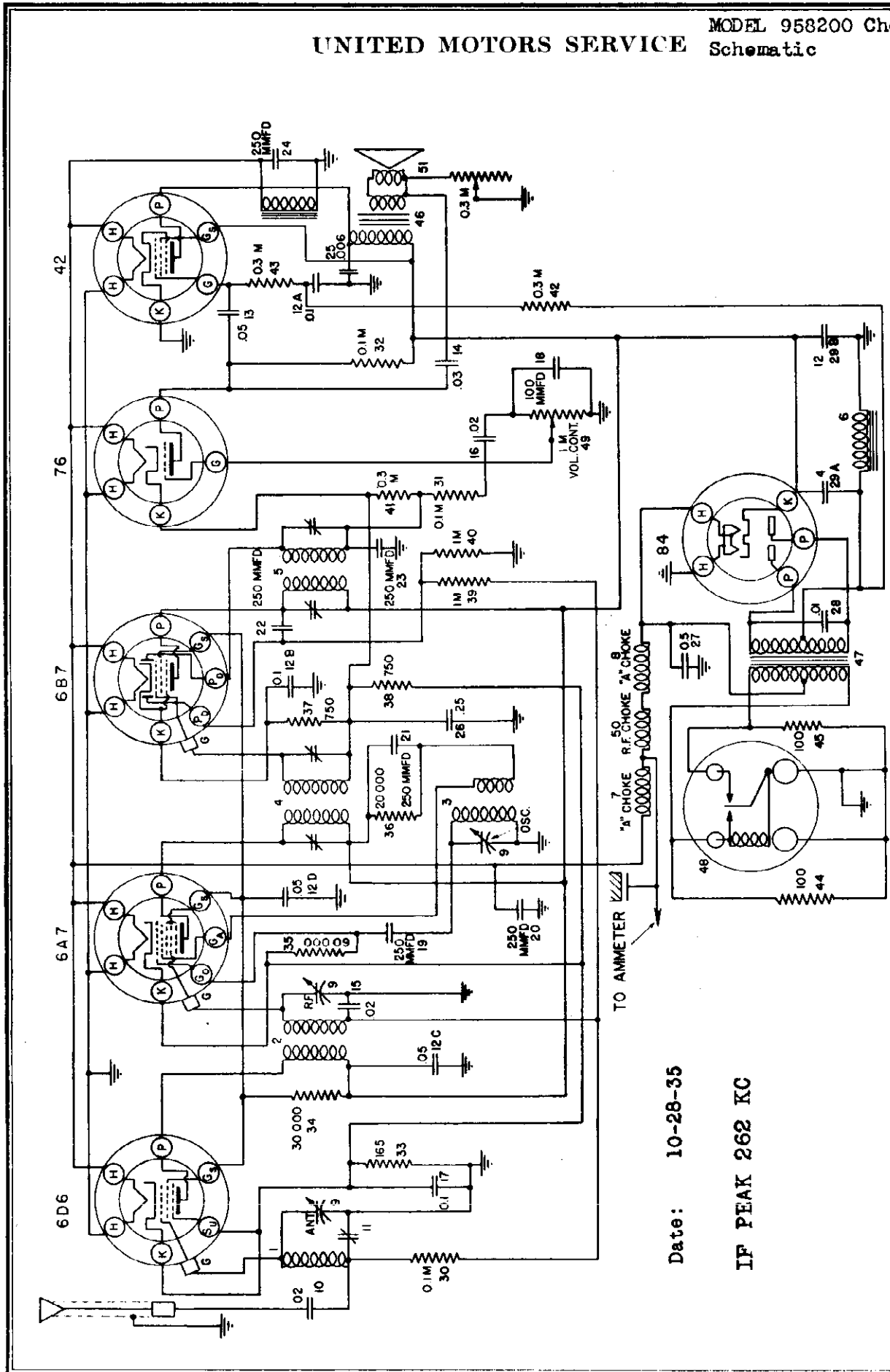
A number of the early receivers have $\frac{1}{4}$ mfd. tubular condenser mounted above the candohm resistor, illustration #42 on Figure 2 and connected in parallel with the 85 tube cathode by-pass section 20D of the #1209144 electrolytic condenser block. The use of the tubular condenser was necessary in production to reduce the R.F. resistance of the 85 cathode by-pass. A change has been made in the design of the condenser block, making the use of the tubular condenser unnecessary. All of the service parts replacement stock of #1209144 electrolytics are of the new design and it is immaterial whether or not the tubular condenser is left in the receiver when replacing the electrolytic condenser block.

It may be noted on some of the earlier receivers that there is a small condenser in a metal case mounted below the candohm resistor, Illus. #42, Fig. 2, with two terminals that are not connected. This condenser was originally placed in the set to filter vibrator interference, but it was found after production started that two small condensers mounted in the vibrator unit were more effective and the external condenser was simply disconnected.

CONVENTIONAL ALIGNMENT-SEE SPECIAL SECTION

Generator frequency at 262 KC, connected thru 1 MFD condenser to the grid of the 6A7 tube. Grid clip is not disturbed. Peak trimmers P3, then P2 and P1.

Generator connected direct to the antenna lead of receiver. Frequency set at 1530 KC. Rotor plates of gang condenser completely out of mesh. Adjust the OSC section parallel trimmer (middle section) to peak. Then adjust the parallel trimmers of the front and rear sections, to maximum peak. Generator then set to 1400 KC. The rotor of variable condenser adjusted until heard. Peak front and rear sections at this frequency. No oscillator padding required.



Date: 10-28-35

IF PEAK 262 KC

FIG. 1--Chevrolet Model 958200 Circuit Diagram

MODEL 958200 Chevrolet
Alignment, Voltage
Parts

UNITED MOTORS SERVICE

CHASSIS ELECTRICAL PARTS

Illus. No.	Part No.	Part Name	Description
1	1210652	Coil	Antenna
2	1210653	Coil	R-F
3	1209345	Coil	Oscillator
4	1210654	Coil Assy.	1st I-F
5	1210655	Coil Assy.	2nd I-F
6	1209603	Coil	"B" filter choke
7, 8	1210656	Coil	"A" filter choke
9	1210657	Condenser	3 gang variable
10	1210658	Condenser	Tubular .02 mfd. 200 V
11	1210659	Condenser	Antenna trimmer
12	1210660	Condenser	By-pass block
13	1209308	Condenser	Tubular .05 mfd. 400 V
14	1209625	Condenser	Tubular .03 mfd. 400 V
15	1209307	Condenser	Tubular .02 mfd. 200 V
16	1209307	Condenser	Tubular .02 mfd. 200 V
17	1209306	Condenser	Tubular .1 mfd. 200 V
18	1210275	Condenser	Molded .0001 mfd.
19, 20, 21	1209796	Condenser	Molded .00025 mfd.
22, 23, 24	1209796	Condenser	Molded .00025 mfd.
25	1209314	Condenser	Tubular .006 mfd. 400 V
26	1209817	Condenser	Tubular .25 mfd. 200 V
27	1210661	Condenser	Tubular .5 mfd. 160 V
28	1209805	Condenser	Oil filled .01 mfd. 1000 V
29	1210662	Condenser	Electrolytic block
30, 31, 32	1209883	Resistor	Carbon 100 M ohms 1/3 watt
33	1208140	Resistor	Flexible 165 ohms 1/2 watt
34	1208682	Resistor	Carbon 30,000 ohms 1 watt
35	1208320	Resistor	Carbon 60,000 ohms 1/3 watt
36	1209405	Resistor	Carbon 20,000 ohms 1/3 watt
37, 38	1208800	Resistor	Flexible 750 ohms 1/2 watt
39, 40	1209885	Resistor	Carbon 1 megohm 1/3 watt
41, 42, 43	1209884	Resistor	Carbon 300 M ohms 1/3 watt
44, 45	1209015	Resistor	Flexible 100 ohms 1/2 watt
46	1205623	Transformer	Output
47	1210663	Transformer	Power
48	5040000	Vibrator	Non-synchronous
49	1210664	Volume Control	1 megohm
50	1210665	Coil	Motor noise choke
			MISCELLANEOUS
Part No.	Part Name	Description	
1210669	Cover	Tube lid	
1210066	Screw	Chassis to case (P.K. #5x3/4")	
1209558	Socket	Speaker	

GENERAL: The Chevrolet Model 958200 is a six tube receiver with a "Dome" type speaker, instrument panel tuning control and tone control. This receiver was designed specifically for 1936 Model Chevrolets and for use on the under-car antenna system required.

Antenna System: The antenna system used with this receiver consists of an assembly of two rubberized metal strips for mounting below each running board with special brackets.

TUBE COMPLEMENTS

The tubes used in this receiver are: 6D6 R-F Amplifier, 6A7 Oscillator-Modulator, 6B7 I-F Amplifier-Diode Detector-A.V.C., 76 1st A-F Amplifier, 42 Power Output and a type 84 Rectifier.

CIRCUIT ALIGNMENT

If Alignment is found necessary -- make all adjustments with chassis in its case and use a calibrated test oscillator and output meter. To align the I-F stages -- feed a test oscillator signal of 262 K.C. into the grid of the 6A7 tube (leave grid clip in place) through a .25 mfd. condenser and adjust the four trimmers located on top of the I-F coils. To align R-F stages -- change the test oscillator setting to 1560 K.C. and feed this signal into the antenna connection on the receiver through a .0002 mfd. condenser. Turn the condenser plates until they are completely out of mesh and adjust the oscillator parallel trimmer on the middle section of the condenser gang. Change test oscillator setting to 1400 K.C. and turn condenser plates until the signal is tuned in. Then adjust the trimmers for the other two sections of the condenser gang. Change the test oscillator setting to 800 K.C. and adjust the antenna compensating condenser, (located through a small hole in the tuning control side of the chassis case) while rocking the tuning condenser plates back and forth slightly. Recheck alignment of the antenna parallel trimmer on condenser gang at 1400 K.C.

TUBE SOCKET VOLTAGES

Tube	H	F	Ga	Gc	I
6D6	6	240	100	-	3.5
6A7	6	140	100	160	3.5
6B7	6	130	100	-	3.5
76	6	130	-	-	8.0
42	6	220	240	-	0
84	5.6	-	-	-	240

NOTE

Ken-Rad 6D6 tubes were used in the R-F Stages of some of these receivers -- in using National Union tubes for replacement the alignment of the "Ant" section of the condenser gang should be checked because of a possible difference in internal capacities of the two makes of tubes.

MODEL 982006 Olds
Alignment, Change

UNITED MOTORS SERVICE

4. Aligning at 1400 Kilocycles

Remove the signal lead of the test oscillator from the grid of the 6D6 Trans-lator tube and connect to the antenna terminal of the receiver THROUGH A .002 MICA CONDENSER connected in place of the .1 mfd. condenser previously used. (It is very important that a .002 mfd. mica condenser be used in aligning the antenna stage of these receivers in order that this circuit can be made to track properly. Some test oscillators have this condenser included and if the capacity is correct, it will not be necessary to use an external series condenser.) Set the test oscillator to 1400 K.C. Turn the condenser rotor plates until the frequency is tuned in with maximum output. Adjust the R-F parallel trimmer on the condenser gang (illus. #9B, Fig. 3) and the antenna compensating condenser (illus. #21, Fig. 4) located on the side of the receiver case for maximum output.

5. Aligning at 600 Kilocycles

The oscillator padding condenser was previously adjusted at 540 K.C., how-ever, it is necessary in most cases to repeak the oscillator tracking con-denser at 600 K.C. in order to make the receiver track properly and to secure full sensitivity.

Set the test oscillator on 600 K.C. Turn the condenser rotor plates until the signal from the test oscillator is tuned in with maximum output. Main-tain a low output signal from the test oscillator and readjust the oscil-lator tracking condenser (illus. #4, Fig. 4) while rocking the variable condenser gang tuning shaft back and forth through the signal. This op-eration should be continued until no further increase in output can be obtained.

SUBJECT--CHANGE IN "CIRCUIT ALIGNMENT" PROCEDURE
 OLDS RADIO #982006 Date: 6-25-36

Oldsmobile radios #982006 were shipped from the factory with their oscil-lator circuits high frequency adjustment made at either 1560 or 1540 K.C.

ADJUSTING OSCILLATOR CIRCUIT

Sets adjusted at 1540 K.C. by the factory will not tune to 1560 K.C. un-less the oscillator trimmer is screwed out too far. If re-alignment of any of these radios is found necessary, make the high frequency adjustment of the oscillator section of the condenser gang at 1540 instead of 1560 K.C. as indicated in the "CIRCUIT ALIGNMENT" procedure. All other ad-justments of the receiver circuits should be made as indicated under "CIRCUIT ALIGNMENT".

CHECKING ALIGNMENT

If it is found in checking the receiver alignment with a test oscillator that the receiver will tune to 1560 K.C., it will not be necessary to re-set the oscillator section of the condenser gang to 1540 K.C. That is, unless the oscillator coil has been replaced, in which case the adjustment should be made at 1540 K.C.

1. Peaking I-F Stages at 262 Kilocycles

IMPORTANT: The "Local-Distance" switch on the tuning control used with this receiver is used to control the alignment of the first I-F coil wind-ings. The capacity existing between the leads and the shielding of the cable connecting to the switch in the tuning control is part of the I-F tuned circuit and must be taken into consideration when aligning the I-F stages.

In order to duplicate this capacity and provide facilities for switching from "Local to Distance" a "TEST AND ALIGNMENT CABLE" (Part #1210201) has been made available. This cable eliminates the necessity of removing the tuning control from the car.

(a) Connect the signal lead of the test oscillator to the grid cap of the 6D6 Translator Tube through a .1 mfd. condenser, leaving the tube's grid clip in place. Connect the ground lead of the test oscillator to the chassis frame.

(b) Insert the four prong plug of the "TEST AND ALIGNMENT CABLE" of the tuning control cable into the socket provided on the receiver chassis. Turn switch on test cable or tuning control to "DISTANCE" position. (If the receiver is aligned with the switch in the "local" position, the "Local-Distance" switch will operate backwards.)

(c) Set the test oscillator to exactly 262 K.C.

(d) Adjust the trimmers on the I-F coils (illus. 5 and 6, Fig. 4) for maximum output. These adjustments should be repeated several times and during alignment the test oscillator output should be kept to as low a value as is consistent with obtaining a readable indication on the output meter.

2. Aligning at 1560 Kilocycles

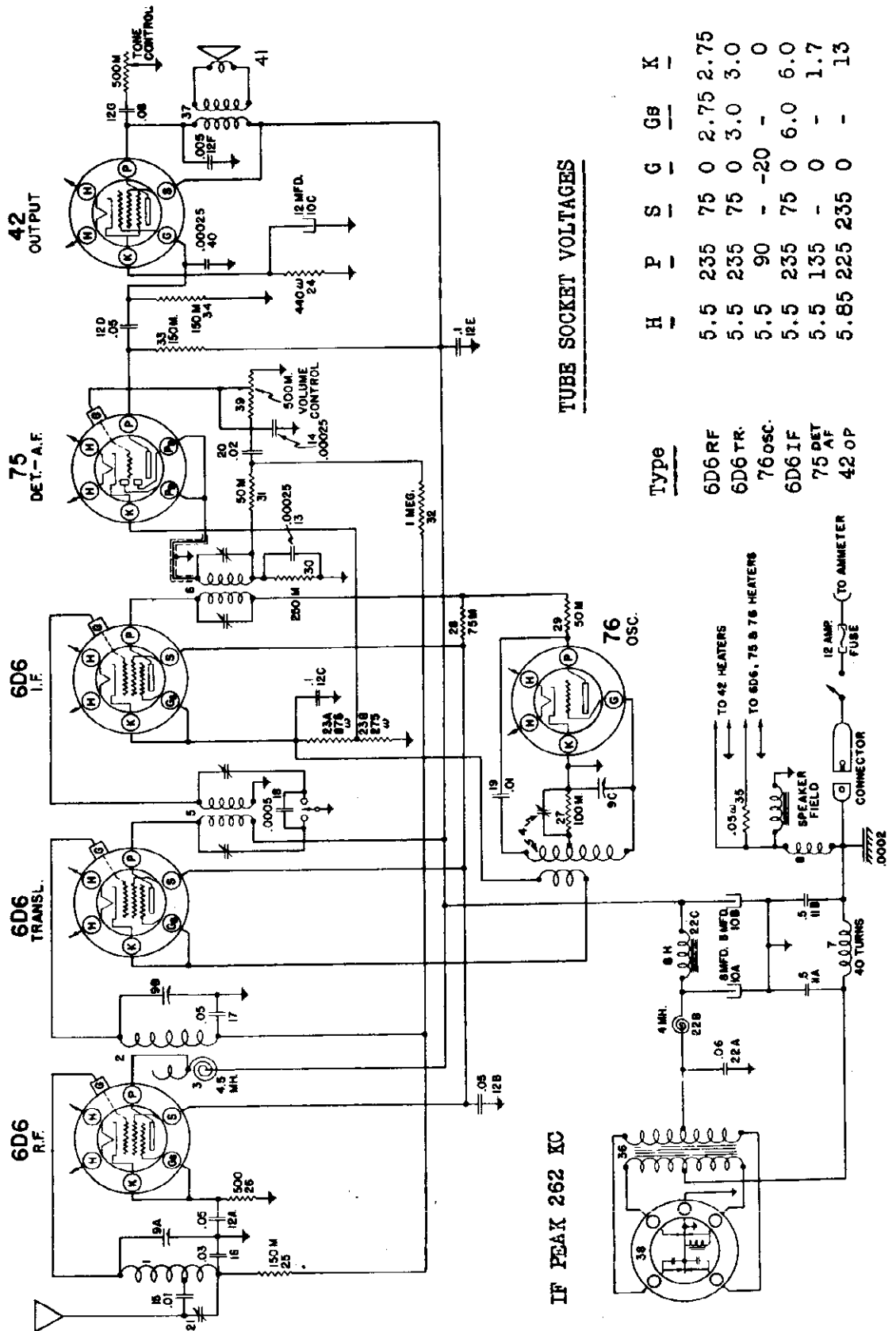
Leave the test oscillator leads connected the same as for aligning the I-F circuits. Turn the rotor plates of the gang condenser all the way out and against the high frequency stop. Set the test oscillator to 1560 kilo-cycles. Adjust the parallel trimmer for the oscillator section of the condenser gang (illus. 9, Fig. 3) for maximum output. (It is very impor-tant that this frequency be set accurately as a slight missetting will cause the receiver to be out of track over the entire high frequency end of the dial.

3. Aligning at 540 Kilocycles

Leave test oscillator leads connected the same as before. Turn the rotor plates of the gang condenser all the way into mesh so that they rest against the low frequency stop. Set the test oscillator to 540 K.C. Adjust the oscillator padding condenser (illus. #4, Fig. 4) located on the under-side of the receiver sub-panel to maximum output. (This adjustment sets the low frequency tuning range of the receiver to 540 K.C.)

UNITED MOTORS SERVICE

MODEL 982006 Olds
Schematic, Voltage



TUBE SOCKET VOLTAGES

Type	H	P	S	G	GB	X
6D6 RF	5.5	235	75	0	2.75	2.75
6D6 TR.	5.5	235	75	0	3.0	3.0
76 OSC.	5.5	90	-	-20	-	0
6D6 IF	5.5	235	75	0	6.0	6.0
75 DET. AF	5.5	135	-	0	-	1.7
42 OP	5.85	225	235	0	-	13

NOTE: Readings taken from tube socket contacts to ground with a D.C. voltmeter having a resistance of 1000 ohms per volt.

Olds Model 982006

19 6 35

MODEL 982006 Olds
 Socket, Trimmers
 Chassis, Note

UNITED MOTORS SERVICE

Overall Oscillation:— On some of the first production of these receivers, overall oscillation was noticed in tuning to resonance on a station. On sets having this trouble--examine the receiver chassis to see if a .00025 mfd. condenser is connected between the 42 tube control grid and ground. (This condenser is shown as Illus. #40 on Fig. 4.) If this condenser is not used--connect a part #1209055 condenser from the 42 tube control grid to ground. This condenser was used in the later production of these receivers and should eliminate all trouble from this source.

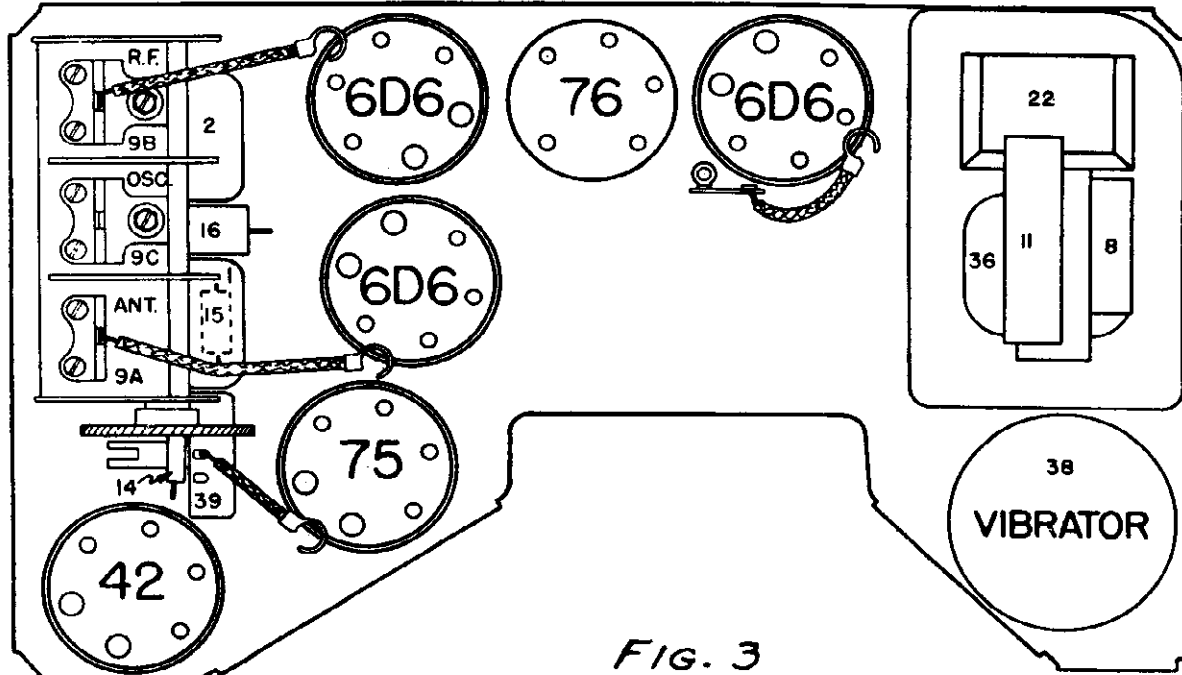


FIG. 3

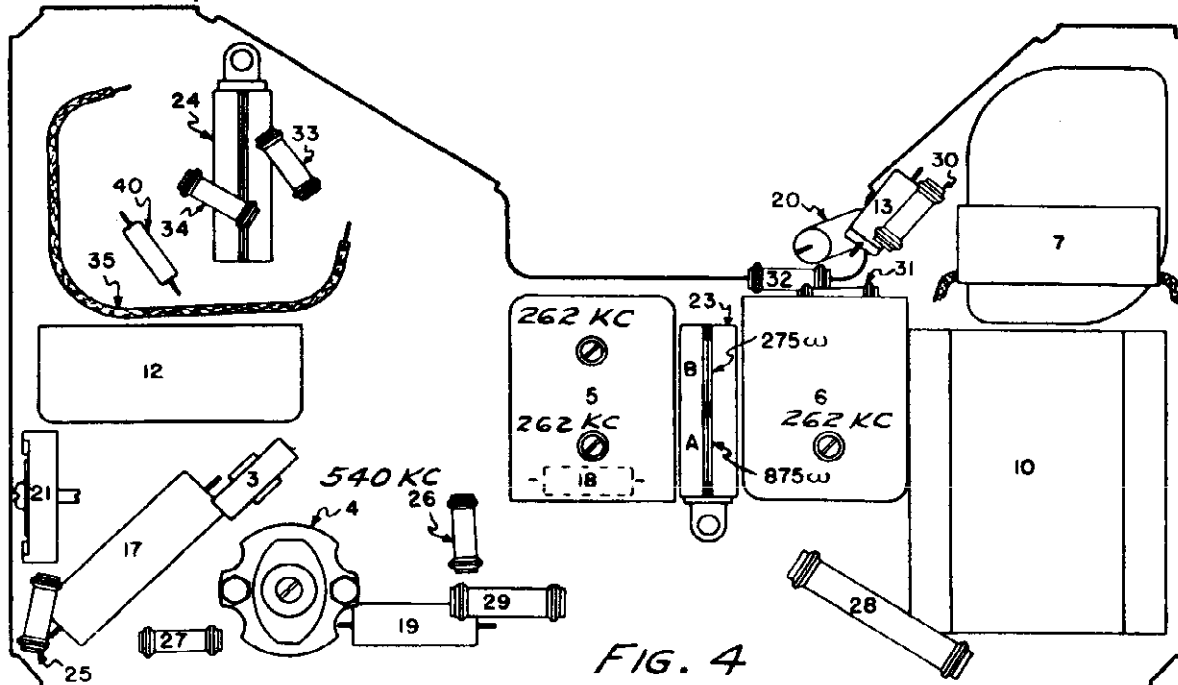
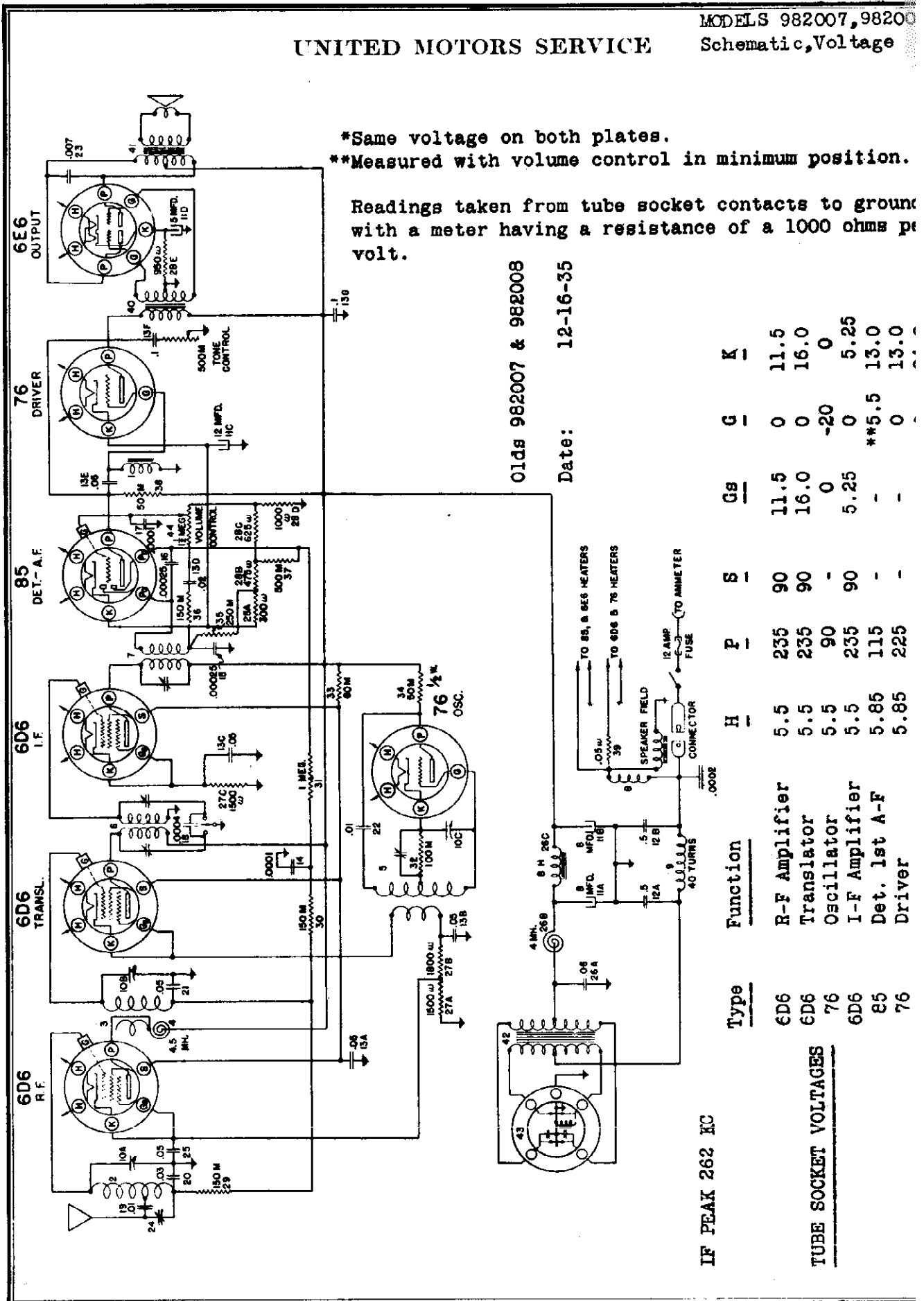


FIG. 4

UNITED MOTORS SERVICE



*Same voltage on both plates.
 **Measured with volume control in minimum position.

Readings taken from tube socket contacts to ground with a meter having a resistance of a 1000 ohms per volt.

Olds 982007 & 982008

Date: 12-16-35

IF PEAK 262 KC	Type	Function	H	P	S	GS	G	K
6D6	R-F Amplifier	5.5	235	90	-	11.5	0	11.5
6D6	Translator	5.5	235	90	-	16.0	0	16.0
76	Oscillator	5.5	90	-	-	0	-20	0
6D6	I-F Amplifier	5.5	235	90	-	5.25	0	5.25
85	Det. 1st A-F	5.85	115	-	-	-	**5.5	13.0
76	Driver	5.85	225	-	-	-	0	13.0

MODEL 982007, 982008

Olds

UNITED MOTORS SERVICE

Alignment, Change

4. Aligning at 1400 Kilocycles

Remove the signal lead of the test oscillator from the grid of the 6D6 Translater tube and connect to the antenna terminal of the receiver THROUGH A .0002 MICA CONDENSER connected in place of the .1 mfd. condenser previously used. It is very important that a .0002 mfd. mica condenser be used in aligning the antenna stage of these receivers in order that this circuit can be made to track properly. Some test Oscillators have this condenser included and if the capacity is correct, it will not be necessary to use an external series condenser. Set the test oscillator to 1400 K.C. Turn the condenser rotor plates until the frequency is tuned in with maximum output. Adjust the B-F parallel trimmer on the condenser gang (illus. #10B, Fig. 2) and the antenna compensating condenser (illus. #24, Fig. 3) located on the side of the receiver case for maximum output.

5. Aligning at 600 Kilocycles

The oscillator padding condenser was previously adjusted at 540 K.C., however, it is necessary in most cases to repeak the oscillator tracking condenser at 600 K.C. in order to make the receiver track properly and to secure full sensitivity.

Set the test oscillator on 600 K.C. Turn the condenser rotor plates until the signal from the test oscillator is tuned in with maximum output. Maintain a low output signal from the test oscillator and readjust the oscillator tracking condenser (illus. #5, Fig. 3) while rocking the variable condenser gang tuning shaft back and forth through the signal. This operation should be continued until no further increase in output can be obtained.

SUBJECT--CHANGE IN "CIRCUIT ALIGNMENT" PROCEDURE

OLDS RADIOS 982007 & 982008 were shipped from the factory with their oscillator circuits high frequency adjustment made at either 1560 or 1540 K.C.

ADJUSTING OSCILLATOR CIRCUIT

Sets adjusted at 1540 K.C. by the factory will not tune to 1560 K.C. unless the oscillator trimmer is screwed out too far. If re-alignment of any of these radios is found necessary, make the high frequency adjustment of the oscillator section of the condenser gang at 1540 instead of 1560 K.C. as indicated in the "CIRCUIT ALIGNMENT" procedure. All other adjustments of the receiver circuits should be made as indicated under "CIRCUIT ALIGNMENT".

CHECKING ALIGNMENT

If it is found in checking the receiver alignment with a test oscillator that the receiver will tune to 1560 K.C., it will not be necessary to re-set the oscillator section of the condenser gang to 1540 K.C. That is, unless the oscillator coil has been replaced, in which case the adjustment should be made at 1540 K.C.

Be sure to check your test oscillator for correct calibration against known station frequencies before making any receiver adjustments.

CIRCUIT ALIGNMENT

1. Peaking I-F Stages at 262 Kilocycles

IMPORTANT: The "Local-Distance" switch on the tuning control used with these receivers is used to control the alignment of the first I-F coil windings. The capacity existing between the leads and the shielding of the cable connecting to the switch in the tuning control is part of the I-F tuned circuit and must be taken into consideration when aligning the I-F stages.

In order to duplicate this capacity and provide facilities for switching from "Local to Distance" a "TEST AND ALIGNMENT CABLE" (Part #1210201) has been made available. This cable eliminates the necessity of removing the tuning control from the car.

(a) Connect the signal lead of the test oscillator to the grid cap of the 6D6 Translater Tube through a .1 mfd. condenser, leaving the tubes grid clip in place. Connect the ground lead of the test oscillator to the chassis frame.

(b) Insert the four prong plug of the "TEST AND ALIGNMENT CABLE" of the tuning control cable into the socket provided on the receiver chassis. Turn switch on test cable or tuning control to "DISTANCE" position. (If the receiver is aligned with the switch in the "Local" position, the "Local-Distance" switch will operate backwards.)

(c) Set the test oscillator to exactly 262 K.C.

(d) Adjust the trimmers on the I-F coils (illus. 6 and 7, Fig. 3) for maximum output. These adjustments should be repeated several times and during alignment the test oscillator output should be kept to as low a value as is consistent with obtaining readable indication on the output.

2. Aligning at 1560 Kilocycles

Leave the test oscillator leads connected the same as for aligning the I-F circuits. Turn the rotor plates of the gang condenser all the way out and against the high frequency stop. Set the test oscillator to 1560 kilocycles. Adjust the parallel trimmer for the oscillator section of the condenser gang (illus. 10C, Fig. 2) for maximum output. (It is very important that this frequency be set accurately as a slight missetting will cause the receiver to be out of track over the entire high frequency end of the dial.)

3. Aligning at 540 Kilocycles

Leave test oscillator leads connected the same as before. Turn the rotor plates of the gang condenser all the way into mesh so that they rest against the low frequency stop. Set the test oscillator to 540 K.C. Adjust the oscillator padding condenser (illus. #5, Fig. 3) located on the under-side of the receiver sub-panel to maximum output. (This adjustment sets the low frequency tuning range of the receiver to 540 K.C.)

UNITED MOTORS SERVICE

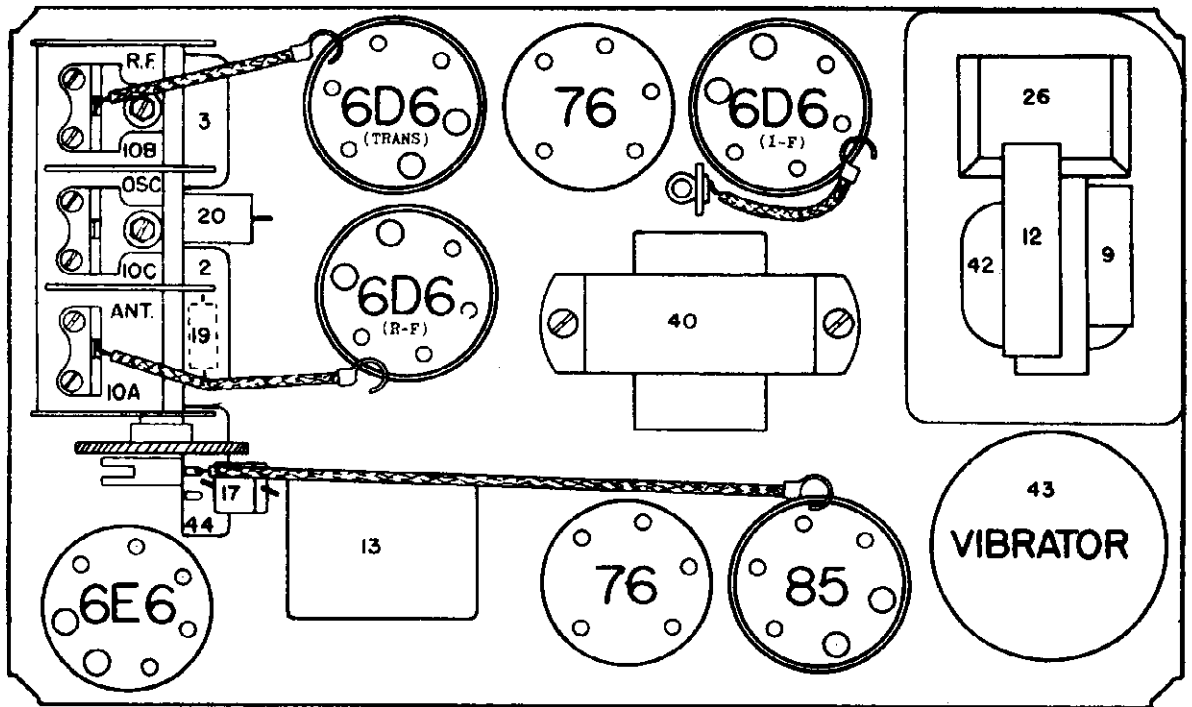
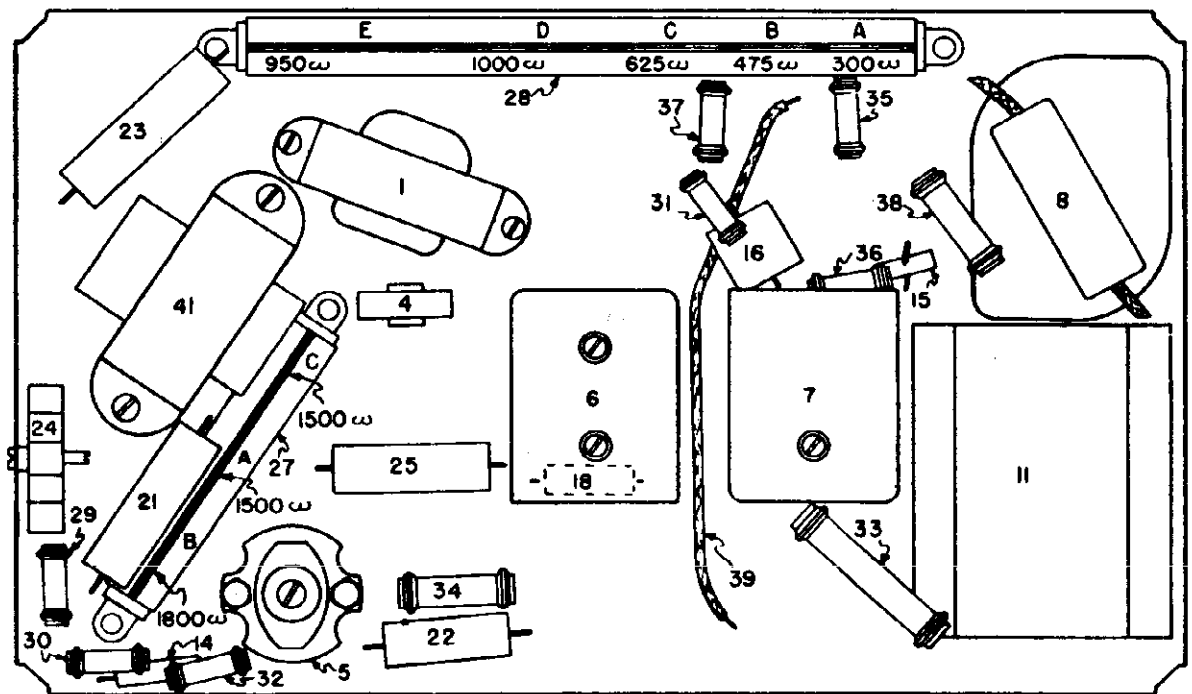
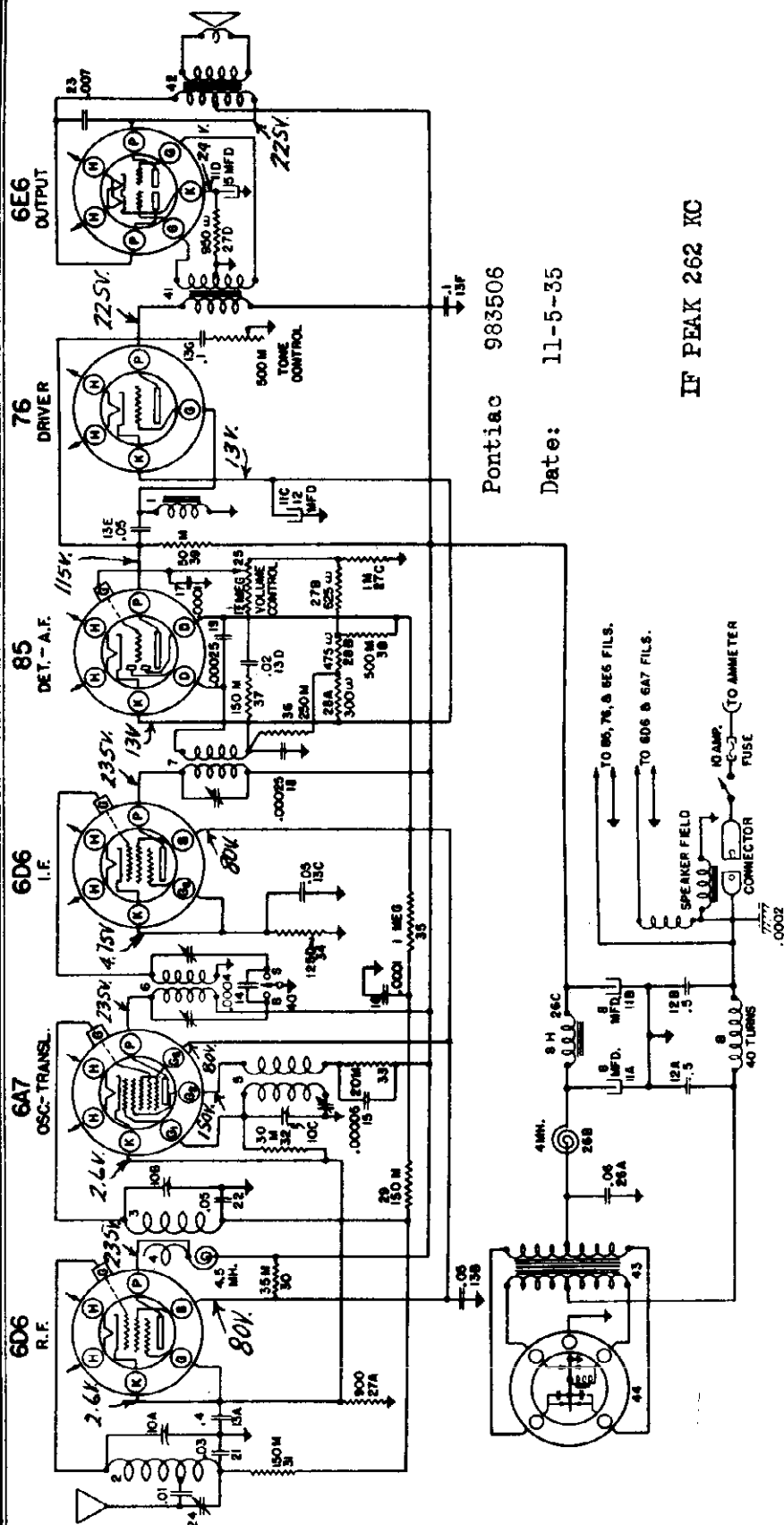


FIG. 2 PARTS LAYOUT--Top View



MODEL 983506 Pontiac
Schematic, Voltage
Alignment

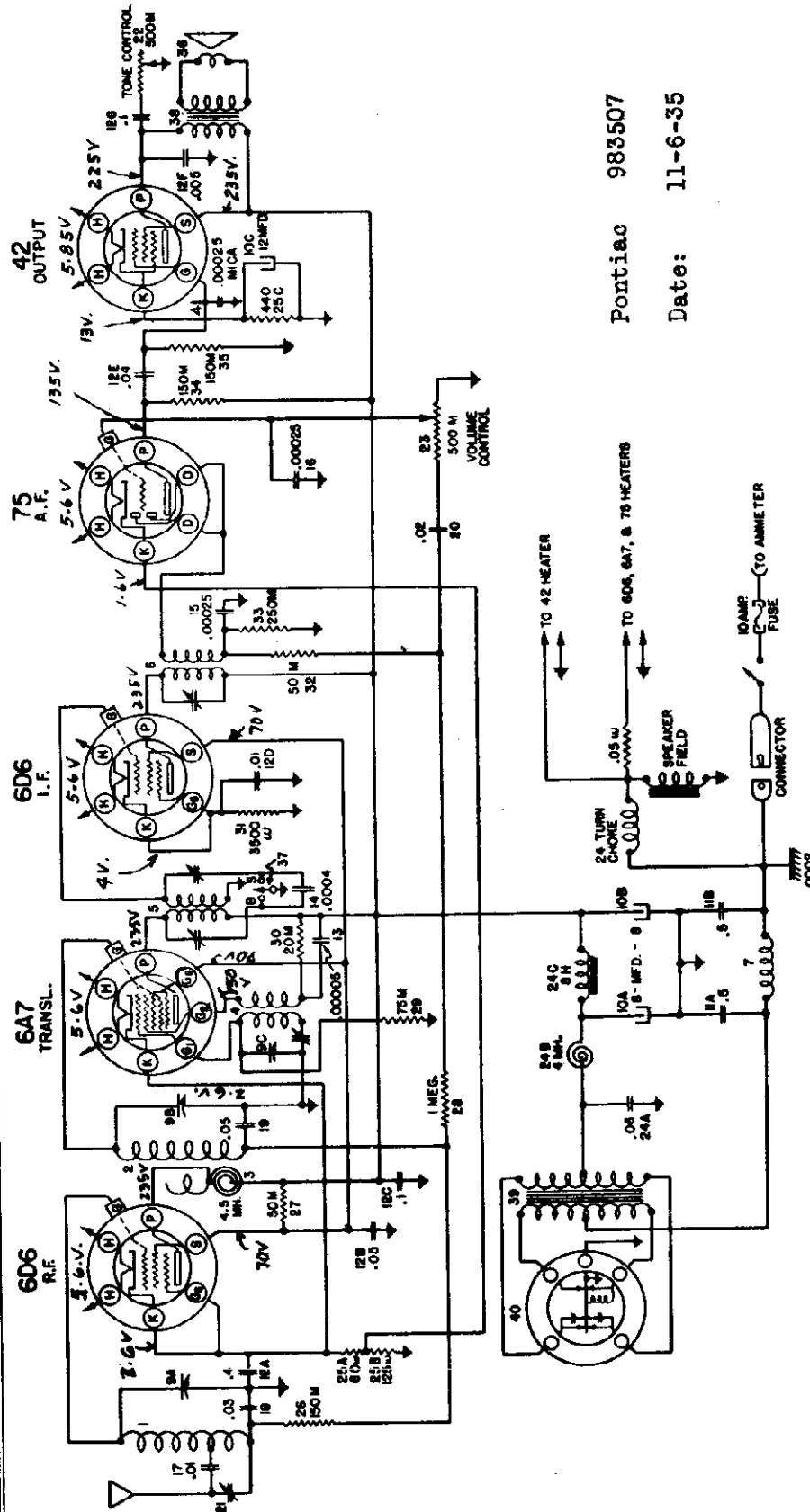
UNITED MOTORS SERVICE



Feed 262-kc. signal to control grid of 6A7. Use 0.25-mf condenser as dummy antenna. Adjust the three trimmers on top of the i-f coils. (Be sure "Local-Distance" switch is in "Distance" position) Feed signal of 1560 kc to antenna post through a 0.002-mf condenser dummy. Turn condenser plates completely out of mesh. Adjust Osc. trimmer-- middle section of condenser gang. Set signal generator and dial to 600 kc. Adjust Osc. tracking condenser (on bottom of chassis) while rocking the gang condenser plates. Set signal generator and dial to 1400 kc. Adjust the r-f trimmer on the condenser gang. Recheck Osc. trimmer of condenser gang at 1560 kc.

UNITED MOTORS SERVICE

MODEL 983507 Pontiac
Schematic, Voltage
Alignment



ALIGNMENT - To align the I-F stages -- feed a test oscillator signal of 262 K.C. into the control grid of the 6A7 tube through a .25 mfd. condenser and adjust the three trimmers located on top of the I-F coils (Make sure that the "Local-Distance" switch is in the "Distance" position). To align the R-F circuits - change the test oscillator frequency to 1560 K.C. into antenna connection on receiver through a .0002 mfd. condenser. Turn the condenser plates until they are completely out of mesh and against the high frequency stop. Adjust the oscillator trimmer on the middle section of the condenser gang. Change test oscillator frequency to 540 Kilocycles and turn condenser plates until this signal is tuned in (approximately 600 K.C. position of plates) and adjust the oscillator tracking condenser located on the bottom of the chassis while rocking the condenser gang plates back and forth slightly, until maximum output is obtained. Change test oscillator setting to 1400 K.C. and turn condenser plates until this signal is tuned in. Adjust the R-F trimmer on the condenser gang. Re-check the setting of the osc.

MODELS 985100, 985300

985301, 985400

Chevrolet

UNITED MOTORS SERVICE

Alignments

CHEVROLET MODEL 985100 - ALIGNMENT1. Aligning I-F Stages at 262 Kilocycles

- Connect the signal lead of the test oscillator to the grid cap of the 6A7 tube, through a .1 mfd. condenser, leaving the tube's grid clip in place.
- Connect the ground lead of the test oscillator to the chassis frame.
- Set the test oscillator to exactly 262 K.C.
- Adjust the trimmers on the I-F coils (illus. 5 and 6) carefully for maximum output. These adjustments should be repeated several times and during alignment the test oscillator output should be kept to as low a value as is consistent with obtaining readable indication on the output meter.

2. Aligning at 1560 Kilocycles

- Leave the test oscillator leads connected the same as for aligning the I-F circuits.
- Turn the rotor plates of the gang condenser all the way out and against the high frequency stop.
- Set the test oscillator to 1560 kilocycles.
- Adjust the parallel trimmer for the oscillator section of the condenser gang (illus. 9C, Fig. 2) for maximum output. It is very important that this frequency be set accurately as a slight missetting will cause the receiver to be out of track over the entire high frequency end of the dial.

3. Aligning at 540 Kilocycles

- Leave test oscillator leads connected the same as before.
- Turn the rotor plates of the gang condenser all the way into mesh so that they rest against the low frequency stop.
- Set the test oscillator to 540 K.C.
- Adjust the oscillator tracking condenser (illus. #4, Fig. 3) located on the under-side of the receiver sub-panel to maximum output. (This adjustment sets the low frequency tuning range of the receiver to 540 K.C.)

4. Aligning at 1400 Kilocycles

- Remove the signal lead of the test oscillator from the grid of the 6A7 tube and connect to the antenna terminal of the receiver through a .0002 mica condenser connected in place of the .1 mfd. condenser previously used.
- Set the test oscillator to 1400 K.C.
- Turn the condenser rotor plates until this frequency is tuned in with maximum output.
- Adjust the R-F parallel trimmer on the condenser gang (illus. #9B, Fig. 2) and the antenna compensating condenser (illus. #16, Fig. 4) located on the side of the receiver case for maximum output.

5. Aligning at 600 Kilocycles

The oscillator padding condenser was previously adjusted at 540 K.C., however, it is necessary in most cases to repeak the oscillator tracking condenser at 600 K.C. in order to make the receiver track properly and to secure full sensitivity.

- Set the test oscillator on 600 K.C.
- Turn the condenser rotor plates until the signal from the test oscillator is tuned in with maximum output.
- Maintain a low output signal from the test oscillator and readjust the oscillator tracking condenser (illus. #4, Fig. 3) while rocking the variable condenser gang tuning shaft back and forth through the signal. This operation should be continued until no further increase in output can be obtained.

NOTE: If the entire alignment procedure has been accomplished correctly, the receiver should be very nearly uniformly sensitive over the entire frequency range.

CHEVROLET MODEL 985300 - ALIGNMENTCIRCUIT ALIGNMENT

If alignment is found necessary -- make all adjustments with chassis in its case and use a calibrated test oscillator and output meter. To align the I-F stages -- feed a test oscillator signal of 262 K.C. into the grid of the 6A7 tube (leave grid clip in place) through a .25 mfd. condenser and adjust the four I-F trimmers located on top of the I-F coils. This operation should be repeated until no further increase in output can be obtained. To align the R-F circuits -- change the test oscillator setting to 1560 K.C. and feed this signal into the antenna connection of the receiver through a .0002 mfd. condenser. Turn the condenser gang plates until they are completely out of mesh. Then adjust the oscillator parallel trimmer on the

middle section of the condenser gang. (The parallel trimmers for the condenser gang are accessible through the side of the chassis case by removing the "spring buttons"). Change test oscillator setting to 1400 K.C. and turn condenser plates until this signal is tuned in, then adjust the trimmers of the other two sections of the condenser gang. Change test oscillator setting to 600 K.C. and turn condenser plates until signal is tuned in having the greatest output (800 K.C. position of plates). Adjust the oscillator tracking condenser (accessible through a small hole in the chassis sub-panel between the condenser gang and the 6A7 tube) while rocking the condenser gang plates back and forth slightly until no further increase in output can be obtained. Recheck the alignment of the parallel trimmer for the middle section of the condenser gang at 1560 K.C.

CHEVROLET MODEL 985301 - ALIGNMENT1. Aligning the I-F Stages at 260 K.C.

The I-F Coil assemblies used in this receiver are "iron core" types and adjustment is made by varying the inductance as the capacity tuning the coil windings is fixed. The inductance is varied by changing the relative positions of the iron cores with the adjusting screws provided on the top and bottom of each I-F coil assembly.

- Feed a test oscillator signal of 260 K.C. into the control grid of the 6A7 tube (leave grid clip in place) through a .25 mfd. condenser. Keep the test oscillator leads away from the grid leads of other tubes.
- Adjust the set screw provided on the top and bottom of each I-F coil assembly. (See illustration 55 and 56, Figures 2 and 3.) Repeat these adjustments until maximum output is obtained.

2. Aligning the R-F Stages

The antenna coil used in this receiver is also an "iron core" type similar to the I-F's. Extreme care should be exercised in carrying out the following procedure to insure proper alignment of the antenna circuit.

- Change the test oscillator setting to 1560 K.C. and feed this signal into the control grid (cap) of the 6D6 R-F tube through a .25 mfd. condenser. Turn the condenser rotor plates until they are completely out of mesh and rest against the high frequency stop. Adjust the parallel trimmer for the oscillator section (center) of the gang condenser.
- Change the test oscillator setting to 600 K.C. and tune condenser gang to pick up this signal (at approximately 600 K.C.) and adjust the oscillator series condenser, (illustration #2, Figure 3) simultaneously rocking the gang condenser back and forth through the signal until maximum output results.
- Re-check setting of parallel trimmer for oscillator section (center) of the gang condenser as covered in paragraph (a).
- Feed a test oscillator signal of 600 K.C. through a .0002 mfd. (mica) condenser into the antenna connection on the receiver. Tune gang condenser to pick up this signal and adjust the screw of the antenna coil (illustration #31 on Fig. 3) simultaneously rocking the condenser gang plates back and forth until maximum output is obtained.
- Change test oscillator setting to 1400 K.C. and turn condenser gang plates until this signal is heard (at 1400 K.C.). Then adjust the parallel trimmers on the top and bottom sections of the gang condenser.
- Repeat paragraph (d) to see if further improvement can be made. If improvement results, repeat paragraph (a).

Bass Compensation--Tone Control: Bass Compensation is obtained at low audio outputs by by-passing some of the higher frequencies to ground, with a series condenser and resistor connected to a tap on the volume control. Tone control action is obtained by by-passing some of the higher frequencies present in the plate circuit of the 76 driver tube to ground, through a series condenser and rheostat. The audio signal voltage present in the 76 tube plate circuit is coupled to one of the voice coil leads in the speaker cable with a small condenser. The higher frequencies are by-passed to ground at the speaker with the tone control.

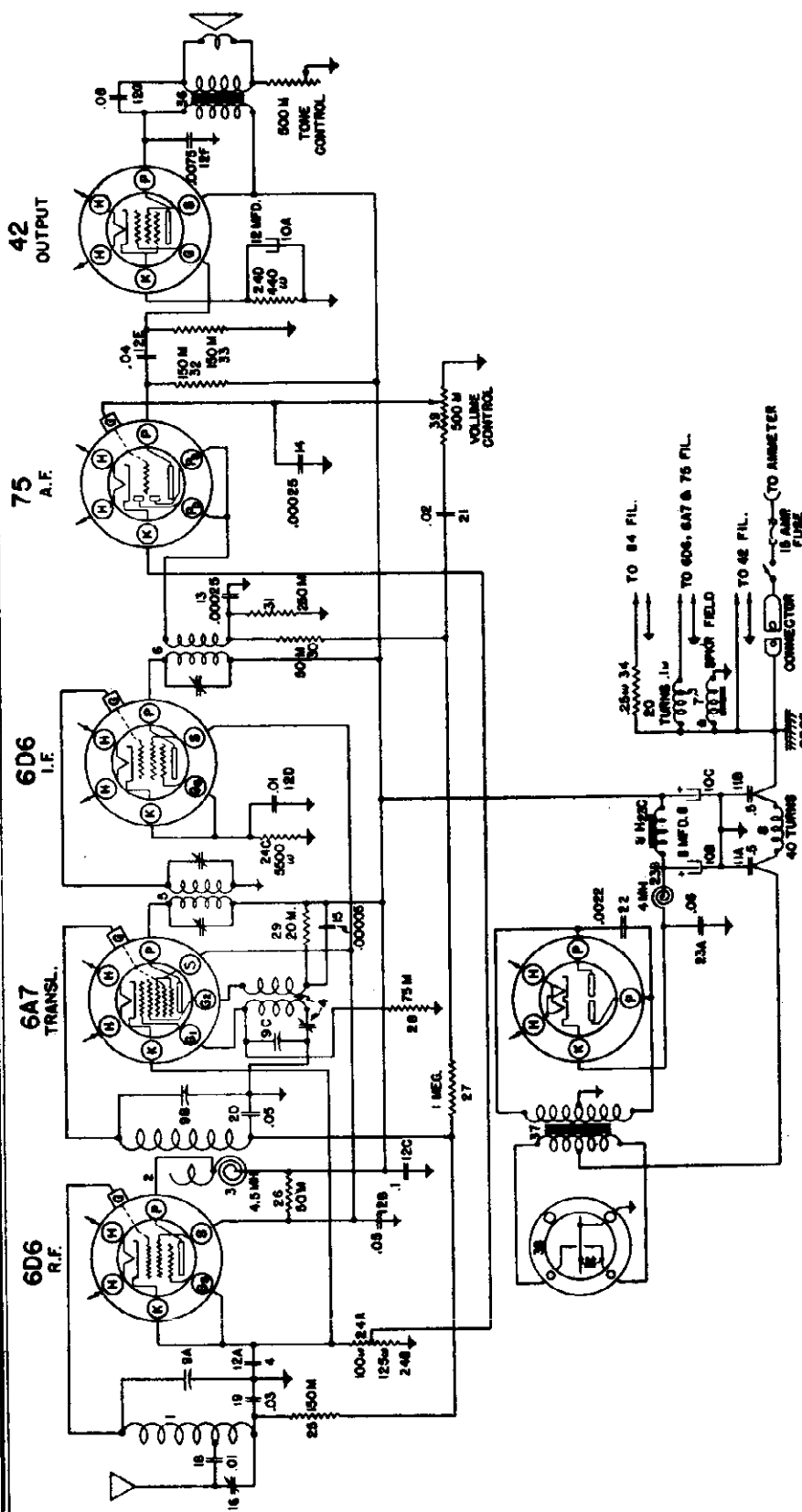
CHEVROLET MODEL 985400 - ALIGNMENTCIRCUIT ALIGNMENT

If alignment is found necessary--make all the adjustments with chassis in its case and use a calibrated test oscillator and output meter. To align the I-F Stages--feed a test oscillator signal of 262 K.C. into the control grid of the 6A7 tube (leave grid clip in place) through a .25 mfd. condenser and adjust the trimmers on the I-F coils for maximum output. Care should be taken to keep the test oscillator leads away from the grid leads of the other tubes in order to avoid inaccurate adjustments.

To align the R-F Stages--change the test oscillator setting to 1560 K.C. and feed this signal into the antenna connection on the chassis through a .0002 mfd. condenser. Turn the condenser rotor plates until they are completely out of mesh and adjust the parallel trimmer for the oscillator section (middle) of the condenser gang. Change the test oscillator setting to 1400 K.C. and turn condenser rotor plates until this signal is tuned in. Then adjust the trimmers for the other two sections of the condenser gang. Change test oscillator setting to 600 K.C. and adjust the antenna compensating condenser (located near the control shaft bushing) while rocking the tuning control plates back and forth slightly. Recheck alignment of the antenna section (see PARTS LAYOUT) of condenser gang for maximum output at 1400 K.C. It will also be necessary to readjust the antenna compensating condenser to the car antenna upon installation.

UNITED MOTORS SERVICE

MODEL 985100 Chevrolet Schematic, Voltage



TUBE SOCKET VOLTAGES

Type	Function	H	F	S	G _B	G ₁	G ₂	K
6D6	R-F Amplifier	5.7	230	70	2.75	-	-	2.75
6A7	Translator	5.7	230	70	-	20	150	2.75
6D6	I-F Amplifier	5.7	230	70	2.75	-	-	6.6
75	Det.-1st A-F	5.7	135	-	-	-	-	1.6
42	Output	6.0	220	235	-	-	-	13.0
84	Rectifier	5.7	*AC	-	-	-	-	240

IF PEAK 262 KC

CHEVROLET MODEL 985100

Date: 9-27-35

NOTE: Above readings taken from tube socket contacts to ground with a D.C. voltmeter having a resistance of 1000 ohms per volt.

MODEL 985100 Chevrolet
 Socket, Trimmers, Notes
 Chassis

UNITED MOTORS SERVICE

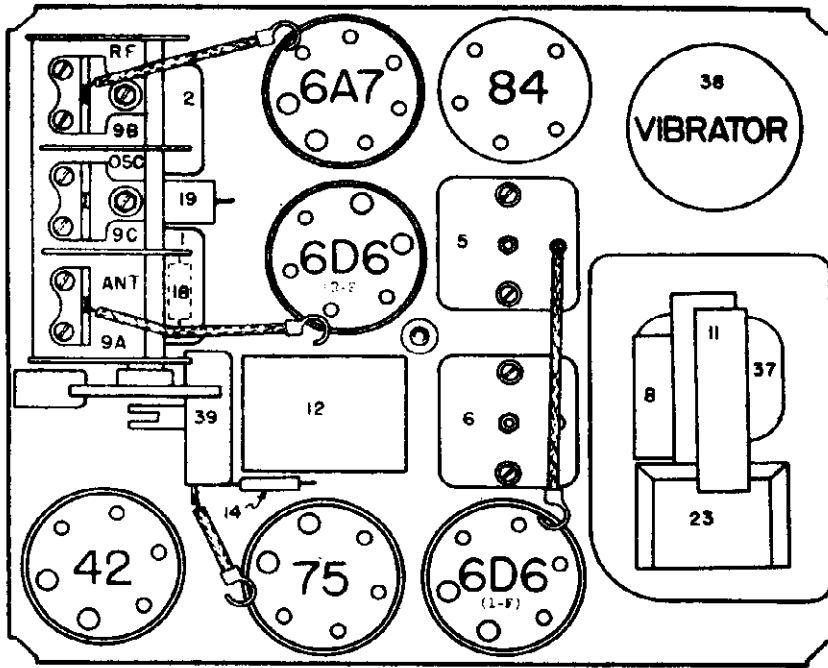


FIG. 2--PARTS LAYOUT--Top View

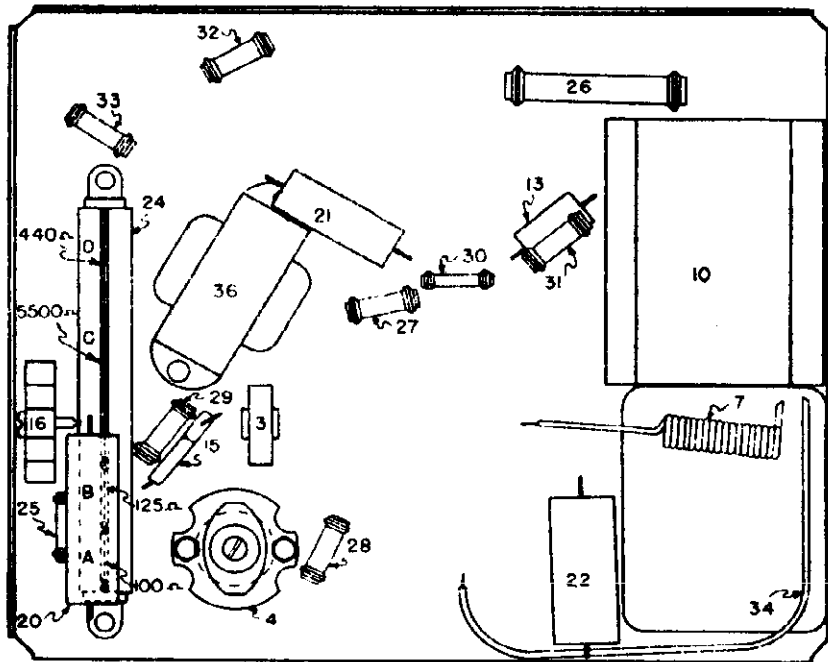


FIG. 3--PARTS LAYOUT--Bottom View

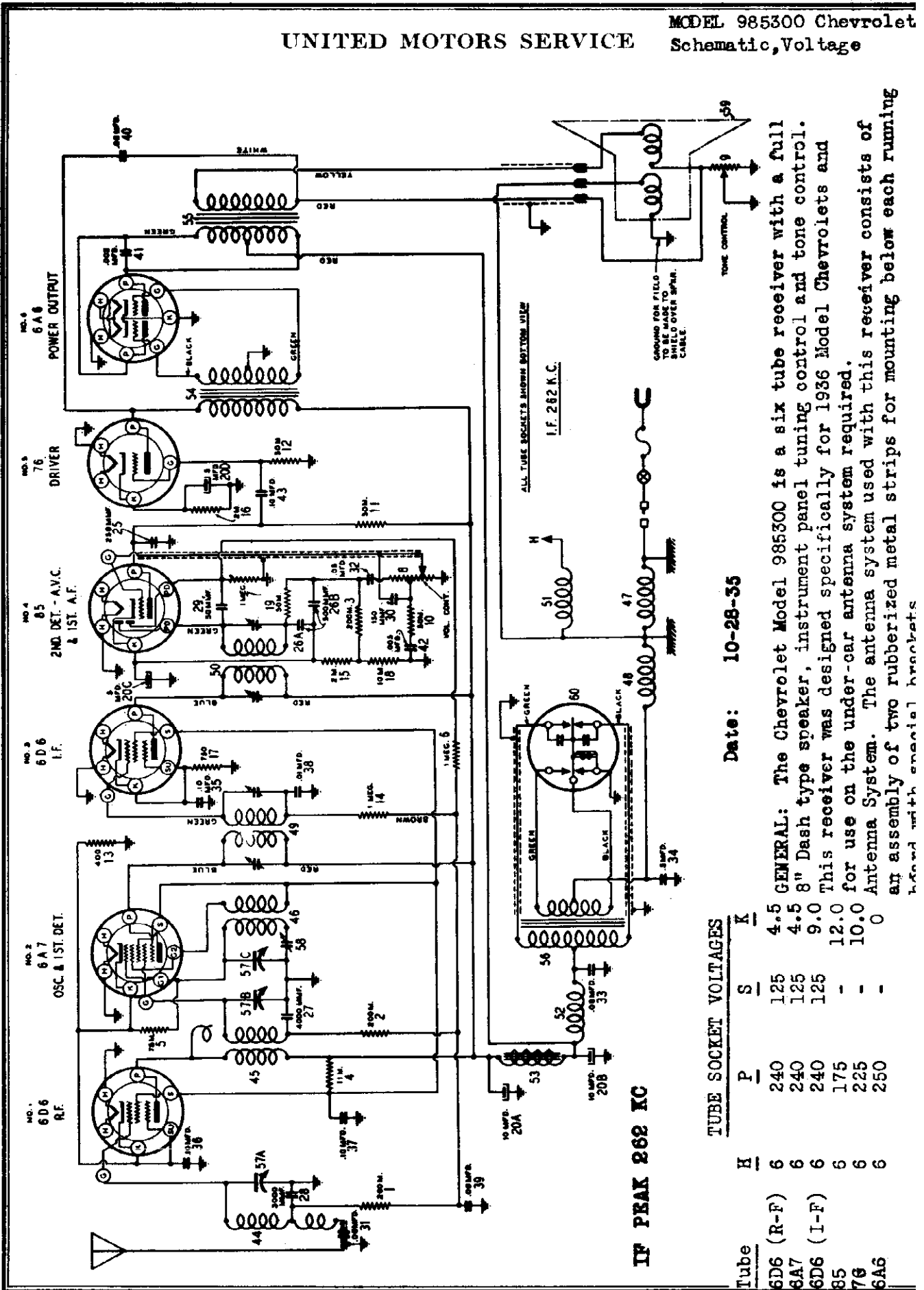
GENERAL: The Chevrolet Model 985100 is a six tube two unit receiver with an instrument panel tuning control, tone control and a "dome" type speaker. This receiver was designed specifically for 1936 Model Chevrolets.

ANTENNA SYSTEM: The antenna system used with this receiver consists of an assembly of three rubberized metal strips mounted beneath each running board with special brackets. The strip assemblies are well insulated having no exposed metal connections thereby reducing the possibility of unsatisfactory reception due to leakage caused by mud, water, etc.

PART #1210760 FILTER ASSEMBLY

The part #1210760 Filter Assembly (Illus. #23) consists of an iron core choke, R-F choke and an .06 mfd. condenser sealed in a separate container. The component parts of this assembly are not serviceable and if any are found to be defective, it will be necessary to replace the complete unit.

UNITED MOTORS SERVICE



Date: 10-28-35

Tube	TUBE SOCKET VOLTAGES		
	H	S	K
6D6 (R-F)	6	125	240
6A7	6	125	240
6D6 (I-F)	6	125	240
85	6	-	175
76	6	-	225
6A6	6	-	250

GENERAL: The Chevrolet Model 985300 is a six tube receiver with a full 4.5" 8" Dash type speaker, instrument panel tuning control and tone control.

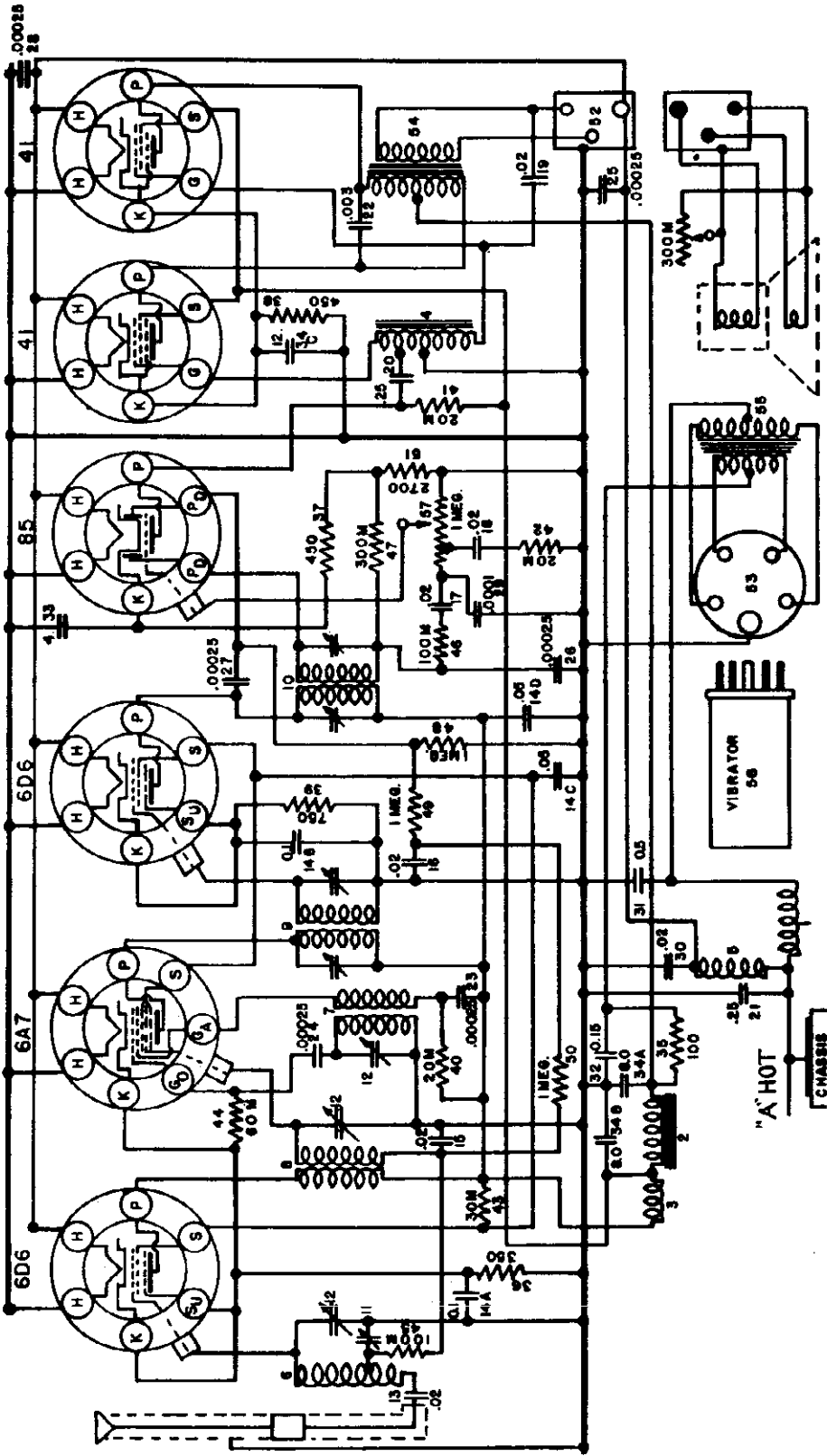
9.0 This receiver was designed specifically for 1936 Model Chevrolets and 12.0 for use on the under-car antenna system required.

10.0 Antenna System. The antenna system used with this receiver consists of an assembly of two rubberized metal strips for mounting below each running bracket with enamel brackets.

MODEL 985400 Chevrolet
Schematic, Voltage

UNITED MOTORS SERVICE

GENERAL: The Chevrolet Model 985400 is a six tube receiver with a full 8" dash type speaker and instrument panel tuning control.



TUBE SOCKET VOLTAGES

Tube	Function	H	P	S	GA	GO	K
6D6	R-F Amp.	6	220	100	-	-	5.7
6A7	Osc.-Mod.	6	220	100	130	*	5.7
6B7	I-F Amp.	6	220	100	-	-	6.8
76	1st A-F	6	130	-	-	-	8.0
41	Output	6	210	220	-	-	18.0
41	Output	6	210	220	-	-	18.0

* Varies from -5 to -15 as tuning condenser is rotated.

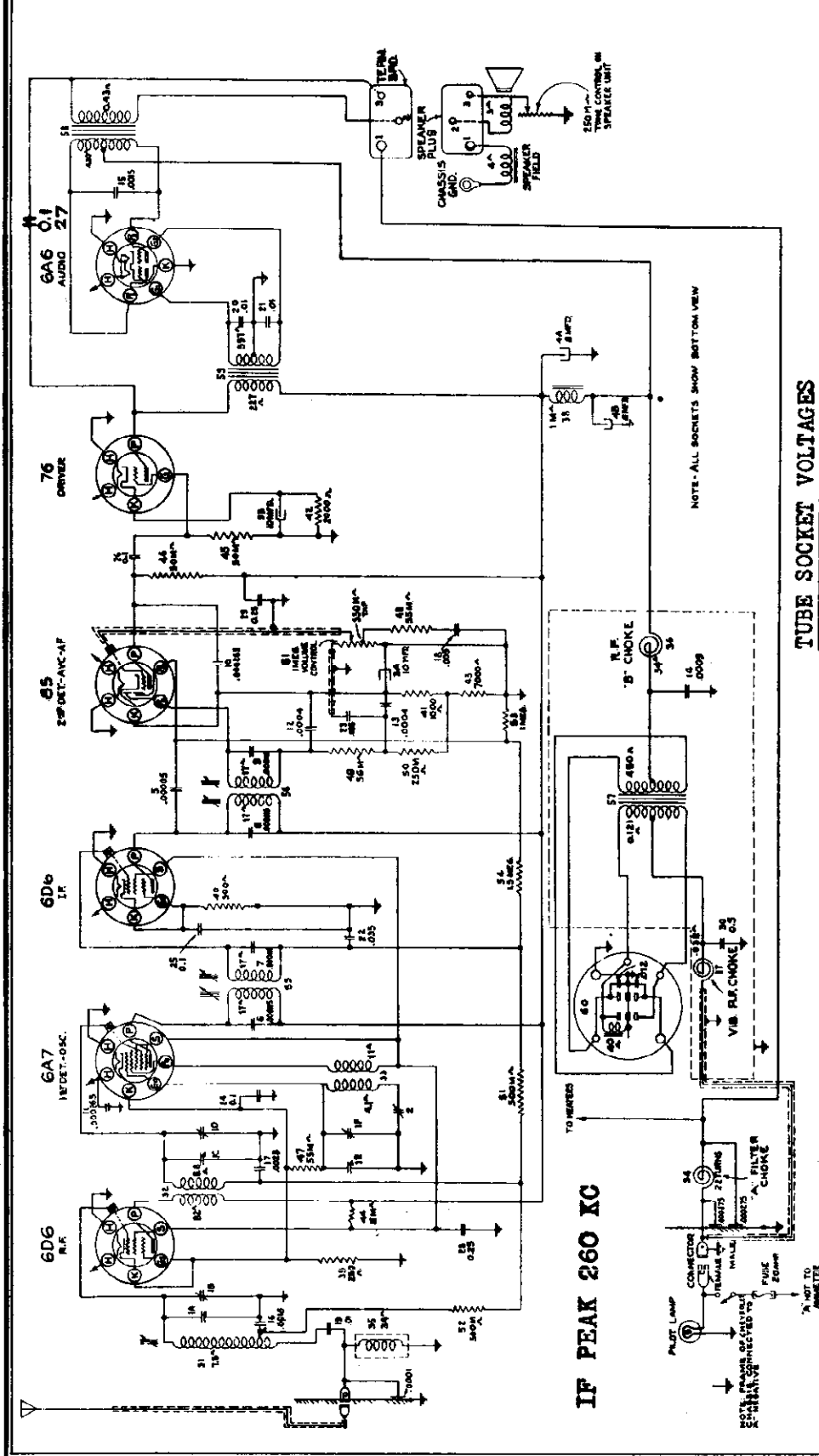
IF PEAK 262 KC

CHEVROLET MODEL 985400

Date: 2-20-36

UNITED MOTORS SERVICE

MODEL 985301 Chevrolet
Schematic, Voltage



TUBE SOCKET VOLTAGES

TUBE	FUNCTION	H	P	S	GS	PO	K
6D6	R-F Amp.	6	235	90	4	-	4
6A7	Det-Osc.	6	235	90	-	90	4
6D6	I-F Amp.	6	235	-	2.6	-	2.6
85	Det-1st A-F	6	145	-	-	-	13
76	Driver	6	230	-	-	-	11
6A6	Output	6	260	-	-	-	0

Above readings taken from tube socket contacts to ground with a 1000 ohm per volt meter, under "no signal" conditions. Volume control setting optional. Ampere drain 7.8 amperes at 6 volts.

IF PEAK 260 KC

CHEVROLET MODEL 985301

Date: 5-11

MODEL 985301 Chevrolet
 Socket, Trimmers, Note
 Chassis

UNITED MOTORS SERVICE

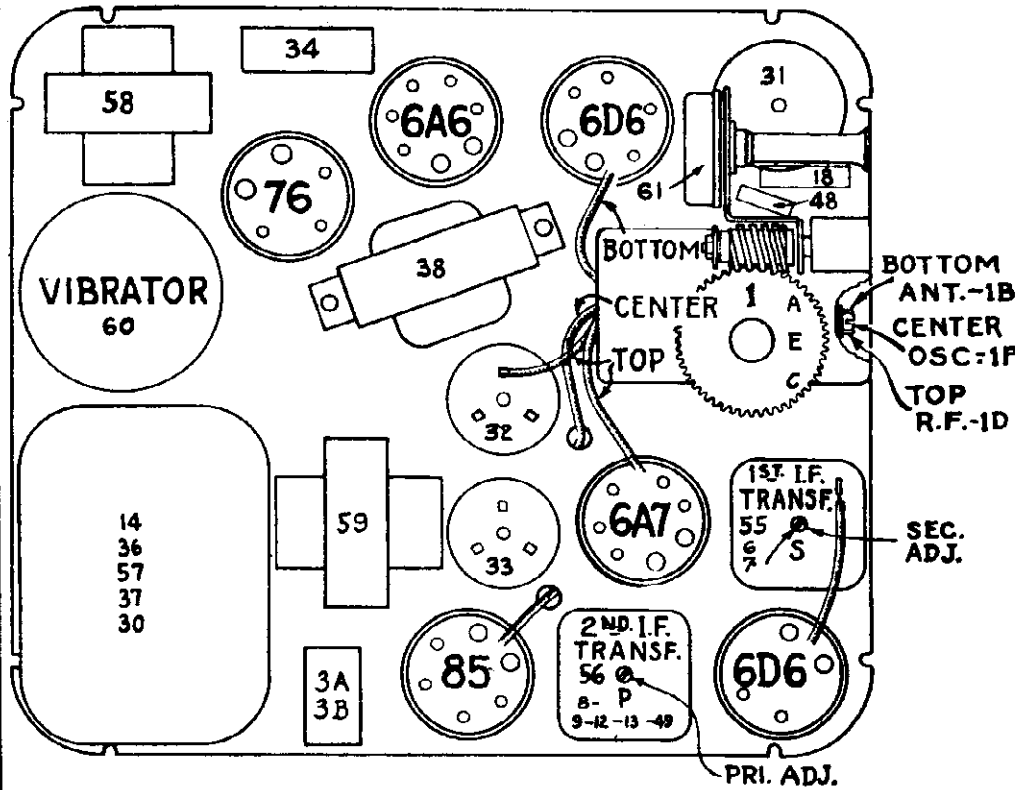


FIG. 2--PARTS LAYOUT--Top View

GENERAL: The Chevrolet Model 985301 is a six tube, two unit auto radio with a "dash" type speaker, instrument panel tuning control, bass compensation and tone control.

Antenna System: The antenna system used with this receiver, consists of an assembly of two rubberized metal strips for mounting beneath each running board with brackets provided.

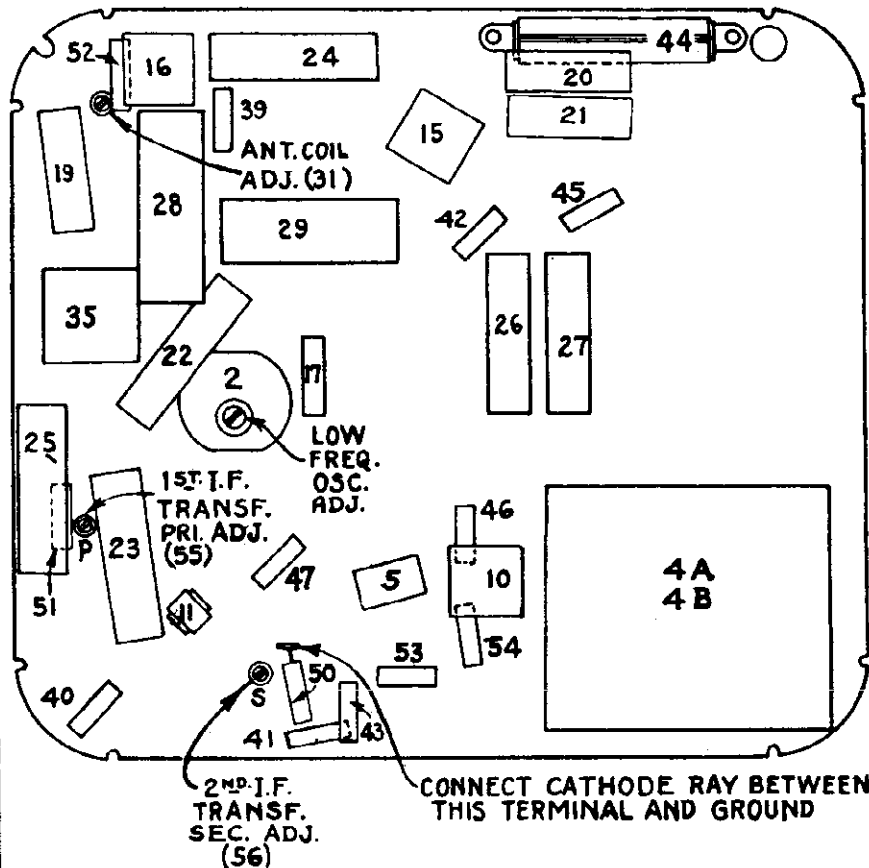
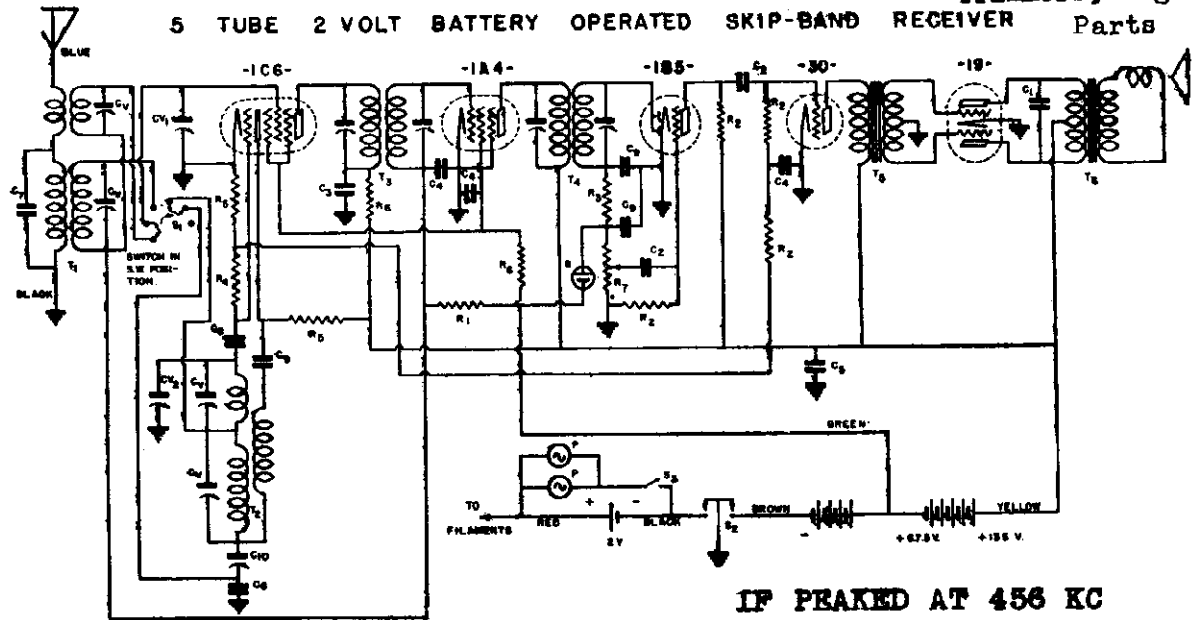


FIG. 3--PARTS LAYOUT--Bottom View

THE WALGREEN CO.

MODEL B25-RS
Schematic, Socket
Trimmers, Alignment
Parts



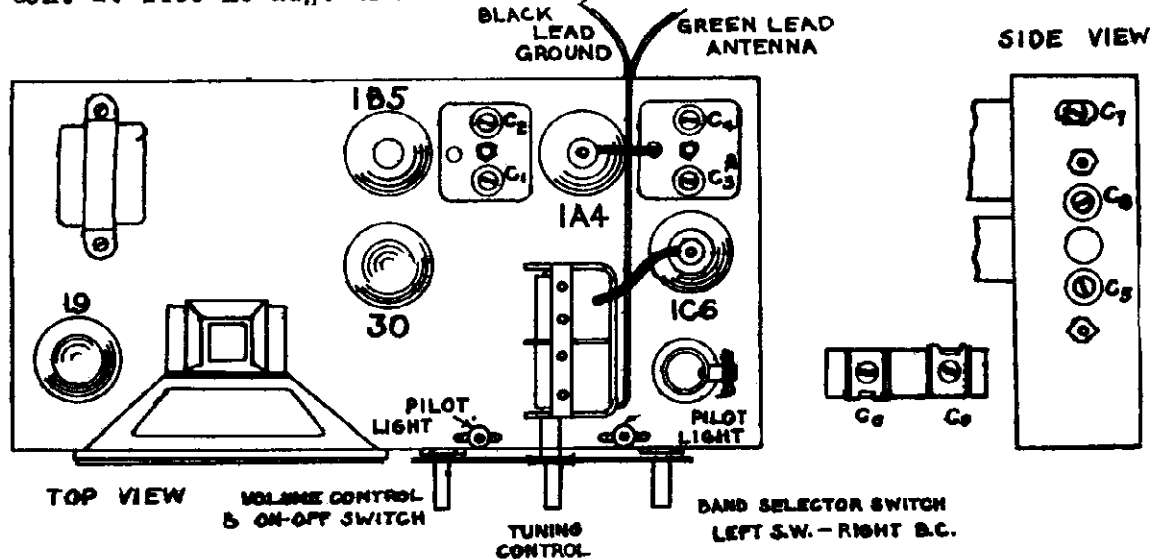
IF PEAKED AT 456 KC
CONVENTIONAL ALIGNMENT - see Index

BROADCAST ALIGNMENT

Gen. at 456 kc mesh condenser and adj. trimmers C1, C2, C3 & C4 to peak.
Gen. and dial at 1400 kc, adj. trimmer C8 and then C6 to peak.
Gen. and dial at 600 kc, adj. trimmer C7, rocking cond., to peak.

SHORT WAVE ALIGNMENT

Gen. and dial at 14 MC adj. trimmer C5 to peak.
Check image at 14.9 Mo.
Gen. at 1400 kc adj. trimmer C9 to peak.



LEGEND	OUR PART NO.	DESCRIPTION
C ₁	218	002MFD 350V. TUBULAR CONDENSER
C ₂	211	01 MFD 400V TUBULAR CONDENSER
C ₃	212	08 MFD 200V TUBULAR CONDENSER
C ₄	203	1 MFD. 200 V. TUBULAR CONDENSER
C ₅	204	25 MFD. 200V TUBULAR CONDENSER
C ₆	410	0018 MFD. MICA CONDENSER
C ₇	412	50 MMFD. MICA CONDENSER
C ₈	400	100 MMFD. MICA CONDENSER
C ₉	401	250 MMFD. MICA CONDENSER
C ₁₀	507	5 PLATE PADDING CONDENSER

LEGEND	OUR PART NO.	DESCRIPTION
CV-2	812	2 GANG VARIABLE CONDENSER
Cv	500	0-30 MMFD TRIMMER CONDENSER
R ₁	119	1 MEGOHM 1/2 WATT CARBON RESISTOR
R ₂	117	1/2 MEGOHM 1/2 WATT CARBON RESISTOR
R ₃	113	50,000 OHM 1/2 WATT CARBON RESISTOR
R ₄	111	25,000 OHM 1/2 WATT CARBON RESISTOR
R ₅	109	10,000 OHM 1/2 WATT CARBON RESISTOR
R ₆	134	2,000 OHM 1/2 WATT CARBON RESISTOR
R ₇	200C	250,000 OHM VOLUME CONTROL
P	2901	MAZDA #40 PILOT LIGHTS

LEGEND	OUR PART NO.	DESCRIPTION
T ₁	122B	SKIP-BAND ANTENNA COIL
T ₂	141E	SKIP-BAND OSCILLATOR COIL
T ₃	150X	INPUT IF TRANSFORMER
T ₄	150Y	OUTPUT IF TRANSFORMER
T ₅	160B	INTERSTAGE TRANSFORMER
T ₆	17A	P.M. DYNAMIC BREAKER TRANSFORMER
S ₁	1830	BAND SELECTOR SWITCH
S ₂	—	LINE SWITCH ON VOLUME CONTROL
S ₃	—	PILOT LIGHT ECONOMIZER SWITCH
B	3000	BIAS BUTTON

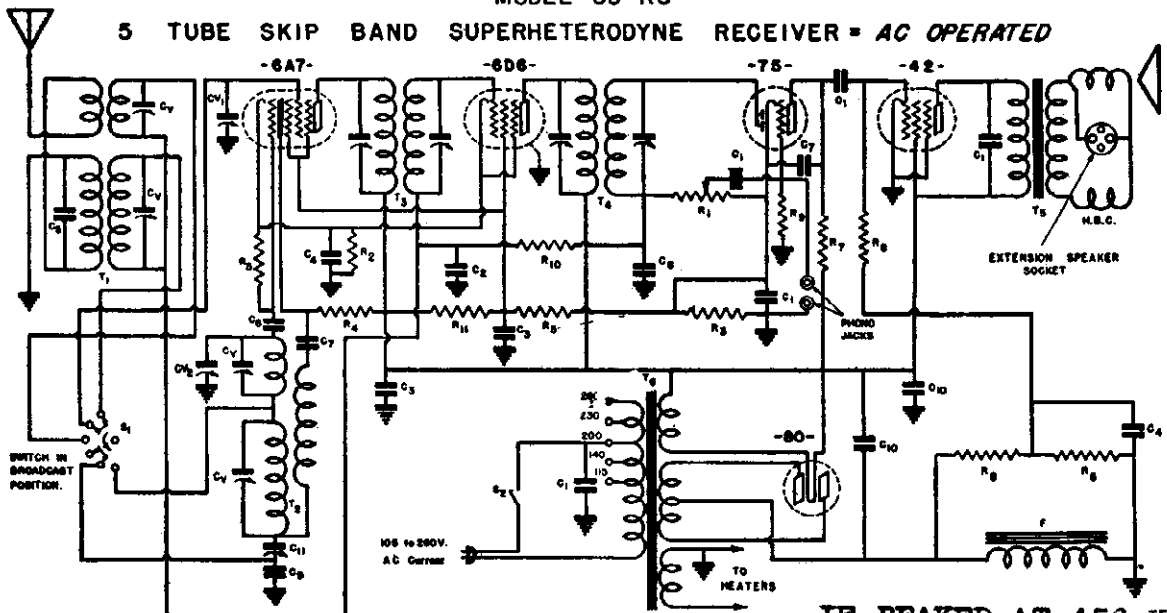
MODEL 55RS
Schematic, Socket

THE WALGREEN CO.

Trimmers, Alignment
Parts

MODEL 55-RS

5 TUBE SKIP BAND SUPERHETERODYNE RECEIVER - AC OPERATED



IF PEAKED AT 456 KC

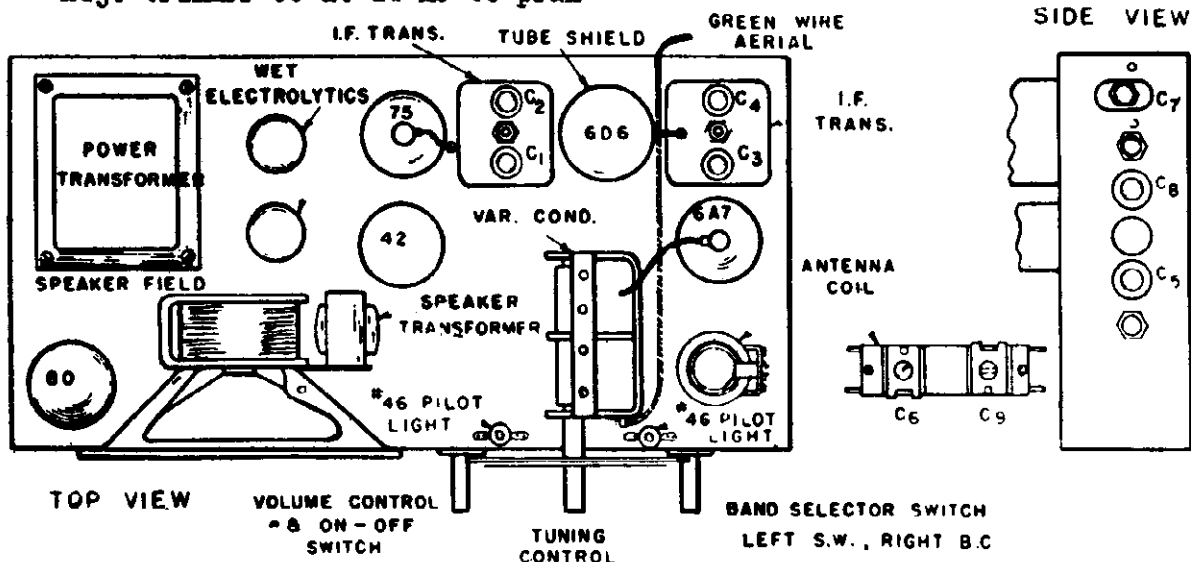
CONVENTIONAL ALIGNMENT - See special section

BROADCAST ALIGNMENT

Gen. at 456 kc mesh condenser & adj. trimmers C1, C2, C3 & C4 to peak.
Gen. & dial at 1400 kc, adj. trimmer C8 and then C6 to peak.
Gen. & dial at 600 kc, adj. trimmer C7, rock cond. and peak.

SHORT WAVE ALIGNMENT

Gen. & dial 14 MC adj. trimmer C5 to peak. Check image at 14.9 Mc.
Adj. trimmer C9 at 14 MC to peak



LEGEND	OUR PART NO.	DESCRIPTION
C1	211	.01 MFD.-400 V. TUBULAR CONDENSER
C2	203	.1 MFD.-200 V. TUBULAR CONDENSER
C3	210	.1 MFD.-400 V. TUBULAR CONDENSER
C4	204	.25 MFD. 800 V. TUBULAR CONDENSER
C5	412	.00005 MFD. MICA CONDENSER
C6	400	.0001 MFD. MICA CONDENSER
C7	401	.00005 MFD. MICA CONDENSER
C8	402	.0005 MFD. MICA CONDENSER
C9	410	.0018 MFD. MICA CONDENSER
C10	317	.8MFD. 450 V. WET ELECTROLYTIC COND.
C11	807	5 PLATE PADDING CONDENSER

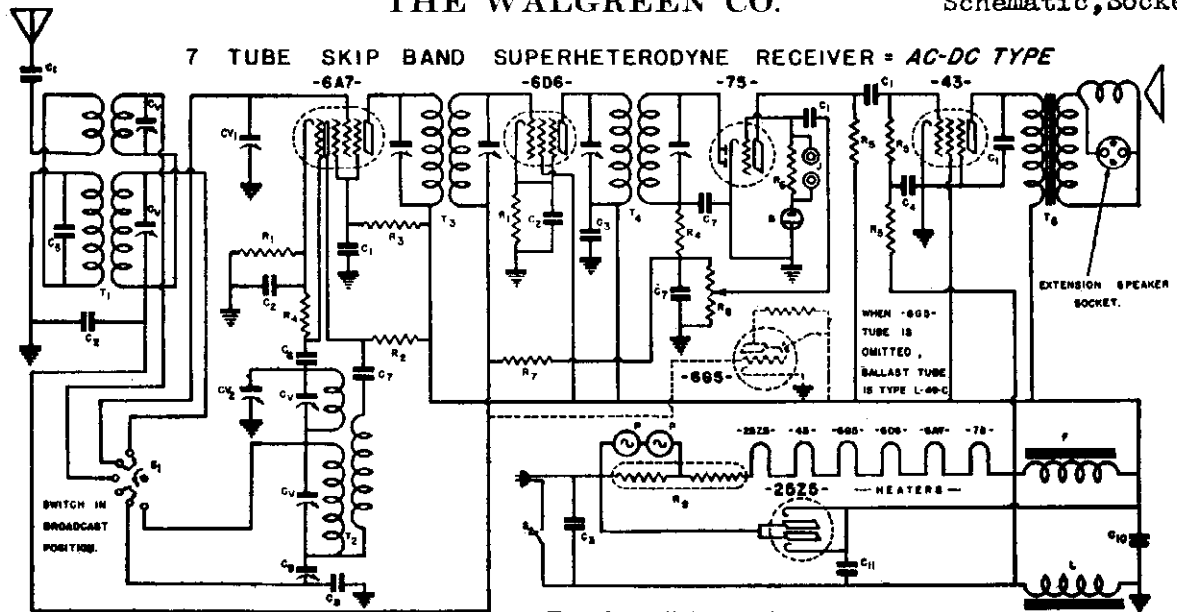
LEGEND	OUR PART NO.	DESCRIPTION
CV1	612-A	5 BAND VARIABLE CONDENSER
Cy	500	5-30 MMFD. TRIMMER CONDENSER
T1	1225	B.C. 8 SKIP BAND ANTENNA COIL
T2	412	B.C. 8 SKIP BAND OSCILLATOR COIL
T3	1003	INPUT I.F. TRANSFORMER
T4	1507	DIODE I.F. TRANSFORMER
T5	811	SPEAKER TRANSFORMER
T6	1017	POWER TRANSFORMER
F	11	SPEAKER FIELD (600 OHMS)
S1	1920	BAND SELECTOR SWITCH
S2	-	LINE SWITCH ON VOLUME CONTROL

LEGEND	OUR PART NO.	DESCRIPTION
R1	8008	200,000 OHM VOLUME CONTROL
R2	103	250 OHM 1/2 WATT CARBON RESISTOR
R3	129	400 OHM 1/2 WATT CARBON RESISTOR
R4	109	10,000 OHM 1/2 WATT CARBON RESISTOR
R5	113	50,000 OHM 1/2 WATT CARBON RESISTOR
R6	115	100,000 OHM 1/2 WATT CARBON RESISTOR
R7	118	250,000 OHM 1/2 WATT CARBON RESISTOR
R8	148	400,000 OHM 1/2 WATT CARBON RESISTOR
R9	117	500,000 OHM 1/2 WATT CARBON RESISTOR
R10	119	1MEG OHM 1/2 WATT CARBON RESISTOR
R11	146	25,000 OHM 1/2 WATT CARBON RESIST.

Trimmers, Alignment Parts

THE WALGREEN CO.

MODEL 57RS
Schematic, Socket



IF PEAKED AT 456 KC

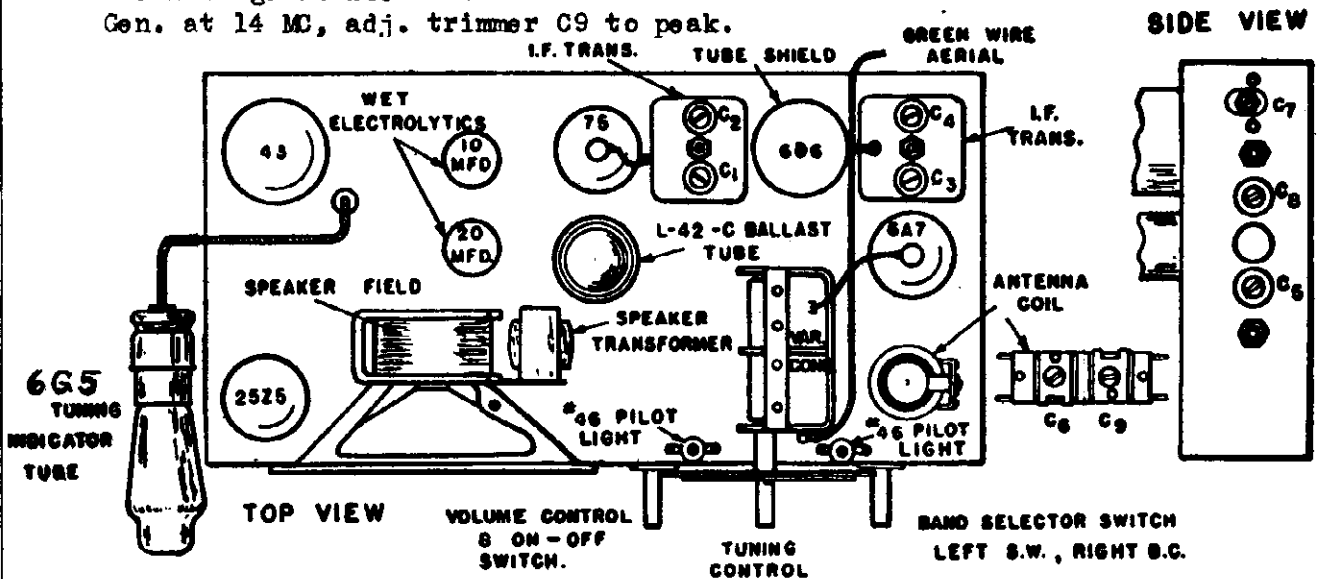
CONVENTIONAL ALIGNMENT - see Index

BROADCAST ALIGNMENT

Gen. at 456 kc, mesh var. cond. and adj. trimmers C1, C2, C3 & C4 to peak.
Gen. and dial at 1400 kc, adj. trimmer C8 and then C6 to peak.
Gen. and dial at 600 kc, adj. C7 to peak.

SHORT WAVE ALIGNMENT

Gen. and dial at 14 MC, adj. trimmer: to peak.
Check image at 14.9 MC.
Gen. at 14 MC, adj. trimmer C9 to peak.



LEGEND	OUR PART NO.	DESCRIPTION
C ₁	211	0.1 MFD. 400V. TUBULAR CONDENSER
C ₂	203	1 MFD. 200V. TUBULAR CONDENSER
C ₃	210	1 MFD. 400V. TUBULAR CONDENSER
C ₄	204	25 MFD. 200V. TUBULAR CONDENSER
C ₅	412	0.0005 MFD. MICA CONDENSER
C ₆	400	0.001 MFD. MICA CONDENSER
C ₇	401	0.0025 MFD. MICA CONDENSER
C ₈	410	0.016 MFD. MICA CONDENSER
C ₉	507	5 PLATE PADDING CONDENSER
C ₁₀	314	10 MFD. 150 W.V. WET ELECTROLYTIC COND.
C ₁₁	311	20 MFD. 100 W.V. WET ELECTROLYTIC COND.

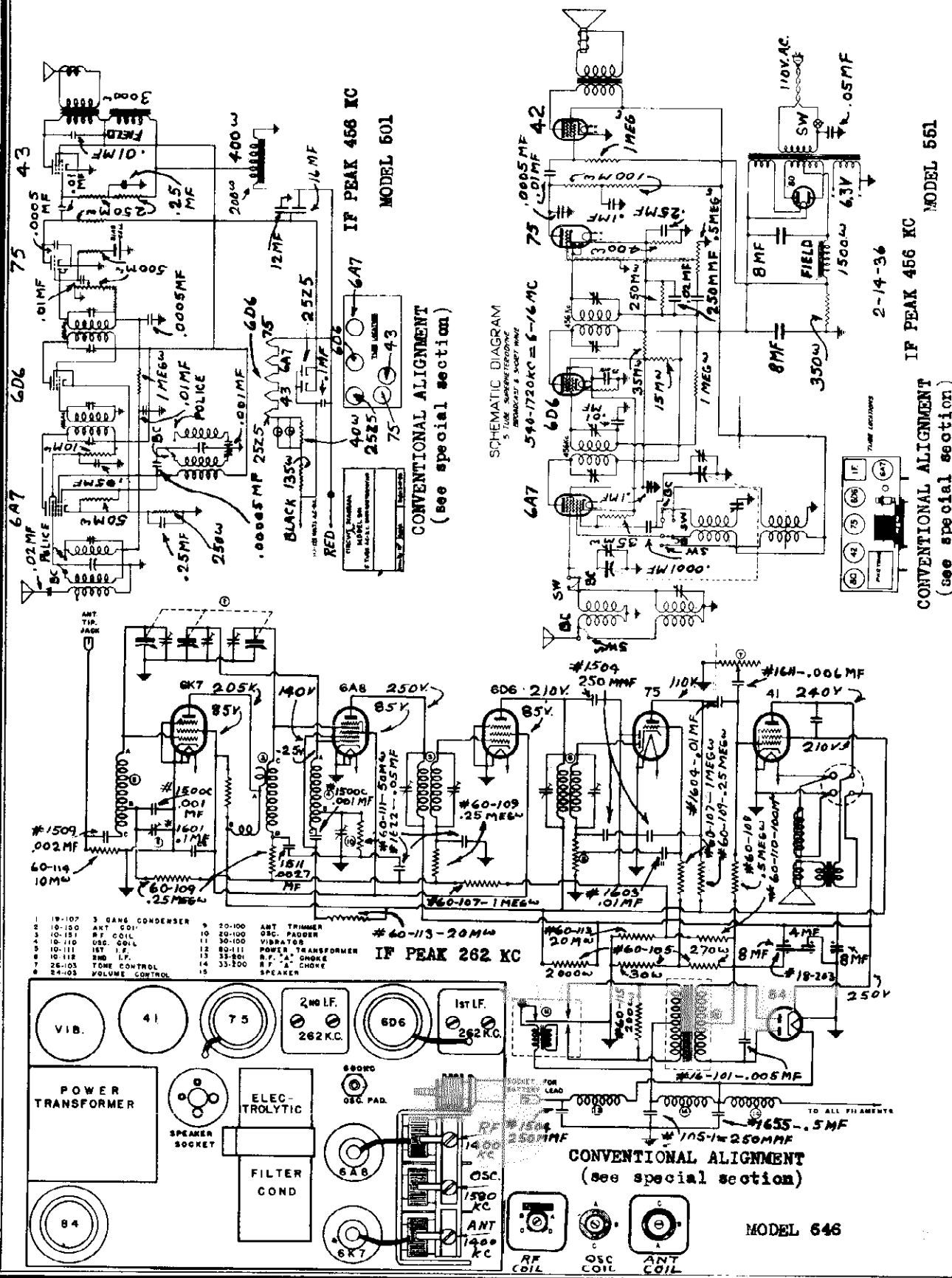
LEGEND	OUR PART NO.	DESCRIPTION
CV ₁₋₂	514-2	2 BAND VARIABLE CONDENSER
C _v	500	5-30 MFD. TRIMMER CONDENSER
R ₁	103	250 OHM 1/2 WATT CARBON RESISTOR
R ₂	104	5000 OHM 1/2 WATT CARBON RESISTOR
R ₃	111	25,000 OHM 1/2 WATT CARBON RESISTOR
R ₄	113	50,000 OHM 1/2 WATT CARBON RESISTOR
R ₅	114	250,000 OHM 1/2 WATT CARBON RESISTOR
R ₆	117	500,000 OHM 1/2 WATT CARBON RESISTOR
R ₇	119	1 MEG OHM 1/2 WATT CARBON RESISTOR
R ₈	2009	500,000 OHM VOLUME CONTROL
R ₉	2508	L-42-C BALLAST TUBE (with 6G5 tube)
R ₉	2808	L-49-C BALLAST TUBE (without 6G5 tube)

LEGEND	OUR PART NO.	DESCRIPTION
I ₁	1220	ANTENNA COIL
T ₂	1412	OSCILLATOR COIL
T ₃	1507	OUTPUT I.F. TRANSFORMER
T ₄	1503	INPUT I.F. TRANSFORMER
T ₅	R.D.	SPEAKER TRANSFORMER
L	1100	FILTER CHOKER
S ₁	1920	BAND SELECTOR SWITCH
S ₂	---	LWRE SWITCH ON VOLUME CONTROL
P	2802	MAZDA NO. 48 PILOT LIGHT
B	3000	BIAS CELL
F	R.D.	SPEAKER FIELD
J	2230	PHONO JACK

Schematics, Socket
Trimmers, Alignment

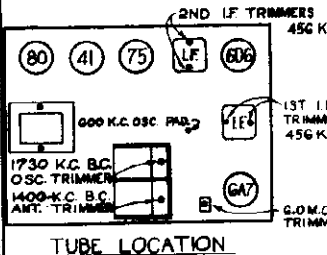
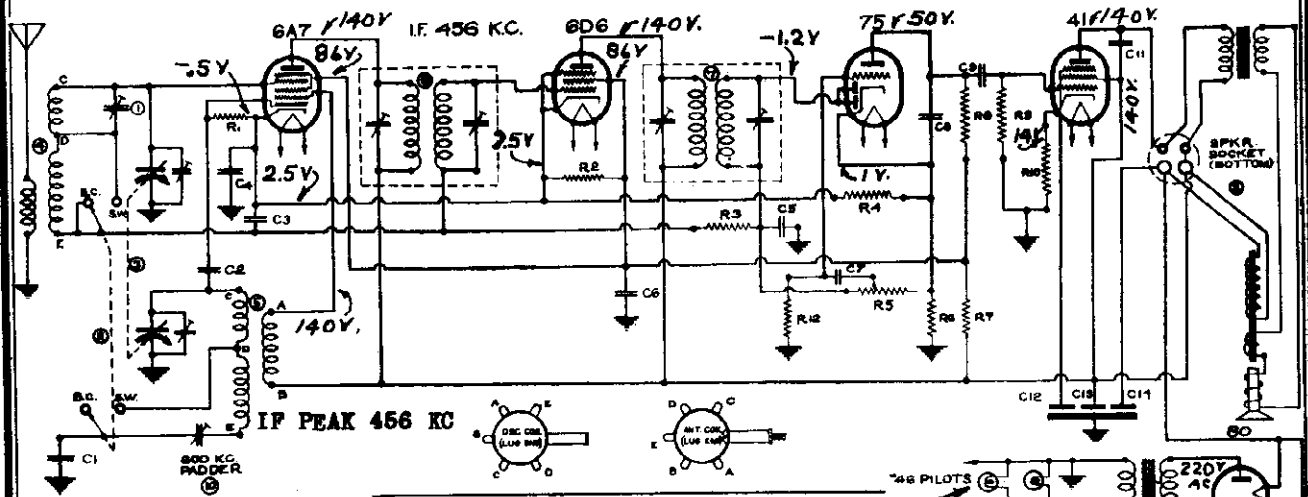
WARWICK MFG. CO.

MODEL 501
MODEL 551
MODEL 646 Aut



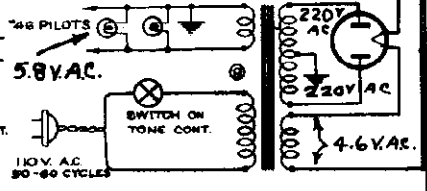
MODEL 518
 MODEL 536
 Schematic, Voltage
 Socket, Trimmers
 Alignment, Parts

WARWICK MFG. CO.

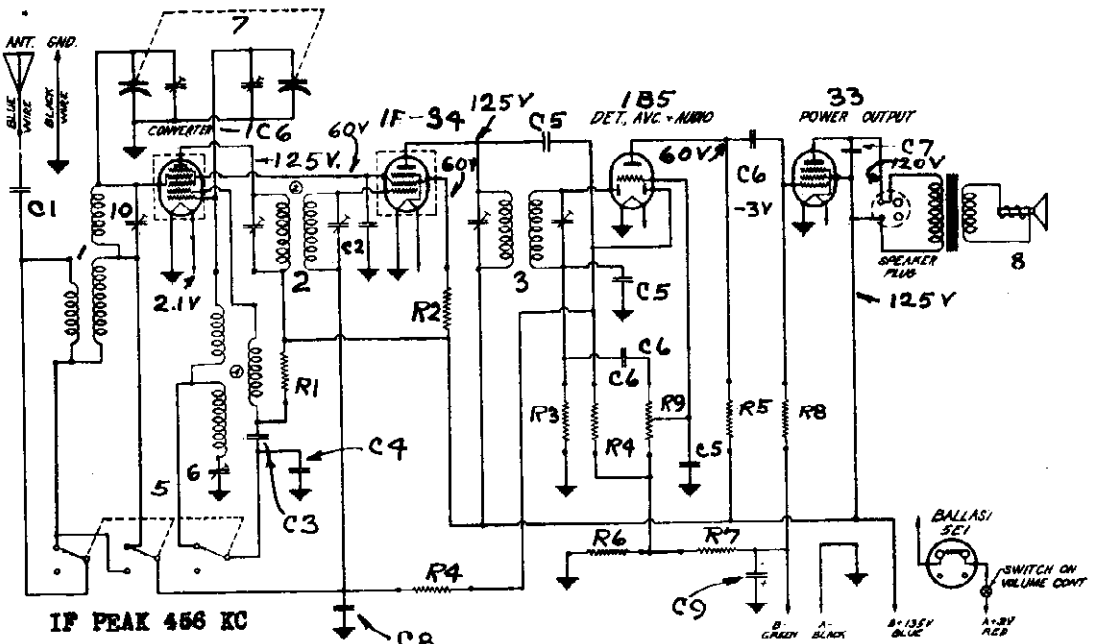


CIRCUIT DATA

PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
C1 15-100	.0015 MFD.	R1 6028	40,000 OHMS 1/2 W
C2 1801	.0001 "	R2 6017	25,000 OHMS 1/2 W
C3 1814	.05 " 200K	R3 6011	300,000 "
C4 1814	.25 "	R4 6011	100 "
C5 1804	.00025 "	R5 24-102	500,000 "
C6 1807	.05 " 400V	R6 6009	30 "
C7 1803	.01 "	R7 6105	10,000 "
C8 1504	.00025 "	R8 6066	200,000 "
C9 1603	.01 "	R9 6018	300,000 "
C10 1801	.004 " 600V	R10 6032	600 "
C11 1801	.004 " 600V	R11 6017	1.0 MEG
C12 18-102	4MFD. 25V. YELLOW	R12 10-147	150-147
	250V. GREEN		1123
	250V. RED		1124
	5W. A.V.C. TRIMMER		
	WAVE BAND S.W.		
	GANG CONDENSER		
	ANT. COIL		

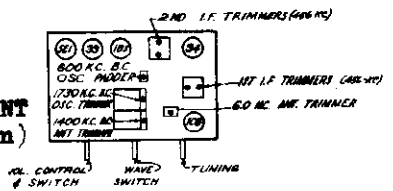


MODEL 518
 CONVENTIONAL ALIGNMENT
 (see special section)



MODEL 536

CONVENTIONAL ALIGNMENT
 (see special section)

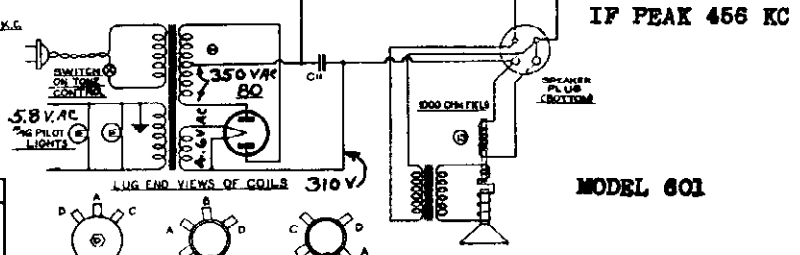
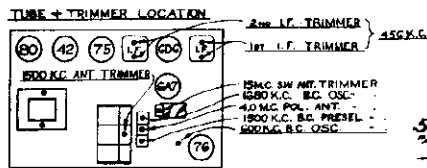
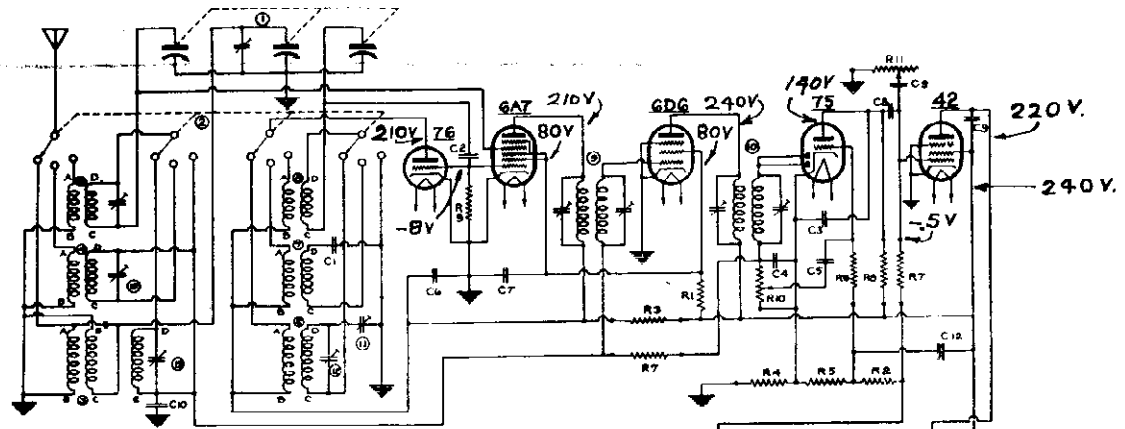


CIRCUIT DATA

PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
C1 15-100	.0015 MFD. 300V	L 10-188	B.C.T.S.W. ANT. COIL
C2 1801	.0001 " 400V	S 1157	1st I.F. TRANSFORMER
C3 1814	.05 " MICA	3 1157	2nd I.F. TRANSFORMER
C4 1700U	.002 " 1.5 S. MICA	4 10-184	B.C.T.S.W. OSC. COIL
C5 1504	.00025 MFD.	5 80-101	WAVE BAND SWITCH
C6 1804	.01 MFD. 500V	6 20-100	OSC. PADLOCK COIL
C7 1611	.004 " 600V	7 19-127	GANG VAR. COND.
C8 1800	.1 " 300V	8 28-113	SPEAKER
C9 16-102	.10 " 25V. ELEC.	10 20-100	PADLOCK
R1 6028	15000 OHMS 1/2 W		
R2 6017	25000 "		
R3 6011	300000 "		
R4 6011	100 "		
R5 24-102	500000 "		
R6 6009	30 "		
R7 6105	10000 "		
R8 6066	200000 "		
R9 6018	300000 "		
R10 6032	600 "		
R11 6017	1.0 MEG		
R12 10-147	150-147		

WARWICK MFG. CO.

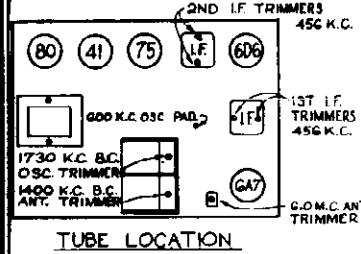
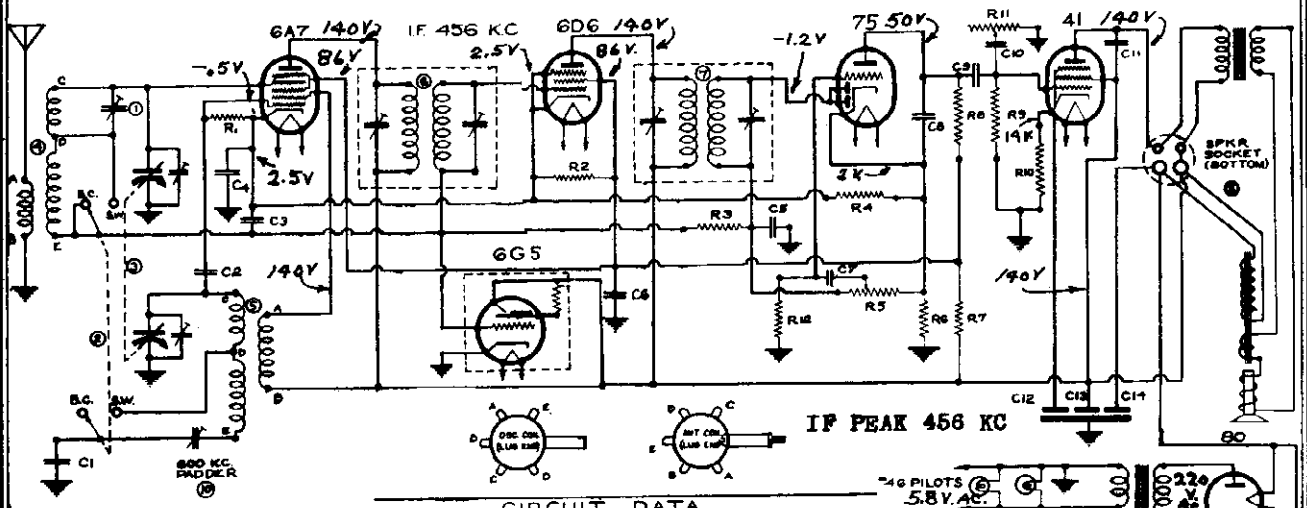
MODEL 601
MODEL 613
Schematics, Voltage
Socket, Trimmers
Alignment, Parts



CIRCUIT DATA

PART No.	DESCRIPTION	PART No.	DESCRIPTION
1800C	4000 MFD. MICAM	R7	6018 50000 OHMS 1/2 W
1803	50000	R8	6034 250 100
1804	50000	R9	6042 50000
1805	50000	R10	6042 50000 VOL. CONTR
1806	50000	R11	6042 500000 TONE CONTR
1807	50000	1	18-102
1808	50000	2	18-102
1809	50000	3	18-102
1810	50000	4	18-102
1811	50000	5	18-102
1812	50000	6	18-102
1813	50000	7	18-102
1814	50000	8	18-102
1815	50000	9	18-102
1816	50000	10	18-102
1817	50000	11	18-102
1818	50000	12	18-102
1819	50000	13	18-102
1820	50000	14	18-102
1821	50000	15	18-102
1822	50000	16	18-102
1823	50000	17	18-102
1824	50000	18	18-102
1825	50000	19	18-102
1826	50000	20	18-102
1827	50000	21	18-102
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1853	50000	47	18-102
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1881	50000	75	18-102
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1899	50000	93	18-102
1900	50000	94	18-102
1901	50000	95	18-102
1902	50000	96	18-102
1903	50000	97	18-102
1904	50000	98	18-102
1905	50000	99	18-102
1906	50000	100	18-102

MODEL 601
CONVENTIONAL ALIGNMENT
(see special section)



CIRCUIT DATA

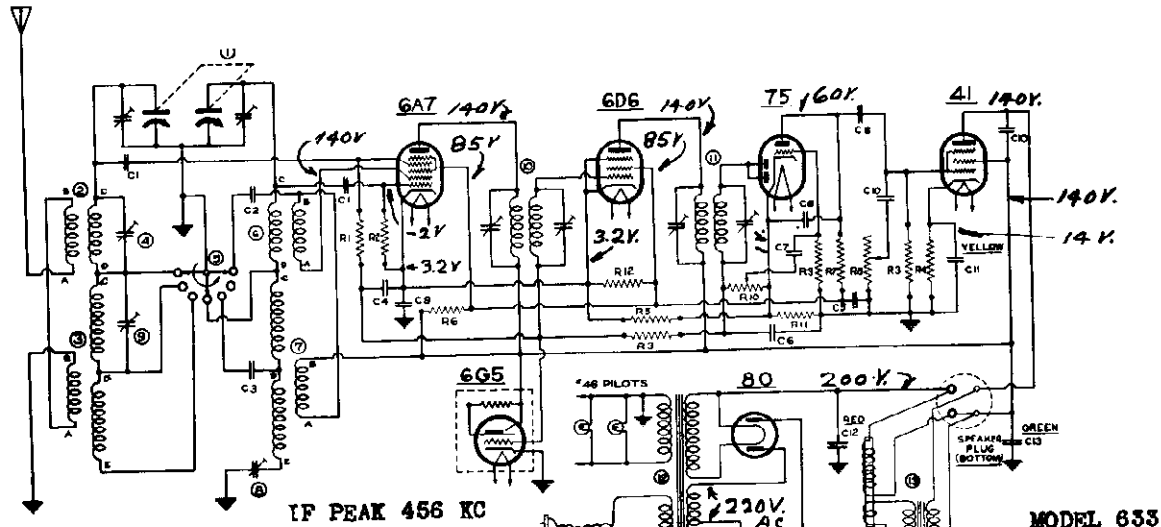
PART No.	DESCRIPTION	PART No.	DESCRIPTION
C1	15-100	R1	6026 10,000 OHMS 1/2 W
C2	1501	R2	6117 25,000 1/2 W
C3	1502	R3	6018 500,000 1/2 W
C4	1503	R4	6011 100
C5	1504	R5	24-101 500,000 VOL. CONT
C6	1505	R6	6028 50
C7	1506	R7	6102 15,000 1/2 W
C8	1507	R8	6056 200,000 1/2 W
C9	1508	R9	6016 500,000
C10	1509	R10	6028 500
C11	1510	R11	65-101 500,000 TONE CONT
C12	1511	R12	6017 10 MEG
C13	1512	5	10-147 OSC. COIL
C14	1513	7	1183 1ST I.F.
1	18-102	8	73-204 6 OHM SPEAKER
2	18-102	9	60-104 POWER TRANSFORMER
3	18-102	10	20-100 PADDLE
4	18-102	11	73-204 6 OHM SPEAKER

MODEL 613
CONVENTIONAL ALIGNMENT
(see special section)

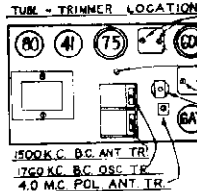
MODEL 633
MODEL 651
Schematics, Voltage

WARWICK MFG. CO.

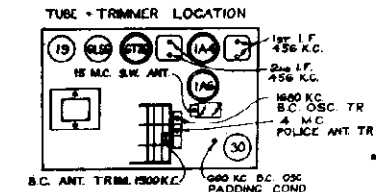
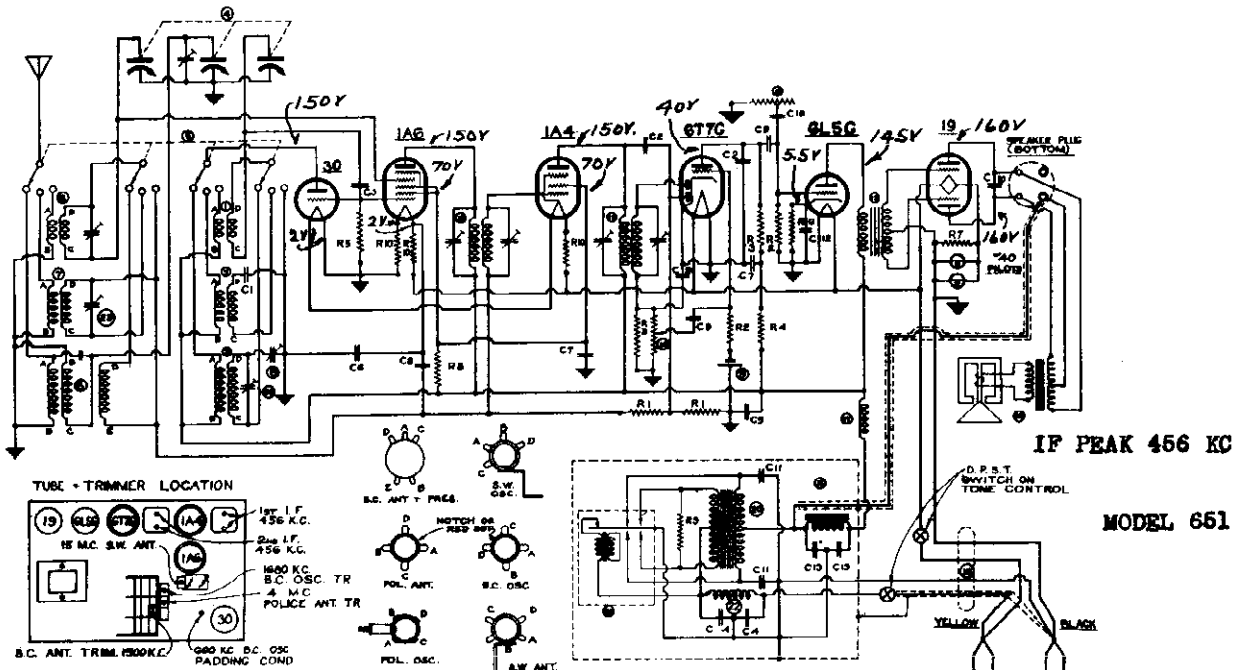
Socket, Trimmers
Alignment, Parts



CIRCUIT DATA			
PART No.	DESCN	PART No.	DESCN
C1	1501 .0001 MFD MICA	R6	2C-101 500,000-TONE CONT
C2	1502 .000157 3%	R7	5017 1 MEG OHM 1/2 W
C3	1503 .001 200V	R10	24 4M 500,000 VOL CT
C4	1504 .001 200V	R11	5009 50 1/2 W
C5	1507 .001 400V	R12	C117 25,000 1/2 W
C6	1508 200025 MICA		
C7	1509 .01 400V	1	19-107 GANG COND.
C8	1510 .01 400V	2	10-128 SW ANT COIL
C9	1511 .01 200V	3	10-129 POL + BC ANT.
C10	1512 .01 200V	4	2052 SW ANT TRIMMER
C11	1513 .01 200V	5	23-102 WAVE SWITCH
C12	1514 .01 200V	6	10-127 SW OSC COIL
C13	1515 .01 200V	7	10-128 POL + BC OSC COIL
		8	20-200 600 KC BC OSC PAD
		9	2054 POL ANT TRIMMER
		10	1123 1st IF
		11	1124 2nd IF
		12	60-104 POWER TRANSFR
		13	SPEAKER
R1	6020 2 MEG OHM 1/2 VV		
R2	6022 40,000 1/2 VV		
R3	6018 500,000 1/2 W		
R4	6022 40,000 1/2 VV		
R5	6017 100 1/2 W		
R6	6015 10,000 1/2 W		
R7	6026 200,000 1/2 W		



CONVENTIONAL ALIGNMENT
(see special section)

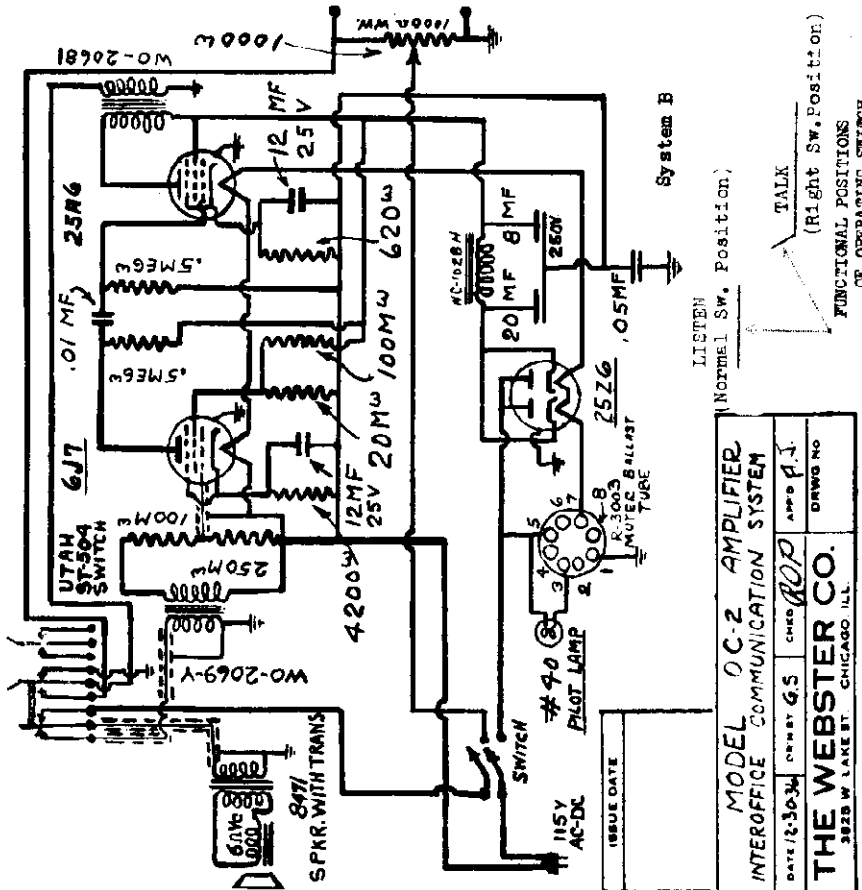


PART NO.	DESCRIPTION	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
C1	1500 .001 MFD MICA	R1	6014 1,000 OHM 1/2 W	6	10-130 SW OSC COIL	14	54-101 VOLUME CONTROL
C2	1501 .000157 3%	R2	6014 1,000 OHM 1/2 W	7	10-130 POLICE OSC COIL	15	20-100 BC OSC PADDING
C3	1502 .001 200V	R3	6024 100,000 1/2 W	8	10-130 3rd GANG	16	SPEAKER
C4	1503 .001 200V	R4	6024 100,000 1/2 W	9	20-102 WAVE SWITCH	17	2303 500 MA 250V CHOKER
C5	1504 .001 200V	R5	6024 100,000 1/2 W	10	10-130 SW ANT. 4PIL	18	2307 100 MA 250V BATTERY CABLE
C6	1507 .001 400V	R6	6024 100,000 1/2 W	11	10-130 POLICE ANT. 6PIL	19	20041 POWER TRANSFORMER
C7	1508 200025 MICA	R7	6007 500 1/2 W	12	10-130 2nd ANT. 6 PENCIL CL	20	2307 VIBRATOR
C8	1509 .01 400V	R8	6017 100 1/2 W	13	6AS6	21	3315 R.F. TUNING TRIMMER STRIP
C9	1510 .01 400V	R9	6017 100 1/2 W	14	6T7C		
C10	1511 .01 200V	R10	6017 100 1/2 W	15	10-130 1st IF TRANSFORMER		
C11	1512 .01 200V	R11	6017 100 1/2 W	16	10-130 2nd IF TRANSFORMER		
C12	1513 .01 200V	R12	6017 100 1/2 W	17	20-104 POWER TRANSFR		
C13	1514 .01 200V	R13	6017 100 1/2 W	18	60-104 POWER TRANSFR		
C14	1515 .01 200V	R14	6017 100 1/2 W	19	60-104 POWER TRANSFR		
		R15	6017 100 1/2 W	20	60-104 POWER TRANSFR		
		R16	6017 100 1/2 W	21	60-104 POWER TRANSFR		
		R17	6017 100 1/2 W	22	60-104 POWER TRANSFR		
		R18	6017 100 1/2 W	23	60-104 POWER TRANSFR		
		R19	6017 100 1/2 W	24	60-104 POWER TRANSFR		
		R20	6017 100 1/2 W	25	60-104 POWER TRANSFR		

CONVENTIONAL ALIGNMENT
(see special section)

WEBSTER CO.

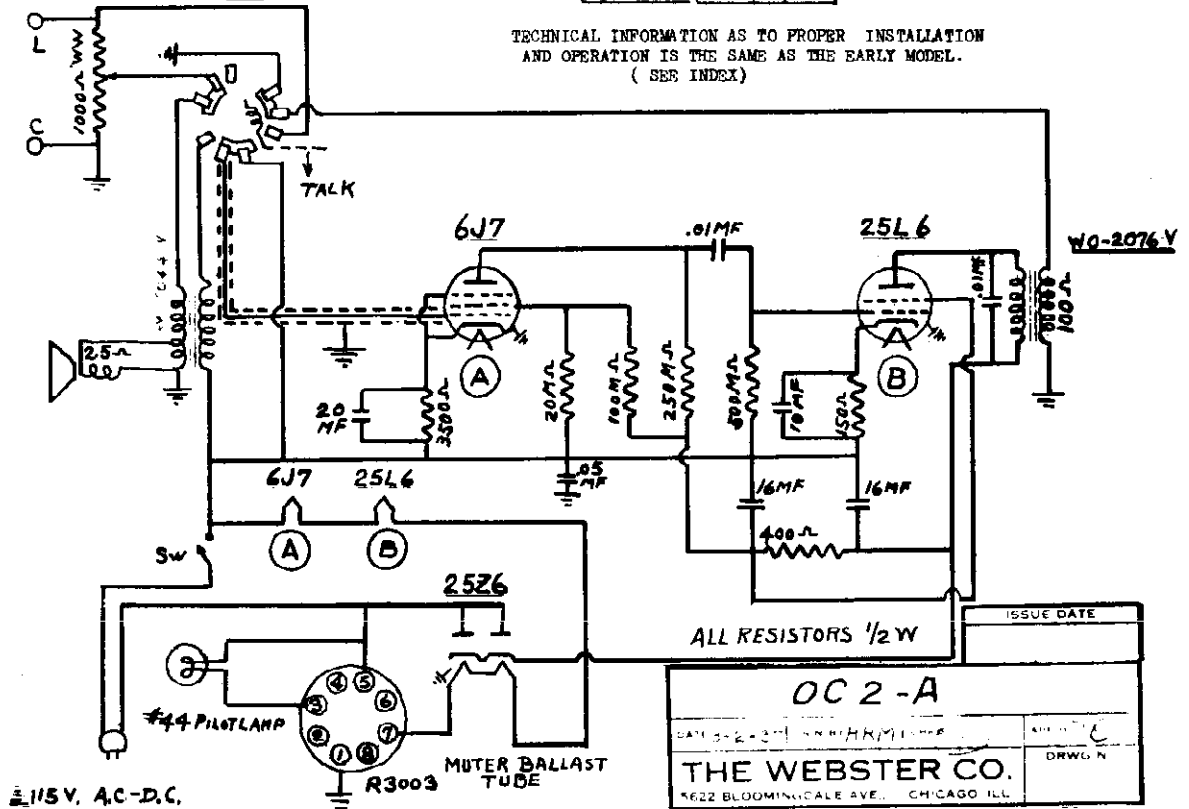
MODEL B, Commun. Sys.
MODEL OC-2 Amplifier
MODEL OC-2A Amplifier
Schematics, Notes



MODEL OC-2 AMPLIFIER
INTEROFFICE COMMUNICATION SYSTEM
DATE 12-30-34 DESIGNED BY G.S. CHECKED ROP APP'D P.J.
THE WEBSTER CO. DRWG NO.
3028 W LAKE ST. CHICAGO ILL.

This system is built for operation on 115 Volt D.C., and 115 Volt A.C., 25, 40, 50 and 60 cycles. IF THE SYSTEM FAILS TO OPERATE WHEN CONNECTED TO D.C. LINE REVERSE THE POWER CORD PLUG.
INSTALLATION Each cabinet contains its own amplifier, and its power cord should be inserted into the nearest light receptacle. The two wires of a two conductor unshielded cord should be connected to lugs at the rear of chassis. The right hand terminal is grounded. The other terminal (ungrounded) is indicated by a red dot. Webster two conductor cable is recommended but whatever cable is used should be color coded so that the same wire is connected to ground on both of the amplifiers. A volume control is mounted on the rear side of the chassis controlling the volume of the station. This control is set for the desired volume. OPERATION - After "ON-OFF" switch is turned on, in 15 seconds station is operative. The "OFF-OFF" switch controls the operation of each unit. The only other control is the operation switch, which, in its normal position, is for listening. Operator turns switch to right hand position to talk, must be held in position while talking, when released it returns to listening position.

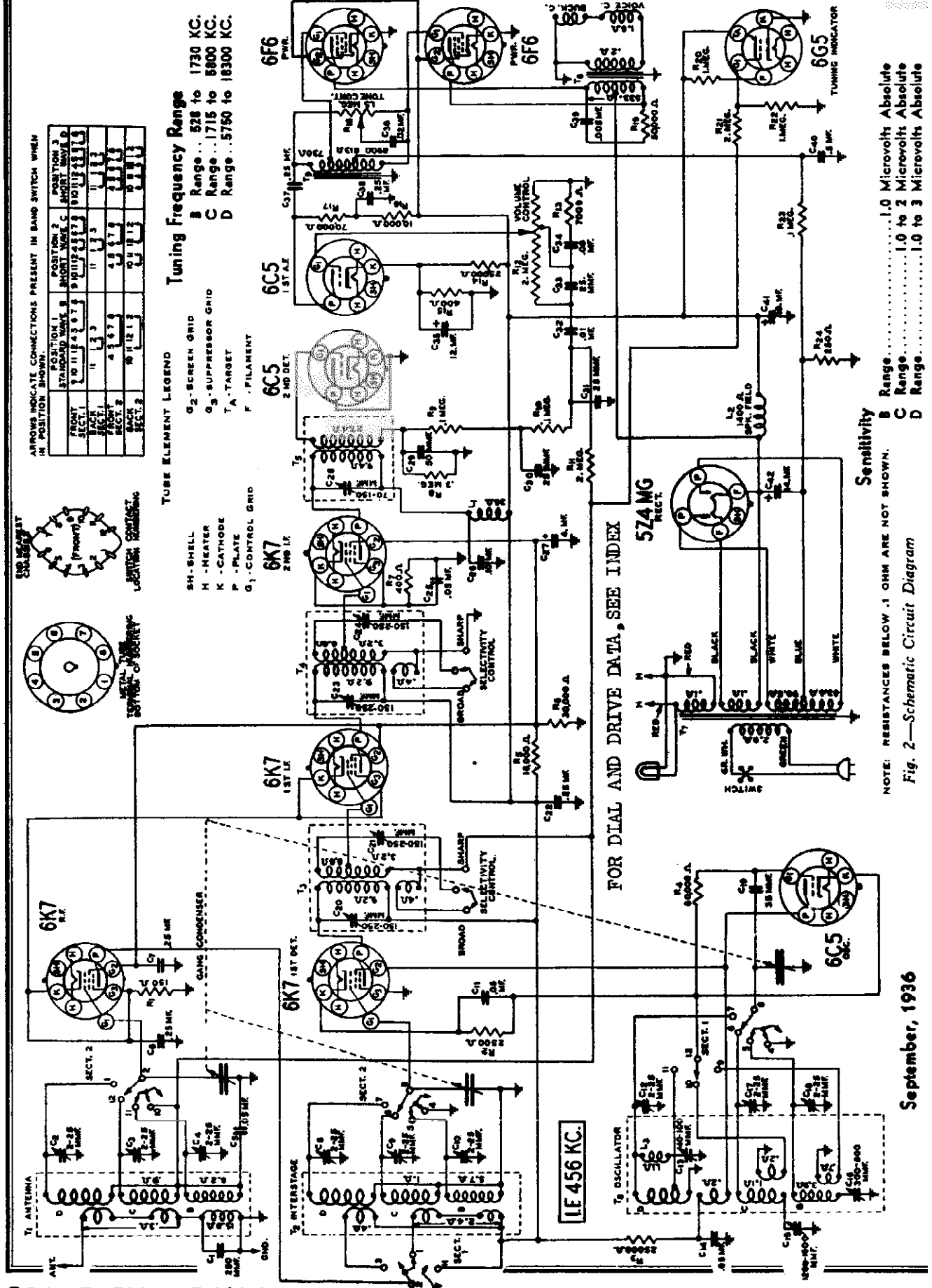
TECHNICAL INFORMATION AS TO PROPER INSTALLATION AND OPERATION IS THE SAME AS THE EARLY MODEL.
(SEE INDEX)



ALL RESISTORS 1/2 W
OC 2-A
DATE 12-2-34 DESIGNED BY R.H.M. CHECKED ROP APP'D P.J.
THE WEBSTER CO. DRWG NO.
5622 BLOOMINGDALE AVE. CHICAGO ILL.

Sensitivity

WELLS-GARDNER & CO.

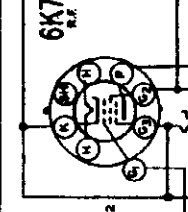
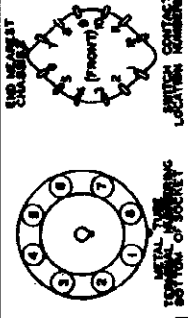


ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN

POSITION	STANDARD WAVE	POSITION 1	POSITION 2
FRONT SECT. 1	1 2 11 12 4 7	9 10 12 4 7	9 10 11 12 4 7
BACK SECT. 1	11 1 3 3	11 1 3 3	11 1 3 3
BACK SECT. 2	4 6 7 3	4 6 7 3	4 6 7 3
BACK SECT. 3	10 11 12 3	10 11 12 3	10 11 12 3

Tuning Frequency Range
 B Range... 528 to 1730 KC.
 C Range... 1715 to 5800 KC.
 D Range... 5750 to 18300 KC.

TUBE ELEMENT LEGEND
 G2 - SCREEN GRID
 G3 - SUPPRESSOR GRID
 H - HEATER
 K - CATHODE
 P - PLATE
 G1 - CONTROL GRID
 F - FILAMENT



FOR DIAL AND DRIVE DATA, SEE INDEX

Sensitivity

NOTE: RESISTANCES BELOW .1 OHM ARE NOT SHOWN.
 B Range... 1.0 Microvolts Absolute
 C Range... 1.0 to 2 Microvolts Absolute
 D Range... 1.0 to 3 Microvolts Absolute

MODEL OEL
Socket, Trimmers
Voltage, Coils

WELLS-GARDNER & CO.

Fig. 6—Location of Tubes

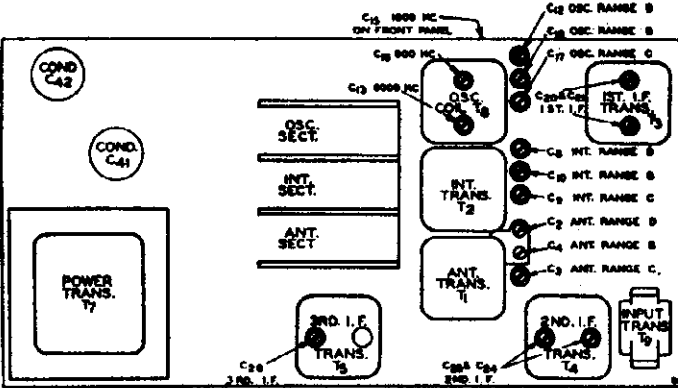
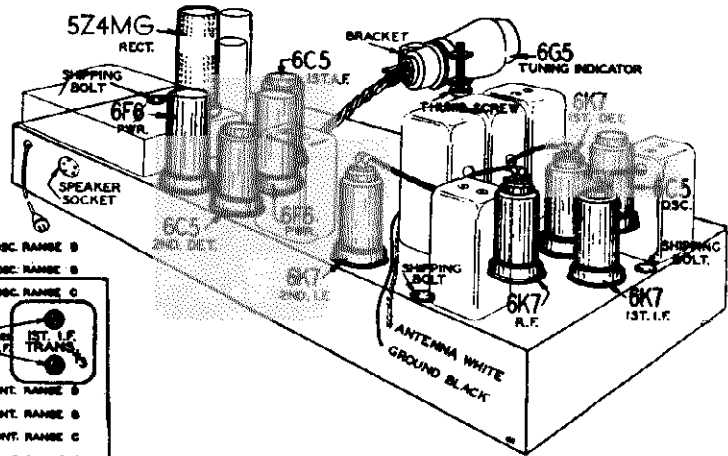


Fig. 3—Location of Trimmers

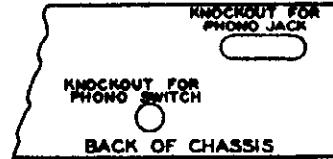
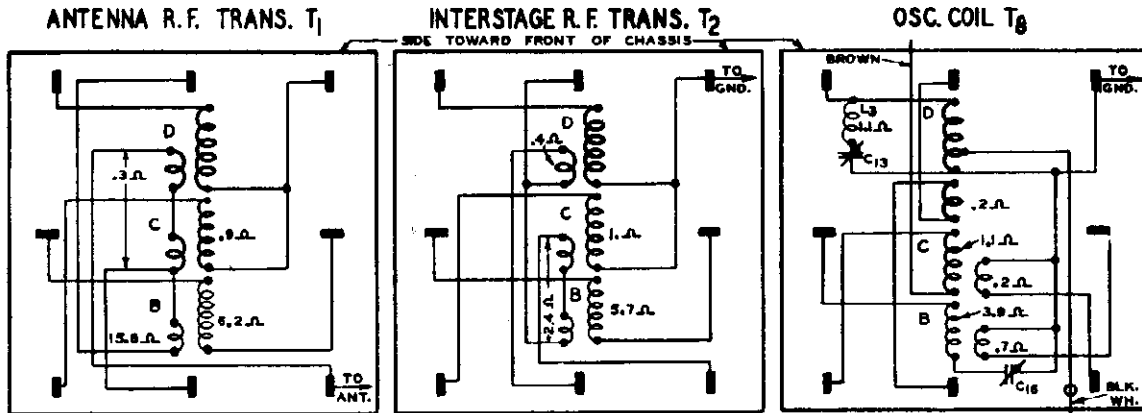


Fig. 8—Location of Phono Knockouts



NOTE: RESISTANCES OF WINDINGS BELOW 0.1 Ω. ARE NOT SHOWN.

Fig. 4—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

Line Voltage: 115
Volume Control: Maximum

Antenna Shorted to Ground
Position of Band Switch: Standard Wave

TUBE	FUNCTION	VOLTAGE BETWEEN SOCKET PRONGS AND GROUND (Unless otherwise indicated)							
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
6K7	R.F.	0	6.1(1)	250	100	2.5	...	6.1(1)	2.5
6K7	1st Det.	0	6.1(1)	250	120	0	...	6.1(1)	9
6C5	Osc.	0	6.1(1)	120	...	...	...	6.1(1)	0
6K7	1st I.F.	0	6.1(1)	250	100	2.5	...	6.1(1)	2.5
6K7	2nd I.F.	0	6.1(1)	250	100	3	...	6.1(1)	3
6C5	2nd Det.	0	6.1(1)	0	...	...	...	6.1(1)	0
6C5	1st A.F.	0	6.1(1)	110	...	...	...	6.1(1)	4.5
6F6	Power Amp.	0	6.1(1)	330	250	25(2)	...	6.1(1)	0
5Z4MG	Rect.	0	4.8(3)	...	640(4)	...	640(4)	...	4.8(3)

6G5	Tuning Indicator	Plate to Ground 20(5)	Target to Ground 250	Cathode to Ground 0	Across Heater 6.1 A.C.
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(1) A.C. voltage as read across heater terminals 2 and 7.
(2) As read across resistor R24.
(3) A.C. voltage as read across heater terminals 2 and 8.

(4) A.C. voltage as read across terminals 4 and 6.
(5) As read with 500,000 ohm meter.

WELLS-GARDNER & CO.

MODEL OEL
Alignment, Phono, Data
Notes

I. F. Adjustment

Set the signal generator for a signal of 456 KC. Connect the output of the signal generator through a .1 mf. condenser to the grid of the 1st detector. Connect the ground lead of the receiver to the ground post of the signal generator. Turn the band switch to the Range B position (standard wave band). Turn the selectivity control to the sharp position and keep it in this position for all adjustments. Turn the volume control to the maximum position. Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC. Then adjust the five I F trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis and the location is shown in Fig. 3.

Range B Alignment

After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

1730 KC Adjustment

Set the signal generator for 1730 KC. Turn the rotor of the tuning condenser to the full open position. Keep the band switch in the standard wave position.

Connect the antenna lead of the receiver through a 200 ohm condenser to the output of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action. Adjust the oscillator Range B trimmer (C18) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

1500 KC Adjustment

Set the signal generator for 1500 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.

In sets using pointers, loosen the screw of the large pointer and set the pointer at the 1500 KC mark on the standard wave band scale. Retighten the screw.

In sets using the moving beam of light, there is a moving light assembly held to the front of the drive drum by means of a screw. Loosen this screw and move the light assembly until it is at the 1500 KC mark on the dial. Retighten the screw.

Adjust the interstage Range B trimmer (C10) and antenna Range B trimmer (C4) to maximum.

Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment

Set the signal generator for 600 KC. Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range C Alignment

CAUTION—When aligning the short wave bands be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is 4088 KC, will be heard at 5000 less 912 KC, or 4088 KC. It may be necessary to increase the input signal to hear the image.

5800 KC Adjustment

Set the signal generator for 5800 KC. Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator. Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range C position (first short wave band).

Adjust the oscillator Range C trimmer (C17) until maximum output is obtained. See Fig. 3 for location of this trimmer.

5000 KC Adjustment

Set the signal generator for 5000 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range C trimmer (C9) and antenna Range C trimmer (C5) to maximum. Do not change the setting of the oscillator Range C trimmer.

1800 KC Adjustment

Set the signal generator for 1800 KC. Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 1800 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range D Alignment

18,300 KC Adjustment

Set the signal generator for 18,300 KC. Keep the antenna lead of the receiver connected through the 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position. Adjust the oscillator Range D trimmer (C12) until maximum output is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range D trimmer (C8) and antenna Range D trimmer (C2) to maximum.

When adjusting the interstage and antenna Range D trimmers, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

Do not change the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC. Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Trimmer Replacement

If one trimmer of the gang trimmer strip should become defective, it is not necessary to replace the entire strip. A single trimmer P.17A36, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (side not grounded) of the defective trimmer in the strip. This connection is then made to the single trimmer. Connect it to the side of the trimmer not in contact with the adjusting screw. The other side of the single trimmer is then connected to a good ground using a piece of heavy wire in order to support the trimmer adequately. In replacing a trimmer, be sure to keep both leads as short as possible and keep the ungrounded lead as far from ground as possible.

Planetary Drive Assembly

The planetary assembly is the unit that is integral with the tuning shaft.

If the nut on the back end of this assembly is too tight, the drive will be jerky and will turn hard in high speed. If this condition exists, back off this nut one or two turns and note the effect.

If this nut is too loose, the drive will slip in slow speed. This remedy in this case, of course, is to tighten the nut.

Should the condenser drive cord slip when the planetary pulley is turning, inspect the tuning condenser, drive drum and gears to see if they are turning properly or if they are being obstructed in some way.

If the drive turns unevenly (rough in spots), this may mean that the planetary assembly is defective or damaged internally and a new unit will be required.

Phonograph Connections

Phonograph connections can be made as shown in Fig. 7. The parts required are shown in the parts list. Knockouts are provided in the back panel of the chassis for mounting the phono jack and phono switch.—See Fig. 8.

The phono switch must be mounted with one set of terminals nearest the bottom of the chassis base. The connections are made by opening the diode return circuit at the volume control. This is done by removing the white wire connected to the insulated lug of the terminal strip on which one end of con-

denser C32 is also connected. The terminal strip is located at the back of the volume control. This wire is then connected to the phono switch, as shown in Fig. 7. A wire is then connected from the lug on the above mentioned terminal strip to the phono switch, as shown in Fig. 7. Both of the above wires are connected to the switch terminals nearest the chassis base and should be twisted together as far

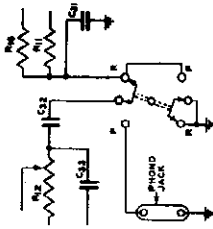


Fig. 7—Phonograph Connections

as possible and run as close to the back of the chassis base as possible.

The lead to condenser C32, after turning away from the back of the chassis base, should be run close to the 6C7 tube sockets.

Complete the other connections as illustrated in Fig. 7, using the lugs in the chassis base, located near the phono switch and jack, for grounding purposes.

The control grid lead of the 6E6 power tube near the back of the chassis should be removed and a longer lead substituted. This lead is run from the tone control to the back of the chassis, along the lower edge and is then brought to the grid terminal by being routed between the speaker socket and the tubular condenser next to it.

If a hum is heard when the phono pickup is touched, reverse the two pickup leads.

Switch Contact Location Numbering

A standard arrangement for switch contact location numbering has been adopted. This numbering is illustrated in Fig. 2. In contact locations not used, the number applying to that particular location is not employed.

Voltage Chart

The voltage readings are taken with a voltmeter, having a resistance of 1000 ohms per volt.

The standard metal tube socket terminal numbering system (bottom of diagram) is shown in Fig. 5. On the schematic circuit diagram, Fig. 2, is a listing of the complete names of the tube elements and the corresponding symbols as used on the sockets on the schematic.

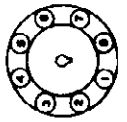


Fig. 5—Metal Tube Terminal numbering (bottom of socket)

MODEL OEL
Notes, Parts

WELLS-GARDNER & CO.

Referring to the 1st and 2nd I.F. transformers T3 and T4 in Fig. 2, it will be noted that there are coupling windings shown below the primaries in the illustration.

When the selectivity control is in the sharp position, the coupling windings are open circuited and the loose coupling which exists between the primary and secondary of these transformers results in high selectivity.

When the selectivity control is in the broad position, the coupling winding which is wound under the primary is connected in series with the secondary. This provides overcoupling which results in a greatly widened resonance curve. Passage of a wide range of audio frequencies is thus obtained.

Across the volume control resistor R12 is a filter composed of condensers C33 and C34 and resistor R13. A tap connection near the low potential end of the volume control is connected between the two condensers. At high volume settings, the filter is not effective. At the low volume settings, as the movable arm approaches the tap, the higher frequencies are by-passed through condenser C34. Very high frequencies are transmitted through condenser C33 to compensate for the reduction of these frequencies. At low volume settings the low frequency amplitudes are increased as a result.

Transformer coupling is used between the first audio stage and the output stage which employs two type 6F6 output pentode tubes in a stage of push-pull amplification. A type 5Z4MG (metal glass tube) full wave rectifier is used in the power unit.

The 6G5 tuning indicator tube is wired as shown in the schematic. This tube contains a triode and cathode ray section in one envelope.

The cathode ray is produced by the attraction of electrons from the upper end of the cathode to the coated target or anode, which is operated at a high positive potential. When this electron stream strikes the target the coating glows. The electron stream is controlled by an additional element, or control electrode, in the tube.

As a signal is tuned in, the control grid of the triode section of the 6G5 cathode ray tube becomes increasingly negative, the negative bias voltage being taken from the AVC line. The AVC voltage is reduced to a suitable value by the potentiometer arrangement of the 1 and 2 megohm resistors. The increased bias voltage reduces the triode plate current. This reduces the voltage drop across the 1 megohm plate resistor and raises the triode plate voltage. The triode plate is connected to the control electrode of the cathode ray section of the tube.

The shape and size of the area on the target struck by the cathode ray is governed by the voltage of the control electrode. When the signal is tuned to resonance, practically no plate current flows and the voltage of the control electrode is the same as that of the target. There is no opposition to the flow of electrons to the target. Tuning off resonance decreases the control electrode voltage and causes the darkened sector of the target to widen, because of the opposition to the flow of electrons in the direction of the control electrode.

NOTICE—There is a large letter on the chassis which identifies the set as to major part changes. When ordering parts, please be sure to mention the series number and this large letter.

Prices subject to change without notice

TRANSFORMERS AND COILS

Part No.	Code	Description	List Price
P-9A422	T1	Antenna Transformer and Can Assembly	\$1.90
P-9A423	T2	R. F. Interstage Transformer and Can Assembly	1.85
P-9A425	T3	1st I. F. Transformer and Can Assembly	1.85
P-9A426	T4	2nd I. F. Transformer and Can Assembly	1.85
P-9A427	T5	3rd I. F. Transformer and Can Assembly	1.80
P-51X41	T6	Output Transformer (Part of Speaker Assembly)	2.46
P-52X113	T7	115 Volt, 60 Cycle, Power Transformer	4.40
P-52X126	T7	115 Volt, 25 Cycle, Power Transformer	7.20
P-52X127	T7	115-230 Volt, 40-60 Cycle Power Transformer	6.20
P-9A424	T8	Oscillator Coil and Can Assembly	2.85
P-50X34	T9	Input Transformer	1.25
P-9A496	L1	2nd I. F. Plate Isolating Reactor	.75

CONDENSERS

TUBULAR

Part No.	Code	Capacitance	Voltage	List Price
P-44X80	C5	.05 mf.	100	\$0.15
P-44X117	C4	.25 mf.	100	.25
P-44X104	C7	.25 mf.	240	.25
P-44X86	C11	.05 mf.	180	.15
P-44X119	C14	.05 mf.	340	.20
P-44X121	C22	.25 mf.	340	.30
P-44X80	C25	.05 mf.	180	.15
P-44X106	C26	.10 mf.	340	.20
P-44X120	C32	.01 mf.	340	.15
P-44X176	C34	.08 mf.	100	.15
P-49X10	C36	.25 mf.	340	.40
	C37	.25 mf.	340	.40
P-44X120	C38	.01 mf.	340	.15
P-44X174	C39	.085 mf.	1000	.20
P-44X191	C40	.5 mf.	100	.30

ELECTROLYTIC

Part No.	Code	Capacitance	Voltage	List Price
P-46X213	C27	4 mf.	100 } Dry	.95
	C28	12 mf.	25 } Dry	
P-44X11	C41	18 mf.	250 } Wet	1.10
P-44X10	C42	14 mf.	400 } Wet	1.25

MOLDED

Part No.	Code	Capacitance	Voltage	List Price
P-47X69	C1	250 mmf.		.15
P-47X83	C19	35 mmf.		.10
P-47X85	C29	50 mmf.		.10
P-47X72	C30	25 mmf.		.10
P-47X72	C31	25 mmf.		.10
P-47X72	C33	25 mmf.		.10

TRIMMER

Part No.	Code	Capacitance	Description	List Price
P-17A46 Trimmer Strip	C2	2-25 mmf.	Range "D" Antenna Trimmer	.95
	C3	2-25 mmf.	Range "C" Antenna Trimmer	
	C4	2-25 mmf.	Range "B" Antenna Trimmer	
	C5	2-25 mmf.	Range "D" Interstage Trimmer	
	C9	2-25 mmf.	Range "C" Interstage Trimmer	
	C10	2-25 mmf.	Range "D" Oscillator Trimmer	
	C12	2-25 mmf.	Range "D" Oscillator Trimmer	
	C18	2-25 mmf.	Range "B" Oscillator Trimmer	

See Part Number 17A36 for replacement of any one section.

Part No.	Code	Capacitance	Description	List Price
P-17A36	C13	40-100 mmf.	Range "D" Oscillator Padding Condenser	.45
	C16	300-400 mmf.	Range "B" Oscillator Padding Condenser	
P-17A47	C15	1200-1400 mmf.	Range "C" Oscillator Padding Condenser	.45
P-17A30	C20	150-250 mmf.	1st I. F. Trimmers	.45
	C21	150-250 mmf.		
P-17A30	C23	150-250 mmf.	2nd I. F. Trimmers	.45
	C24	150-250 mmf.		
P-17A40	C28	70-150 mmf.	3rd I. F. Trimmer	.30

MISCELLANEOUS

Part No.	Description	List Price
P-17A34	2-25 mmf. (to be used for replacement of any one section of Trimmer Strip P-17A45)	.10
P-14A52	3 Gang Condenser, Less Dial and Drive Assembly	3.40

RESISTORS

CARBON

Part No.	Code	Resistance	Wattage	List Price
P-A94151	R1	150 Ohms	0.2	\$0.15
P-A95282	R2	2,500 Ohms	0.2	.10
P-C94283	R3	25,000 Ohms	1.0	.15
P-A94803	R4	80,000 Ohms	0.2	.15
P-D93163	R5	14,000 Ohms	2.0	.45
P-C94303	R6	30,000 Ohms	1.0	.15
P-A94401	R7	400 Ohms	0.2	.15
P-A94304	R8	300,000 Ohms	0.2	.10
P-A95104	R9	100,000 Ohms	0.2	.10
P-A95104	R10	100,000 Ohms	0.2	.10
P-A94205	R11	2.0 Megohms	0.2	.15
P-A94702	R13	7,000 Ohms	0.2	.15
P-E94251	R14	25,000 Ohms	3.0	.30
P-A94401	R15	400 Ohms	0.2	.15
P-A95103	R16	10,000 Ohms	0.2	.10
P-B96703	R17	70,000 Ohms	0.5	.10
P-C96603	R19	50,000 Ohms	1.0	.10
P-A95105	R20	1.0 Megohms	0.2	.10
P-A94205	R21	2.0 Megohms	0.2	.15
P-A94105	R22	1.0 Megohms	0.2	.15
P-A95104	R23	100,000 Ohms	0.2	.10

WIRE WOUND

Part No.	Code	Resistance	Wattage	List Price
P-43X54	R24	250 Ohms	3.0	.30

VARIABLE

Part No.	Code	Resistance	Description	List Price
P-34X219	R12	2.0 Megohms	Volume Control and On-Off Switch	1.10
P-40X213	R18	1.5 Megohms	Tone Control and Selectivity Switch	1.30

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MODEL OF
Schematic
Sensitivi

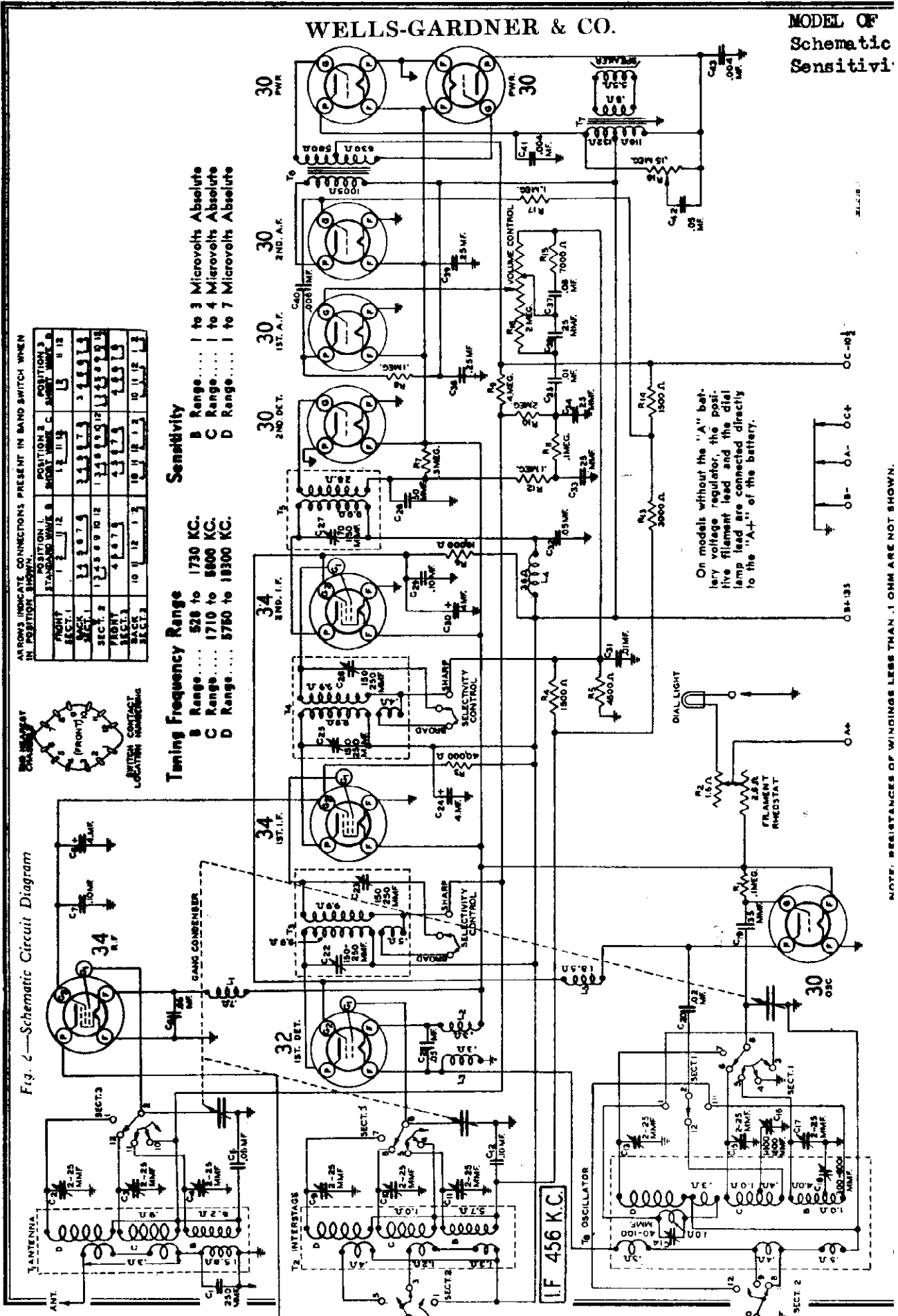


Fig. 2—Schematic Circuit Diagram

ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION

POSITION 1	POSITION 2	POSITION 3
FRONT SECT. 1	1 2 11 12	1 3 11 12
BACK SECT. 1	3 4 8 7 5	3 4 8 7 5
FRONT SECT. 2	1 2 5 6 9 10 12	1 2 5 6 9 10 12
BACK SECT. 2	4 8 7 5	4 8 7 5
FRONT SECT. 3	10 11 12 1 3	10 11 12 1 3
BACK SECT. 3	10 11 12 1 3	10 11 12 1 3

Tuning Frequency Range
 B Range... 528 to 1730 KC.
 C Range... 1710 to 8600 KC.
 D Range... 5780 to 18300 KC.

Sensitivity
 B Range... 1 to 3 Microvolts Absolute
 C Range... 1 to 4 Microvolts Absolute
 D Range... 1 to 7 Microvolts Absolute

On models without the "A" battery voltage regulator, the positive filament lead and the dial lamp lead are connected directly to the "A+" of the battery.

NOTE: RESISTANCES OF WINDINGS LESS THAN .1 OHM ARE NOT SHOWN.

MODEL OF
Socket, Trimmers
Voltage, Coils, Notes

WELLS-GARDNER & CO.

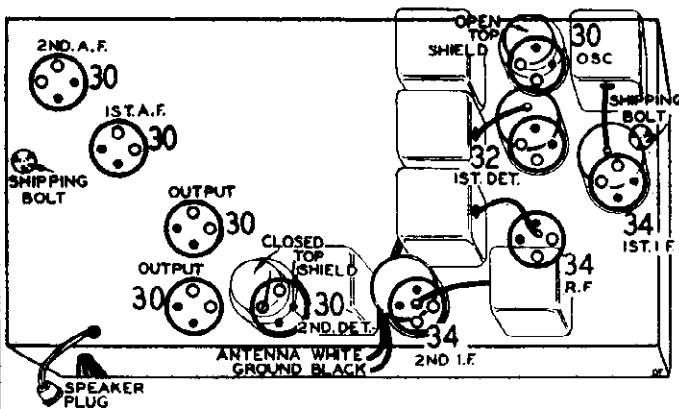


Fig. 7—Location of Tubes

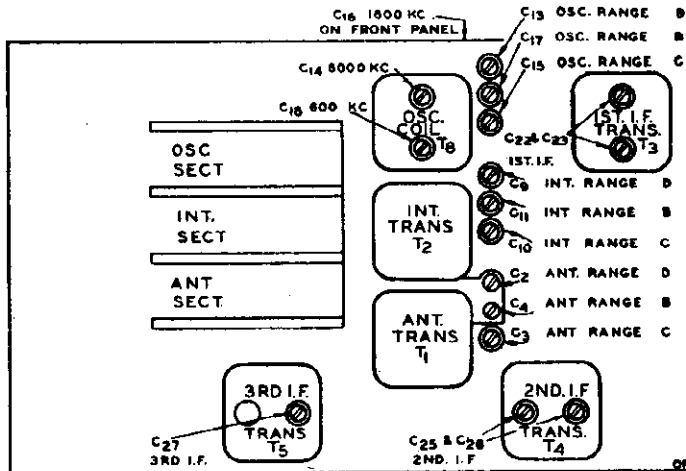


Fig. 6—Location of Trimmers

VOLTAGES AT SOCKETS
Volume Control at Maximum Antenna Shorted to Ground
Band Switch in Standard Wave Position

Type of Tube	Function	Across Filament	Plate to Ground	Screen to Ground	Control Grid to Ground
34	R. F.	2.0	135	65	
32	1st Det.	2.0	135	90	6
30	Osc.	2.0	90		
34	1st I. F.	2.0	135	65	
34	2nd I. F.	2.0	135	90	4.5
30	2nd Det.	2.0			
30	1st A. F.	2.0	75		4.5(1)
30	2nd A. F.	2.0	132		9 (2)
30	Power	2.0	135		10.5

- (1) Volume control at minimum setting.
- (2) As read from connection between R13 and R14, and ground.

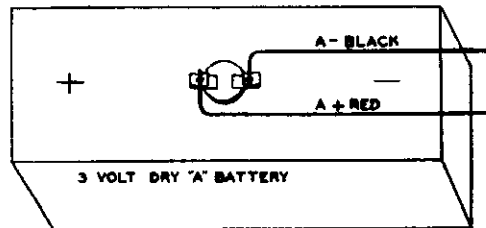


Fig. 4—3 V. Dry "A" Battery Connections

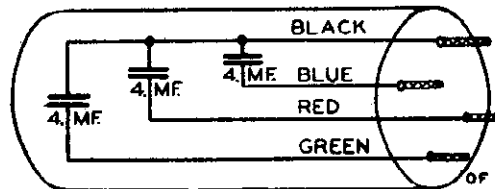
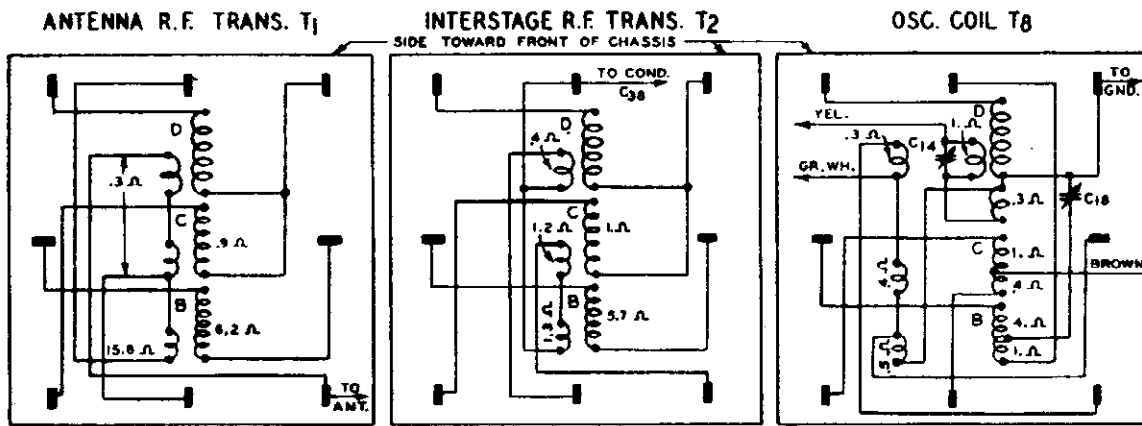


Fig. 9—Electrolytic Condenser Internal Connections



NOTE: RESISTANCES OF WINDINGS LESS THAN .1 Ω ARE NOT SHOWN.

Fig. 8—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

Trimmer Replacement

If one trimmer of the gang trimmer strip should become defective, it is not necessary to replace the entire strip. A single trimmer P-17A36, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (side not grounded) of the defective trimmer in the strip. This connection is then made to the single trimmer. Connect it to

the side of the trimmer not in contact with the adjusting screw. The other side of the single trimmer is then connected to a good ground, using a piece of heavy wire in order to support the trimmer adequately. In replacing a trimmer, be sure to keep both leads as short as possible and keep the ungrounded lead as far from ground as possible.

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MODEL OF Alignment, Part Notes, Batt. Data

DIAL AND DRIVE ASSEMBLY

Table with columns for Part No., Description, and Price. Includes sub-sections for DIAL ASSEMBLY, TUBULAR, and MISC. PARTS.

DAVE ASSEMBLY

Table listing parts for Dave Assembly, including Part No., Description, and Price.

"A" Battery (Models with Voltage Regulator)

Models equipped with the voltage regulator on the back of the chassis may use any type of "A" battery delivering from 2 to 3 volts.

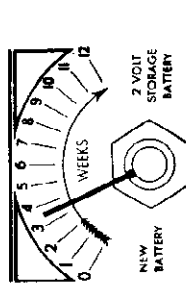


Fig. 3 - "A" Battery Voltage Regulator

Batteries

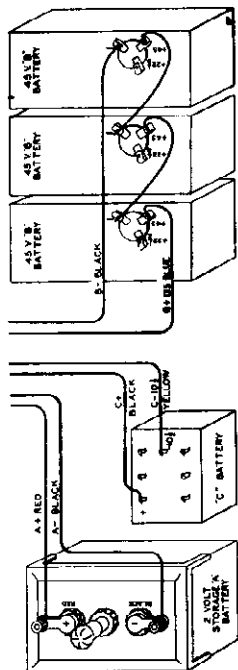


Fig. 4 - "A", "B", and "C" Battery Connections

MISCELLANEOUS

Table listing miscellaneous parts including resistors, capacitors, and trimmers.

MISCELLANEOUS

If the drive turns unevenly (rough in spots) this may mean that the planetary assembly is defective or damaged internally and a new unit will be required. Referring to the 1st and 2nd I. F. transformers T3 and T4 in Fig. 2, it will be noted that there are coupling windings shown below the primaries in the illustration.

TRANSFORMERS AND COILS

Table listing transformer and coil parts including Part No., Description, and Price.

REPLACEMENT PARTS

At low volume settings the low frequency amplitudes are increased as a result. Models with the filament rheostat are connected as shown in Fig. 2. This rheostat permits the use of a 3 volt "A" battery. As shown in Fig. 2, there are two separate variable resistors one of which controls the filament voltage and the other the dial lamp voltage.

CONDENSERS

Should the condenser drive cord slip when the planetary pulley is turning, inspect the tuning cone driver, drive drum and gears to see if they are turning properly or if they are being obstructed in some way.

1. F. Adjustment

Set the signal generator for a signal of 450 KC. Connect the output of the signal generator through a 1 mfd. condenser in the grid of the 1st detector. Connect the ground lead of the receiver to the ground post of the signal generator.

Range B Alignment

After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check. 1730 KC Adjustment

Range C Alignment

When aligning the short wave bands be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 1000 KC. The signal will then be heard at 1000 KC on the dial of the radio. The image frequency, which will be heard at 2000 KC, will be heard at 1000 KC. To check for image frequency, tune to increase the input signal to hear the image.

6000 KC Adjustment

Set the signal generator for 6000 KC. Turn the tuning condenser rotor until maximum output is obtained. Turn the rotor slowly back and forth, at the same time adjusting the 600 KC trimmer, until the peak of greatest intensity is obtained. See Fig. 6 for location of this trimmer.

Range D Alignment

Turn the band switch to the Range D position (second short wave band). Adjust the oscillator Range D trimmer (C13) until maximum output is obtained. See Fig. 6 for location of this trimmer.

WELLS-GARDNER & CO.

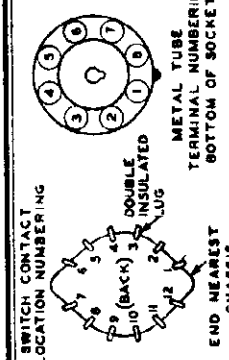
MODELS 5F,
Schematic
Sensitivity

ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN POSITION SHOWN.

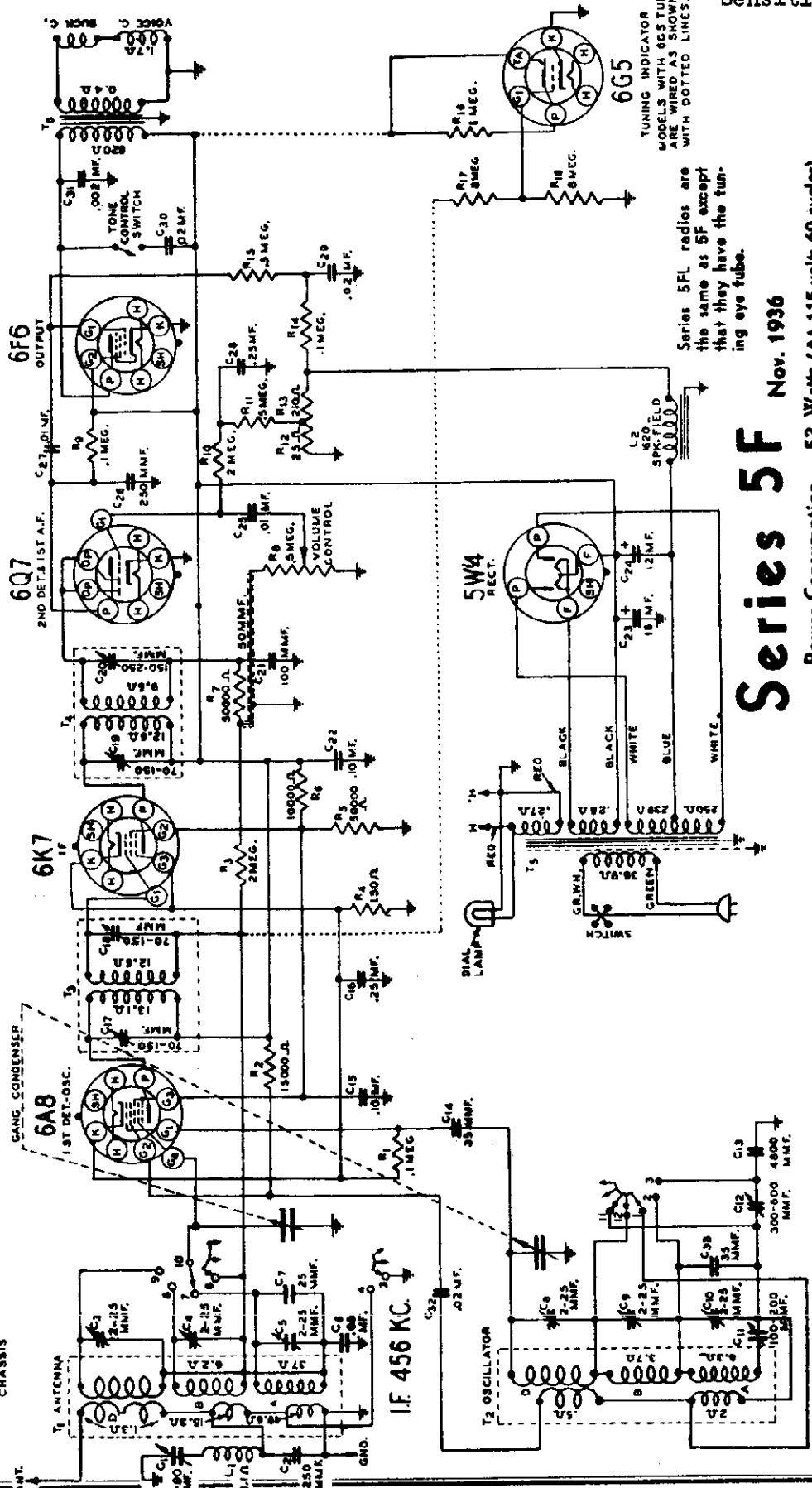
POSITION NO. 1	BACK	1	2	3	4	5	6	7	8	9	10	11	12
LONG WAVE "A"	FRONT												
POSITION NO. 2	BACK	1	2	3	4	5	6	7	8	9	10	11	12
MEDIUM WAVE "B"	FRONT												
POSITION NO. 3	BACK	1	2	3	4	5	6	7	8	9	10	11	12
SHORT WAVE "D"	FRONT												

TUBE ELEMENT LEGEND

- SH - SHELL
- H - HEATER
- K - CATHODE
- F - FILAMENT
- P - PLATE
- G₁ - CONTROL GRID
- G₂ - SCREEN GRID
- G₃ - SUPPRESSOR GRID
- D₁ - DIODE PLATE
- T_A - TARGET
- 6A6 TUBE ONLY
- G₁ - OSC. CONTROL GRID
- G₂ - OSC. ANODE GRID
- G₃ - SCREEN GRID
- G₄ - CONTROL GRID



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TUNING INDICATOR MODELS WITH 6G5 TUBE ARE WIRED AS SHOWN WITH DOTTED LINES.

Series 5F

Nov. 1936

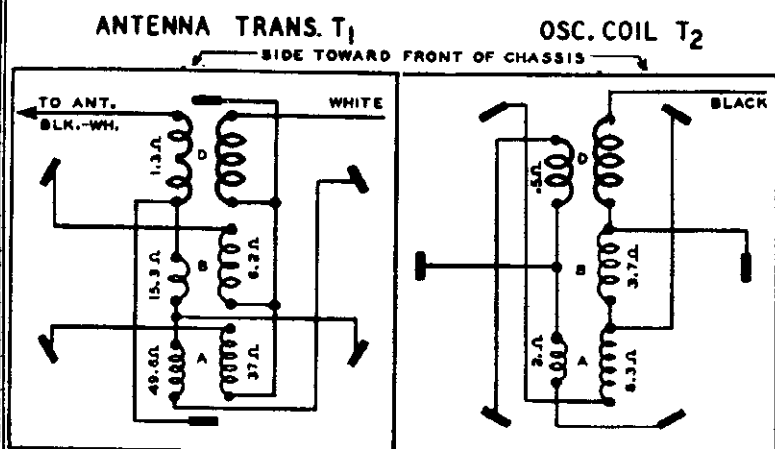
Power Consumption - 53 Watts (At 115 volts 60 cycles)
Power Output - 2 Watts Undistorted

Sensitivity
A Range 12 Microvolts Absolute
B Range 12 Microvolts Absolute

Tuning Frequency Range
A Range 148 to 300 KC
B Range 528 to 1730 KC

MODELS 5F, 5FL
Socket, Trimmers
Voltage, Coils

WELLS-GARDNER & CO.



NOTE: RESISTANCES OF WINDINGS LESS THAN .1 Ω ARE NOT SHOWN

Fig. 4—R.F. and Oscillator Coil Base Terminal Arrangement and D.C. Resistance of Windings

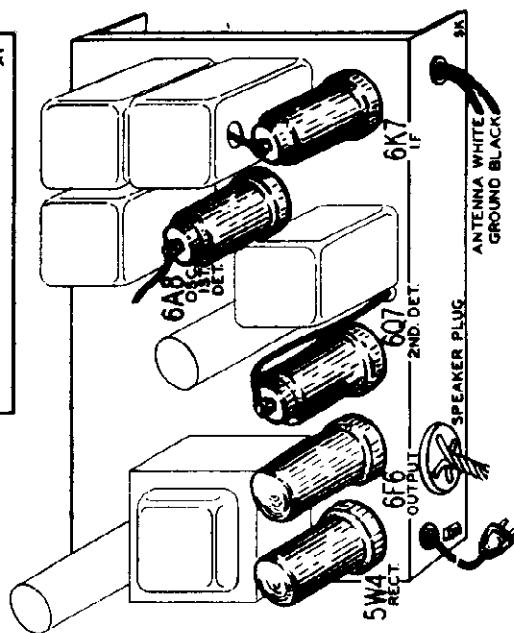


Fig. 5—Location of Tubes

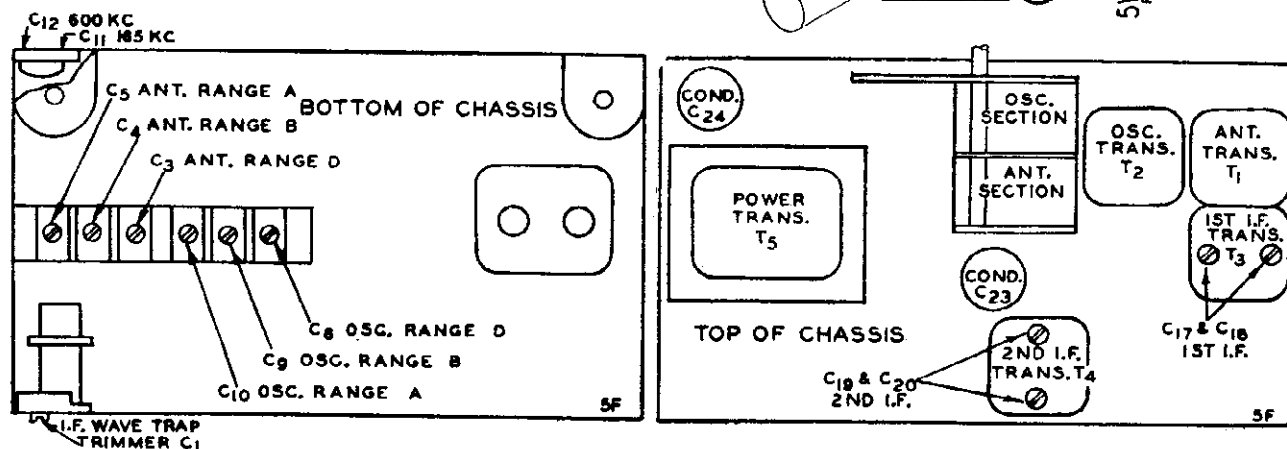


Fig. 3—Location of Trimmers

VOLTAGES AT SOCKETS

Line Voltage: 115

Volume Control: Maximum

Antenna Shorted to Ground

TUBE	FUNCTION	VOLTAGE BETWEEN SOCKET PRONGS AND GROUND (Unless otherwise indicated)							
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
6A8	1st Det.-Osc.	0	6.3(1)	200	110		160	6.3(1)	3
6K7	I.F.	0	6.3(1)	200	110	3		6.3(1)	3
6Q7	2nd Det.	0	6.3(1)	110	0	0		6.3(1)	0(2)
6F6	Output	0	6.3(1)	185	200	12.5(3)		6.3(1)	0
5W4	Rectifier	0	5.1(4)		620(5)		620(5)		5.1(4)
6G5	Tuning Indicator ...	Plate to Ground 25		Target to Ground 200		Cathode to Ground 0		Across Heater 6.3 A.C.	

(1) A.C. voltage as read across heater terminals 2 and 7.

(2) Bias (1.5 volts) as read across resistor R12.

(3) Read across resistor R12 and R13.

(4) A.C. voltage as read across heater terminals 2 and 8.

(5) A.C. voltage read across terminals 4 and 6.

WELLS-GARDNER & CO.

MODEL 5H
Schematic
Data

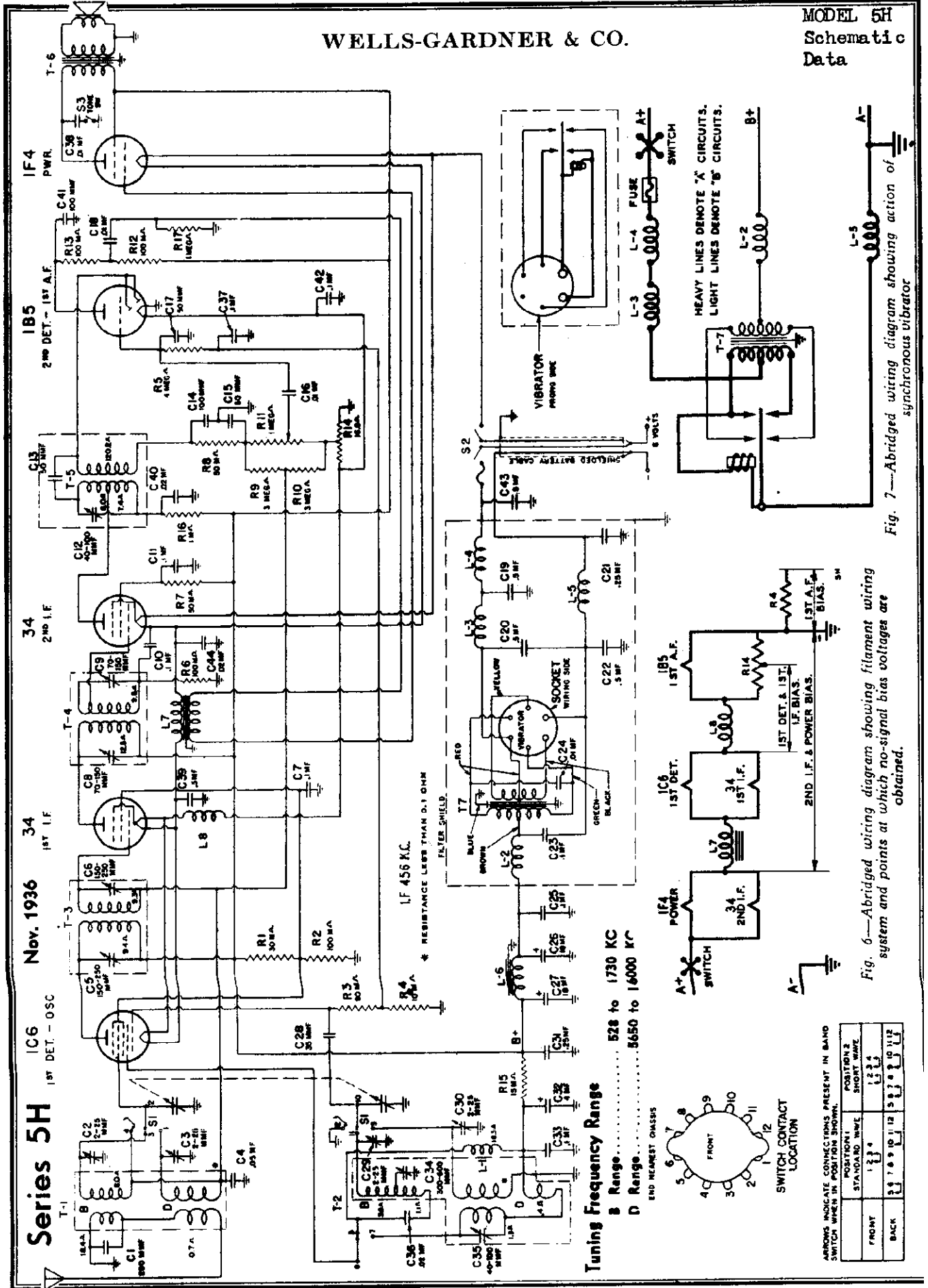


Fig. 6—Abridged wiring diagram showing filament wiring system and points at which no-signal bias voltages are obtained.

Fig. 7—Abridged wiring diagram showing action of synchronous vibrator

ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHICH IN POSITION SHOWN.

POSITION	STANDARD NAME	POSITION 3 SHORT NAME
FRONT	1 2 3	1 2 3
BACK	4 5 6 7 8 9 10 11 12	4 5 6 7 8 9 10 11 12

MODEL 5H

Socket, Trimmers
Voltage, Coils
Resistance

WELLS-GARDNER & CO.

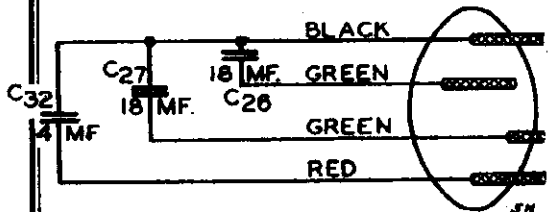
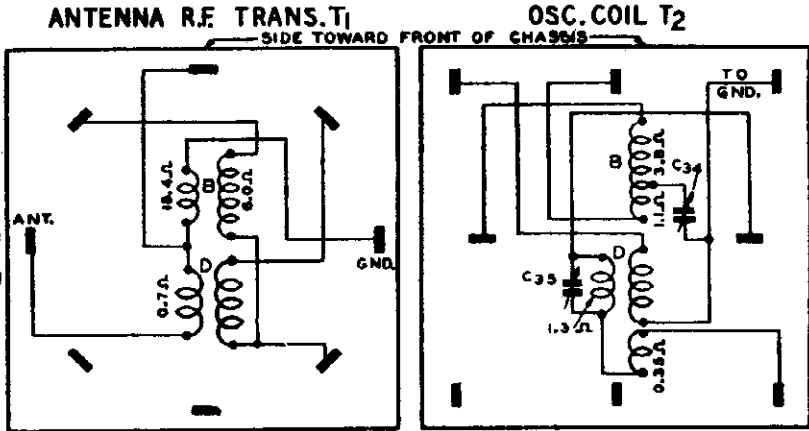


Fig. 4—Electrolytic Condenser
Internal Connections



NOTE: RESISTANCES OF WINDINGS LESS THAN 1.0 Ω ARE NOT SHOWN
Fig. 8—R.F. and Oscillator Coil Base Terminal Arrangement
and D.C. Resistance of Windings

Power Consumption 1.1 Amperes at 6.3 Volts

Power Output . . . 0.35 Watt Undistorted

D. C. Resistances of Audio and Filter
Circuit Windings —
Other Resistances are Shown in Fig. 2

The values given below will vary slightly in different sets.

Part No.	Winding	Code	D. C. Resistance in Ohms
51X47	Output Transformer	T6	
	Primary Winding		713.
	Secondary Winding		0.4
12A248 & 12A249	Dynamic Speaker 6" and 8"		
	Speaker Voice Coil		5.4
53X132	Power Transformer	T7	
	Primary Winding		0.3
	Center Tap to Inside		0.3
	Secondary Winding		166.
	Center Tap to Outside		185.
9A645	"B" Reactor	L1	18.3
9A647	"A" Reactor	L2	17.7
9A646	Vibrator Reactor	L3	0.1
9A654	"A" Line Reactor	L4	0.1
9A654	"A" Line Reactor	L5	0.1
52X45	"B" Reactor	L6	305.
52X48	Transformer	L7	
	Audio Choke (Primary)		1.3
	Hum Bucking Winding (Secondary)		22.7
9A645	"A" Reactor	L8	0.3

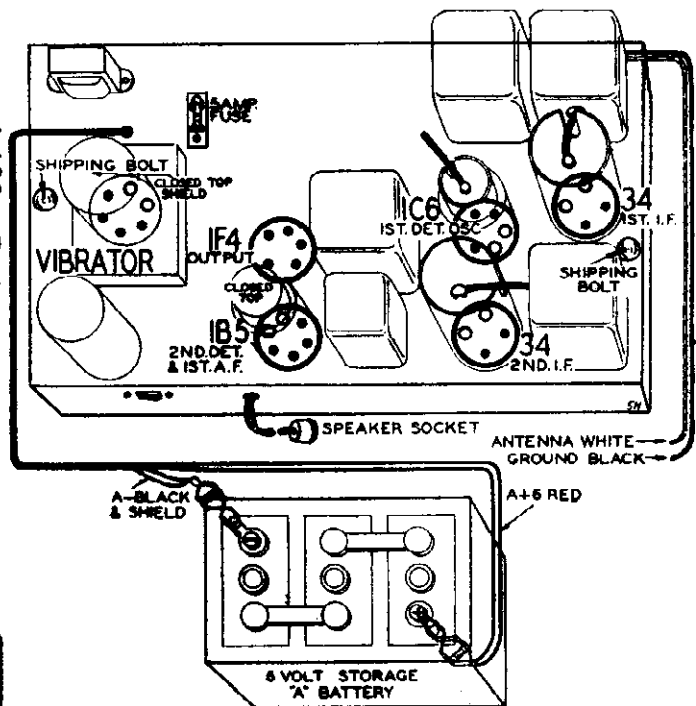


Fig. 5—Tube Arrangement and Battery Connections

VOLTAGES AT SOCKETS					
Volume Control at Maximum			Antenna Shorted to Ground		
Battery—4 Volts			Band Switch in Standard Wave Position		
Type of Tube	Function	Across Filament	Plate to Ground	Screen to Ground	Bias Voltage
IC6	1st Det.-Osc.	2.0	140 110(1)	55	1.1(2)
34	1st I.F.	2.0	140	55	1.1(2)
34	2nd I.F.	2.0	140	75	4.0
1B5	2nd Det. 1st A.F.	2.0	75		3.0(3)
IF4	Power	2.0	135	140	

- (1) Anode Grid to ground.
- (2) As read from negative filament leg to center tap of R14.
- (3) As read across Resistor R4 (using 100,000 ohm meter). This voltage is subject to considerable variation depending on band and frequency setting.

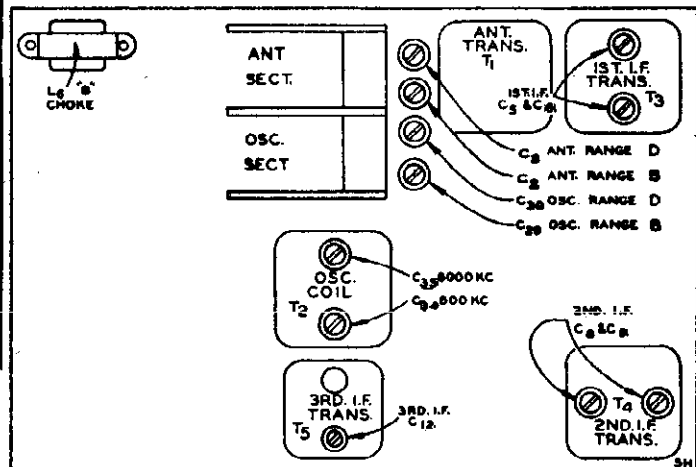


Fig. 3—Location of Trimmers

WELLS-GARDNER & CO.

MODEL 5H Alignment, Notes Parts

Parts list table with columns for Part No., Description, and Quantity. Includes sections for TUBULAR, ELECTROLYTIC, MISC. WORD, SOCKET, RESISTORS, TRANSFORMERS AND COILS, CONDENSERS, and WIRE WOUND.

If the receiver does not operate after being turned on, turn the switch on immediately, examine the lead connections and the fuse and see if all tubes are properly inserted.

Replacement Parts

The primary of transformer T7 serves as an audio choke in the filament circuit. The secondary of this transformer is in the control grid circuit of the 1F4.

MISCELLANEOUS

There is a large letter on the sheet which identifies the parts to be replaced. When ordering parts, please refer to the number in the column and this large letter.

TRANSFORMERS AND COILS

When the rotor is in the range D position, the primary of the power transformer is connected to the 110 volt AC line.

CONDENSERS

Do not turn the receiver on unless ALL the tubes are in the sockets. Removal of any of them will result in abnormal voltages on the remaining tubes.

Under the ground connections from the top legs on the inside of the chassis base (right side from front).

Range D Alignment

When aligning the short wave band, be sure NOT to adjust the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio.

16,000 KC Adjustment

Set the signal generator for 16,000 KC. Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

15,000 KC Adjustment

Set the signal generator for 15,000 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.

6000 KC Adjustment

Set the signal generator for 6000 KC. Turn the tuning condenser rotor until maximum output is obtained.

1500 KC Adjustment

Set the signal generator for 1500 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Range B Alignment

After the procedure for the alignment of each range has been followed below is completed, it is advisable to repeat the procedure as a final check.

Now unsolder the mounting lug holding the terminal strip to the transformer cover. Remove the four nuts from the bolts holding the transformer assembly to the chassis.

Trimmer Replacement

If one trimmer of the gang trimmer strip should become defective, it is not necessary to replace the entire strip. A single trimmer 17A16, as shown in the replacement parts list, may be used.

Caution

Do not turn the receiver on unless ALL the tubes are in the sockets. Removal of any of them will result in abnormal voltages on the remaining tubes.

Service Power Unit

The power unit is that portion of the chassis assembly contained within the large rectangular shield can and the circuit for which is shown within the shield lines at the lower center of the schematic diagram, Fig. 4.

600 KC Adjustment

Set the signal generator for 600 KC. Turn the rotor of the tuning condenser until maximum output is obtained.

1500 KC Adjustment

Set the signal generator for 1500 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.

600 KC Adjustment

Set the signal generator for 600 KC. Turn the tuning condenser rotor until maximum output is obtained.

Turn the volume control to the maximum position. Adjust the signal from the signal generator to prevent the leveling-off action of the AVC.

1730 KC Adjustment

Set the signal generator for 1730 KC. Turn the rotor of the tuning condenser to the full open position.

1500 KC Adjustment

Set the signal generator for 1500 KC. Turn the rotor of the tuning condenser until maximum output is obtained.

1500 KC Adjustment

Set the signal generator for 1500 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.

600 KC Adjustment

Set the signal generator for 600 KC. Turn the tuning condenser rotor until maximum output is obtained.

1500 KC Adjustment

Set the signal generator for 1500 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.

600 KC Adjustment

Set the signal generator for 600 KC. Turn the tuning condenser rotor until maximum output is obtained.

MODELS 5K, 5KL Alignment, Parts

WELLS-GARDNER & CO.

Table with columns: Part No., Description, Price. Lists various components like Volume Indicator Card, Lamp Sockets, Lamp, etc.

TRANSFORMERS AND COILS

Table with columns: Part No., Description, Price. Lists transformers and coils like Antenna Transformer, I.F. Transformer, etc.

CONDENSERS

Table with columns: Code, Description, Price. Lists various capacitor codes and values.

MISCELLANEOUS

Table with columns: Part No., Description, Price. Lists miscellaneous parts like sockets, speakers, knobs, etc.

TRIMMERS

Table with columns: Code, Description, Price. Lists various trimmer codes and types.

MISCELLANEOUS

Table with columns: Code, Description, Price. Lists miscellaneous parts like resistors, carbon, wire wound, etc.

RESISTORS

Table with columns: Code, Description, Price. Lists various resistor codes and values.

WIRE WOUND

Table with columns: Code, Description, Price. Lists wire wound resistor codes and values.

Loosen the screw of the large pointer and set the pointer at the 1700 KC mark on the standard wave band scale. Retighten the screw.

Adjust the antenna Range B trimmer (C5) to maximum.

Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer (C11) until the peak of greatest intensity is obtained.

location of this trimmer.

Replacement Parts

NOTICE—There is a large letter on the chart which identifies the set as to major part changes.

be sure to mention the series number and this large letter.

MISCELLANEOUS

Table with columns: Part No., Description, Price. Lists miscellaneous parts like sockets, speakers, knobs, etc.

TRIMMERS

Table with columns: Code, Description, Price. Lists various trimmer codes and types.

MISCELLANEOUS

Table with columns: Code, Description, Price. Lists miscellaneous parts like resistors, carbon, wire wound, etc.

WIRE WOUND

Table with columns: Code, Description, Price. Lists wire wound resistor codes and values.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the antenna Range D trimmer (C3) to maximum.

When adjusting the antenna Range D trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

Do not change the setting of the oscillator Range D trimmer.

Range C Alignment

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 5800 KC trimmer (C11) until the peak of greatest intensity is obtained.

location of this trimmer.

Turn the band switch to the Range C position (1st short wave band).

Adjust the oscillator Range C trimmer (C9) until maximum output is obtained.

5000 KC Adjustment

Set the signal generator for 5000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the antenna Range C trimmer (C4) to maximum.

Do not change the setting of the oscillator Range C trimmer.

Range B Alignment

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

1730 KC Adjustment

Set the signal generator for 1730 KC.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the standard wave position.

Connect the antenna lead of the receiver through a 200 mmf. condenser to the output of the signal generator.

Adjust the oscillator Range B trimmer (C10) until maximum output is obtained.

The location of this trimmer is shown in Fig. 3.

1500 KC Adjustment

1. F. Adjustment Set the signal generator for a signal of 416 KC.

Connect the output of the signal generator through a .1 mf. condenser to the grid of the 1st detector.

Connect the ground lead of the receiver to the ground post of the signal generator.

Turn the band switch to the Range B position (standard wave band).

Turn the volume control to the maximum position.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

Then adjust the four I.F. trimmers until maximum output is obtained.

The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 3.

Connect the antenna lead of the receiver through a 200 mmf. condenser to the output of the signal generator, and adjust the I.F. wave trap trimmer (C1) for minimum output.

The location of this trimmer is shown in Fig. 3.

Range D Alignment

After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

CAUTION—When aligning the short wave bands be sure NOT to adjust at the image frequency.

This can be checked as follows: Let us say the signal generator is set for 5000 KC.

The signal will then be heard at 5000 KC on the dial of the radio.

The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC.

It may be necessary to increase the input signal to hear the image.

18,300 KC Adjustment

Set the signal generator for 18,300 KC.

Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range D position (2nd short wave band).

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the oscillator Range D trimmer (C8) until maximum output is obtained.

See Fig. 3 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

See Fig. 3 for location of this trimmer.

100,000 Ohm

50,000 Ohm

25,000 Ohm

10,000 Ohm

5,000 Ohm

2,500 Ohm

1,000 Ohm

500 Ohm

250 Ohm

100 Ohm

50 Ohm

25 Ohm

10 Ohm

5 Ohm

2.5 Ohm

1 Ohm

.5 Ohm

.25 Ohm

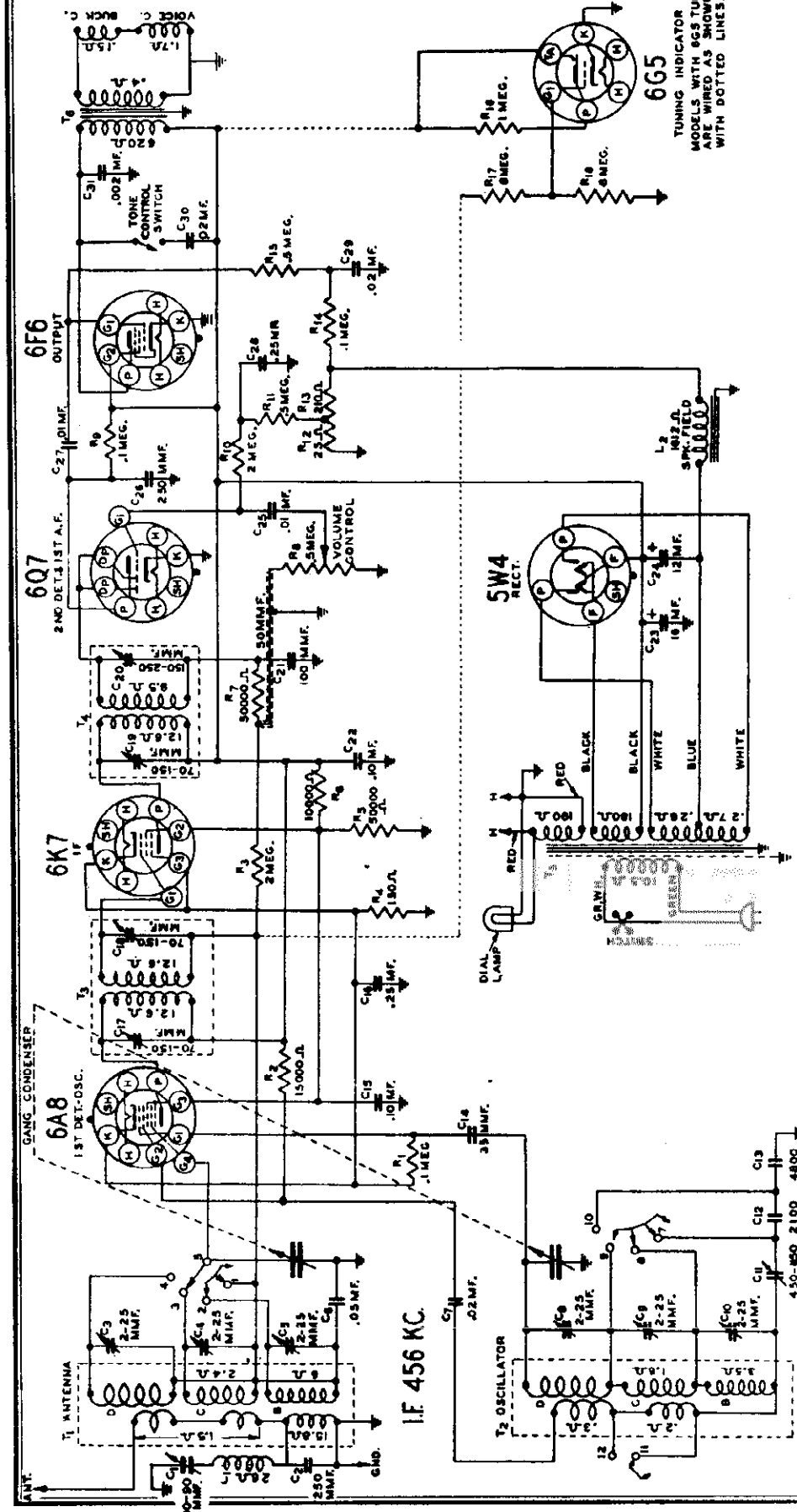
.1 Ohm

.05 Ohm

.025 Ohm

WELLS-GARDNER & CO.

MODELS 5K, 5KL
Schematic
Sensitivity



Power Consumption - 53 Watts (At 115 volts 60 cycles) Tuning Frequency Range
 B Range..... 528 to 1730 KC
 C Range..... 1710 to 5900 KC
 D Range..... 5750 to 18300 KC

Power Output 2 Watts Undistorted

Selectivity 35 KC Broad at 1000 times Signal

Intermediate Frequency 456 KC

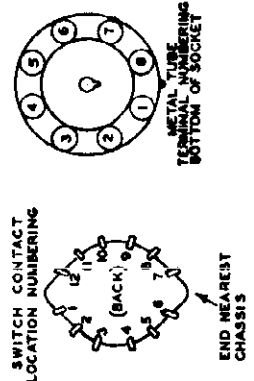
Speaker 6", 8" or 10" Dynamic

Sensitivity
 B Range..... 12 Microvolts Absolute
 C Range..... 17 to 24 Microvolts Absolute
 D Range..... 28 to 35 Microvolts Absolute

NOTE: RESISTANCES OF WINDINGS LESS THAN .1 Ω ARE NOT SHOWN.

ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

SEC. 1	POSITION 1 STANDARD WAVE	POSITION 2 SHORT WAVE C	POSITION 3 SHORT WAVE D
1	2	3	4
2	3	4	5
3	4	5	6
4	5	6	7
5	6	7	8
6	7	8	9
7	8	9	10



- TUBE ELEMENT LEGEND
- SW - SHELL
 - H - HEATER
 - K - CATHODE
 - F - FILAMENT
 - P - PLATE
 - G₁ - CONTROL GRID
 - G₂ - SCREEN GRID
 - G₃ - SUPPRESSOR GRID
 - D₂ - DIODE PLATE
 - T_A - TARGET
 - BAS - TUBE ONLY
 - G₁ - OSC. CONTROL GRID
 - G₂ - OSC. ANODE GRID
 - G₃ - SCREEN GRID
 - C₁ - CONTROL GRID

Series 5KL

Series 5K radios are the same as 5KL except that they do not have the tuning eye tube.

Nov. 1936

MODELS 5K, 5KL
Socket, Trimmers
Voltage, Coils

WELLS-GARDNER & CO.

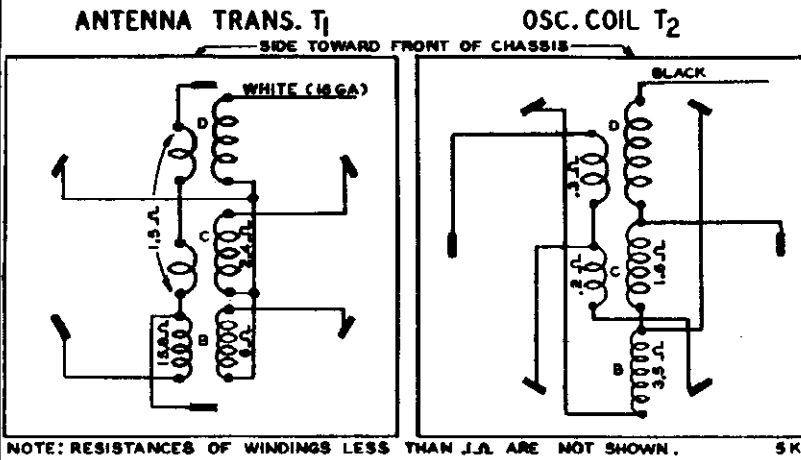


Fig. 4—R.F. and Oscillator Coil Base Terminal Arrangement and D.C. Resistance of Windings

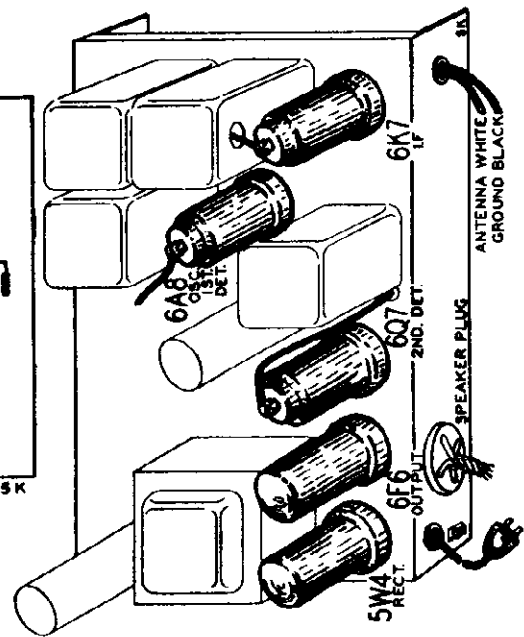


Fig. 5—Location of Tubes

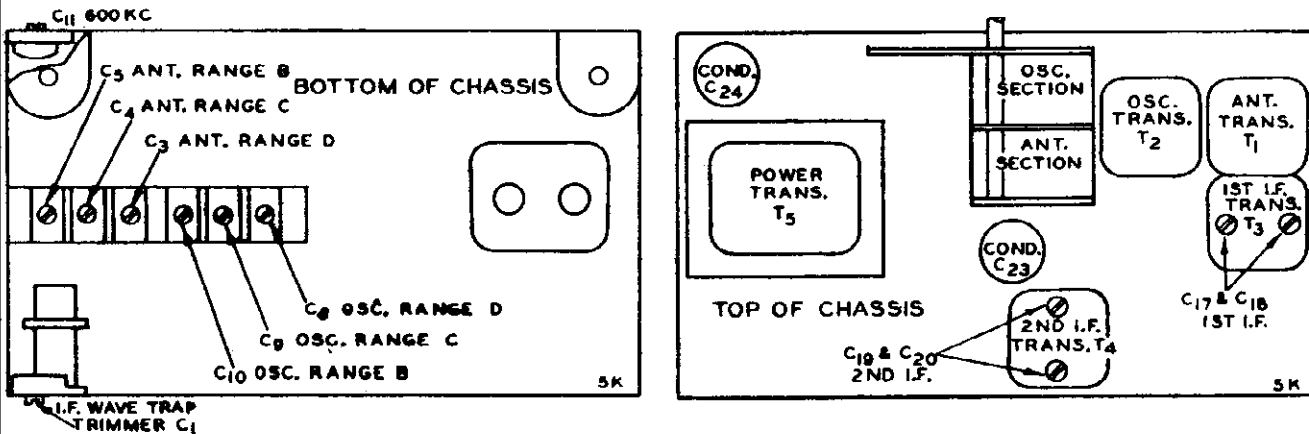


Fig. 3—Location of Trimmers

VOLTAGES AT SOCKETS

Line Voltage: 115

Volume Control: Maximum

Antenna Shorted to Ground

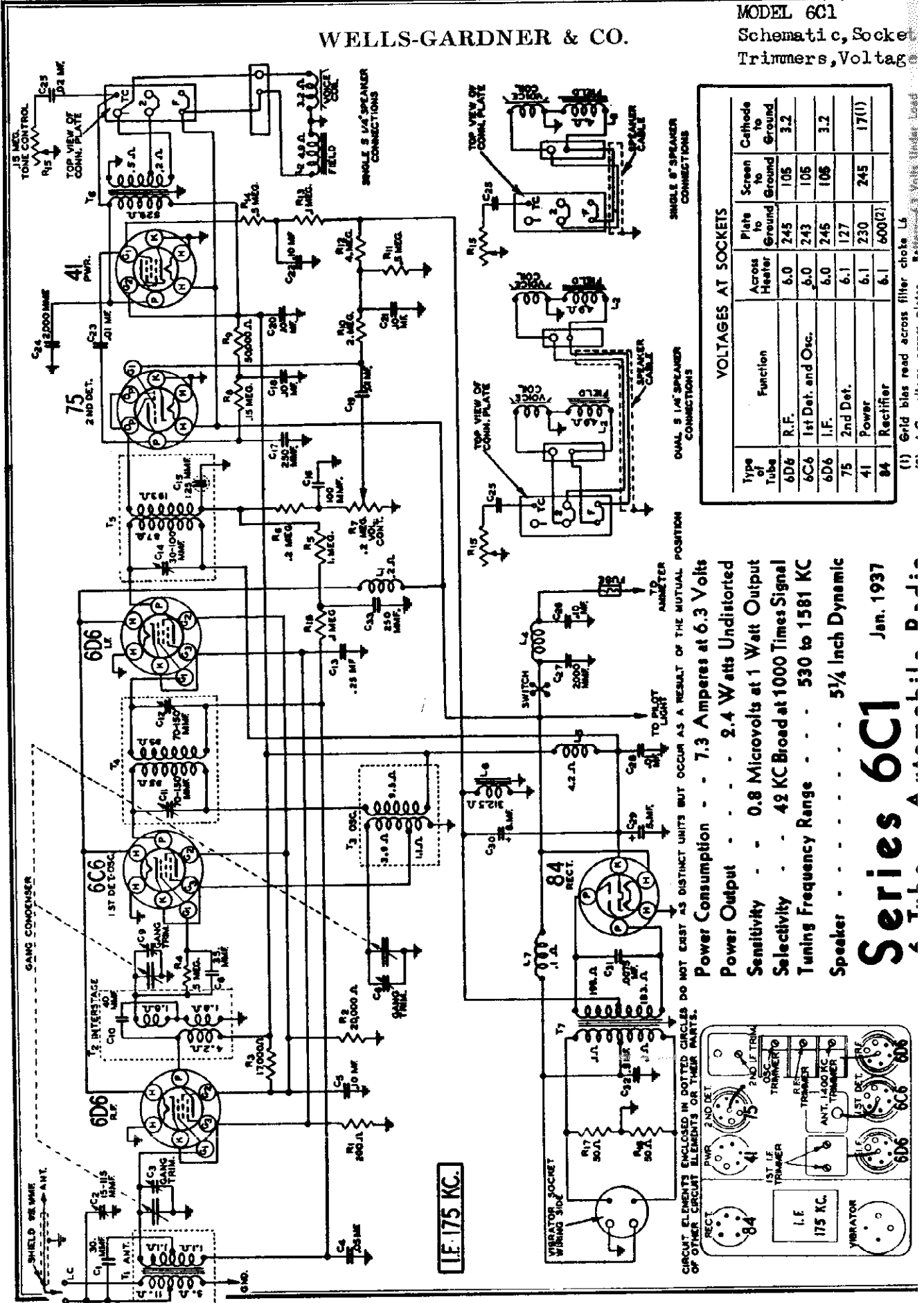
TUBE	FUNCTION	VOLTAGE BETWEEN SOCKET PRONGS AND GROUND (Unless otherwise indicated)							
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
6A8	1st Det.-Osc.	0	6.3(1)	200	110		160	6.3(1)	3
6K7	I.F.	0	6.3(1)	200	110	3		6.3(1)	3
6Q7	2nd Det.	0	6.3(1)	110	0	0		6.3(1)	0(2)
6F6	Output	0	6.3(1)	195	200	12.5(3)		6.3(1)	0
5W4	Rectifier	0	5.1(4)		620(5)		620(5)		5.1(4)
6G5	Tuning Indicator ...	Plate to Ground 18		Target to Ground 200		Cathode to Ground 0		Across Heater 6.3 A.C.	

(1) A.C. voltage as read across heater terminals 2 and 7.
(2) Bias (1.5 volts) as read across resistor R12.
(3) Read across resistor R12 and R13.

(4) A.C. voltage as read across heater terminals 2 and 8.
(5) A.C. voltage read across terminals 4 and 6.

WELLS-GARDNER & CO.

MODEL 6C1
Schematic, Socket
Trimmers, Voltag



VOLTAGES AT SOCKETS

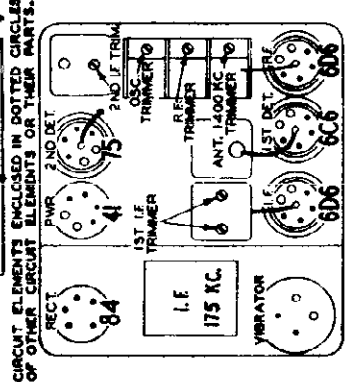
Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground
6D6	R.F.	6.0	245	105	3.2
6C6	1st Det. and Osc.	6.0	243	105	3.2
6D6	I.F.	6.0	245	105	3.2
75	2nd Det.	6.1	127		
41	Power	6.1	230	245	17(1)
84	Rectifier	6.1	600(2)		

(1) Grid bias read across filter choke L₆

Power Consumption - - - 7.3 Amperes at 6.3 Volts
Power Output - - - 2.4 Watts Undistorted
Sensitivity - - 0.8 Microvolts at 1 Watt Output
Selectivity - - 42 KC Broad at 1000 Times Signal
Tuning Frequency Range - - - 530 to 1581 KC
Speaker - - - 5 1/4 inch Dynamic

Series 6C1
 T.T.L. A.A.A.L.L.L. - D.J. -
 Jan. 1937

I.F. 175 KC.



CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS.

MODEL 6C1
Coils, Mounting Data

WELLS-GARDNER & CO.

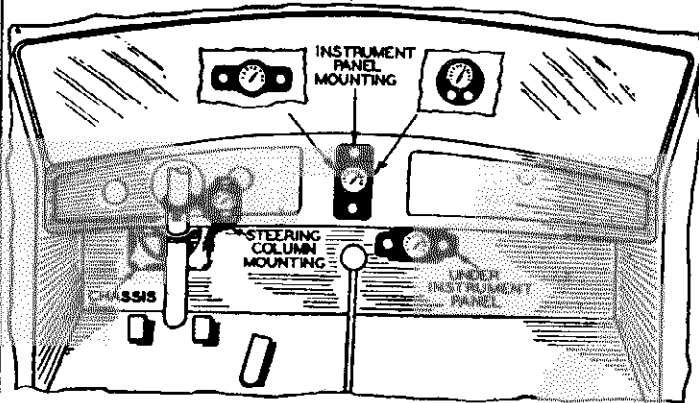


Fig. 6—Various Control Head Mountings

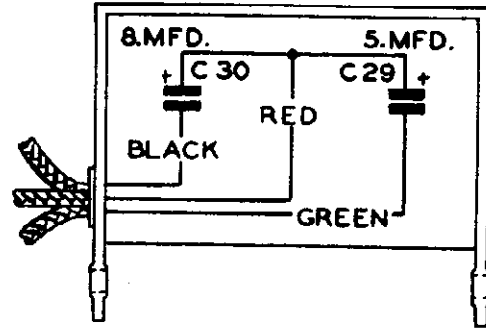


Fig. 5—Condenser Block—Internal Wiring

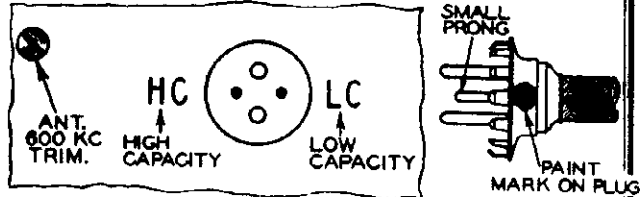


Fig. 3—Antenna Plug Insertion

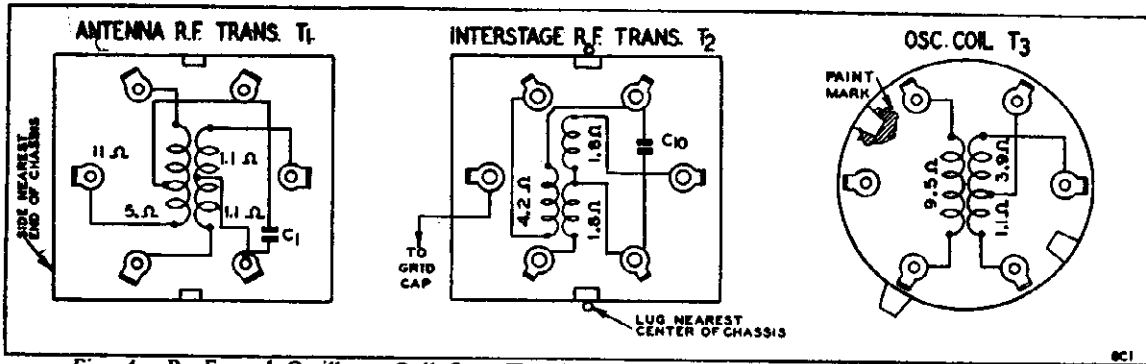


Fig. 4—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

Instrument Panel Mounting Kits

Car	Year & Model	Kit No.	Car	Year & Model	Kit No.	Car	Year & Model	Kit No.
Buick	1937 40-60 Series	21A68	Ford	1937 DeLuxe	21A74	Packard	Six	21A56
	1936 80-90 Series	21A69		1936 Standard	21A73		1937 120-C	21A57
Cadillac	1937	21A16		1936 Std. & DeLuxe	21A10		1936 Super 8 & 12	21A77
	1936	21A70	Graham	1935 DeLuxe	21A32		1936 120-B	21A21
Chevrolet	1937 All Models	21A58		1934 Standard	21A38	1935 120	21A41	
	1936-35 Standard & Master	21A11	Hudson	1937 Cavalier & Supercharger	21A87	Plymouth	1937 DeLuxe	21A78
Chrysler	Royal	21A59		1936	21A75		1936 Standard	21A64
	1937 Imperial	21A71	LaFayette	1937 Zephyr 1937	21A76		1936 DeLuxe	21A12
	Airflow	21A72		1936	21A17		1936-35 Standard	21A37
	Six	21A19		1935	21A48	1935 DeLuxe	21A33	
	1936 Eight	21A30	1934	21A35	1934	21A49		
Airflow	21A31	LaSalle	1936-35	21A50	Pontiac	1936-35 Standard-DeLuxe 6 & 8	21A15	
1935-34 Except Imperial	21A47		1937	21A89		Studebaker	Dictator Coupe	21A65
1937	21A60	1936	21A40	1937 Dictator	21A54			
DeSoto	Airflow & Airstream Custom	21A22	Lincoln	Zephyr 1936	21A10	1936 Dictator	21A55	
	Airstream DeLuxe	21A26	Nash	1937 Ambassador	21A63	1936 Dictator	21A20	
	1935 DeLuxe	21A46	1936-35	21A36	President	21A24		
	1934	21A47	Nash Laf. 400	1937	21A62	Terraplane	1937	21A80
1937	21A61	1937		21A88	1936		21A18	
Dodge	1936 DeLuxe	21A13	1936	21A14	1935		21A48	
	1935	21A45	1935	21A34	1934		21A35	
	1934	21A49	Steering column and under panel kit.	Chromium Black	21A66			

1934, 1935, 1936 and No. 21A67 Steering Column Kits Net Price ea. \$0.60~
 1937 and No. 21A66 Steering Column Kits Net Price ea. .75

WELLS-GARDNER & CO.

MODEL 6C1 Alignment, Parts Notes

Table with columns for part numbers and descriptions under the heading 'ELECTRONIC MOLDING'.

Table with columns for part numbers and descriptions under the heading 'INSTALLATION ITEMS'.

Table with columns for part numbers and descriptions under the heading 'MISCELLANEOUS MOUNTING ITEMS'.

Table with columns for part numbers and descriptions under the heading 'CONTROL HEAD AND PLATE ASSEMBLY'.

Table with columns for part numbers and descriptions under the heading 'ROOF SPEAKER MOUNTING KITS'.

8 inch speaker). This radio is designed that roof speaker installations in these cars can readily be made.

Table with columns for part numbers and descriptions under the heading 'MISCELLANEOUS SOCIETIES'.

Table with columns for part numbers and descriptions under the heading 'TRANSFORMERS AND COILS'.

Table with columns for part numbers and descriptions under the heading 'RESISTORS'.

Table with columns for part numbers and descriptions under the heading 'CONDENSERS'.

If the total capacity of the antenna and shielded lead is approximately 70 mmf, such as may be the case if a "fish pole" antenna is used, insert the antenna plug with the mark on the LC side.

Control Head Mounting This auto radio is supplied with a Universal control head. This head, in conjunction with suitable screwdown plates and mounting brackets, can be mounted in the instrument panel of practically all widely sold 1936 and 1937 automobiles.

Panel Kits 1937 Radio—See Fig. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

Pointers, Screws and Spacer Washers A few of the first shipments of 1937 panel kits did not contain the pointer screw and spacer washer. It may, therefore, be necessary to order these items in some instances.

Roof Speaker and Dual Speakers The Ford and General Motors 1936 automobiles have provision for mounting a speaker in the car roof (Ford 5 1/2 inch speaker, General Motors 5 1/4 or 1936 Cars).

I. F. Adjustment Set the signal generator for a signal of 173 KC. Connect the output of the signal generator through a .05 mf. condenser to the rotor of the R.F. linkage section of the tuning condenser. (See Fig. 2 for location of this section.)

600 KC Adjustment Turn the rotor of the tuning condenser to the full open position. Insert the antenna plug with the mark on the antenna lead from the chassis through a 150 mf. condenser to the antenna post of the signal generator.

1400 KC Adjustment Turn the rotor of the tuning condenser carefully until maximum output is obtained. Adjust the R.F. interstage and antenna 1400 KC trimmer for maximum output.

Adjusting Antenna 600 KC Trimmer After the radio is installed and the car antenna is connected, it will be necessary to readjust the antenna trimmer. Tune in a weak signal at approximately 600 KC with the volume control about three-quarters open. Turn the adjusting screw of the antenna trimmer up or down until maximum output is obtained. See Fig. 3 for location of this trimmer.

Inserting Antenna Plug IMPORTANT—The antenna plug can be inserted in two ways depending on whether the antenna is of high or low capacity. If the total capacity of the antenna and shielded lead is approximately 200 mmf., which would be the case in a running board or ordinary roof antenna (not metal roof), insert the antenna plug with the mark on the HC side—See Fig. 3.

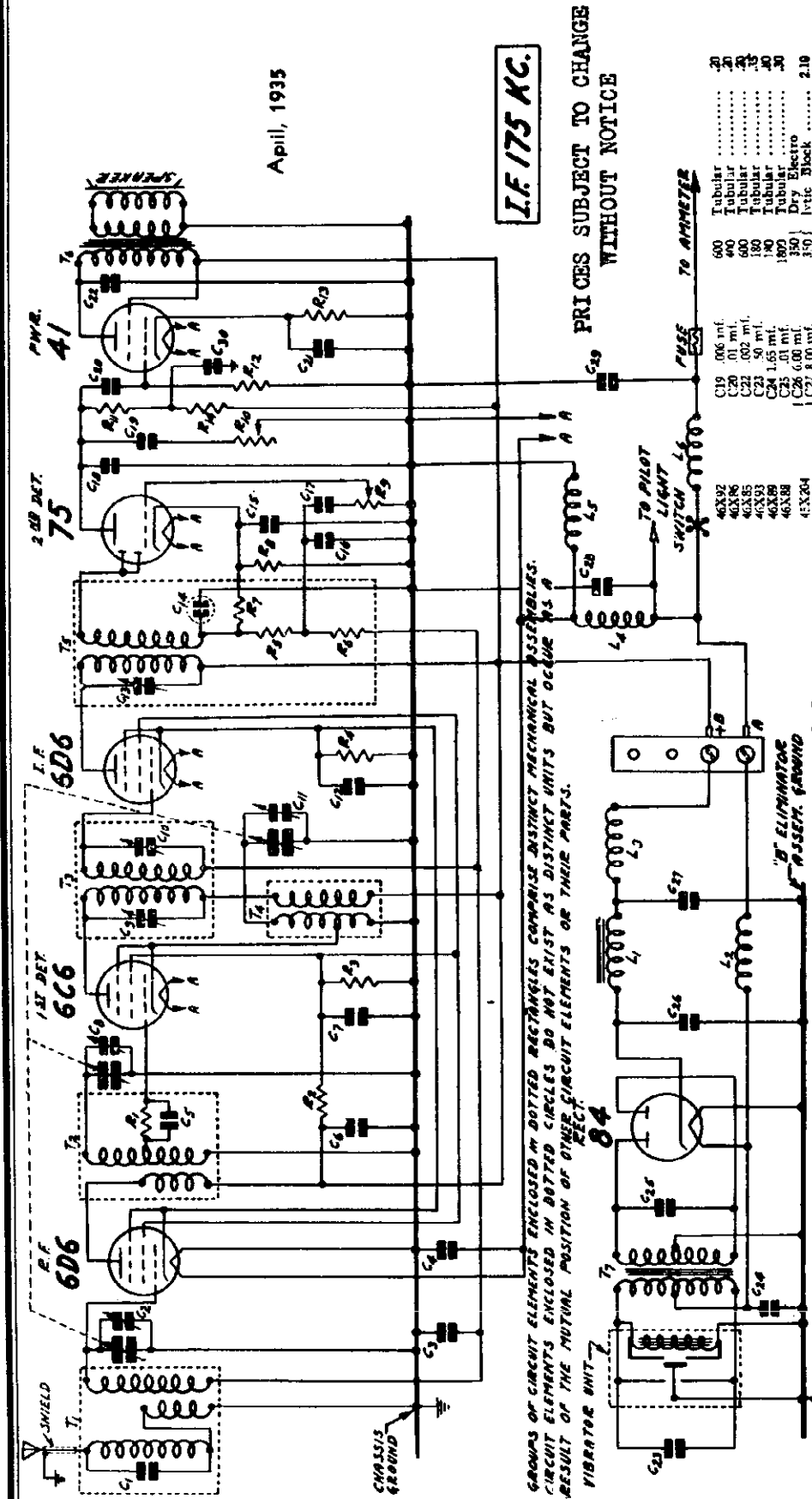
WELLS-GARDNER & CO., INC.

MODEL 68
Schematic
Parts

April, 1935

I.F. 175 KC.

PRICES SUBJECT TO CHANGE
WITHOUT NOTICE



GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES. CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS.

Part No.	Description	Old Part No.	New Part No.	List Price	Code
51X17-6S	Output Transformer	47X54	47X54	1.63	T8
9A368-6S	Antenna Coil Assembly (Less Can)	47X30	47X30	.14	T1
9A369-6S	R.F. Interstage Coil Assembly (Less Can)	47X33	47X33	1.25	T2
1A23-6S	Dual-Coil Can Assembly Only (for above two coils)	46X33	46X33	.30	
9A371-6S	1st I.F. Coil & Can Assembly	170	17A32	.80	T3
9A370-6S	Oscillator Coil & Can Assembly	170	17A33	.70	T4
9A372-6S	2nd I.F. Coil & Can Assembly	195	19A18	2.05	T5
9A373-6S	Complete	195	19A18	2.25	L4
9A374-6S	Pilot Light Choke Assembly	195	19A18	.25	L5
9A375-6S	Motor Noise Choke Assembly	195	19A18	.25	L3
9A376-6S	R.F. "B" Choke Coil Assembly	195	19A18	.30	L2
53X72-6S	Filament Reactor	50533	50533	1.20	L1
53X72-6S	Power Transformer	50533	50533	1.20	L1
50533	Filter Choke	50533	50533	.90	L1

Code	Capacity	Voltage	Type	List Price
C1	.0005 mf.		Moulded	.15
C2	Antenna Trimmer	180	Tubular	.25
C3	.05 mf.		Moulded	.10
C4	.003 mf.		Moulded	.25
C5	.00035 mf.		Tubular	.25
C6	.10 mf.		Tubular	.18
C7	.10 mf.		Tubular	.18
C8	1st Detector Trimmer-Part of Gang Condenser			.45X41
C9	1st I.F. Trimmer Con.			.50
C10	130-300 mmf. 1st I.F. Trimmer Con.			.50
C11	70-150 mmf. 2nd I.F. Trimmer Con.			.50
C12	10-100 mmf. 3rd I.F. Trimmer Con.			.50
C13	10-100 mmf. 4th I.F. Trimmer Con.			.50
C14	.0005 mf. Part of 2nd I.F. Coil Assembly			.35
C15	12.00 mf.		Lytic Electro.	1.05
C16	.00025 mf.		Moulded	.15
C17	.01 mf.		Moulded	.15
C18	.00025 mf.		Moulded	.15

Code	Resistance	Wattage	Type	List Price
R1	500,000 Ohm	0.2	Carbon	.10
R2	15,000 Ohm	0.5	Carbon	.15
R3	20,000 Ohm	0.3	Carbon	.15
R4	800 Ohm	0.2	Armored Wire	.30
R5	50,000 Ohm	0.2	Carbon	.10
R6	1.0 Megohm	0.2	Carbon	.10
R7	500,000 Ohm	0.2	Carbon	.10
R8	7,500 Ohm	0.2	Carbon	.10
R9	2.0 Megohm	0.2	Volume Control & Switch	1.15
R10	100,000 Ohm	0.2	Tone Control	.75
R11	200,000 Ohm	0.2	Carbon	.10
R12	150,000 Ohm	0.2	Carbon	.10
R13	500,000 Ohm	0.2	Carbon	.10
R14	50,000 Ohm	0.2	Carbon	.10

Code	Capacity	Voltage	Type	List Price
C19	.006 mf.		Tubular	.20
C20	.01 mf.		Tubular	.20
C21	.02 mf.		Tubular	.20
C22	.50 mf.		Tubular	.30
C23	.50 mf.		Tubular	.30
C24	.01 mf.		Tubular	.30
C25	.01 mf.		Tubular	.30
C26	6.00 mf.		Dry Electro	2.10
C27	8.00 mf.		Lytic Block	.25
C28	.50 mf.		Tubular	.25
C29	.045 mf.		Moulded	.35
C30	.25 mf.		Tubular	.40
			3 Section Gang Condenser	4.20

MODEL 6S

Alignment, Voltage
Socket, Trimmers
Resistance, Notes

WELLS-GARDNER & CO.

Remove chassis from case.
Establish ground connection between chassis and power supply.

Reconnect A and B wires from power supply to chassis.
Set the signal generator for a signal of 175 KC.

Connect the antenna lead of the signal generator thru a .05 mf. condenser to the stator of the 1st detector (middle) section of the tuning condenser. This can be done by pushing a wire or conductor between the stator plates or by extending an insulated wire thru the hole in the shield over the stator and pushing the wire thru the hole in the lug which extends up from the insulated stator assembly.

Connect the ground lead of the signal generator to the chassis ground.

Short out the oscillator section of the tuning condenser.
Set the volume control at the maximum position.

Attenuate the signal from the signal generator to prevent the levelling off action of the A.V.C.

Then adjust the three I.F. trimmers until maximum output is obtained. The location of these trimmers are shown in Fig. 2.

1650 KC. Adjustment

Set the signal generator for 1650 KC.
Turn the rotor of the tuning condenser to the full open position.

Connect the shielded antenna lead from the chassis through a 250 nmf. condenser to the antenna post of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A. V. C. action.

Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained—see Fig. 2 for location of this trimmer.

1400 K C. Adjustment

Set the signal generator for 1400 KC.
Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st detector and antenna trimmers for maximum output.

Do not change the setting of the oscillator trimmer.

Adjusting Antenna Trimmer

After the receiver is installed and the car antenna is connected it will be necessary to adjust the antenna trimmer. Tune in a weak signal between 1200 and 1400 KC. with the volume control about three-fourths on. Remove the cover of the chassis case. The antenna trimmer is the trimmer condenser closest to the terminal strip—see Fig. 2. Turn the adjusting screw of this condenser up or down until maximum output is obtained. CAUTION—Do not turn any of the other trimmer adjusting screws for this adjustment.

Calibrating the Receiver

After installing the receiver in the car, it will be necessary to calibrate the control unit. Tune in a station of known frequency at about the center of the dial. At the back of the control unit is a calibration screw—See Fig. 4 in the installation manual enclosed with each receiver. Remove the pilot light assembly.

The calibration screw will be seen at the bottom of the receptacle from which the pilot light assembly is withdrawn. Insert a screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received. The knob must be held during this adjustment.

Voltages At Sockets

On the voltage chart are given the voltages at the sockets with all tubes in and the set in operating condition. The antenna should be disconnected.

The voltages can be read with the chassis in the case, by means of an analyzer plug.

If the chassis unit is taken out of the case all of the socket terminals can easily be reached under the chassis with test prods.

If the chassis is taken out, a jumper wire must be connected from the chassis base to the metal wall of the "B" power unit, in order to complete the ground circuit.

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis.

New Part No.	ITEM	Code	D. C. Resistance in Ohms
9A368-6S	Antenna Trans. Primary in Series	T1	6.3
	Antenna Trans. Secondary	T1	2.5
9A369-6S	R.F. Interstage Trans. Pri.	T2	4.5
	R.F. Interstage Trans. Sec. (Center Tap to inside)		1.8
	(Center Tap to ground)		1.3
9A371-6S	1st I.F. Trans. Primary	T3	58.
9A370-6S	1st I.F. Trans. Secondary	T3	58.
	Oscillator Cathode Coil (Total)	T4	3.
	Oscillator Plate Coil	T4	6.
9A372-6S	2nd I.F. Trans. Primary	T5	46.
	2nd I.F. Trans. Secondary	T5	46.
JX17-6S	Output Trans. Primary	T6	440.
	Output Trans. Sec. and Voice coil in parallel	T6	4.
FX72-6S	Power Trans. Primary	T7	3.
	Power Trans. Secondary	T7	500.
52X27-6S	Filter Choke	T1	300.
9A374-6S	Filament Reactor	T2	Small
9A268-6S	R.F. "B" Choke	T3	3.5
9A375-6S	Pilot Light Choke Assembly	T4	Small
12A62A	Speaker Field	T5	8.
9A376-6S	Motor Neum Choke	T6	Small

Voltages at Sockets
Antenna Disconnected - Voltage at Battery 6.1

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cath. to Ground	Normal Plate M.A.
6D6	R.F.	5.8	218	100	5.2	5.8
6C6	1st Det. and Osc.	5.8	218	100		2.0
6D6	I.F.	5.8	218	100	5.2	5.8
75	2nd Det. & 1st A.F.	5.8	160 (1)		1.4	2.8
41	Output	5.8	210	220	16.0	16.0
84	Rectifier	5.8				20.0 per plate

Speaker Field . . . 1.15 Amperes "D" Unit 3.00 Amperes
Chassis 1.50 Amperes Pilot Lamp 0.1 Amperes

(1) Measured on 1000 V. Scale (1000 Ohms per volt)

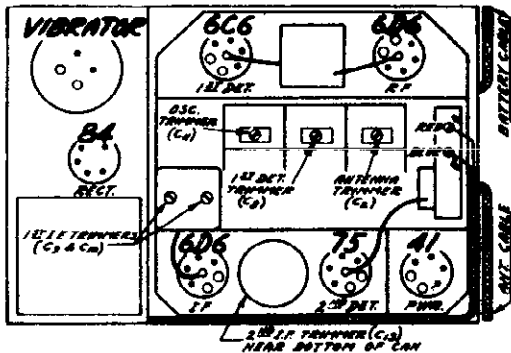


Fig. 2—Tube Arrangement and Trimmers

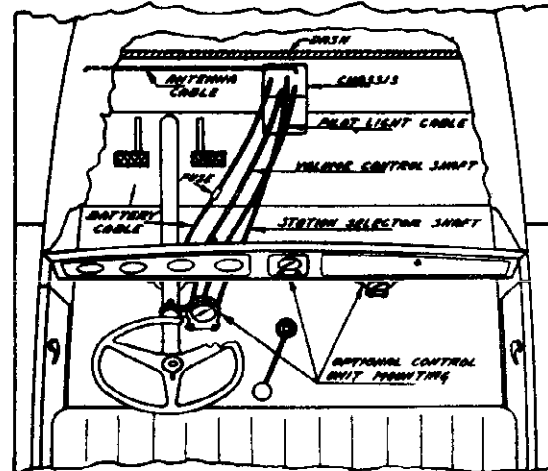


Fig. 1—General Mounting Position

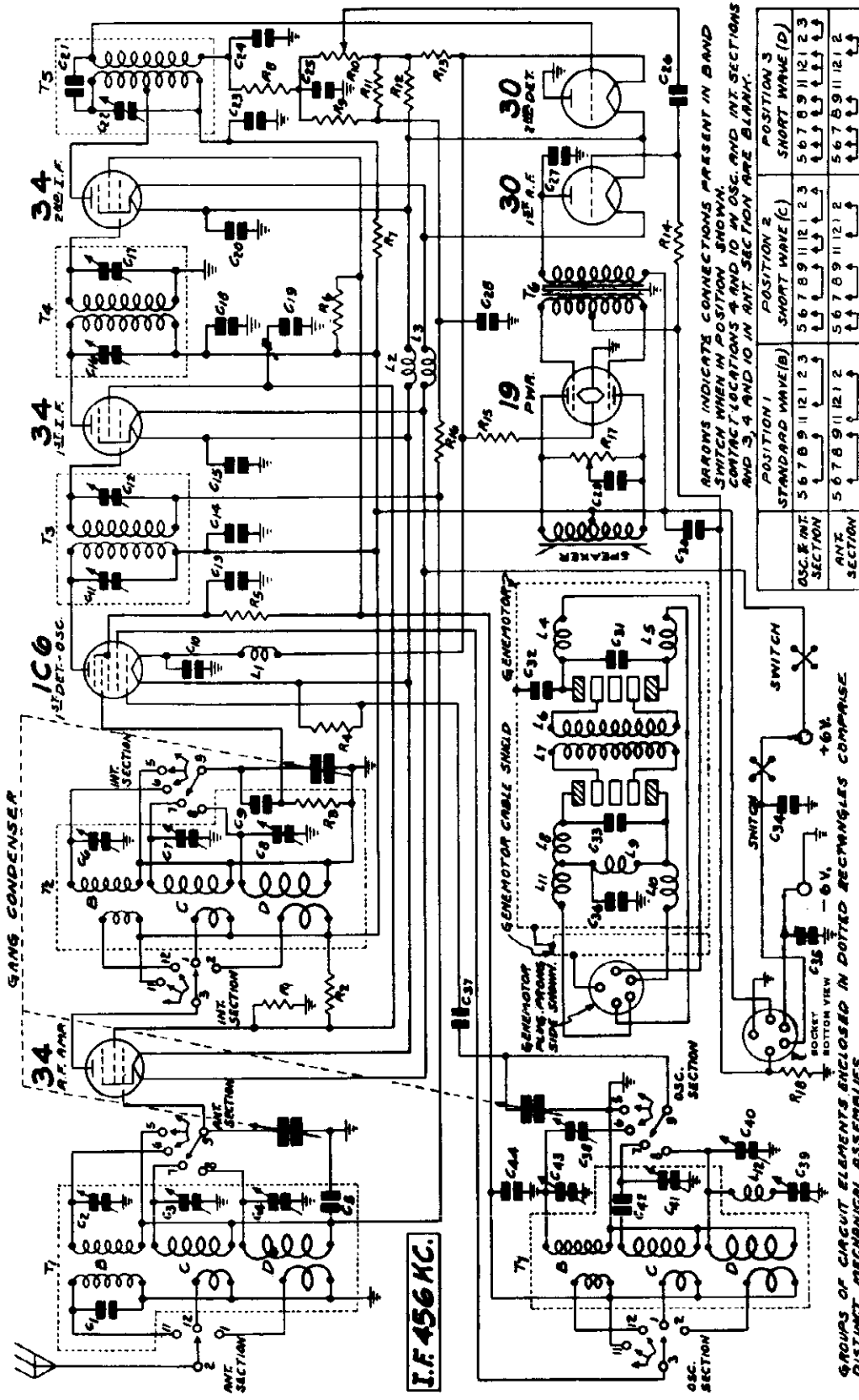
WELLS - GARDNER & CO.

MODEL 7E
Schematic

Power Consumption - 1.8 Amperes at 6.3 Volts
Power Output - - - - - 1 Watt Undistorted

Tuning Frequency Range

B Range 535 to 1730 KC.
C Range 1680 to 4800 KC.
D Range 5650 to 16000 KC.



ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN. CONTACT LOCATIONS 4 AND 10 IN OSC. AND INT. SECTIONS AND 3, 4 AND 10 IN ANTE. SECTION ARE BLANK.

	POSITION 1	POSITION 2	POSITION 3
OSC. & INT. SECTION	STANDARD WAVE (B)	SHORT WAVE (C)	SHORT WAVE (D)
ANTE. SECTION	5 6 7 8 9 11 12 1 2 3	5 6 7 8 9 11 12 1 2 3	5 6 7 8 9 11 12 1 2 3

- C 1 250 mmf.
- C 2 2.25 mmf.
- C 3 2.25 mmf.
- C 4 2.25 mmf.
- C 5 .05 mf. 180 V.
- C 6 2.25 mmf.
- C 7 2.25 mmf.
- C 8 2.25 mmf.
- C 9 .35 mmf.
- C 10 .25 mf. 180 V.
- C 11 70-150 mmf. | ONE UNIT
- C 12 .05 mf. 180 V.
- C 13 .05 mf. 180 V.
- C 14 20.0 mf. 150 V. Electrolytic
- C 15 25.0 mf. 180 V.
- C 16 70-150 mmf. | ONE UNIT
- C 17 20-150 mmf. | ONE UNIT
- C 18 50 mf. 180 V.
- C 19 .35 mf. 180 V.
- C 20 .05 mf.
- C 21 50 mmf.
- C 22 .05 mf. 180 V.
- C 23 .05 mf. 180 V.
- C 24 100 mmf.
- C 25 50 mmf.
- C 26 .302 mf. 600 V.
- C 27 250 mmf.
- C 28 .05 mf. 180 V.
- C 29 .05 mf. 240 V.
- C 30 20.0 mf. 150 V. Electrolytic
- C 31 .25 mf. 180 V.
- C 32 .25 mf. 180 V.
- C 33 .25 mf. 180 V.
- C 34 .25 mf. 180 V.
- C 35 .25 mf. 180 V.
- C 36 .50 mmf.
- C 37 35 mmf.
- C 38 300-600 mmf. | ONE UNIT
- C 39 40-100 mmf. | ONE UNIT
- C 40 20.0 mf. 150 V. Electrolytic
- C 41 25.0 mf. 180 V.
- C 42 25.0 mf. 180 V.
- C 43 2.25 mmf.
- C 44 .25 mf. 18 V.
- R 1 100,000 ohm 2 W.
- R 2 60,000 ohm 2 W.
- R 3 1 megohm 2 W.
- R 4 100,000 ohm 2 W.
- R 5 5,000 ohm 2 W.
- R 6 10,000 ohm 5 W.
- R 7 10,000 ohm 2 W.
- R 8 60,000 ohm 2 W.
- R 9 1 megohm 2 W. Control
- R 10 1 megohm 2 W.
- R 11 1 megohm 2 W.
- R 12 150,000 ohm 2 W.
- R 13 12.5 ohm 1.0 W. ARMORED
- R 14 1 megohm 2 W. RESISTOR
- R 15 70 ohm .50 W.
- R 16 150 ohm 2.0 W.
- R 17 150,000 ohm 2 W.
- R 18 12.5 ohm 1.0 W. ARMORED
- R 19 150 ohm 2.0 W. RESISTOR
- R 20 150,000 ohm 2 W.
- R 21 12.5 ohm 1.0 W. ARMORED
- R 22 12.5 ohm 1.0 W. ARMORED
- R 23 12.5 ohm 1.0 W. ARMORED
- R 24 12.5 ohm 1.0 W. ARMORED
- R 25 12.5 ohm 1.0 W. ARMORED
- R 26 12.5 ohm 1.0 W. ARMORED
- R 27 12.5 ohm 1.0 W. ARMORED
- R 28 12.5 ohm 1.0 W. ARMORED
- R 29 12.5 ohm 1.0 W. ARMORED
- R 30 12.5 ohm 1.0 W. ARMORED
- R 31 12.5 ohm 1.0 W. ARMORED
- R 32 12.5 ohm 1.0 W. ARMORED
- R 33 12.5 ohm 1.0 W. ARMORED
- R 34 12.5 ohm 1.0 W. ARMORED
- R 35 12.5 ohm 1.0 W. ARMORED
- R 36 12.5 ohm 1.0 W. ARMORED
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- R 48 12.5 ohm 1.0 W. ARMORED
- R 49 12.5 ohm 1.0 W. ARMORED
- R 50 12.5 ohm 1.0 W. ARMORED
- R 51 12.5 ohm 1.0 W. ARMORED
- R 52 12.5 ohm 1.0 W. ARMORED
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- R 81 12.5 ohm 1.0 W. ARMORED
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- R 92 12.5 ohm 1.0 W. ARMORED
- R 93 12.5 ohm 1.0 W. ARMORED
- R 94 12.5 ohm 1.0 W. ARMORED
- R 95 12.5 ohm 1.0 W. ARMORED
- R 96 12.5 ohm 1.0 W. ARMORED
- R 97 12.5 ohm 1.0 W. ARMORED
- R 98 12.5 ohm 1.0 W. ARMORED
- R 99 12.5 ohm 1.0 W. ARMORED
- R 100 12.5 ohm 1.0 W. ARMORED
- T 1 Ant. R. F. Trans.
- T 2 Interstage R. F. Trans.
- T 3 1st I. F. Trans.
- T 4 2nd I. F. Trans.
- T 5 3rd I. F. Trans.
- T 6 Push Pull Input Trans.
- T 7 Osc. Inductors
- L 1 Single Filament Reactor
- L 2 Double Filament
- L 3 Reactor
- L 4 "B" Choke
- L 5 "B" Choke
- L 6, 7, 8 & 9 Genemotor Windings
- L 10 "A" Choke
- L 11 "A" Choke
- L 12 Osc. Tracking Coil

GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.

SWITCH BOTTOM VIEW

GENERATOR CABLE SHIELD

GENERATOR ALING APPROX. SIDE SHOWN

GENERATOR

MODEL 7E

Socket, Trimmers
Voltage, Data

WELLS - GARDNER & CO.

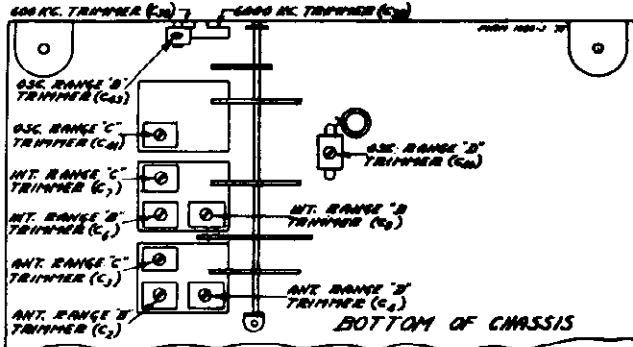


Fig. 3—Arrangement of Trimmers

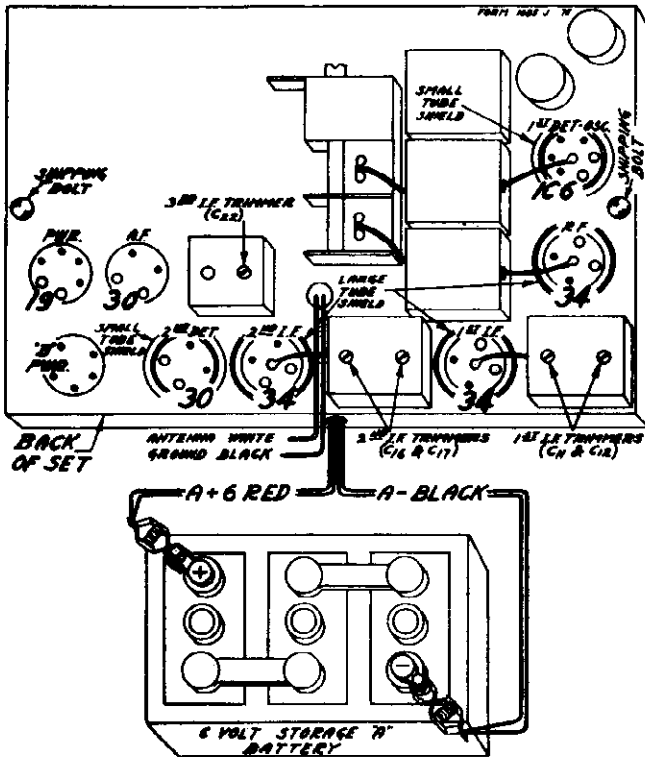


Fig. 4—Tube Arrangement and Battery Connections

VOLTAGES AT SOCKETS
Antenna Shorted to Ground—Battery 6 Volts
under load
Volume Control at Maximum

Type of Tube	Function	Across Filament	Plate to Ground	Screen to Ground	Bias Voltage (see Notes)	Normal Plate M. A.
34	R. F.	2.0	135	45	1.5(1)	1.7
1C6	1st Det.	2.0	135 80(2)	70	2.0(3)	3.2 1.7(2)
34	1st I. F.	2.0	135	45	1.5(1)	1.7
34	2nd I. F.	2.0	135	80	4.0(3)	3.2
30	2nd Det.	2.0				
30	1st A. F.	2.0	135		8.0(4)	2.3
19	Power	2.0	135		3.9(5)	2.3 (per plate)

- (1) As read from negative filament leg to low potential end of resistor R12.
- (2) Anode Grid
- (3) As read from negative filament leg to ground.
- (4) Total voltage drop from negative filament leg to ground and across R18.
- (5) As read across R18.

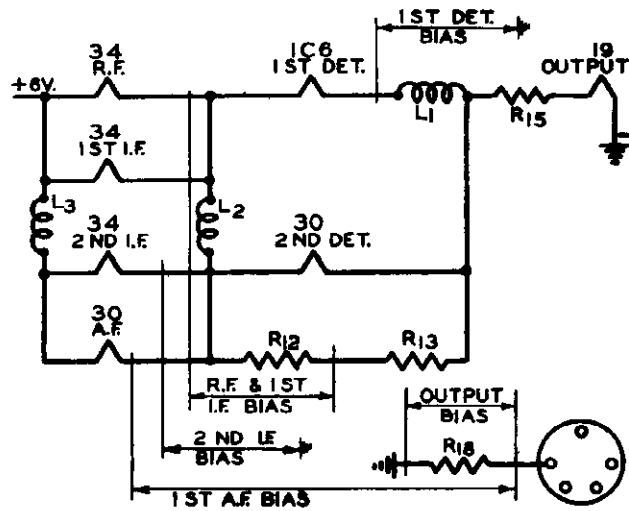


Fig. 6—Abridged Wiring Diagram showing Filament Wiring System and Points at which No-Signal Bias Voltages are obtained.

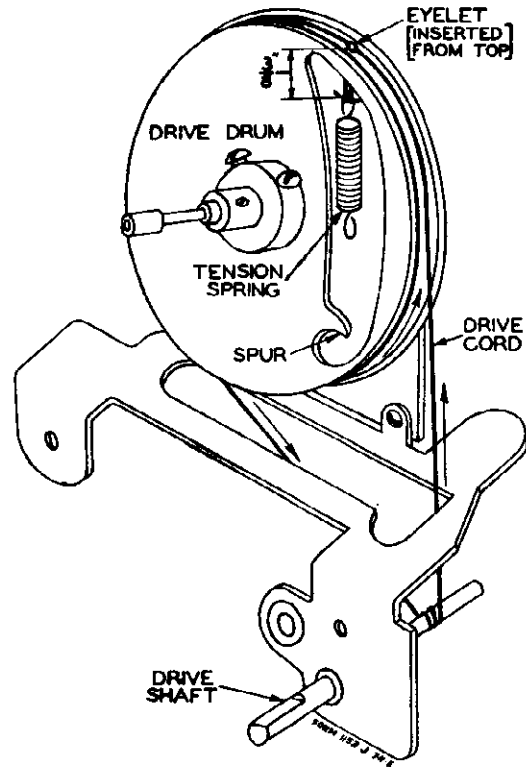


Fig. 7—Drive Cord Replacement

Battery Connections—CAUTION

CAUTION: Do not turn the switch on unless ALL the tubes are in the sockets.

CAUTION: Be sure that the battery clips are properly connected to the battery. If the connections are reversed, the receiver may be damaged.

WELLS - GARDNER & CO.

MODEL 7E
Alignment, Coils
Drive Cord Data

REPLACING DRIVE CORD

Remove the chassis from the cabinet. Take off the stem pointer by removing the screw at the center of the dial. Loosen the two set screws in the collar on the band selector switch shaft. Loosen the dial assembly by taking out the two screws which secure the bottom of this assembly to the chassis and one screw at the top which secures this assembly to the bracket. Pull the dial assembly forward until the collar is free of the band selector shaft; and lay the assembly face downward in front of the chassis.

Turn the dial drum until the opening in this drum is approximately vertical and with the hole at the top. Remove the tension spring and the old drive cord. When replacing this drive cord a 50 pound test cord as regularly supplied by the factory should be used.

See that the eyelet is in the hole in the drive drum. Insert one end of the new drive cord from the outside through the hole in the eyelet in the drive drum. Tie the end of the cord, which has been inserted through the hole, to one end of the tension spring. Now wrap the cord in a counter clock-wise direction (facing the front of the chassis) around the drive drum for approximately one and one half turns, progressing towards the front. Then tilt the chassis up on its back panel and bring the cord mentioned in the previous paragraph down to the drive shaft. Wrap it two and one-half times around this shaft, progressing toward the back of the chassis. Wrap the cord on directly in line with the drive drum above. Then bring this cord up to the drive drum until it is up to the eye-let in the drive drum.

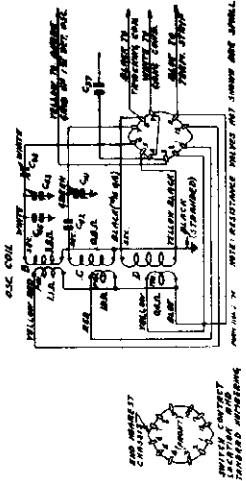
Now insert the free end of the cord through the hole in the eyelet and tie it to the end of the tension spring. The end of the spring when hanging free and with the slack taken out of the drive cord should be three eights or less from the flange of the drum. Cut off the surplus length of the cord after it has been knotted.

Now secure the other end of the tension spring over the spur on the drive drum. Turn the drive shaft back and forth several times.

Replace the dial assembly and pointer.

Replace the chassis in the cabinet.

Fig. 5—Color Coding of Coil Wires and D. C. Resistance of Windings. (Also see complete D. C. Resistance List Below)



(940) until maximum output is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment
Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range D trimmer (C8) and antenna Range D trimmer (C4) to maximum.

When adjusting the interstage Range D trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of the greatest intensity is obtained.

Then go back and repeat the procedure as given for the 16,000 KC adjustment. If it is found necessary to make any appreciable change in the settings of the oscillator Range D trimmer, the 15,000 KC adjustment must be repeated.

Do not make any further change in the setting of the oscillator Range D trimmer.

8000 KC Adjustment
Set the signal generator for 8000 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 8000 KC trimmer until the peak of greatest intensity is obtained. See Fig. 5 for location of this trimmer.

Adjust the interstage Range B trimmer (C6) and antenna Range B trimmer (C2) to maximum.

Do not change the setting of the oscillator Range B trimmer.

800 KC Adjustment
Set the signal generator for 800 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 800 KC trimmer until the peak of the greatest intensity is obtained. See Fig. 5 for location of this trimmer.

Be sure to use a non-metallic screwdriver for this adjustment.

RANGE C ALIGNMENT

4900 KC Adjustment
Set the signal generator for 4900 KC.

Connect the antenna lead of the receiver through a 400-ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band selector to the Range C position (let short wave band — green dial color).

As mentioned above, keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A.V.C. action.

Adjust the oscillator Range C trimmer (C41) until maximum output is obtained. See Fig. 5 for location of this trimmer.

4400 KC Adjustment
Set the signal generator for 4400 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range C trimmer (C7) and antenna Range C trimmer (C5) to maximum.

Do not change the setting of the oscillator Range C trimmer.

RANGE D ALIGNMENT

16,000 KC Adjustment
Set the signal generator for 16,000 KC.

Keep the antenna lead of the receiver connected through the 400-ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band selector to the Range D position (End short wave band—red dial color).

As mentioned above, keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A.V.C. action.

Adjust the oscillator Range D trimmer

A signal generator that will provide an accurately calibrated signal at 456, 1750, 1500, 800, 4800, 4800, 15,000, 16,000 and 8000 KC and an output indicating meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I.F. Adjustment
Set the signal generator for a signal of 456 KC.

Connect the output of the signal generator through a 0.1 mf. condenser to the switch end of condenser C9—see Fig. 2. There is a lead which goes to the lug on the top of the center stator section of the tuning condenser—see Fig. 4. The connection can be made at this lug.

Connect the ground lead of the receiver to the ground post of the signal generator. Turn the band selector to the Range B position (standard wave band—purple dial color).

Turn the volume control to the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the A.V.C.

Then adjust the five I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 4.

RANGE B ALIGNMENT

1750 KC Adjustment
Set the signal generator for 1750 KC.

Turn the rotor of the tuning condenser to the full open position.

Keep the band selector in the standard wave position.

Connect the antenna lead of the receiver through a 200 mf. condenser to the output of the signal generator.

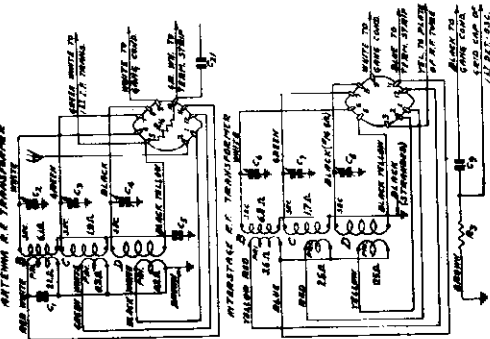
For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A.V.C. action.

Adjust the oscillator Range B trimmer (C45) until maximum output is obtained. The location of this trimmer is shown in Fig. 5.

1500 KC Adjustment
Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Loosen the pointer set screw and set the large pointer at the 1500 KC mark on the standard wave band scale. Retighten the set screw.



MODEL 7E
Parts, Resistance

WELLS - GARDNER & CO.

Series 7E—Replacement Parts

RESISTORS

New Part No.	Code	Resistance	Wattage	Type	List Price
P-A94104	R1	100,000 Ohms	0.2	Carbon	.15
P-A94603	R2	60,000 Ohms	0.2	Carbon	.15
P-A95105	R3	1.0 Megohm	0.2	Carbon	.10
P-A94104	R4	100,000 Ohms	0.2	Carbon	.15
P-A95502	R5	5,000 Ohms	0.2	Carbon	.10
P-B94103	R6	10,000 Ohms	0.5	Carbon	.15
P-A95102	R7	1,000 Ohms	0.2	Carbon	.10
P-A95603	R8	60,000 Ohms	0.2	Carbon	.10
P-A94305	R9	3.0 Megohm	0.2	Carbon	.15
P-36X209	R10	1.0 Megohm	Volume Control and Switch		1.15
P-A94105	R11	1.0 Megohm	0.2	Carbon	.15
P-43X43	R12	12.5 Ohms	1.0	Armored Wire Wound	.65
	R13	12.5 Ohms	1.0		
	R15	0.7 Ohms	0.5		
	R18	150.0 Ohms	2.0		
P-A95305	R14	3.0 Megohms	0.2	Carbon	.10
P-A95504	R16	500,000 Ohms	0.2	Carbon	.10
P-40X203	R17	150,000 Ohms		Tone Control	.75

P-17A41	C40	2-25 mmf.	Oscillator Range D Trimmer	.10
P-17A36	C41	2-25 mmf.	Oscillator Range C Trimmer	.10
P-47X60	C42	1400 mmf.	Moulded	.30
P-17A41	C43	2-25 mmf.	Oscillator Range B Trimmer	.10
P-46X117	C44	0.25 mf.	180 Tubular	.25
P-47X64	C45	5 mmf.	Moulded	.15
P-14A41			3 Section Gang Condenser	3.80

DIAL AND DRIVE ASSEMBLY

New Part No.	Old Part No.	Description	List Price
P-5A27		Gang Support and Bearing Assembly	\$.45
P-26X208		Drive Shaft	.15
P-19X21	20953	Horse Shoe Washer	.10
P-26X212		Pointer Shaft	.10
P-26X204		Drive Drum and Hub with Set Screw	.35
P-26X27		Drive Tension Spring	.10
P-10X13		26 inch Black Drive Cord	.10
P-26X34		Pointer Slide Take-Up Spring	.10
P-10X9		4 1/2 Inch Black Indicator Drive Cord	.05
P-29X42		Brass Collar and Set Screw for securing above cords to shaft	.10
		Dial Strip (Specify Name and Series No. of Receiver—also Std. Wave Band Dial Color)	.55
P-30X36		Dial Clamp and Mtg. Screw	.10
P-15X22		Large Double End Pointer	.10

CONDENSERS

New Part No.	Code	Capacity	Voltage	Type	List Price
P-47X59	C1	250 mmf.		Moulded	\$.15
P-17A36	C2	2-25 mmf.		Antenna Range B Trimmer	.10
P-17A36	C3	2-25 mmf.		Antenna Range C Trimmer	.10
P-17A36	C4	2-25 mmf.		Antenna Range D Trimmer	.10
P-46X80	C5	0.05 mf.	180	Tubular	.15
P-17A36	C6	2-25 mmf.		Interstage Range B Trimmer	.10
P-17A36	C7	2-25 mmf.		Interstage Range C Trimmer	.10
P-17A36	C8	2-25 mmf.		Interstage Range D Trimmer	.10
P-47X53	C9	35 mmf.		Moulded	.10
P-46X117	C10	0.25 mf.	180	Tubular	.25
P-17A33	C11	70-150 mmf.		1st I.F. Trimmer Condensers	.40
	C12	70-150 mmf.			
P-46X80	C13	0.05 mf.	180	Tubular	.15
P-44X17	C14	20.0 mf.	150	Wet Electrolytic	.95
P-46X117	C15	0.25 mf.	180	Tubular	.25
P-17A33	C16	70-150 mmf.		2nd I.F. Trimmer Condensers	.40
	C17	70-150 mmf.			
P-46X123	C18	0.50 mf.	180	Tubular	.30
P-46X125	C19	0.85 mf.	180	Tubular	.50
P-46X80	C20	0.05 mf.	180	Tubular	.15
P-47X56	C21	50 mmf.		Moulded	.10
P-17A33	C22	40-100 mmf.		3rd I.F. Primary Trimmer	.25
P-46X80	C23	0.05 mf.	180	Tubular	.15
P-47X57	C24	100 mmf.		Moulded	.10
P-47X56	C25	50 mmf.		Moulded	.10
P-46X100	C26	0.002 mf.	600	Tubular	.15
P-47X53	C27	250 mmf.		Moulded	.15
P-46X124	C28	0.01 mf.	180	Tubular	.15
P-46X133	C29	0.05 mf.	240	Tubular	.15
P-44X17	C30	20.0 mf.	150	Wet Electrolytic (laminated Mtg.)	.95
P-46X117	C31	0.25 mf.	180	Tubular (in Genemotor)	.25
P-46X80	C32	0.05 mf.	180	Tubular (in Genemotor)	.15
P-46X117	C33	0.25 mf.	180	Tubular (in Genemotor)	.25
P-46X117	C34	0.25 mf.	180	Tubular	.25
P-46X117	C35	0.25 mf.	180	Tubular	.25
P-46X123	C36	0.50 mf.	180	Tubular (in Genemotor)	.30
P-47X53	C37	35 mmf.		Moulded	.10
P-17A35	C38	300-600 mmf.		600 KC Osc. Padding Cond.	.45
	C39	40-100 mmf.				6000 KC Osc. Padding Cond.

TRANSFORMERS AND COILS

New Part No.	Old Part No.	Code	Description	List Price
P-9A419		T1	Antenna R.F. Transformer and Can Assembly	\$3.00
P-9A420		T2	Interstage R.F. Transformer and Can Assembly	3.10
P-9A421		T7	Oscillator Coil and Can Assembly	2.65
P-9A422		T3	1st I.F. Transformer and Can Assembly	1.70
P-9A423		T4	2nd I.F. Transformer and Can Assembly	1.70
P-9A424		T5	3rd I.F. Transformer and Can Assembly	1.70
P-50X11		T6	Audio Input Transformer	2.10
P-9A403		L1	Single Filament Reactor	.20
P-9A404		L2	Double Filament Reactor	.50
		L3		
		L4		
P-9A268	5174	L4	"B" R.F. Choke Coil (in Genemotor)	.10
P-9A268	5174	L5	"B" R.F. Choke Coil (in Genemotor)	.10
P-9A402		L10	"A" Choke Coil (in Genemotor)	.55
P-9A402		L11	"A" Choke Coil (in Genemotor)	.55
P-9A391		L12	High Frequency Oscillator Tracking Coil	.25

GENEMOTOR AND PARTS

New Part No.	Old Part No.	Description	List Price
P-22A203		Genemotor Complete with Filter Units, Case and Cover	\$18.85
P-22A202		Genemotor in Case with Cover and Condenser (C31 and C33) Less Filter	16.00
P-13X216		Shielded, Four Wire Cable and Plug	.70
P-46X117		0.25 mf. 180 Volt Tubular Condensers (C31 & C33), ea.	.25
P-46X123		0.50 mf. 180 Volt Tubular Condenser (C36)	.30
P-46X80		0.05 mf. 180 Volt Tubular Condenser (C32)	.15
P-9A268	5174	"B" R.F. Choke Coils (L4 and L5), each	.10
P-9A402		"A" Choke Coils (L10 and L11), each	.55

D. C. Resistance of Windings

Refer to Figs. 5 & 2

Following are the D. C. resistances of the various coil windings in the chassis. The values given below will vary slightly in different sets.

Part No.	Winding	Code	D. C. Resistance in Ohms
P-9A419	Antenna R. F. Transformer	T1	
	Range B Primary Winding		21.0
	Range C Primary Winding		0.3
	Range D Primary Winding		0.2
	Range B Secondary Winding		6.1
	Range C Secondary Winding		1.9
Range D Secondary Winding		Small	
P-9A420	Interstage R. F. Transformer	T2	
	Range B Primary Winding		3.6
	Range C Primary Winding		2.6
	Range D Primary Winding		0.5
	Range B Secondary Winding		6.8
	Range C Secondary Winding		1.7
Range D Secondary Winding		Small	
P-9A421	Oscillator Coils	T7	
	Range B Plate Coil		1.1
	Range C Plate Coil		1.0
	Range D Plate Coil		0.4
	Range B Grid Coil		3.8
	Range C Grid Coil		0.9
Range D Grid Coil		Small	

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Part No.	Winding	Code	D. C. Resistance in Ohms
P-9A422	1st I. F. Transformer	T3	
	Primary Winding		11.4
	Secondary Winding		11.4
P-9A423	2nd I. F. Transformer	T4	
	Primary Winding		11.4
	Secondary Winding		11.4
P-9A424	3rd I. F. Transformer	T5	
	Primary Winding (either section)		8.4
	Secondary Winding		130.8
P-50X11	Audio Input Transformer	T6	
	Primary Winding		1065.0
	Secondary Winding		
	Center Tap to Inside		580.0
Center Tap to Outside		630.0	
*P-12A218	8 Inch Magnetic Speaker		
	Speaker Coil		
	Center Tap to Inside		275.0
Center Tap to Outside		300.0	
P-9A403	Single Filament Reactor	L1	.65
P-9A404	Double Filament Reactor		
	(either section)	L2 & L3	.65
P-9A391	High Frequency Oscillator Tracking Coil	L12	0.7

*Speakers with other part numbers may have slightly different values of D. C. Resistance.

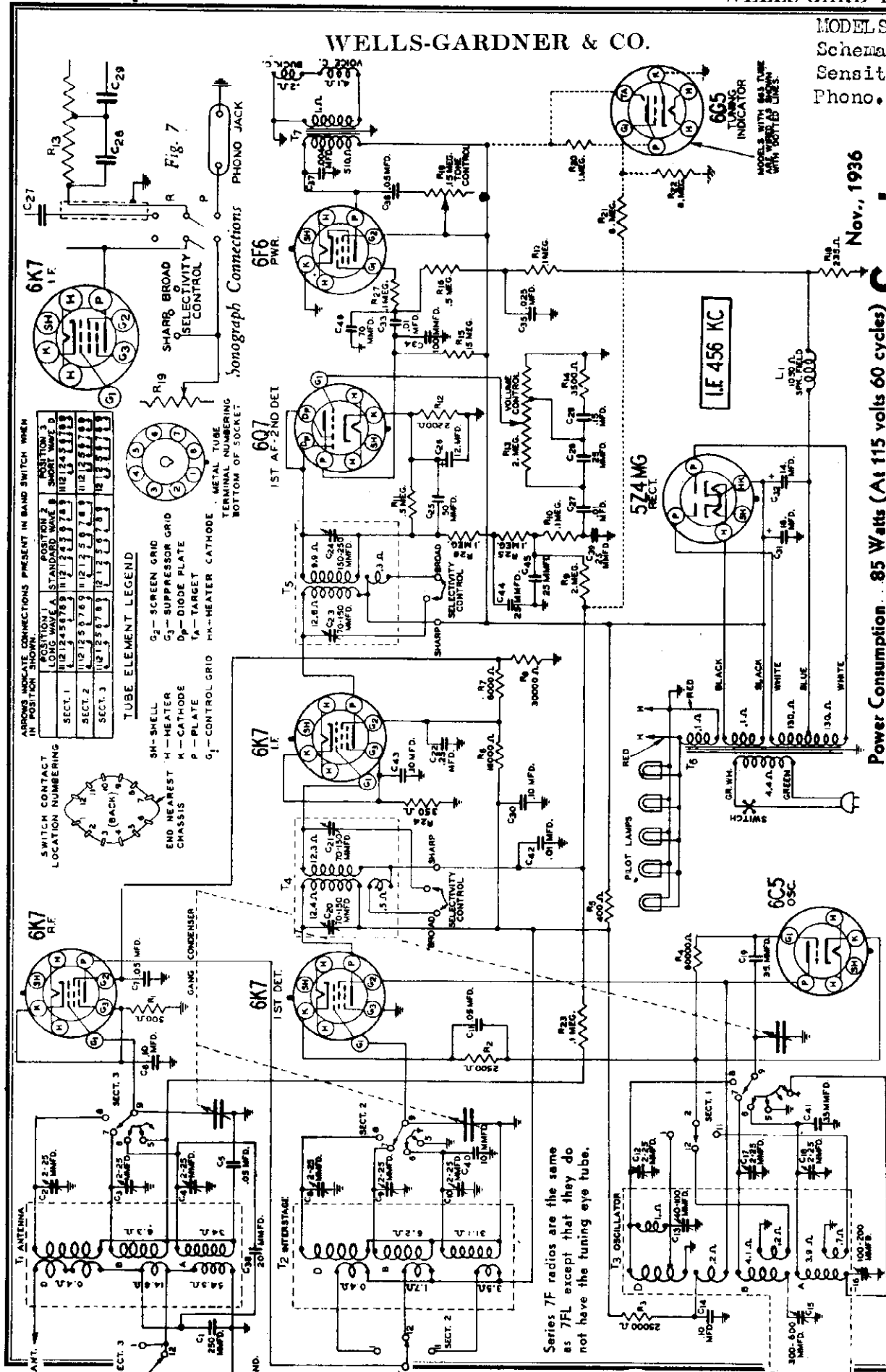
WELLS-GARDNER & CO.

MODEL S 7F, 7E
Schematic
Sensitivity
Phono. Com.

Nov., 1936

Series
7F1

Power Consumption . . . 85 Watts (At 115 volts 60 cycles)
Power Output 3 Watts Undistorted
Selectivity 28 KC Broad at 1000 times Signal (Sharp)
Speaker 8" and 10" Dynamic



Series 7F radios are the same as 7FL except that they do not have the tuning eye tube.

Tuning Frequency Range
A Range . . . 148 to 380 KC.
B Range . . . 528 to 1730 KC.

Sensitivity
A Range . . . 0.5 to 2 Microvolts Absolute
B Range . . . 0.5 to 2 Microvolts Absolute

MODELS 7F, 7FL
Socket, Trimmers

WELLS-GARDNER & CO.

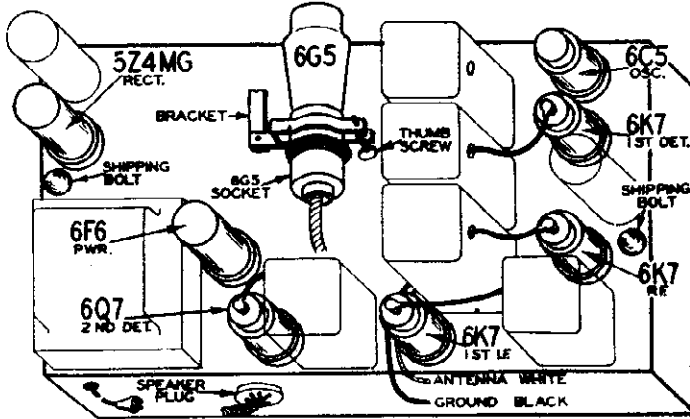


Fig. 6—Location of Tubes
KNOCK OUT FOR
PHONO JACK

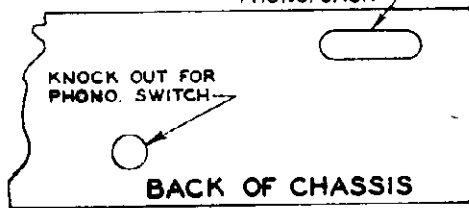


Fig. 8—Location of Phono Knockouts

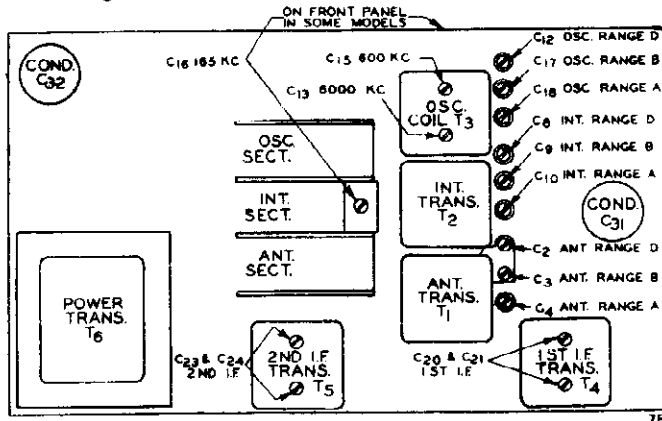


Fig. 3—Location of Trimmers

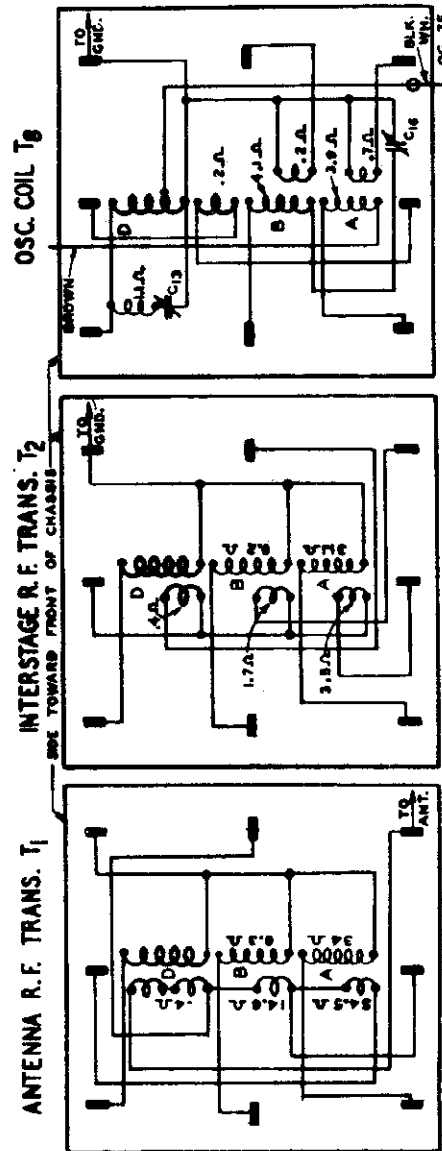


Fig. 4—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

Line Voltage: 115
Volume Control: Maximum

Antenna Shorted to Ground
Position of Band Switch: Standard Wave

VOLTAGE BETWEEN SOCKET PRONGS AND GROUND (Unless otherwise indicated)

TUBE	FUNCTION	VOLTAGE BETWEEN SOCKET PRONGS AND GROUND (Unless otherwise indicated)							
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
6K7	RF.....	0	6.1(1)	260	100	4.0	....	6.1(1)	4.0
6K7	1st Det.....	0	6.1(1)	260	118	0	....	6.1(1)	9.0
6C5	Osc.....	0	6.1(1)	120	....	0	....	6.1(1)	0
6K7	I F.....	0	6.1(1)	260	138	4.0	....	6.1(1)	4.0
6Q7	1st A.F.—2nd Det.....	0	6.1(1)	105	0	0	....	6.1(1)	1.4
6F6	Power Amp.....	0	6.1(1)	238	260	18	....	6.1(1)	0
5Z4MG	Rect.....	0	4.9(2)	....	680(3)	....	680(3)	....	4.9(2)
6G5	Tuning Indicator	Plate to Ground 30(4)		Target to Ground 270		Cathode to Ground 0		Across Heater 6.1 A.C.	

(1) A.C. voltage as read across heater terminals 2 and 7.
(2) A.C. voltage as read across heater terminals 2 and 8.

(3) A.C. voltage as read across terminals 4 and 6.
(4) As read with 500,000 ohm meter.

WELLS-GARDNER & CO.

MODEL S 7F, 7FL Alignment, Part Phono. Data

Table with columns for part numbers and descriptions, including 'ELECTROLYTIC' and 'MISCELLANEOUS' sections.

Shielding of the cable. The switch terminal shown connected to the tone control R19 in Fig. 7, should be connected to the switch terminal which connects to the 01 condenser C27.

Trimmer Replacement. If one trimmer of the gang trimmer strip should become defective, it is not necessary to replace the entire strip. A single trimmer P.17A15, as shown in the replacement parts list, may be used.

Across the volume control resistor R13 is a filter capacitor C20. A R.F.A. connection was the low potential end of the volume control is connected between the two condenser. At high volume settings, the filter is not effective.

Replacement Parts. NOTICE—There is a large letter on the chassis which identifies the set as to major part changes. When ordering parts, please be sure to mention the series number and the large letter.

MISCELLANEOUS SOCIETY. Includes a list of various electronic components and their specifications.

PHONO ATTACHMENT PARTS WITH SWITCH MOUNTED ON CHASSIS. Lists various phono attachment parts and their part numbers.

TRANSFORMERS AND COILS. Lists various transformers and coils used in the radio set.

CONDENSERS. Lists various types of condensers and their specifications.

Twenty-five Cycle Receivers. The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer is used. The correct power transformer for the twenty-five cycle receiver can be operated either factory from a sixty cycle power supply.

Phonograph Connections Switch on Back Panel of Chassis. Phonograph connections can be made as shown in Fig. 7. The parts required are shown in the parts list.

Range D Adjustment. CAUTION—When aligning this short wave band be sure NOT to adjust at the image frequency. This can be checked as follows: Lay on any the signal generator at 15,000 KC. The signal will be heard at 15,000 KC. The image signal, which is 11,000 less 912 KC, or 14,088 KC. It may be necessary to increase the input signal to hear the image.

Range B Adjustment. Set the signal generator for 15,000 KC. Turn the tuning condenser rotor until maximum output is obtained. Slowly back and forth at the same rate adjusting the 600 KC trimmer until the greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range A Alignment. After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

380 KC Adjustment. Set the signal generator for 380 KC. Turn the rotor of the tuning condenser to the full open position.

350 KC Adjustment. Set the signal generator for 350 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.

165 KC Adjustment. Set the signal generator for 165 KC. Turn the tuning condenser rotor until maximum output is obtained.

1730 KC Adjustment. Set the signal generator for 1730 KC. Turn the rotor of the tuning condenser to the full open position.

600 KC Adjustment. Set the signal generator for 600 KC. Turn the tuning condenser rotor until maximum output is obtained. Slowly back and forth at the same rate adjusting the 600 KC trimmer until the greatest intensity is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment. Set the signal generator for 15,000 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.

18,300 KC Adjustment. Set the signal generator for 18,300 KC. Connect the antenna lead of the radio through a 400 ohm resistor to the output of the signal generator.

6000 KC Adjustment. Set the signal generator for 6000 KC. Turn the tuning condenser rotor until maximum output is obtained.

1900 KC Adjustment. Set the signal generator for 1900 KC. Turn the rotor of the tuning condenser to the full open position.

1900 KC Adjustment. Set the signal generator for 1900 KC. Turn the rotor of the tuning condenser carefully through the 500 ohm resistor to the output of the signal generator.

1900 KC Adjustment. Set the signal generator for 1900 KC. Turn the rotor of the tuning condenser to the full open position.

1900 KC Adjustment. Set the signal generator for 1900 KC. Turn the rotor of the tuning condenser carefully through the 500 ohm resistor to the output of the signal generator.

MODEL 7J
Phono. Conn.
Parts

WELLS-GARDNER & CO.

Replacement Parts List

Code	Description	Selling Price
T1	Antenna Trans. and Can Assembly	\$1.12
T2	Antenna Transformer	.84
T3	1st I.F. Coil and Can Assembly	.72
T4	2nd I.F. Coil and Can Assembly	1.00
T5	Oscillator-Coil and Can Assembly	1.82
T6	Power Transformer - 115 Volt	2.34
T7	60 Cycle Transformer	3.84
T8	Power Transformer - 230 Volt	2.64
L1	High Frequency Oscillator Track	.12

Code	Description	Selling Price
P-9A336	Phono Switch (Double Pole Double Throw)	.30
P-9A337	Switch Knob	.10
P-9A338	900 Ohm 0.2 Watt Electrolytic Capacitor	.08
P-9A339	12 Leaks of No. 7225 Shielded Hookup Wire	.04

TRANSFORMERS AND COILS

PHONO ATTACHMENT PARTS

Phonograph Connections

Phonograph connections can be made as shown in Fig. 7. The parts required are shown in the parts list. Knockouts are provided in the back panel of the chassis for mounting the phono jack and phono switch—see Fig. 8.

For mounting the 12 mfd. 25 volt dry electrolytic condenser, two No. 27 drill holes should be drilled in the side of the chassis base directly below the wet electrolytic condensers. These holes are 1 1/4" from

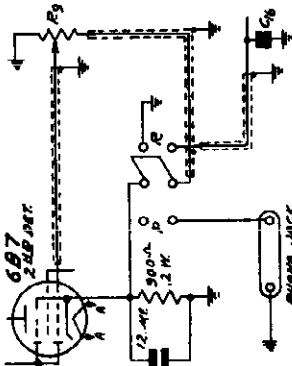


Fig. 7—Phonograph Connections

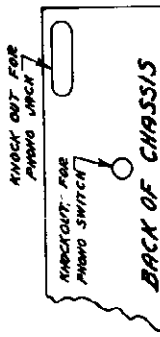


Fig. 8—Location of Phono Knockouts

the bottom, 3/8" and 3 3/4" from the front of the chassis.

The ground lug which extends out from the side of the chassis should be bent back into the chassis wall. The connections are made by opening the diode return circuit at the volume control. Unsolder the shielded lead which runs from the I. F. transformer to the volume control at the lug on the volume control. Cut this lead to length and connect it to the switch as shown in Fig. 7. The extra length of shielded lead which is provided, is connected from the volume control R9 to the phono switch as illustrated.

Remove the ground from the cathode terminal of the 6B7 2nd detector tube by bending the chassis

ground lug away from this terminal. Be sure to solder back to this ground lug any leads that were connected to it (not including cathode connection of socket).

Connect one side of the 12 mfd. 25 volt electrolytic condenser to ground and the other side of the condenser to the cathode terminal of the 6B7 2nd detector and the phono switch as shown in Fig. 7. To this same terminal on the phono switch connect the 900 ohm .2 watt resistor. The other side of this resistor goes to ground. Complete the other connections as illustrated.

A high impedance pick-up should be used. If a low impedance pick-up is used a step-up transformer will be required for sufficient volume. The volume control and tone control of the set will regulate the phono volume and tone.

Servicing R. F. Coil Assemblies

The R. F. coil assemblies in this receiver are sold complete with can. This is due to the fact that the trimmers are soldered to the can, and cannot be easily disassembled.

The lead colors and resistances of the various windings in each assembly are shown in Fig. 3.

If it is ever necessary to remove one of coil assemblies from the can, proceed as follows: First remove the nuts from the screws at the top of the can. The outside lug on the trimmer condenser is inserted in a slot in the coil can, and this lug is soldered into position.

Apply a soldering iron to the can at the point of the soldered connection. Then with a screw driver lift up on the outside edge of the trimmer (edge soldered to can) until the trimmer is clear of the can. After the trimmers are all unsoldered, the coil can be taken out.

Twenty-five Cycle Receivers

The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer is used. The correct power transformer is shown in the parts list.

The twenty-five cycle chassis can be operated satisfactorily from a sixty cycle power supply. However, the reverse is not true; the sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

A 115-230 Volt, 40 to 60 cycle as well as other power transformers with special power ratings are also available for this model.

MISCELLANEOUS

Part No.	Description	Selling Price
P-3A129	Type 80 Tube Socket (4 Prong)	.06
P-3A112	Type 42 Tube Socket (6 Prong)	.06
P-3A120	Type 68 Tube Socket (6 Prong)	.06
P-3A126	Type 68 Tube Socket (6 Prong)	.06
P-3A113	Type 68 Tube Socket (6 Prong)	.06
P-3A18	5 Prong Speaker Socket	.06
P-12A22	Dynamic Speaker Comp. with 8" Output Trans. T7	2.08
P-12A21	Dynamic Speaker Comp. with 10" Output Trans. T7	3.16
P-3X32	Tube Shield Lugs	4.18
P-3X30	Tube Shield Base	.04
P-3X23	Rubber Chassis Mounting Cushions	.04
P-3A13	Knobs, Large, Suiton Type	.10
P-17X1	Knobs, Small, Suiton Type	.08
P-2X25	Glass Dial Control	.08
P-2X23	Crystal Resistor Ring	.04
P-2X22	Non-Inductive Bleed Change Switch	.01
P-30014	Green Chip Soldering Feet	.01
P-4A18	Two Lug Terminal Strip (1 Lug Insulated)	.04
P-4A17	Single Lug Terminal Strip	.01
P-4A16	Single Lug Terminal Strip (Cable hole used)	.01
P-4A15	Two Lug Terminal Strip (Both Lugs Insulated)	.01
P-7A54	Pilot Light Socket and Spring in Center	.01
P-7A53	Pilot Light Bulb (6.8 Volt)	.01
P-13X24	Antenna and Ground Lead Assembly	.14
P-15A3	Antenna and Plug Assembly	.14
P-15A2	Antenna and Plug Assembly	.14
P-15A1	Bial Strip Only	1.24

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

RESISTORS

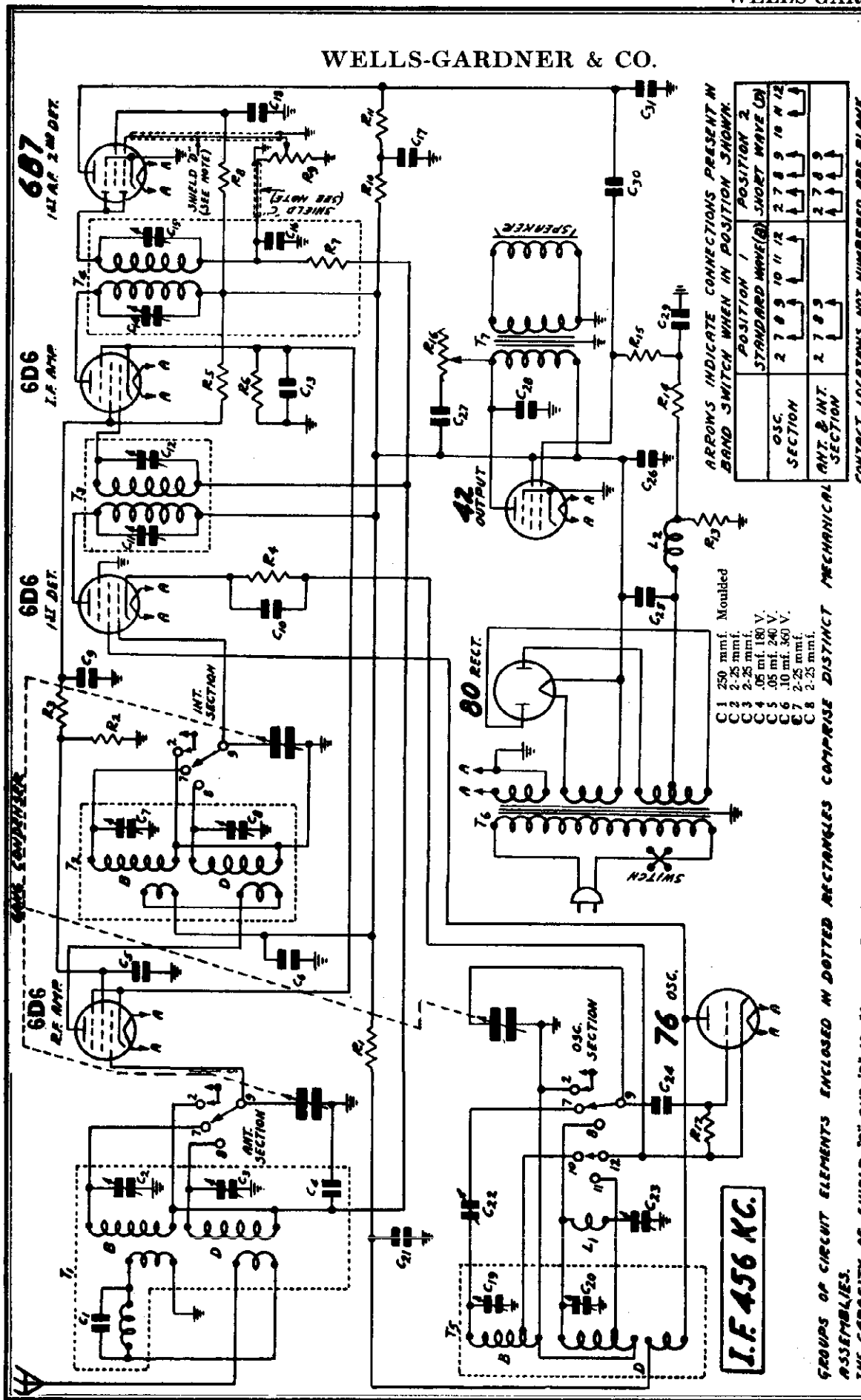
Code	Resistance	Wattage	Type	Selling Price
R1	25,000 ohms	1.0	Carbon	.06
R2	30,000 ohms	.5	Carbon	.06
R3	4,000 ohms	.5	Carbon	.06
R4	10,000 ohms	.5	Carbon	.06
R5	16,000 ohms	2.0	Carbon	.06
R6	150 ohms	2.0	Carbon	.08
R7	2.0 Megohms	2.0	Carbon	.05
R8	500,000 ohms	2.0	Carbon	.03
R9	500,000 ohms	2.0	Carbon	.03
R10	20,000 ohms	2.0	Carbon	.08
R11	10,000 ohms	2.0	Carbon	.08
R12	80,000 ohms	2.0	Carbon	.08
R13	235 ohms	2.0	Carbon	.05
R14	150,000 ohms	2.0	Carbon	.12
R15	150,000 ohms	2.0	Carbon	.03
R16	150,000 ohms	2.0	Carbon	.06

CONDENSERS

Code	Capacity	Voltage	Type	Selling Price
C1	250 mfd.	2.5 mfd.	Modified Antenna Standard	.08
C2	2.5 mfd.	2.5 mfd.	Wave Trimmer	.06
C3	2.5 mfd.	2.5 mfd.	Antenna Short	.01
C4	.05 mfd.	180	Tubular	.01
C5	.05 mfd.	360	Tubular	.01
C6	.10 mfd.	360	Tubular	.01
C7	2.5 mfd.	2.5 mfd.	Short Wave Trimmer	.01
C8	2.5 mfd.	2.5 mfd.	R.F. Interstage	.01
C9	.05 mfd.	360	Tubular	.01
C10	.05 mfd.	360	Tubular	.01
C11	20-150 mfd.	150	I.F. Trimmers	.12
C12	70-150 mfd.	150	I.F. Trimmers	.12
C13	20-150 mfd.	150	I.F. Trimmers	.14
C14	20-150 mfd.	150	I.F. Trimmers	.14
C15	50 mfd.	50	Modified Tubular	.06
C16	50 mfd.	50	Modified Tubular	.06
C17	50 mfd.	50	Modified Tubular	.06
C18	50 mfd.	50	Modified Tubular	.06
C19	2.5 mfd.	2.5 mfd.	Oscillator Standard	.06
C20	2.5 mfd.	2.5 mfd.	Wave Trimmer	.01
C21	.100	300	Oscillator Short	.05
C22	300-600 mfd.	600	Tubular	.10
C23	40-100 mfd.	400	Oscillator 600 Kc	.22
C24	35 mfd.	400	Fixed Trimmer	.06
C25	14.0 mfd.	400	Fixed Trimmer	.06
C26	18.0 mfd.	400	Fixed Trimmer	.06
C27	18.0 mfd.	400	Fixed Trimmer	.06
C28	.02 mfd.	600	Wet Electrolytic	.08
C29	.02 mfd.	180	Tubular	.08
C30	.02 mfd.	180	Tubular	.08
C31	.02 mfd.	400	Tubular	.08
C32	.10 mfd.	400	Tubular	.08
C33	.10 mfd.	400	Tubular	.08
C34	.10 mfd.	400	Tubular	.08
C35	.10 mfd.	400	Tubular	.08
C36	.10 mfd.	400	Tubular	.08
C37	.10 mfd.	400	Tubular	.08
C38	.10 mfd.	400	Tubular	.08
C39	.10 mfd.	400	Tubular	.08
C40	.10 mfd.	400	Tubular	.08
C41	.10 mfd.	400	Tubular	.08
C42	.10 mfd.	400	Tubular	.08
C43	.10 mfd.	400	Tubular	.08
C44	.10 mfd.	400	Tubular	.08
C45	.10 mfd.	400	Tubular	.08
C46	.10 mfd.	400	Tubular	.08
C47	.10 mfd.	400	Tubular	.08
C48	.10 mfd.	400	Tubular	.08
C49	.10 mfd.	400	Tubular	.08
C50	.10 mfd.	400	Tubular	.08
C51	.10 mfd.	400	Tubular	.08
C52	.10 mfd.	400	Tubular	.08
C53	.10 mfd.	400	Tubular	.08
C54	.10 mfd.	400	Tubular	.08
C55	.10 mfd.	400	Tubular	.08
C56	.10 mfd.	400	Tubular	.08
C57	.10 mfd.	400	Tubular	.08
C58	.10 mfd.	400	Tubular	.08
C59	.10 mfd.	400	Tubular	.08
C60	.10 mfd.	400	Tubular	.08
C61	.10 mfd.	400	Tubular	.08
C62	.10 mfd.	400	Tubular	.08
C63	.10 mfd.	400	Tubular	.08
C64	.10 mfd.	400	Tubular	.08
C65	.10 mfd.	400	Tubular	.08
C66	.10 mfd.	400	Tubular	.08
C67	.10 mfd.	400	Tubular	.08
C68	.10 mfd.	400	Tubular	.08
C69	.10 mfd.	400	Tubular	.08
C70	.10 mfd.	400	Tubular	.08
C71	.10 mfd.	400	Tubular	.08
C72	.10 mfd.	400	Tubular	.08
C73	.10 mfd.	400	Tubular	.08
C74	.10 mfd.	400	Tubular	.08
C75	.10 mfd.	400	Tubular	.08
C76	.10 mfd.	400	Tubular	.08
C77	.10 mfd.	400	Tubular	.08
C78	.10 mfd.	400	Tubular	.08
C79	.10 mfd.	400	Tubular	.08
C80	.10 mfd.	400	Tubular	.08
C81	.10 mfd.	400	Tubular	.08
C82	.10 mfd.	400	Tubular	.08
C83	.10 mfd.	400	Tubular	.08
C84	.10 mfd.	400	Tubular	.08
C85	.10 mfd.	400	Tubular	.08
C86	.10 mfd.	400	Tubular	.08
C87	.10 mfd.	400	Tubular	.08
C88	.10 mfd.	400	Tubular	.08
C89	.10 mfd.	400	Tubular	.08
C90	.10 mfd.	400	Tubular	.08
C91	.10 mfd.	400	Tubular	.08
C92	.10 mfd.	400	Tubular	.08
C93	.10 mfd.	400	Tubular	.08
C94	.10 mfd.	400	Tubular	.08
C95	.10 mfd.	400	Tubular	.08
C96	.10 mfd.	400	Tubular	.08
C97	.10 mfd.	400	Tubular	.08
C98	.10 mfd.	400	Tubular	.08
C99	.10 mfd.	400	Tubular	.08
C100	.10 mfd.	400	Tubular	.08
C101	.10 mfd.	400	Tubular	.08
C102	.10 mfd.	400	Tubular	.08
C103	.10 mfd.	400	Tubular	.08
C104	.10 mfd.	400	Tubular	.08
C105	.10 mfd.	400	Tubular	.08
C106	.10 mfd.	400	Tubular	.08
C107	.10 mfd.	400	Tubular	.08
C108	.10 mfd.	400	Tubular	.08
C109	.10 mfd.	400	Tubular	.08
C110	.10 mfd.	400	Tubular	.08
C111	.10 mfd.	400	Tubular	.08
C112	.10 mfd.	400	Tubular	.08
C113	.10 mfd.	400	Tubular	.08
C114	.10 mfd.	400	Tubular	.08
C115	.10 mfd.	400	Tubular	.08
C116	.10 mfd.	400	Tubular	.08
C117	.10 mfd.	400	Tubular	.08
C118	.10 mfd.	400	Tubular	.08
C119	.10 mfd.	400	Tubular	.08
C120	.10 mfd.	400	Tubular	.08
C121	.10 mfd.	400	Tubular	.08
C122	.10 mfd.	400	Tubular	.08
C123	.10 mfd.	400	Tubular	.08
C124	.10 mfd.	400	Tubular	.08
C125	.10 mfd.	400	Tubular	.08
C126	.10 mfd.	400	Tubular	.08
C127	.10 mfd.	400	Tubular	.08
C128	.10 mfd.	400	Tubular	.08
C129	.10 mfd.	400	Tubular	.08
C130	.10 mfd.	400	Tubular	.08
C131	.10 mfd.	400	Tubular	.08
C132	.10 mfd.	400	Tubular	.08
C133	.10 mfd.	400	Tubular	.08
C134	.10 mfd.	400	Tubular	.08
C135	.10 mfd.	400	Tubular	.08
C136	.10 mfd.	400	Tubular	.08
C137	.10 mfd.	400	Tubular	.08
C138	.10 mfd.	400	Tubular	.08
C139	.10 mfd.	400	Tubular	.08
C140	.10 mfd.	400	Tubular	.08
C141	.10 mfd.	400	Tubular	.08
C142	.10 mfd.	400	Tubular	.08
C143	.10 mfd.	400	Tubular	.08
C144	.10 mfd.	400	Tubular	.08
C145	.10 mfd.	400	Tubular	.08
C146	.10 mfd.	400	Tubular	.08
C147	.1			

WELLS-GARDNER & CO.

MODEL 7
Schematic



ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

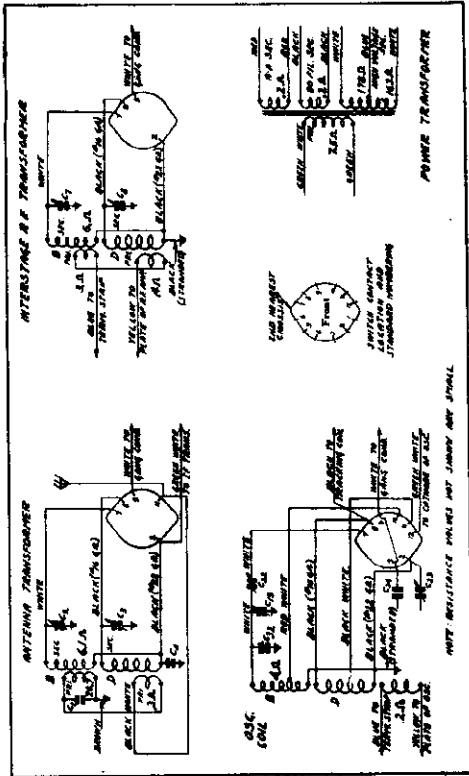
	POSITION 1	POSITION 2
OSC. SECTION	2 7 8 9 10 11 12	2 7 8 9 10 11 12
ANT. & INT. SECTION	2 7 8 9	2 7 8 9

- GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES. THE CAPACITY OF SHIELD "C" AND "D" IS 50 MMF. EACH.
- C 9 .25 mf. 240 V.
 - C 10 .05 mf. 180 V.
 - C 11 70-150 mmf. } One
 - C 12 70-150 mmf. } Assembly
 - C 13 .25 mf. 180 V.
 - C 14 70-150 mmf. } One
 - C 17 .25 mf. 360 V.
 - C 18 .25 mf. 360 V.
 - C 19 2-25 mmf.
 - C 20 2-25 mmf.
 - C 21 30 mf. 360 V.
 - C 22 300-500 mmf. } One
 - C 25 14 mf. 400 V. Electrolytic
 - C 26 13 mf. 300 V. Electrolytic
 - C 27 .05 mf. 600 V.
 - C 28 .002 mf. 600 V.
 - C 29 .03 mf. 180 V.
 - C 30 .01 mf. 480 V.
 - C 31 .002 mf. 600 V.
 - R 3 6000 ohm. 5 W.
 - R 4 2500 ohm. 2 W.
 - R 5 16000 ohm. 2 W.
 - R 6 150 ohm. 2 W.
 - R 7 2.0 Megohm. 2 W.
 - R 8 50000 ohm. 5 W.
 - R 9 50000 ohm. Volume Control
 - R 10 20000 ohm. 2 W.
 - R 13 235 ohm. Armored Wire Wound
 - R 14 100000 ohm. 2 W.
 - R 15 50000 ohm. 2 W.
 - R 16 150000 ohm. Tone Control
 - T 1 Antenna R. F. Trans.
 - T 2 250 mmf. Moulded
 - T 3 2-25 mmf.
 - T 4 2-25 mmf.
 - T 5 .05 mf. 180 V.
 - T 6 .05 mf. 240 V.
 - T 7 .10 mf. 360 V.
 - T 8 2-25 mmf.
 - T 9 50000 ohm. Volume Control
 - T 10 20000 ohm. 2 W.
 - T 11 Antenna R. F. Trans.
 - T 12 2.0 Megohm. 2 W.
 - T 13 50000 ohm. 2 W.
 - T 14 2nd I. F. Trans.
 - T 15 Osc. Inductors
 - T 16 Power Trans.
 - T 17 Output Trans.
 - L 1 Osc. Tracking Coil

MODEL 7J

Alignment, Socket Trimmers, Voltage Resistance, Coils Changes

WELLS-GARDNER & CO.



D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets. Refer to Fig. 3.

Part No.	Item	Code	D. C. Resistance in Ohms
9A38	Antenna Transformer Winding	T1	27
	Range B Primary Winding	T1	0.3
	Range B Secondary Winding	T1	Small
9A39	N. F. Interstage Transformer	T2	2.6
	Range B Primary Winding	T2	2.6
	Range B Secondary Winding	T2	2.6
9A38	Oscillator Transformer	T3	11
	Range B Grid Coil	T3	Small
	Red White to White	T3	Small
	Black White to Black	T3	Small
9A39	Oscillator Plate Coil	T4	11.9
	Primary Winding	T4	11.9
9A39	2nd Primary Winding	T5	12.9
	Secondary Winding	T5	4.5
	Range B Plate Coil	T5	19
	Primary Winding	T5	19
	Secondary Winding	T5	19
	Speaker Field	L3	105
	Speaker Voice Coil	L3	33
	Speaker Printing Coil	L3	32.0

Changes in Early Models

In the early models the antenna transformer had two B primary windings as shown in Fig. 3. In later models only one winding was used as shown in Fig. 3.

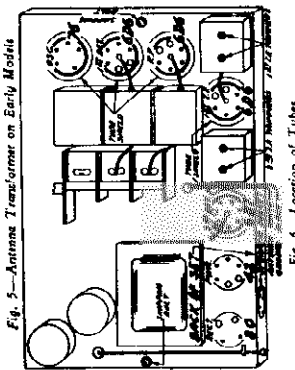
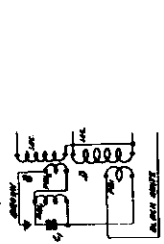


Fig. 6—Location of Tubes

Loosen the pointer set screw and set the pointer at the 1500 KC mark on the standard wave band scale. Retighten the set screw.

Adjust the interstage standard wave trimmer (C7) and antenna standard wave trimmer (C7) until maximum output is obtained. Do not change the setting of the oscillator standard wave trimmer.

600 KC Adjustment
Set the signal generator for 600 KC. Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer until the peak of greatest intensity is obtained. See Fig. 4 for location of this trimmer.

Be sure to use a non-metallic screw driver for this adjustment.

18,300 KC Adjustment
Set the signal generator for 18,300 KC. Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the short wave position. As mentioned above, keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A.V.C. action. Adjust the oscillator short wave trimmer (C20) until maximum output is obtained. See Fig. 4 for location of this trimmer.

If a maximum output peak cannot be reached, it may be due to the fact that the antenna and interstage short wave trimmers are screwed down too far. Back off these two trimmer screws two or three turns and then adjust the oscillator short wave trimmer for maximum output.

15,000 KC Adjustment
Set the signal generator for 15,000 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage short wave trimmer (C8) and antenna short wave trimmer (C5) until maximum output is obtained.

When adjusting the interstage short wave trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

Then go back and repeat the procedure as given for the 18,300 KC adjustment. If it is found necessary to make any appreciable change in the setting of the oscillator short wave trimmer, the 15,000 KC adjustment must be repeated.

Do not make any further change in the setting of the oscillator short wave trimmer.

6000 KC Adjustment
Set the signal generator for 6000 KC. Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained. See Fig. 4 for location of this trimmer.

Use a non-metallic screw driver for this adjustment.

Correct alignment is extremely important in connection with all wave receivers. The receiver is all properly aligned at the factory with precision instruments and re-alignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide an accurately calibrated signal at 456, 1730, 1500, 600, 18,300, 15,000 and 6000 KC and an output indicating meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screw driver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 456 KC. Connect the antenna lead of the signal generator thru a 1 MF condenser to the grid of the 1st detector. Connect the ground lead of the signal generator to the chassis ground.

Turn the band switch to the standard wave position. Turn the volume control to the maximum position. Attenuate the signal from the signal generator to prevent the leveling-off action of the A.V.C.

Then adjust the four I. F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 6.

1730 KC Adjustment

Set the signal generator for 1730 KC. Turn the rotor of the tuning condenser to the full open position.

Keep the band switch in the standard wave position. Connect the antenna lead of the receiver through a 270 muf. condenser to the output of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A.V.C. action.

Adjust the oscillator standard wave trimmer (C19) until maximum output is obtained. The location of this trimmer is shown in Fig. 4.

1500 KC Adjustment

Set the signal generator for 1500 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.



Fig. 4—Location of Trimmers

VOLTAGES AT SOCKETS
Line Voltage - 115
Antenna Shorted to Ground

Type Tube	Function	Heater Volts	Plate to Ground	Screen to Ground	Grid to Ground	Triode to Ground
6D6	R. F.	6.1	240	95	3	7.
6D6	1st Det.	6.1	240	100	9	3.5
76	Osc.	6.1	100			5
6D6	I. F.	6.1	240	120	3	7.5
487	2nd Det.	6.1	55	40	0	2.3
42	Power	6.1	225	240	17 (0)	30.0
80	Rectifier	4.6				32.0

WELLS-GARDNER & CO.

MODEL OEL
 MODEL 2DL
 MODEL 7L
 Dial & Drive
 Data

Series 7L - OEL - 2DL

October, 1936 DIAL AND DRIVE PARTS LIST SUPPLEMENT

Four distinct types of dials are used in the above series of radios. Each type is supplied in two sizes. When ordering dial parts, specify the items shown to the right to insure getting the correct part.

When ordering parts specify

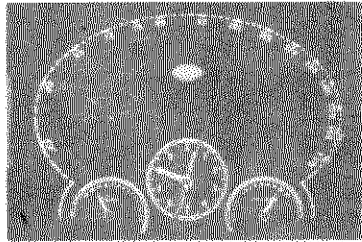
- 1—Type of dial.
- 2—Size of dial.
- 3—Name on dial or escutcheon.
- 4—Model or series of radio.

TYPE OF DIAL

Pointer Dials

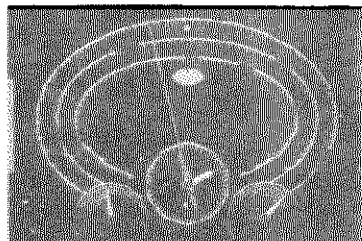
No. 2 Dial

External pointers — each dial scale a different color for each band — circular micrometer scale numbered to 10.



No. 4 Dial

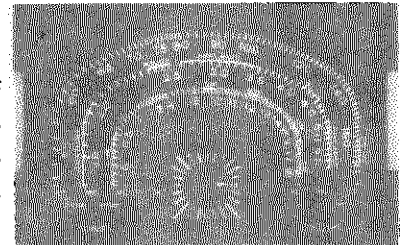
External pointers—all dial scales gold etched — ten sided micrometer scale numbered to 100.



Phantom Light Dials

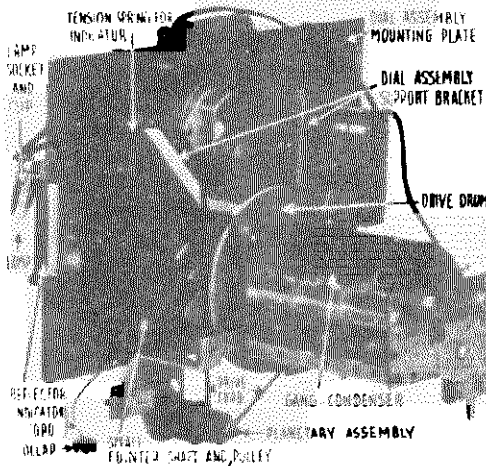
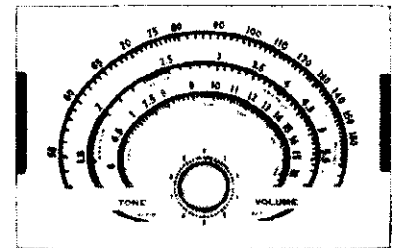
No. 3 Dial

Moving beam of light indicators — celluloid translucent background.

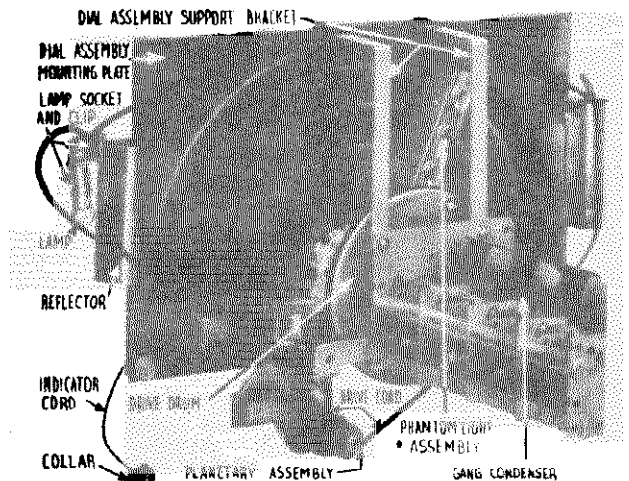


No. 7 Dial

Moving beam of light indicators — mirror background.



Back View of Pointer Dial

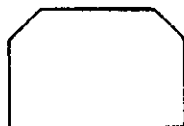


Back View of Phantom Light Dial

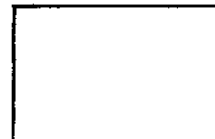
SIZE OF DIAL

In each of the above types of dial there are two sizes known as the "7 inch" and "9 inch" size. The size of the dial is determined not by the length of

the glass but by the horizontal distance across the opening of the escutcheon.



The "7 inch" dials have the upper corners cut off as shown in the illustration at left, and are approximately 8 inches in length.



The "9 inch" dials are rectangular in shape as shown in the illustration at left, and are approximately 10 inches in length.

MODEL OEL
MODEL 2DL
MODEL 7L

WELLS-GARDNER & CO.

No. 2 and No. 4 POINTER DIALS

Dial & Drive Parts

DIAL ASSEMBLY

Dial Assembly Complete with Dial Glass; Dial Cardboard; Dial Assembly Mounting Plate; Reflectors; Small Pointers; Cords, Collars, Springs and Pulleys for Small Pointers; and Band Indicator Assembly Less Large Station Pointer and Micrometer Pointer.....

Dial Glass Only.....

Dial Cardboard (For Radios with Tuning Eye mounted in Dial).....

Dial Cardboard (For Radios without Tuning Eye mounted in Dial).....

Dial Assembly Mounting Plate Only (Includes Small Pointer Shafts and Pulleys, and Band Indicator Assembly).....

Dial Assembly Support Brackets (Attached to Gang Condenser) .. ea.

Large Station Pointer.....

Micrometer Pointer (No. 2 Dial).....

Micrometer Pointer (No. 4 Dial).....

Small Volume or Tone Control Pointer (No. 2 Dial)..... ea.

Small Volume or Tone Control Pointer (No. 4 Dial)..... ea.

Fibre Strip (At bottom of Dial Glass).....

Dial Lamp Reflectors (At each side of Dial Assembly Mounting Plate)..... ea.

Dial Lamp Sockets and Clips..... ea.

Dial Lamps—No. 51 Bayonet Type..... ea.

10" Black Cord for Small Pointers..... doz.

Brass Collar with Set Screws for Securing Small Pointer Cords to Shafts..... ea.

Tension Springs for Small Pointer Cords..... ea.

Small Pointer Shafts and Pulleys..... ea.

Glass Crystal (Mounted in Escutcheon Plate).....

Retaining Ring (For above Crystal).....

DRIVE ASSEMBLY

Planetary Assembly Complete with Hex Nut and Lock Washer (This is the unit mounted at the front of the Chassis Base. It is integral with the Tuning Shaft).....

Black Tuning Drive Cord Only.....

Tension Spring for Tuning Drive Cord.....

Drive Drum Assembly Complete with Gears and Shafts.....

Spreader Spring for Stationary Gear.....

Spreader Spring for Rotary Gear.....

Rubber Cushion (Front) for Gang Condenser.....

Rubber Cushion (Rear) for Gang Condenser.....

Rubber Cushion (Rear—under Chassis Base) for Gang Condenser.....

Rear Mounting Foot for Gang Condenser.....

7 INCH		9 INCH	
PART NO.	LIST PRICE	PART NO.	LIST PRICE
Specify 4 items listed at top of reverse side—also location of Tun. Eye..... \$3.85		Specify 4 items listed at top of reverse side—also location of Tun. Eye..... \$4.30	
Same as above..... 1.75		Same as above..... 1.75	
P-9X21	.10	P-9X22	.10
P-9X16	.10	P-9X23	.10
P-25A125	1.20	P-25A126	1.20
P-25X297	.10	P-25X297	.10
P-15X59	.20	P-15X72	.20
P-15X60	.10	P-15X60	.10
P-15X74	.10	P-15X74	.10
P-15X57	.10	P-15X57	.10
P-15X73	.10	P-15X73	.10
P-11X41	.10	P-11X41	.10
P-41X12	.10	P-41X12	.10
P-7A37	.10	P-7A37	.10
P-7A32	.20	P-7A32	.20
	.25		.25
P-29X20	.10	P-29X20	.10
P-28X44	.10	P-28X44	.10
P-26X229	.10	P-26X229	.10
P-17X15	.35	P-17X18	.45
P-28X58	.15	P-28X82	.15
P-5A34	1.25	P-5A34	1.25
P-10X14	.30	P-10X14	.30
P-28X69	.10	P-28X69	.10
P-24X239	1.35	P-24X239	1.35
P-28X83	.10	P-28X83	.10
P-28X84	.10	P-28X84	.10
P-8X43	.10	P-8X43	.10
P-8X44	.10	P-8X44	.10
P-8X45	.10	P-8X45	.10
P-25X283	.10	P-25X283	.10

No. 3 and No. 7 PHANTOM LIGHT DIALS

DIAL ASSEMBLY

Dial Assembly Complete with Dial Glass, Dial Assembly Mounting Plate, Reflectors, Micrometer Indicator, Cardboard Reflector, Tone and Volume Indicators, Tension Spring for Tone and Volume Indicators, Indicator Cords, Brass Collars for Indicators, Fibre Dial Strip and Dial Assembly Support Brackets. (This Assembly also includes Celluloid Background for No. 3 Dials only)..... (No. 3 Dial)

Dial Assembly Complete as above..... (No. 7 Dial)

Dial Glass Only.....

Celluloid Background for Dial (Used on No. 3 Dial Only).....

Dial Assembly Mounting Plate Complete with Tone and Volume Indicators and Indicator Pulleys..... (No. 3 Dial)

Dial Assembly Mounting Plate as above..... (No. 7 Dial)

Dial Assembly Support Brackets (Attached to Gang Condenser) .. ea.

Tension Spring for Tone and Volume Indicators..... doz.

10" Black Cord for Tone and Volume Indicators..... doz.

Brass Collars with Set Screw for Securing Indicator Cords to Shafts..... ea.

Dial Lamp Reflector (Left from front of Radio).....

Dial Lamp Reflector (Right from front of Radio).....

Dial Lamp Sockets and Clips (For edge lighting of dial and for Tone and Volume Indicators)..... ea.

Dial Lamps—No. 51 Bayonet Type (For edge lighting and Phantom Light Assembly)..... ea.

Phantom Light Assembly Complete with Lamps.....

Springs for Lamps of Phantom Light Assembly..... ea.

Brass Collars for Lamps of Phantom Light Assembly..... ea.

Micrometer Indicator (Celluloid and metal disc)..... (No. 3 Dial)

Micrometer Indicator (Metal disc)..... (No. 7 Dial)

Cardboard Reflector for Micrometer Indicator..... (No. 3 Dial)

Cardboard Reflector for Micrometer Indicator..... (No. 7 Dial)

Fibre Strip (At bottom of Dial Glass).....

Switch for Phantom Light Assembly (This switch is not included in any of the above Assemblies).....

DRIVE ASSEMBLY

Planetary Assembly Complete with Hex Nut and Lockwasher (This is the unit mounted at the front of the Chassis Base. It is integral with the Tuning Shaft).....

Black Tuning Drive Cord Only.....

Tension Spring for Tuning Drive Cord.....

Drive Drum Assembly Complete with Gears and Gear Spreader Springs.....

Spreader Spring for Stationary Gear.....

Spreader Spring for Rotary Gear.....

Rubber Cushion (Front) for Gang Condenser.....

Rubber Cushion (Rear) for Gang Condenser.....

Rubber Cushion (Rear—under Chassis Base) for Gang Condenser.....

Rear Mounting Foot for Gang Condenser.....

7 INCH		9 INCH	
PART NO.	LIST PRICE	PART NO.	LIST PRICE
Specify 4 items listed at top of reverse side..... \$5.60		Specify 4 items listed at top of reverse side..... \$6.10	
Same as above..... 4.85		Same as above..... 5.30	
Same as above..... 1.75		Same as above..... 1.75	
P-58X141	.60	P-58X142	.70
P-25A127	1.45	P-25A128	1.45
P-25A129	1.45	P-25A130	1.45
P-25X321	.10	P-25X322	.10
P-28X88	.10	P-28X87	.10
	.25		.25
P-29X42	.10	P-29X42	.10
P-41X14	.10	P-41X14	.10
P-41X15	.10	P-41X15	.10
P-7A37	.10	P-7A37	.10
P-7A32	.20	P-7A32	.20
P-25A98	1.80	P-25A99	1.90
P-28X86	.10	P-28X86	.10
P-19X61	.10	P-19X61	.10
P-25A131	.35	P-25A131	.35
P-15X85	.10	P-15X85	.10
P-9X28	.10	P-9X28	.10
P-9X31	.10	P-9X31	.10
P-11X48	.10	P-11X49	.10
P-25A134	.75	P-25A134	.75
P-5A34	1.25	P-5A34	1.25
P-10X14	.30	P-10X14	.30
P-28X69	.10	P-28X69	.10
P-24X247	1.40	P-24X247	1.40
P-28X83	.10	P-28X83	.10
P-28X84	.10	P-28X84	.10
P-8X43	.10	P-8X43	.10
P-8X44	.10	P-8X44	.10
P-8X45	.10	P-8X45	.10
P-25X283	.10	P-25X283	.10

Prices Subject to Change Without Notice

MODEL S-721
Voltage, Parts
Alignment

WESTERN AUTO SUPPLY CO.

REPAIR PARTS LIST FOR 7 TUBE
SUPERHETERODYNE RECEIVER

When ordering parts, the part number and the serial number of chassis must be given. If there is a spot of paint on the chassis be sure to give this color. If this information is not available return the old part to insure getting the correct part.

PRICES SUBJECT TO CHANGE
WITHOUT NOTICE

Part No.	Name	List Price
P-1677	No. 57 Tube Socket	\$.15
P-1678	No. 58 Tube Socket	.15
P-1468	No. 47 Tube Socket	.15
P-1474	No. 80 Tube Socket	.15
P-1479	Speaker Socket	.15
P-4042C	Aluminum Tube Shield	.20
P-4032S	Tube Shield Base	.10
P-40411	Aluminum Coil Shield—R.F. Coils	.20
P-1476	Three-Lug Insulated Terminal Strip	.10
P-1513	Eleven-Lug Insulated Terminal Strip	.15
P-1054	"On-Off" Switch	.80
P-20529	Drive Shaft	.10
P-10224	Rubber Drive Pinion	.10
P-30374	Brass Bushing for Rubber Pinion	.10
P-10191	Rubber Cushions for Channel Brackets	.10
P-1273	Pilot Lamp 2.5 Volt	.25
P-5062	Antenna R.F. Transformer Assembly	.80
P-5057	Interstage R.F. Transformer Assembly	.80
P-5058	Oscillator Coil Assembly	.95
P-5059	1st I.F. Transformer Assembly, complete with can	2.25
P-5060	2nd I.F. Transformer Assembly, complete with can	2.50
P-50541	Output Transformer Assembly	1.75
P-50542	Power Transformer, 60 cycle, 110 volt	5.25
P-50543	Power Transformer, 25 cycle, 110 volt	8.50
P-50545	Power Transformer, 40-60 cycle, 110 volt	8.00
P-1497	Pilot Light Bracket and Drive Gear Assembly	.45
P-1383-C	Drive Bracket and Bearing	.30
P-1684	Celluloid Dial Strip	.20

CONDENSERS

Part No.	Code	Capacity	Voltage	Type	List Price
P-80862-C	C-1	.05 mfd.	200 V.	Tubular	\$.30
P-80858-A	C-2	.25 mfd.	200 V.	Tubular	.40

P-80886-C	{ C-3 .5 mfd. 200 V. } { C-7 .25 mfd. 400 V. } { C-11 .25 mfd. 200 V. }	Block	1.60
P-80867	{ C-4 .0005 mfd. 600 V. } { C-5 .01 mfd. 600 V. }	Model	.25
P-80872-B	{ C-6 .01 mfd. 600 V. } { C-8 .1 mfd. 200 V. }	Tubular	.25
P-80864-D	{ C-9 .1 mfd. 400 V. } { C-10 .002 mfd. 600 V. }	Tubular	.25
P-80887-B	{ C-11 .25 mfd. 200 V. } { C-12 4.0 mfd. 150 V. }	Tubular	.40
P-80914	{ C-13 .05 mfd. 400 V. } { C-14 8.0 mfd. 450 V. }	Tubular	.20
P-80891-B	{ C-15 .05 mfd. 200 V. } { C-16 .05 mfd. 200 V. }	Electrolytic	.85
P-80890-B	{ C-17 8.0 mfd. 450 V. }	Electrolytic Block	2.85
P-80894-B	{ C-15 .05 mfd. 200 V. } { C-16 .05 mfd. 200 V. }	Tubular	.30
P-80862-C	C-16 .05 mfd. 200 V.	Tubular	.30
P-80849	C-17 8.0 mfd. 450 V.	Wet Electrolytic (25 Cycle only)	2.20
P-1385-B	600 K.C. Trimmer Condenser		.75
P-80882	Three-Gang Condenser		5.70

RESISTORS

Part No.	Code	Resistance	Wattage	Type	List Price
*P-91003	R-1	27,000 ohms	.5 Watts	Carbon	\$.25
P-90954	R-2	250,000 ohms	2 Watts	Carbon	.25
*P-91002	R-3	25,000 ohms	1.0 Watts	Carbon	.25
P-90916	R-4	40,000 ohms	.2 Watts	Carbon	.25
P-90941	R-5	50,000 ohms	2 Watts	Carbon	.25
P-90963	R-6	150,000 ohms	2 Watts	Carbon	.25
P-90929	R-7	500,000 ohms	2 Watts	Carbon	.25
P-90930	R-8	10,000 ohms	.2 Watts	Carbon	.20
P-90905	R-9	15,000 ohms	.2 Watts	Carbon	.25
P-90905	R-10	250,000 ohms	2 Watts	Carbon	.25
P-90954	R-11	30,000 ohms	.2 Watts	Carbon	.25
P-91040	{ R-12 330 ohms } { R-14 60 ohms }			Vitreous Enamel	.50
P-90993	R-13	150,000 ohms		Tone Control	.90
P-91041	R-15	150 ohms		Volume Control	.80
P-90916	R-16	40,000 ohms	.2 Watts	Carbon	.25
†P-91048	{ R12 220 ohm 1.0 Watts } { R14 40 ohm .2 Watts } { R1 9540 ohm 1.0 Watts } { R3 10650 ohm 2.5 Watts }			Armored Wire-wound Resistor	1.05

* Used in early models—in later models these resistors are replaced by resistor P-91048.
† See above.

Voltages at Sockets

LINE VOLTAGE 115—ANTENNA LEAD SHORTED TO GROUND—VOLUME CONTROL AT MAXIMUM

Type of Tube	Function	Across Filament or Heater	For early Models with 2-section vitreous enamel resistor.				For later Models with 4-section armoured wire-wound resistor.			
			Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M. A.	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M. A.
'58	R.F.	2.4	282	107	4 ⁽¹⁾	8.	258	106	2.8 ⁽¹⁾	8.0
'57	1st Det.	2.4	270	100	5	.4	250	103	5	.4
'58	I.F. ⁽²⁾	2.4	282	107	4 ⁽¹⁾	8.	258	106	2.8 ⁽¹⁾	8.0
'57	A.V.C.	2.4	90	40	9.5	0	103	45	10	0
'57	2nd Det.	2.4	207	98	6	.15	190	101	6	.15
'47	Audio	2.4	262	280	24 ⁽³⁾	31	242	260	17 ⁽³⁾	30
'80	Rect.	4.8				30 per plate				34 per plate

- (1) Read Across R-14.
- (2) If I.F. readings are made with a cord and plug, ground the control grid through a condenser to prevent oscillation.
- (3) Read Across R12 and R14.

Condenser Alignment

Misalignment or mistracking of condensers generally manifests itself in broad tuning and lack of volume at portions or all of the broadcast band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment. A signal generator that will provide an accurately calibrated signal of 175 K.C. and accurately calibrated signals over the broadcast band, and an output indicating meter are necessary. The procedure is as follows:

Set the signal generator for 175 K.C. Connect the signal lead from the signal generator to the grid of the 1st detector tube through a .05 mfd condenser. Turn the tuning condenser rotor until the plates are completely out. The ground lead from the signal generator goes to the ground lead of the receiver. Then adjust the four intermediate frequency condensers for maximum output. The adjusting

screws for these condensers are reached from the bottom of the chassis.

Next set the signal generator for a signal of exactly 1400 K.C. The antenna lead from the signal generator, in this instance, connected to the antenna lead of the receiver. Set the dial pointer on the 1400 K.C. mark on the dial scale and adjust the three trimmer condensers on the gang tuning condenser for maximum output, adjusting the oscillator trimmer first.

Next set the signal generator for a signal of 600 K.C. and adjust the oscillator 600 K.C. trimmer. The adjusting screw for this condenser is reached from the top of the chassis and is between the I.F. and oscillator coil cans.

A non-metallic screwdriver is necessary for this adjustment. Turn the tuning condenser rotor until maximum output is obtained. Then turn the rotor slowly back and forth over this setting, at the same time adjusting the 600 K.C. trimmer screw until the highest output is obtained.

Then set the signal generator again for a signal of 1400 K.C. and check the adjustment of the tuning condenser trimmers at this frequency for maximum output.

WESTERN AUTO SUPPLY CO.

MODEL S-724
Schematic, Socket
Parts

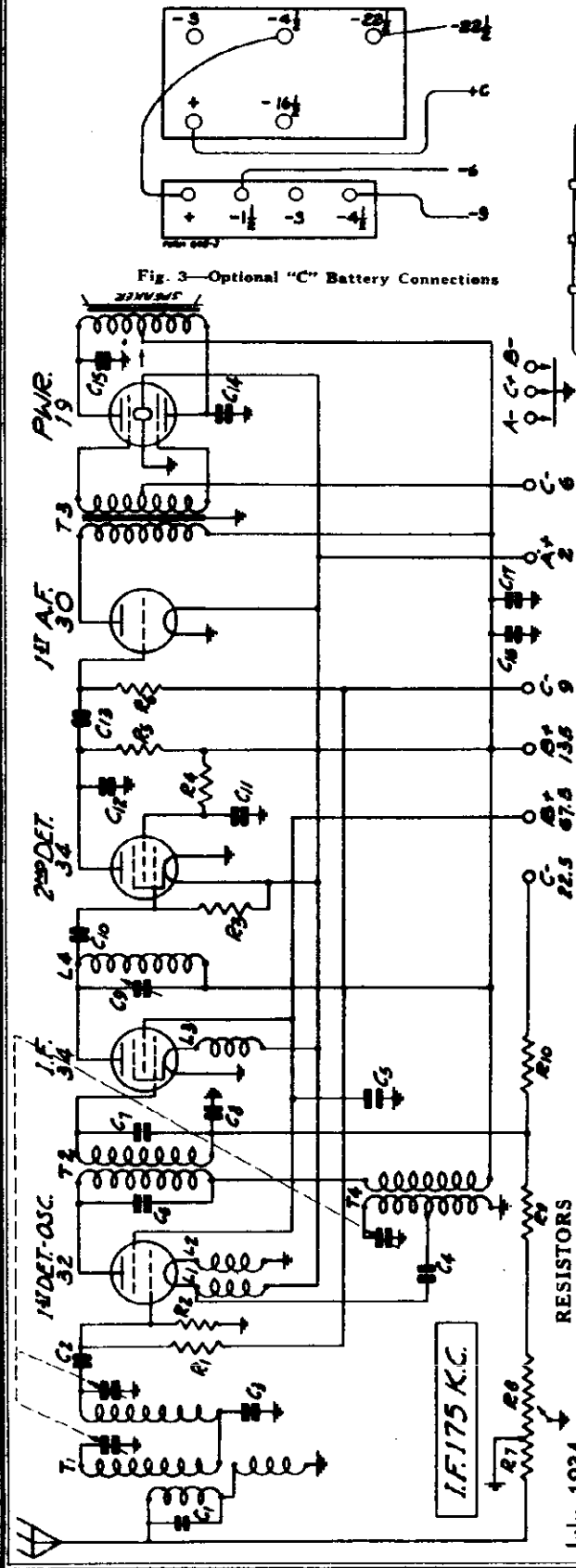


Fig. 1—Schematic Circuit Diagram.

July, 1934

Part No. Code	Resistance	Wattage	Type
P-A94506 R1	5 Megohm	0.2	Carbon
P-A94105 R2	1 Megohm	0.2	Carbon
P-A94205 R3	2 Megohm	0.2	Carbon
P-B94104 R4	100,000 Ohm	0.5	Carbon
P-B94403 R5	40,000 Ohm	0.5	Carbon
P-A95105 R6	1 Megohm	0.2	Carbon
P-96001 R7	3,000 Ohm		Volume Control
P-A94901 R8	60,000 Ohm		Wire Wound
P-A94652 R9	900 Ohm	0.2	Carbon
P-A94108 R10	6,500 Ohm	0.2	Carbon
P-A94205 R2	2 Megohm	0.2	Carbon

*These resistors were used on first models.

CONDENSERS

Part No.	Capacity	Voltage	Type
P-81812 C1	200 mmf.		Wire—Part of Ant. Assem.
P-81801 C2	85 mmf.		Wire—Part of Ant. Assem.
P-80362 C3	0.05 mf	200V	Tubular
P-80362 C4	0.05 mf	200V	Tubular
P-80362 C5	0.05 mf	200V	Tubular
P-81808 C6	70 mmf.		Wire
P-81804 C7	45 mmf.		Wire
P-80562 C8	0.05 mf	200V	Tubular
P-1695 C9	70 + 30 mmf.		L. F. Trimmer
P-81800 C10	0.25 mf	200V	Tubular
P-81045 C11	0.25 mf	200V	Tubular
P-80362 C12	0.05 mf	600V	Tubular
P-80362 C13	0.05 mf	600V	Tubular
P-80362 C14	0.01 mf	400V	Dual Tubular
P-80362 C15	0.01 mf	400V	Tubular
P-80362 C16	0.1 mf	200V	Electrolytic
P-80362 C17	4.0 mf	150V	Electrolytic

MISCELLANEOUS

Part No.	ITEM
P-2181	No. 32 Socket.
P-1646	No. 34 Socket.
P-1644	No. 30 Socket.
P-1833	No. 19 Socket.
P-1640	Speaker Socket.
P-20406-A	Tube Shield for 34 and 32 Tubes.
P-20788	Audio Input Transformer T1.
P-80586-D	Double Tuned Ant. Trans. Assem. Comp. with resistors and condensers T1 less can.
P-3168	Can for above Assem. T2.
P-40482	1st I.F. Coil and Can Assem. T2.
P-5199	Oscillator Coil and Can Assem. T1.
P-5187	2nd I.F. Coil and Can Assem. L4.
P-5172	Double Filament Reactor L1, L2.
P-5189	Single Filament Reactor L3.
P-30342-A	Grid Cap Only
P-2040	Knob, plain.
P-2122	Knob, Arrow Indicator.
P-1441-A	Double Insulated Terminal Strip.
P-1786	Five Lug Terminal Strip.
P-1881	On-Off Switch
P-20711	Gang Condenser Shield.
P-10272	Rubber Chassis Cushions
P-70708	Antenna and Ground Wire
P-70749	"B" Battery Wire Assem.
P-70771	"A" Battery Wire Assem.
P-70772	"C" Battery Wire Assem.
P-2124	Speaker 6"
P-2125	Speaker 8"

Fig. 3—Optional "C" Battery Connections

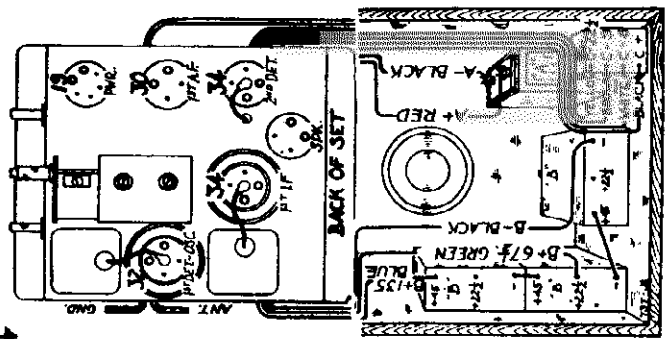
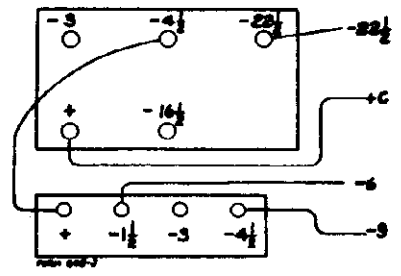


Fig. 2—Tube Arrangement and Battery Connections.

MODEL S-724

Circuit Data
Alignment, Voltage
Resistance

WESTERN AUTO SUPPLY CO.

Circuit

This receiver is designed to operate from a battery power supply the values of which are shown in Fig. 1. All of the tubes used are of the 2 volt type. The receiver is designed to operate at a very low current drain from the batteries and still have a very satisfactory quality of output.

The circuit has a preselector stage incorporating 2 tuned circuits for image rejection. This couples into the type 32 first detector-oscillator tube through a combination of inductive coupling in T1 and capacitive coupling through C3. In Fig. 1 the two coils to the right of the 32 1st detector tube are the primary and secondary of the 1st I. F. transformer while below this tube are the oscillator coils. The oscillating circuit is tuned by the oscillator section of the gang condenser and is always resonant at a frequency of 175 K. C. above the frequency to which the R. F. circuit is tuned.

One stage of I. F. amplification is employed using a 34 tube. Fixed condensers tune the primary and secondary of the first I. F. transformer. A second I. F. unit of the impedance coupled type is provided in which the inductance L4 is tuned by a trimmer condenser C9. The volume control is of the variable antenna input and I. F. bias type. Referring to Fig 1 it will be noted that one end of the volume control strip is connected to the antenna and the other end is connected to resistor R9. Also note that the volume control strip is tapped. Bias voltage for the 34 I. F. tube is obtained from a potentiometer consisting of resistors R9, R10 and the 60,000 ohm section of the volume control R8 which resistors are connected across the 22½ volt "C" battery.

As the slider of the volume control is moved away from the antenna end, the signal input to the antenna stage is increased. The bias voltage of the I. F. tube is not affected until the tap is reached. As the slider moves from this point to the end of the strip the I. F. bias is decreased, thus increasing the sensitivity. When this happens the plate current goes up and more battery current is used.

A 34 tube is used as the 2nd detector or demodulator. Demodulation takes place in the grid circuit of this tube.

Resistance coupling is used between the 2nd detector and the 1st audio stage which uses a 30 tube. The 1st audio stage is transformer coupled to the output stage. Class "B" amplification is employed in the output stage which uses a type 19 tube. This consists of two output tubes in one envelope. A magnetic reproducer is used.

A 3 pole switch controls all three sources of battery supply.

Condenser Alignment

Misalignment or mistracking of condensers generally manifests itself as broad tuning and lack of volume at portions or all of the broadcast band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment. A signal generator that will provide accurately calibrated signals over the broadcast band and at the intermediate frequency, and an output meter are required for indicating the effect of adjustments.

First set the signal generator to a frequency of 175 K. C. Connect the antenna lead of the signal generator to the grid of the 1st detector thru a .05 mfd. condenser. The ground lead from the signal generator goes to the ground lead of the receiver. Adjust trimmer condenser C9 on the back panel of the chassis until maximum output is obtained. A non-metallic screw driver should be used in making this adjustment as the I. F. trimmer is at B+ potential.

Next set the signal generator for 1730 K. C. Turn the rotor to the full open position. The antenna lead from the signal generator is in this instance connected to the antenna lead of the receiver. Adjust the trimmer of the oscillator section of the 3 gang condenser until maximum output is obtained. The oscillator section is the one with the cut plate rotor.

Then set the signal generator for 1400 K. C. and turn the rotor until maximum output is obtained. Adjust the other two trimmers on the gang condenser for maximum output.

To obtain dial scale calibration tune in an 800 K. C. signal and set the dial pointer at that mark on the dial scale. When calibrated in this manner, the setting will be approximately correct at both ends of the scale.

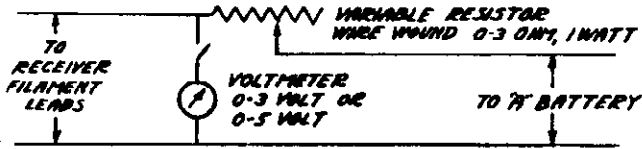


Fig. 4—Using Voltage Regulator with 3 Volt "A" Battery
The use of the cut plate type of condenser eliminates the necessity of a 600 K. C. padder and no adjustment, at this frequency, therefore, is required.

D. C. Resistance of Windings

Following are the D.C. resistances of the various windings in the chassis.

Part No.	Item	Code	D. C. Resistance in Ohms
P-5168	Double Tuned Ant. Coil Pri.....	T1	19.2
	Double Tuned Ant. Coil Sec. (Preselector)	T1	3.2
	Double Tuned Ant. Coil Sec. (1st Det.)	T1	3.2
P-5199	1st I.F. Coil Pri.....	T2	90.0
	1st I.F. Coil Sec.....	T2	116.0
P-50586-D	Audio Input Trans. Pri.....	T3	1010.
	Audio Input Trans. Sec. Cent. Tap to outside end.....	T3	648.
	Audio Input Trans. Sec. Cent. Tap to inside end.....	T3	585.
P-5187	Oscillator Coil, Grid Winding.....	T4	4.1
	Oscillator Coil, Plate Winding.....	T4	10.4
P-5172	Double Filament Reactor Assem.....	L1	.61
	Double Filament Reactor Assem.....	L2	.61
	Single Filament Reactor Assem.....	L3	.61
P-5189	2nd I.F. Reactor Coil.....	L4	52.1
P-2124	6" Magnetic Speaker, Center Tap to outside end.....		272.
	6" Magnetic Speaker, Center Tap to inside end.....		225.
P-2125	8" Magnetic Speaker (same as P-2124)		

VOLTAGES AT SOCKETS

Volume Control at Maximum—Antenna Shorted to Ground
B+ 135 Volts
Voltages to Chassis

Type of Tube	Function	Across Filament	Plate to Cath.	Screen to Cath.	Grid to Cath.	Normal Plate M. A.
32	1st Det. & Osc.	2.0	135	67.5	7.5 ⁽¹⁾ (2)	2.5
34	I. F.	2.0	135	67.5	2.5 ⁽³⁾	2.8
34	2nd Det.	2.0	50	40 ⁽¹⁾	0	1.8
30	1st Audio	2.0	135		9 ⁽⁴⁾	3.0
19	Output	2.0	135		6	1.8
						Total

(1) With 250,000 ohm meter.
(2) Subject to variation due to oscillatory current.
(3) With 25,000 ohm meter.
(4) As read at "C" battery.

Voltages

Check the voltages at the sockets to see if correct values are being delivered to the tubes. The antenna and ground should be disconnected and the antenna and ground leads from the set connected together. The volume control should be turned to the right or maximum position.

The voltage chart gives the voltages with all tubes in, the speaker connected and the set in operating condition. These voltages are typical of the sets but will vary slightly with variations in individual receivers, tubes, test equipment used and battery voltages.

MODEL S-727

Voltage, Alignment
Resistance, Socket
Trimmers, Change

WESTERN AUTO SUPPLY CO.

Condenser Alignment

Correct alignment is extremely important in connection with all wave receivers. The receivers are all properly aligned at the factory with precision instruments and the alignment should not be attempted unless all other possible causes of trouble have been investigated. Turn the antenna lead to the full open position. An oscillator should be used as the proper equipment. A signal generator that will provide a accurately calibrated signal of 456 K. C. and accurately calibrated over the broadcast and short wave bands, 530-1740 K. C. and 5.3-18.3 M. C., is required. An output indicating meter is also necessary. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screw driver for the adjustments. The complete procedure is as follows:

Intermediate Frequency Adjustment

Set the signal generator for 456 K. C. Connect the antenna lead of the signal generator to the grid of the 1st detector through a .05 mfd. condenser. Turn the tuning condenser rotor until the plates are completely out. The condenser rotor of the receiver is now at the maximum position. Reduce the signal so that A. V. C. action is not obtained.

Then adjust the five I. F. trimmer condensers until maximum output is obtained. The adjusting screws for the 1st, 2nd, 3rd, 4th and 5th trimmer condensers are reached from the top of the chassis. The trimmer condensers are held in position by small cover plates which are held in position by screws. Loosen these screws until the cover plates can be swung away. **CAUTION - Use an insulated screwdriver for adjusting trimmers to prevent short-circuiting to ground.** In the 3rd I. F. coil, only the primary has a variable trimmer condenser. This condenser is mounted on the back panel of the chassis as shown in Fig. 2 and the adjustment screw is reached through a hole in the back panel.

Broadcast Band Adjustment

The broadcast short wave switch should be in the broadcast position. Set the signal generator for 1740 K. C. Turn the rotor to the full open position. The antenna lead from the signal generator to the primary connected to the antenna lead of the receiver. Adjust the oscillator broadcast trimmer until maximum output is obtained. This trimmer is on the tuning condenser and its location is shown in Fig. 2. Then set the signal generator for 1500 K. C. Turn the rotor until maximum output is obtained. Loosen the 1st trimmer condenser rotor for the primary at the 1500 K. C. mark on the broadcast band control. Then set the rotor for V. C. action is not obtained. Adjust the oscillator broadcast trimmer until maximum output is obtained. This trimmer is on the tuning condenser and its location is shown in Fig. 2. Then set the signal generator for 600 K. C. and adjust the 600 K. C. trimmer. The adjusting screw is reached through a hole in the front panel of the chassis as shown in Fig. 2. Then turn the rotor slowly back and forth over this setting at the same time adjusting the 600 K. C. trimmer screw until the highest output is obtained.

Short Wave Band Adjustment

CAUTION - After the broadcast band alignment as described above has been made, do not change the adjustment of any of the broadcast band trimmers.

In aligning the short wave band of the receiver, it will be noted that the signal will be heard with the signal generator set at two 15,000 K. C. apart. That is, if the receiver is aligned at 15,000 K. C. and again at 16,500 K. C. and the signal generator is set at 15,912 K. C. This is due to image reception on the fact that a 456 K. C. beat is obtained when the signal is 456 K. C. lower than the receiver oscillator and also when the signal is 456 K. C. higher than the receiver oscillator. Care should

Replacing Drive Cord

Remove chassis from cabinet.
Take off the pilot light assembly by lifting of the two sockets and spring clips.
Detach the large pointer by removing the screw at the center of the dial.
Loosen the dial assembly by taking out the two screws which secure the bottom of this assembly to the chassis.
Then lay the complete dial assembly face downward in front of the chassis. It is not necessary to remove the volume control and tone control collars which hold the indicator cords of these two controls in position.
Turn the drive drum until the opening in this drum is approximately vertical and with the hole at the top as shown in Fig. 4.

Remove the tension spring and the old drive cord. See that the eyelet is in the hole in the arc drum as shown in Fig. 4. Insert one end of the drive cord from the outside through the hole at the center in the drive drum. Tie the end of the cord which has been inserted in the hole to one end of the tension spring.
Wrap the cord in a clockwise direction (facing front of chassis) round the drive drum approximately one-half turn. Then tilt the chassis up on its back panel and bring the cord across the top of the chassis and wrap around the drive shaft. Wrap it two or one-half times around the drive shaft as shown in Fig. 4.
Then bring this cord up from the drive shaft and wrap it around the drive drum approximately one and one fifth

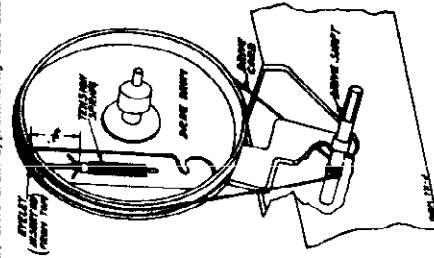


Fig. 4—Drive Cord Replacement

turns in a clockwise direction until it is up to the hole in this drum as illustrated.
Insert the free end of the cord through the hole in the eyelet and tie it to the end of the tension spring. The end step-up transformer will be approximately 1/2" from the front of the chassis as shown in Fig. 4. Cut off volume.
Then secure the other end of the tension spring over the spur on the drive drum.
Replace the dial assembly and pointer.
Replace the pilot light assembly after which the chassis ground was connected to the B+ side of the 1st I. F. coil primary.

Change in Early Models

In the early models of this receiver the side of the trimmer condenser C27 which is shown in Fig. 1 as connected to chassis ground was connected to the B+ side of the 1st I. F. coil primary.

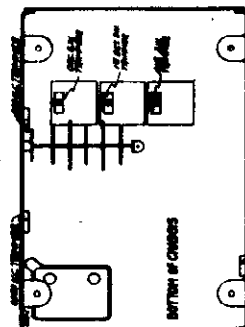
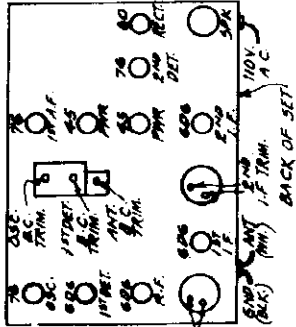


Fig. 3—Tube Arrangement & Location of Trimmers

Voltages of Sockets
LINE VOLTAGE — 115
ANTENNA SHORTED TO GROUND

Tube	Function	Across Plate to Heater	Screen Cath. to Cath.	Control Cath. to Ground	North. Plate to M. A.	
6D6	R. F.	6.3	95	95	2.8	7.0
6D6	1st Det.	6.3	88	95	9.2	2.9
76	Osc.	6.3	110	95	—	5.0
6D6	1st I. F.	6.3	95	95	—	7.0
6D6	2nd I. F.	6.3	300	95	3.3	6.0
76	2nd Det.	6.3	—	—	—	—
76	1st Audio	6.3	160	—	9.0	4.0
45	Rectifier	2.5	243	—	48.0	30.0
80	Rectifier	5.0	800 V. A. C. pl. to pl.	—	58.0	58.0

Phono Connections

Phonograph connections can be made as shown in Fig. 5. A single pole double throw switch and double pin jack are a square inch in size and are mounted on the back panel of the chassis close to the 2nd detector. The connections are made by opening the diode circuit at this point through switch and pin jacks as indicated. A high impedance pick-up should be used. If a low impedance pick-up is used a step-up transformer will be required for sufficient volume. The volume control of the set will regulate the phono volume.

be taken to see that the receiver is tracked with the signal generator adjusted to the lower of the two frequencies at which a signal is heard, in order that the oscillator in the receiver will be 456 K. C. higher in frequency than the signal. Turn the broadcast short wave switch to the short wave position. Turn the rotor to the full open position. An oscillator should be used as the proper equipment. A signal generator that will provide a accurately calibrated signal of 456 K. C. and accurately calibrated over the broadcast and short wave bands, 530-1740 K. C. and 5.3-18.3 M. C., is required. An output indicating meter is also necessary. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screw driver for the adjustments. The complete procedure is as follows:

Then set the signal generator for 600 K. C. and adjust the 600 K. C. trimmer. The adjusting screw is reached through a hole in the front panel of the chassis as shown in Fig. 2. Then turn the rotor slowly back and forth over this setting at the same time adjusting the 600 K. C. trimmer screw until the highest output is obtained.



Fig. 2—Arrangement of Controls

D. C. Resistance of Windings

Following are the D.C. resistances of the various windings in the chassis.

Part No.	Description	Winding	D.C. Resistance (ohms)
P-316	S. W. and B. C. Antenna R. F. Transformer	Coil	2.0
P-316	S. W. and B. C. Antenna R. F. Transformer	Primary	2.0
P-316	S. W. and B. C. Antenna R. F. Transformer	Secondary	2.0
P-316	S. W. and B. C. Antenna R. F. Transformer	Small	2.0
P-317	S. W. and B. C. Antenna R. F. Transformer	Coil	2.7
P-317	S. W. and B. C. Antenna R. F. Transformer	Primary	2.7
P-317	S. W. and B. C. Antenna R. F. Transformer	Secondary	2.7
P-317	S. W. and B. C. Antenna R. F. Transformer	Small	2.7
P-318	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-318	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-318	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-318	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
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P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
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P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
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P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
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P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
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P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
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P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
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P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
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P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
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P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Secondary	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Small	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Coil	3.0
P-319	S. W. and B. C. Antenna R. F. Transformer	Primary	3.0
P-319	S		

WESTINGHOUSE ELEC. SUPPLY CO.

MODELS WR-103
WR-103-A
Socket, Trimmers
Chassis

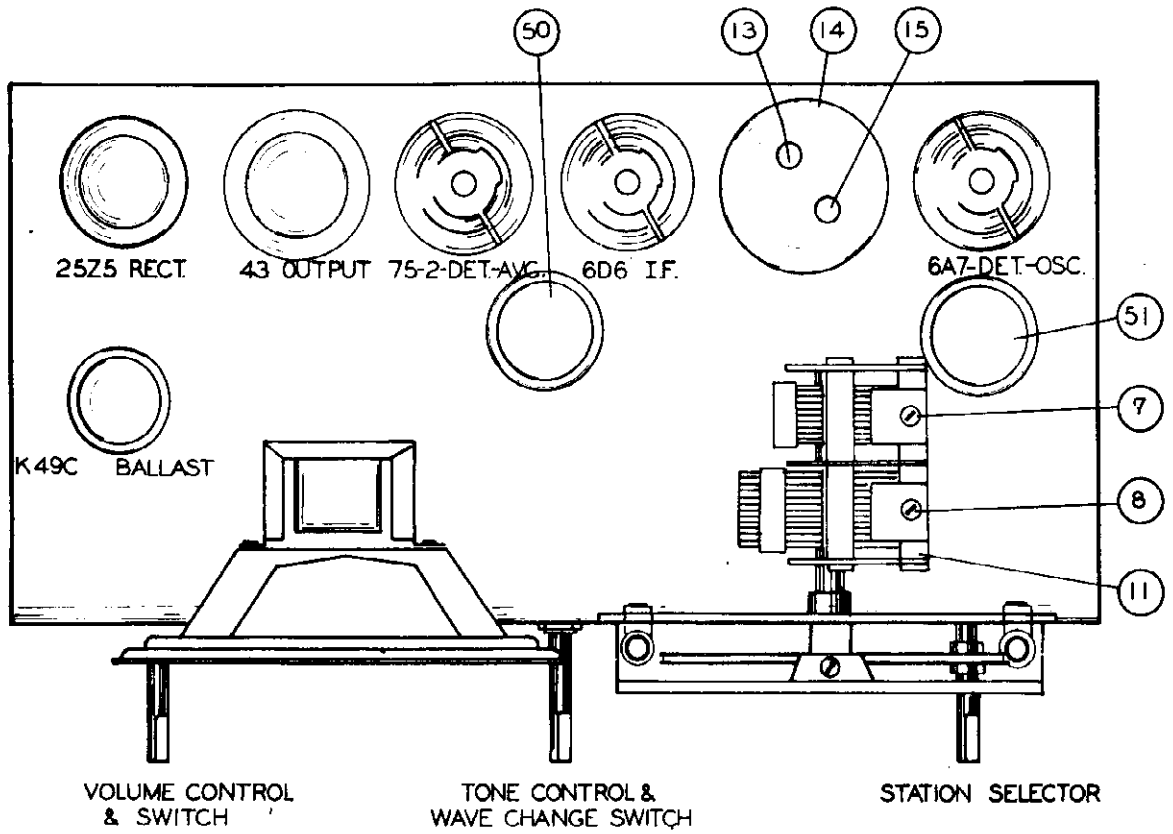


Figure No. 1

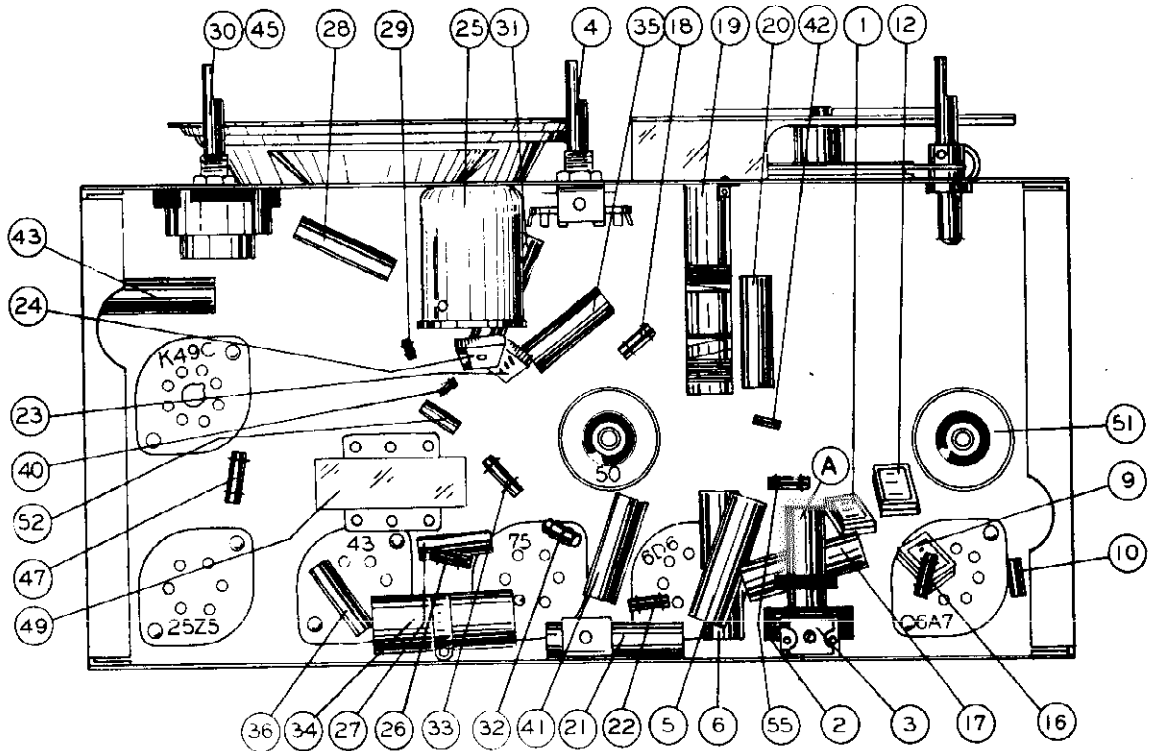


Figure No. 2

MODELS WR-103
 WR-103-A WESTINGHOUSE ELEC. SUPPLY CO.
 Alignment, Parts

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes 1 #6A7, 1 #6D6, 1 #75, 1 #45, 1 #25Z5, 1 #48C - Total 6
 Power Supply 105 to 125 volt, D.C., or 105 to 125 volt, 50 to 60 cycle A.C.
 Power Consumption 47 Watts
 Tuning Ranges 540 to 1850 and 1500 to 3500 KC.
 Maximum Output75 watt
 Maximum Undistorted Output75 watt
 Line-Up Frequencies I.F. 465 KC., 1400 KC.

LINE-UP CAPACITOR ADJUSTMENTS
 ADJUSTMENT OF I.F. (465 KC.)

- Set volume control on full, the wave-change switch on the Broadcast (treble position) and the dial indicator at approximately 600 KC.
- Connect output meter across voice coil of speaker.
- Set test oscillator to 465 KC., and adjust its output to produce a measurable reading on output meter when test signal is applied to the grid of the 6D6 I.P. tube through a .5 mfd. blocking condenser.
- Adjust #24 (see Fig. #2) to maximum output, reducing output of test oscillator as required.
- Apply test signal to grid of 6A7 first detector-oscillator tube and adjust #15 and #15 (Fig. #1) to maximum output.
- With test signal still on the grid of 6A7 tube, repeat the above adjustments for greatest sensitivity.
- Apply strong 465 KC. signal to the antenna and adjust trap coil trimmer #5 to a minimum output.

ADJUSTMENT OF BROADCAST BAND

- Apply test signal on grid of 6A7 tube and set the test oscillator to 1400 KC.
- Turn the gang condenser to its maximum position. Adjust dial indicator until either end is directly over the long horizontal lines on the dial scale. Then set dial indicator to 1400 KC.
- Adjust trimmer #7 to maximum output.
- Apply test signal to antenna of set through a .0002 mfd. condenser and adjust trimmer #8 to maximum output.

ADJUSTMENT OF POLICE BAND

When adjustments as outlined under the Broadcast Band are completed, the Police Band requires no adjustment unless the coil has been changed. In this event, see 1700 KC. trimmer test signal and readjusted. The Police Band test signal is indicated by #15 in Fig. #2. Adjust the position of this winding by sliding it back and forth on the coil until maximum output is indicated on the output meter. This winding should then be secured in place by applying a thin coat of coil cement.

Part #	Description of Parts	List Price
35	CW 4-005	.15
36	WR 9580	1.25
37	TR 9593	4.50
38	SK 9544	.15
39	RE 9572	.15
40	CE 9546	.15
41	RE 9572	.15
42	RE 9572	.15
43	CE 9546	.15
44	LP 9513	.20
45	LP 9513	.20
46	Line cable	.60
47	25 ohm, 1/2 W. resistor	.20
48	Field coil	.95
49	Choke coil assembly	.95
50	20 mfd., 150 V. electrolytic condenser	.65
51	20 mfd., 150 V. electrolytic condenser	.65
52	20 mfd., 150 V. electrolytic condenser	.65
53	20 mfd., 150 V. electrolytic condenser	.65
54	75,000 ohm, 1/4 W. resistor	.15

MAIN ASSEMBLIES

Part #	Description of Parts	List Price
CH 95148	Chassis assembly	\$ 4.50
SK 9544	Speaker	.15
KA 9589	Cabinet	.05
CB 95128	Antenna cable	.10
PR 97180	Dial Drive cable - 18'	.05 Per Yard
CV 9560	Tube shield - plain top	.05
FP 105947	Tube shield - slotted top	.05
SA 105461	Tube shield ring	.20
SA 104617	Tube socket - 7 prong	.20
SO 9556	Tube socket - 5 prong	.20
BE 9556	Tube shield base	.05

CABLES

Part #	Description of Parts	List Price
CV 9560	Tube shield - plain top	.05
FP 105947	Tube shield - slotted top	.05
SA 105461	Tube shield ring	.20
SA 104617	Tube socket - 7 prong	.20
SO 9556	Tube socket - 5 prong	.20
BE 9556	Tube shield base	.05

TUBE SOCKETS & TUBE SHIELDS

Part #	Description of Parts	List Price
CV 9560	Tube shield - plain top	.05
FP 105947	Tube shield - slotted top	.05
SA 105461	Tube shield ring	.20
SA 104617	Tube socket - 7 prong	.20
SO 9556	Tube socket - 5 prong	.20
BE 9556	Tube shield base	.05

SCREWS

Part #	Description of Parts	List Price
SC 953	Mounting screw and felt foot	.05
SC 97061	Set screw - dial pulley	.05
SC 102441	Set screw - dial drive pulley	.05
SC 952	Dial indicator screw	.05
SC 958	Escutcheon plate screw	.05

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

The Model WR 103-4 is the same as the Model WR 103, except for the following items:

Part #	Description of Parts	List Price
CH 95180	Chassis assembly	\$ 4.50
SK 9549	Speaker	.15
DA #	Description of Parts	List Price
36	CW 2-10	.15
37	TR 9593	1.25
38	SK 9549	4.50
47	CE 9553	.60
50	RE 9572	.10
52	RE 9572	.10
53	CE 9546	.10
54	CE 9546	.10
55	RE 9572	.10
56	CE 9546	.10
57	RE 95119	.10

Power Tube 25B6G
 Power Consumption 48 Watts
 Maximum Output 1.5 Watts
 Maximum Undistorted Output 1 Watt

ADJUSTMENT OF POLICE BAND

- Set volume control on full, the wave-change switch on the Broadcast (treble position) and the dial indicator at approximately 600 KC.
- Connect output meter across voice coil of speaker.
- Set test oscillator to 465 KC., and adjust its output to produce a measurable reading on output meter when test signal is applied to the grid of the 6D6 I.P. tube through a .5 mfd. blocking condenser.
- Adjust #24 (see Fig. #2) to maximum output, reducing output of test oscillator as required.
- Apply test signal to grid of 6A7 first detector-oscillator tube and adjust #15 and #15 (Fig. #1) to maximum output.
- With test signal still on the grid of 6A7 tube, repeat the above adjustments for greatest sensitivity.
- Apply strong 465 KC. signal to the antenna and adjust trap coil trimmer #5 to a minimum output.

ADJUSTMENT OF BROADCAST BAND

- Apply test signal on grid of 6A7 tube and set the test oscillator to 1400 KC.
- Turn the gang condenser to its maximum position. Adjust dial indicator until either end is directly over the long horizontal lines on the dial scale. Then set dial indicator to 1400 KC.
- Adjust trimmer #7 to maximum output.
- Apply test signal to antenna of set through a .0002 mfd. condenser and adjust trimmer #8 to maximum output.

ADJUSTMENT OF POLICE BAND

When adjustments as outlined under the Broadcast Band are completed, the Police Band requires no adjustment unless the coil has been changed. In this event, see 1700 KC. trimmer test signal and readjusted. The Police Band test signal is indicated by #15 in Fig. #2. Adjust the position of this winding by sliding it back and forth on the coil until maximum output is indicated on the output meter. This winding should then be secured in place by applying a thin coat of coil cement.

ADJUSTMENT OF POLICE BAND

- Set volume control on full, the wave-change switch on the Broadcast (treble position) and the dial indicator at approximately 600 KC.
- Connect output meter across voice coil of speaker.
- Set test oscillator to 465 KC., and adjust its output to produce a measurable reading on output meter when test signal is applied to the grid of the 6D6 I.P. tube through a .5 mfd. blocking condenser.
- Adjust #24 (see Fig. #2) to maximum output, reducing output of test oscillator as required.
- Apply test signal to grid of 6A7 first detector-oscillator tube and adjust #15 and #15 (Fig. #1) to maximum output.
- With test signal still on the grid of 6A7 tube, repeat the above adjustments for greatest sensitivity.
- Apply strong 465 KC. signal to the antenna and adjust trap coil trimmer #5 to a minimum output.

ADJUSTMENT OF BROADCAST BAND

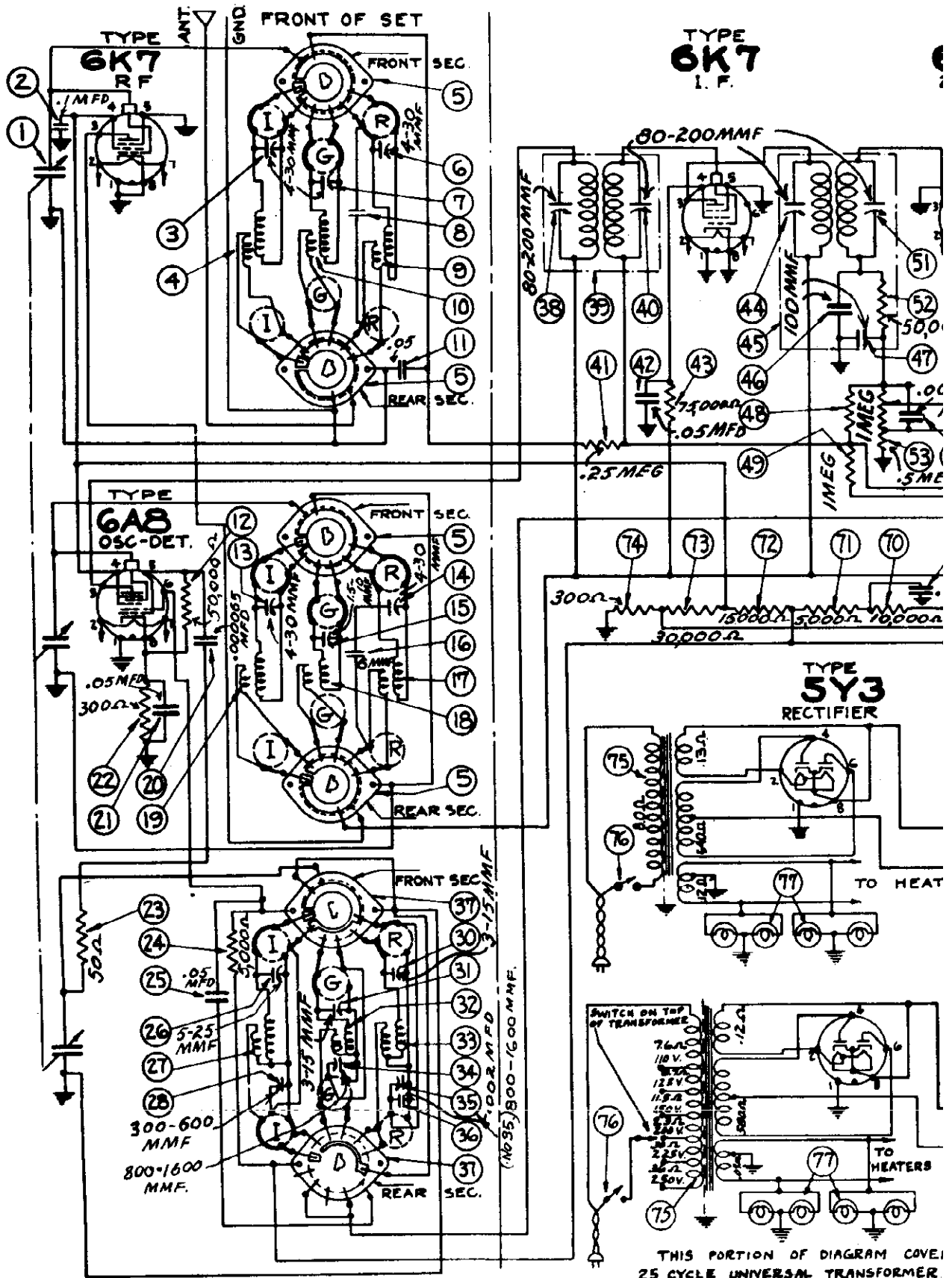
- Apply test signal on grid of 6A7 tube and set the test oscillator to 1400 KC.
- Turn the gang condenser to its maximum position. Adjust dial indicator until either end is directly over the long horizontal lines on the dial scale. Then set dial indicator to 1400 KC.
- Adjust trimmer #7 to maximum output.
- Apply test signal to antenna of set through a .0002 mfd. condenser and adjust trimmer #8 to maximum output.

ADJUSTMENT OF POLICE BAND

When adjustments as outlined under the Broadcast Band are completed, the Police Band requires no adjustment unless the coil has been changed. In this event, see 1700 KC. trimmer test signal and readjusted. The Police Band test signal is indicated by #15 in Fig. #2. Adjust the position of this winding by sliding it back and forth on the coil until maximum output is indicated on the output meter. This winding should then be secured in place by applying a thin coat of coil cement.

DA #	Part #	Description of Parts	List Price
1	CM 9519	.0005 mfd. mica condenser	.20
2	RC 95165	Antenna coil assembly	1.50
3	SO-50	30-50 mmf. trimmer condenser - part of RC 95165	
4	SW 9562	Wave-change switch	.75
5	CW 2-10	.1 mfd., 200 V. condenser	.15
6	CW 6-10	.1 mfd., 600 V. condenser	.20
7	TR 9572	Trimmer condenser - part of CW 9547	
8	SA 106417	Trimmer condenser - part of CW 9547	.20
9	RE 9536	.0001 mfd. mica condenser	.15
10	RE 9581	50,000 ohm, 1/4 W. resistor	.15
11	CC 9547	Variable condenser - 2 gang	2.50
12	CM 9522	.00048 mfd. mica condenser	.20
13	IC 9586	35-130 mmf. trimmer condenser - part of IC 9586	2.00
14	RE 9536	First I.P. coil - 465 KC.	.10
15	RE 9536	35-130 mmf. trimmer condenser - part of IC 9586	.10
16	RE 9536	20,000 ohm, 1/4 W. resistor	.15
17	SA 105245	500 mfd., 250 V. condenser	.15
18	RC 95166	500 mfd., 250 V. condenser	.15
19	RC 95166	500 mfd., 250 V. condenser	.70
20	CW 2-10	.1 mfd., 200 V. condenser	.15
21	CW 2-10	.1 mfd., 200 V. condenser	.15
22	RE 9570	180 ohm, 1/8 W. resistor	.10
23	CM 9519	.0005 mfd. mica condenser	.20
24	IC 9585	30-60 mmf. trimmer condenser - part of IC 9585	1.60
25	IC 9585	Second I.F. coil - 465 KC.	.15
26	SA 105279	.25 meg., 1/4 W. resistor	.15
27	CW 4-005	.005 mfd., 400 V. condenser	.15
28	CW 4-005	.005 mfd., 400 V. condenser	.15
29	RE 9572	500,000 ohm, 1/4 W. resistor	1.25
30	VR 957	.5 meg. volume control	1.25
31	CW 2-10	.1 mfd., 200 V. condenser	.15
32	RE 9572	.5 meg., 1/4 W. resistor	.15
33	RE 9572	.1 mfd., 100 V. resistor	.40
34	CV 9525	.1 mfd., 100 V. resistor	.15
35	CW 2-05	.05 mfd., 200 V. condenser	.15

WESTINGHOUSE EI

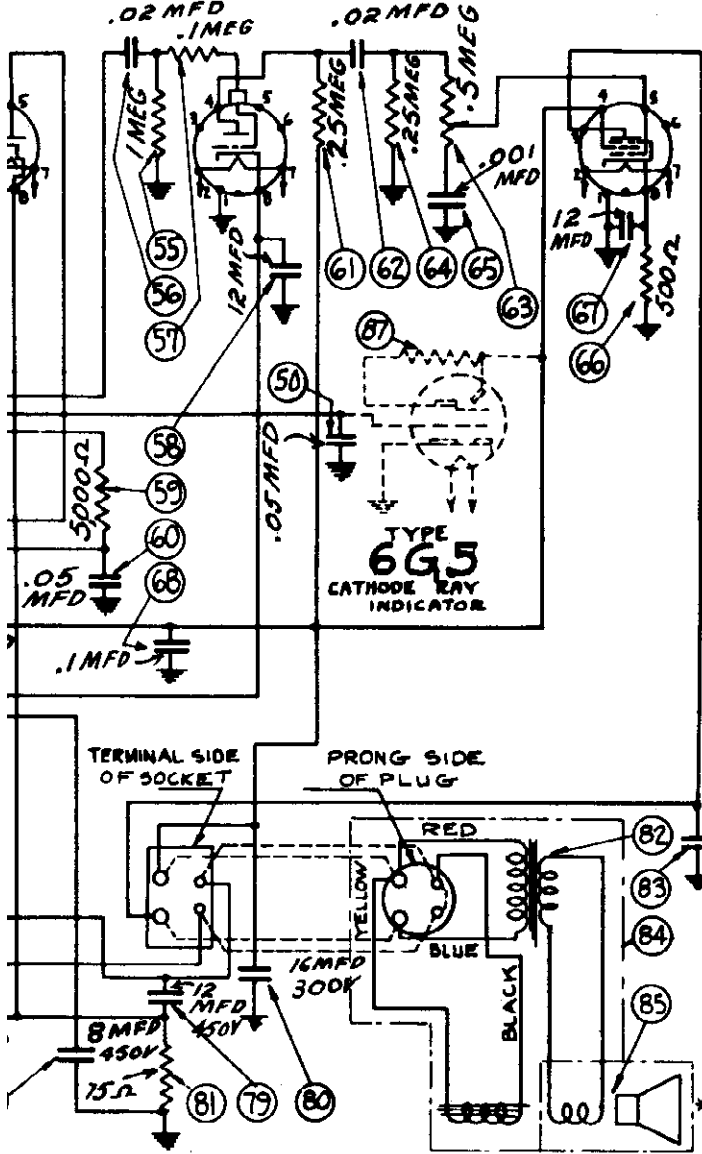


THIS PORTION OF DIAGRAM COVERS 25 CYCLE UNIVERSAL TRANSFORMER

... SUPPLY CO.

MODELS WR-212, WR-312
Schematic, Voltage
Resistance

TYPE 16 DET.
TYPE 6F5 1st A.F.
TYPE 6F6 POWER PENTODE



DC RESISTANCE			
MEASURED WITH WAVE-CHANGE SWITCH IN CORRESPONDING BAND POSITION			
COIL	WIND	PRIM	SEC.
I-ANT	4	10.50	3.00
I-EF	.9	0.8	10.7
I-OSC	27	1.4	2.3
Q-ANT	10	2.1	1.0
Q-EF	10	1.8	1.0
Q-OSC	32	0.8	0.8
R-ANT	9	0.7	0.09
R-EF	17	2.0	0.09
R-OSC	33	0.5	0.09
1E IF	39	0.4	0.6
2E IF	45	0.6	0.6
OUTPUT TRANS	82	150	0.5
SPKR FIELD		1500	
VOICE COIL	85	3	

INT. FREQ. 465 KC.

SOCKET VOLTAGES—LINE=115 VOLTS TAKEN FROM BOTTOM OF SOCKETS								
MEASUREMENTS MADE WITH A 1000 OHMS PER VOLT VOLTMETER & WITH WAVE CHANGE SWITCH IN BROADCAST BAND POSITION								
TUBE	STAGE	PIV	PIN NOS	PLATE	PIN NOS	SCREEN	PIN NOS	BIAS - PIN NOS
6K7	R.F.	6.35	2-7	263	3-1	94	4-1	SEE NOTE
6A8	DET-OSC	6.35	2-7	153 167	3-1 2-1	94	4-1	2.7 8-1
6K7	I.F.	6.35	2-7	263	3-1	103	4-1	SEE NOTE
6H6	2 nd DET. AVC	6.35	2-7					-3.5 8-1
6F5	AUDIO	6.35	2-7	111	4-1			1.1 8-1
6F6	OUTPUT	6.35	2-7	247	3-1	263	4-1	17.5 8-1
5Y3	RECTIFIER	5.15	2-8	300	8-1			
6G5	INDICATOR	6.35	1-6	243	2-5			SEE NOTE

WESTINGHOUSE ELEC. SUPPLY CO. Socket, Trimmers
Chassis

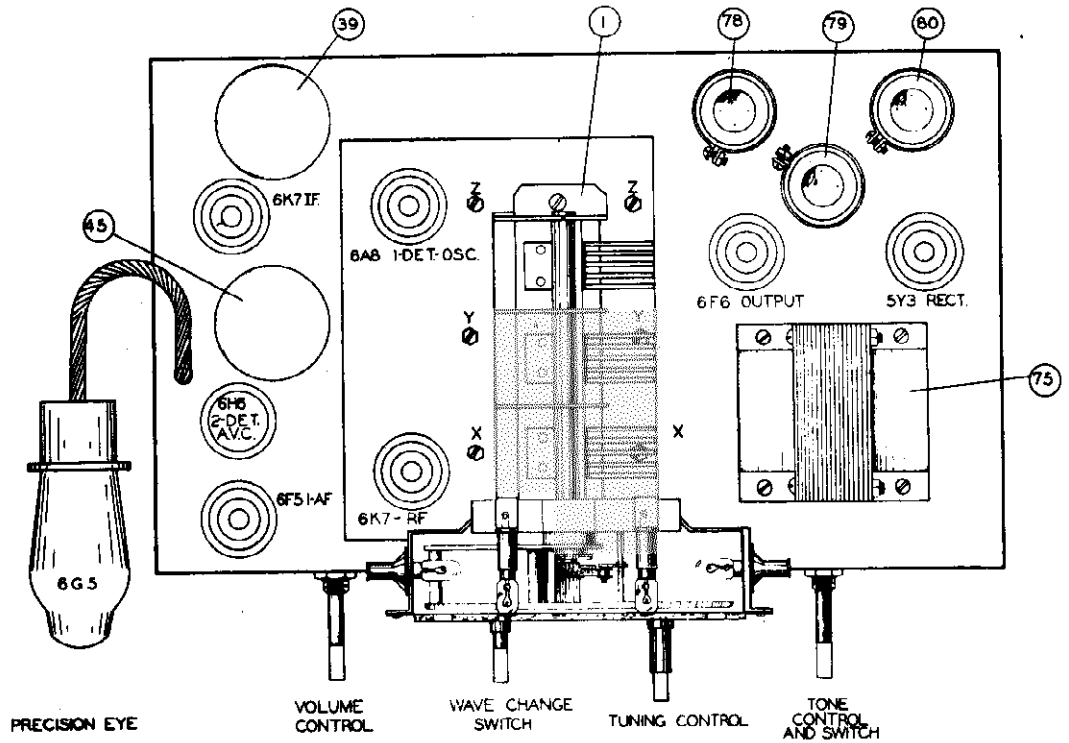


Figure No. 1

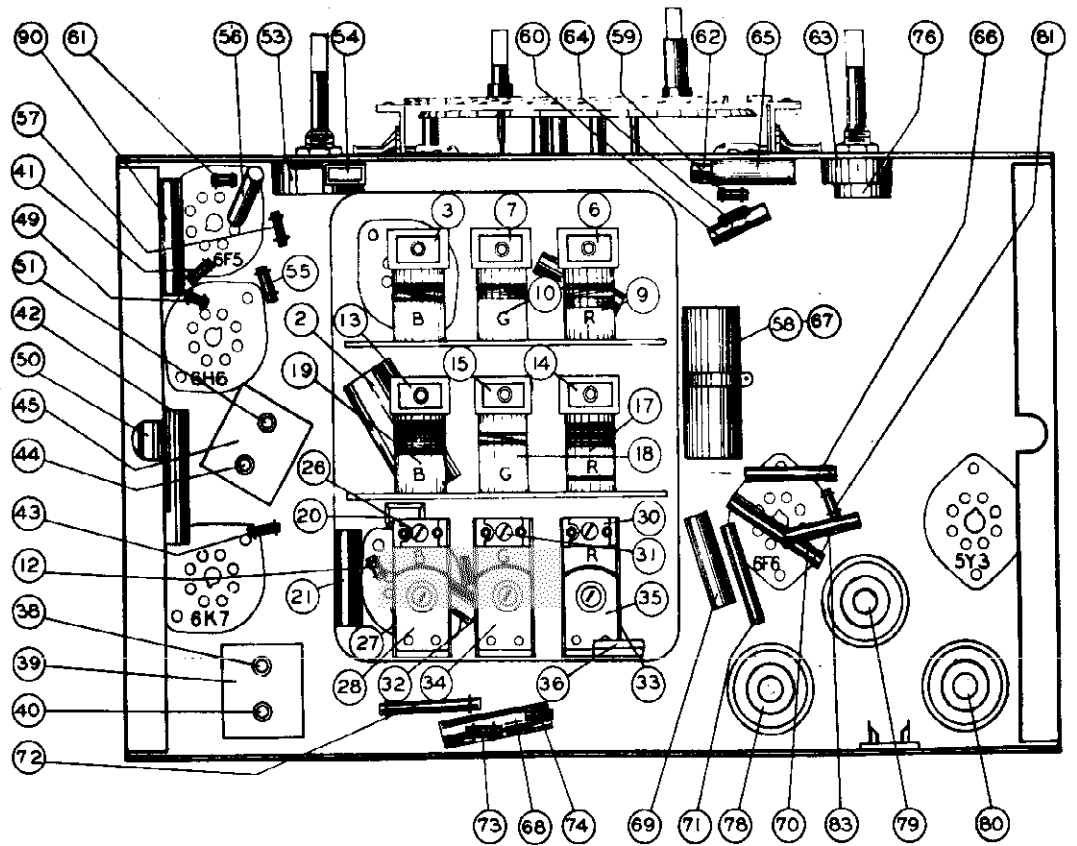


Figure No. 2

MODELS WR-212, WR-312
Alignment, Parts

WESTINGHOUSE ELEC. SUPPLY CO.

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes ... 2 6SK7, 1 6AB, 1 6BE, 1 6G5, 1 6G6, 1 6G5, 1 6Y3 - Total B Power Supply
 Power Consumption 105 to 125 volts, 50 to 60 cycles A.C. 80 Watts
 Maximum Output 3.5 Watts
 Maximum Undistorted Output 2.6 Watts
 Tuning Ranges (White Band - 525 to 1800 KC. Green Band - 1750 to 6000 KC. Red Band - 5800 to 18500 KC. Line-Up Frequencies .. I.P. 465 KC., 1600 KC., 570 KC., 5600 KC., 1900 KC., 17000 KC., 46000 KC.)

LINE-UP CAPACITOR ADJUSTMENTS

ADJUSTMENT OF I.P. (465 KC.)
 1. Set volume control on fully turn tone control to the bass position, the wave change switch on broadcast and the dial indicator at approximately 600 KC.
 2. Connect output meter across voice coil of speaker.
 3. Set test oscillator to 465 KC. and adjust its output to produce a measurable reading on output meter when test signal is applied to the grid of the 6E7 I.P. tube through a .5 mfd. blocking condenser.
 4. Adjust trimmers #44 and #51 to maximum output, reducing output of test oscillator as required.
 5. Apply coil to grid of 6AB detector coil and adjust #38 and #40 to maximum output.

ADJUSTMENT OF BROADCAST BAND

1. Set wave change switch to the White or Broadcast Band position.
 2. Set test oscillator and dial indicator to 1600 KC.
 3. Apply test signal to antenna terminal of chassis through a .0002 mfd. series condenser and adjust #26, #15 and #5 to maximum output.
 4. Set test oscillator and dial indicator to 570 KC. and adjust #28 to maximum output, at the same time rocking the variable tuning condenser.
 5. Return to 1600 KC. setting with both test oscillator and dial indicator and readjust #28, #15 and #5 for accuracy.

ADJUSTMENT OF GREEN BAND

NOTE: In adjusting the two short-wave bands (Green and Red) a .0002 mfd. condenser

ser and a 400 ohm resistor connected in series should be inserted in the high side of the test oscillator leads. This condenser-resistor combination is the approximate equivalent of a short-wave antenna.
 1. Set wave change switch to the Green Band position.
 2. Set test oscillator and dial indicator to 5500 KC. and adjust #31, #15 and #7 to maximum output.
 3. Set test oscillator and dial indicator to 1900 KC. and adjust #34 to maximum output, at the same time rocking the variable tuning condenser.
 4. Return to 5500 KC. setting and make re-adjustment of #31, #15 and #7.

ADJUSTMENT OF RED BAND

1. Set wave change switch to the Red Band position.
 2. Set test oscillator and dial indicator to 17000 KC. and adjust #30, #14 and #6 to maximum output.
 3. Set test oscillator and dial indicator to 6000 KC. and adjust #35 to maximum output, at the same time rocking the variable tuning condenser.
 4. Return to 17000 KC. setting and make re-adjustment of #30, #14 and #6.

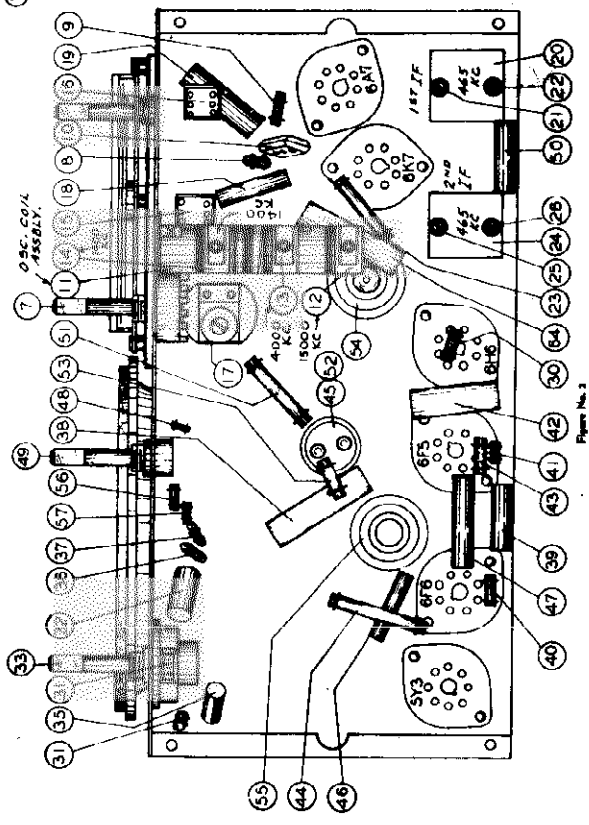
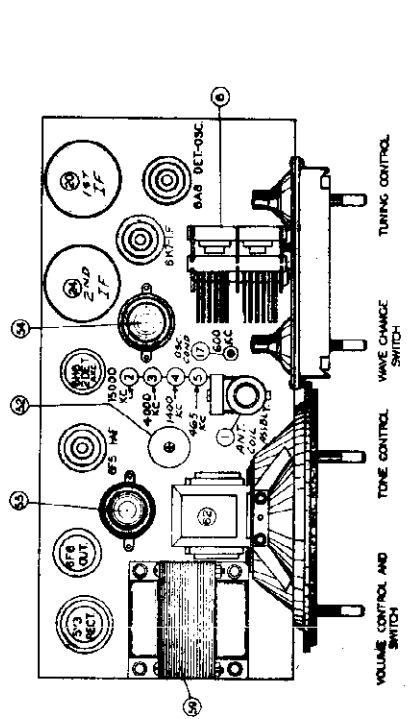
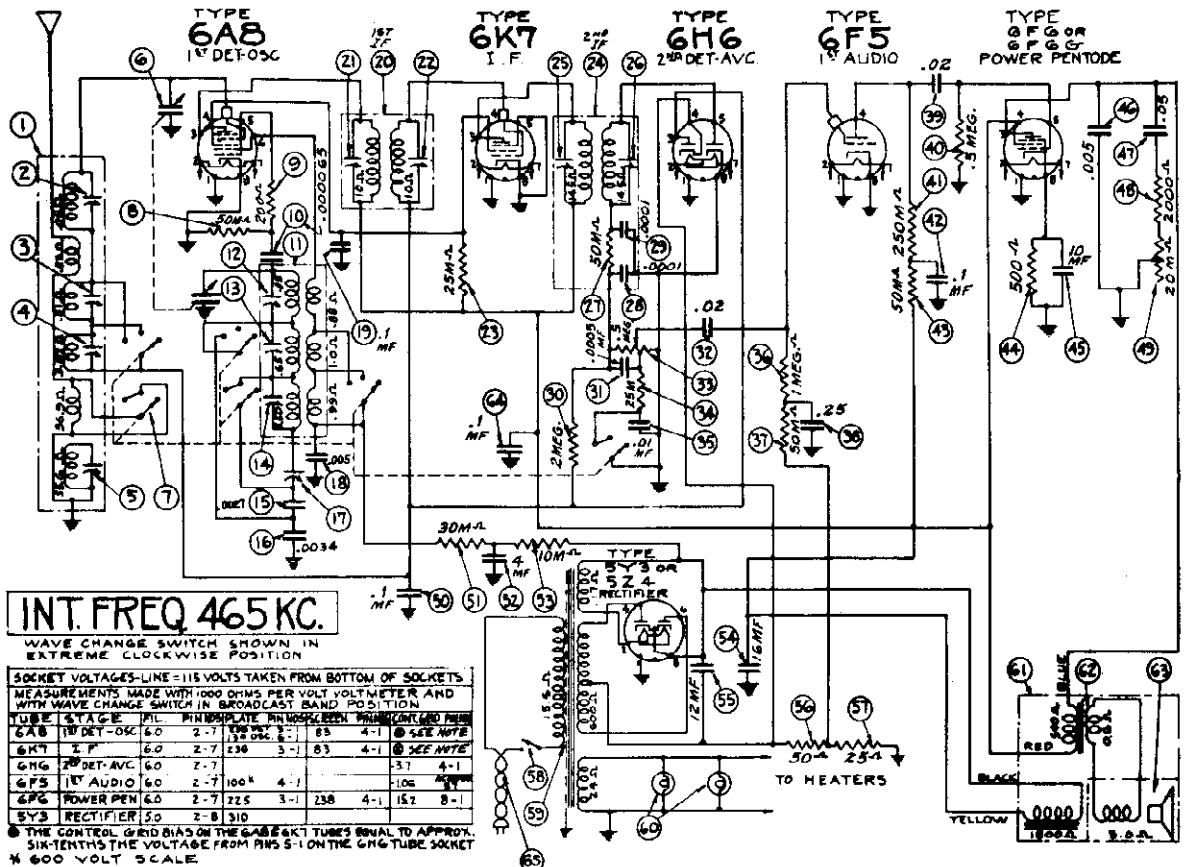
IMPORTANT: While testing or making repairs on this receiver, the chassis should not be turned upside down or on its side for any long period of time while the set is turned on as the chemicals in the electrolytic filter condenser will come out through the air vents making the condenser appear to be defective. If left in this position too long the condenser may be injured.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Dia. #	Part #	Description of Parts	List Price
1	CG 9560	Variable condenser	4.50
2	CG 2-50	.5 mfd., 200 V. condenser	.15
3	CG 9564	4-50 mfd., trimmer condenser	.25
4	RC 95209	Antenna coil (broadcast)	1.00
5	3W 9565	Switch and bracket assembly - Antenna & R.F. sections	1.40
6	CG 9554	4-50 mfd., trimmer condenser	.15
7	CG 9554	4-50 mfd., trimmer condenser	.15
8	RC 95206	Twisted wire - part of RC 95206	.95
9	RC 95212	Antenna coil - green band	.80
10	CG 9513	.05 mfd., 200 V. condenser	.25
11	RE 9563	50,000 ohm, 1/4 W. resistor	.10
12	CG 9564	4-50 mfd., trimmer condenser	.15
13	CG 9554	4-50 mfd., trimmer condenser	.15
14	CG 9554	4-50 mfd., trimmer condenser	.15
15	CG 9555	1.5-10 mfd., trimmer condenser	.15
16	CG 9512	6 mfd., mica condenser	.15
17	RC 95207	R.F. coil assembly - red	1.25

Dia. #	Part #	Description of Parts	List Price
18	RC 95214	R.F. coil assembly - green	1.00
19	RC 95210	R.F. coil assembly (broadcast)	1.00
20	CG 9511	.000665 mfd. mica condenser	.15
21	CG 2-05	.05 mfd., 200 V. condenser	.15
22	RE 9559	300 ohm, 1/4 W. resistor	.10
23	RE 9557	50 ohm, 1/4 W. resistor	.10
24	CG 9558	5,000 ohm, 1 W. resistor (1/2 W. size)	.20
25	CG 9513	.05 mfd., 200 V. condenser	.25
26	RC 95211	5-25 mfd., trimmer condenser - part of CG 9540	.60
27	RC 95211	Oscillator coil (broadcast)	1.75
28	RC 95211	300-600 mfd. oscillator series cond. - part of CG 9540	.60
29	RC 95211	5-15 mfd. trimmer condenser - part of CG 9580	.75
30	RC 95211	3-15 mfd. trimmer condenser - part of CG 9580	1.75
31	RC 95213	Oscillator coil - green	2.25
32	RC 95208	Oscillator coil - red	2.25
33	CG 9559	800-1600 mfd. oscillator series cond. - part of CG 9580	.75
34	CG 9559	800-1600 mfd. oscillator series cond. - part of CG 9580	.75
35	CG 9554	Switch and bracket assembly - oscillator section	.45
36	CG 9554	30-200 mfd. trimmer condenser - part of IC 9576	1.50
37	IC 9576	First I.P. coil assembly - 465 KC.	1.50
38	IC 9576	30-200 mfd. trimmer condenser - part of IC 9576	.10
39	RE 9573	.25 mfd., 200 V. condenser	.20
40	RE 9573	.25 mfd., 200 V. condenser	.20
41	SA 105877	75,000 ohm, 1/4 W. resistor	.15
42	SA 105877	90-200 mfd. trimmer condenser - part of IC 9577	1.85
43	SA 105877	Second I.P. coil assembly - 465 KC.	1.85
44	IC 9577	100 mfd. mica condenser - part of IC 9577	.15
45	IC 9577	100 mfd. mica condenser - part of IC 9577	.15
46	SA 105881	1 meg., 1/4 W. resistor	.15
47	SA 105881	1 meg., 1/4 W. resistor	.15
48	SA 105881	.05 mfd., 200 V. condenser	.15
49	SA 105881	50,000 ohm, 1/4 W. resistor - part of IC 9577	.85
50	SA 105881	50,000 ohm, 1/4 W. resistor - part of IC 9577	.20
51	SA 105881	Volume control - .5 meg.	.15
52	VA 9536	.0005 mfd. mica condenser	.15
53	SA 105881	1 meg., 1/4 W. resistor	.15
54	SA 105881	.02 mfd., 200 V. condenser	.15
55	RE 9554	12 mfd., 25 V. condenser - part of CG 9536	.90
56	SA 105849	5,000 ohm, 1/4 W. resistor	.15
57	CG 2-05	.05 mfd., 200 V. condenser	.15
58	RE 9573	.25 mfd., 200 V. condenser	.15
59	RE 9573	.25 mfd., 200 V. condenser	.15
60	CG 2-05	.05 mfd., 200 V. condenser	.15
61	CG 2-05	.05 mfd., 200 V. condenser	.15
62	CG 2-05	.05 mfd., 200 V. condenser	.15
63	VA 9536	Volume control - .5 meg.	1.10
64	RE 9585	.25 mfd., 200 V. condenser	.15
65	CG 2-001	.001 mfd., 200 V. condenser	.15
66	SA 107891	500 ohm, 1 W. resistor	.20
67	CG 4-10	12 mfd., 25 V. condenser - part of CG 9586	.90
68	CG 4-10	1 mfd., 400 V. condenser	.15
69	CG 4-10	1 mfd., 400 V. condenser	.15
70	SA 103835	10,000 ohm, 2 W. resistor	.25
71	SA 107972	5,000 ohm, 1 W. resistor	.20
72	SA 101404	15,000 ohm, 1 W. resistor	.25
73	SA 103866	50,000 ohm, 1/2 W. resistor	.15
74	SA 103866	50,000 ohm, 1/2 W. resistor	.15
75	IR 9557	Power transformer - 105-125 V., 50-60 cycle	4.00
76	IR 9557	Power transformer - 105-125 V., 50-60 cycle	4.00
77	IP 9515	Diaphragm 3.0" V. - part of WR 9512	.90
78	CG 9526	8 mfd., 450 V. electrolytic condenser	.80
79	CG 9536	12 mfd., 450 V. electrolytic condenser	.80
80	CG 9536	16 mfd., 300 V. electrolytic condenser	.75
81	RE 95101	57 ohm, 1/4 W. resistor	1.25
82	TR 9559	Output transformer	7.50
83	CG 4-005	.005 mfd., 400 V. condenser	1.15
84	SK 9511	Speaker	1.15
85	SA 107282	Diaphragm	.80
86	CG 9512	1 meg., 1/4 W. resistor - part of CG 9598	.70
87	CG 9512	Line cable assembly	.70
88	CG 9598	Precision eye cable assembly	.70
89	CG 9598	.05 mfd., 200 V. condenser	.15
90	CG 2-05	.05 mfd., 200 V. condenser	.15

WESTINGHOUSE ELEC. SUPPLY CO. MODEL WR-211 Schematic, Socket Trimmers, Chassis Alignment, Voltage



MODEL WR-315
 Socket, Trimmers
 Chassis

WESTINGHOUSE ELEC. SUPPLY CO.

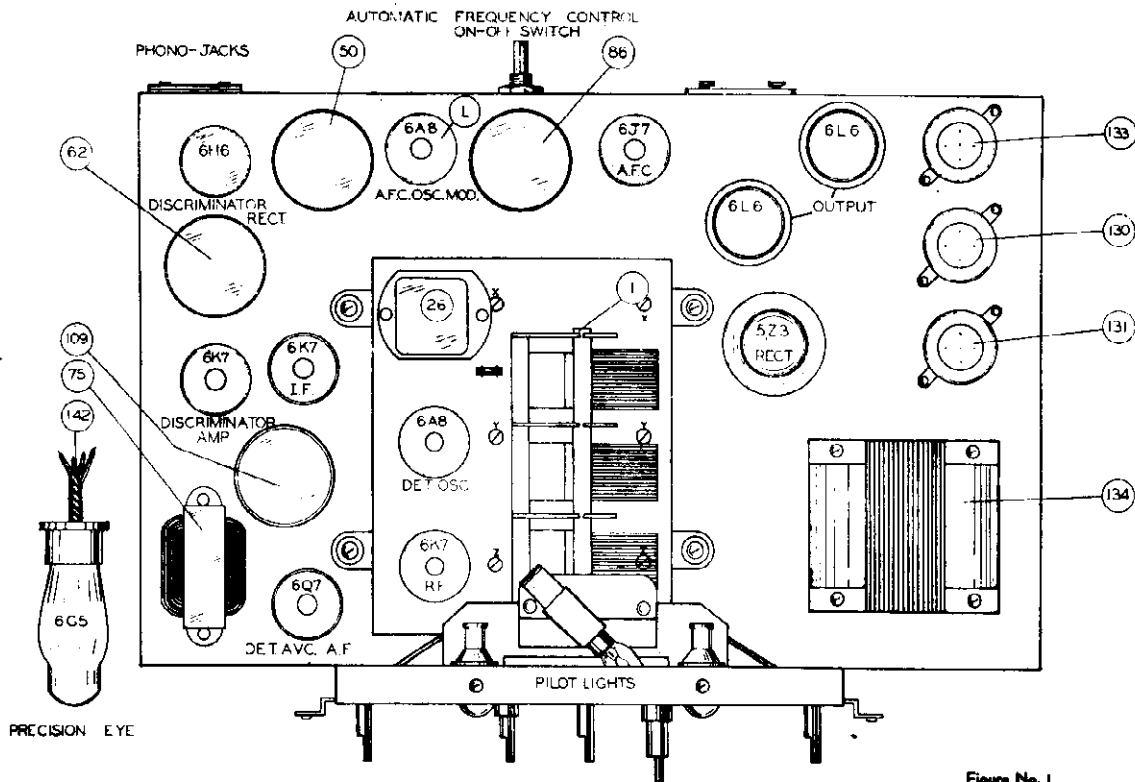


Figure No. 1

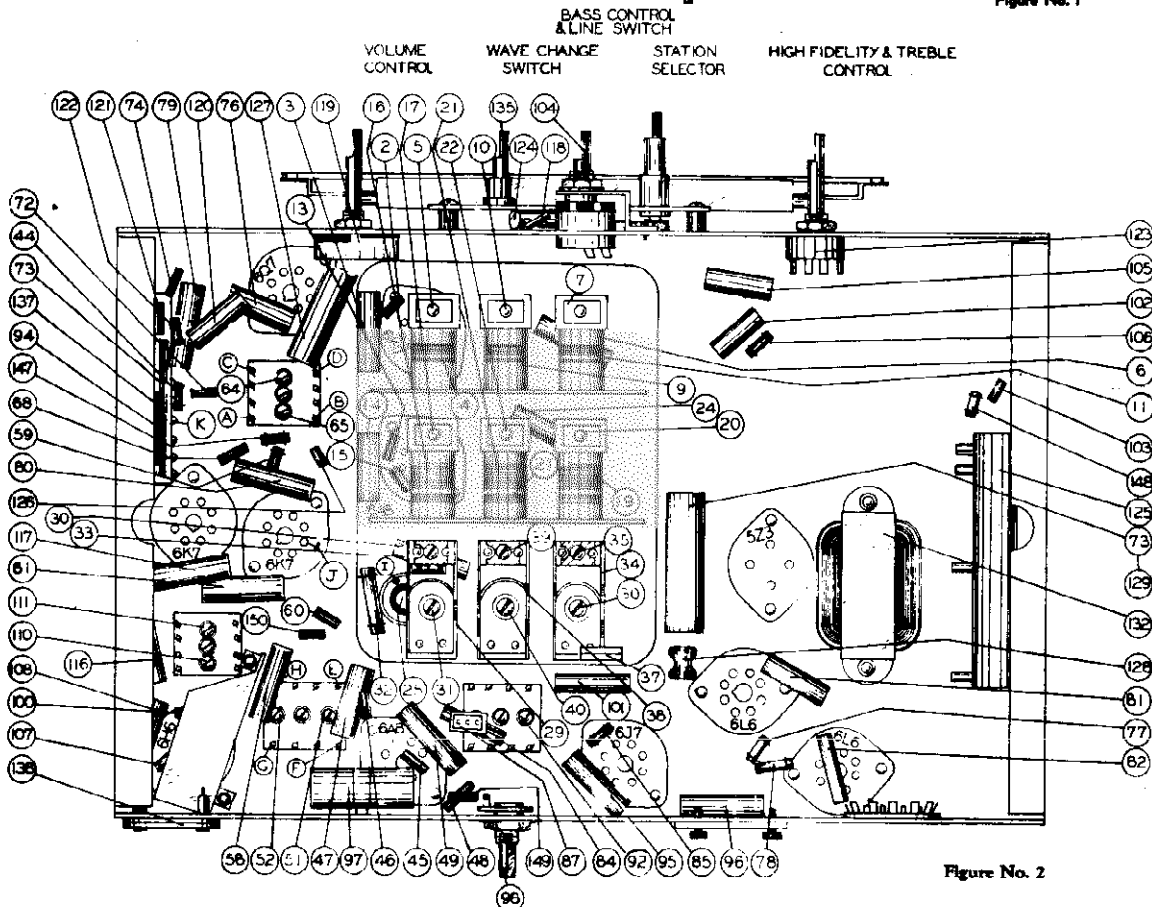
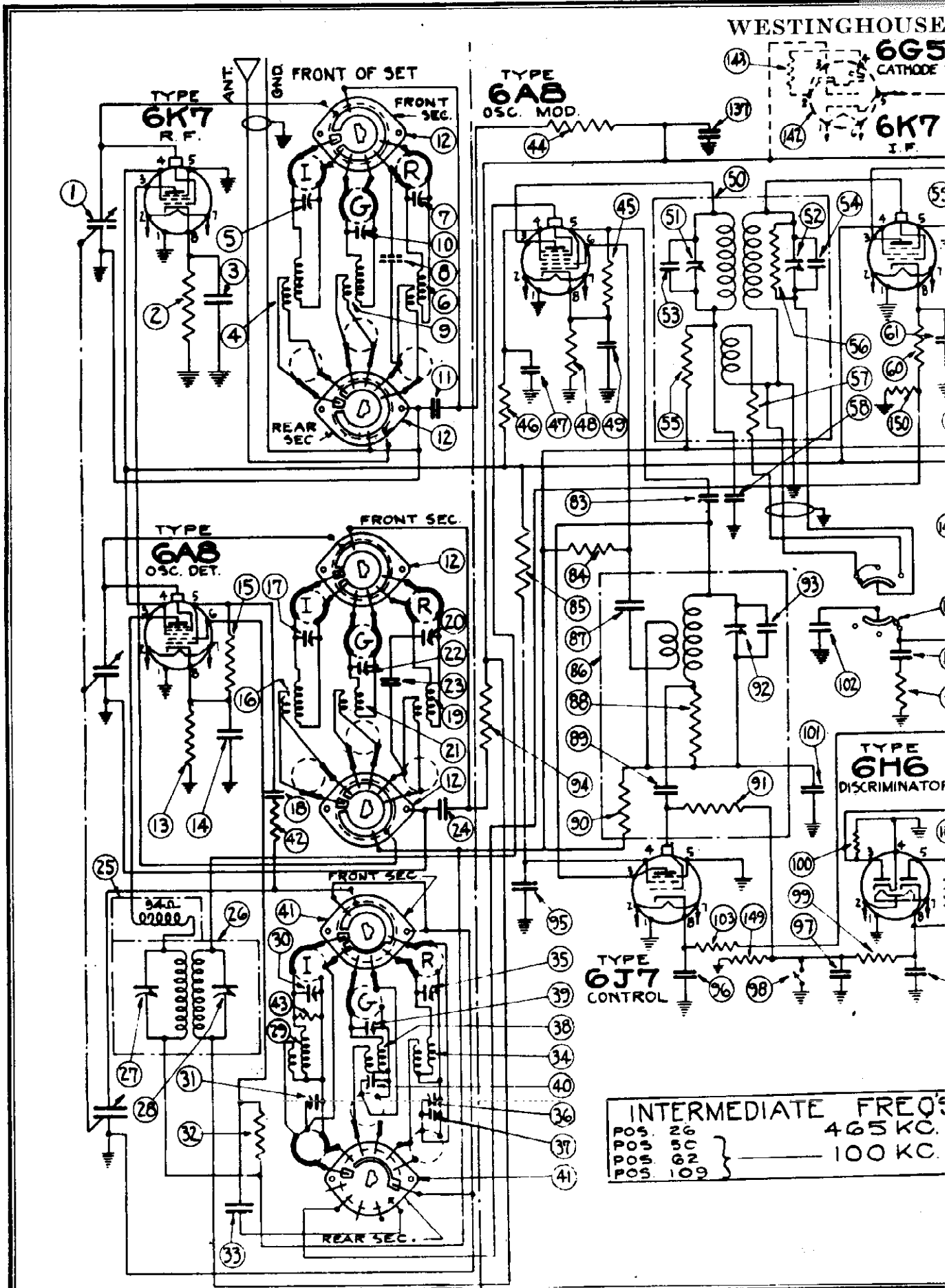


Figure No. 2

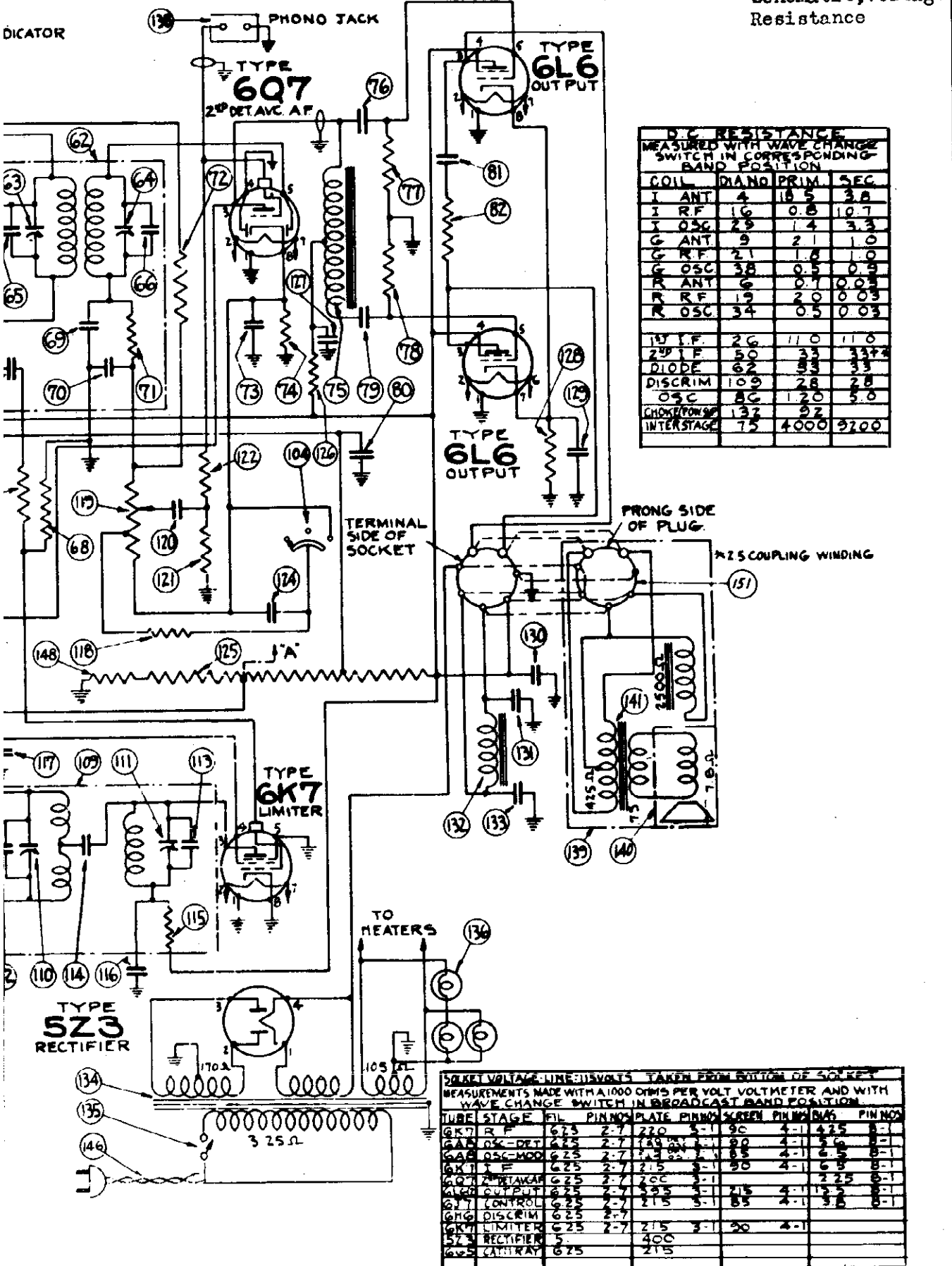
WESTINGHOUSE



INTERMEDIATE FREQ'S
 POS. 26 } 465 KC.
 POS. 50 }
 POS. 62 } 100 KC.
 POS. 109 }

EC. SUPPLY CO.

MODEL WR-315
Schematic, Voltage
Resistance



D.C. RESISTANCE
MEASURED WITH WAVE CHANGE
SWITCH IN CORRESPONDING
BAND POSITION

COIL	Ω	MIN	PRIM.	SEC.
I ANT	4	18	5	3.8
I RF	16	0.8		10.7
I OSC	29	7.4		3.3
G ANT	9	2.1		1.0
G RF	21	1.8		1.0
G OSC	38	0.5		0.9
R ANT	6	0.7		10.05
R RF	19	2.0		0.03
R OSC	34	0.5		0.03
1 ST I.F.	26	11.0		11.0
2 ND I.F.	50	3.3		33.2
DIODE	62	3.3		3.3
DISCRIM	109	2.8		2.8
OSC	86	1.20		5.0
CHOKE POWER	132	9.2		
INTERSTAGE	75	4000		9200

SOCKET VOLTAGE LINE—VOLTS TAKEN FROM BOTTOM OF SOCKET
MEASUREMENTS MADE WITH A 1000 OHMS PER VOLT VOLTMETER AND WITH
WAVE CHANGE SWITCH IN BROADCAST BAND POSITION

TUBE	STAGE	FIL	PIN NO.	PLATE	PIN NO.	SCREEN	PIN NO.	GRID	PIN NO.
6Q7	R.F.	6.25	2-7	220	5-1	90	4-1	4.25	8-1
6AB	OSC-DET	6.25	2-7	143	3-1	80	4-1	5.6	8-1
6AB	OSC-MOD	6.25	2-7	143	3-1	85	4-1	6.5	8-1
6X1	I.F.	6.25	2-7	215	3-1	90	4-1	6.5	8-1
6Q7	2 ND DET. AVC.	6.25	2-7	200	3-1	90	4-1	7.25	8-1
6L6	OUTPUT	6.25	2-7	305	3-1	215	4-1	15.2	8-1
6Y7	CONTROL	6.25	2-7	215	3-1	85	4-1	3.5	8-1
6HG	DISCRIM.	6.25	2-7						
6K7	LIMITER	6.25	2-7	215	3-1	90	4-1		
5Z3	RECTIFIER	5		400					
6W5	CATHRAY	6.25		215					

WESTINGHOUSE ELEC. SUPPLY CO.

ELECTRICAL SPECIFICATIONS

Type and Number of Tubes	5 #6K7, 2 #6AB, 1 #6Q7, 2 #6L6, 1 #6H6, 1 #6V7, 1 #5Y3
Power Supply Characteristics	105 to 125 volt, 50 to 60 cycle A.C.
Superheterodyne Receiver and Intermediate Frequency	1 #6G5 - Total 12
Maximum Output	125 Watts
Maximum Undistorted Output	21 Watts
Tuning Ranges	White Band - 525 to 1,800 KC. Green Band - 1750 to 5,000 KC. Red Band - 5500 KC. to 15,000 KC.
Line-Up Frequencies	100 KC., 465 KC., 1600 KC., 570 KC., 5500 KC., 1500 KC., 17,000 KC., and 5000 KC.

GENERAL DESCRIPTION

This model is a twelve-tube three-band, superheterodyne receiver and incorporates a Type 6AB oscillator-modulator. This tube converts the 465 KC. I.F. to a second I.F. frequency of 100 KC. The automatic frequency control works by automatically changing the frequency of this second oscillator.

From the output of the oscillator-modulator the signal is fed through a conventional I.F. to the A.V.C. detector and audio system.

The signal is also fed from the output of the I.F. to the type 6K7 limiter tube which is so connected as to give fairly even output, regardless of input. This will then give the same amount of control, regardless of the strength of the station being received. The signal is then fed to the discriminator type 6H6 tube which is connected to the grid of the type 6V7 control tube. In the discriminator circuit voltages are developed either positive or negative, depending on which side of resonance the set is tuned. This change of bias on the control tube (6V7) will cause this tube to change the frequency of the oscillator to bring the set into tune.

Before attempting to align the receiver, the service man should familiarize himself with the general layout of the chassis, the location of the tubes and various signal condensers. Top and bottom views of the chassis are shown in Figures #1 and #2 and should be carefully studied before the actual work is started.

ADJUSTMENT OF I.F. CONTROL OSCILLATOR AND DISCRIMINATOR

1. Set the volume control on full and turn the bass control to the bass position (position immediately after set is turned).
2. Connect the output meter across the voice coil of the speaker.
3. Set the test oscillator to 100 KC., and adjust the output to give a readable deflection on the output meter when the signal is applied to the grid of the 6K7 I.F. amplifier tube through a 0.5 mfd. blocking condenser.
4. Connect a 10,000 ohm resistor across the primary winding of the third I.F. coil #62. This should be connected to terminals marked "A" and "B" in Figure #2.
5. Adjust trimmer #64 to maximum output, reducing the output of the test oscillator as required.
6. Remove the 10,000 ohm resistor from the primary side of I.F. coil #62 and connect terminals marked "C" and "D".
7. Adjust trimmer #63 to maximum output, reducing the output of the test oscillator as required. Remove 10,000 ohm resistor.
8. Turn switch #98 to the left-hand position (cleared from rear of chassis).
9. Set the output of the test oscillator to a high level.
10. Connect a 0 to 5 microammeter across resistor #149 and adjust trimmer condenser #111 to maximum swing of the microammeter, keeping the output of the signal generator or test point which will give a deflection of 0.5 microampere when connected across terminals marked "E" and "F".

LINE-UP CAPACITOR ADJUSTMENTS

To properly align the circuits of the receiver it is essential to use a high grade modulated test oscillator, the output of which can be continuously varied when the individual circuits are brought into alignment. A conventional output meter can be connected across the terminals of the speaker voice coil to indicate when the circuits are aligned. The sensitivity of the output meter must be sufficient to give satisfactory reading with a low input signal. It is also necessary to use an 0-5 microammeter in order to align the discriminator circuits.

11. Adjust trimmer #110 until the microammeter reading is reduced exactly to zero.
12. Turn switch #98 to the right-hand position and proceed with the alignment of the I.F.
13. Apply the test signal to the grid of the 6AB oscillator-modulator tube.
14. Connect the 10,000 ohm resistor across the primary of I.F. coil #50 by connecting it to the terminals marked "G" and "H" in Figure #3.
15. Adjust trimmer #52 to maximum output, reducing the output of the test oscillator as required.
16. Remove the 10,000 ohm resistor and connect across the secondary of I.F. transformer #51. Connect to terminals marked "G" and "H".
17. Adjust trimmer #51 to maximum output, reducing the output of the test oscillator as required.
18. Remove the 10,000 ohm resistor.
19. Set the test oscillator to 465 KC., and adjust the control oscillator trimmer #92 to maximum output.
20. Apply the test signal to the grid of the type 6AB oscillator-detector tube.
21. Connect the 10,000 ohm resistor across the primary of I.F. transformer #28 by connecting it to the points marked "J" and "K" in Figure #3.
22. Adjust trimmer #28 to maximum output, reducing the output of the test oscillator as required.
23. Remove the 10,000 ohm resistor and connect across the secondary of the I.F. transformer #26 by connecting it to the points marked "L" and "M" in Figure #1.
24. Adjust trimmer #27 to maximum output, reducing the output of the test oscillator as required. Remove the 10,000 ohm resistor.

ADJUSTMENT OF BROADCAST BAND

1. Set the wave-change switch to the White or Broadcast Band position.
2. Set the test oscillator and dial indicator to 1500 KC.
3. Apply the test signal to the antenna terminal of the chassis through a .0002 mfd. series condenser and adjust the oscillator trimmer condenser #80 until the signal is received at a maximum.
4. Adjust trimmers #17 and #5 to maximum output.
5. Set the test oscillator and dial indicator to 570 KC., and adjust the oscillator series condenser #31 to maximum output, at the same time rocking the condenser gang.

6. Return both the test oscillator and dial indicator to 1500 KC., and check the adjustment of trimmers #30, #41 and #6 for accuracy.

ADJUSTMENT OF GREEN BAND

1. Set the wave-change switch to the Green Band position.
2. Set the test oscillator and dial indicator to 5500 KC., and adjust the oscillator trimmer condenser #39 until the signal is received at a maximum.
3. Adjust trimmer condensers #22 and #10 to maximum output.
4. Set the test oscillator and dial indicator to 1500 KC., and adjust the oscillator series condenser #40 to maximum output, at the same time rocking the condenser gang.
5. Return both the test oscillator and dial indicator to 5500 KC., and check the adjustment of trimmers #39, #22 and #10 for accuracy.

ADJUSTMENT OF RED BAND

1. Set the wave-change switch to the Red Band position.
2. Set the test oscillator and dial indicator to 17000 KC., and adjust the oscillator trimmer condenser #36 until the signal is received.

NOTE: When adjusting the oscillator trimmer condenser #36 it will be possible to tune several peaks. The peak secured with the trimmer screw turned in that direction should be used. When aligned on the correct peak a strong signal will be heard at 17000 KC., and a weaker signal at approximately 16000 KC. No signal should be heard at 18000 KC.

3. Adjust trimmer condensers #20 and #7 to maximum output.
 4. Set the test oscillator and dial indicator to 6000 KC., and adjust the oscillator series condenser #56 to maximum output, at the same time rocking the condenser gang.
 5. Return both the test oscillator and dial indicator to 17000 KC., and check adjustment of trimmers #36, #20 and #7 for accuracy.
- IMPORTANT: While testing or making repairs on this receiver the chassis should not be turned upside down or on its side for any long period of time while the set is turned on as the chemicals in the electrolytic filter condensers will come out through the air vents, making the condenser appear to be defective. If left in this position too long the condenser may be injured.

MODELS WR-116, WR-116X
WR-316, WR-316X

Alignment, Parts

WESTINGHOUSE ELEC. INTERNATIONAL CO.

Diag. #	Part #	Description of Parts	List Price
1	SA 10577E	.001 mfd. mica condenser	.20
2	CG 9549	Variable condenser	2.80
3	RC 4583	4-25 mmf. trimmer condenser - part of RC 9583	5.80
4	RC 4583	Prescaler coil assembly	.80
5	CS 9566	1.5-10 mfd. trimmer condenser - part of RC 9566	.40
6	CS 9566	150-300 mmf. trimmer condenser	.15
7	CS 9546	4-25 mmf. trimmer condenser	.15
8	CS 9546	Trap coil assembly	.20
9	RC 9587	.005 mfd., 400 V. condenser	1.00
10	CG 4-006	50-60 mmf. trimmer condenser - part of CG 9587	1.15
11	CG 4-01	Wave-change switch	1.00
12	SW 9546	.01 mfd., 200 V. condenser	.15
13	CG 4-01	.01 mfd., 200 V. condenser	.15
14	CG 9566	2000 ohm, 1/4 W. resistor	.15
15	RE 9530	7000 ohm, 1/4 W. resistor	.20
16	RE 9530	2000 ohm, 1/4 W. resistor	.15
17	LP 9514	Dial lamp, (5.5 V., 0.15 amp.)	.20
18	RE 9520	130 ohm, 25 W. resistor (220-volt models only)	.70
19	RE 9520	130 ohm, 25 W. resistor	.70
20	SA 10577E	.001 mfd. mica condenser	.20
21	CG 9549	Variable condenser	2.80
22	RC 4583	4-25 mmf. trimmer condenser - part of RC 9583	5.80
23	RC 4583	Prescaler coil assembly	.80
24	CS 9566	1.5-10 mfd. trimmer condenser - part of RC 9566	.40
25	CS 9566	150-300 mmf. trimmer condenser	.15
26	CS 9546	4-25 mmf. trimmer condenser	.15
27	CS 9546	Trap coil assembly	.20
28	RC 9587	.005 mfd., 400 V. condenser	1.00
29	CG 4-006	50-60 mmf. trimmer condenser - part of CG 9587	1.15
30	CG 4-01	Wave-change switch	1.00
31	SW 9546	.01 mfd., 200 V. condenser	.15
32	CG 4-01	.01 mfd., 200 V. condenser	.15
33	CG 9566	2000 ohm, 1/4 W. resistor	.15
34	RE 9530	7000 ohm, 1/4 W. resistor	.20
35	RE 9530	2000 ohm, 1/4 W. resistor	.15
36	LP 9514	Dial lamp, (5.5 V., 0.15 amp.)	.20
37	RE 9520	130 ohm, 25 W. resistor (220-volt models only)	.70
38	RE 9520	130 ohm, 25 W. resistor	.70
39	SA 10577E	.001 mfd. mica condenser	.20
40	CG 9549	Variable condenser	2.80
41	RC 4583	4-25 mmf. trimmer condenser - part of RC 9583	5.80
42	RC 4583	Prescaler coil assembly	.80
43	CS 9566	1.5-10 mfd. trimmer condenser - part of RC 9566	.40
44	CS 9566	150-300 mmf. trimmer condenser	.15
45	CS 9546	4-25 mmf. trimmer condenser	.15
46	CS 9546	Trap coil assembly	.20
47	RC 9587	.005 mfd., 400 V. condenser	1.00
48	CG 4-006	50-60 mmf. trimmer condenser - part of CG 9587	1.15
49	CG 4-01	Wave-change switch	1.00
50	SW 9546	.01 mfd., 200 V. condenser	.15
51	CG 4-01	.01 mfd., 200 V. condenser	.15
52	CG 9566	2000 ohm, 1/4 W. resistor	.15
53	RE 9530	7000 ohm, 1/4 W. resistor	.20
54	RE 9530	2000 ohm, 1/4 W. resistor	.15
55	LP 9514	Dial lamp, (5.5 V., 0.15 amp.)	.20
56	RE 9520	130 ohm, 25 W. resistor (220-volt models only)	.70
57	RE 9520	130 ohm, 25 W. resistor	.70
58	SA 10577E	.001 mfd. mica condenser	.20
59	CG 9549	Variable condenser	2.80
60	RC 4583	4-25 mmf. trimmer condenser - part of RC 9583	5.80
61	RC 4583	Prescaler coil assembly	.80
62	CS 9566	1.5-10 mfd. trimmer condenser - part of RC 9566	.40
63	CS 9566	150-300 mmf. trimmer condenser	.15
64	CS 9546	4-25 mmf. trimmer condenser	.15
65	CS 9546	Trap coil assembly	.20
66	RC 9587	.005 mfd., 400 V. condenser	1.00
67	CG 4-006	50-60 mmf. trimmer condenser - part of CG 9587	1.15
68	CG 4-01	Wave-change switch	1.00
69	SW 9546	.01 mfd., 200 V. condenser	.15
70	CG 4-01	.01 mfd., 200 V. condenser	.15
71	CG 9566	2000 ohm, 1/4 W. resistor	.15
72	RE 9530	7000 ohm, 1/4 W. resistor	.20
73	RE 9530	2000 ohm, 1/4 W. resistor	.15
74	LP 9514	Dial lamp, (5.5 V., 0.15 amp.)	.20
75	RE 9520	130 ohm, 25 W. resistor (220-volt models only)	.70
76	RE 9520	130 ohm, 25 W. resistor	.70
77	SA 10577E	.001 mfd. mica condenser	.20
78	CG 9549	Variable condenser	2.80
79	RC 4583	4-25 mmf. trimmer condenser - part of RC 9583	5.80
80	RC 4583	Prescaler coil assembly	.80
81	CS 9566	1.5-10 mfd. trimmer condenser - part of RC 9566	.40
82	CS 9566	150-300 mmf. trimmer condenser	.15
83	CS 9546	4-25 mmf. trimmer condenser	.15
84	CS 9546	Trap coil assembly	.20
85	RC 9587	.005 mfd., 400 V. condenser	1.00
86	CG 4-006	50-60 mmf. trimmer condenser - part of CG 9587	1.15
87	CG 4-01	Wave-change switch	1.00
88	SW 9546	.01 mfd., 200 V. condenser	.15
89	CG 4-01	.01 mfd., 200 V. condenser	.15
90	CG 9566	2000 ohm, 1/4 W. resistor	.15
91	RE 9530	7000 ohm, 1/4 W. resistor	.20
92	RE 9530	2000 ohm, 1/4 W. resistor	.15
93	LP 9514	Dial lamp, (5.5 V., 0.15 amp.)	.20
94	RE 9520	130 ohm, 25 W. resistor (220-volt models only)	.70
95	RE 9520	130 ohm, 25 W. resistor	.70

BROADCAST BAND ADJUSTMENT

1. Set the test oscillator and dial indicator to 1400 KC.
2. Apply the test signal to the antenna of the receiver through a .0002 mfd. condenser.
3. Adjust oscillator trimmer condenser #37 (#13 position on Figure 2 of Form #2563) until the signal is received.
4. Adjust the prescaler trimmer condenser #5 (#4 position on Figure 1 of Form #2563) to maximum output.
5. Set test oscillator and dial indicator to 800 KC., and adjust the oscillator series condenser #6 (#16 position on Figure 1 of Form #2563) until the signal is received. Tune the receiver to a slightly lower frequency and readjust trimmer #6 to maximum output. If this sensitivity increases, continue this procedure in the same direction until maximum sensitivity is obtained. If the sensitivity decreases try this procedure at slightly higher frequencies.
6. Return maximum sensitivity to maximum output.
7. Return test oscillator and dial indicator to 1400 KC., and check adjustment of the oscillator and prescaler trimmer condensers.

RED BAND ADJUSTMENT

1. Set the wave-change switch to the Red Band position.
2. Set the test oscillator and dial indicator to 57000 KC., and adjust the oscillator trimmer condenser #38 (#12 position on Figure 2 of Form #2563) until the signal is received. Two positions may be found at which the signal may be tuned in. Use the position with the lower capacity trimmer setting or with the alignment screw turned farther out.
3. Adjust the prescaler trimmer #5 to maximum output.
4. Check the receiver over scale for calibration and sensitivity.

LINE-UP CAPACITOR ADJUSTMENTS
MODELS WR-116X and WR-316X

1. Set the volume control to maximum position, the tone control to treble position, the wave-change switch on Broadcast and the dial indicator at approximately 500 KC.
2. Connect the output meter to the terminals of the voice coil.
3. Set the test oscillator to 465 KC., and apply the test signal to the grid of the 6X7 tube through a .45 mfd. block trimmer condenser #48 (#36 position on Figure 2 of Form #2563) and #50 (#37 position on Figure 2 of Form #2563) to maximum output.
5. Apply the test signal to the grid of the type 6A8 first detector-oscillator tube and adjust trimmer condensers #30 (#22 position on Figure 2 of Form #2563) and #32 (#23 position on Figure 2 of Form #2563) to maximum output.
6. Connect the test oscillator to the antenna of the receiver and with a strong input signal adjust wave trap trimmer condenser #6 to maximum output.

LONG-WAVE BAND ADJUSTMENT

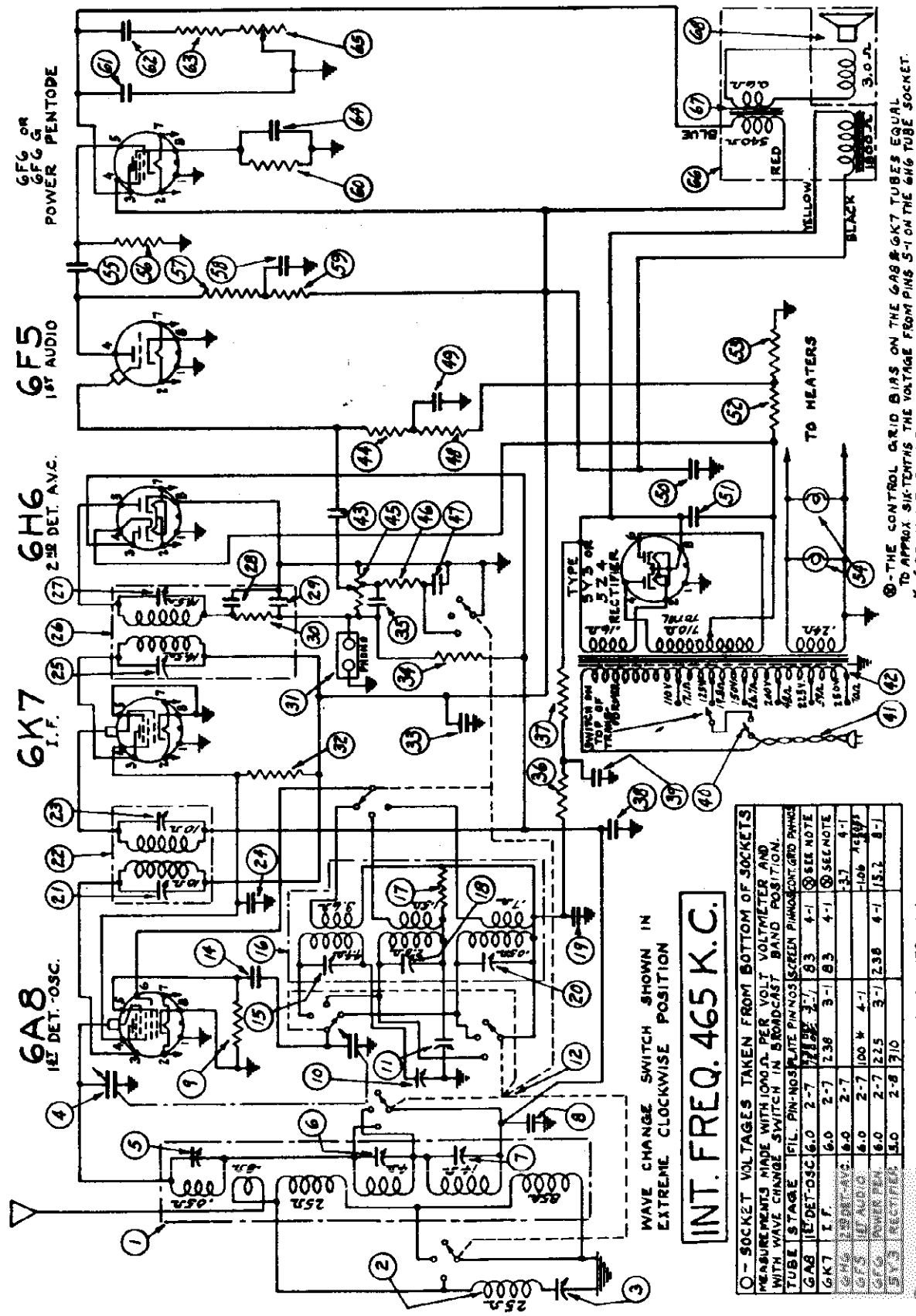
1. Set the wave-change switch to the long-wave band (White).
2. Set the test oscillator and dial indicator to 350 KC.
3. Apply the test signal to the antenna of the receiver through a .0002 mfd. condenser.
4. Adjust the oscillator trimmer condenser #29 (#14 position on Figure 2 of Form #2563) until the signal is received.
5. Adjust the antenna trimmer condenser #7 (#5 position on Figure 1 of Form #2563) to maximum output.
6. Set the test oscillator and dial indicator to 165 KC., and adjust the oscillator series condenser #3 (located under chassis in front right-hand corner, viewing the set from the rear) to maximum output at the same time rocking the variable tuning condenser.
7. Return both the test oscillator and dial indicator to 1400 KC., and check the adjustment of trimmers #29 and #7.

Description of Parts

Diag. #	Part #	Description of Parts	List Price
1	SA 10577E	.001 mfd. mica condenser	.20
2	CG 9549	Variable condenser	2.80
3	RC 4583	4-25 mmf. trimmer condenser - part of RC 9583	5.80
4	RC 4583	Prescaler coil assembly	.80
5	CS 9566	1.5-10 mfd. trimmer condenser - part of RC 9566	.40
6	CS 9566	150-300 mmf. trimmer condenser	.15
7	CS 9546	4-25 mmf. trimmer condenser	.15
8	CS 9546	Trap coil assembly	.20
9	RC 9587	.005 mfd., 400 V. condenser	1.00
10	CG 4-006	50-60 mmf. trimmer condenser - part of CG 9587	1.15
11	CG 4-01	Wave-change switch	1.00
12	SW 9546	.01 mfd., 200 V. condenser	.15
13	CG 4-01	.01 mfd., 200 V. condenser	.15
14	CG 9566	2000 ohm, 1/4 W. resistor	.15
15	RE 9530	7000 ohm, 1/4 W. resistor	.20
16	RE 9530	2000 ohm, 1/4 W. resistor	.15
17	LP 9514	Dial lamp, (5.5 V., 0.15 amp.)	.20
18	RE 9520	130 ohm, 25 W. resistor (220-volt models only)	.70
19	RE 9520	130 ohm, 25 W. resistor	.70

WESTINGHOUSE ELEC. INTERNATIONAL CO. WR-211X

Schematic, Voltage

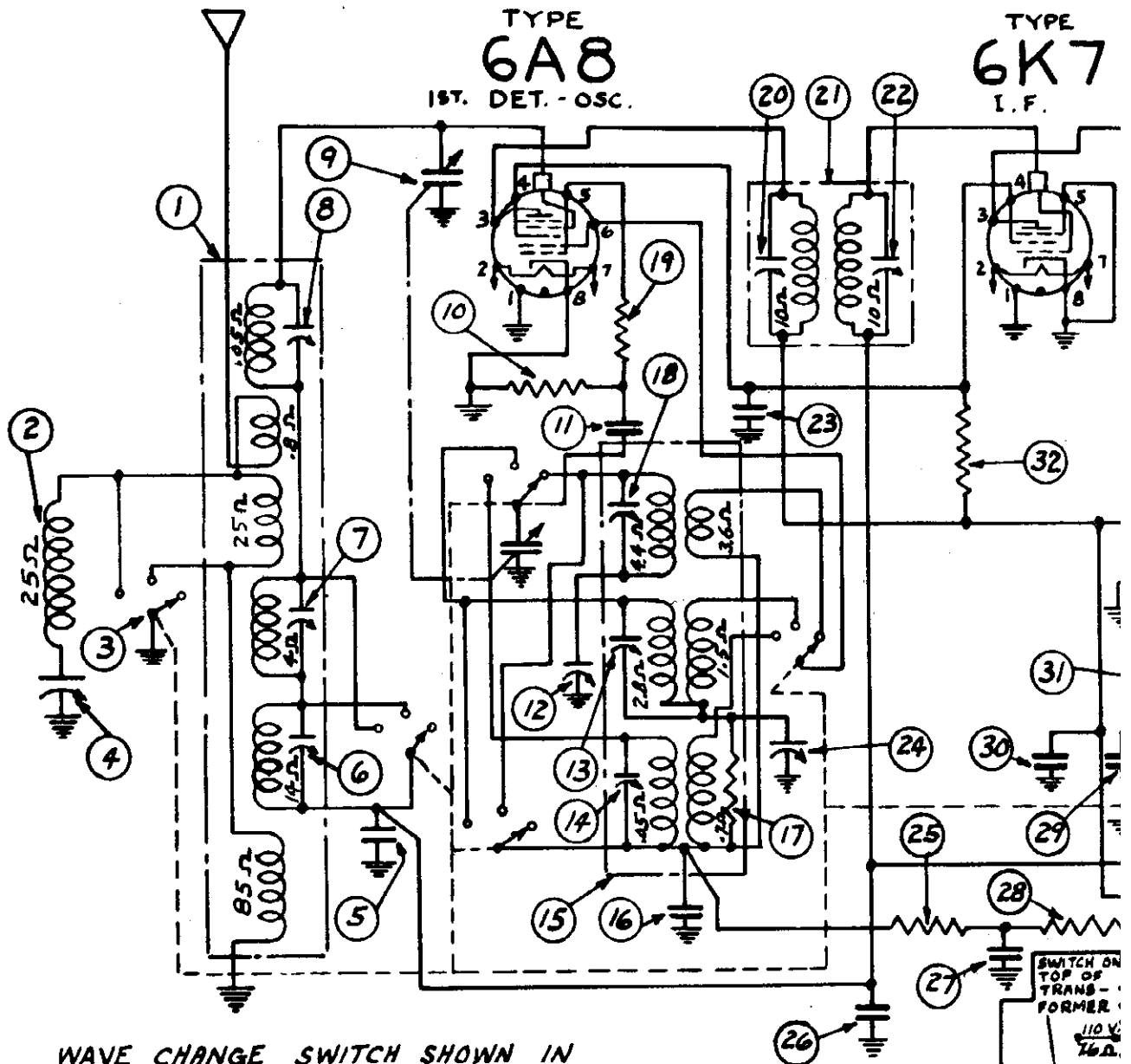


INT. FREQ. 465 K.C.

SOCKET VOLTAGES TAKEN FROM BOTTOM OF SOCKETS MEASUREMENTS MADE WITH 1000 Ω. PER VOLT VOLTMETER AND WITH WAVE CHANGE SWITCH IN BROADCAST BAND POSITION.

TUBE	STAGE	FIL.	PIN-NUMBER	PIN-NUMBER	SCREEN	CONTROL	GRID	NOTE
6A8	1st DET.-OSC.	6.0	2-7	2-7	8-3	4-1	8-3	SEE NOTE
6K7	I.F.	6.0	2-7	2-7	3-1	8-3	4-1	SEE NOTE
6H6	2nd DET. AVC.	6.0	2-7	2-7	100 *	4-1	3-7	4-1
6F5	1st AUDIO	6.0	2-7	2-7	2-25	3-1	2-38	4-1
6FG	POWER PENT.	6.0	2-7	2-25	3-1	2-38	4-1	15.2
5Y3	RECTIFIER	6.0	2-8	3-10				

*-LINE VOLTAGE IS = TO VOLTAGE STATED ON TRANSFORMER TAP, WHICH IS USED.



WAVE CHANGE SWITCH SHOWN IN EXTREME CLOCKWISE POSITION.

SOCKET VOLTAGES—LINE = 115 VOLTS TAKEN FROM BOTTOM OF SOCKETS
 MEASUREMENTS MADE WITH 1000-Ω PER VOLT VOLTMETER & WITH
 WAVE CHANGE SWITCH IN BROADCAST BAND POSITION.

TUBE	STAGE	FIL. PIN NOS.	PLATE PIN NOS.	SCREEN PIN NOS.	BIAS PIN NOS.
6A8	1ST DET. OSC.	6-35	2-7	298 DET. 3-1 12.5 OSC. 6-1	62 4-1
6K7	I. F.	6-35	2-7	298 3-1	62 4-1
6H6	2ND DET. A.V.C.	6-35	2-7		-4.5 4-1
6F5	1ST AUDIO	6-35	2-7	*113 4-1	-1.5 ACROSS 62
6F6	POWER PEN.	6-35	2-7	283 3-1	298 4-1
5Y3	RECTIFIER	5-15	2-8	395 8-1	

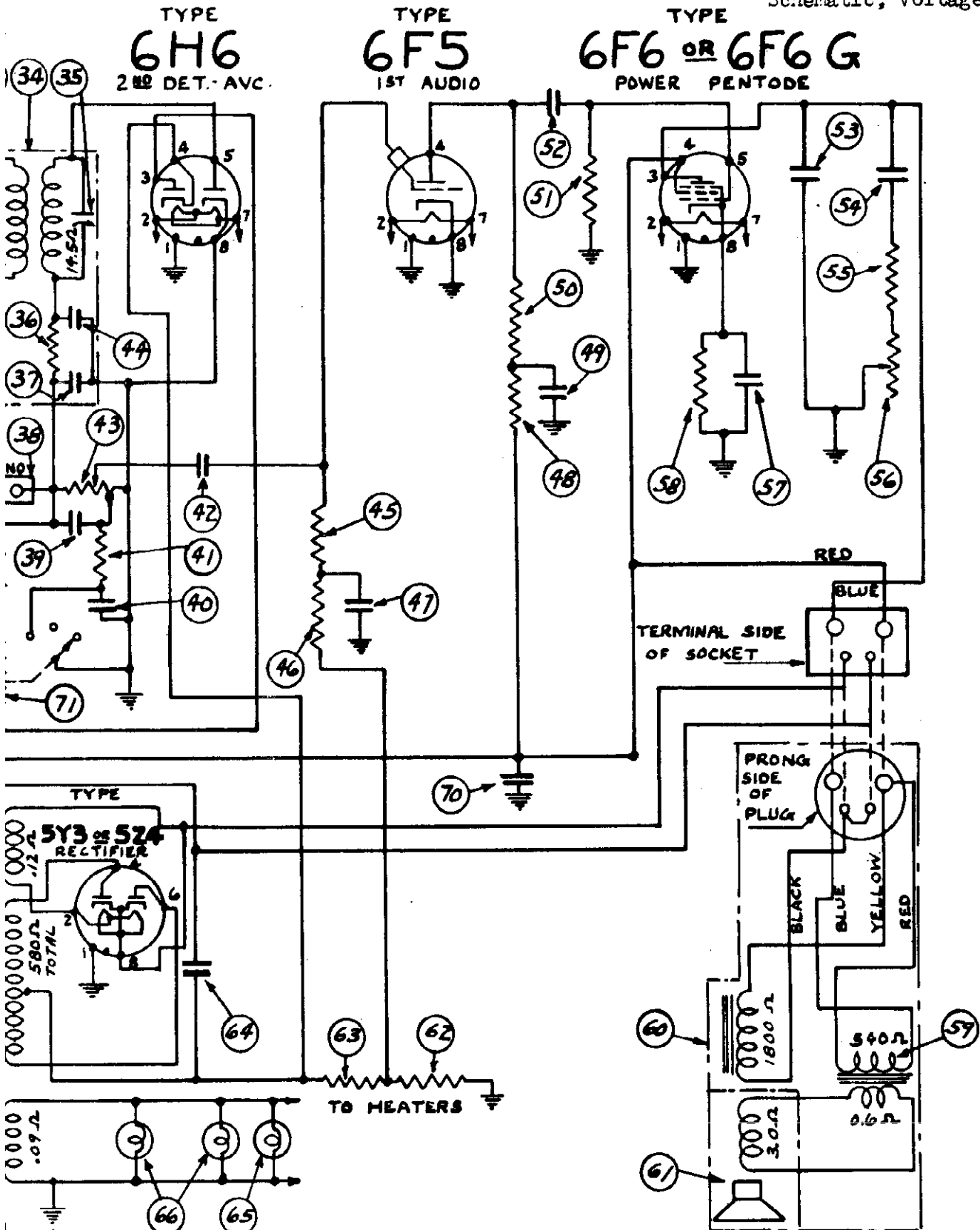
Ⓢ THE CONTROL GRID BIAS ON THE 6K7 & 6A8 TUBES EQUAL TO APPROX. SIX-TENTHS THE VOLTAGE FROM PINS 5-1 ON THE 6H6 TUBE SOCKET.

* 600 VOLT SCALE

INTERNATIONAL CO.

MODEL S WR-211U, WR311(Final)
WR-311X

Schematic, Voltage



INT. FREQ. 465 K. C.

WESTINGHOUSE ELEC. INTERNATIONAL CO WR-311X
Alignment, Parts

Dis. #	Part #	Description of Parts	List Price
1	RC 95263	Preslector coil	\$ 3.50
2	RC 9527	Trap coil	.85
3	RC 9548	Wave-change switch	1.00
4	SW 9548	10-55 mfd. trimmer condenser - part of RC 9548	.15
5	CW 4-01	.01 mfd., 400 V. condenser	
6		4-25 mfd. trimmer condenser - part of RC 95263	2.50
7	CO 9549	Variable tuning condenser	.15
8	RE 9575	10,000 ohm, 1/4 W. resistor	.15
9	RE 9511	150,000 ohm, 1/4 W. resistor	.30
10	CS 9586	1-5-10 mfd. trimmer condenser - part of RC 95264	2.75
11	RC 95264	Oscillator coil assembly	.35
12	RC 9524	.0034 mfd. mica condenser	.15
13	SA 105240	500 ohm, 1/4 W. resistor	.15
14		50-90 mfd. trimmer condenser - part of RC 95264	1.35
15	IC 9572	1st I.F. coil (465 KC.)	.15
16		45-135 mfd. trimmer condenser - part of IC 9572	.40
17		45-135 mfd. trimmer condenser - part of IC 9572	.80
18	CW 2-10	1 mfd., 400 V. condenser	.15
19	CS 9545	500-600 mfd. oscillator series condenser	.20
20	RE 95115	50,000 ohm, 1 W. resistor	.15
21	CW 2-05	.05 mfd., 200 V. condenser	1.25
22	SA 100625	4 mfd., 450 V. electrolytic condenser - part of CE 9537	.15
23	CW 2-10	10,000 ohm, 1/2 W. resistor	.15
24	CW 4-10	1 mfd., 200 V. condenser	.15
25	SA 9957	1 mfd., 400 V. condenser	.25
26	IC 9574	1 meg., 1/4 W. resistor	1.75
27	IC 9574	End I. F. coil (465 KC.)	.15
28	IC 9574	50-100 mfd. trimmer condenser - part of IC 9574	.15
29	IC 9574	50-100 mfd. trimmer condenser - part of IC 9574	.15
30	IC 9574	50,000 ohm, 1/8 W. resistor	.15
31	SA 100060	500-600 mfd. mica condenser - part of IC 9574	.10
32	SA 100060	500-600 mfd. mica condenser	.15
33	SA 100060	500-600 mfd. mica condenser	.15
34	SA 100060	500-600 mfd. mica condenser	.15
35	SA 100060	500-600 mfd. mica condenser	.15
36	SA 100060	500-600 mfd. mica condenser	.15
37	SA 100060	500-600 mfd. mica condenser	.15
38	SA 100060	500-600 mfd. mica condenser	.15
39	SA 100060	500-600 mfd. mica condenser	.15
40	SA 100060	500-600 mfd. mica condenser	.15
41	SA 100060	500-600 mfd. mica condenser	.15
42	SA 100060	500-600 mfd. mica condenser	.15
43	SA 100060	500-600 mfd. mica condenser	.15
44	SA 100060	500-600 mfd. mica condenser	.15
45	SA 100060	500-600 mfd. mica condenser	.15
46	SA 100060	500-600 mfd. mica condenser	.15
47	SA 100060	500-600 mfd. mica condenser	.15
48	SA 100060	500-600 mfd. mica condenser	.15
49	SA 100060	500-600 mfd. mica condenser	.15
50	SA 100060	500-600 mfd. mica condenser	.15
51	SA 100060	500-600 mfd. mica condenser	.15
52	SA 100060	500-600 mfd. mica condenser	.15
53	SA 100060	500-600 mfd. mica condenser	.15
54	SA 100060	500-600 mfd. mica condenser	.15
55	SA 100060	500-600 mfd. mica condenser	.15
56	SA 100060	500-600 mfd. mica condenser	.15
57	SA 100060	500-600 mfd. mica condenser	.15
58	SA 100060	500-600 mfd. mica condenser	.15
59	SA 100060	500-600 mfd. mica condenser	.15
60	SA 100060	500-600 mfd. mica condenser	.15
61	SA 100060	500-600 mfd. mica condenser	.15
62	SA 100060	500-600 mfd. mica condenser	.15
63	SA 100060	500-600 mfd. mica condenser	.15
64	SA 100060	500-600 mfd. mica condenser	.15
65	SA 100060	500-600 mfd. mica condenser	.15
66	SA 100060	500-600 mfd. mica condenser	.15
67	SA 100060	500-600 mfd. mica condenser	.15
68	SA 100060	500-600 mfd. mica condenser	.15
69	SA 100060	500-600 mfd. mica condenser	.15
70	SA 100060	500-600 mfd. mica condenser	.15
71	SA 100060	500-600 mfd. mica condenser	.15

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Type and Number of Tubes 1 #6A5, 1 #6K7, 1 #6X5, 1 #6Y5, 1 #5Y3 - Total 6
 Power Supply Characteristics 110 to 250 volt, 25 to 60 cycle A.C.
 Power Consumption 62 Watts
 Maximum Output 2.5 Watts
 Maximum Undistorted Output 540 to 1,500 KC.
 (Green Band - 1,500 to 4,500 KC.
 (Red Band - 5,500 to 16,500 KC.
 (White Band - 150 to 370 KC.
 (Green Band - 540 to 1,500 KC.
 (Red Band - 5,500 to 16,500 KC.
 (White Band - 150 to 370 KC.)
 (Models WR-311, WR-211U
 (Model WR-311X
 Line-Up Frequencies. Models WR-311, WR-211U - I.F. 465 KC., 1,400 KC., 4,000 KC.,
 15,000 KC. Model WR-311X - I.F. 465 KC., 350 KC., 185 KC., 1,400 KC.,
 500 KC., 15,000 KC.

indicator to 550 KC., and check adjustment of trimmers #18 and #6.
 ADJUSTMENT OF BROADCAST BAND (540-1500 KC.)
 1. Set wave-change switch to standard Broadcast Band position, and dial indicator to 1400 KC.
 2. Set test signal to the antenna of speaker and adjust the oscillator trimmer condenser #15 (#15 position on Figure 2 of Form #2567) until the signal is received.
 3. Adjust the preslector trimmer #7 (#7 position on Figure 1 of Form #2567) to maximum output.
 4. Set the test oscillator and dial indicator to 600 KC., and adjust the coil-lator series condenser #24 (#17 position on Figure 1 of Form #2567) until the signal is received. Tune the variable condenser to a slightly lower frequency and readjust trimmer #24 to maximum output. If the sensitivity increases, continue this trial and error method in the same direction until no further improvement in sensitivity can be made. If the sensitivity decreases, try this adjustment at slightly higher frequencies.

ADJUSTMENT OF RED BAND (5,500-16,500 KC.)
 1. Set the wave-change switch to the Red Band position, and dial indicator to 15,000 KC.
 2. Set test signal to the antenna of speaker and adjust the oscillator trimmer condenser #15 (#15 position on Figure 2 of Form #2567) until the signal is received. Tune the variable condenser to a slightly lower frequency and readjust trimmer #15 to maximum output. If the sensitivity increases, continue this trial and error method in the same direction until no further improvement in sensitivity can be made. If the sensitivity decreases, try this adjustment at slightly higher frequencies.

ADJUSTMENT OF LONG-WAVE BAND (150-370 KC.)
 1. Set the wave-change switch to the long-wave band position and apply the test signal to the antenna of the receiver through a .0002 mfd. condenser.
 2. Set the dial indicator and test oscillator to 350 KC., and adjust trimmer #2567 until the signal is received at a maximum.
 3. Adjust trimmer condenser #5 (#4 on Figure 1 of Form #2567) to maximum output.
 4. Set the test oscillator and dial indicator to 150 KC., and adjust trimmer condenser #19 (#19 position on Figure 1 of Form #2567) to maximum output at the rear of the chassis viewed from rear of the set, rocking the variable tuning condenser.
 5. Return both the test oscillator and dial

indicator to 550 KC., and check adjustment of trimmers #18 and #6.
 ADJUSTMENT OF BROADCAST BAND (540-1500 KC.)
 1. Set wave-change switch to standard Broadcast Band position, and dial indicator to 1400 KC.
 2. Set test signal to the antenna of speaker and adjust the oscillator trimmer condenser #15 (#15 position on Figure 2 of Form #2567) until the signal is received.
 3. Adjust the preslector trimmer #7 (#7 position on Figure 1 of Form #2567) to maximum output.
 4. Set the test oscillator and dial indicator to 600 KC., and adjust the coil-lator series condenser #24 (#17 position on Figure 1 of Form #2567) until the signal is received. Tune the variable condenser to a slightly lower frequency and readjust trimmer #24 to maximum output. If the sensitivity increases, continue this trial and error method in the same direction until no further improvement in sensitivity can be made. If the sensitivity decreases, try this adjustment at slightly higher frequencies.

ADJUSTMENT OF RED BAND (5,500-16,500 KC.)
 1. Set the wave-change switch to the Red Band position, and dial indicator to 15,000 KC.
 2. Set test signal to the antenna of speaker and adjust the oscillator trimmer condenser #15 (#15 position on Figure 2 of Form #2567) until the signal is received. Tune the variable condenser to a slightly lower frequency and readjust trimmer #15 to maximum output. If the sensitivity increases, continue this trial and error method in the same direction until no further improvement in sensitivity can be made. If the sensitivity decreases, try this adjustment at slightly higher frequencies.

ADJUSTMENT OF LONG-WAVE BAND (150-370 KC.)
 1. Set the wave-change switch to the long-wave band position and apply the test signal to the antenna of the receiver through a .0002 mfd. condenser.
 2. Set the dial indicator and test oscillator to 350 KC., and adjust trimmer #2567 until the signal is received at a maximum.
 3. Adjust trimmer condenser #5 (#4 on Figure 1 of Form #2567) to maximum output.
 4. Set the test oscillator and dial indicator to 150 KC., and adjust trimmer condenser #19 (#19 position on Figure 1 of Form #2567) to maximum output at the rear of the chassis viewed from rear of the set, rocking the variable tuning condenser.
 5. Return both the test oscillator and dial

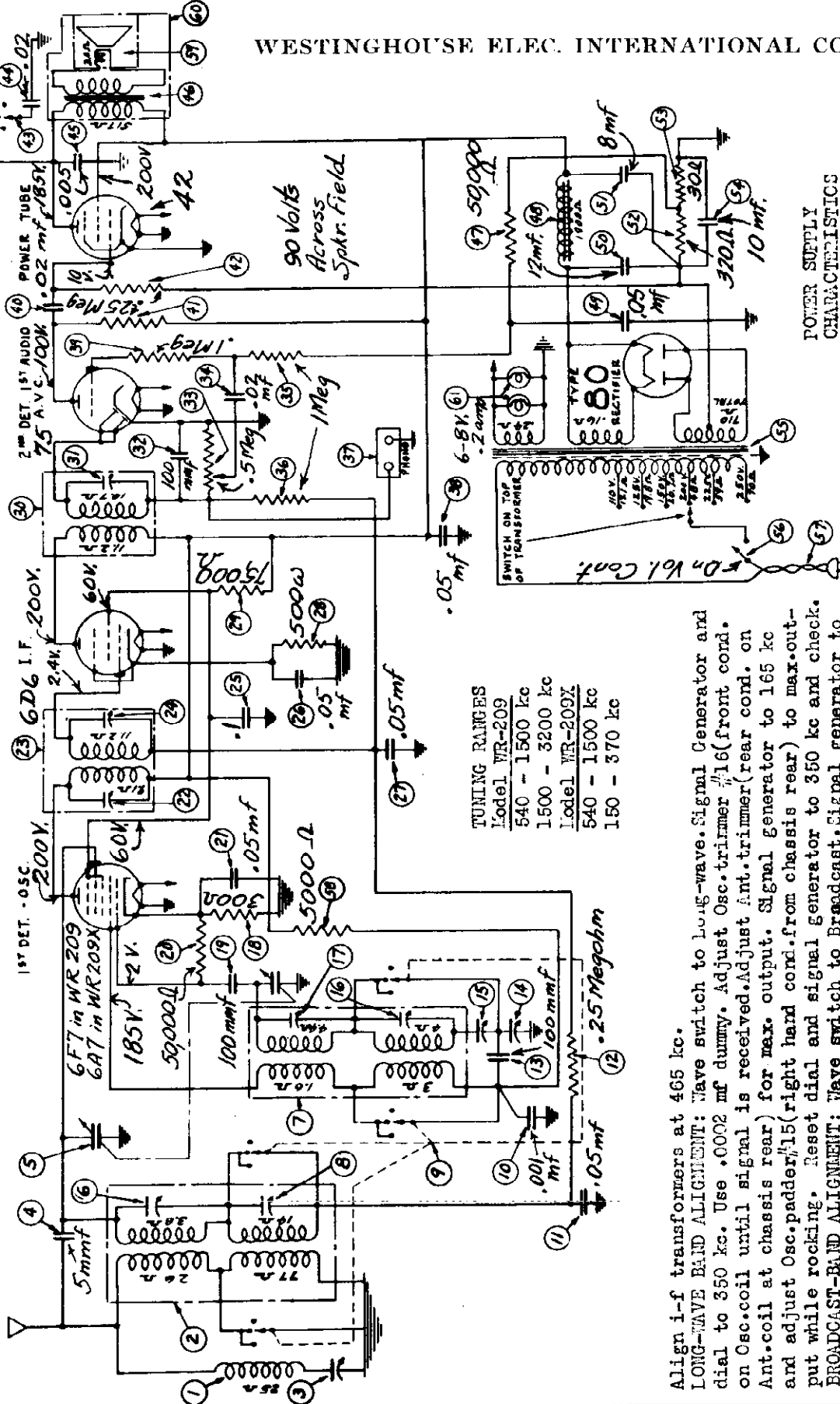
indicator to 550 KC., and check adjustment of trimmers #18 and #6.
 ADJUSTMENT OF BROADCAST BAND (540-1500 KC.)
 1. Set wave-change switch to standard Broadcast Band position, and dial indicator to 1400 KC.
 2. Set test signal to the antenna of speaker and adjust the oscillator trimmer condenser #15 (#15 position on Figure 2 of Form #2567) until the signal is received.
 3. Adjust the preslector trimmer #7 (#7 position on Figure 1 of Form #2567) to maximum output.
 4. Set the test oscillator and dial indicator to 600 KC., and adjust the coil-lator series condenser #24 (#17 position on Figure 1 of Form #2567) until the signal is received. Tune the variable condenser to a slightly lower frequency and readjust trimmer #24 to maximum output. If the sensitivity increases, continue this trial and error method in the same direction until no further improvement in sensitivity can be made. If the sensitivity decreases, try this adjustment at slightly higher frequencies.

ADJUSTMENT OF RED BAND (5,500-16,500 KC.)
 1. Set the wave-change switch to the Red Band position, and dial indicator to 15,000 KC.
 2. Set test signal to the antenna of speaker and adjust the oscillator trimmer condenser #15 (#15 position on Figure 2 of Form #2567) until the signal is received. Tune the variable condenser to a slightly lower frequency and readjust trimmer #15 to maximum output. If the sensitivity increases, continue this trial and error method in the same direction until no further improvement in sensitivity can be made. If the sensitivity decreases, try this adjustment at slightly higher frequencies.

MODELS WR-209(Final), WR-209X

Schematic, Voltage Alignment

WESTINGHOUSE ELEC. INTERNATIONAL CO.



TUNING RANGES

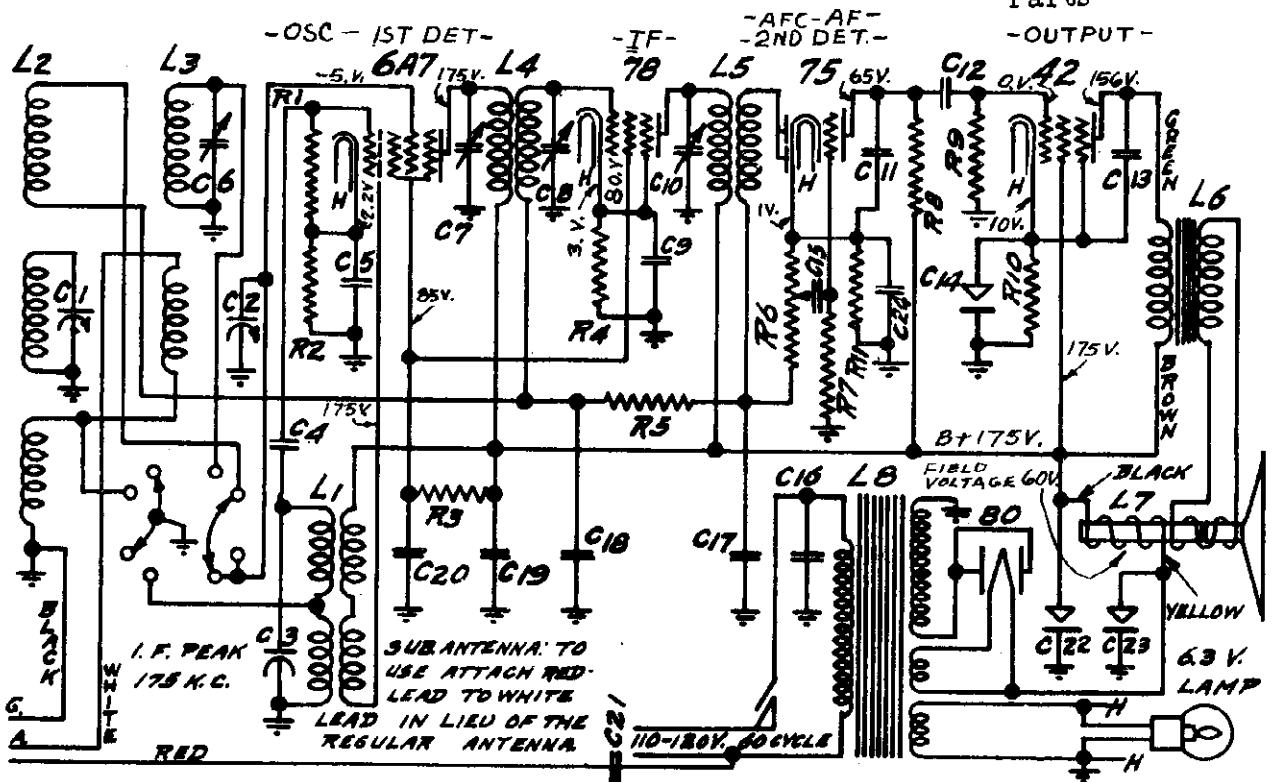
Model WR-209	540 - 1500 kc
Model WR-209X	540 - 1500 kc
	150 - 370 kc

POWER SUPPLY CHARACTERISTICS
 WR-209: 130 Volts- 50-60 cyc.
 WR-209X: 220 Volts- 50-60 cyc.
 110-250 Volts 25-60 cyc.

Align i-f transformers at 465 kc.
LONG-WAVE BAND ALIGNMENT: Wave switch to Long-wave. Signal Generator and dial to 350 kc. Use .0002 mf dummy. Adjust Osc. trimmer #16 (front cond. on Osc. coil until signal is received. Adjust Ant. trimmer (rear cond. on Ant. coil at chassis rear) for max. output. Signal generator to 165 kc and adjust Osc. padder #15 (right hand cond. from chassis rear) to maximum while rocking. Reset dial and signal generator to 350 kc and check.
BROADCAST-BAND ALIGNMENT: Wave switch to Broadcast. Signal generator to 465 kc. Adjust wave-trap trimmer #3 (under trap coil under base) to MINIMUM output. Set dial and signal generator to 1400 kc and adjust the Osc. trimmer (rear cond. on Osc. coil) until signal is received. Adjust trimmer #14 (to left of #15 viewed from rear) to maximum output while rocking. Return signal generator and dial to 1400 kc and check alignment.

WILCOX-GAY CORP.

MODEL 6A5
Schematic, Voltage
Socket, Alignment
Parts

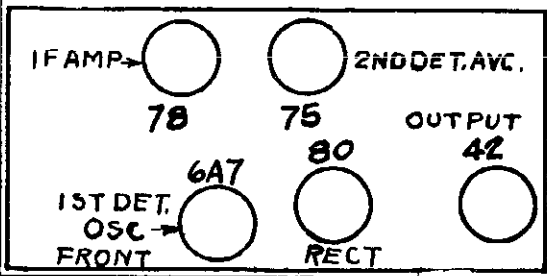


C1	77-833	366 MMFD. Pres. Section of 3 Gang	R9	53-925	500,000 Ohm 42 Grid Resistor
C2	77-833	366 MMFD. Pres. Section of 3 Gang	R10	53-1063	500 Ohm 42 Cathode Resistor
C3	77-833	328 MMFD. Osc. Section of 3 Gang	R11	53-919	5,000 Ohm 75 Cathode Resistor
C4	76-2002	.00005 Mfd. Mica Osc. Grid Condenser	L1	17-21Q1	Oscillator Coil Assembly
C5	75-2006	.1 Mfd. 200 V. Paper 6A7 Cathode By-Pass Cond.	L2	17-21C0	Broadcast Preselector Coil Assembly
C6	78-2010	5-50 MMFD. Police Band Pres. Trimmer Cond.	L3	17-21G5	Police Band Preselector Coil Assembly
C7	78-2008	First I.F. Primary Trimmer Condenser	L4	58-2012	First I. F. Transformer Assembly
C8	78-2011	First I.F. Secondary Trimmer Condenser	L5	17-21C2	Second I. F. Transformer Coil Assembly
C9	75-2006	.1 Mfd. 200 V. Paper 78 Cathode By-Pass Cond.	L6	64-2021	5" Speaker 42 Tube Output Trans. on L7
C10	78-2009	Second I.F. Trimmer Condenser	L7	64-2021	5" Speaker 1500 Ohm Field
C11	76-662	.002 Mfd. Mica 75 Plate Filter Condenser	L8	80-2006	Power Transformer for 110-120 V. 60 Cycle
C12	76-2006	.01 Mfd. 400 V. Paper Audio Feed Cond.			
C13	78-2001	.002 Mfd. 600 V. Paper 42 Plate Filter Cond.			
C14	18-928	25 Mfd. 25 V. Dry Electrolytic Condenser			
C15	76-2003	.01 Mfd. 400 V. Paper Audio Feed Condenser			
C16	76-2003	.01 Mfd. 400 V. Paper Line By-Pass Cond.			
C17	76-307	.0005 Mfd. Mica Diode Filter Condenser			
C18	78-2006	.1 Mfd. 200 V. Paper A.V.C. By-Pass Cond.			
C19	78-2011	.5 Mfd. 200 V. Paper B Supply By-Pass Cond.			
C20	75-2006	.1 Mfd. 200 V. Paper 6A7 & 78 Screen By-Pass Cond.			
C21	78-2008	.01 Mfd. 400 V. Paper Sub. Antenna Condenser			
C22	18-2006	16 Mfd. 250 W.V. Electrolytic Condenser			
C23	18-2006	12 Mfd. 325 W.V. Electrolytic Condenser			
C24	75-2006	.1 Mfd. 200 V. Paper 75 Cathode By-Pass Cond.			
R1	53-898	50,000 Ohm 6A7 Grid Resistor			
R2	53-1062	250 Ohm 6A7 Cathode Resistor			
R3	53-1042	25,000 Ohm 6A7 & 78 Screen Resistor			
R4	53-1063	500 Ohm 78 Cathode Resistor			
R5	53-925	1 Meg Ohm A.V.C. Network Resistor			
R6	16-1291	500,000 Ohm Volume Control & Switch			
R7	53-925	500,000 Ohm 75 Grid Resistor			
R8	53-924	250,000 Ohm 75 Plate Resistor			

MODEL 6A5

FREQUENCY RANGE -
1500 to 550 KC
4.0 to 1.5 MC
15.5 to 5.5 MC

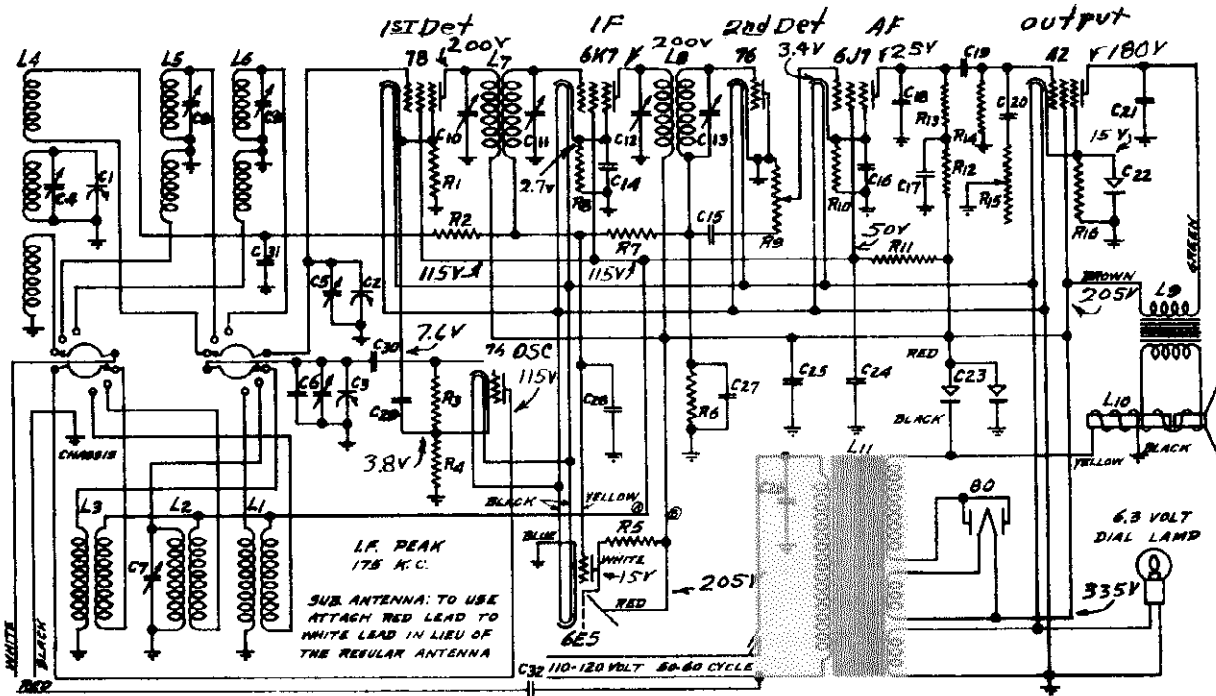
BROADCAST - Gen. to ANT lead thru standard dummy antenna, set at 1400 KC, adjust OSC trim (rear of gang), then pre-selector trimmers to maximum peak. Pad OSC circuit at 600 KC. **FOREIGN** - Generator to 15 MC, locate signal on dial, peak PRE-SELECTOR trimmers, and then check at 6 MC. **POLICE** - Generator to 3.5 MC, locate signal on dial, then adjust PRE-SELECTOR trimmers to maximum peak. During Broadcast padding rock gang condenser. **CONVENTIONAL ALIGNMENT** (see special section)



MODEL 6B8

Schematic, Voltage
Socket, Alignment
Parts

WILCOX-GAY CORP.



R1	53-1005	1,000 Ohm	First Detector Cathode Resistor
R2	53-923	100,000 Ohm	A.V.C. Network Resistor
R3	53-941	20,000 Ohm	Oscillator Grid Resistor
R4	53-1049	250 Ohm	Oscillator Cathode Resistor
R5	53-926	1 Meg Ohm	825 Triode Plate Resistor
R6	53-925	500,000 Ohm	Diode Load Resistor
R7	53-928	1 Meg Ohm	A.V.C. Network Resistor
R8	53-1062	250 Ohm	1F5 Amplifier Cathode Resistor
R9	18-1291	500,000 Ohm	Volume Control & Switch
R10	53-920	10,000 Ohm	First Audio Cathode Resistor
R11	53-990	5,000 Ohm	Boreon Resistor
R12	53-923	100,000 Ohm	First Audio Plate Bore Resistor
R13	53-924	250,000 Ohm	First Audio Plate Resistor
R14	53-925	800,000 Ohm	Output Grid Resistor
R15	18-1317	280,000 Ohm	Tone Control
R16	53-1428	750 Ohm	Output Cathode Resistor
C1	77-833	16-366 MFD.	Preselector Section of 3 Gang
C2	77-833	16-366 MFD.	Preselector Section of 3 Gang
C3	77-833	16-366 MFD.	Oscillator Section of 3 Gang
C4	77-835	First Preselector Trimmer on C1	
C5	77-835	Second Preselector Trimmer on C2	
C6	77-835	Oscillator Trimmer on C3	
C7	78-1898	3-30 MFD.	Police Band Oscillator Trimmer
C8	78-1898	3-30 MFD.	Police Band Preselector Trimmer
C9	78-1898	3-30 MFD.	Foreign Band
C10	78-2009	First I.F. Secondary Trimmer Condenser	
C11	78-2011	Second I.F. Primary Trimmer Condenser	
C12	78-2008	Second I.F. Secondary Trimmer Condenser	
C13	78-2013	Second I.F. Secondary Trimmer Condenser	
C14	78-2005	.1 Mfd. 500 Volt I.F. Cathode By-Pass Cond.	
C15	78-2005	.01 Mfd. 400 Volt Audio Feed Condenser	
C16	78-2011	.5 Mfd. 500 Volt First Audio Cathode By-Pass	
C17	78-2008	.1 Mfd. 500 Volt First Audio Plate Bore Filter	
C18	78-2005	.001 Mfd. Mica First Audio Plate By-Pass Cond.	
C19	78-2009	.01 Mfd. 400 Volt Audio Feed Condenser	
C20	78-2005	.01 Mfd. 400 Volt Tone Control Condenser	
C21	78-2001	.01 Mfd. 400 Volt Output Filter By-Pass Cond.	
C22	18-928	.25 Mfd. 25 Volt Dry Electrolytic Condenser	
C23	18-2002	4-4 Mfd. 450 V.V. Dry Electrolytic Condenser	
C24	78-2008	.1 Mfd. 500 Volt Screen By-Pass Condenser	
C25	78-2015	1. Mfd. 500 Volt 2 Supply By-Pass Condenser	
C26	78-2003	.01 Mfd. 400 Volt Line By-Pass Condenser	
C27	78-2007	.0005 Mfd. Mica Diode Filter Condenser	
C28	78-2008	.1 Mfd. 500 Volt A.V.C. Network By-Pass Cond.	
C29	78-2003	.01 Mfd. 400 Volt Oscillator Coupling Cond.	
C30	78-2002	.00005 Mfd. Mica Oscillator Grid Condenser	
C31	78-2005	.01 Mfd. 400 Volt A.V.C. Network By-Pass Cond.	
C32	78-2003	.01 Mfd. 400 Volt Sub Antenna Condenser	

INDUCTANCES	
L1	17-2077 Foreign Band Oscillator Coil Assembly
L2	17-1667 Police Band Oscillator Coil Assembly
L3	17-2030 Broadcast Oscillator Coil Assembly
L4	17-2028 Broadcast Preselector Coil Assembly
L5	17-1665 Police Band Preselector Coil Assembly
L6	17-2076 Foreign Band Preselector Coil Assembly
L7	66-2026 First I.F. Trans. Assembly
L8	68-2084 Second I.F. Trans. Assembly
L9	64-2025 Speaker With 800 Ohm Field
L10	64-2025 Speaker With 2800 Ohm Field
L11	60-2010 Power Transformer (Unless Spec'ed)

MODEL 6B8

FREQUENCY RANGE -

- 1500 to 550 KC
- 4 to 1.5 MC
- 15.5 to 5.5 MC

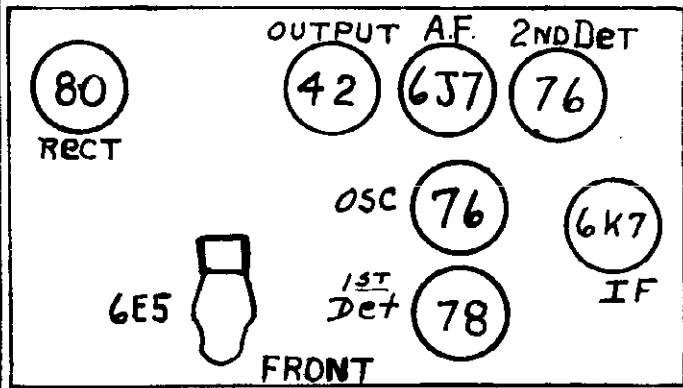
ALIGNMENT

BROADCAST - Generator is connected to ANT lead thru a standard dummy antenna, set at 1400 KC, trim the Oscillator trimmer, then the Pre-selector trimmers to maximum peak. Pad the Oscillator circuit at 600 KC while rocking the rotor of gang condenser.

FOREIGN - Generator is connected in same manner, set at 15 MC, locate signal on dial, trim Pre-selector trimmers to peak. Check at 6 MC

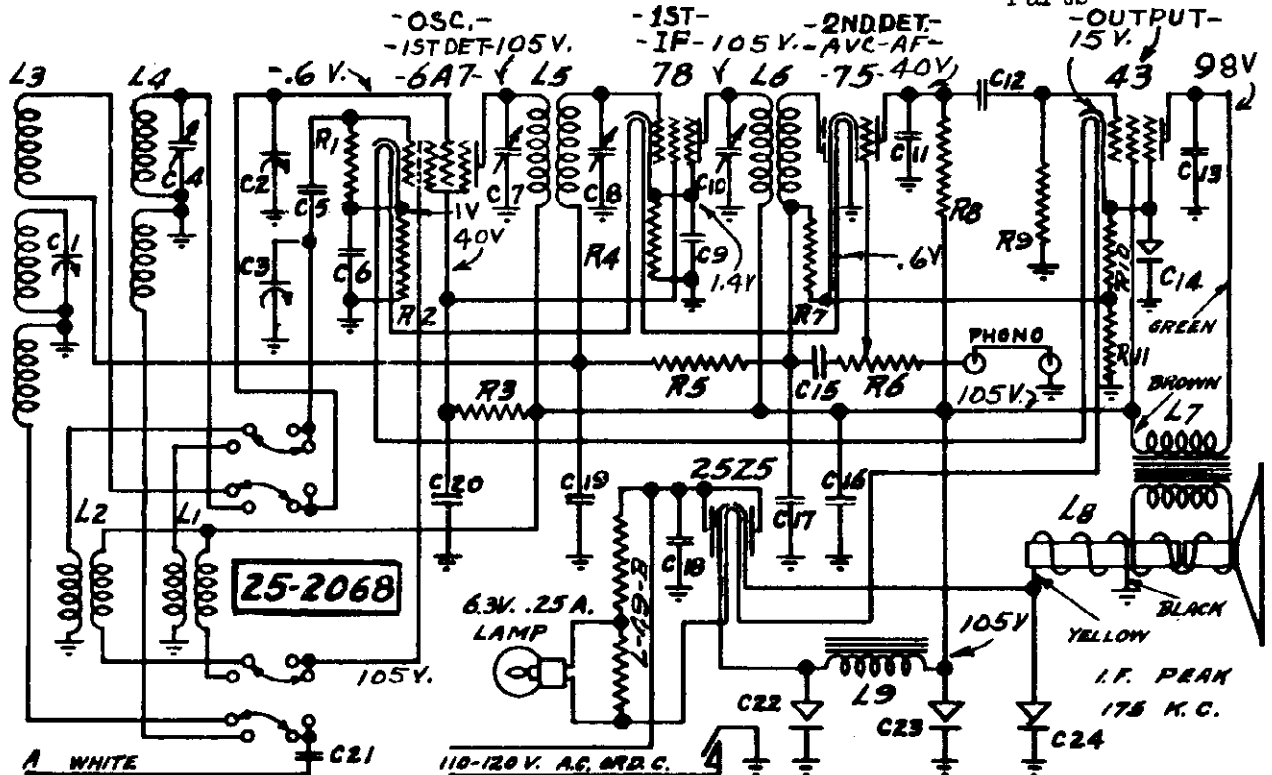
POLICE - Generator to 3.5 MC, locate signal on dial, then trim Pre-select- or trimmers to peak. Repeat adjustments.

CONVENTIONAL ALIGNMENT
(See special section)



WILCOX-GAY CORP.

MODEL 6D6
Schematic, Voltage
Socket, Alignment
Parts



R1	53-898	50,000 Ohm Oscillator Grid Resistor	C25	18-2006	4 Mfd. 150 W.V. Dry Electrolytic Condenser
R2	53-1062	250 Ohm Oscillator Cathode Resistor	C24	18-2006	4 Mfd. 150 W.V. Dry Electrolytic Condenser
R3	53-1042	25,000 Ohm 6A7 & 78 Screen Resistor	L1	17-2077	Foreign Band Oscillator Coil Assembly
R4	53-1063	500 Ohm 78 Cathode Resistor	L2	17-2079	Broadcast Oscillator Coil Assembly
R5	53-926	1 Meg Ohm AVC Network Resistor	L3	17-2080	Broadcast Preselector Coil Assembly
R6	19-1291	500,000 Ohm Volume Control & Switch	L4	17-2078	Foreign Band Preselector Coil Assembly
R7	53-925	500,000 Ohm Diode Resistor	L5	08-2012	First I.F. Transformer Assembly
R8	53-924	250,000 Ohm 75 Plate Resistor	L6	17-2064	Second I.F. Transformer Assembly
R9	53-925	500,000 Ohm 43 Grid Resistor	L7	64-2006	5" Speaker 43 Output Transformer on L8
R10	53-1062	500 Ohm 43 Cathode Resistor	L8	64-2006	5" Speaker 3000 Ohm Field
R11	53-1122	40 Ohm 75 Cathode Resistor	L9	14-940	20 Henry Filter Choke
C1	77-833	366 MMFD. Preselector Section of 3 Gang			
C2	77-833	366 MMFD. Preselector Section of 3 Gang			
C3	77-833	328 MMFD. Oscillator Section of 3 Gang			
C4	78-2010	3-30 MMFD. Foreign Band Preselector Trimmer Cond.			
C5	78-2002	.00005 Mfd. Mica Oscillator Grid Condenser			
C6	78-2006	.1 Mfd. 200 Volt Paper 6A7 Cathode By-Pass Cond.			
C7	78-2008	First I.F. Primary Trimmer Condenser			
C8	78-2011	First I.F. Secondary Trimmer Condenser			
C9	78-2006	.1 Mfd. 200 Volt Paper 78 Cathode By-Pass Cond.			
C10	78-2009	Second I.F. Trimmer Condenser			
C11	78-266	.001 Mfd. Mica 75 Plate Filter Condenser			
C12	78-2003	.01 Mfd. 400 Volt Paper Audio Feed Condenser			
C13	78-2002	.004 Mfd. 600 Volt Paper 43 Plate Filter Condenser			
C14	18-928	25 Mfd. 25 Volt Dry Electrolytic Condenser			
C15	78-2003	.01 Mfd. 400 Volt Paper Audio Feed Condenser			
C16	78-2011	.5 Mfd. 200 Volt Paper B Supply By-Pass Condenser			
C17	78-507	.0005 Mfd. Mica Diode Filter Condenser			
C18	78-2006	.1 Mfd. 200 Volt Paper Line By-Pass Condenser			
C19	78-2006	.1 Mfd. 200 Volt Paper A.V.C. Network By-Pass Cond.			
C20	78-2006	.1 Mfd. 200 Volt Paper 6A7 & 78 Screen By-Pass Cond.			
C21	78-2003	.01 Mfd. 400 Volt Paper Antenna Series Condenser			
C22	18-2003	11 Mfd. 150 W.V. Dry Electrolytic Condenser			

MODEL 6D6

FREQUENCY RANGE -

1500 to 550 KC

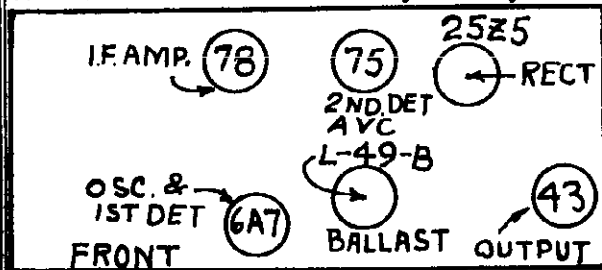
5.5 to 15.5 MC

BROADCAST BAND ALIGNMENT :

Wave change switch in counter clockwise position, generator to antenna lead thru standard dummy antenna. Adjust OSC trimmer (rear of gang) to 1400 KC peak. Then adjust the ANT and Pre-selector trimmers to peak. Pad the OSC circuit at 600 KC.

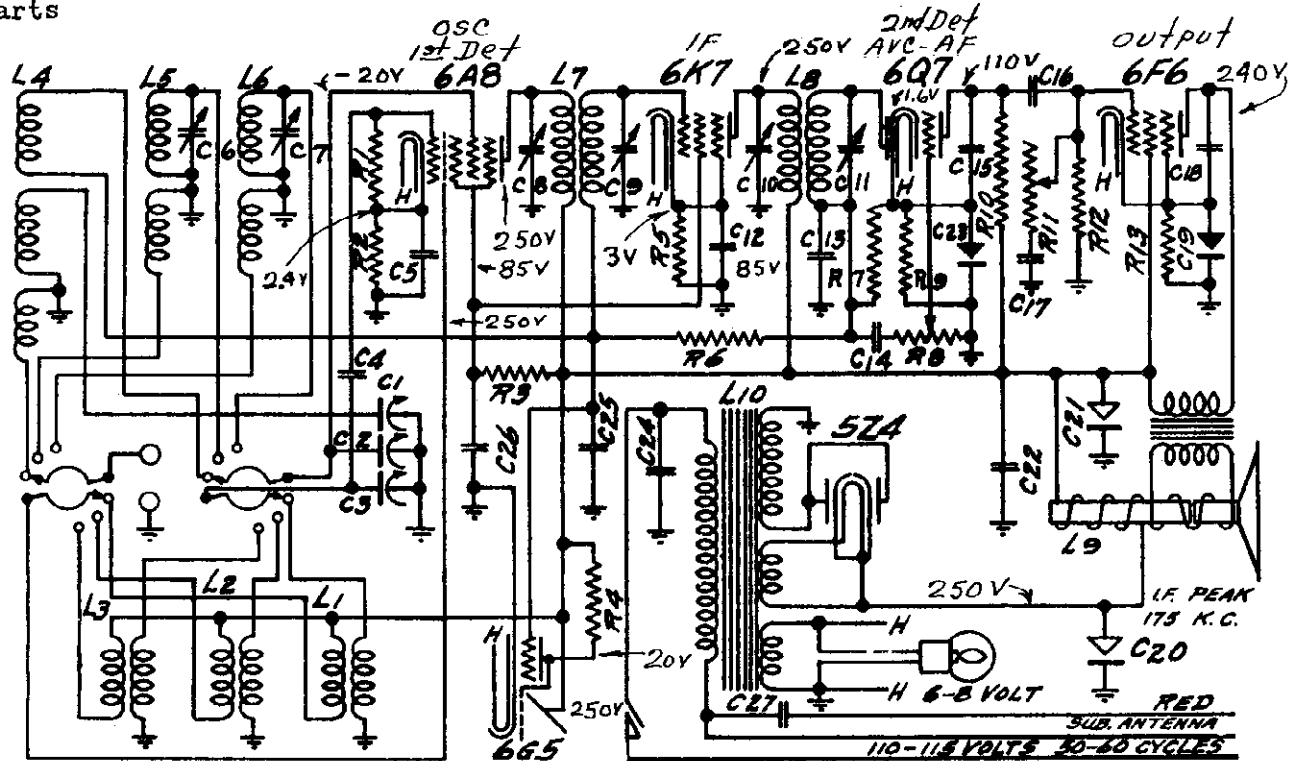
SHORT WAVE BAND - Wave change switch in clockwise position. Generator to 15 MC, locate signal on dial, then peak ANT and Pre-selector trimmers. No padding of oscillator circuit required on band.

CONVENTIONAL ALIGNMENT -
(see the special section)



MODELS 6F6, 6FB6
Schematic, Voltage
Socket, Alignment
Parts

WILCOX-GAY CORP.



R1	53-898	50,000 Ohm Oscillator Grid Resistor	C21	18-2006	16 Mfd. 250 W.V. Electrolytic Capacitor
R2	53-1062	250 Ohm Oscillator Cathode Resistor	C22	75-2012	.5 Mfd. 400 Volt Paper B Supply By-Pass Cond.
R3	53-898	50,000 Ohm R.F. & I.F. Screen Resistor	C23	18-928	25 Mfd. 25 Volt Elect. 6Q7 Cathode By-Pass Cond.
R4	53-926	1 Meg Ohm 6G5 Triode Plate Resistor	C24	75-2003	.01 Mfd. 400 Volt Paper Line By-Pass Cond.
R5	53-1063	800 Ohm I.F. Cathode Resistor	C25	75-2005	.1 Mfd. 200 Volt Paper A.V.C. Network By-Pass Cond.
R6	53-926	1 Meg Ohm A.V.C. Network Resistor	C26	75-2005	.1 Mfd. 200 V. Paper R.F. & I.F. Screen By-Pass Cond.
R7	53-925	500,000 Ohm Diode Load Resistor	C27	75-2003	.01 Mfd. 400 Volt Paper Sub. Antenna Cond.
R8	19-1311	500,000 Ohm Volume Control			
R9	53-919	5,000 Ohm 6Q7 Cathode Resistor			
R10	53-924	250,000 Ohm 6Q7 Plate Resistor			
R11	19-1317	250,000 Ohm Tone Control			
R12	53-926	500,000 Ohm 6F6 Grid Resistor			
R13	53-1063	800 Ohm 6F6 Cathode Resistor			
C1	77-833	366 MMFD. Pre-selector Section of 3 Gang	L1	17-2106	Broadcast Oscillator Coil Assembly
C2	77-833	366 MMFD. Pre-selector Section of 3 Gang	L2	17-2106	Police Band Oscillator Coil Assembly
C3	77-833	328 MMFD. Oscillator Section of 3 Gang	L3	17-2095	Foreign Band Oscillator Coil Assembly
C4	78-2002	.00005 Mfd. Mica Osc. Grid Condenser	L4	17-2100	Broadcast Pre-selector Coil Assembly
C5	75-2005	.1 Mfd. 200 Volt Paper 6A8 Cathode Cond.	L5	17-2104	Police Band Pre-selector Coil Assembly
C6	78-1587	3-50 MMFD. Police Band Pres. Trimmer Cond.	L6	17-2096	Foreign Band Pre-selector Coil Assembly
C7	78-1587	3-50 MMFD. Foreign Band Pres. Trimmer Cond.	L7	68-2026	First I.F. Transformer Assembly
C8	78-2008	First I.F. Primary Trimmer Condenser	L8	68-2024	Second I.F. Transformer Assembly
C9	78-2011	First I.F. Secondary Trimmer Condenser	L9	64-2050	12" Speaker 1800 Ohm Field, 6F6 Trans.
C10	78-2008	Second I.F. Primary Trimmer Condenser	L10	64-2022	8" Speaker, 1800 Ohm Field, 6F6 Trans.
C11	78-2013	Second I.F. Secondary Trimmer Condenser			
C12	75-2005	.1 Mfd. 200 Volt Paper 6K7 Cathode Cond.			
C13	78-307	.0005 Mfd. Diode Filter Condenser			
C14	75-2005	.1 Mfd. 200 Volt Paper Audio Feed Cond.			
C15	78-265	.001 Mfd. Mica 6Q7 Plate Filter Cond.			
C16	75-2005	.1 Mfd. 200 Volt Paper Audio Feed Cond.			
C17	75-2003	.01 Mfd. 400 Volt Tone Control Cond.			
C18	75-2001	.002 Mfd. 800 Volt Paper 6F6 Plate Filter Cond			
C19	18-928	25 Mfd. 25 Volt Dry Electrolytic Capacitor			
C20	19-2006	12 Mfd. 325 W.V. Electrolytic Capacitor			

MODEL 6F6, 6FB6

FREQUENCY RANGE -

- 1500 to 550 KC
- 4 to 1.5 MC
- 15.5 to 5.5 MC

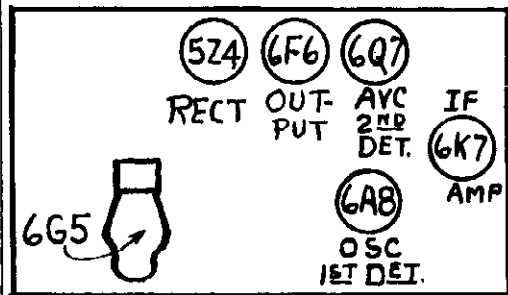
BROADCAST - Gen. to ANT lead thru standard dummy antenna, set at 1400 KC, trim OSC trimmer, then Pre-selector trimmers to maximum peak. Pad OSC circuit at 600 KC while rocking gang.

FOREIGN- Generator to 15 MC, locate signal on dial, peak Pre-selector trimmers to maximum. Check at 6 MC.

POLICE - Generator to 3.5 MC, locate the signal on dial, adjust Pre-selector trimmers to peak. Repeat adjustments for maximum response.

CONVENTION ALIGNMENT PROCEDURE

(see special section)

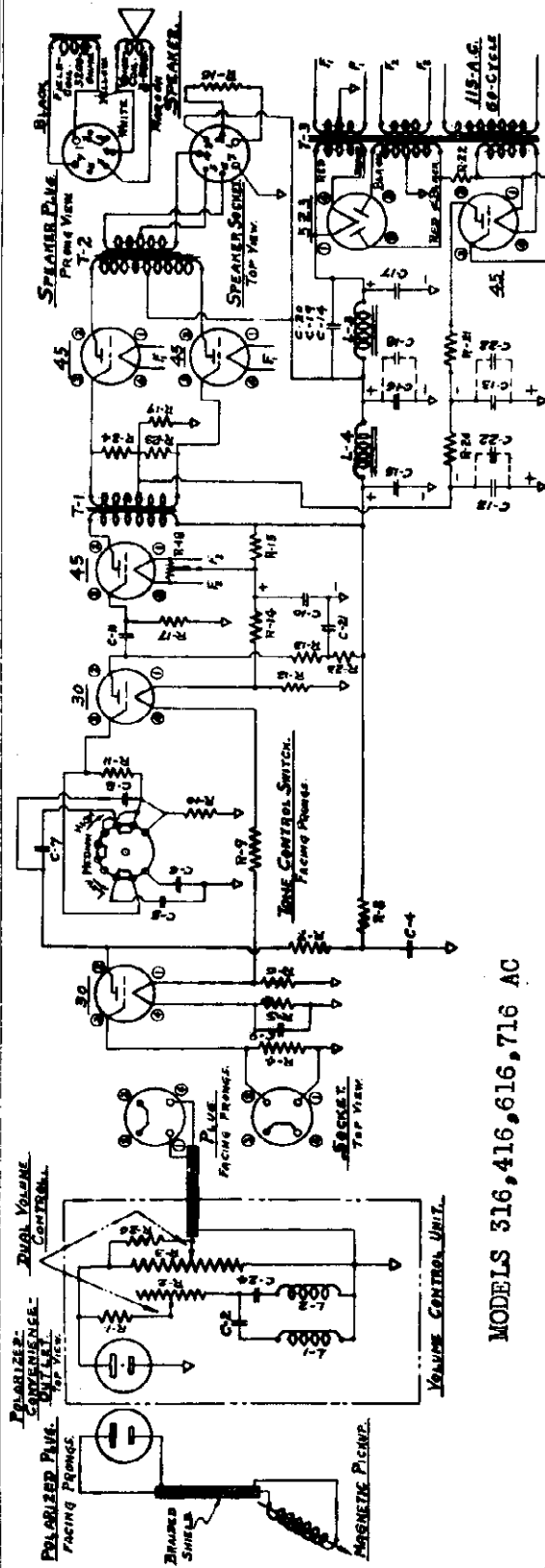


THE RUDOLPH WURLITZER CO.

MODELS 316, 416, 616
716 AC

Schematic, Voltage
Parts

PICKUP PART NO 24707 VOLUME CONTROL *177AM-PART NO 24298 AMPLIFIER *771. 40-CYCLE #24368 SPEAKERS JENSEN #26923, MAGNAVOX-26409. 25-CYCLE #24369. 40-CYCLE #24370. 60-CYCLE #24274.



MODELS 316, 416, 616, 716 AC

ITEM	REMARKS	ITEM	VALUE	REMARKS	ITEM	VALUE	REMARKS
R-1	10K	R-1	220K	10-WATT	C-1	200MFD	10%
R-2	10K	R-2	220K	10-WATT	C-2	200MFD	10%
R-3	150	R-3	220K	10-WATT	C-3	200MFD	10%
R-4	150	R-4	220K	10-WATT	C-4	200MFD	10%
R-5	150	R-5	220K	10-WATT	C-5	200MFD	10%
R-6	150	R-6	220K	10-WATT	C-6	200MFD	10%
R-7	150	R-7	220K	10-WATT	C-7	200MFD	10%
R-8	150	R-8	220K	10-WATT	C-8	200MFD	10%
R-9	150	R-9	220K	10-WATT	C-9	200MFD	10%
R-10	150	R-10	220K	10-WATT	C-10	200MFD	10%
R-11	150	R-11	220K	10-WATT	C-11	200MFD	10%
R-12	150	R-12	220K	10-WATT	C-12	200MFD	10%
R-13	150	R-13	220K	10-WATT	C-13	200MFD	10%
R-14	150	R-14	220K	10-WATT	C-14	200MFD	10%
R-15	150	R-15	220K	10-WATT	C-15	200MFD	10%
R-16	150	R-16	220K	10-WATT	C-16	200MFD	10%
R-17	150	R-17	220K	10-WATT	C-17	200MFD	10%
R-18	150	R-18	220K	10-WATT	C-18	200MFD	10%

ITEM	VALUE	REMARKS	ITEM	VALUE	REMARKS
C-19	24364	1 - MFD	C-24	22241	100-1000 OHMS
C-20	24364	5 - MFD	C-25	22241	100-1000 OHMS
C-21	24364	5 - MFD	C-26	22241	100-1000 OHMS
C-22	24364	5 - MFD	C-27	22241	100-1000 OHMS
C-23	24364	5 - MFD	C-28	22241	100-1000 OHMS
C-24	24364	5 - MFD	C-29	22241	100-1000 OHMS
C-25	24364	5 - MFD	C-30	22241	100-1000 OHMS
C-26	24364	5 - MFD	C-31	22241	100-1000 OHMS
C-27	24364	5 - MFD	C-32	22241	100-1000 OHMS
C-28	24364	5 - MFD	C-33	22241	100-1000 OHMS
C-29	24364	5 - MFD	C-34	22241	100-1000 OHMS
C-30	24364	5 - MFD	C-35	22241	100-1000 OHMS
C-31	24364	5 - MFD	C-36	22241	100-1000 OHMS
C-32	24364	5 - MFD	C-37	22241	100-1000 OHMS
C-33	24364	5 - MFD	C-38	22241	100-1000 OHMS
C-34	24364	5 - MFD	C-39	22241	100-1000 OHMS
C-35	24364	5 - MFD	C-40	22241	100-1000 OHMS
C-36	24364	5 - MFD	C-41	22241	100-1000 OHMS
C-37	24364	5 - MFD	C-42	22241	100-1000 OHMS
C-38	24364	5 - MFD	C-43	22241	100-1000 OHMS
C-39	24364	5 - MFD	C-44	22241	100-1000 OHMS
C-40	24364	5 - MFD	C-45	22241	100-1000 OHMS

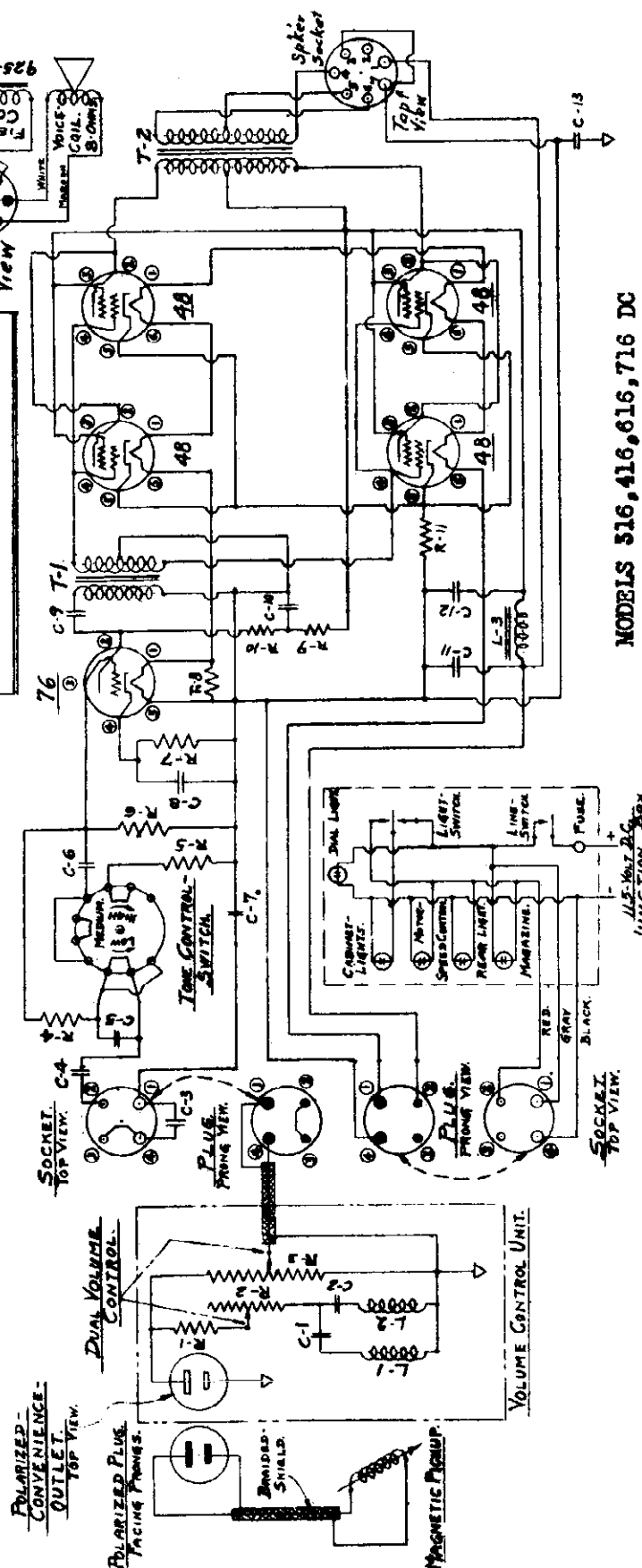
1937

MODELS 316, 416, 616
716 DC

THE RUDOLPH WURLITZER CO.

Schematic, Voltage
Parts

PICK UP - PART NO 24707 VOLUME CONTROL 157AM PART NO 26374 AMPLIFIER *751 - PART NO 26367.
SPEAKER, PART NO 27156.



MODELS 316, 416, 616, 716 DC

ITEM PART NO	VALUE	REMARKS	ITEM PART NO	VALUE	REMARKS
R-1	22330	1000 OHM ± 10% 1/4 - WATT	R-11	22287	53 OHM ± 5% 70
R-2	26378	7500 OHM DUAL Y.C. REAR SECT.	R-12		
R-3	21939	150,000 OHM DUAL Y.C. PANEL SECT.	R-13		
R-4	21939	50,000 OHM ± 10% 1/4 - WATT	R-14		
R-5	21938	35,000 OHM ± 10% 1/4 - WATT	R-15		
R-6	20455	150,000 OHM ± 10% 1/4 - WATT	R-16		
R-7	22329	2000 OHM ± 10% 1/4 - WATT	R-17		
R-8	22251	63 OHM ± 5% 0 - WATT	C-1	22241	.002 - MFD. ± 10% MICA
R-9	21997	50,000 OHM ± 10% 1/4 - WATT	C-2	20663	.25 - MFD. ± 10% 240 W.VOLTS
R-10	21938	100,000 OHM ± 10% 1/4 - WATT	C-3	22281	.002 - MFD. ± 10%
C-1			C-4		
C-2			C-5		
C-3			C-6		
C-4			C-7		
C-5			C-8		
C-6			C-9		
C-7			C-10		
C-8			C-11		
C-9			C-12		
C-10			C-13		
C-11			C-14		
C-12					
C-13					
C-14					
S-1					

VOLTAGES AND CURRENTS OF MODEL *751-AMPLIFIER. ALL MEASUREMENTS MADE WITH LINE VOLTAGE 115-VOLTS D.C.

ALL VOLTAGES MEASURED WITH 1000-OHMS PER VOLT VOLTMETER.

AVERAGE PLATE VOLTAGE MEASURED FROM PLATE + TO CONTACT *7-ON SPEAKER SOCKET. -48 110-VOLTS D.C. 20-VOLTS D.C.

AVERAGE BIAS VOLTAGE MEASURED FROM CATHODE OF TUBE TO *7-CONTACT ON SPEAKER SOCKET. -48 16.0-VOLTS D.C. 1.0-VOLT D.C.

AVERAGE FILAMENT VOLTAGE :- -48 27.5-VOLTS D.C.

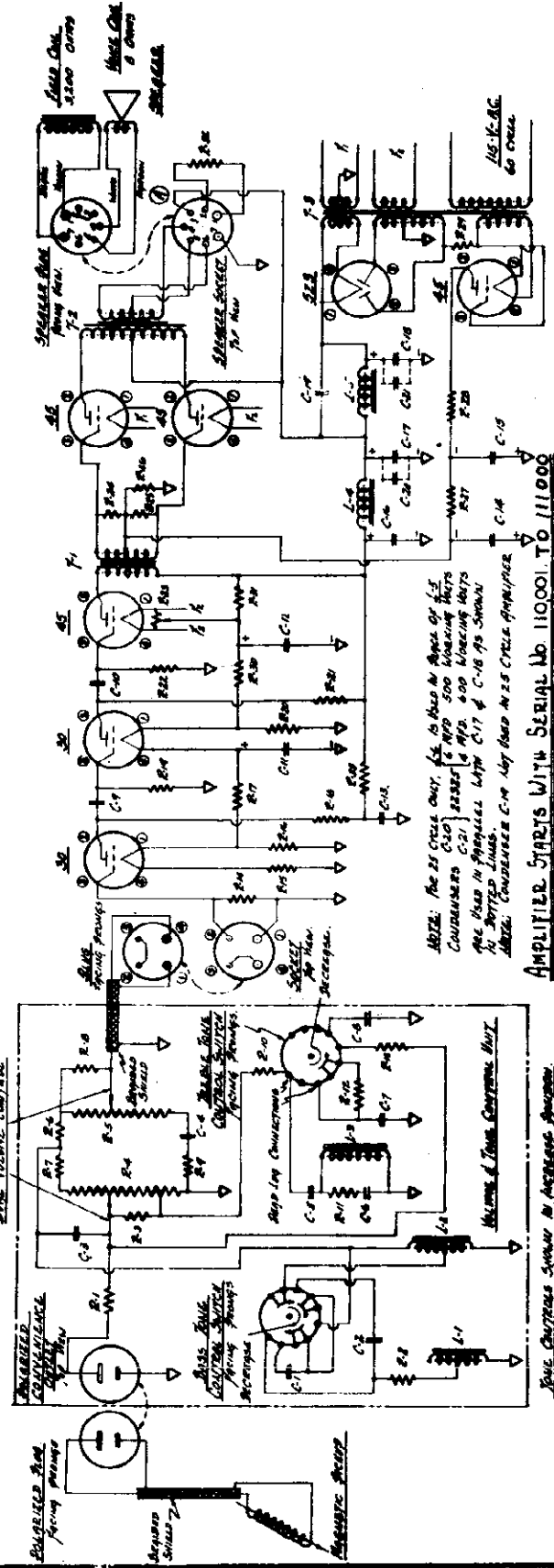
-76 6.1-VOLTS D.C.

1937

THE RUDOLPH WURLITZER CO.

MODEL 400
 Ser #110001-111000
 Schematic, Voltage
 Parts

PICKUP PART # 23223 VOLUME CONTROL # 176 AM PART # 23209 AMPLIFIER # 671 2.5-CYCLE # 23744 SPEAKER PART # 23069



NOTE: The 2.5 cycle out. is in line in range of 1.5
 C-10 2.5 cycle out. is in range of 1.5
 C-17 2.5 cycle out. is in range of 1.5
 C-18 2.5 cycle out. is in range of 1.5
 C-19 2.5 cycle out. is in range of 1.5
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 C-96 2.5 cycle out. is in range of 1.5
 C-97 2.5 cycle out. is in range of 1.5
 C-98 2.5 cycle out. is in range of 1.5
 C-99 2.5 cycle out. is in range of 1.5
 C-100 2.5 cycle out. is in range of 1.5

TUBE PART NO.	TYPE	WIRE	REMARKS	TYPE	WIRE	REMARKS
21790	45	22	6X4	21790	45	6X4
21791	32	22	6X6	21791	32	6X6
21792	45	22	6X4	21792	45	6X4
21793	45	22	6X4	21793	45	6X4
21794	45	22	6X4	21794	45	6X4
21795	45	22	6X4	21795	45	6X4
21796	45	22	6X4	21796	45	6X4
21797	45	22	6X4	21797	45	6X4
21798	45	22	6X4	21798	45	6X4
21799	45	22	6X4	21799	45	6X4
21800	45	22	6X4	21800	45	6X4
21801	45	22	6X4	21801	45	6X4
21802	45	22	6X4	21802	45	6X4
21803	45	22	6X4	21803	45	6X4
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21896	45	22	6X4	21896	45	6X4
21897	45	22	6X4	21897	45	6X4
21898	45	22	6X4	21898	45	6X4
21899	45	22	6X4	21899	45	6X4
21900	45	22	6X4	21900	45	6X4

VOLTAGES AND CURRENTS OF MODEL # 671 AMPLIFIER. ALL MEASUREMENTS MADE WITH LINE VOLTAGE 115-VOLTS.

ALL VOLTAGES MEASURED WITH 1000 OHMS PER VOL. VOLTMETER.

AVERAGE PLATE VOLTAGE MEASURED FROM PLATE TO CHASSIS -

OUTPUT -45 355-VOLTS D.C.

DRIVER -45 327-VOLTS D.C.

-30 175-VOLTS D.C.

-30 80-VOLTS D.C.

AVERAGE VOLTAGES ACROSS SPEAKER FIELDS AND ELECTROLYTIC CONDENSERS.

3200-OHM AUXILIARY SPEAKER FIELD VOLTAGE MEASURED FROM #1-CONTACT TO #1-CONTACT ON SPEAKER SOCKET 205-VOLTS D.C.

2500-OHM SPEAKER FIELD VOLTAGE MEASURED FROM #1-CONTACT TO #3-CONTACT ON SPEAKER SOCKET 155-VOLTS D.C.

C-18 ELECTROLYTIC 305-VOLTS D.C.

C-17 ELECTROLYTIC 360-VOLTS D.C.

C-16 ELECTROLYTIC 355-VOLTS D.C.

AVERAGE GRID VOLTAGE MEASURED FROM GRID TO FILAMENT.

RECTIFIER 523 50-VOLTS A.C.

OUTPUT -45 87-VOLTS D.C.

DRIVER -45 40-VOLTS D.C.

-30 2.1-VOLTS A.C.

-30 2.1-VOLTS D.C.

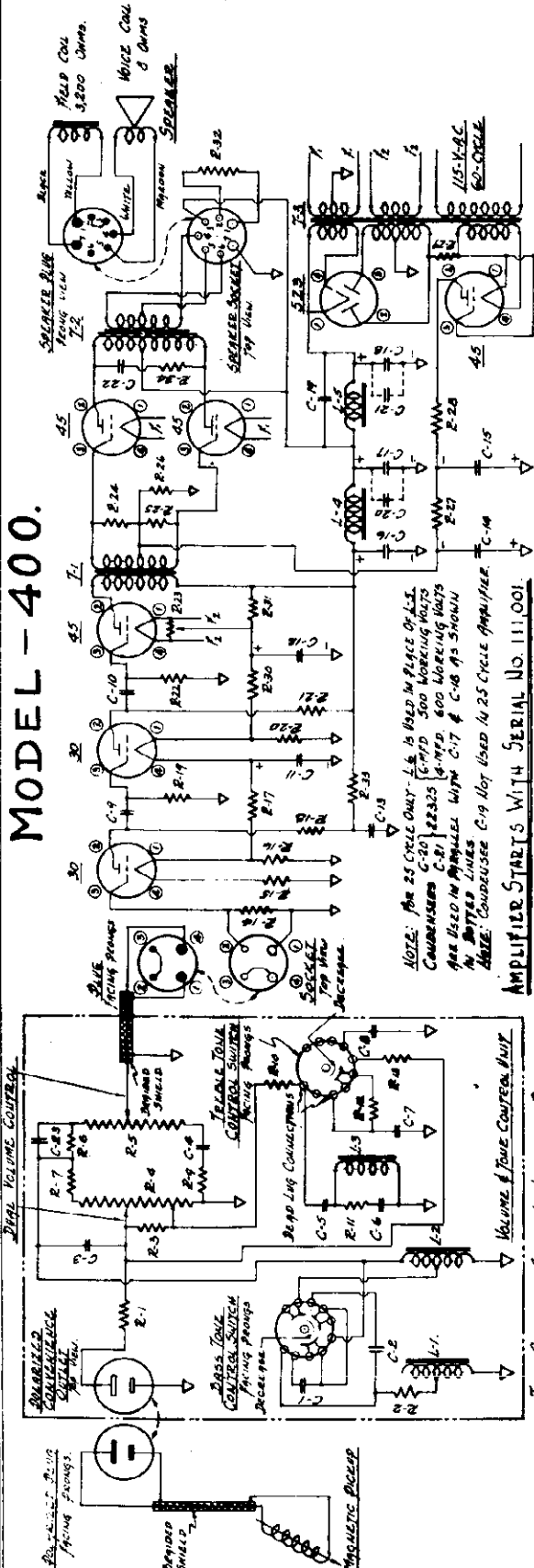
MODEL 400

Ser. #111001-111500
Schematic, Voltage
Parts

THE RUDOLPH WURLITZER CO.

PICKUP PART NO 23223 VOLUME CONTROL *276-AM-PART NO 24065 AMPLIFIER *672-60-CYCLE-24062 SPEAKER PART NO 23089

MODEL - 400.

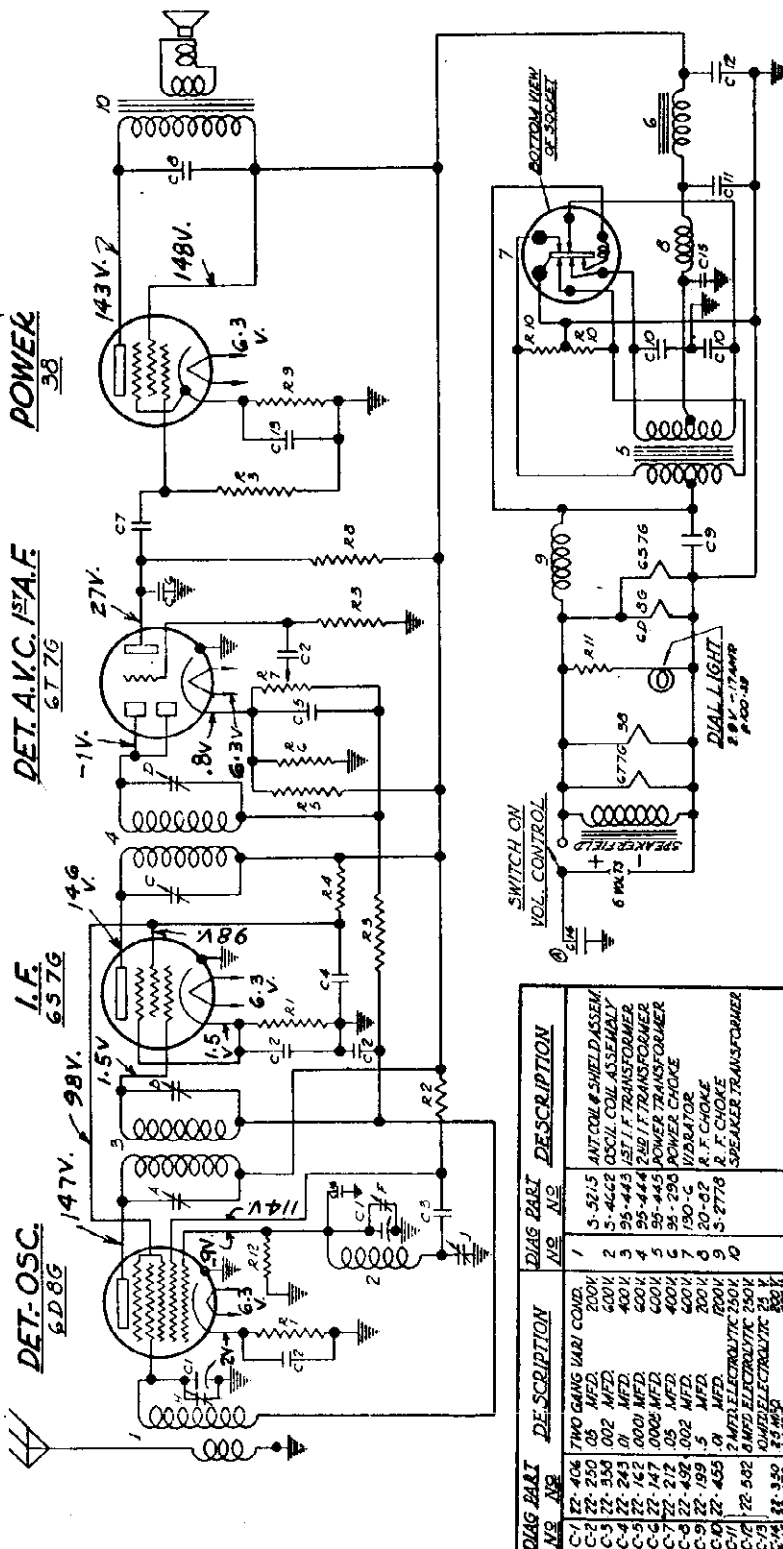


TUBE	TYPE	RESISTANCE	WATTAGE	VALUE	REMARKS
E-1	6X4	250,000 OHMS	20%	4 WATT	RECTIFIER
E-2	6AV6	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-3	6AR5	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-4	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-5	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-6	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-7	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-8	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-9	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-10	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-11	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-12	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-13	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-14	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-15	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-16	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-17	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-18	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-19	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-20	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-21	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-22	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-23	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-24	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-25	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-26	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-27	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-28	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-29	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-30	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-31	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-32	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-33	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-34	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-35	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-36	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-37	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-38	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-39	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-40	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-41	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-42	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-43	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-44	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-45	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-46	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-47	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-48	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-49	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-50	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-51	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-52	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-53	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-54	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-55	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-56	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-57	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-58	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-59	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-60	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-61	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-62	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-63	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-64	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-65	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-66	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-67	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-68	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-69	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-70	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-71	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-72	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-73	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-74	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-75	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-76	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-77	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-78	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-79	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-80	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-81	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-82	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-83	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-84	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-85	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-86	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-87	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-88	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-89	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-90	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-91	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-92	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-93	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-94	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-95	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-96	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-97	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-98	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-99	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE
E-100	6X4	20,000 OHMS	2.5%	1 WATT	60 CYCLE

VOLTAGES AND CURRENTS OF MODEL 672-AMPLIFIER. ALL MEASUREMENTS MADE WITH LINE VOLTAGE 115-VOLTS.	
ALL VOLTAGES MEASURED WITH 1,000-OHMS PER VOLT VOLTMETER.	
AVERAGE PLATE VOLTAGE MEASURED FROM PLATE + TO CHASSIS -	AVERAGE GRID VOLTAGE MEASURED
OUTPUT - 45 355-VOLTS D.C.	FROM GRID TO FILAMENT.
DRIVER - 45 38.0-M.A.D.C.	OUTPUT - 45 87-VOLTS D.C.
-30 175-VOLTS D.C.	DRIVER - 45 40-VOLTS D.C.
-30 80-VOLTS D.C.	-30 1.5-M.A.D.C.
AVERAGE VOLTAGES ACROSS SPEAKER FIELDS AND ELECTROLYTIC CONDENSERS.	
3,200-OHM SPEAKER FIELD VOLTAGE MEASURED FROM #1-CONTACT TO #7-CONTACT ON SPEAKER SOCKET	205-VOLTS D.C.
2,500-OHM AUXILIARY SPEAKER FIELD VOLTAGE MEASURED FROM #1-CONTACT TO #3-CONTACT ON SPEAKER SOCKET	155-VOLTS D.C.
C-18 ELECTROLYTIC	385-VOLTS D.C.
C-16 ELECTROLYTIC	355-VOLTS D.C.
FROM RECTIFIER - 45-PLATE - TO CHASSIS + 150-VOLTS D.C.	

Chassis 5409
Schematic, Voltage
Socket, Trimmers
Alignment, Parts

ZENITH RADIO CORP.

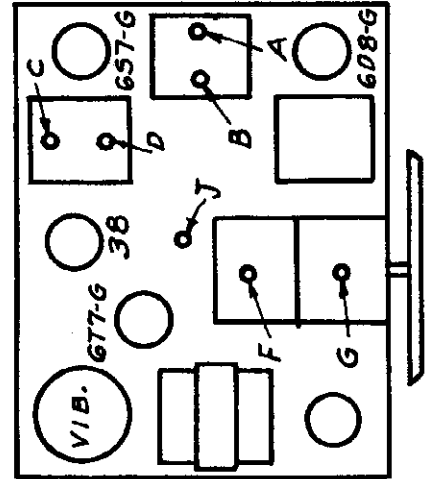


4 TUBE BATTERY SUPERHETERODYNE
I.F. - FREQUENCY 456 K.C.

FOR PHONO. DATA, SEE INDEX

ALIGNMENT PROCEDURE

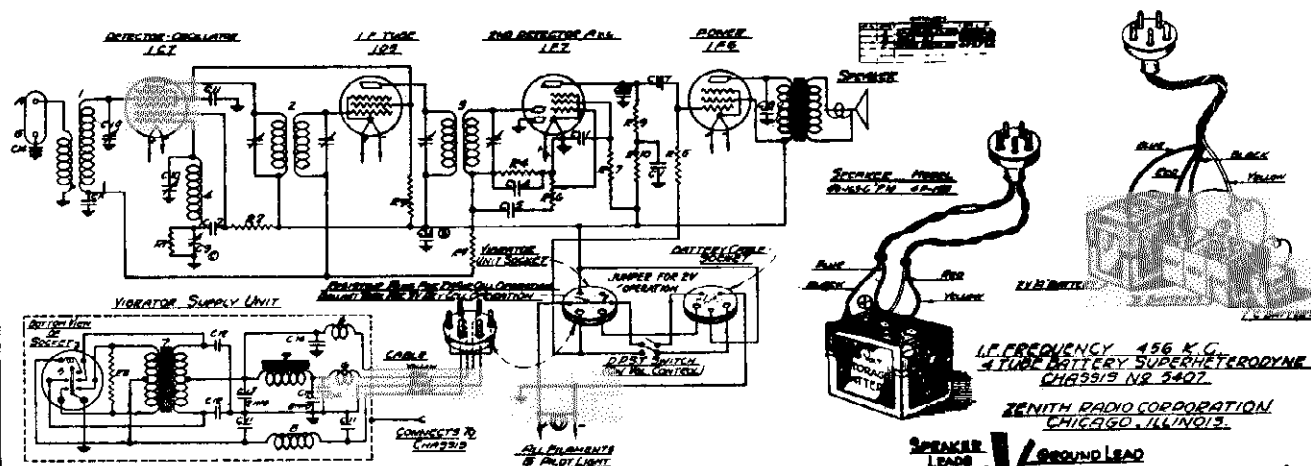
Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mmfd.	456	Br'dc't	600	A B C D	I. F. Alignment
2	Rec. Ant. Lead	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	G	Alignment of Ant.
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5	" " "	200 Mmfd.	1500	"	1500	F G	Repeat 3 & 4.



DIAG PART NO.	DESCRIPTION	DIAG PART NO.	DESCRIPTION
1	5-5215 ANTICOLL. SHIELD ASSEMBLY	1	127-406 TWO GANG VARI COND. 200V
2	5-4622 OSCIL. COIL ASSEMBLY	2	127-250 .05 MFD. 500V
3	98-443 151 I.F. TRANSFORMER	3	22-250 .002 MFD.
4	98-444 2ND I.F. TRANSFORMER	4	22-243 .01 MFD.
5	98-445 3RD I.F. TRANSFORMER	5	22-142 .0005 MFD.
6	98-290 POWER TRANSFORMER	6	22-147 .0005 MFD.
7	130-5 VIBRATOR	7	22-212 .05 MFD.
8	R.F. CHOKES	8	22-458 .002 MFD.
9	R.F. CHOKES	9	22-199 .5 MFD.
10	SPEAKER TRANSFORMER	10	22-455 .01 MFD.
		11	22-582 2 MFD. ELECTROLYTIC 250V
		12	22-582 2 MFD. ELECTROLYTIC 250V
		13	22-582 2 MFD. ELECTROLYTIC 250V
		14	22-582 2 MFD. ELECTROLYTIC 250V
		15	22-582 2 MFD. ELECTROLYTIC 250V
		16	22-582 2 MFD. ELECTROLYTIC 250V
		17	22-582 2 MFD. ELECTROLYTIC 250V
		18	22-582 2 MFD. ELECTROLYTIC 250V
		19	22-582 2 MFD. ELECTROLYTIC 250V
		20	22-582 2 MFD. ELECTROLYTIC 250V
		21	22-582 2 MFD. ELECTROLYTIC 250V
		22	22-582 2 MFD. ELECTROLYTIC 250V
		23	22-582 2 MFD. ELECTROLYTIC 250V
		24	22-582 2 MFD. ELECTROLYTIC 250V
		25	22-582 2 MFD. ELECTROLYTIC 250V
		26	22-582 2 MFD. ELECTROLYTIC 250V
		27	22-582 2 MFD. ELECTROLYTIC 250V
		28	22-582 2 MFD. ELECTROLYTIC 250V
		29	22-582 2 MFD. ELECTROLYTIC 250V
		30	22-582 2 MFD. ELECTROLYTIC 250V
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		32	22-582 2 MFD. ELECTROLYTIC 250V
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		34	22-582 2 MFD. ELECTROLYTIC 250V
		35	22-582 2 MFD. ELECTROLYTIC 250V
		36	22-582 2 MFD. ELECTROLYTIC 250V
		37	22-582 2 MFD. ELECTROLYTIC 250V
		38	22-582 2 MFD. ELECTROLYTIC 250V
		39	22-582 2 MFD. ELECTROLYTIC 250V
		40	22-582 2 MFD. ELECTROLYTIC 250V
		41	22-582 2 MFD. ELECTROLYTIC 250V
		42	22-582 2 MFD. ELECTROLYTIC 250V
		43	22-582 2 MFD. ELECTROLYTIC 250V
		44	22-582 2 MFD. ELECTROLYTIC 250V
		45	22-582 2 MFD. ELECTROLYTIC 250V
		46	22-582 2 MFD. ELECTROLYTIC 250V
		47	22-582 2 MFD. ELECTROLYTIC 250V
		48	22-582 2 MFD. ELECTROLYTIC 250V
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		50	22-582 2 MFD. ELECTROLYTIC 250V
		51	22-582 2 MFD. ELECTROLYTIC 250V
		52	22-582 2 MFD. ELECTROLYTIC 250V
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		57	22-582 2 MFD. ELECTROLYTIC 250V
		58	22-582 2 MFD. ELECTROLYTIC 250V
		59	22-582 2 MFD. ELECTROLYTIC 250V
		60	22-582 2 MFD. ELECTROLYTIC 250V
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		64	22-582 2 MFD. ELECTROLYTIC 250V
		65	22-582 2 MFD. ELECTROLYTIC 250V
		66	22-582 2 MFD. ELECTROLYTIC 250V
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		74	22-582 2 MFD. ELECTROLYTIC 250V
		75	22-582 2 MFD. ELECTROLYTIC 250V
		76	22-582 2 MFD. ELECTROLYTIC 250V
		77	22-582 2 MFD. ELECTROLYTIC 250V
		78	22-582 2 MFD. ELECTROLYTIC 250V
		79	22-582 2 MFD. ELECTROLYTIC 250V
		80	22-582 2 MFD. ELECTROLYTIC 250V
		81	22-582 2 MFD. ELECTROLYTIC 250V
		82	22-582 2 MFD. ELECTROLYTIC 250V
		83	22-582 2 MFD. ELECTROLYTIC 250V
		84	22-582 2 MFD. ELECTROLYTIC 250V
		85	22-582 2 MFD. ELECTROLYTIC 250V
		86	22-582 2 MFD. ELECTROLYTIC 250V
		87	22-582 2 MFD. ELECTROLYTIC 250V
		88	22-582 2 MFD. ELECTROLYTIC 250V
		89	22-582 2 MFD. ELECTROLYTIC 250V
		90	22-582 2 MFD. ELECTROLYTIC 250V
		91	22-582 2 MFD. ELECTROLYTIC 250V
		92	22-582 2 MFD. ELECTROLYTIC 250V
		93	22-582 2 MFD. ELECTROLYTIC 250V
		94	22-582 2 MFD. ELECTROLYTIC 250V
		95	22-582 2 MFD. ELECTROLYTIC 250V
		96	22-582 2 MFD. ELECTROLYTIC 250V
		97	22-582 2 MFD. ELECTROLYTIC 250V
		98	22-582 2 MFD. ELECTROLYTIC 250V
		99	22-582 2 MFD. ELECTROLYTIC 250V
		100	22-582 2 MFD. ELECTROLYTIC 250V

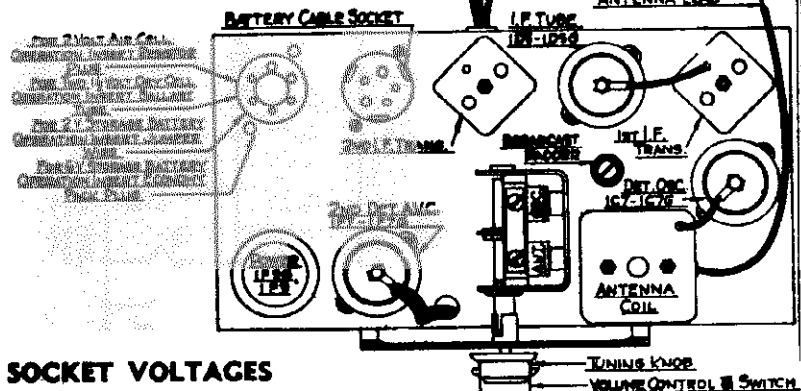
MODEL 4F133
 Chassis 5407
 Schematic, Voltage
 Socket, Trimmers
 Alignment, Parts
 Battery Conn.

ZENITH RADIO CORP.



I.F. FREQUENCY 456 K.C.
 4 TUBE BATTERY SUPERHETERODYNE
 CHASSIS NO. 5407
 ZENITH RADIO CORPORATION
 CHICAGO, ILLINOIS

QTY	PART NO.	DESCRIPTION	VAL	VAL	DESCRIPTION
1	1C7	6S 650	500V	125	500V 125 1/2" TRANSFORMER
1	1D5	6X4	500V	125	500V 125 1/2" TRANSFORMER
1	1F7	6AV6	500V	125	500V 125 1/2" TRANSFORMER
1	1F5	6X4	500V	125	500V 125 1/2" TRANSFORMER
1	1C7	6S 650	500V	125	500V 125 1/2" TRANSFORMER
1	1D5	6X4	500V	125	500V 125 1/2" TRANSFORMER
1	1F7	6AV6	500V	125	500V 125 1/2" TRANSFORMER
1	1F5	6X4	500V	125	500V 125 1/2" TRANSFORMER
1	1C7	6S 650	500V	125	500V 125 1/2" TRANSFORMER
1	1D5	6X4	500V	125	500V 125 1/2" TRANSFORMER
1	1F7	6AV6	500V	125	500V 125 1/2" TRANSFORMER
1	1F5	6X4	500V	125	500V 125 1/2" TRANSFORMER
1	1C7	6S 650	500V	125	500V 125 1/2" TRANSFORMER
1	1D5	6X4	500V	125	500V 125 1/2" TRANSFORMER
1	1F7	6AV6	500V	125	500V 125 1/2" TRANSFORMER
1	1F5	6X4	500V	125	500V 125 1/2" TRANSFORMER
1	1C7	6S 650	500V	125	500V 125 1/2" TRANSFORMER
1	1D5	6X4	500V	125	500V 125 1/2" TRANSFORMER
1	1F7	6AV6	500V	125	500V 125 1/2" TRANSFORMER
1	1F5	6X4	500V	125	500V 125 1/2" TRANSFORMER
1	1C7	6S 650	500V	125	500V 125 1/2" TRANSFORMER
1	1D5	6X4	500V	125	500V 125 1/2" TRANSFORMER
1	1F7	6AV6	500V	125	500V 125 1/2" TRANSFORMER
1	1F5	6X4	500V	125	500V 125 1/2" TRANSFORMER



SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
1C7	1st Det. Osc.	0	2	125	45	-2	112	0	0	0
1D5	I.F.	0	2	126	48	-	-	0	0	0
1F7	2nd Det. A.V.C.	0	2	27	0	0	9	0	0	0
1F5	Power	0	2	123	136	0	-	0	0	-

All voltages measured with a 1000 ohm per volt D.C. meter and using the Zenith 6 V Economy Pack—Antenna and ground disconnected.

Battery Voltage—6.3 V.

Battery Drain—.98 amp. **ALIGNMENT**

Connect the output leads of the signal generator to the grid of the first detector and receiver ground lead. Also connect an output meter across the speaker leads.

Set the signal generator at 456 K.C. and carefully adjust the four I.F. trimmers to the point giving the greatest output reading. These I.F. transformers are of a very high gain, selective type, and the adjustments should be repeated several times for greatest accuracy.

Change the signal generator leads to the antenna and ground terminals of the receiver.

Set the signal generator at 1400 K.C. Set the pointer on the receiver dial at the same frequency. First adjust the oscillator and then the detector trimmers on the gang condenser to the point giving the maximum reading on the output meter, using as small a signal from the generator as possible so as to prevent the A.V.C. action from affecting the output readings.

Reset the signal generator to 600 K.C.

Slowly rock the pointer past 600 K.C. on dial meanwhile adjusting the osc. padder (located in rear of gang condenser) to the combination giving the greatest output reading.

Repeat operation No. 4.

ZENITH RADIO CORP.

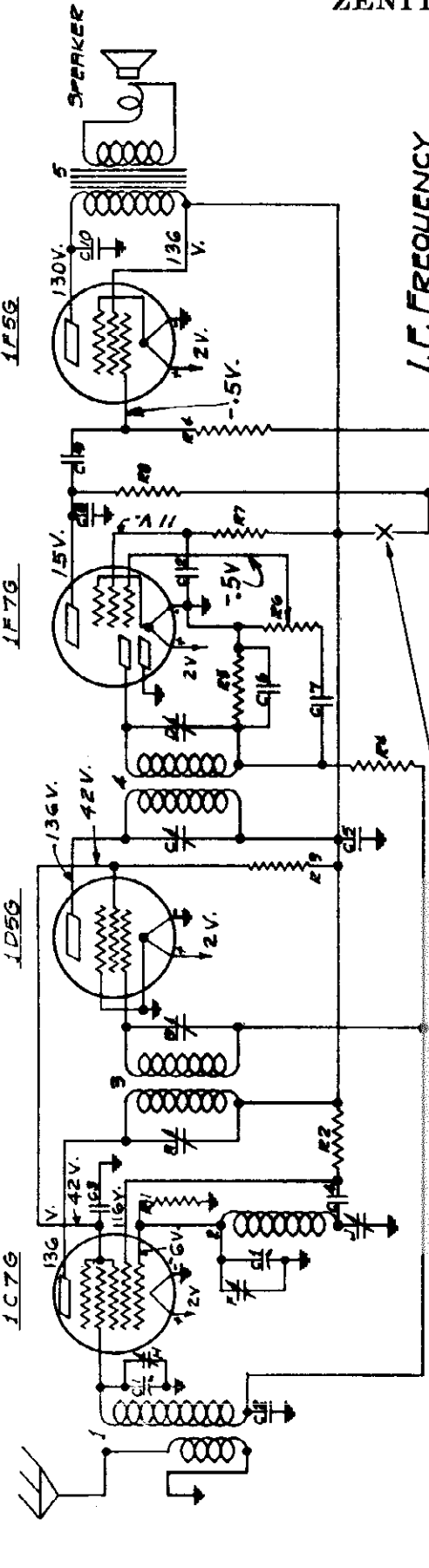
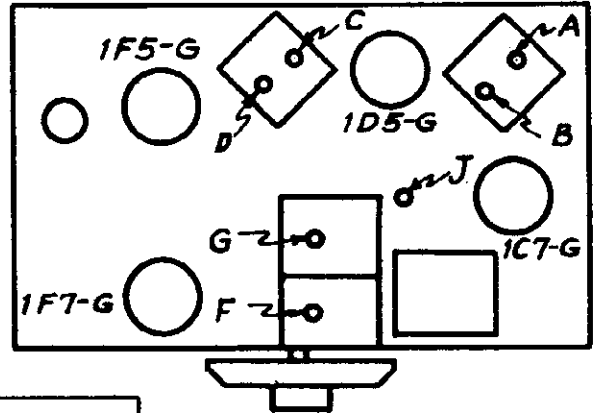
POWER
1F5G

2ND DETECTOR A.K.C.
1F7G

I.F. TUBE
1D5G

DETECTOR-OSCILLATOR
1C7G

I.F. FREQUENCY
456 K.C.



ALL FILAMENTS

PILOT LITE
21-440-10

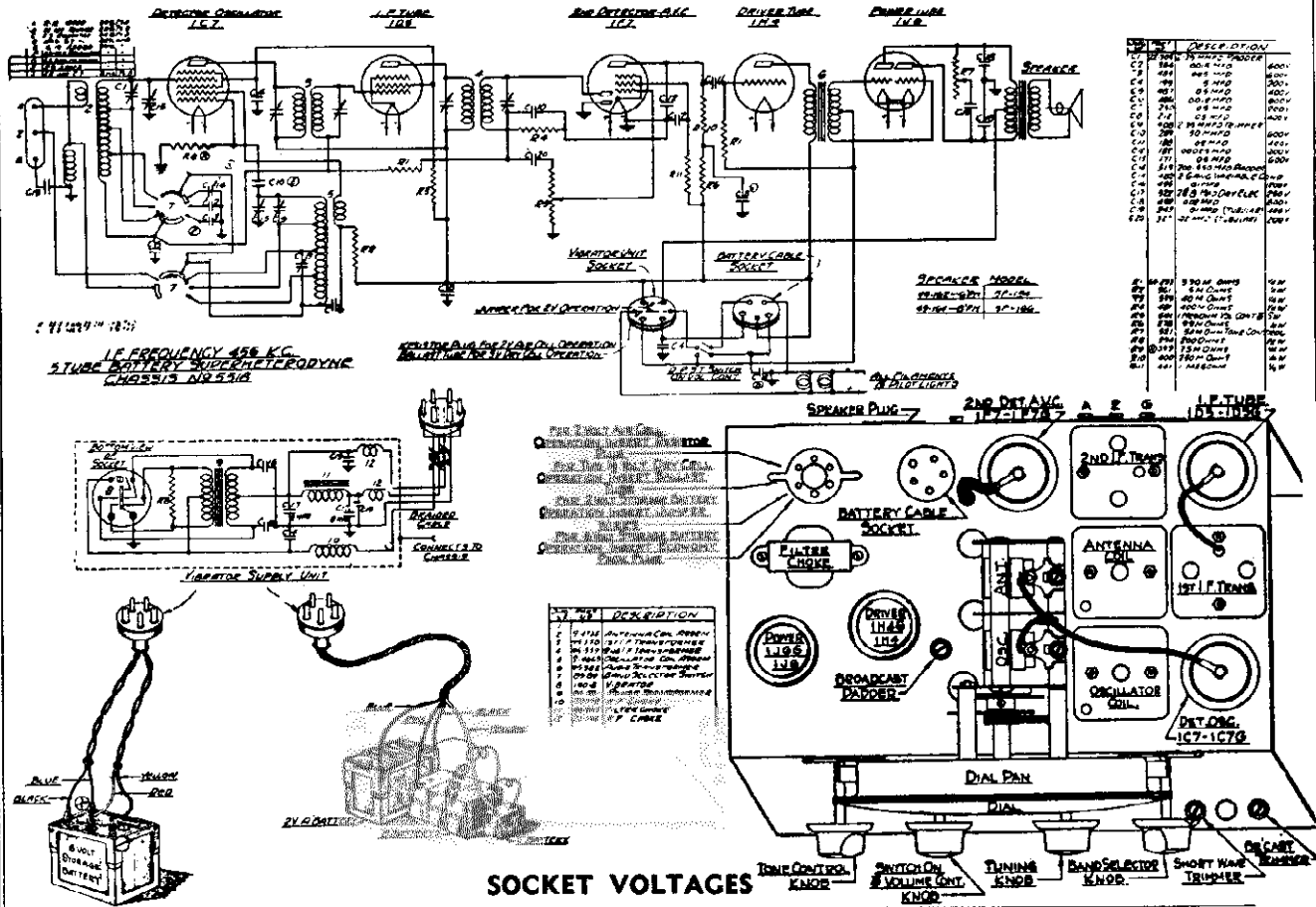
Part No.	Description	QTY	Part No.	Description
C1	200V	1	S 6100	PNT. 60L B SHIELD ASSEMBLY
C2	200V	1	S 4668	OSCILLATOR OIL ASSEMBLY
C3	200V	1	9C-410	1ST. I.F. TRANSFORMER
C4	200V	1	9C-420	2ND. I.F. TRANSFORMER
C5	200V	1	9C-430	SPEAKER TRIMMER (ON SPEAKER)
C6	200V	1		VARIABLE RESISTANCE
C7	200V	1	19T-1	1ST. I.F. TRANSFORMER PRIMARY
C8	200V	1	19T-2	1ST. I.F. TRANSFORMER SECONDARY
C9	200V	1	19T-3	2ND. I.F. TRANSFORMER PRIMARY
C10	200V	1	19T-4	2ND. I.F. TRANSFORMER SECONDARY
R1	47K OHM	1	19T-5	DETECT. OSCILLATOR (ON CHASSIS)
R2	500K OHM	1	19T-6	ANTENNA BRACKET (ON CHASSIS)
R3	500K OHM	1	19T-7	19T-5/9 OSCILLATOR PHOSOR.
R4	500K OHM	1		
R5	500K OHM	1		
R6	500K OHM	1		
R7	500K OHM	1		
R8	500K OHM	1		
R9	500K OHM	1		
R10	500K OHM	1		

FOR PHONO. DATA, SEE INDEX
ALIGNMENT

Operation	Connect Test Oscillator to—	Dummy Antennae	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Algm't
2	Rec. Ant. Lead	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	"	"	1500	"	1500	G	Algm't of Ant.
4	"	"	600	"	600	J	Rock gang & adj. for max. output

MODELS 5F134, 5F166
 Chassis 5518
 Schematic, Voltage
 Socket, Trimmers
 Alignment, Parts
 Battery Conn.

ZENITH RADIO CORP.



Tube	Position	1	2	3	4	5	6	7	8	9
1C7	1st Det. Osc.	0	2	130	53	0	115	0	0	0
1D5	I.F.	0	2	130	53	—	—	0	0	0
1F7	2nd Det. A.V.C.	0	2	24	0	0	15	0	0	0
1H4	Driver	0	2	120	—	0	—	0	0	—
1J6	Power	0	2	143	—1	—1	143	0	0	—

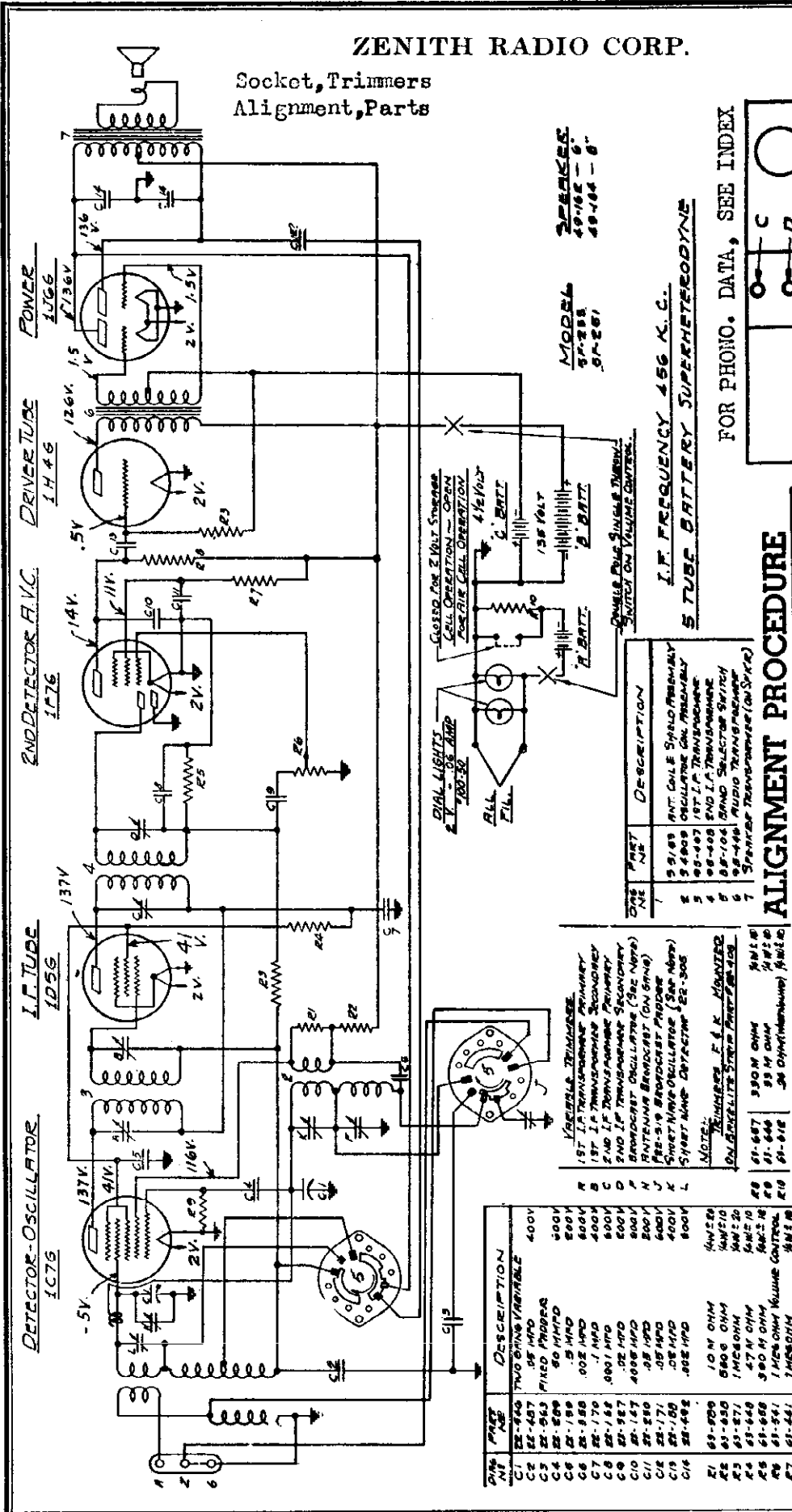
All voltages measured with a 1000 ohm per volt D.C. meter and using the Zenith 6 V Economy Pack—Antenna and ground disconnected.
 Battery Voltage—6.3 V.
 Battery Drain—1.1 ampere

ALIGNMENT PROCEDURE

- Connect the output leads of the signal generator to grid of the first detector and receiver chassis. Also connect an output meter across the speaker transformer leads.
- Set the signal generator at 456 K.C. and carefully adjust the four I.F. trimmers to the point giving the highest reading on the output meter. The I. F. transformers are of a very high gain, selective type, and these adjustments should be repeated several times in order to secure maximum accuracy.
- All adjustments should be made using as weak an output from the signal generator as possible in order to prevent the A.V.C. action from affecting the output readings.
- Change the signal generator leads to the antenna and ground terminals of the receiver.
- Set signal generator at 5 M.C. Switch receiver to band B and adjust osc. trimmer on gang for correct dial reading.
- Set signal generator at 1400 K.C. Switch receiver to band A and adjust broadcast trimmer (located at front of chassis—see diagram below) for correct dial reading. Also adjust antenna trimmer on gang to resonance.
- Set signal generator at 18 M.C.—Switch receiver to band C and adjust the short wave trimmer while rocking the pointer past 18 M.C. on the dial to the combination giving the greatest output.
- Set signal generator at 600 K.C.—Switch receiver to band A and rock pointer past 600 on dial while adjusting the broadcast padder (located adjacent to gang condenser) to combination giving the greatest output reading.
- Readjust broadcast and ant trimmers at 1400 K.C. (Same as No. 5).

ZENITH RADIO CORP.

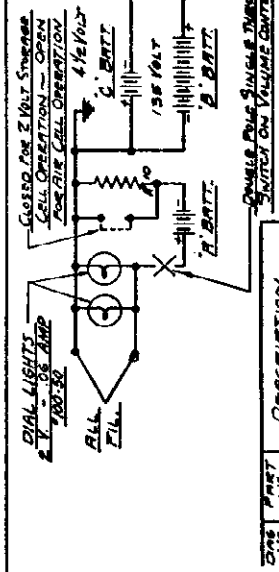
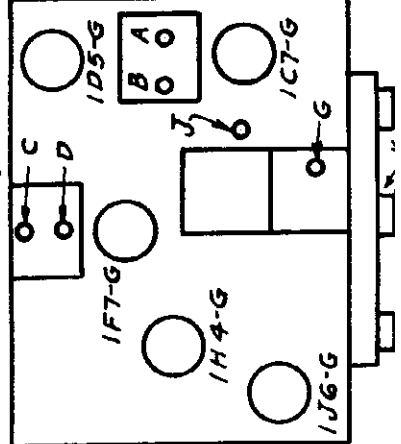
Socket, Trimmers
Alignment, Parts



MODEL 5F-233 5F-251
SPEAKERS 49-102-6 49-104-6

I.F. FREQUENCY 456 K.C.
5 TUBE BATTERY SUPERHETERODYNE

FOR PHONO. DATA, SEE INDEX



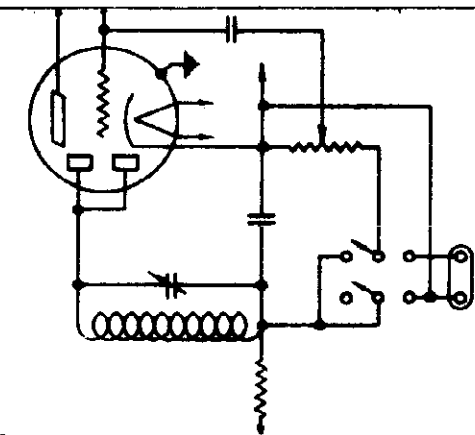
ONE PART NO.	DESCRIPTION
59-89	ANT. COIL S.P.D. PRIMARILY
54-89	OSCILLATOR COIL PRIMARILY
58-407	1ST I.F. TRANSFORMER
58-408	2ND I.F. TRANSFORMER
58-104	5ND I.F. TRANSFORMER
58-104	AUDIO TRANSFORMER
58-148	SPARKER TRANSFORMER (ON SPEAKERS)

ALIGNMENT PROCEDURE

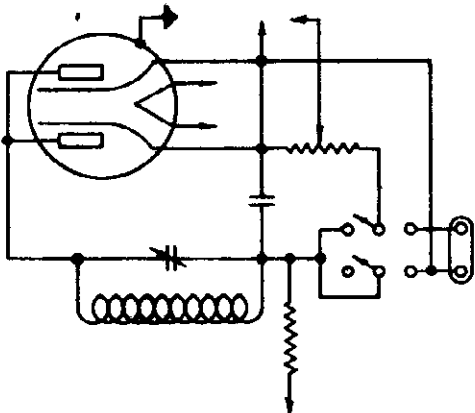
Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Adjust Dial At	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	I. F. Alignment
2	Rec. Ant. Lead	200 Mmfd.	1500	"	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	G	Alignment of Ant. Rock gang & adj. for max. output. Repeat 3 & 4.
4	" " "	200 Mmfd.	600	"	J	Set Osc. to Scale
5	Rec. Ant. Lead	400 Ohms	18000	S.W.	FG	Rock gang & adj.
6	" " "	"	"	"	K	"

ONE PART NO.	DESCRIPTION
C1	22-240 TWO GANG VARIABLE 400V
C2	22-487 .05 MFD
C3	22-563 .05 MFD
C4	22-563 .05 MFD
C5	22-199 .5 MFD
C6	22-199 .5 MFD
C7	22-170 .02 MFD
C8	22-170 .02 MFD
C9	22-157 .02 MFD
C10	22-157 .02 MFD
C11	22-280 .05 MFD
C12	22-171 .05 MFD
C13	22-171 .05 MFD
C14	22-492 .05 MFD
Z1	69-209 10 M OHM
Z2	69-209 10 M OHM
Z3	69-271 1 MEG OHM
Z4	69-271 1 MEG OHM
Z5	69-271 1 MEG OHM
Z6	69-271 1 MEG OHM
Z7	69-271 1 MEG OHM

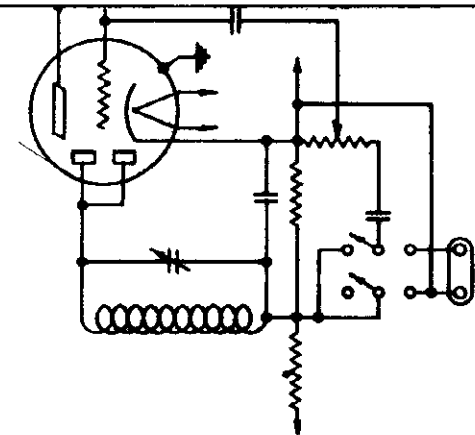
1938 PHONO CIRCUIT DATA



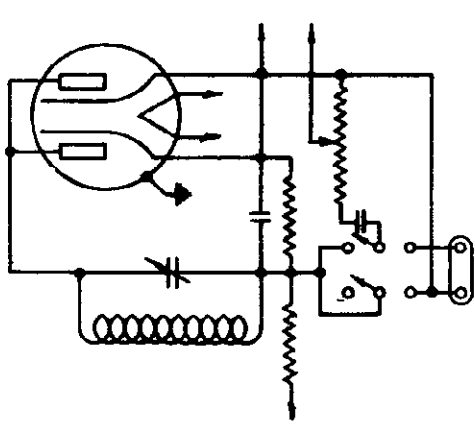
CIRCUIT CHANGES FOR PHONOGRAPHER INSTALLATIONS ON CHASSIS MODELS—
5008-5221-5221A-5221AT-5223-5224-
5224T-5226-5260A-527-5232



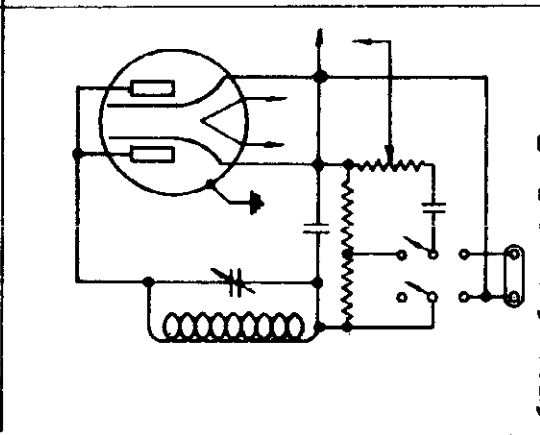
CIRCUIT CHANGES FOR PHONOGRAPHER INSTALLATIONS ON CHASSIS MODELS—
2628-570-
5888



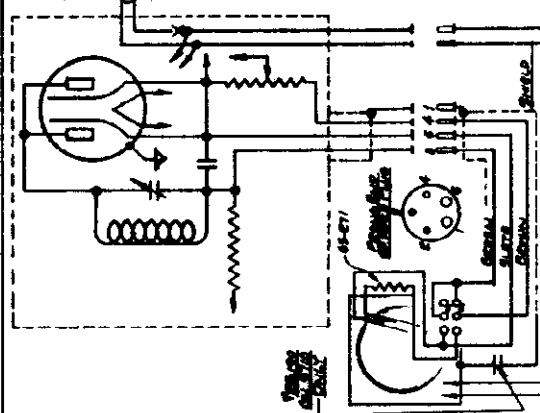
CIRCUIT CHANGES FOR PHONOGRAPHER INSTALLATIONS ON CHASSIS MODELS—
5408-5522
5648-5711-5711T



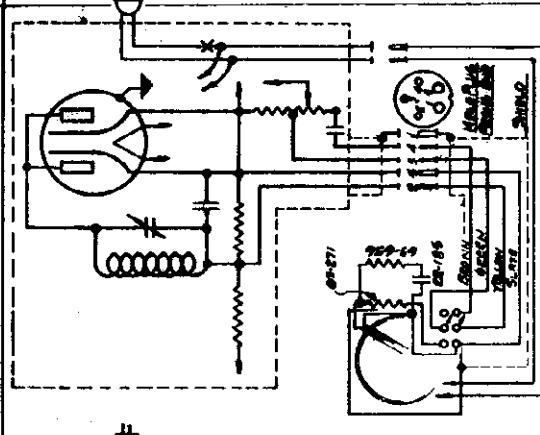
CIRCUIT CHANGES FOR PHONOGRAPHER INSTALLATIONS ON CHASSIS MODELS—
5644-5644A-5644AT-5709-5709A-
5709AT-5925-5925A-5925AT



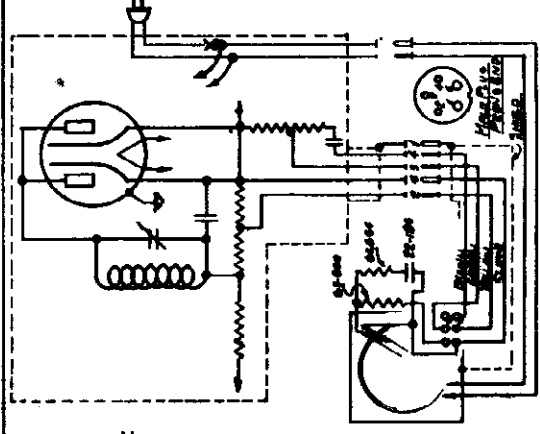
CIRCUIT CHANGES FOR PHONOGRAPHER INSTALLATIONS ON CHASSIS MODELS—
1E04-1E01
1E04A-1E01A



CHANGES IN CIRCUIT FOR RADIO-PHONO COMBINATIONS ON CHASSIS MODELS—
2628-5630A-5710



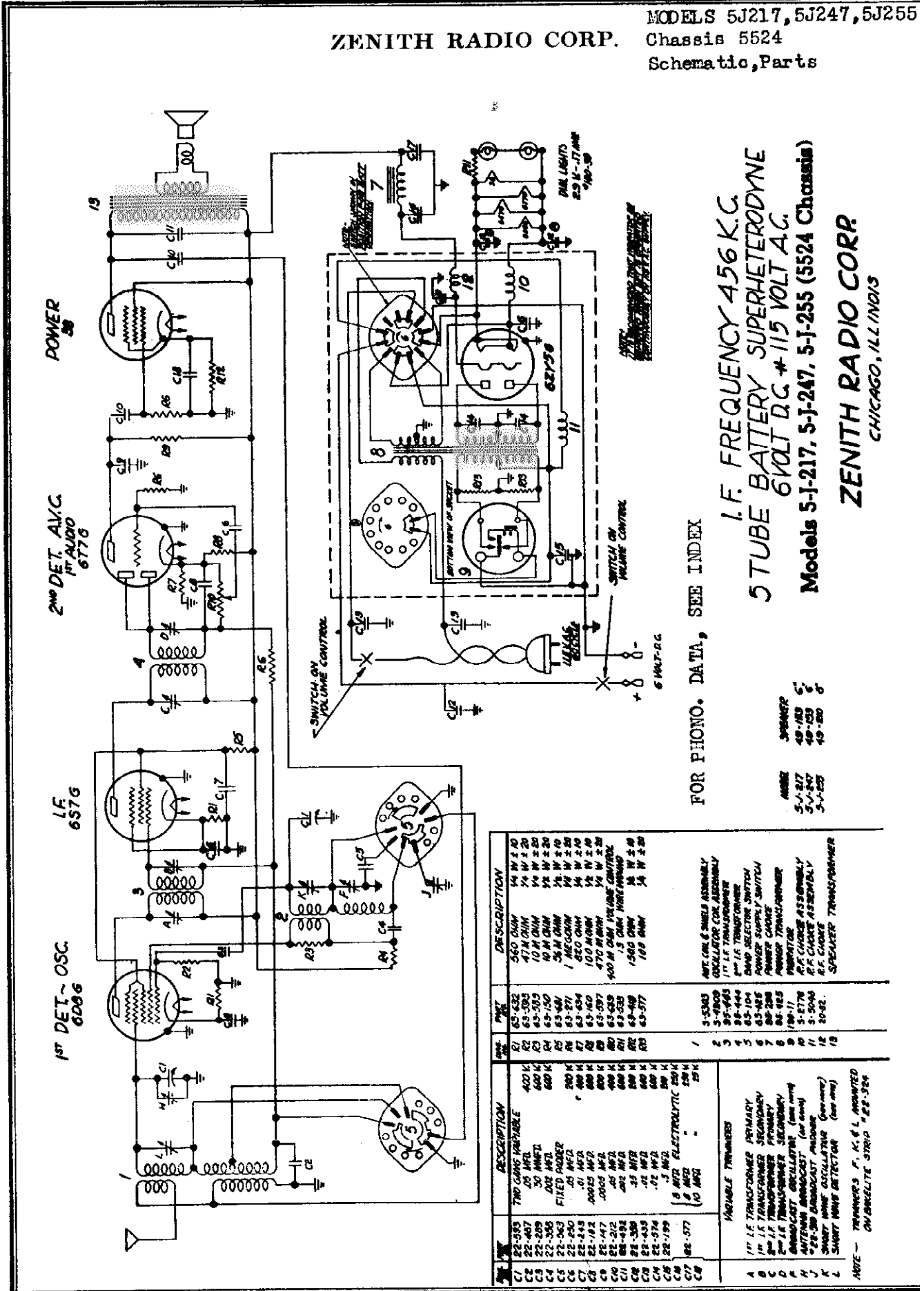
CHANGES IN CIRCUIT FOR RADIO-PHONO COMBINATIONS ON CHASSIS MODELS—
5905-5905A



CHANGES IN CIRCUIT FOR RADIO-PHONO COMBINATIONS ON CHASSIS MODELS—
1E04-1E01A

MODELS 5J217, 5J247, 5J255
 Chassis 5524
 Schematic, Parts

ZENITH RADIO CORP.



FOR PHONO. DATA, SEE INDEX

I.F. FREQUENCY 456 K.C.
 5 TUBE BATTERY SUPERHETERODYNE
 6 VOLT D.C. #115 VOLT A.C.
 Models 5-J-217, 5-J-247, 5-J-255 (5524 Chassis)
 ZENITH RADIO CORP.
 CHICAGO, ILL. IND'Y

MODEL	SPARKS
5-J-217	49-185
5-J-247	49-185
5-J-255	49-185

PKT	DESCRIPTION	QTY	DESCRIPTION
1	560 OHM	14	1/4 W ± 20
2	470 OHM	14	1/4 W ± 20
3	10 OHM	14	1/4 W ± 20
4	47 OHM	14	1/4 W ± 20
5	100 OHM	14	1/4 W ± 20
6	150 OHM	14	1/4 W ± 20
7	180 OHM	14	1/4 W ± 20
8	220 OHM	14	1/4 W ± 20
9	270 OHM	14	1/4 W ± 20
10	330 OHM	14	1/4 W ± 20
11	390 OHM	14	1/4 W ± 20
12	470 OHM	14	1/4 W ± 20
13	560 OHM	14	1/4 W ± 20
14	680 OHM	14	1/4 W ± 20
15	820 OHM	14	1/4 W ± 20
16	100 OHM	14	1/4 W ± 20
17	1500 OHM	14	1/4 W ± 20
18	100 OHM	14	1/4 W ± 20
19	100 OHM	14	1/4 W ± 20
20	100 OHM	14	1/4 W ± 20
21	100 OHM	14	1/4 W ± 20
22	100 OHM	14	1/4 W ± 20
23	100 OHM	14	1/4 W ± 20
24	100 OHM	14	1/4 W ± 20
25	100 OHM	14	1/4 W ± 20
26	100 OHM	14	1/4 W ± 20
27	100 OHM	14	1/4 W ± 20
28	100 OHM	14	1/4 W ± 20
29	100 OHM	14	1/4 W ± 20
30	100 OHM	14	1/4 W ± 20
31	100 OHM	14	1/4 W ± 20
32	100 OHM	14	1/4 W ± 20
33	100 OHM	14	1/4 W ± 20
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36	100 OHM	14	1/4 W ± 20
37	100 OHM	14	1/4 W ± 20
38	100 OHM	14	1/4 W ± 20
39	100 OHM	14	1/4 W ± 20
40	100 OHM	14	1/4 W ± 20
41	100 OHM	14	1/4 W ± 20
42	100 OHM	14	1/4 W ± 20
43	100 OHM	14	1/4 W ± 20
44	100 OHM	14	1/4 W ± 20
45	100 OHM	14	1/4 W ± 20
46	100 OHM	14	1/4 W ± 20
47	100 OHM	14	1/4 W ± 20
48	100 OHM	14	1/4 W ± 20
49	100 OHM	14	1/4 W ± 20
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56	100 OHM	14	1/4 W ± 20
57	100 OHM	14	1/4 W ± 20
58	100 OHM	14	1/4 W ± 20
59	100 OHM	14	1/4 W ± 20
60	100 OHM	14	1/4 W ± 20
61	100 OHM	14	1/4 W ± 20
62	100 OHM	14	1/4 W ± 20
63	100 OHM	14	1/4 W ± 20
64	100 OHM	14	1/4 W ± 20
65	100 OHM	14	1/4 W ± 20
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67	100 OHM	14	1/4 W ± 20
68	100 OHM	14	1/4 W ± 20
69	100 OHM	14	1/4 W ± 20
70	100 OHM	14	1/4 W ± 20
71	100 OHM	14	1/4 W ± 20
72	100 OHM	14	1/4 W ± 20
73	100 OHM	14	1/4 W ± 20
74	100 OHM	14	1/4 W ± 20
75	100 OHM	14	1/4 W ± 20
76	100 OHM	14	1/4 W ± 20
77	100 OHM	14	1/4 W ± 20
78	100 OHM	14	1/4 W ± 20
79	100 OHM	14	1/4 W ± 20
80	100 OHM	14	1/4 W ± 20
81	100 OHM	14	1/4 W ± 20
82	100 OHM	14	1/4 W ± 20
83	100 OHM	14	1/4 W ± 20
84	100 OHM	14	1/4 W ± 20
85	100 OHM	14	1/4 W ± 20
86	100 OHM	14	1/4 W ± 20
87	100 OHM	14	1/4 W ± 20
88	100 OHM	14	1/4 W ± 20
89	100 OHM	14	1/4 W ± 20
90	100 OHM	14	1/4 W ± 20
91	100 OHM	14	1/4 W ± 20
92	100 OHM	14	1/4 W ± 20
93	100 OHM	14	1/4 W ± 20
94	100 OHM	14	1/4 W ± 20
95	100 OHM	14	1/4 W ± 20
96	100 OHM	14	1/4 W ± 20
97	100 OHM	14	1/4 W ± 20
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100	100 OHM	14	1/4 W ± 20

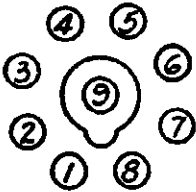
MODELS 5J217, 5J247, 5J255
Chassis 5524

ZENITH RADIO CORP.

Voltage, Socket, Trimmers
Alignment

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6D8	Converter Osc.	0	0	129	42.5	-2	110	6.3	1.5	0
6S7	I. F.	0	0	130	42.5	1.5	—	6.3	1.5	0
6T7	2nd Det. A.V.C. 1st Audio	0	0	23	.1	.1	—	6.3	.5	0
6ZY5G	Rect.	0	6.3	-3.5	—	-3.5	—	0	140	—
		H	P	S	K	H	G			
38	Power	0	124	129	12	6.3	0			



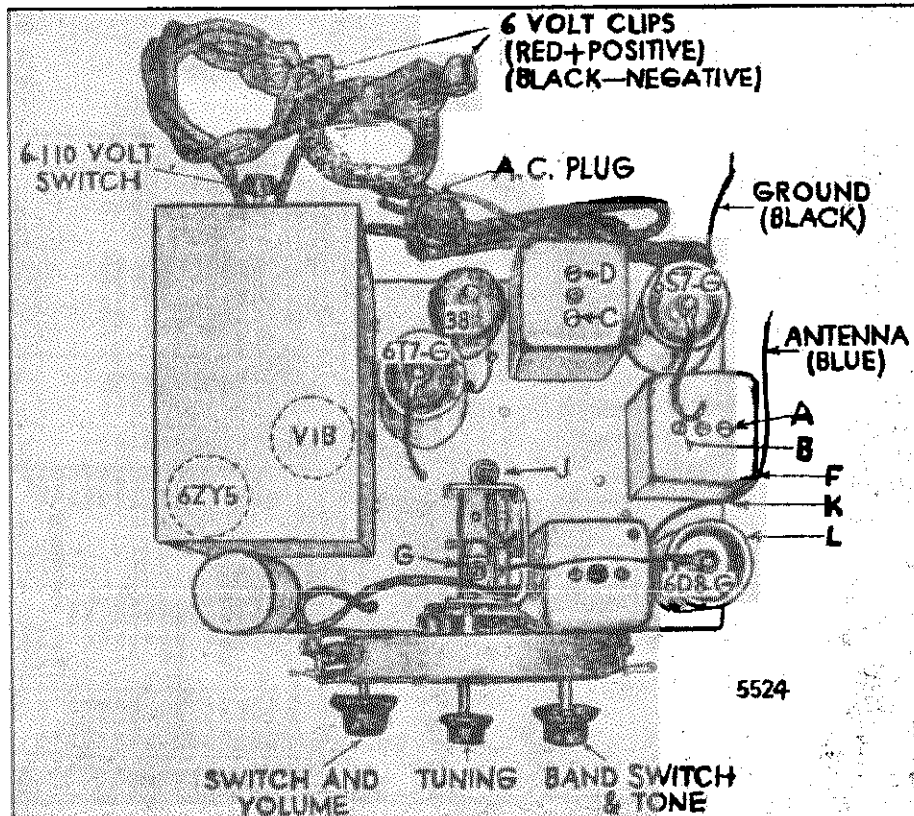
All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 16W. Battery voltage 6.3V consumption 2.1 Amp. Power Output .84W.

**BOTTOM VIEW
OF SOCKET**

ALIGNMENT PROCEDURE

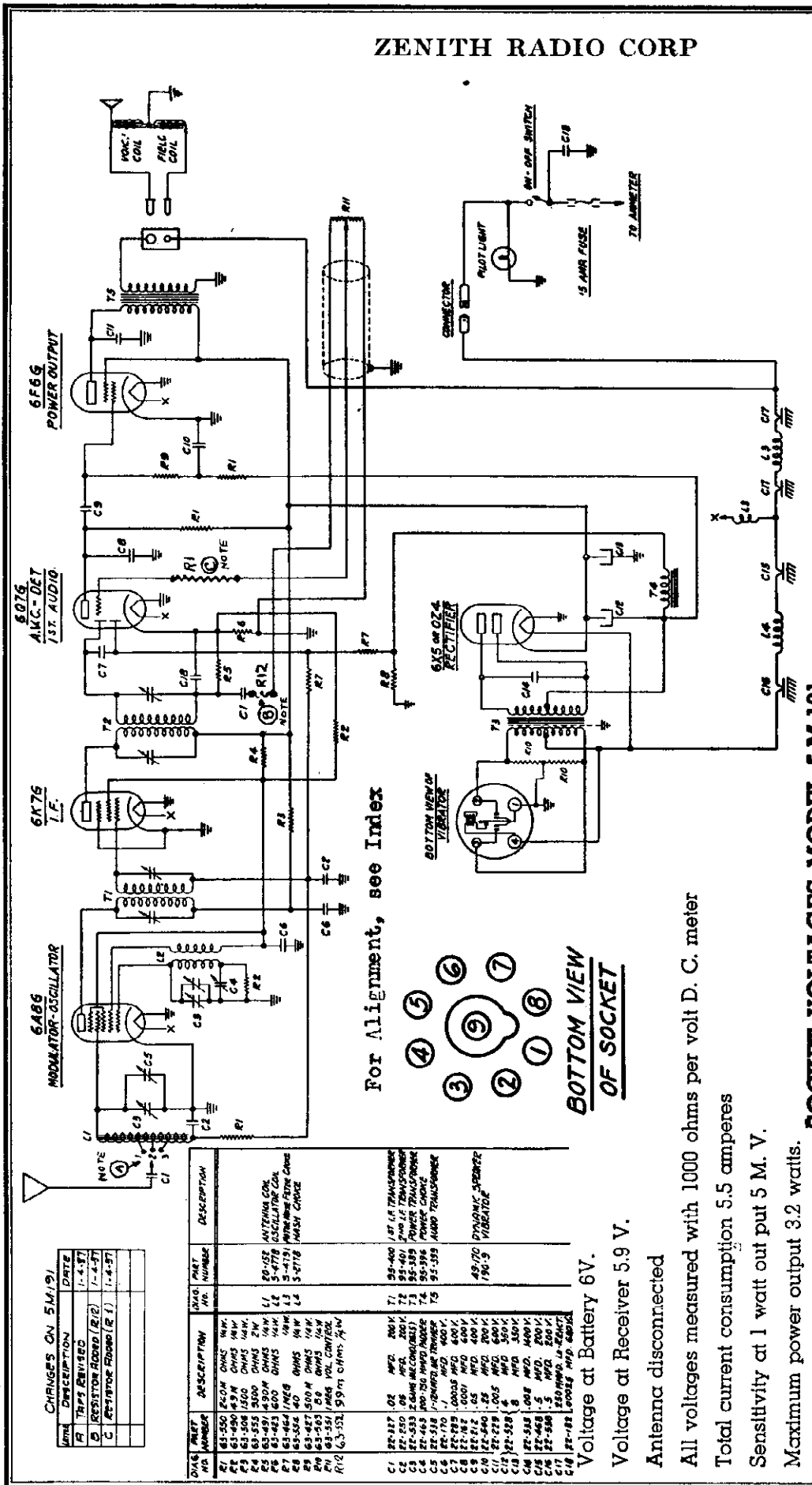
Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Lead	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output.
5	" " "	"	"	"	"	FG	Repeat 2 & 3.
6	Rec. Ant. Lead	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
7	" " "	400 Ohms	16500	S.W.	16500	L	Rock gang & adj. for max. output.

**LOCATION
OF TRIMMERS**

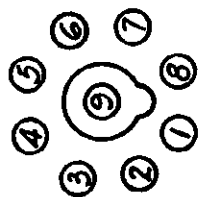


ZENITH RADIO CORP

MODEL 5M191
Chassis 5520
Schematic, Voltage
Changes, Parts



For Alignment, see Index



**BOTTOM VIEW
OF SOCKET**

CHANGES ON 5M191

ITEM	DESCRIPTION	DATE
A	TAPS REVISED	(1-4-37)
B	RESISTOR BOARD (R12)	(1-4-37)
C	RESISTOR BOARD (R1)	(1-4-37)

DWG. NO.	PART NUMBER	DESCRIPTION
R1	63-550	500Ω 1/2W
R2	63-400	4.7K 1/2W
R3	63-508	1500Ω 1/2W
R4	63-555	5000Ω 1/2W
R5	63-491	450Ω 1/2W
R6	63-451	450Ω 1/2W
R7	63-554	40Ω 1/2W
R8	63-427	500Ω 1/2W
R9	63-563	50Ω 1/2W
R10	63-563	50Ω 1/2W
R11	63-551	100Ω 1/2W
R12	63-551	50Ω 1/2W
T1	58-400	1st. I.F. TRANSFORMER
T2	58-400	2nd. I.F. TRANSFORMER
T3	58-400	3rd. I.F. TRANSFORMER
T4	58-400	4th. I.F. TRANSFORMER
T5	58-400	5th. I.F. TRANSFORMER
T6	58-400	6th. I.F. TRANSFORMER
T7	58-400	7th. I.F. TRANSFORMER
T8	58-400	8th. I.F. TRANSFORMER
T9	58-400	9th. I.F. TRANSFORMER
T10	58-400	10th. I.F. TRANSFORMER
T11	58-400	11th. I.F. TRANSFORMER
T12	58-400	12th. I.F. TRANSFORMER
T13	58-400	13th. I.F. TRANSFORMER
T14	58-400	14th. I.F. TRANSFORMER
T15	58-400	15th. I.F. TRANSFORMER
T16	58-400	16th. I.F. TRANSFORMER
T17	58-400	17th. I.F. TRANSFORMER
T18	58-400	18th. I.F. TRANSFORMER
T19	58-400	19th. I.F. TRANSFORMER
T20	58-400	20th. I.F. TRANSFORMER

Voltage at Receiver 6V.

Voltage at Receiver 5.9 V.

Antenna disconnected

All voltages measured with 1000 ohms per volt D. C. meter

Total current consumption 5.5 amperes

Sensitivity at 1 watt out put 5 M. V.

Maximum power output 3.2 watts.

I.F. FREQUENCY 456 K.C.

MODEL 5M191 CHASSIS 5520
ZENITH RADIO CORPORATION
CHICAGO, ILL.

SOCKET VOLTAGES MODEL 5M-191

Tube	Position	1	2	3	4	5	6	7	8	9
6A8	Mixer Osc.	0	0	190	90	—	90	5.9	0	0
6K7	I. F.	0	0	195	90	0	—	5.9	0	0
6Q7	Det. A. V. C. Audio	0	0	80	0	—	—	5.9	.8	0
6F6	Power	0	0	185	195	—	—	5.9	0	—

MODEL 5M191
Socket, Trimmers
Chassis, Drive Data

ZENITH RADIO CORP.

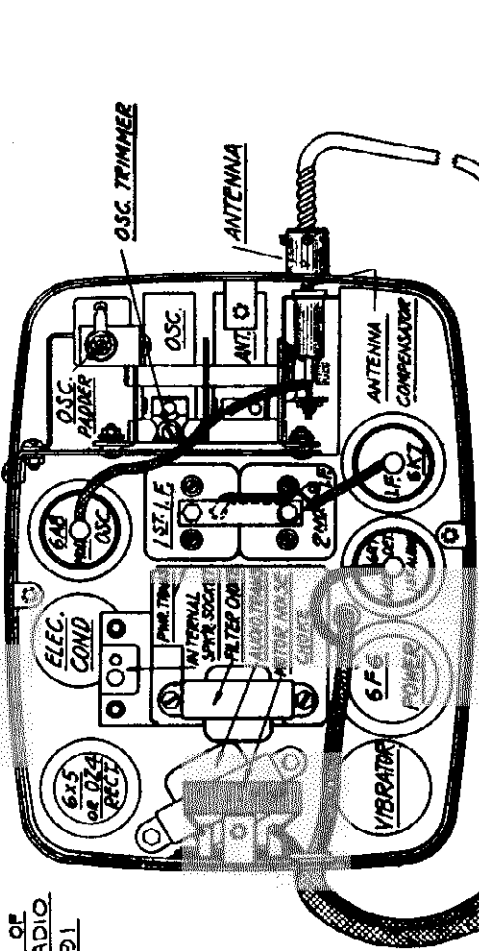


Fig. 3.—Tube Position S-M-191

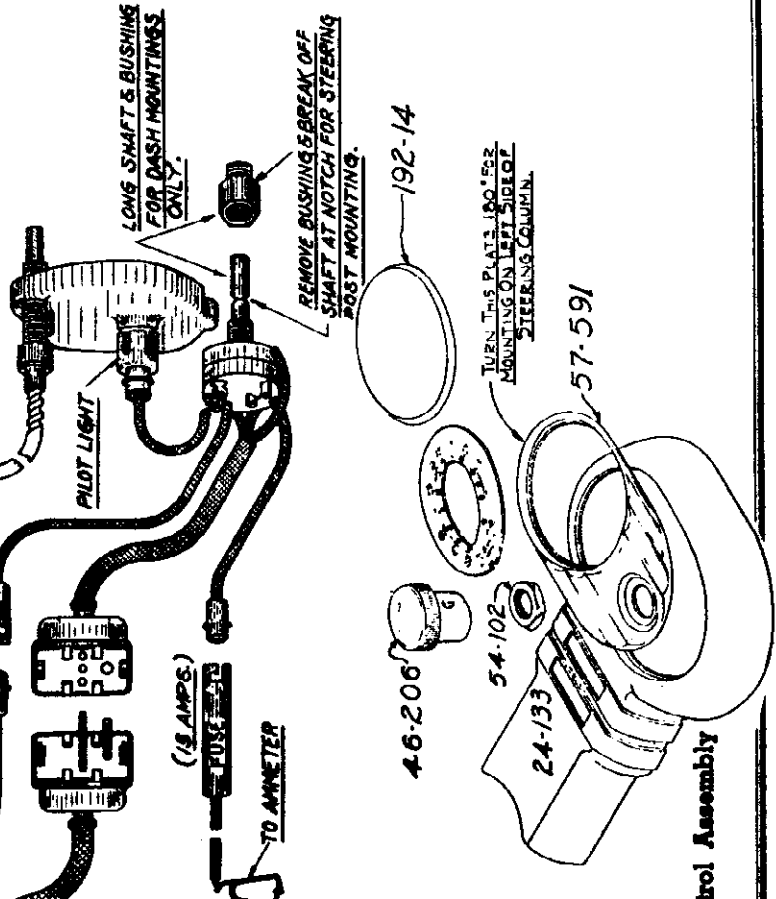


Fig. 7.—Steering Control Assembly

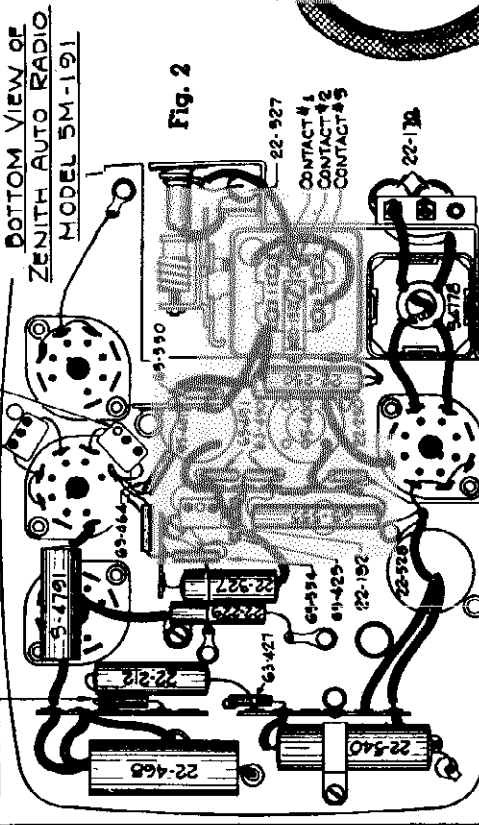


Fig. 2

BOTTOM VIEW OF
ZENITH AUTO RADIO
MODEL 5M-191

CONNECT TO CONTACT #1 FOR ANTENNA CAPACITORS, \$50 TO 700 OHMS, SUCH AS 1939 DODGE, FORD, STUDEBAKER, PLYMOUTH, BUICK, CHRYSLER, OLDSMOBILE, LINCOLN, ZEPHYR, LUGGAGE COMPARTMENT, BOOR ANTENNA, ETC.

TIGHTEN POINT CONTACTS SECURELY. USE SCREWS FROM DRIVE SHAFT ASSEMBLY. DO NOT USE SCREWS FROM OTHER SETS.

TO AMMETER (1.5 AMPS.)

TO AMMETER (1.5 AMPS.)

REMOVE BUSHING BREAK OFF SHAFT AT NOTCH FOR STEERING POST MOUNTING.

TURN THIS PLATE 180° & FIT MOUNTING ON LEFT SIDE OF STEERING COLUMN.

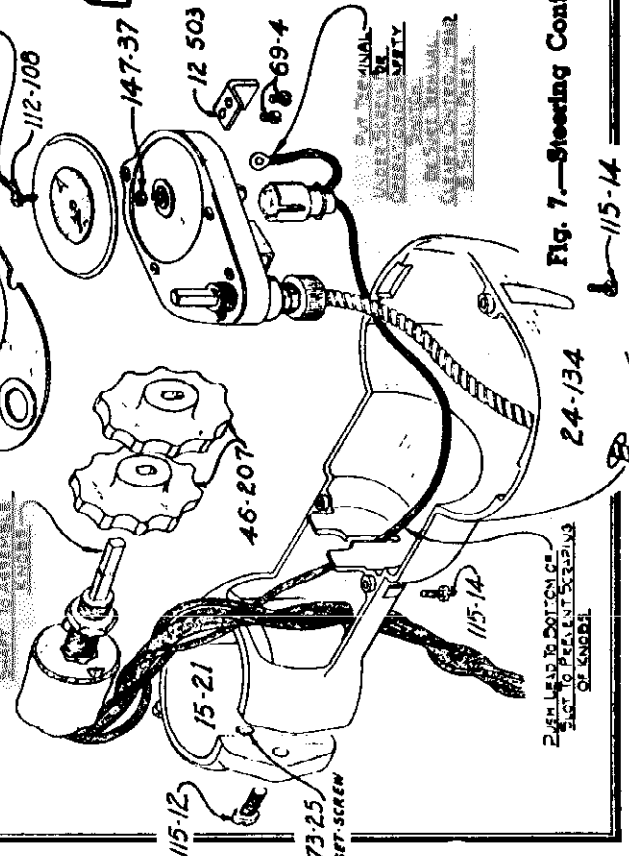


Fig. 7.—Steering Control Assembly

ZENITH RADIO CORP.

MODEL 5M191

MODEL 6 6M192, 6M193, 6M194

MODEL 8M195

Alignment Notes

IMPORTANT ANTENNA INFORMATION
(All Models)

Some cars are factory equipped with an antenna. If this is the case, the lead should be checked to make certain that it is not grounded, and after being shielded by a large diameter foam, ground this lead to the instrument panel, and attach the Delco-Remy male connector to the end of the antenna wire. This should be done carefully so as to insure a good solder joint, and prevent any grounding at this point to the braided shieldings. Insert the antenna lead-in connector into the female Delco-Remy receptacle directly below the tuning cable shoulder on the receiver case.

Where a car is not equipped with an antenna, such as convertible models, or those with all steel turret top, any one of the following Zenith antennas may be used:

Undercar antenna—part No. S-4800 and S-4801.

Over the Top Antenna (Sedan) S-4802.

Over the Top Antenna (Coupe) S-4803.

Zenith Fleet Wing Antenna S-4821.

Zenith Bumper Pole Antenna S-4822.

Complete instructions covering the installation of each of the above antennas is furnished with the various kits.

IMPORTANT: BALANCING SET TO ANTENNA. There is such an extremely wide variation in antenna capacities that it is difficult to match this condition without some means of variable antenna alignment. To accomplish this, an antenna compensating adjustment is provided through the small hole directly above the antenna cable connector on the receiver case. In addition to this, a tapped antenna transformer is also incorporated (see Figure No. 2). The proper method of alignment is as follows: After completely connecting receiver, tune in a signal between 1400 and 1450 K.C. and adjust the antenna compensator shown in Figure 3, for either the root antenna, or single or double under-car antenna. The receiver is shipped from the factory with the antenna tap shown in Figure 2 set to the No. 2 position, and, therefore, need not be changed for either of the two types of antennas mentioned.

For Zenith Fleet Wing, and Over the Top Antennas, unsolder the antenna lead from the No. 2 lug, and resolder it to the No. 3 lug. After this is done, tune in a station between 1450 and 1400 K.C., and adjust the antenna compensator shown in Figure 3 to resonance.

For high capacity antennas such as the 1936 Dodge solid steel roof, or the Lincoln Zephyr luggage compartment, drawer antenna, etc., remove the antenna lead from the No. 2 lug, as it comes from the factory, and resolder it to the No. 1 connector. After this is done, the same procedure of tuning in a signal from 1450 to 1400 K.C., and balancing to resonance with the antenna compensator, as described above, should be followed.

This system of tapped transformer, and variable compensating adjustment gives an extremely flexible means of resonating the receiver to any type of antenna, and it should be noted that the tap need only be changed in two cases. Of course, it is necessary to remove the bottom cover in order to shift the antenna tap where necessary.

IGNITION INTERFERENCE

Remove the center high tension lead of the distributor and insert the suppressor into the distributor at that point. The wire is then placed in the open end of the suppressor. The generator condenser is fastened under the cut-out housing and the wire connected to the generator connection on the coil cut-out. The coil condenser is attached to the battery connection of the coil and the other end to the coil case. Make absolutely certain that this condenser is not accidentally connected to the distributor side of the coil since this will increase motor noise terrifically and make operation of the receiver highly unsatisfactory when the motor is running. Where two distributors or two coils are employed a corresponding number of condensers and suppressors must be applied. In some instances it might be of benefit to attach a by-pass condenser from one side of the antenna to a grounded part of the instrument panel. If the dome light is feeding interference to the antenna the lead should be cut where it comes from the post and a switch inserted on the instrument panel at that point, to turn it off and on. In some cases, a by-pass condenser connected to the dome-light lead and grounded at the post is as effective as a separate switch. Try this first.

If additional attention is necessary to reduce motor interference, the motor block must be securely bonded, both at the rear and front supports with 1/2 inch copper braid. Also bond or ground all metal control cables or pipes feeding from the motor side into the car. These bonds should be made to the control wire or pipe and soldered to the fire wall immediately adjacent on the motor side. As a further precaution the rotor should be lengthened to reduce the gap between it and the distributor housing contacts by either peening the end or applying a small quantity of solder at this point.

ALIGNMENT

5-M-1

"A" Connect the service oscillator output leads to the control grid of the 6A8 tube, and to the chassis. If the oscillator output is a single shielded lead the shield should connect to the chassis.

Connect an output meter across the primary of the speaker transformer.

Set the service oscillator at 456 K.C. and adjust the trimmers on the I.F. transformers to the point giving the greatest reading on the output meter. These, as well as the following adjustments should be made using as small an output from the signal generator as possible so that the A.V.C. action will be least effective.

"B" Change the service oscillator lead from the grid of the 6A8 to the antenna connection. A male Delco Remy connector may be used in making a connection to the antenna lead.

Set the service oscillator at 1600 K.C. and rotate the gang condenser until the plates are entirely out of mesh. Adjust the oscillator section trimmer until the 1600 K.C. signal is tuned in.

"C" Set the service oscillator to 800 K.C. and rock the gang condenser slowly to and fro past the point where this signal is received, meanwhile adjusting the peadder condenser for a setting which gives the greatest output reading.

"D" Repeat operation "B". See antenna instruction page 379 for correct alignment of antenna stage.

5-M-192 — 5-M-193 — 5-M-194 — 5-M-195

"A" Connect the service oscillator to the control grid of the 6A8 tube and the chassis.

Connect the output meter across the primary of the speaker transformer.

Set the service oscillator to 252.5 K.C. and adjust the trimmers on the I.F. transformers for the greatest output reading. These adjustments should be repeated several times using as weak an input signal as possible so as to obtain greater accuracy.

"B" Change the service oscillator lead from the grid of the 6A8 to the antenna connection. A male Delco Remy connector may be used in making a connection to the antenna lead.

Set the service oscillator at 1600 K.C. and rotate the gang condenser until the plates are entirely out of mesh. Adjust the oscillator section trimmer until the 1600 K.C. signal is tuned in.

Change the service oscillator to 1400 K.C. Rotate the gang condenser until this signal is tuned in, and then adjust the R.F. trimmer on the gang condenser to the point giving the greatest output reading.

"C" Set the service oscillator to 500 K.C. and rock the gang condenser slowly to and fro past the point where this signal is received, meanwhile adjusting the peadder condenser for a setting which gives the greatest output reading.

"D" Repeat operation "B".

The sensitivity control should be in the extreme clockwise position when making all adjustments.

NOTE — Due to the high gain type of I.F. transformers used in these receivers it is essential that a non-metallic screw driver be used in making all adjustments. See antenna instructions for correct alignment of antenna stage.

SERVICE NOTE

The 02A rectifier tube used in the 5 and 6 tube models may be replaced with a 6X5 rectifier, providing the 6X5 tube is installed in a grounded tube shield.

The Coat shield with a ground clip which connects to the shield contact pin of the tube is the most convenient type to use.

MODEL 5M191
 MODELS 6M192, 6M193, 6M194
 MODEL 8M195
Parts Lists

ZENITH RADIO CORP.

Part No.	Description	QTY.	PR.	ST.	ST. PR.
20-146	Antenna Coil	8	6	6	1.25
20-150	R.F. Coil	8	6	5	1.00
20-152	Antenna Coil	8	6	5	1.25
55-322	1st I.F. Transformer	8	1.25		
55-323	2nd I.F. Transformer	8	1.25		
55-324	1st I.F. Transformer	8	1.25		
55-325	2nd I.F. Transformer	8	1.25		
55-400	1st I.F. Transformer	8	1.25		
55-401	2nd I.F. Transformer	8	1.25		
55-402	1st I.F. Transformer	8	1.25		
55-403	2nd I.F. Transformer	8	1.25		
54-771	Oscillator Coil	8	6	5	.45
54-772	Oscillator Coil	8	6	5	.45
54-773	Motor Noise Filter Choke	8	6	5	.50
54-781	Motor Noise Filter Choke	8	6	5	.50

PARTS LIST

Part No.	Description	QTY.	PR.	ST.	ST. PR.
22-92	.001 mfd. 600 Volt	8	6	5	.25
22-162	.001 mfd. 600 Volt	8	6	5	.25
22-170	.001 mfd. 600 Volt	8	6	5	.25
22-182	.0025 mfd. 600 Volt	8	6	5	.25
22-190	.005 mfd. 600 Volt	8	6	5	.25
22-228	.005 mfd. 600 Volt	8	6	5	.25
22-229	.05 mfd. 200 Volt	8	6	5	.15
22-230	.0005 mfd. 600 Volt	8	6	5	.12
22-327	.02 mfd. 200 Volt	8	6	5	.12
22-338	.005 mfd. 120 Volt	8	6	5	.15
22-390	.25 mfd. 200 Volt	8	6	5	.15
22-463	.20 mfd. 200 Volt	8	6	5	.25
22-470	200 ohm 1/4 Watt	8	6	5	.25
22-470	.0015 mfd. 600 Volt	8	6	5	.20
22-470	.0035 mfd. 750 Volt	8	6	5	.15
22-528	8.8 mfd. Dry Ele. 340 Volt	8	6	5	1.25
22-527	8.8 mfd. 350 Volt-20 mfd. 20 Volt	8	6	5	2.25
22-528	4.8 mfd. 350 Volt	8	6	5	1.25
22-531	.5 mfd. 120 Volt	8	6	5	1.25
22-532	2 Ohm Variable Cond. 385 mfd.	8	6	5	4.50
22-533	2 Ohm Variable Cond. 385 mfd.	8	6	5	4.50
22-534	25 mfd. 400 Volt	8	6	5	3.00
22-535	.008 mfd. 1400 Volt	8	6	5	.25
22-537	.0005 mfd. 120 Volt	8	6	5	.15
22-538	1-12 mfd. Air Trimmer	8	6	5	.25
22-539	.5 mfd. 200 Volt	8	6	5	.30
22-540	.25 mfd. 200 Volt	8	6	5	.25

Coils and Chokes

Condensers

Resistors

Part No.	Description	QTY.	PR.	ST.	ST. PR.
63-422	200 Ohm 1/4 Watt	8	6	5	.20
63-423	600 Ohm 1/4 Watt	8	6	5	.20
63-424	500 Ohm 1/4 Watt	8	6	5	.20
63-425	300 Ohm 1/4 Watt	8	6	5	.20
63-443	750 Ohm 1/4 Watt	8	6	5	.20
63-464	1 megohm 1/4 Watt	8	6	5	.20
63-460	49 Meg 1/4 Watt	8	6	5	.20
63-461	490 Ohm 1/4 Watt	8	6	5	.20
63-483	50 Meg 1/4 Watt	8	6	5	.20
63-494	13 Meg 2 Watt	8	6	5	.25
63-495	18 Meg 2 Watt	8	6	5	.25
63-510	19 Meg 1 Watt	8	6	5	.20
63-512	2 megohm vol. and tone control (dual)	8	6	5	2.00
63-550	240 Ohm 1/4 Watt	8	6	5	.20
63-551	1 megohm vol. control	8	6	5	1.00
63-552	69 Meg 1/4 Watt	8	6	5	.20
63-553	9.500 Ohm 1/4 Watt	8	6	5	.25
63-557	60 Ohm 1/4 Watt	8	6	5	.20
63-558	120 Ohm wire wound 1/4 Watt	8	6	5	.20
63-560	Sensitivity Control	8	6	5	.70
63-561	4900 Ohm 1/4 Watt	8	6	5	.20

Additional Optional Control Cables

Part No.	Description	QTY.	PR.	ST.	ST. PR.
76-208	Tuning Control Flexible Shaft 24"	1.25			
76-214	Tuning Control Flexible Shaft 30"	1.50			
76-218	Tuning Control Flexible Shaft 36"	1.75			
76-223	Tuning Control Flexible Shaft 24"	1.25			
76-224	Tuning Control Flexible Shaft 30"	1.50			
76-225	Tuning Control Flexible Shaft 36"	1.75			
8-4700	Steering Column Control Head Assembly D1	2.188			
8-4701	Mechanism Retaining Bracket	.05			
8-4702	Steering Column Wg. Cap	.30			
8-4703	Upper Half	1.50			
8-4704	Steering Column Wg.	2.00			
8-4705	Cover, Lower Half	.20			
8-4706	Tuning Control Knob	.15			
8-4707	Volume & Tone Control Knobs	.15			
8-4708	Bezel Plates	.45			
8-4709	Control Knob	.30			
8-4710	Bezel Plate	.01			
8-4711	No. 10/32 x 3/16" R.H.M.S. N.P.	.01			
8-4712	Headless Set Screw	.01			
8-4713	Popcorn Bushings	.01			
8-4714	Dial Pointer Wg.	.01			
8-4715	No. 10/32 x 7/32" R.H.M.S. N.P.	.01			
8-4716	No. 4/32 x 3/4" R.H.M.S. N.P.	.01			
8-4717	Headless Set Screw	.01			
8-4718	Unbreakable Dial Glass	.20			
8-4810	Steering Column Mounting Shaft	8-188			
8-4811	Control Mechanism	.05			
8-4812	Retaining Bracket	.05			
8-4813	Control Housing Mfg. Bracket	.05			
8-4814	Control Housing Retaining Clamp	.20			
8-4815	Control Housing	.25			
8-4816	Tuning Control Knob	.30			
8-4817	Volume & Tone Control Knob	.30			
8-4818	Bezel Plate	.01			
8-4819	No. 6/32 x 3/16" R.H.M.S. N.P.	.01			
8-4820	No. 8/32 x 7/8" R.H.M.S. N.P.	.01			
8-4821	Headless Set Screw	.01			
8-4822	Popcorn Bushings	.01			
8-4823	No. 10/32 x 5/16" R.H.M.S. N.P.	.01			
8-4824	No. 10/32 x 3/4" R.H.M.S. N.P.	.01			
8-4825	No. 10/32 x 7/8" R.H.M.S. N.P.	.01			
8-4826	No. 10/32 x 5/16" R.H.M.S. N.P.	.01			
8-4827	No. 10/32 x 3/4" R.H.M.S. N.P.	.01			
8-4828	No. 10/32 x 7/8" R.H.M.S. N.P.	.01			
8-4829	Headless Set Screw	.01			
8-4830	Unbreakable Dial Glass	.20			

Miscellaneous

Part No.	Description	QTY.	PR.	ST.	ST. PR.
13-502	Spr. Wg. Brackets (5M191 - 6M192 Only)	6	5	.03	
13-503	Chassis Box Top Cover Grd.	8	6	.01	
19-65	Speaker Plug Jack	8	6	.05	
44-14	Steadily Control Knob	8	6	.20	
48-170	5" Dynamic Speaker	3.50			
48-171	6" P.M. Dynamic Speaker	5.00			
48-172	6" P.M. Dynamic Speaker	2.00			
48-173	6" P.M. Dynamic Speaker	2.00			
48-174	6" P.M. Dynamic Speaker	2.00			
48-175	6" P.M. Dynamic Speaker	2.00			
48-176	6" P.M. Dynamic Speaker	2.00			
48-177	6" P.M. Dynamic Speaker	2.00			
48-178	6" P.M. Dynamic Speaker	2.00			
48-179	6" P.M. Dynamic Speaker	2.00			
48-180	6" P.M. Dynamic Speaker	2.00			
48-181	6" P.M. Dynamic Speaker	2.00			
48-182	6" P.M. Dynamic Speaker	2.00			
48-183	6" P.M. Dynamic Speaker	2.00			
48-184	6" P.M. Dynamic Speaker	2.00			
48-185	6" P.M. Dynamic Speaker	2.00			
48-186	6" P.M. Dynamic Speaker	2.00			
48-187	6" P.M. Dynamic Speaker	2.00			
48-188	6" P.M. Dynamic Speaker	2.00			
48-189	6" P.M. Dynamic Speaker	2.00			
48-190	6" P.M. Dynamic Speaker	2.00			
48-191	6" P.M. Dynamic Speaker	2.00			
48-192	6" P.M. Dynamic Speaker	2.00			
48-193	6" P.M. Dynamic Speaker	2.00			
48-194	6" P.M. Dynamic Speaker	2.00			
48-195	6" P.M. Dynamic Speaker	2.00			
48-196	6" P.M. Dynamic Speaker	2.00			
48-197	6" P.M. Dynamic Speaker	2.00			
48-198	6" P.M. Dynamic Speaker	2.00			
48-199	6" P.M. Dynamic Speaker	2.00			
48-200	6" P.M. Dynamic Speaker	2.00			

External Speakers to 1927 Auto Radios

Part No.	Description	QTY.	PR.	ST.	ST. PR.
52-102	5 mfd. Ignition Coil	8	6	.01	
52-103	Condenser 200 ufd.	8	6	.01	
52-104	120 Ohm wire wound 1/4 Watt	8	6	.01	
52-105	Sensitivity Control	8	6	.01	
52-106	4900 Ohm 1/4 Watt	8	6	.01	
52-107	240 Ohm 1/4 Watt	8	6	.01	
52-108	1 megohm vol. control	8	6	.01	
52-109	69 Meg 1/4 Watt	8	6	.01	
52-110	9.500 Ohm 1/4 Watt	8	6	.01	
52-111	60 Ohm 1/4 Watt	8	6	.01	
52-112	120 Ohm wire wound 1/4 Watt	8	6	.01	
52-113	Sensitivity Control	8	6	.01	
52-114	4900 Ohm 1/4 Watt	8	6	.01	

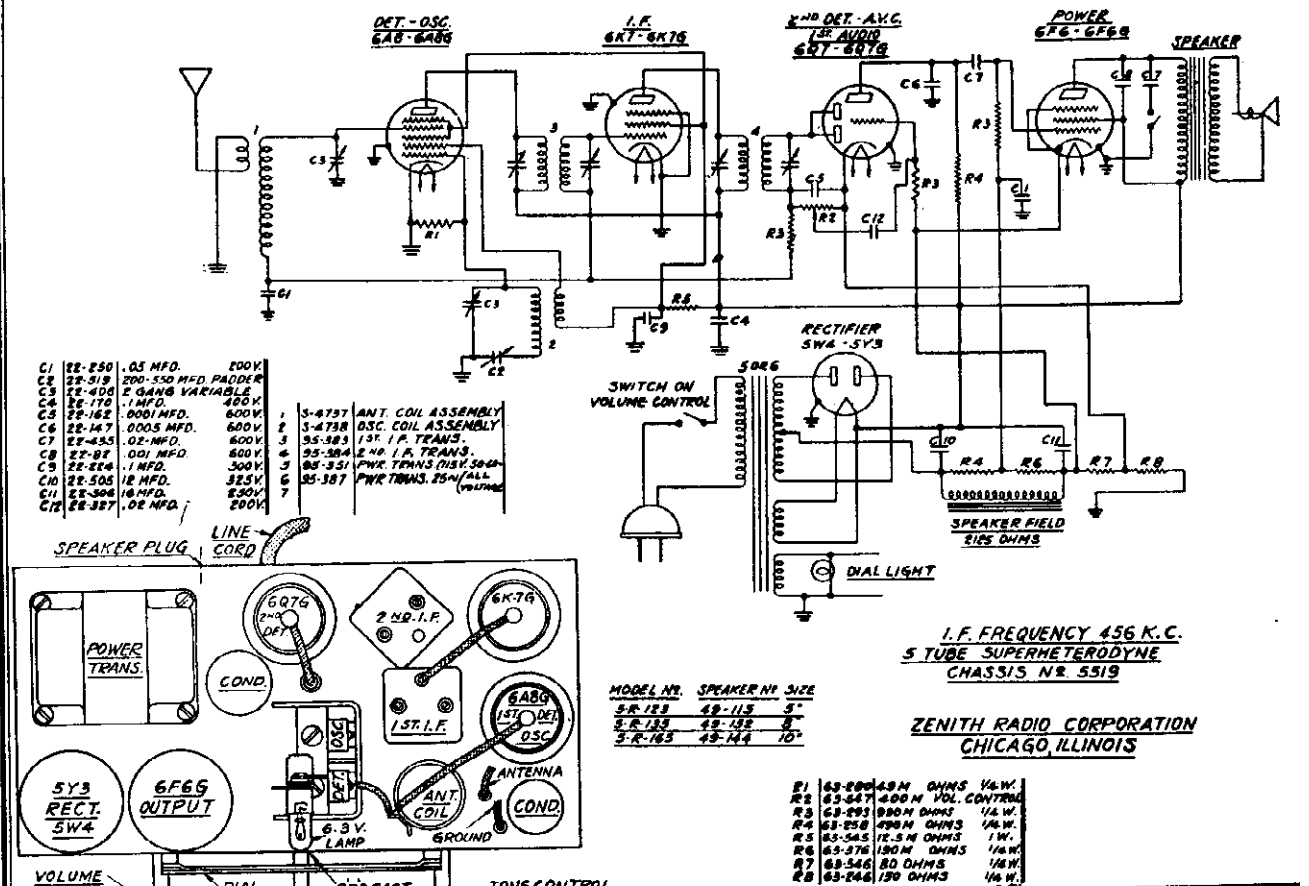
Set Mounting Parts

Part No.	Description	QTY.	PR.	ST.	ST. PR.
112-130	No. 8 x 1/4" H.H. Slotted Self Tapping Screw Acorn Head	8	6	.10	
112-131	Tube Shield Complete With Rings	8	6	.10	
112-132	Insulation Coupling	8	6	.10	
112-133	Vibrator	8	6	.50	

These Price Supplements All Previous Quotations and Are Subject to Regular Discounts and Change Without Notice.

ZENITH RADIO CORP.

MODELS 5R123, 5R135, 5R165
 Chassis 5519
 Schematic, Socket, Voltage
 Trimmers, Alignment, Parts



SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8
6A8C	1st Det. Osc.	0	0	220	102	—5	97	6.1AC	0
6K7G	I. F.	0	0	220	102	0	—	6.1AC	0
6Q7G	2nd Det. A. V. C.	0	0	54	—3	—3	—	6.1AC	—3
6F6G	Power	0	0	210	225	—4	—	6.1AC	—5
5Y3	Rect.	0	225	—	305AC	—	305AC	—	225

Line voltage 115 V. Antenna and ground disconnected. All voltages measured from point indicated to ground, using a 1000 ohm per volt meter.

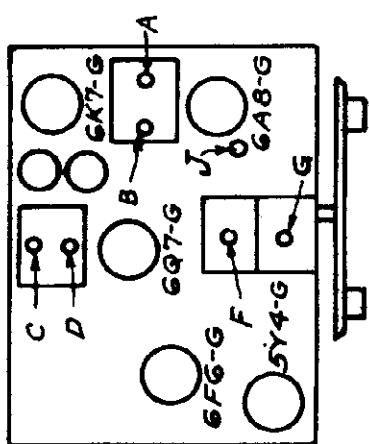
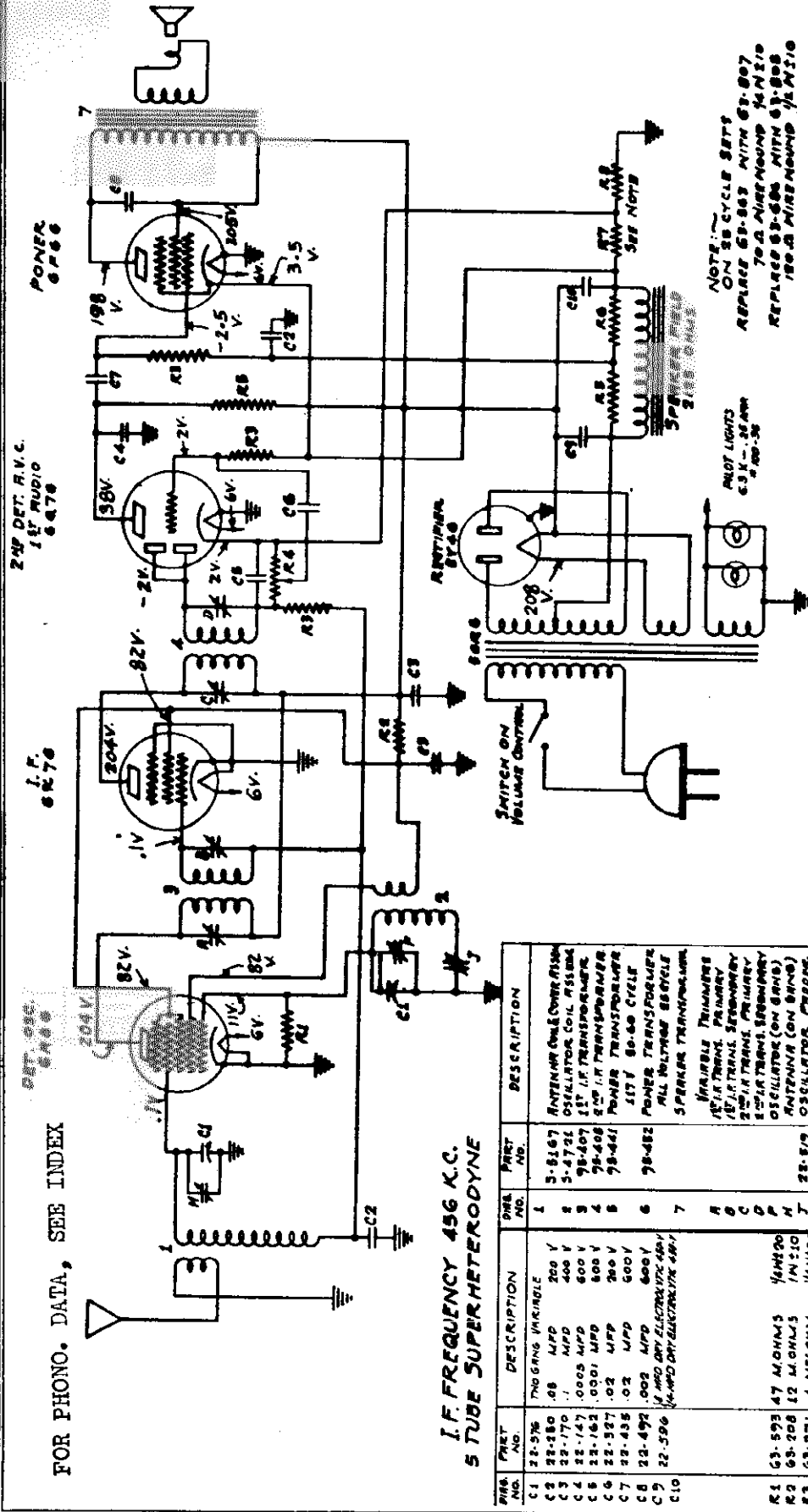
ALIGNMENT PROCEDURE

Connect the output leads of the signal generator to the grid of the first detector and receive ground lead. Also connect an output meter across the speaker leads.
 Set the signal generator at 456 K.C. and carefully adjust the four I.F. trimmers to the point giving the greatest output reading. These I.F. transformers are of a very high gain, selectivity type and the adjustments should be repeated several times for greatest accuracy.
 Change the signal generator leads to the antenna and ground leads of the receiver.
 Set the signal generator at 1400 K.C. Set the pointer on the receiver dial at the same frequency. First adjust the oscillator and then the detector trimmers on the gang condenser to the point giving the maximum reading on the output meter, using as small a signal from the generator as possible so as to prevent the A.V.C. action from affecting the output readings.
 Reset the signal generator to 600 K.C.
 Slowly rock the pointer past 600 K.C. on dial meanwhile adjusting the osc. padder (located beneath dial on front of chassis) to the combination giving the greatest output reading.
 Repeat operation No. 4.

MODELS 5R216, 5R226, 5R236
 Chassis 5526

ZENITH RADIO CORP.

Schematic, Voltage, Parts
 Socket, Trimmers, Alignment



ALIGNMENT PROCEDURE

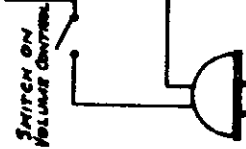
Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mmfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ani. Lead	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	G	Align of Ant.
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5	" " "	200 Mmfd.	1500	"	1500	FG	Repeat 3 & 4.

**I. F. FREQUENCY 456 K.C.
 5 TUBE SUPERHETERODYNE**

TUB. NO.	PART NO.	DESCRIPTION	DIR. PART NO.	DESCRIPTION
C1	22-576	7MG GANG VARIABLE	1	ANTENNA COIL OVER COIL
C2	22-580	.08 MFD	2	OSCILLATOR COIL #15 BKA
C3	22-170	.1 MFD	3	1ST I.F. TRANSFORMER
C4	22-147	.0005 MFD	4	2ND I.F. TRANSFORMER
C5	22-162	.0001 MFD	5	POWER TRANSFORMER
C6	22-527	.02 MFD	6	500V 50-00 CYCLE
C7	22-435	.02 MFD	7	POWER TRANSFORMER
C8	22-492	.002 MFD	8	ALL WOLFRAM BICYCLE
C9	22-596	.1 MFD 50V ELECTROLYTIC	9	SPEAKER TRANSFORMER
C10		.1 MFD 50V ELECTROLYTIC	10	VARIABLE TRIMMER
R1	63-593	47 M OHMS	A	1ST I.F. TRANS. PRIMARY
R2	63-208	12 M OHMS	B	1ST I.F. TRANS. SECONDARY
R3	63-271	1 MEG OHM	C	2ND I.F. TRANS. PRIMARY
R4	63-565	500 M OHMS	D	2ND I.F. TRANS. SECONDARY
R5	63-597	470 M OHMS	E	OSCILLATOR (ON BRK)
R6	63-684	180 M OHMS	F	ANTENNA (ON BRK)
R7	63-563	80 OHM WIREWOUND	G	OSCILLATOR FEEDING
R8	63-686	180 OHM WIREWOUND	H	
			I	
			J	

NOTE: ON 55 CYCLE SETS
 REPLACE 63-583 WITH 63-597
 TO ALIGN POINT 14 IN 10
 REPLACE 63-585 WITH 63-588
 TO ALIGN POINT 14 IN 10

ANT LIGHTS
 6.3 X .25 AMP
 250-30



FOR PHONO. DATA, SEE INDEX

MODELS 6D202, 6D219
6D221, 6D238
Chassis 5639

ZENITH RADIO CORP.

Voltage, Alignment
Socket, Trimmers

SOCKET VOLTAGES

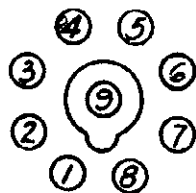
Tube	Position	1	2	3	4	5	6	7	8	9
6A8	Converter									
	Osc.	0	AC	102	55	-1	85	AC	0	-1
6K7	I.F.	0	AC	104	104	0	—	AC	0	-1
6Q7	2nd Det. AVC									
	1st Audio	0	AC	24	-1	-1	—	AC	-1	-1
25L6	Power	0	AC	94	104	-5	—	AC	-4	—
25Z6	Rect.	0	AC	AC	119	AC	—	AC	119	—
	Ballast									

All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 55W. Power output 1.75W.

ALIGNMENT PROCEDURE

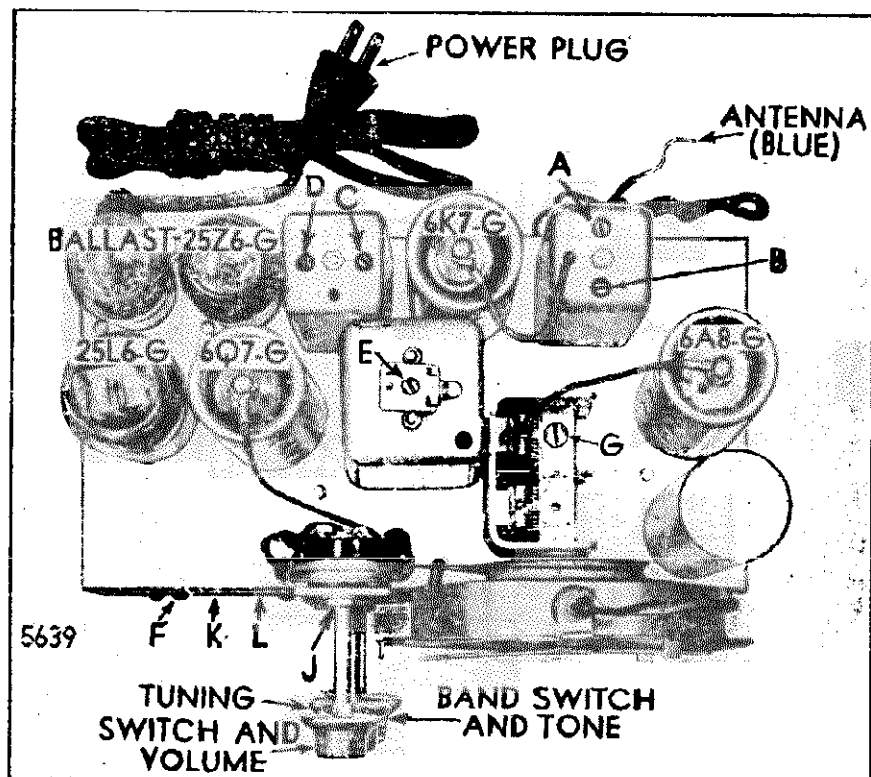
Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Lead	200 Mmfd.	456	"	600	E	See Note
3	" " "	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
4	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
5	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
6						FG	Repeat 3 & 4
7	" " "	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
8	" " "	400 Ohms	16500	S.W.	16500	L	Rock gang & adj. for max. output

NOTE: If receiver is used in a location subject to code interference adjust wave trap (E) for minimum interference with antenna connected and receiver operating in broadcast band.



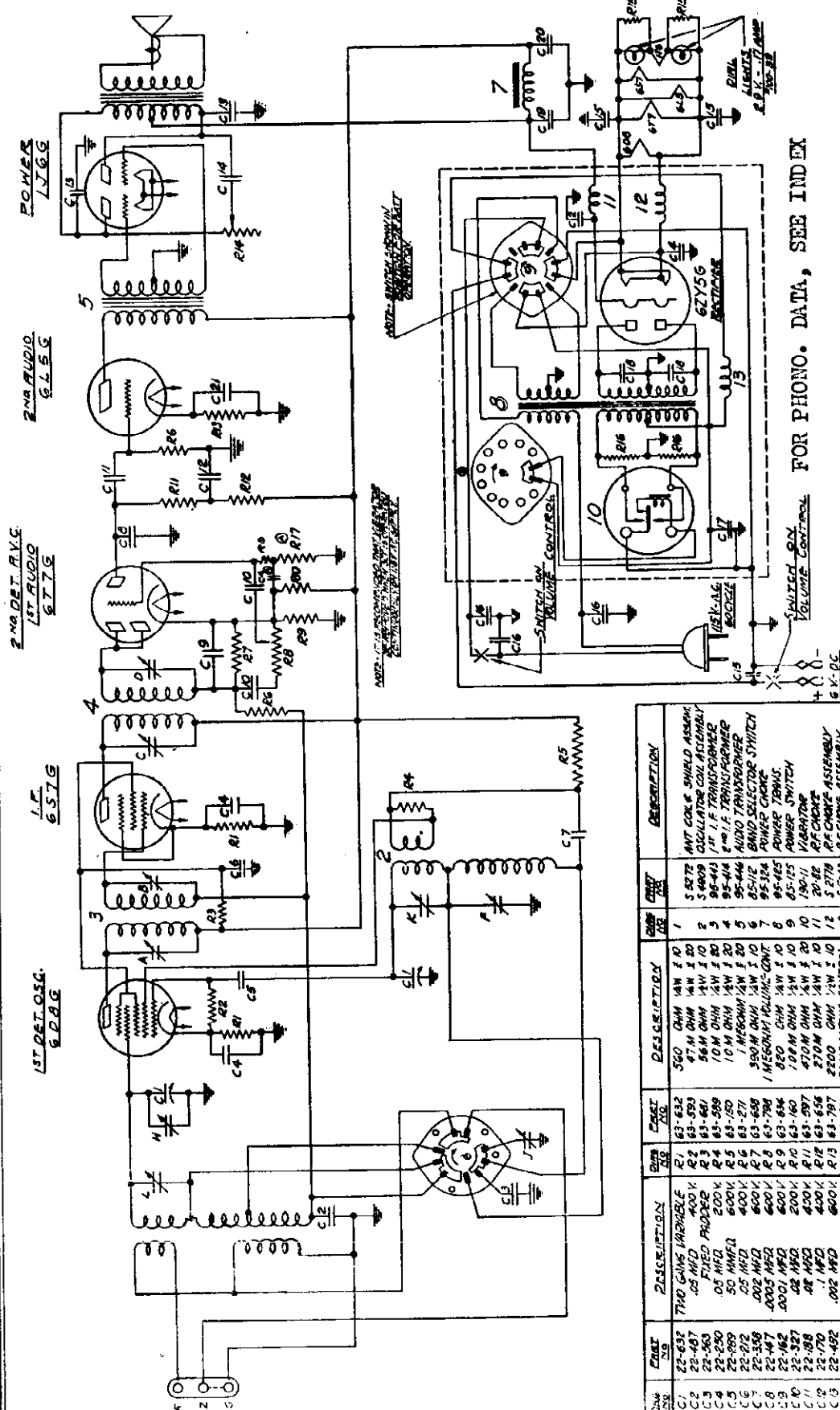
BOTTOM VIEW OF SOCKET

LOCATION OF TRIMMERS



ZENITH RADIO CORP.

MODELS 6J230, 6J235
Chassis 5642
Schematic, Parts



I.F. FREQUENCY 456 K.C.
6 TUBE SUPERHETERODYNE
6 VOLT DC 115 VOLT A.C.
MODEL 6J230 49-162 6 Models 6-J-230, 6-J-257 (5642 Chassis)
6-J-257 49-164 6
ZENITH RADIO CORPORATION
CHICAGO, ILL.

FOR PHONO. DATA, SEE INDEX

Part No.	Description	Part No.	Description	Part No.	Description
1	500 OHM 1/4W 1.0	1	ANT. COIL & SHIELD ASSEMBLY	1	6X4
2	500 OHM 1/4W 1.0	2	500 OHM 1/4W 1.0	2	6X5
3	500 OHM 1/4W 1.0	3	500 OHM 1/4W 1.0	3	6X6
4	500 OHM 1/4W 1.0	4	500 OHM 1/4W 1.0	4	6X7
5	500 OHM 1/4W 1.0	5	500 OHM 1/4W 1.0	5	6X8
6	500 OHM 1/4W 1.0	6	500 OHM 1/4W 1.0	6	6X9
7	500 OHM 1/4W 1.0	7	500 OHM 1/4W 1.0	7	6X10
8	500 OHM 1/4W 1.0	8	500 OHM 1/4W 1.0	8	6X11
9	500 OHM 1/4W 1.0	9	500 OHM 1/4W 1.0	9	6X12
10	500 OHM 1/4W 1.0	10	500 OHM 1/4W 1.0	10	6X13
11	500 OHM 1/4W 1.0	11	500 OHM 1/4W 1.0	11	6X14
12	500 OHM 1/4W 1.0	12	500 OHM 1/4W 1.0	12	6X15
13	500 OHM 1/4W 1.0	13	500 OHM 1/4W 1.0	13	6X16
14	500 OHM 1/4W 1.0	14	500 OHM 1/4W 1.0	14	6X17
15	500 OHM 1/4W 1.0	15	500 OHM 1/4W 1.0	15	6X18
16	500 OHM 1/4W 1.0	16	500 OHM 1/4W 1.0	16	6X19
17	500 OHM 1/4W 1.0	17	500 OHM 1/4W 1.0	17	6X20
18	500 OHM 1/4W 1.0	18	500 OHM 1/4W 1.0	18	6X21
19	500 OHM 1/4W 1.0	19	500 OHM 1/4W 1.0	19	6X22
20	500 OHM 1/4W 1.0	20	500 OHM 1/4W 1.0	20	6X23
21	500 OHM 1/4W 1.0	21	500 OHM 1/4W 1.0	21	6X24
22	500 OHM 1/4W 1.0	22	500 OHM 1/4W 1.0	22	6X25
23	500 OHM 1/4W 1.0	23	500 OHM 1/4W 1.0	23	6X26
24	500 OHM 1/4W 1.0	24	500 OHM 1/4W 1.0	24	6X27
25	500 OHM 1/4W 1.0	25	500 OHM 1/4W 1.0	25	6X28
26	500 OHM 1/4W 1.0	26	500 OHM 1/4W 1.0	26	6X29
27	500 OHM 1/4W 1.0	27	500 OHM 1/4W 1.0	27	6X30
28	500 OHM 1/4W 1.0	28	500 OHM 1/4W 1.0	28	6X31
29	500 OHM 1/4W 1.0	29	500 OHM 1/4W 1.0	29	6X32
30	500 OHM 1/4W 1.0	30	500 OHM 1/4W 1.0	30	6X33
31	500 OHM 1/4W 1.0	31	500 OHM 1/4W 1.0	31	6X34
32	500 OHM 1/4W 1.0	32	500 OHM 1/4W 1.0	32	6X35
33	500 OHM 1/4W 1.0	33	500 OHM 1/4W 1.0	33	6X36
34	500 OHM 1/4W 1.0	34	500 OHM 1/4W 1.0	34	6X37
35	500 OHM 1/4W 1.0	35	500 OHM 1/4W 1.0	35	6X38
36	500 OHM 1/4W 1.0	36	500 OHM 1/4W 1.0	36	6X39
37	500 OHM 1/4W 1.0	37	500 OHM 1/4W 1.0	37	6X40
38	500 OHM 1/4W 1.0	38	500 OHM 1/4W 1.0	38	6X41
39	500 OHM 1/4W 1.0	39	500 OHM 1/4W 1.0	39	6X42
40	500 OHM 1/4W 1.0	40	500 OHM 1/4W 1.0	40	6X43
41	500 OHM 1/4W 1.0	41	500 OHM 1/4W 1.0	41	6X44
42	500 OHM 1/4W 1.0	42	500 OHM 1/4W 1.0	42	6X45
43	500 OHM 1/4W 1.0	43	500 OHM 1/4W 1.0	43	6X46
44	500 OHM 1/4W 1.0	44	500 OHM 1/4W 1.0	44	6X47
45	500 OHM 1/4W 1.0	45	500 OHM 1/4W 1.0	45	6X48
46	500 OHM 1/4W 1.0	46	500 OHM 1/4W 1.0	46	6X49
47	500 OHM 1/4W 1.0	47	500 OHM 1/4W 1.0	47	6X50
48	500 OHM 1/4W 1.0	48	500 OHM 1/4W 1.0	48	6X51
49	500 OHM 1/4W 1.0	49	500 OHM 1/4W 1.0	49	6X52
50	500 OHM 1/4W 1.0	50	500 OHM 1/4W 1.0	50	6X53
51	500 OHM 1/4W 1.0	51	500 OHM 1/4W 1.0	51	6X54
52	500 OHM 1/4W 1.0	52	500 OHM 1/4W 1.0	52	6X55
53	500 OHM 1/4W 1.0	53	500 OHM 1/4W 1.0	53	6X56
54	500 OHM 1/4W 1.0	54	500 OHM 1/4W 1.0	54	6X57
55	500 OHM 1/4W 1.0	55	500 OHM 1/4W 1.0	55	6X58
56	500 OHM 1/4W 1.0	56	500 OHM 1/4W 1.0	56	6X59
57	500 OHM 1/4W 1.0	57	500 OHM 1/4W 1.0	57	6X60
58	500 OHM 1/4W 1.0	58	500 OHM 1/4W 1.0	58	6X61
59	500 OHM 1/4W 1.0	59	500 OHM 1/4W 1.0	59	6X62
60	500 OHM 1/4W 1.0	60	500 OHM 1/4W 1.0	60	6X63
61	500 OHM 1/4W 1.0	61	500 OHM 1/4W 1.0	61	6X64
62	500 OHM 1/4W 1.0	62	500 OHM 1/4W 1.0	62	6X65

MODELS 6J230, 6J257
Voltage, Alignment
Socket, Trimmers

ZENITH RADIO CORP.

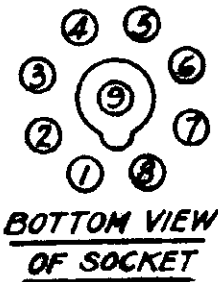
SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6D8	Converter Osc.	0	0	125	35	-1	97	6.3	1.5	0
6S7	I.F.	0	0	124	35	1	-	6.3	1	0
6T7	2nd Det. AVC 1st Audio	0	0	15	.1	.1	-	6.3	.5	0
6L5	2nd Audio	0	0	120	-	0	-	6.3	.2	-
1J6	Power	0	3	137	0	0	137	1	0	-
6ZY5	Rect.	0	6.3	AC	-	AC	-	0	140	-

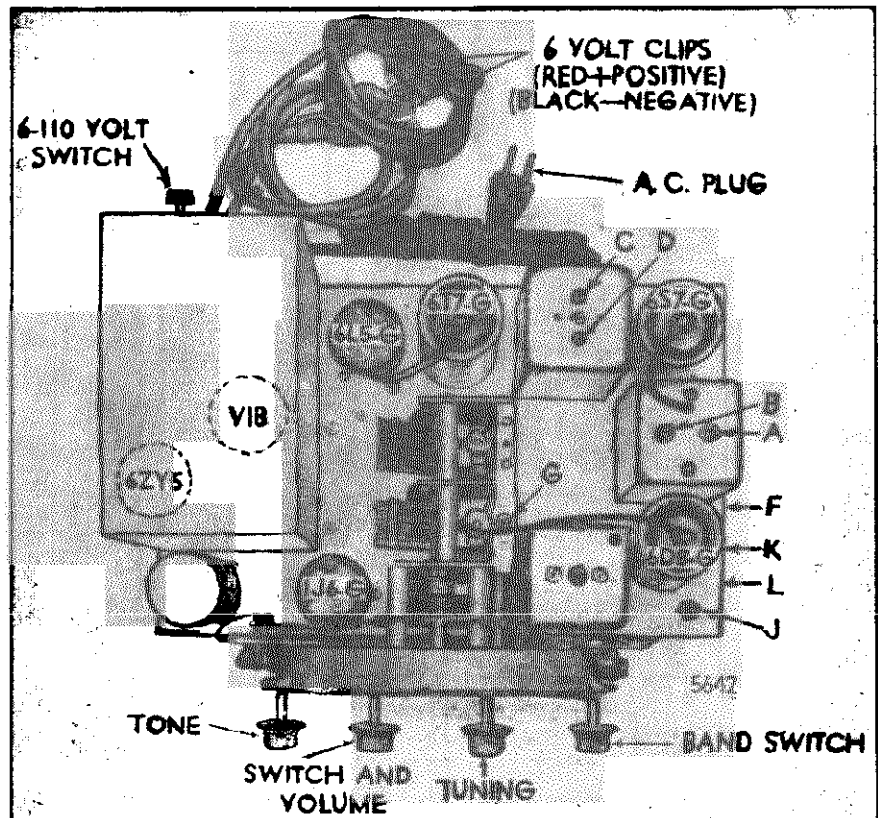
All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 17W. Battery voltage 6.3V consumption 2.04 Amp. Power output 1.75W.

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Lead	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5	" " "	"	"	"	"	FG	Repeat 3 & 4
6	Rec. Ant. Lead	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
7	" " "	400 Ohms	16500	S.W.	16500	L	Rock gang & adj. for max. output

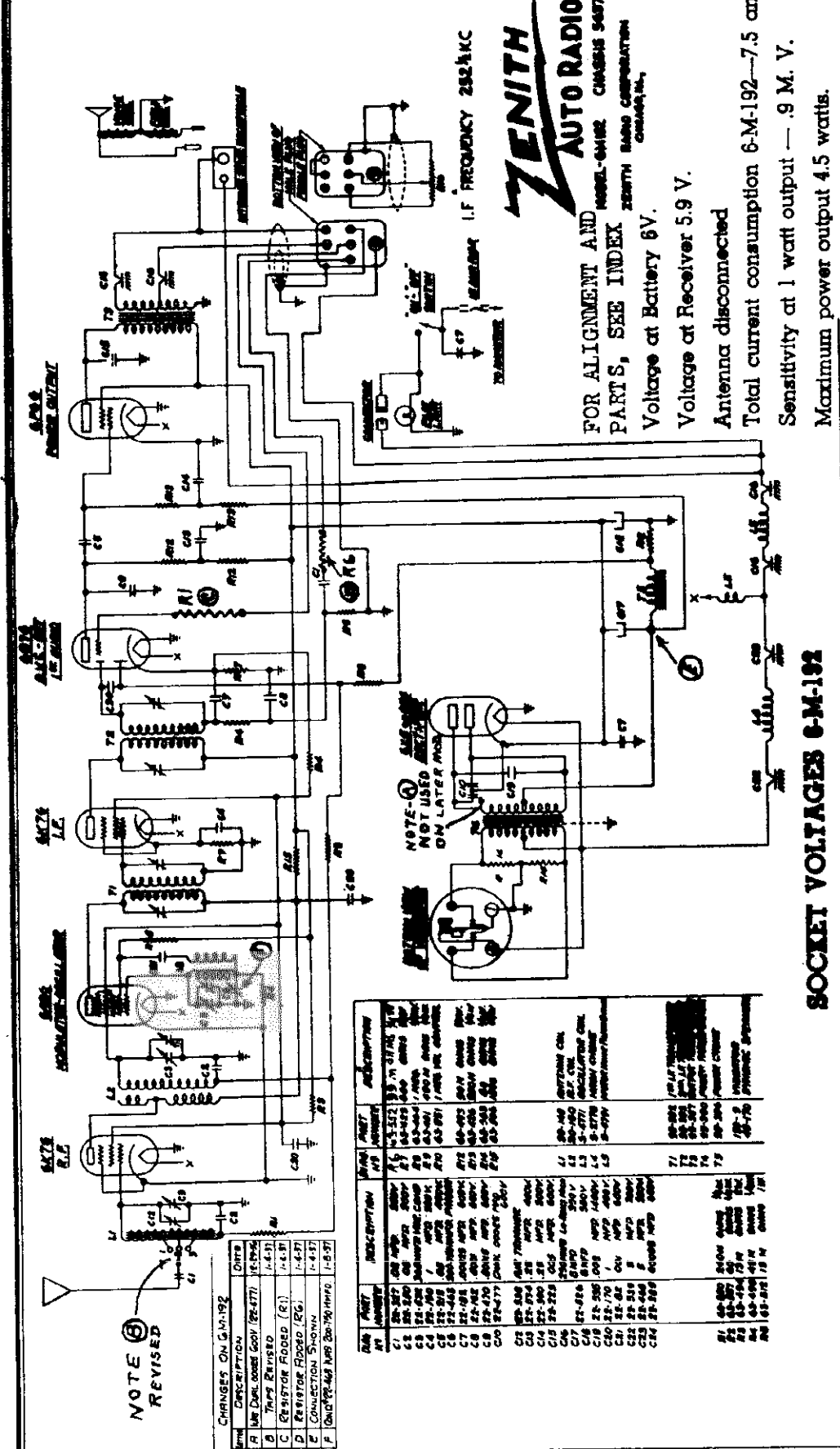


LOCATION OF TRIMMERS



ZENITH RADIO CORP.

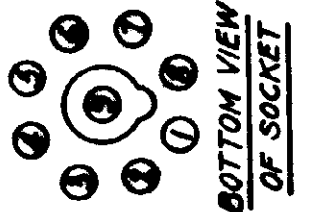
MODEL 6M192
 Chassis 5637
 Schematic, Voltage
 Changes, Parts



ZENITH
 AUTO RADIO
 MODEL-6M192 CHASSIS 5637
 ZENITH RADIO CORPORATION
 CHICAGO, ILL.

FOR ALIGNMENT AND PARTS, SEE INDEX
 Voltage at Battery 8V.
 Voltage at Receiver 5.9 V.
 Antenna disconnected
 Total current consumption 6-M-192—7.5 amp
 Sensitivity at 1 watt output — .9 M. V.
 Maximum power output 4.5 watts.

SOCKET VOLTAGES 6-M-192



Tube	Position	1	2	3	4	5	6	7	8	9	
6K7	R. F.	0	0	225	95	0	—	5.9	0	0	
6A8	Mixer Osc.	0	0	225	95	—32	140	5.9	0	0	
6K7	I. F.	0	0	235	95	4	—	5.9	4	0	
6Q7	Det. A. V. C. Audio	0	0	140	0	—5	—	5.9	—2	0	
6F6	Power	0	0	215	233	—14	—	5.9	0	—	
67A	Rectifier	Inaccessible									

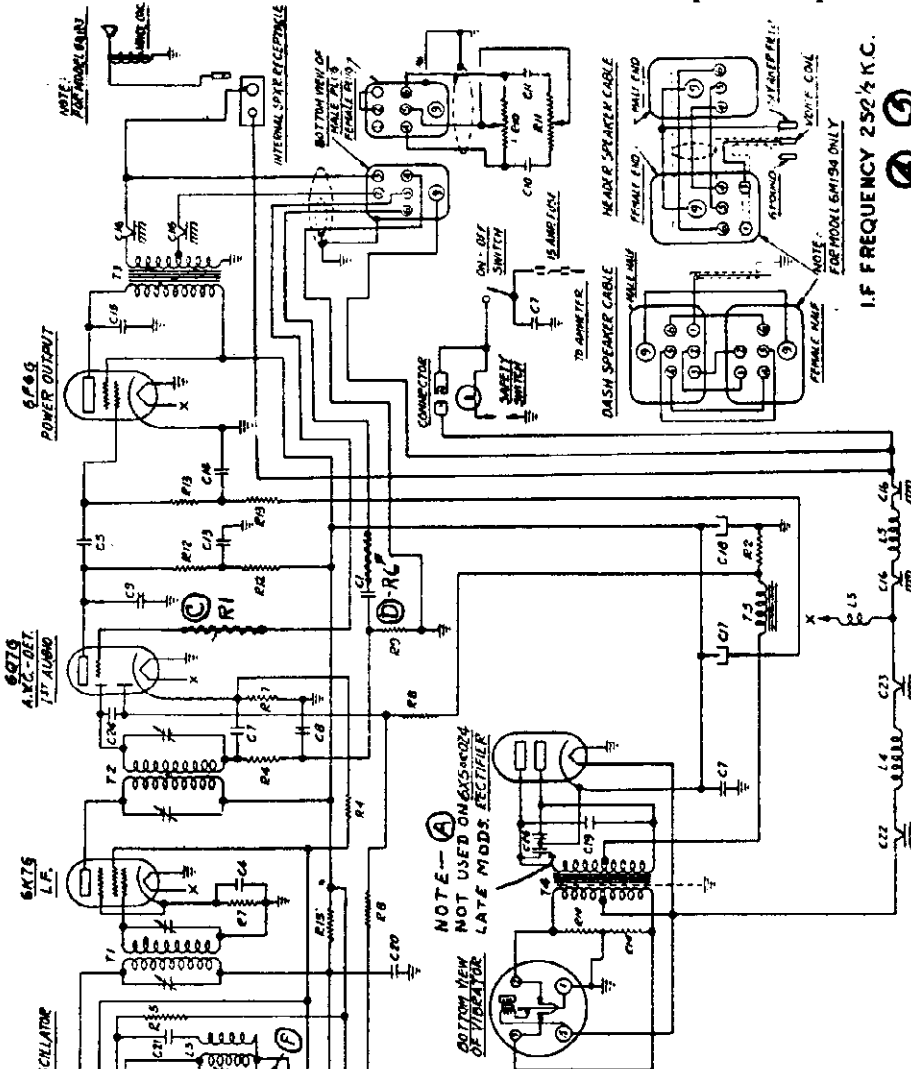
MODELS 6M193, 6M194
Chassis 5637

ZENITH RADIO CORP.

Schematic, Voltage
Parts, Changes

CHANGES ON 6-M-193-4	DATE
DESCRIPTION	DATE
F. New Det. socket (22-17)	1-4-37
G. TRING RINGED	1-4-37
C. RESISTOR R10D (R1)	1-4-37
D. RESISTOR R10D (R2)	1-4-37
E. CONNECTION CHANGED	1-4-37
F. Change defines cap. type	1-4-37

Voltage at Battery 6V. All voltages measured with 1000 ohms per volt D. C. meter
Voltage at Receiver 5.9 V. Total current consumption 6-M-193—6-M-194 5.9 amperes
Antenna disconnected Sensitivity at 1 watt output — .9 M. V.
Maximum power output 4.5 watts.



QWG NO.	QWG NUMBER	DESCRIPTION	QWG NUMBER	DESCRIPTION
102	102	500K MFD	61	6B7G
103	103	500K MFD	62	6Q7G
104	104	500K MFD	63	6B7G
105	105	500K MFD	64	6Q7G
106	106	500K MFD	65	6B7G
107	107	500K MFD	66	6Q7G
108	108	500K MFD	67	6B7G
109	109	500K MFD	68	6Q7G
110	110	500K MFD	69	6B7G
111	111	500K MFD	70	6Q7G
112	112	500K MFD	71	6B7G
113	113	500K MFD	72	6Q7G
114	114	500K MFD	73	6B7G
115	115	500K MFD	74	6Q7G
116	116	500K MFD	75	6B7G
117	117	500K MFD	76	6Q7G
118	118	500K MFD	77	6B7G
119	119	500K MFD	78	6Q7G
120	120	500K MFD	79	6B7G
121	121	500K MFD	80	6Q7G
122	122	500K MFD	81	6B7G
123	123	500K MFD	82	6Q7G
124	124	500K MFD	83	6B7G
125	125	500K MFD	84	6Q7G
126	126	500K MFD	85	6B7G
127	127	500K MFD	86	6Q7G
128	128	500K MFD	87	6B7G
129	129	500K MFD	88	6Q7G
130	130	500K MFD	89	6B7G
131	131	500K MFD	90	6Q7G
132	132	500K MFD	91	6B7G
133	133	500K MFD	92	6Q7G
134	134	500K MFD	93	6B7G
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136	136	500K MFD	95	6B7G
137	137	500K MFD	96	6Q7G
138	138	500K MFD	97	6B7G
139	139	500K MFD	98	6Q7G
140	140	500K MFD	99	6B7G
141	141	500K MFD	100	6Q7G
142	142	500K MFD	101	6B7G
143	143	500K MFD	102	6Q7G
144	144	500K MFD	103	6B7G
145	145	500K MFD	104	6Q7G
146	146	500K MFD	105	6B7G
147	147	500K MFD	106	6Q7G
148	148	500K MFD	107	6B7G
149	149	500K MFD	108	6Q7G
150	150	500K MFD	109	6B7G
151	151	500K MFD	110	6Q7G
152	152	500K MFD	111	6B7G
153	153	500K MFD	112	6Q7G
154	154	500K MFD	113	6B7G
155	155	500K MFD	114	6Q7G
156	156	500K MFD	115	6B7G
157	157	500K MFD	116	6Q7G
158	158	500K MFD	117	6B7G
159	159	500K MFD	118	6Q7G
160	160	500K MFD	119	6B7G
161	161	500K MFD	120	6Q7G
162	162	500K MFD	121	6B7G
163	163	500K MFD	122	6Q7G
164	164	500K MFD	123	6B7G
165	165	500K MFD	124	6Q7G
166	166	500K MFD	125	6B7G
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169	169	500K MFD	128	6Q7G
170	170	500K MFD	129	6B7G
171	171	500K MFD	130	6Q7G
172	172	500K MFD	131	6B7G
173	173	500K MFD	132	6Q7G
174	174	500K MFD	133	6B7G
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236	236	500K MFD	195	6B7G
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258	258	500K MFD	217	6B7G
259	259	500K MFD	218	6Q7G
260	260	500K MFD	219	6B7G
261	261	500K MFD	220	6Q7G
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265	265	500K MFD	224	6Q7G
266	266	500K MFD	225	6B7G
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276	276	500K MFD	235	6B7G
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297	297	500K MFD	256	6Q7G
298	298	500K MFD	257	6B7G
299	299	500K MFD	258	6Q7G
300	300	500K MFD	259	6B7G
301	301	500K MFD	260	6Q7G
302	302	500K MFD	261	6B7G
303	303	500K MFD	262	6Q7G
304	304	500K MFD	263	6B7G
305	305	500K MFD	264	6Q7G
306	306	500K MFD	265	6B7G
307	307	500K MFD	266	6Q7G
308	308	500K M		

Chassis 5637
Socket, Trimmers
Chassis

ZENITH RADIO CORP.

MODEL 6M192
MODELS 6M193, 6M194

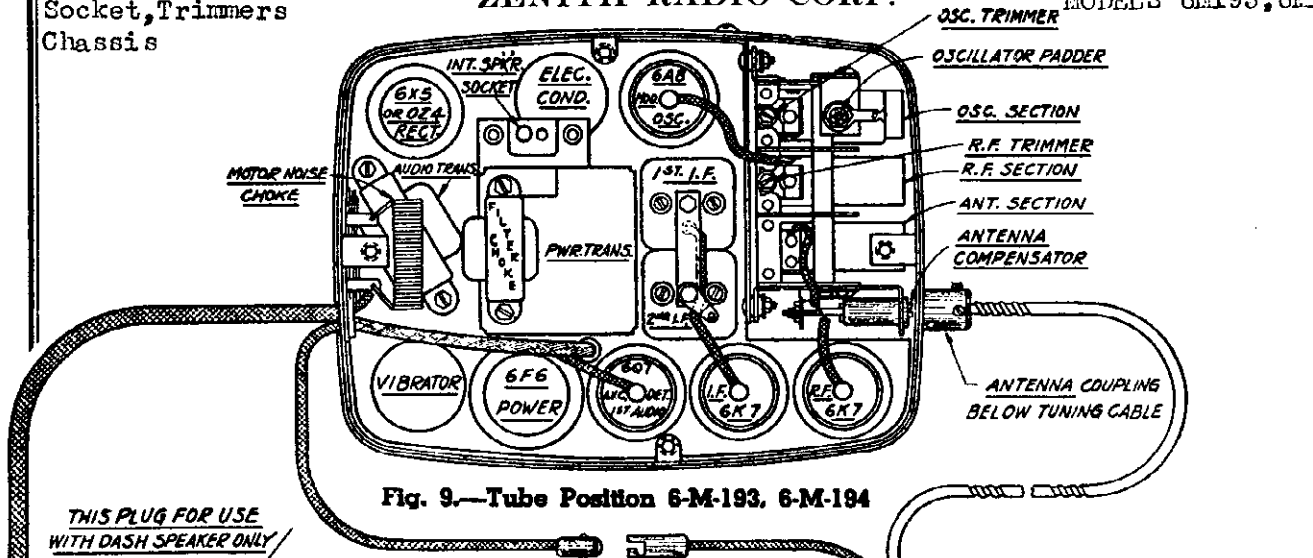


Fig. 9.—Tube Position 6-M-193, 6-M-194

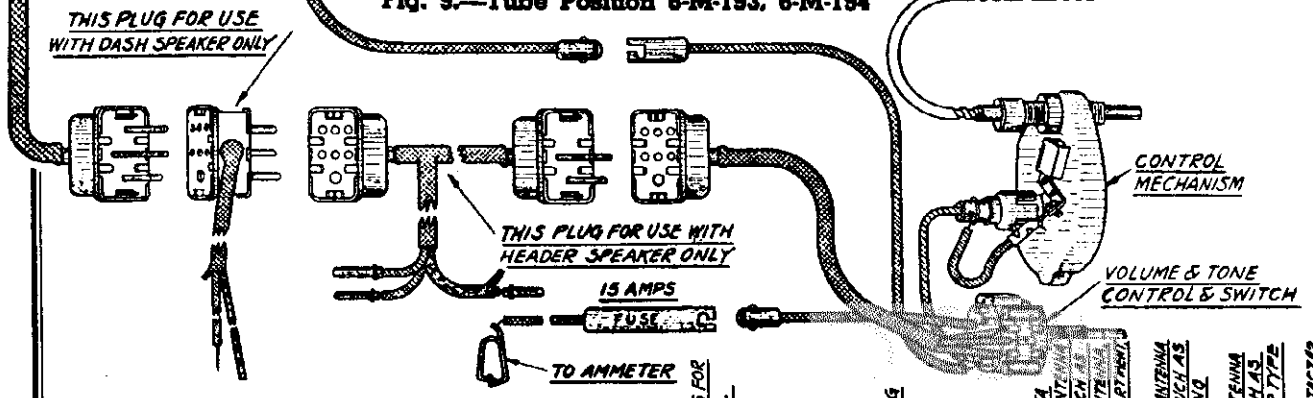


Fig. 6.—Bottom View—6-M-192, 6-M-193, 6-M-194

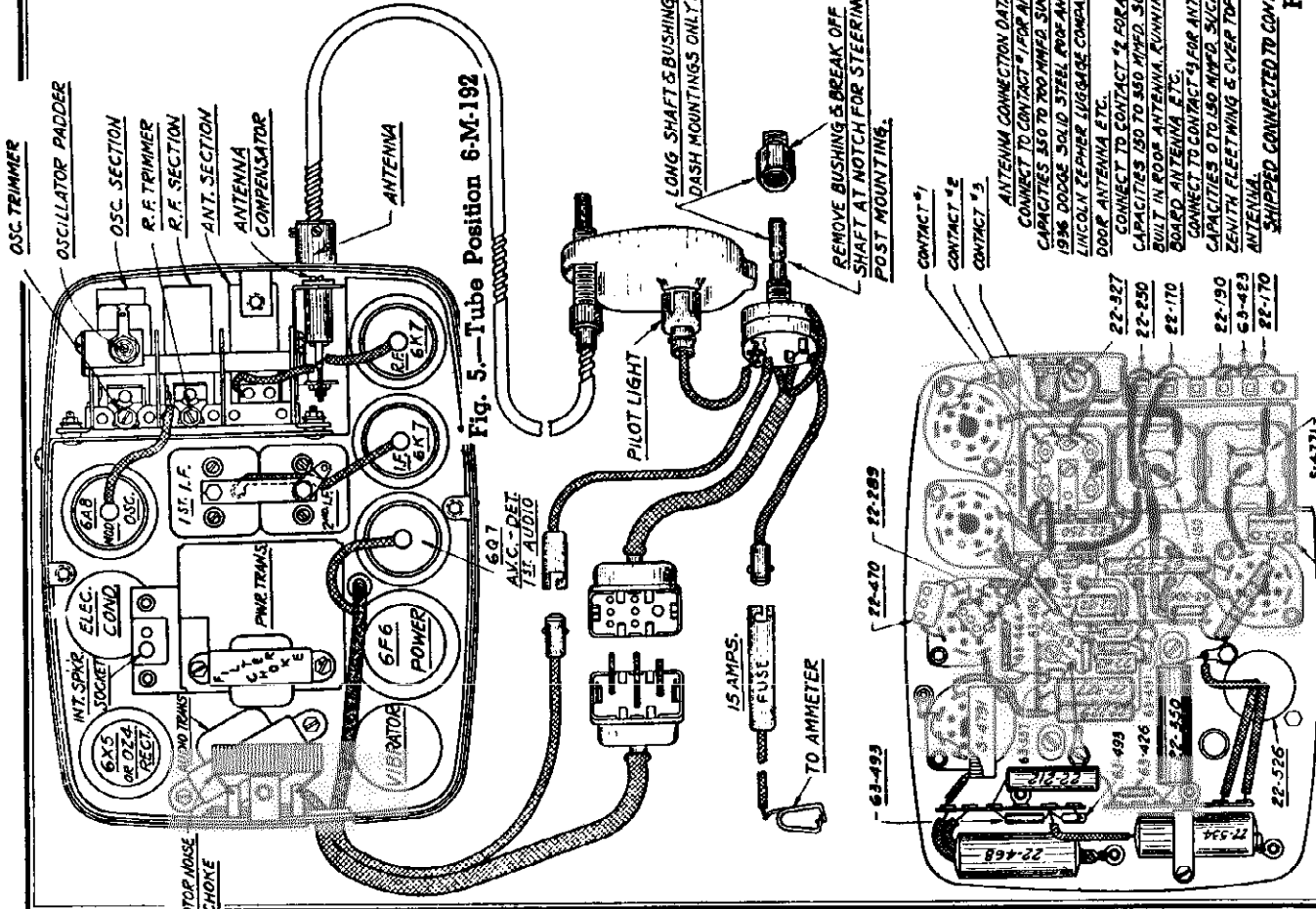
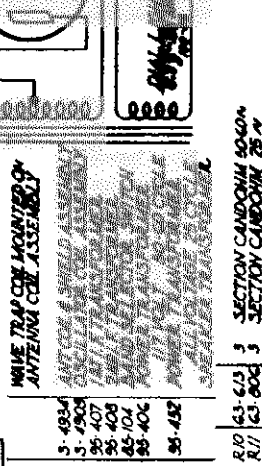
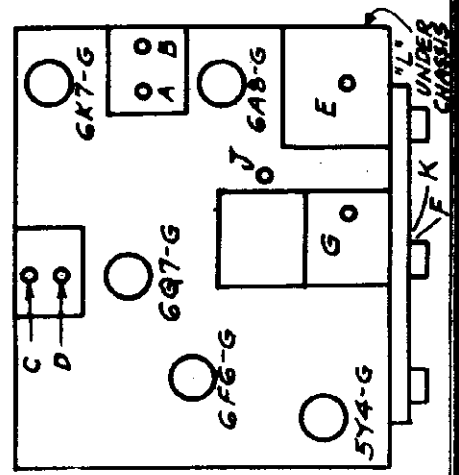
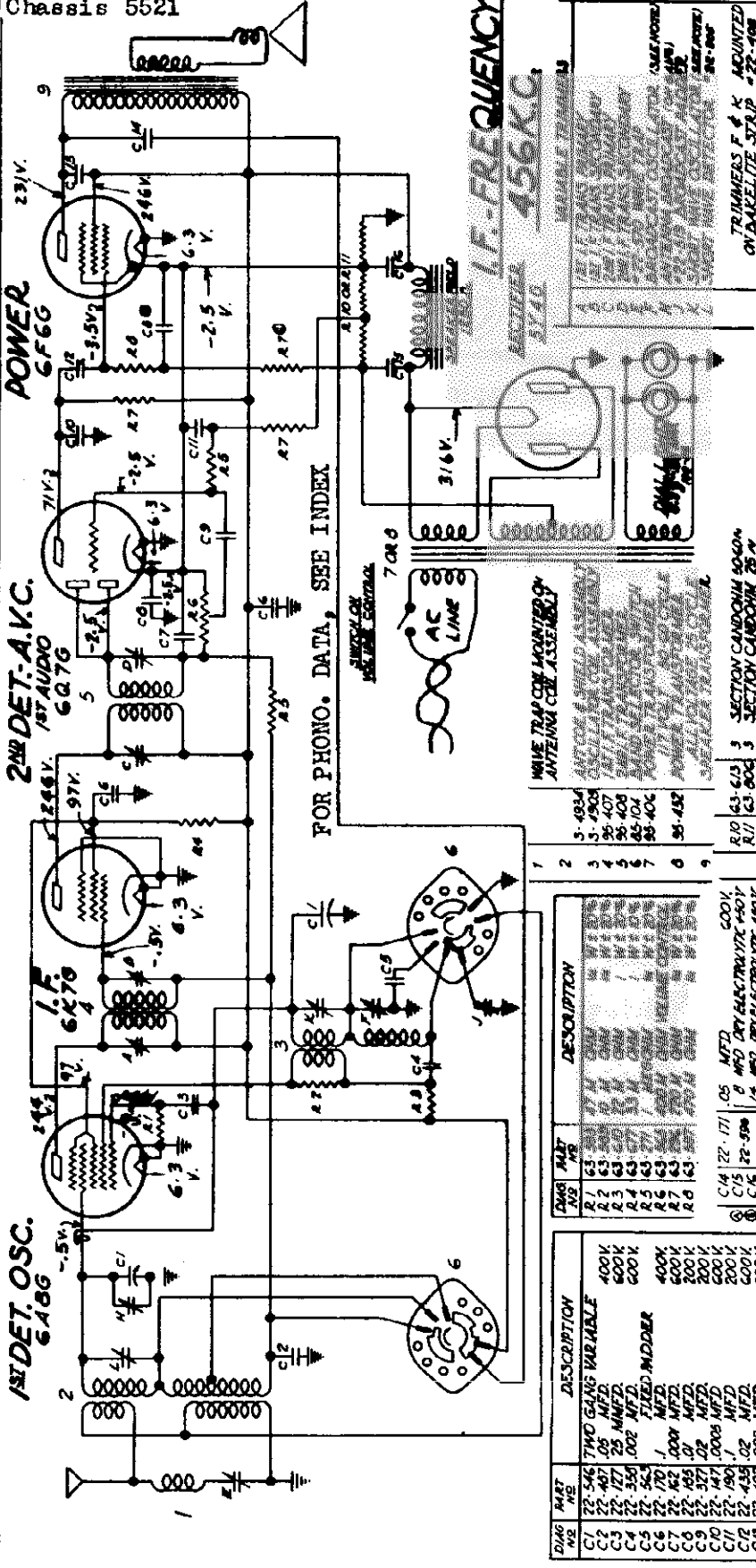


Fig. 5.—Tube Position 6-M-192

MODEL S 5S201, 5S218, 5S220
5S228, 5S237, 5S250
5S252

ZENITH RADIO CORP Schematic, Socket, Trimmers
Alignment, Voltage, Parts

Chassis 5521



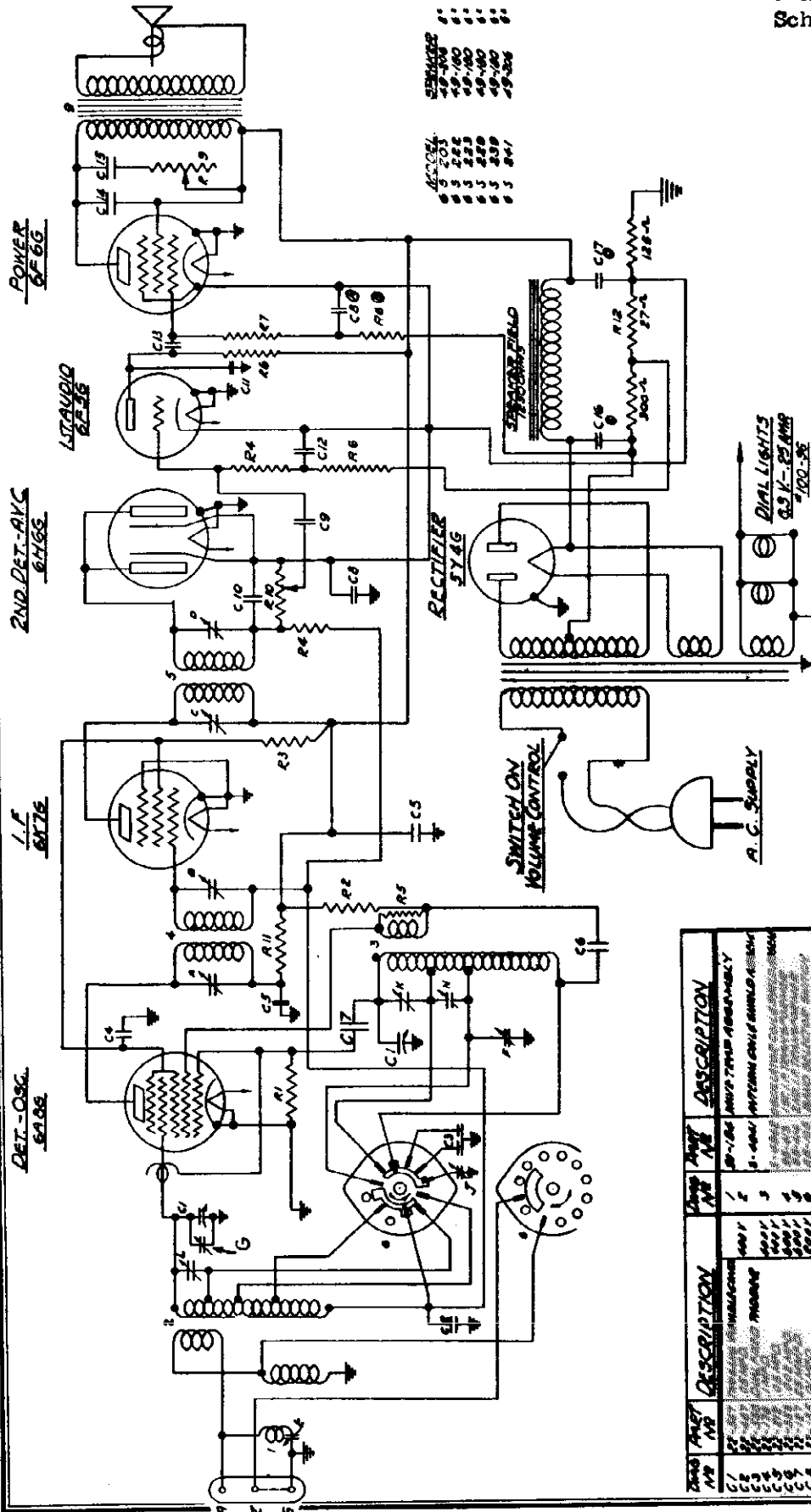
DIAG. NO.	PART NO.	DESCRIPTION
R 1	63	5-4934
R 2	63	5-4934
R 3	63	36-408
R 4	63	36-408
R 5	63	36-408
R 6	63	36-408
R 7	63	36-408
R 8	63	36-408
C 1	22-171	500V
C 2	22-171	500V
C 3	22-171	500V
C 4	22-171	500V
C 5	22-171	500V
C 6	22-171	500V
C 7	22-171	500V
C 8	22-171	500V
C 9	22-171	500V
C 10	22-171	500V
C 11	22-171	500V
C 12	22-171	500V
C 13	22-171	500V

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Lead	200 Mmfd.	456	"	600	E	See Note
3	"	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
4	"	200 Mmfd.	1500	"	1500	G	Alignment of Ant.
5	"	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
6	"	400 Ohms	18000	S.W.	18000	FG	Repeat 3 & 4.
7	Rec. Ant. Lead	400 Ohms	16500	S.W.	16500	K	Set Osc. to Scale
8	"	400 Ohms	16500	S.W.	16500	L	Rock gang & adj. for max. output

NOTE: If receiver is used in a location subject to code interference adjust wave trap (E) for minimum interference with antenna connected and receiver operating in broadcast band.

MODELS 6S203, 6S222, 6S223, 6S229, 6S239, 6S241
 Chassis 5638
 Schematic, Parts

ZENITH RADIO CORP.



- RESISTORS
 1 100K
 2 100K
 3 100K
 4 100K
 5 100K
 6 100K
 7 100K
 8 100K
 9 100K
 10 100K
 11 100K
 12 100K
 13 100K
 14 100K
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 91 100K
 92 100K
 93 100K
 94 100K
 95 100K
 96 100K
 97 100K
 98 100K
 99 100K
 100 100K

I.F. FREQUENCY 456 K.C.
 6 TUBE SUPERHETERODYNE - 3 BANDS
 CHASSIS 5638
 Models 6-S-203, 6-S-222, 6-S-223, 6-S-229, 6-S-239, 6-S-241
 FOR PHONO. DATA, SEE INDEX
 ZENITH RADIO CORPORATION
 CHICAGO, ILLINOIS

Part No.	Description	Part No.	Description
6A106	DET.-OSC. 6A106	6A76	I.F. AUDIO 6A76
6A66	2ND DET.-A.V.C. 6A66	6F66	POWER 6F66
6A76	I.F. 6A76		
6F66	POWER 6F66		
6S203	MODEL 6S203	6S222	MODEL 6S222
6S223	MODEL 6S223	6S229	MODEL 6S229
6S239	MODEL 6S239	6S241	MODEL 6S241

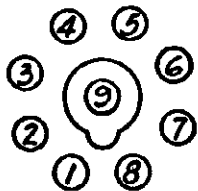
MODELS 6S203, 6S222, 6S223
6S229, 6S239, 6S241

ZENITH RADIO CORP.

Chassis 5638
Voltage, Alignment
Socket, Trimmers

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6A8	Converter Osc.	0	6.1	245	83	-9	200	0	0	-1
6K7	I.F.	0	6.1	247	83	0	-	0	0	-1
6H6	2nd Det. AVC	0	0	-2	-2	-2	-	6.1	-2	-
6F5	1st Audio	0	0	-	114	-	-	6.1	-2	-2
6F6	Power	0	0	231	247	-3.5	-	6.1	-2	-
5Y4	Rect.	0	-	AC	-	AC	-	322	322	-



All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 65W. Power Output 4.5W. FOR PHONO. DATA, SEE INDEX

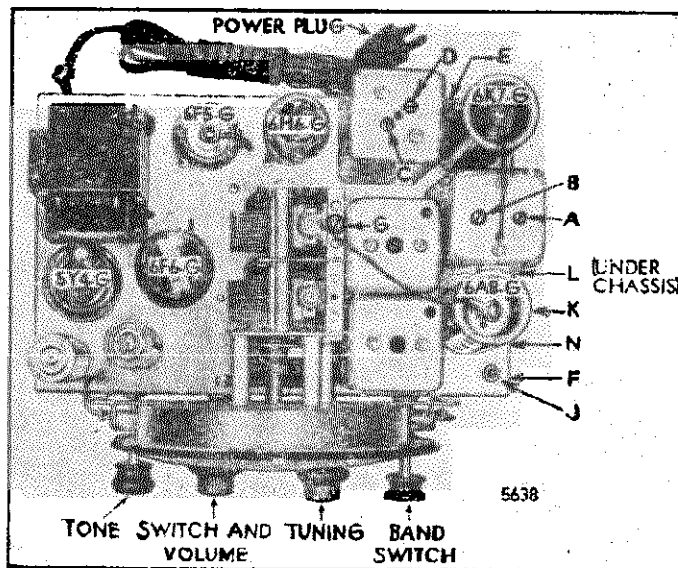
BOTTOM VIEW OF SOCKET

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	456	"	600	E	See Note
3	" " "	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
4	" " "	200 Mmfd.	1500	"	1500	G	Al'gmt of Ant.
5	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
6	" " "	200 Mmfd.				FG	Repeat 3 & 4
7	" " "	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
8	" " "	400 Ohms	16500	S.W.	16500	L	Rock gang & adj. for max. output
9	" " "	400 Ohms	5500	Police	5500	N	Rock gang & adj. for max. output

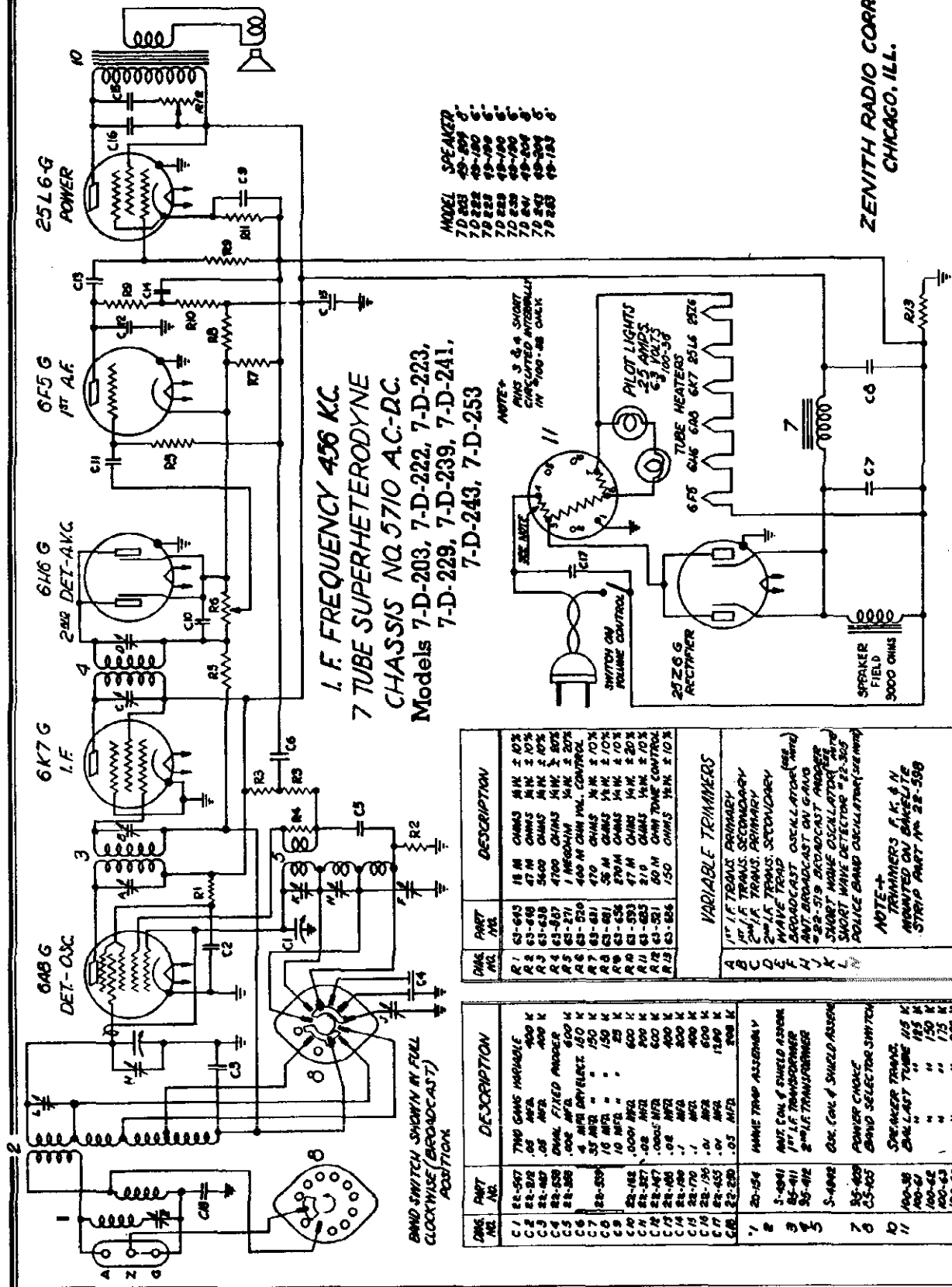
NOTE: If receiver is used in a location subject to code interference adjust wave trap (E) for minimum interference with antenna connected and receiver operating in broadcast band.

LOCATION OF TRIMMERS



ZENITH RADIO CORP.

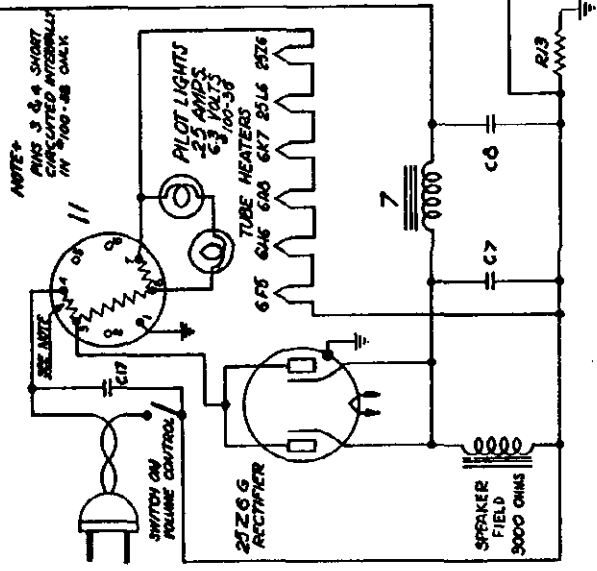
MODEL S 7D203, 7D222, 7D223
 7D229, 7D239, 7D241
 7D243, 7D253
 Chassis 5710 AC-DC
 Schematic, Parts



SPEAKER

MODEL	7D 203	7D 222	7D 223	7D 229	7D 239	7D 241	7D 243	7D 253
	45-809 G	45-100 G	45-100 G	45-100 G	45-100 G	45-209 G	45-209 G	45-103 G

I. F. FREQUENCY 456 KC.
7 TUBE SUPERHETERODYNE
CHASSIS NO. 5710 AC-DC.
Models 7-D-203, 7-D-222, 7-D-223,
7-D-229, 7-D-239, 7-D-241,
7-D-243, 7-D-253



ZENITH RADIO CORP.
 CHICAGO, ILL.

DWG. NO.	PART NO.	DESCRIPTION
R 1	63-643	15 M OHMS 1/4W ± 10%
R 2	63-648	47 M OHMS 1/4W ± 10%
R 3	63-628	5600 OHMS 1/4W ± 10%
R 4	63-837	4700 OHMS 1/4W ± 20%
R 5	63-171	1 MEG OHMS 1/4W ± 20%
R 6	63-570	400 M OHMS 1/4W CONTROL
R 7	63-481	470 OHMS 1/4W ± 10%
R 8	63-481	50 M OHMS 1/4W ± 10%
R 9	63-456	270 M OHMS 1/4W ± 10%
R 10	63-456	47 M OHMS 1/4W ± 10%
R 11	63-593	210 OHMS 1/4W ± 10%
R 12	63-423	50 M OHMS 1/4W CONTROL
R 13	63-186	150 OHMS 1/4W ± 10%

DWG. NO.	PART NO.	DESCRIPTION
A 1	63-104	1ST I.F. TRANS. PRIMARY
A 2	63-104	2ND I.F. TRANS. PRIMARY
A 3	63-104	3RD I.F. TRANS. PRIMARY
A 4	63-104	1ST I.F. TRANS. SECONDARY
A 5	63-104	2ND I.F. TRANS. SECONDARY
A 6	63-104	3RD I.F. TRANS. SECONDARY
A 7	63-104	4TH I.F. TRANS. SECONDARY
A 8	63-104	5TH I.F. TRANS. SECONDARY
A 9	63-104	6TH I.F. TRANS. SECONDARY
A 10	63-104	7TH I.F. TRANS. SECONDARY
A 11	63-104	8TH I.F. TRANS. SECONDARY
A 12	63-104	9TH I.F. TRANS. SECONDARY
A 13	63-104	10TH I.F. TRANS. SECONDARY
A 14	63-104	11TH I.F. TRANS. SECONDARY
A 15	63-104	12TH I.F. TRANS. SECONDARY
A 16	63-104	13TH I.F. TRANS. SECONDARY
A 17	63-104	14TH I.F. TRANS. SECONDARY
A 18	63-104	15TH I.F. TRANS. SECONDARY
A 19	63-104	16TH I.F. TRANS. SECONDARY
A 20	63-104	17TH I.F. TRANS. SECONDARY
A 21	63-104	18TH I.F. TRANS. SECONDARY
A 22	63-104	19TH I.F. TRANS. SECONDARY
A 23	63-104	20TH I.F. TRANS. SECONDARY
A 24	63-104	21TH I.F. TRANS. SECONDARY
A 25	63-104	22TH I.F. TRANS. SECONDARY
A 26	63-104	23TH I.F. TRANS. SECONDARY
A 27	63-104	24TH I.F. TRANS. SECONDARY
A 28	63-104	25TH I.F. TRANS. SECONDARY
A 29	63-104	26TH I.F. TRANS. SECONDARY
A 30	63-104	27TH I.F. TRANS. SECONDARY
A 31	63-104	28TH I.F. TRANS. SECONDARY
A 32	63-104	29TH I.F. TRANS. SECONDARY
A 33	63-104	30TH I.F. TRANS. SECONDARY
A 34	63-104	31TH I.F. TRANS. SECONDARY
A 35	63-104	32TH I.F. TRANS. SECONDARY
A 36	63-104	33TH I.F. TRANS. SECONDARY
A 37	63-104	34TH I.F. TRANS. SECONDARY
A 38	63-104	35TH I.F. TRANS. SECONDARY
A 39	63-104	36TH I.F. TRANS. SECONDARY
A 40	63-104	37TH I.F. TRANS. SECONDARY
A 41	63-104	38TH I.F. TRANS. SECONDARY
A 42	63-104	39TH I.F. TRANS. SECONDARY
A 43	63-104	40TH I.F. TRANS. SECONDARY
A 44	63-104	41TH I.F. TRANS. SECONDARY
A 45	63-104	42TH I.F. TRANS. SECONDARY
A 46	63-104	43TH I.F. TRANS. SECONDARY
A 47	63-104	44TH I.F. TRANS. SECONDARY
A 48	63-104	45TH I.F. TRANS. SECONDARY
A 49	63-104	46TH I.F. TRANS. SECONDARY
A 50	63-104	47TH I.F. TRANS. SECONDARY
A 51	63-104	48TH I.F. TRANS. SECONDARY
A 52	63-104	49TH I.F. TRANS. SECONDARY
A 53	63-104	50TH I.F. TRANS. SECONDARY
A 54	63-104	51TH I.F. TRANS. SECONDARY
A 55	63-104	52TH I.F. TRANS. SECONDARY
A 56	63-104	53TH I.F. TRANS. SECONDARY
A 57	63-104	54TH I.F. TRANS. SECONDARY
A 58	63-104	55TH I.F. TRANS. SECONDARY
A 59	63-104	56TH I.F. TRANS. SECONDARY
A 60	63-104	57TH I.F. TRANS. SECONDARY
A 61	63-104	58TH I.F. TRANS. SECONDARY
A 62	63-104	59TH I.F. TRANS. SECONDARY
A 63	63-104	60TH I.F. TRANS. SECONDARY
A 64	63-104	61TH I.F. TRANS. SECONDARY
A 65	63-104	62TH I.F. TRANS. SECONDARY
A 66	63-104	63TH I.F. TRANS. SECONDARY
A 67	63-104	64TH I.F. TRANS. SECONDARY
A 68	63-104	65TH I.F. TRANS. SECONDARY
A 69	63-104	66TH I.F. TRANS. SECONDARY
A 70	63-104	67TH I.F. TRANS. SECONDARY
A 71	63-104	68TH I.F. TRANS. SECONDARY
A 72	63-104	69TH I.F. TRANS. SECONDARY
A 73	63-104	70TH I.F. TRANS. SECONDARY
A 74	63-104	71TH I.F. TRANS. SECONDARY
A 75	63-104	72TH I.F. TRANS. SECONDARY
A 76	63-104	73TH I.F. TRANS. SECONDARY
A 77	63-104	74TH I.F. TRANS. SECONDARY
A 78	63-104	75TH I.F. TRANS. SECONDARY
A 79	63-104	76TH I.F. TRANS. SECONDARY
A 80	63-104	77TH I.F. TRANS. SECONDARY
A 81	63-104	78TH I.F. TRANS. SECONDARY
A 82	63-104	79TH I.F. TRANS. SECONDARY
A 83	63-104	80TH I.F. TRANS. SECONDARY
A 84	63-104	81TH I.F. TRANS. SECONDARY
A 85	63-104	82TH I.F. TRANS. SECONDARY
A 86	63-104	83TH I.F. TRANS. SECONDARY
A 87	63-104	84TH I.F. TRANS. SECONDARY
A 88	63-104	85TH I.F. TRANS. SECONDARY
A 89	63-104	86TH I.F. TRANS. SECONDARY
A 90	63-104	87TH I.F. TRANS. SECONDARY
A 91	63-104	88TH I.F. TRANS. SECONDARY
A 92	63-104	89TH I.F. TRANS. SECONDARY
A 93	63-104	90TH I.F. TRANS. SECONDARY
A 94	63-104	91TH I.F. TRANS. SECONDARY
A 95	63-104	92TH I.F. TRANS. SECONDARY
A 96	63-104	93TH I.F. TRANS. SECONDARY
A 97	63-104	94TH I.F. TRANS. SECONDARY
A 98	63-104	95TH I.F. TRANS. SECONDARY
A 99	63-104	96TH I.F. TRANS. SECONDARY
A 100	63-104	97TH I.F. TRANS. SECONDARY
A 101	63-104	98TH I.F. TRANS. SECONDARY
A 102	63-104	99TH I.F. TRANS. SECONDARY
A 103	63-104	100TH I.F. TRANS. SECONDARY

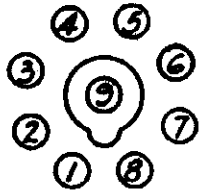
MODELS 7D203, 7D222, 7D223
7D229, 7D239, 7D241
7D243, 7D253

ZENITH RADIO CORP.

Chassis 5710 AC-DC
Voltage, Alignment, Socket
Trimmers

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6A8	Converter Osc.	0	AC	104	63	-5.5	74	AC	0	-1
6K7	I.F.	0	AC	104	104	0	-	AC	0	-1
6H6	2nd Det. A.V.C.	0	AC	-1.5	-1	-1.5	-	AC	-1	-
6F5	1st Audio	0	AC	-	24	-	-	AC	-1	-1.5
25L6	Power	0	AC	99	100	-5	-	AC	4.5	-
25Z6	Rect.	0	AC	AC	119	AC	-	AC	119	-
	Ballast									



All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 55W. Power output 1.75W.

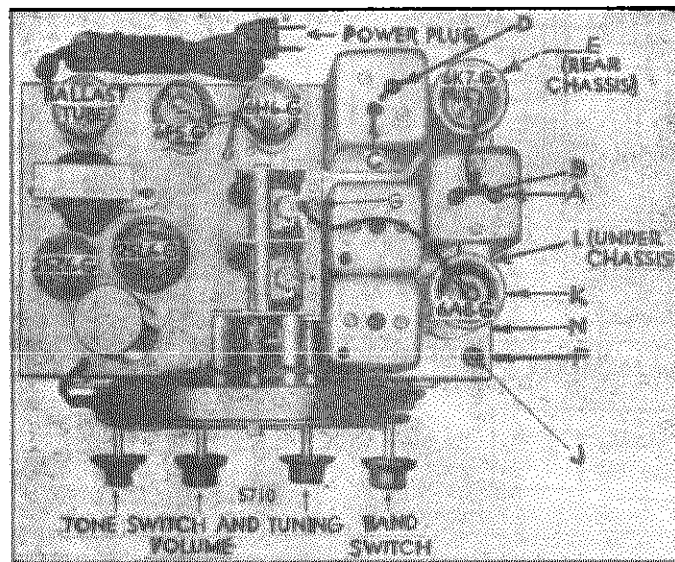
BOTTOM VIEW OF SOCKET

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	456	"	600	E	See Note
3	" " "	200 ⁰ Mmfd.	1500	"	1500	F	Set Osc. to Scale
4	" " "	200 Mmfd.	1500	"	1500	G	Al'gment of Ant.
5	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
6	" " "	200 Mmfd.		"		FG	Repeat 3 & 4
7	" " "	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
8	" " "	400 Ohms	16500	S.W.	16500	L	Rock gang & adj. for max. output
9	" " "	400 Ohms	5500	Police	5500	N	Rock gang & adj. for max. output

NOTE: If receiver is used in a location subject to code interference adjust wave trap (E) for minimum interference with antenna connected and receiver operating in broadcast band.

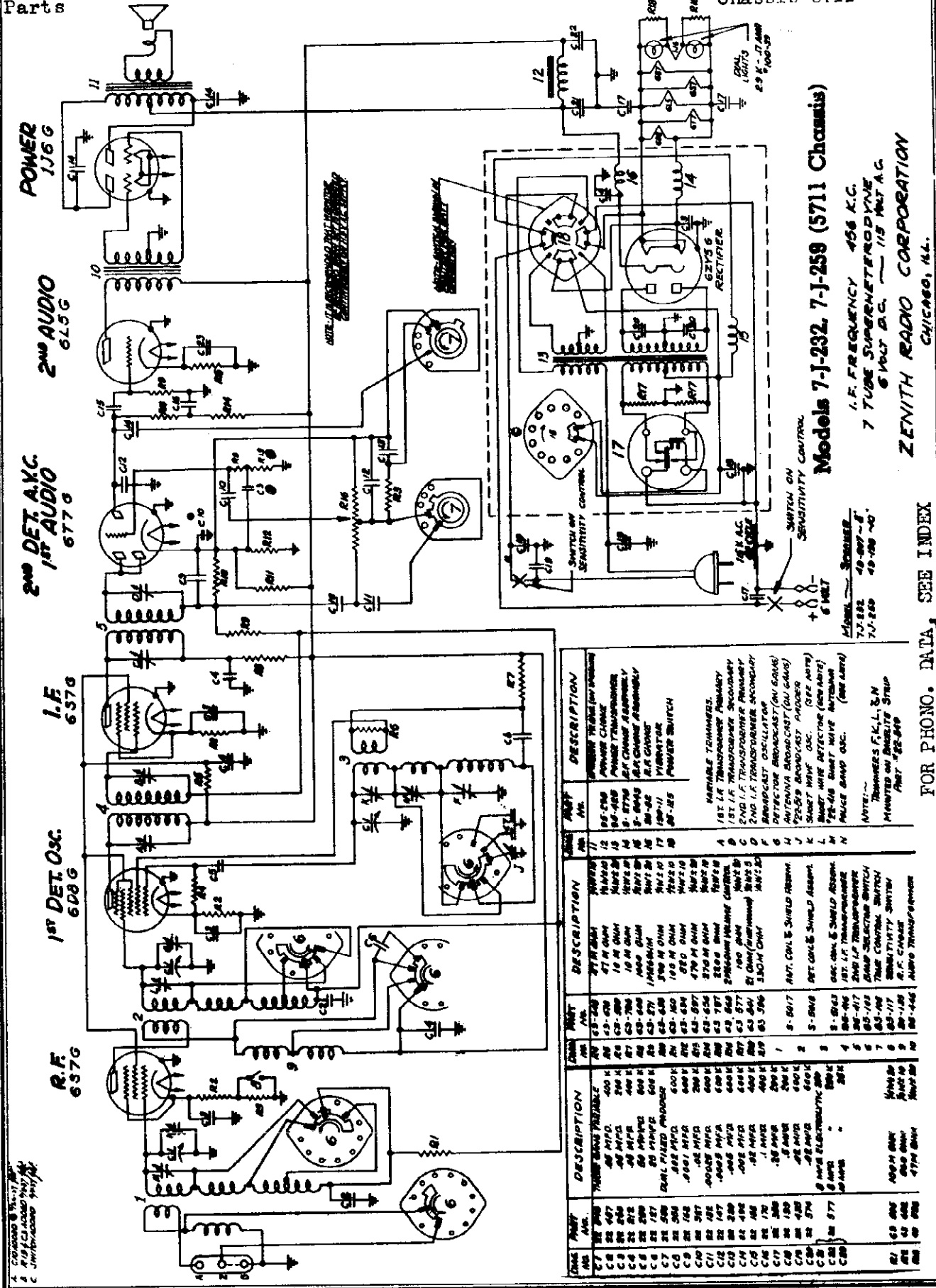
LOCATION OF TRIMMERS



Schematic, Changes
Parts

ZENITH RADIO CORP.

MODEL S 7J232, 7J259
Chassis 5711



Models 7-J-232, 7-J-259 (5711 Chassis)

I.F. FREQUENCY 456 K.C.
 7 TUBE SUPERHETERODYNE
 6 VOLT D.C. — 115 VOLT A.C.

ZENITH RADIO CORPORATION
 CHICAGO, ILL.

PART NO.	DESCRIPTION	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
1	400 K	11	POWER TRANSFORMER	1	ANT. COIL & SHIELD ASSEMBLY
2	200 K	12	6T7 G	2	RET. COIL & SHIELD ASSEMBLY
3	100 K	13	6L5 G	3	637 G
4	50 K	14	6D8 G	4	637 G
5	25 K	15	6T7 G	5	637 G
6	10 K	16	637 G	6	637 G
7	5 K	17	637 G	7	637 G
8	2.5 K	18	637 G	8	637 G
9	1.25 K	19	637 G	9	637 G
10	630 OHM	20	637 G	10	637 G
11	315 OHM	21	637 G	11	637 G
12	157.5 OHM	22	637 G	12	637 G
13	78.75 OHM	23	637 G	13	637 G
14	39.375 OHM	24	637 G	14	637 G
15	19.6875 OHM	25	637 G	15	637 G
16	9.84375 OHM	26	637 G	16	637 G
17	4.921875 OHM	27	637 G	17	637 G
18	2.4609375 OHM	28	637 G	18	637 G
19	1.23046875 OHM	29	637 G	19	637 G
20	0.615234375 OHM	30	637 G	20	637 G
21	0.3076171875 OHM	31	637 G	21	637 G
22	0.15380859375 OHM	32	637 G	22	637 G
23	0.076904296875 OHM	33	637 G	23	637 G
24	0.0384521484375 OHM	34	637 G	24	637 G
25	0.01922607421875 OHM	35	637 G	25	637 G
26	0.009613037109375 OHM	36	637 G	26	637 G
27	0.0048065185546875 OHM	37	637 G	27	637 G
28	0.00240325927734375 OHM	38	637 G	28	637 G
29	0.001201629638671875 OHM	39	637 G	29	637 G
30	0.0006008148193359375 OHM	40	637 G	30	637 G
31	0.00030040740966796875 OHM	41	637 G	31	637 G
32	0.000150203704833984375 OHM	42	637 G	32	637 G
33	0.0000751018524169921875 OHM	43	637 G	33	637 G
34	0.00003755092620849609375 OHM	44	637 G	34	637 G
35	0.000018775463104248046875 OHM	45	637 G	35	637 G
36	0.00000938773155221222291875 OHM	46	637 G	36	637 G
37	0.000004693865776106111119375 OHM	47	637 G	37	637 G
38	0.000002346932888053055596875 OHM	48	637 G	38	637 G
39	0.0000011734664440265277984375 OHM	49	637 G	39	637 G
40	0.00000058673322201326389921875 OHM	50	637 G	40	637 G
41	0.000000293366611006631949609375 OHM	51	637 G	41	637 G
42	0.0000001466833055033159748046875 OHM	52	637 G	42	637 G
43	0.00000007334165275165798740234375 OHM	53	637 G	43	637 G
44	0.0000000366708263758289937171875 OHM	54	637 G	44	637 G
45	0.00000001833541318791449688909375 OHM	55	637 G	45	637 G
46	0.000000009167706593957248444546875 OHM	56	637 G	46	637 G
47	0.0000000045838532969786242222734375 OHM	57	637 G	47	637 G
48	0.00000000229192664848931211113671875 OHM	58	637 G	48	637 G
49	0.00000000114596332424465605555596875 OHM	59	637 G	49	637 G
50	0.000000000572981662122328280277984375 OHM	60	637 G	50	637 G
51	0.0000000002864908310616441401389921875 OHM	61	637 G	51	637 G
52	0.00000000014324541553082207006949609375 OHM	62	637 G	52	637 G
53	0.000000000071622707765411035034748046875 OHM	63	637 G	53	637 G
54	0.0000000000358113538827055175173740234375 OHM	64	637 G	54	637 G
55	0.00000000001790567694135275876868909375 OHM	65	637 G	55	637 G
56	0.000000000008952838470676379384344546875 OHM	66	637 G	56	637 G
57	0.000000000004476419235338189692172222734375 OHM	67	637 G	57	637 G
58	0.0000000000022382096176690948460555596875 OHM	68	637 G	58	637 G
59	0.0000000000011191048088345474230277984375 OHM	69	637 G	59	637 G
60	0.00000000000055955240422737121151389921875 OHM	70	637 G	60	637 G
61	0.000000000000279776202113560555596875 OHM	71	637 G	61	637 G
62	0.0000000000001398881010578277984375 OHM	72	637 G	62	637 G
63	0.000000000000069944050528914896921875 OHM	73	637 G	63	637 G
64	0.0000000000000349720252644595984609375 OHM	74	637 G	64	637 G
65	0.0000000000000174860126322297984375 OHM	75	637 G	65	637 G
66	0.000000000000008743006316114896921875 OHM	76	637 G	66	637 G
67	0.0000000000000043715031557074484609375 OHM	77	637 G	67	637 G
68	0.000000000000002185751577853724230277984375 OHM	78	637 G	68	637 G
69	0.0000000000000010928757889268611151389921875 OHM	79	637 G	69	637 G
70	0.00000000000000054643789446343055596875 OHM	80	637 G	70	637 G
71	0.000000000000000273218947231715277984375 OHM	81	637 G	71	637 G
72	0.0000000000000001366094736158576896921875 OHM	82	637 G	72	637 G
73	0.00000000000000006830473680792896921875 OHM	83	637 G	73	637 G
74	0.00000000000000003415236840396448484609375 OHM	84	637 G	74	637 G
75	0.00000000000000001707618420198224230277984375 OHM	85	637 G	75	637 G
76	0.0000000000000000085380921009911151389921875 OHM	86	637 G	76	637 G
77	0.000000000000000004269046050495576896921875 OHM	87	637 G	77	637 G
78	0.0000000000000000021345230252477896921875 OHM	88	637 G	78	637 G
79	0.000000000000000001067261512623896921875 OHM	89	637 G	79	637 G
80	0.000000000000000000533630756311948484609375 OHM	90	637 G	80	637 G

MODELS 7J232, 7J259
 Chassis 5711
 Voltage, Alignment
 Socket, Trimmers

ZENITH RADIO CORP.

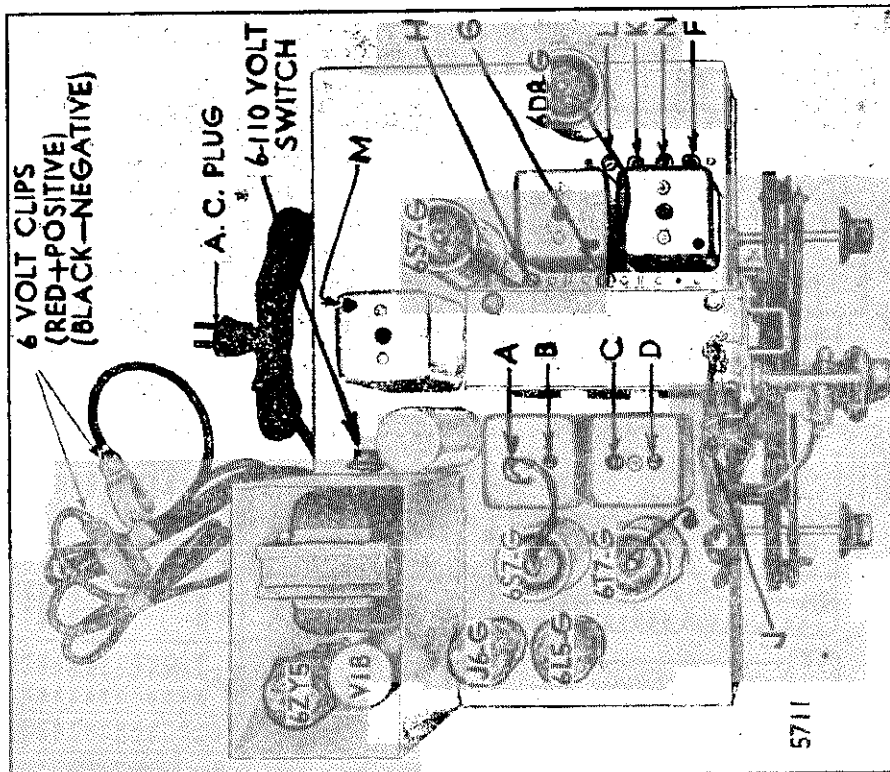
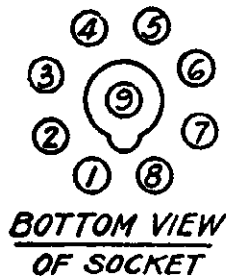
SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6S7	R.F.	0	6.3	126	34	1.5	—	0	1.5	0
6D8	Converter Osc.	0	6.3	126	34	—1	106	0	1	0
6S7	I.F.	0	6.3	123	34	1	—	0	1	0
6T7	2nd Det. AVC 1st Audio	0	6.3	15	.1	.1	—	0	1	0
6L5	2nd Audio	0	6.3	122	—	0	—	0	4.5	—
1J6	Power	—	1	133	0	0	133	3	—	—
6ZY5G	Rect.	0	6.3	AC	—	AC	—	0	137	—

All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 19W. Battery voltage 6.3V consumption 2.19 Amp. Power output 1.75W.

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	GH	Algmt. of Ant. & Det
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5	" " "	"	"	"	"	FGH	Repeat 2 & 3
6	Rec. Ant. Post	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
7	" " "	400 Ohms	16500	S.W.	16500	LM	Rock gang & adj. for max. output
8	" " "	400 Ohms	5500	Police	5500	N	Rock gang & adj. for max. output

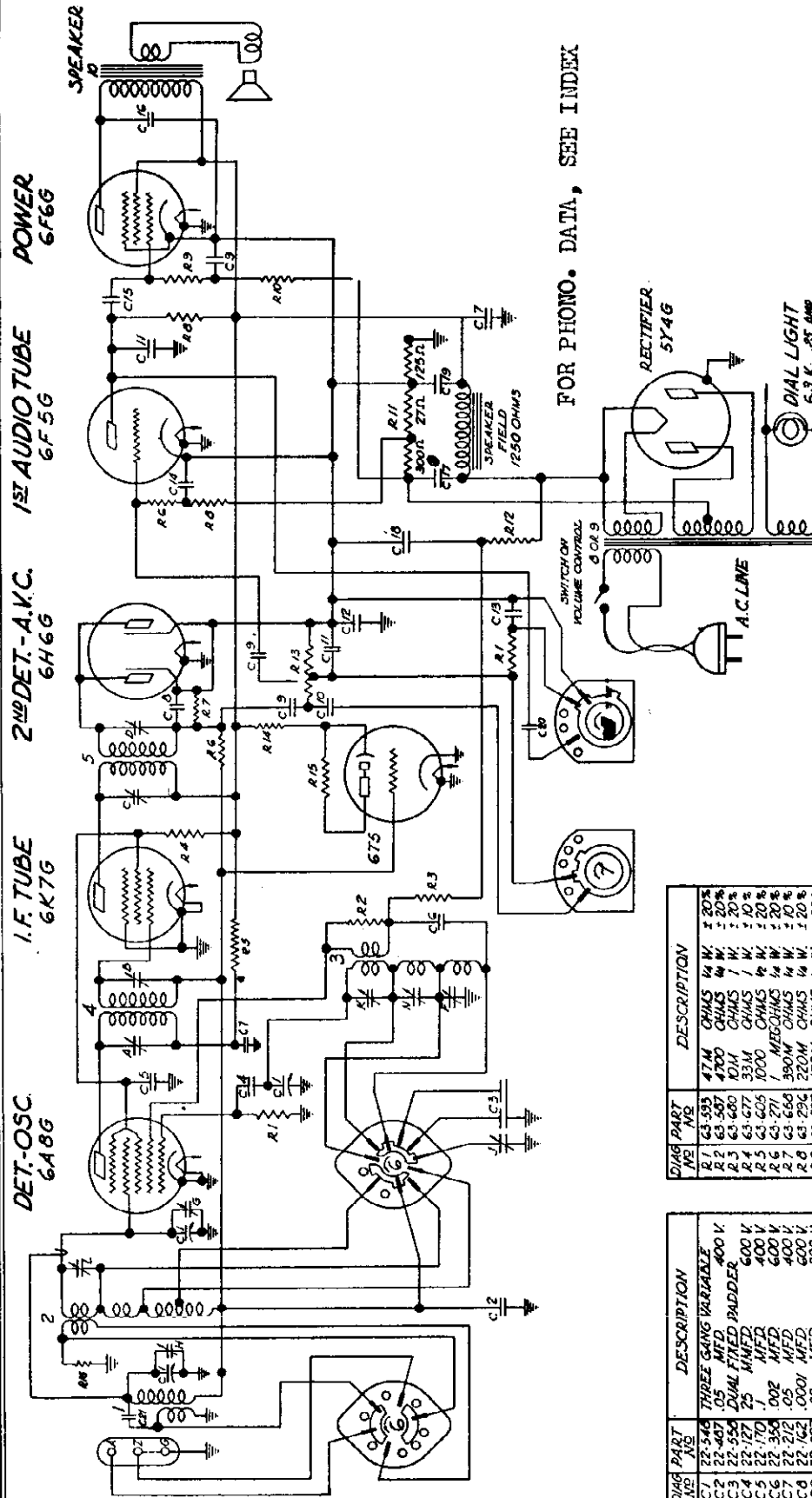


LOCATION OF TRIMMERS

Chassis 5709
Schematic, Parts

ZENITH RADIO CORP.

MODELS 7S204, 7S232, 7S240,
7S242, 7S258, 7S260,
7S261



FOR PHONO. DATA, SEE INDEX

I.F. FREQUENCY 456 K.C.
7 TUBE SUPERHETERODYNE
3 BAND

CHASSIS NO 5709
Models 7-S-204, 7-S-232, 7-S-240, 7-S-242,
7-S-258, 7-S-260, 7-S-261

ZENITH RADIO CORP.
CHICAGO, ILLINOIS

DIAG. PART NO.	DESCRIPTION	QUANTITY	MODELS
C1	22-601 10 MFD. CERAMIC	1	7-S-232
R6	63-385 1000 OHMS 1/4 W ± 20%	6	7-S-240
		6	7-S-242
		6	7-S-258
		6	7-S-260
		6	7-S-261

DIAG. PART NO.	DESCRIPTION
A	1ST I.F. TRANS PRIMARY
B	1ST I.F. TRANS SECONDARY
C	2ND I.F. TRANS PRIMARY
D	2ND I.F. TRANS SECONDARY
F	BROADCAST OSCILLATOR (SEE NOTE)
G	DETECTOR BROADCAST (ON GANG)
H	ANTENNA BROADCAST (ON GANG)
J	*22.519 BROADCAST BINDER
K	SHORT WAVE OSCILLATOR (SEE NOTE)
L	SHORT WAVE DETECTOR (SEE NOTE)
N	POLICE BAND OSCILLATOR (SEE NOTE)

DIAG. PART NO.	DESCRIPTION
C2	22-548 THREE GANG VARIABLE
C3	22-407 .05 MFD
C4	22-554 DUAL FIXED PADDER
C5	22-127 25 M MFD
C6	22-170 .1 MFD
C7	22-354 .002 MFD
C8	22-162 .001 MFD
C9	22-327 .02 MFD
C10	22-182 .00025 MFD
C11	22-147 .01 MFD
C12	22-306 .003 MFD
C13	22-190 .1 MFD
C14	22-435 .02 MFD
C15	22-627 12 MFD ELECTROLYTIC
C16	22-569 2 MFD
C17	22-528 2 MFD
C18	22-446 .004 MFD
C19	22-446 .004 MFD
C20	S-4760 ANTENNA COIL ASSEMBLY
1	S-5054 DETECTOR CON. & SHIELD ASSEM.
2	S-4959 OSCILLATOR COIL & SHIELD ASSEM.
3	95-416 1ST I.F. TRANS.
4	95-417 2ND I.F. TRANS.
5	65-110 3 BAND SELECTOR SWITCH
6	85-108 TONE CONTROL SWITCH
7	95-418 POWER TRANS. -117T 50-0-0-50V
8	95-451 POWER TRANS. -117T 50-0-50V
9	95-451 SPEAKER TRANS. -FORMER

NOTE: TRIMMERS F, K, L, N MOUNTED ON DAKELITE STRIP #22-549

MODELS 7S204, 7S232, 7S240
7S242, 7S258, 7S260
7S261

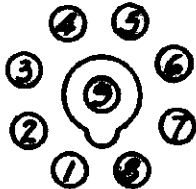
ZENITH RADIO CORP.

Chassis 5709

Voltage, Alignment, Socket
Trimmers

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6A8	Converter Osc.	0	6.4	255	89	-10	182	0	0	-2
6K7	I.F.	0	6.4	243	89	0	—	0	0	-2
6H6	2nd Det. A.V.C.	0	0	-2	-2	-2	—	6.4	-2	—
6F5	1st Audio	0	0	—	117	—	—	6.4	-1.5	-1.5
6F6	Power	0	0	243	255	-2	—	6.4	-2	—
5Y4	Rect.	0	—	AC	—	AC	—	328	328	—
		H	Ep	Eg	Et	Ek	H			
6T5	Target	0	16	-2	255	-2	6.4			



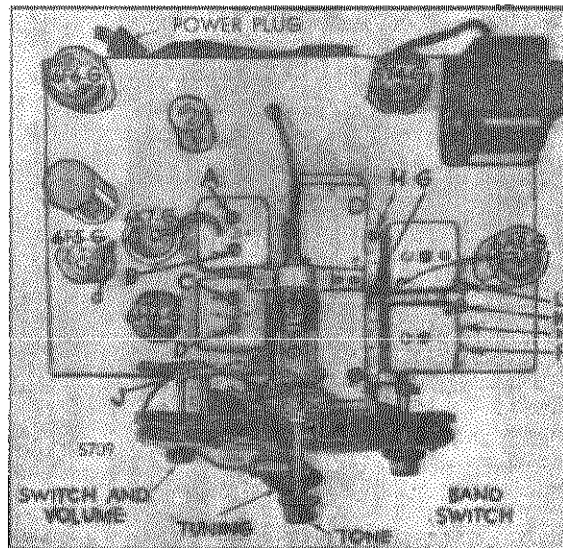
All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 75W. Power output 4.5W.

BOTTOM VIEW
OF SOCKET

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	GH	Algmt. of Ant. & De.
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5				"		FGH	Repeat 2 & 3
6	" " "	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
7	" " "	400 Ohms	16500	S.W.	16500	L	Rock gang & adj. for max. output
8	" " "	400 Ohms	5500	Police	5500	N	Rock gang & adj. for max. output

LOCATION OF TRIMMERS



ZENITH RADIO CORP.

MODEL 8M195
 Chassis 5803
 Schematic, Voltage
 Changes, Parts

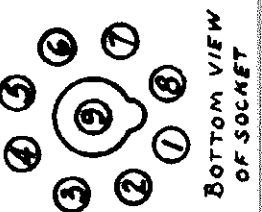
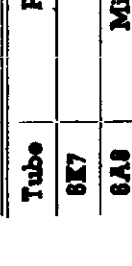
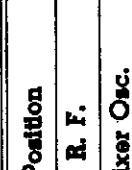
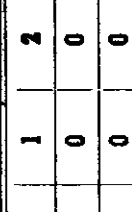
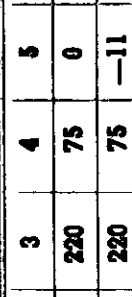
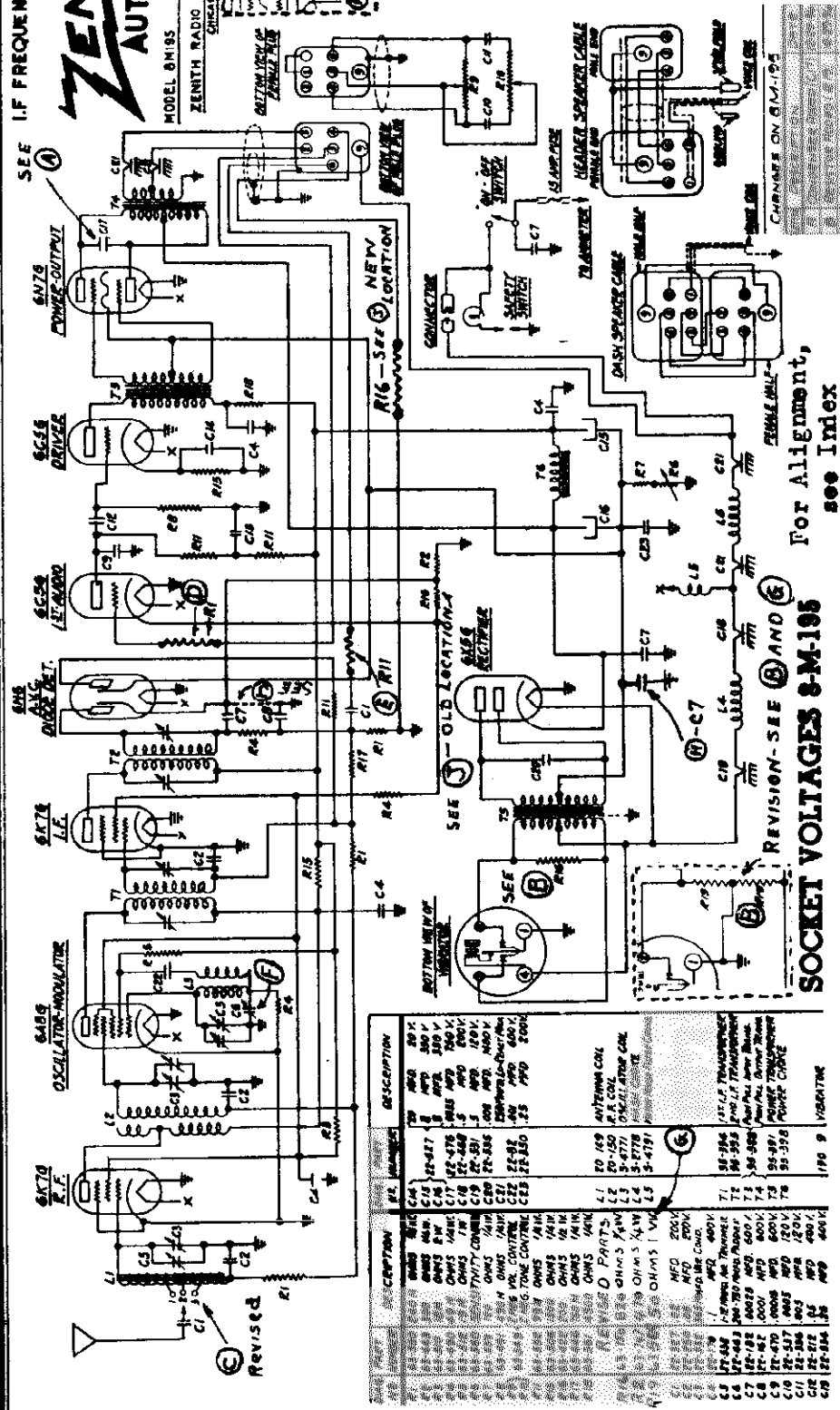
SEE I.F. FREQUENCY 252 1/2 K.C.



MODEL 8M195 CHASSIS 5803
 ZENITH RADIO CORPORATION
 CHICAGO, ILL.

10-REVISION

Voltage at Battery 6V. Total current consumption 9.2 amperes
 Voltage at Receiver 5.9 V. Maximum sensitivity at 1 watt output .9 M. V.
 Antenna disconnected Maximum power output 9 watts



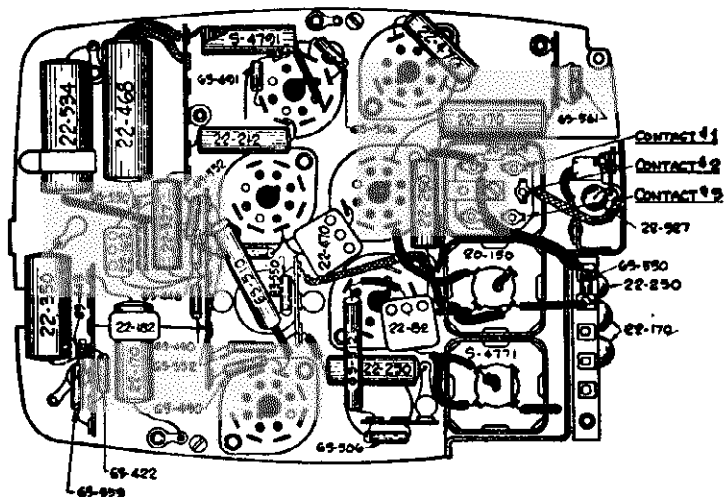
For Alignment, see Index

REVISION-SEE (B) AND (C)
 SOCKET VOLTAGES 8-M-195

Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R. F.	0	0	220	75	0	—	5.9	0	0
6A9	Mixer Osc.	0	0	220	75	-11	115	5.9	0	0
6K7	L. F.	0	0	230	75	0	—	5.9	0	0
6H8	Det. A. V. C.			Inaccessible						
6C5	Audio	0	5.9	44	—	0	—	0	1.1	—
6C5	Driver	0	5.9	200	—	0	—	0	6.8	—
6N7	Power	0	0	235	-3.5	-3.5	235	5.9	-3.5	—
6X5	Rectifier			Inaccessible						

MODEL 8M195
 Chassis 5803
 Socket, Trimmers
 Chassis

ZENITH RADIO CORP.



CONNECT TO CONTACT #1 FOR ANTENNA
 CAPACITOR AND TO CONTACT #2 FOR
 OSCILLATOR TRIMMER AND TO CONTACT #3
 FOR ANTENNA COMPENSATOR. (SEE
 ANTENNA SECTION FOR ANTENNA
 COUPLING AND ANTENNA COMPENSATOR
 CONNECTIONS.)
 CONNECT TO CONTACT #2 FOR ANTENNA
 CAPACITOR AND TO CONTACT #3 FOR
 ANTENNA COMPENSATOR. (SEE
 ANTENNA SECTION FOR ANTENNA
 COUPLING AND ANTENNA COMPENSATOR
 CONNECTIONS.)

BOTTOM VIEW OF
 ZENITH AUTO RADIO -
 MODEL 8M195

Fig. 12.—Bottom View 8-M.195

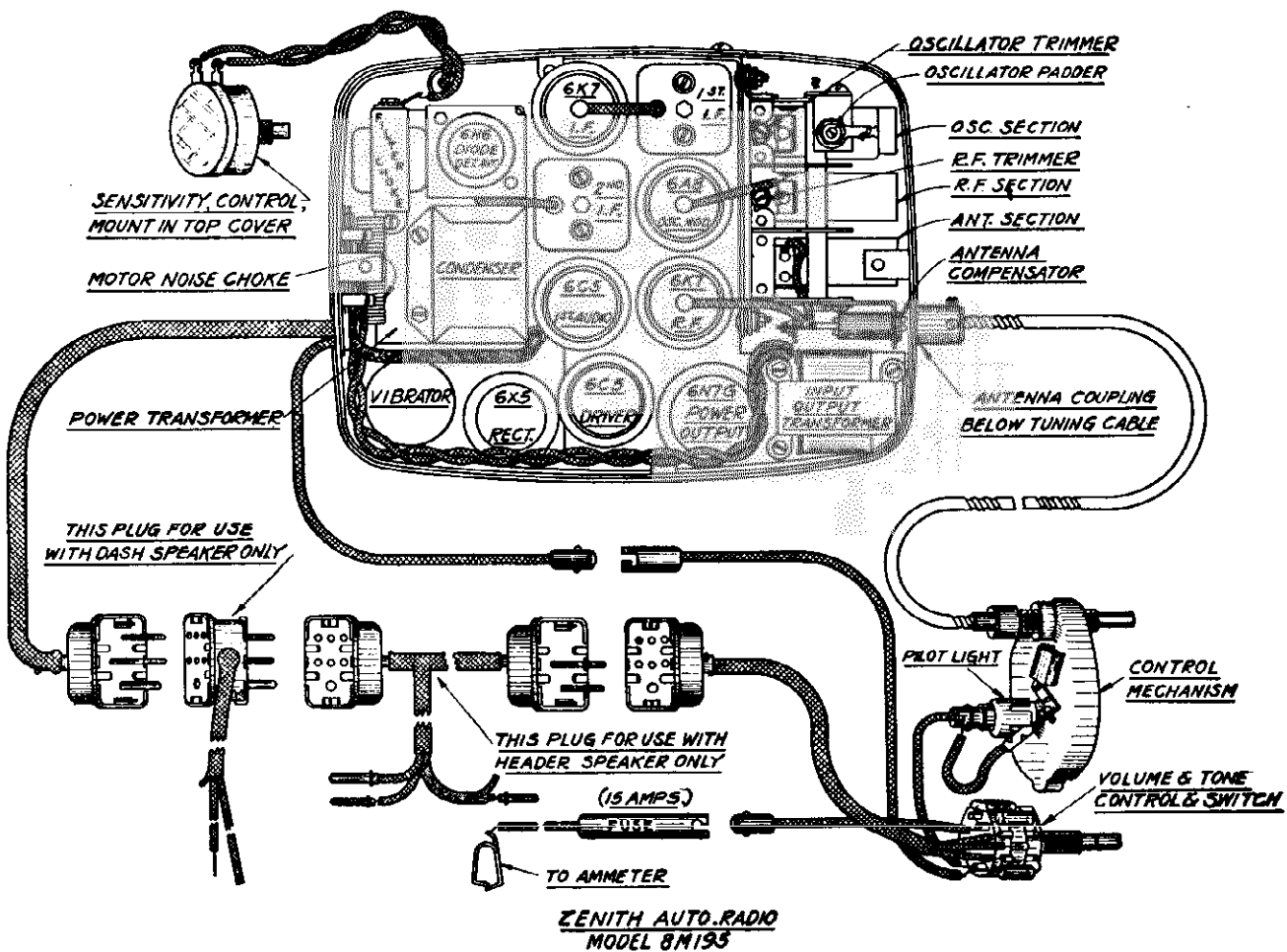


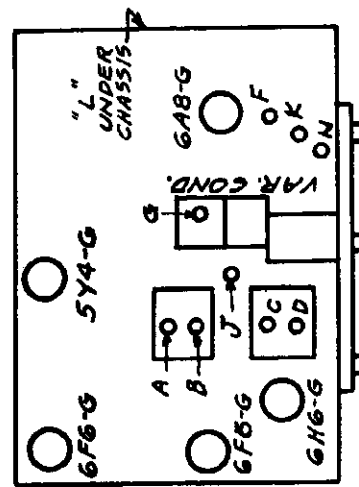
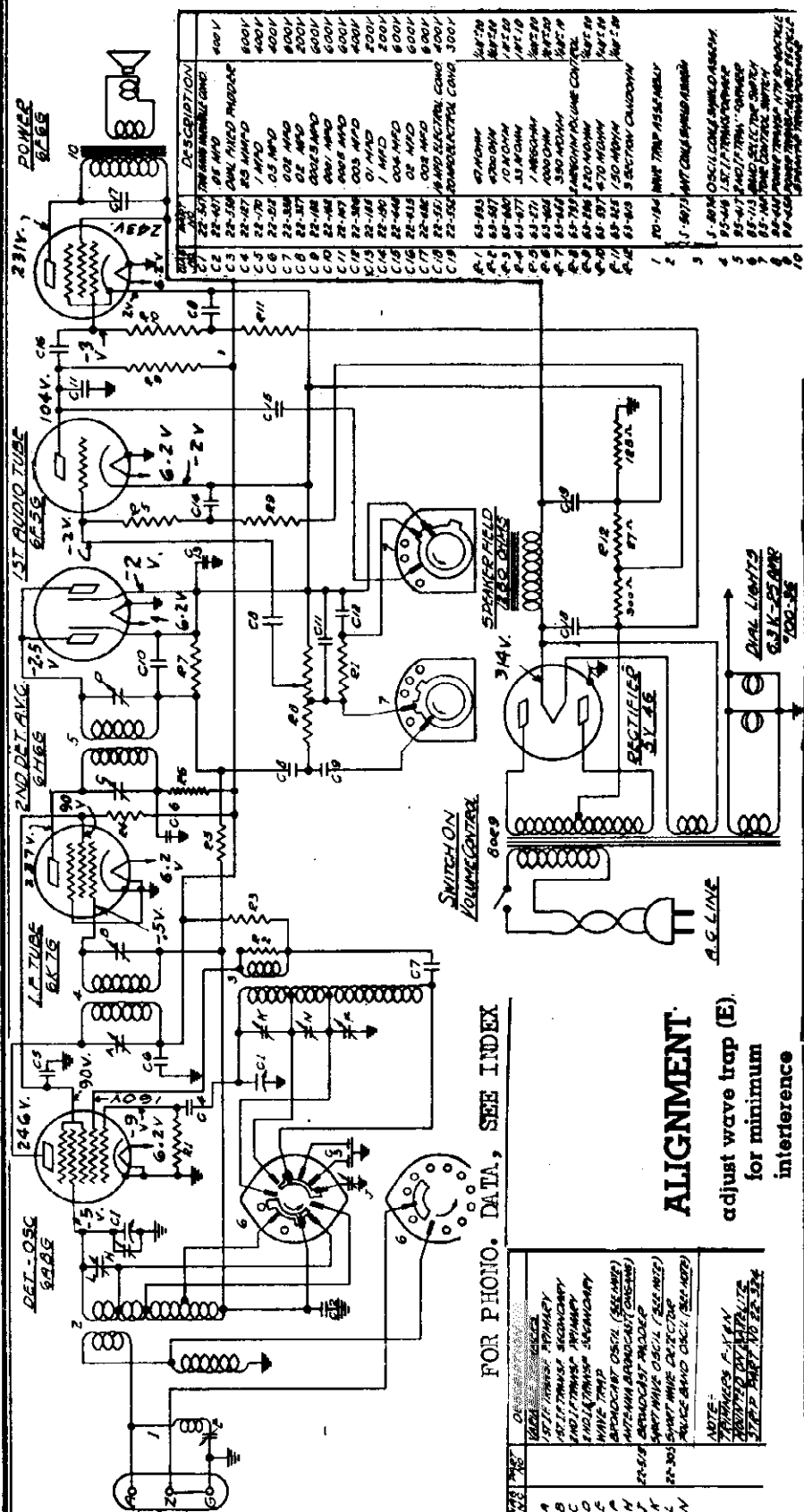
Fig. 11.—Tube Position 8-M.195

Schematic, Voltage
Socket, Trimmers
Alignment, Parts

ZENITH RADIO CORP.

MODELS 6S254, 6S255
Chassis 5644

I.F. FREQUENCY 456 KG
6 TUBE SUPERHETERODYNE - 3 BAND
CHASSIS NO 5644



FOR PHONO. DATA, SEE INDEX

ALIGNMENT
adjust wave trap (E)
for minimum
interference

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	456	"	600	E	See Note
3	"	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
4	"	200 Mmfd.	1500	"	1500	G	Align of Ant.
5	"	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
6	"	200 Mmfd.	18000	S.W.	18000	FG	Repeat 3 & 4
7	"	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
8	"	400 Ohms	16500	S.W.	16500	L	Rock gang & adj. for max. output
	"	"	"	"	"	"	Rock gang & adj.

MODELS 6B107, 6B129, 6B164
Chassis 5635
MODELS 8S129, 8S154
Chassis 5801

ZENITH RADIO CORP.
MODELS 12U158, 12U159
Chassis 1203 Alignment

MODELS 10S130, 10S147, 10S153
10S155, 10S156, 10S157
10S160
Chassis 1004

Connect ordinary single wire antenna to A with jumper wire placed between Z and C (shipped from factory in this manner).

When using a ZENITH DOUBLET ANTENNA, remove jumper wire between Z and C and attach doublet lead-in to A and Z.

Although it is not usually necessary to ground the receiver, there may be occasional instances where a ground connection removes noise or may aid reception of signals. It should be tried and left connected if any improvement is noted. Where it does not help, or if it introduces hum, try reversing the wall plug or leave the ground lead off entirely.

CHASSIS No. 1203

ALIGNMENT PROCEDURE

- (1) Connect the output leads of the signal generator to the control grid of the first detector and receiver ground. Also connect an output meter across the speaker transformer leads.
- (2) Set the signal generator at 456 K.C. and carefully adjust the four I.F. trimmers to the point giving the highest reading on the output meter. The output transformers are of a very high gain, selective type, and these adjustments should be repeated several times in order to secure maximum accuracy. All adjustments should be made using as weak an output from the signal generator as possible in order to prevent the A.V.C. action from affecting the output readings.
- (3) Change the signal generator leads to the antenna and ground terminals of the receiver.
- (4) Set signal generator at 1400 K.C.—Switch receiver to Band A and adjust broadcast oscillator trimmer "A," (located on front of chassis) for correct dial reading. Also adjust the R.F. and det. trimmers on gang condenser for greatest output.
- (5) Set signal generator at 600 K.C., and rock pointer past 600 K.C. on dial scale, meanwhile adjusting the broadcast paddler until combination is reached which gives the greatest output reading.
- (6) Realign broadcast trimmers as outlined in operation No. 4.
- (7) Set signal generator at 5.5 M.C.—Switch receiver to Band B, and adjust trimmer "B," (located on front of chassis) while rocking pointer past 5.5 on dial scale for combination giving the highest output reading.
- (8) Set signal generator at 18 M.C.—Switch receiver to Band D and adjust the short wave trimmer "D," (located on front of chassis) while rocking the pointer past 18 M.C. on dial scale to combination giving the highest output reading.
- (9) There are no adjustments on the I.C. ultra short wave band. Caution! The length and position of the leads on both coil trimmers and band switch greatly affect the tuning on the short wave bands. These leads should not be altered in any way.

SERVICE NOTES ON 1203 CHASSIS

OFF SCALE—Unable to line up and gain drops off—check 20 ohm resistor in screen of 1st detector for open R-15 63-41, check 50 mfd condenser in oscillator circuit C4-22-289.

NOISY—Tubes, antenna and ground. Poor contact on band switch; volume control; coil wires short to band switch; poor contact on sensitivity switch. Noisy air trimmers, 16 mfd. screen condenser noisy, C-21—22-506.

NOISY ON "D" BAND—Clear gang bonds away from chassis, center in chassis holes, wire of "D" band tuned circuit shorting, loose solder lugs or terminals.

LACK SENSITIVITY ON "D" BAND—Open coil winding, defective 6H6, 6L7 tubes, poor contact of tube prongs, poor contact on band switch, check antenna, check I.F. peak at 18 M.C. Shorted 25 mfd condenser in detector circuit, if it shorts in "D" band circuit.

NOISY AND OFF SCALE ON "D" BAND—Replace 50 mfd. in oscillator circuit, will vary scale reading considerably, if defective.

STATIONS RIDE IN—Check balance, check .0012 in oscillator plate circuit.

LACK SENSITIVITY ON ULTRA SHORT WAVE—Note: Do not expect extreme pick-up on this band. However, the following will affect operation of the band—open oscillator coil, open or shorted .0012 condenser, shorted 50 mfd across HF coil, grounded trimmer on detector section of gang. Do not alter or change length of wires or position of coils, etc., as this will affect short wave band operation—leave or replace all units in position shipped from factory. Open resistor in short wave reception, also aerial installation.

DISTORTION—Tubes, open 16 mfd condenser, output tubes mismatched, 10 mfd. dry electrolytic in cathode circuit; open cathode circuits, defective by-pass condenser; grounded or shorted tone circuit; defective speaker. Distortion only on normal, tone switch lugs are shorted. Also shorted .005 on one of the output tubes, open P.P. transformer.

CARRIER HUM—Open electrostatic shield in power transformer, by-pass A.C. line with approx. 600 micromold. Reverse A.C. plug. Open cathodum ground—shorted .005 plate of output tube, grounded tap on volume control, tubes 6C5, 6H6 and output.

LACK MICHAS—Poor contact on tone switch, .0025 open; if tap on volume control is open, tone dial will have no R.F. signals. S meter coil broken loose from gang terminal. Shorted air trimmer, gang trimmer shorted, open resistor in plate 1st audio. Tubes, filters shorted or by-pass condenser. Open coils.

B. C. OFF SCALE—Check pointer—line up across dial scale parallel to line with gang closed. Note: Air trimmer for "B" band as shown in earlier receivers and listed in technical book not used on later models. B.C. and D trimmers in same position as shown—follow usual line up procedure.

CHASSIS Nos. 5635-5801-1004

ALIGNMENT PROCEDURE

- (1) Connect the output leads of the signal generator to the grid of the first detector and receiver chassis. Also connect an output meter across the speaker transformer leads.
- (2) Set the signal generator at 456 K.C. and carefully adjust the four I.F. trimmers to the point giving the highest reading on the output meter. The output transformers are of a very high gain, selective type and these adjustments should be repeated several times in order to secure maximum accuracy. All adjustments should be made using as weak an output from the signal generator as possible in order to prevent the A.V.C. action from affecting the output readings.
- (3) Change the signal generator leads to the antenna and ground terminals of the receiver.
- (4) Set signal generator at 6 M.C.—Switch receiver to band B, and adjust osc. trimmer on gang for correct dial reading.
- (5) Set signal generator at 1400 K.C.—Switch receiver to band A and adjust broadcast trimmer (located in front of oscillator tube—see diagram below) for correct dial reading. Also adjust ant. and det. trimmer on gang to resonance, adjust only the det. trimmer on two gang sets.
- (6) Set signal generator at 18 M.C.—Switch receiver to band C and adjust the short wave trimmer while rocking the pointer past 18 M.C. or the dial to the combination giving the greatest output.
- (7) Set signal generator at 600 K.C.—Switch receiver to band A, and rock pointer past 600 on dial while adjusting the broadcast paddler (located adjacent to gang condenser) to combination giving the greatest output reading.
- (8) Re-align broadcast trimmers at 1400 K.C. as outlined in operation 5.

SERVICE NOTES 1004 CHASSIS

OFF SCALE AT LOW FREQUENCY END OF DIAL, UNABLE TO ADJUST BY REGULAR ALIGNMENT—Check 600 paddler, broken lug, wire, etc. Also check .0012 condenser in oscillator plate circuit C-6 22-485.

LACK OF SENSITIVITY ON ALL BANDS—Check tubes, antenna and ground—all coils. Poor contact on sensitivity switch—rebalance.

LACK OF SENSITIVITY ON BROADCAST BAND—Open radio frequency plate choke.

NOISY—Tubes, check condenser bond wires to clear chassis; dirty gang condenser or wipers; loose lugs on cathodum resistor; shorted bus bar wires in coil circuits; aerial and ground. Also loose connecting wire between C and Z on aerial strip.

NOISY ON "C" BAND ONLY IN SPOTS—Check dial pulley—move pulley away from dial pan; condenser bonds do not clear chassis hold. Poor contacts on any of the band, tone or sensitivity switches; defective volume control; defective 16 mfd. condenser—22-506.

HUM—Tubes, oscillator tube shorted or output tubes not matched; open filter, electrostatic shield open in power transformer. This will give carrier hum and can be corrected by by-passing the A.C. line with .001 mica-condenser. Reverse A.C. plug.

STATIONS RIDE IN—Check balance; check .0012 condenser in oscillator plate circuit.

WEAK OR LACK VOLUME—Open 2nd detector cathode resistor or cathodum; will also affect tone quality if open; .00025 condenser grounded in tone circuit; noticeable on high fidelity position of switch, with distortion. Repeat I.F.'s to 456 K.C. Defective tubes, in particular 1st and 2nd detector. Switch on normal and with lack volume—check tone switch for short circuit to foreign lug.

FLUTTERING AT LOW FREQUENCY—Tubes, particularly oscillator tube, rebalance I.F.'s to 456.

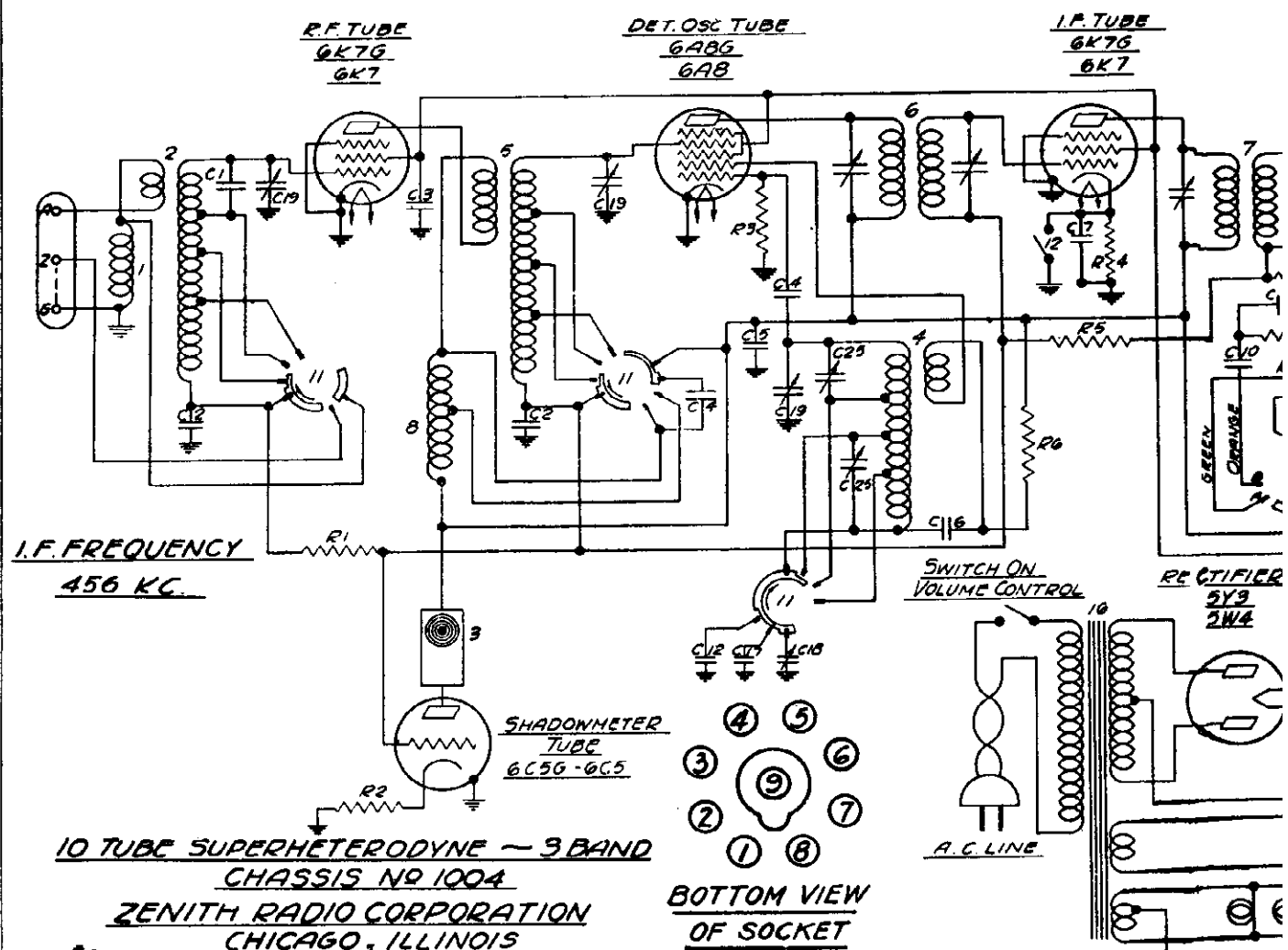
INTERMITTENT RECEPTION—Tubes, I.F. trimmers short; dirty variable condenser, poor ground at cathodum; loose link wire across Z and G on aerial strip. Poor contact on band switch; defective aerial; defective by-pass condenser.

POOR ACTION OF TARGET TUNER—Note: Do not expect target to center exactly in the center of bull's eye, except on very strong input signal. Check 6C5 tube or replace target unit.

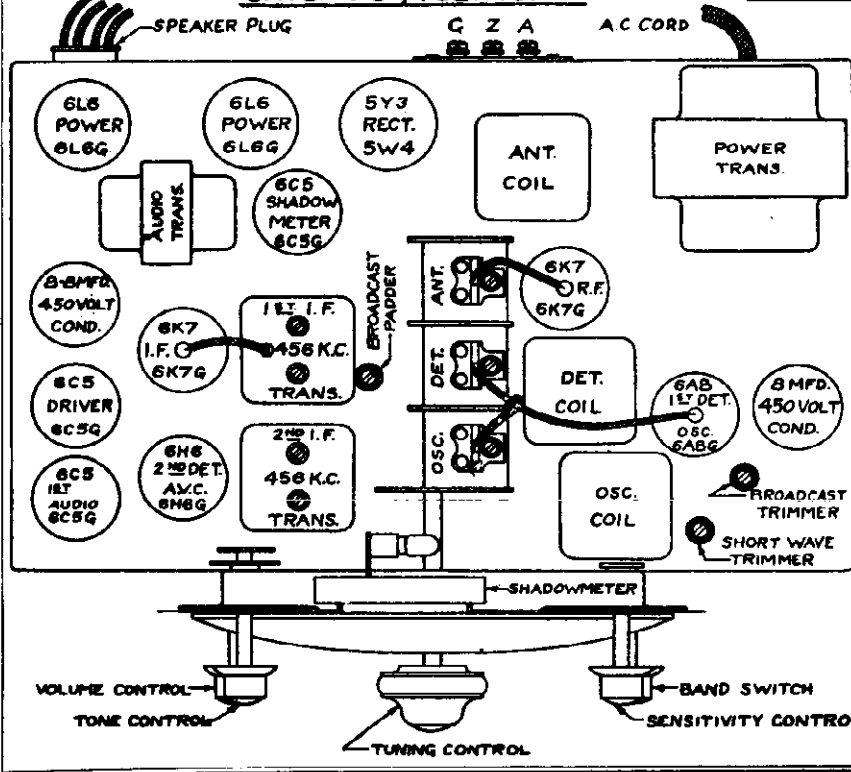
IMPORTANT!



ZENITH R.



10 TUBE SUPERHETERODYNE - 3 BAND
CHASSIS NO 1004
ZENITH RADIO CORPORATION
CHICAGO, ILLINOIS



Diag No	Part No	DESCRIPTION	Diag No	Part No
C1	22-303	5 M MFD	1	20
C2	487	.05 MFD	2	544
C3	324	1 MFD	3	122
C4	127	25 M MFD	4	544
C5	170	1 MFD	5	544
C6	486	.0012 MFD	6	95-
C7	243	.01 MFD	7	95-
C8	289	.001 MFD	8	20-
C9	250	.05 MFD	9	95-
C10	182	.00025 MFD	10	95-
C11	147	.0005 MFD	11	85-
C12	485	.005 MFD	12	85-
C13	188	.02 MFD	13	85-
C14	182	.0001 MFD	14	85-
C15	435	.02 MFD	15	44
C16	507	10 MFD DRY ELEC COND	16	95-
C17	384	.0015 MFD		95-
C18	205	200-550 M MFD OSC PADDER		
C19	488	5 GANG VARIABLE COND		
C20	504	8 MFD WET ELEC COND 600V 450V		
C21	508	16 MFD WET ELEC COND 250V		
C22	493	8 x 8 MFD DRY ELEC COND 60W 450V		
C23	405	10 MFD DRY ELEC COND 50V		
C24	229	.005 MFD		
C25	408	2-35 M MFD TRIMMER		
R1	68-278	99 M OHMS		
R2	309	700 OHMS		
R3	280	49 M OHMS		
R4	261	9900 OHMS		
R5	295	990 M OHMS		
R6	373	11M OHMS		
R7	280	100 M OHMS		
R8	385	300M OHMS		
R9	525	2MEG OHMS		
R10	300	990 OHMS		
R11	522	2MEG OHM VOLUME CONT 5 SW		
R12	516	CANDORH RESISTOR		
			C26	22
			C27	25
			C28	25

IO CORP.

1ST DET. AVC
6H6
6H6

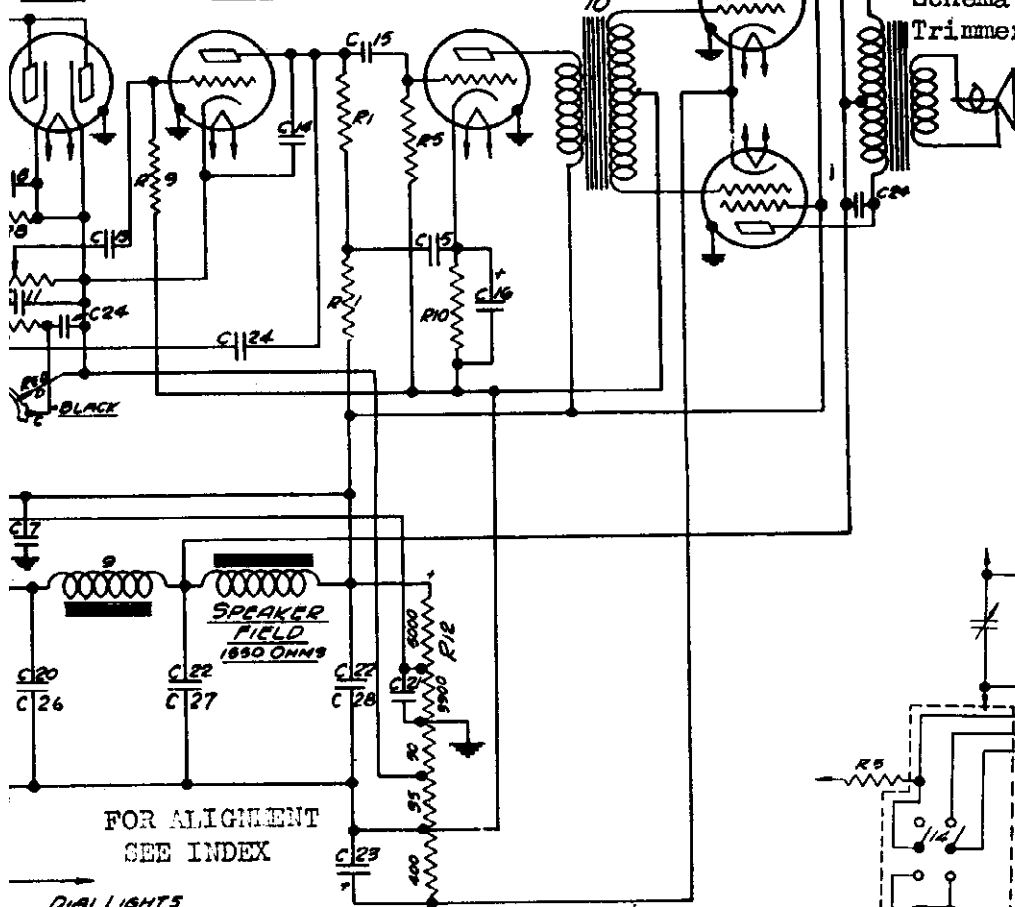
1ST AUDIO
6C5G
6C5

DRIVER
6C5G
6C5

POWER TUBES
6L6
6L6

MODELS 10S130, 10S147, 10S153
10S155, 10S156, 10S157
10S160

Chassis 1004
Schematic, Voltage, Socket
Trimmers, Phono. Data, Parts



SPEAKER	MODEL
49-146 8"	10S190
	10S195
49-147 12"	10S136
	10S140
	10S147
49-156 12"	10S159
	10S157

FOR ALIGNMENT
SEE INDEX

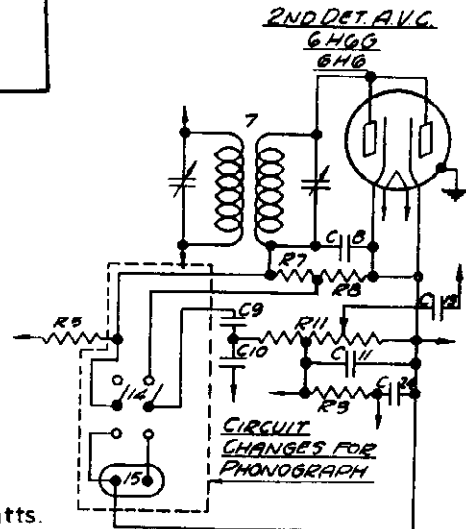
- DESCRIPTION**
- ANTENNA CHOKE
 - ANTENNA COIL ASSEM
 - AINING METER
 - OSCILLATING COIL ASSEM
 - ECTOR COIL ASSEM
 - I.F. TRANSFORMER
 - I.F. TRANSFORMER
 - F. PLATE CHOKE
 - DRIVER CHOKE
 - UDIO TRANSFORMER
 - AND SELECTOR SWITCH
 - NSITIVITY CONT. SWITCH
 - NE CONTROL SWITCH
 - ONOGRAPH SWITCH
 - ONOGRAPH JACK
 - OWER TRANS 115V 30-00 CYCLE
 - OWER TRANS 25 CYCLE - ALL VOLTAGE

NOTE

*22-510 8.18.8 MFD DRY
LECTROLYTIC REPLACES
2-4916 *22-506. *22-512
MFD DRY ELECTROLYTIC
REPLACES *22-504 0MFD NET
LECTROLYTIC IN MODEL
75-147 END TABLE.

4MFD WET ELEC COND. 25 CYCLE 450V
4MFD DRY ELEC COND 25 CYCLE 450V
1MFD DRY ELEC COND 25 CYCLE 450V

Line Voltage 112V.
Current Consumption 110 watts.
Power Output 12 watts.



SOCKET VOLTAGES

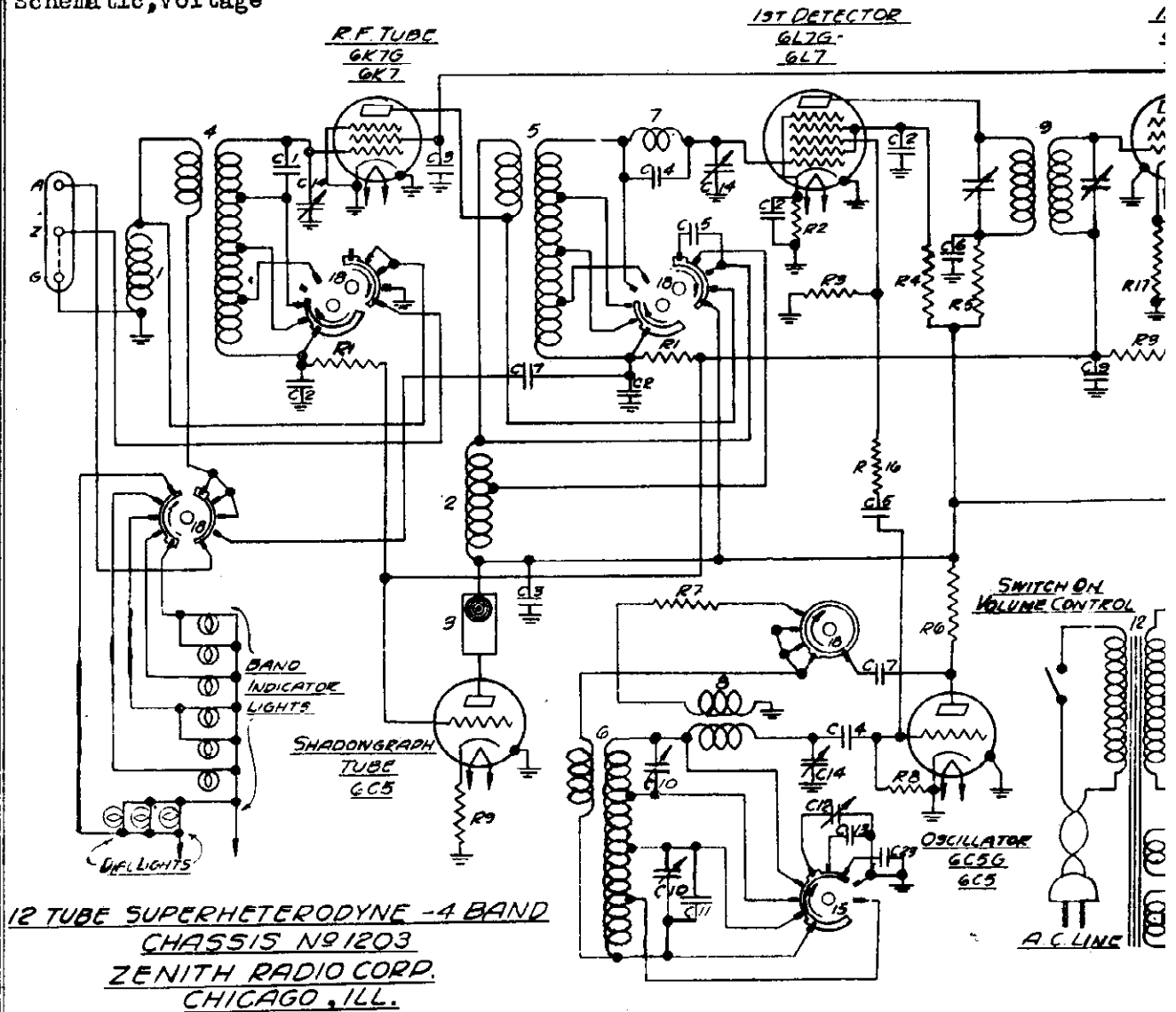
Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R. F.	0	3AC	250	100	0	—	3AC	0	0
6A8	1st Det. Osc.	0	3AC	250	100	-6.5	175	3AC	0	0
6K7	I. F.	0	3AC	250	100	0	—	3AC	Local 9	0
6H6	2nd Det. A.V.C.	0	3AC	-2.5	.25	-2.5	—	3AC	-2.5	—
6C5	1st Audio	0	3AC	45	—	-2	—	3AC	-2.5	—
6C5	Driver	0	3AC	235	—	-2	—	3AC	2	—
6L6	Power	0	3AC	320	120	-4	—	3AC	13	—
6C5	Target Tuning Amp.	0	3AC	250	—	-5	—	3AC	4	—
5Y3	Rectifier	0	340	—	AC	—	AC	—	340	—
5W4										

All voltages measured from point indicated to ground, using a 1000 ohm per volt meter. Antenna and ground disconnected.

MODELS 12U156, 12U159
Chassis 1203
Schematic, Voltage

Socket, Trimmers
Phono. Data, Parts

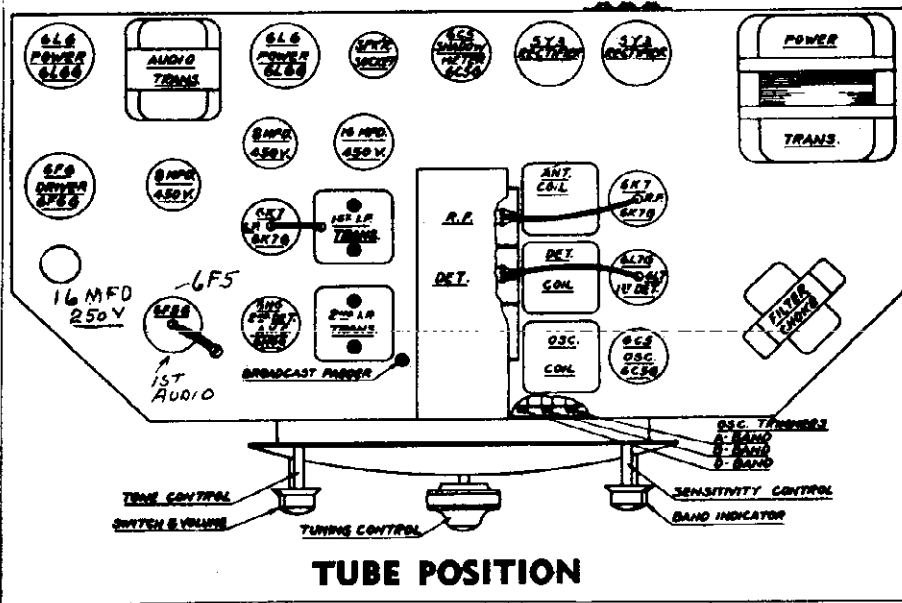
ZENITH



12 TUBE SUPERHETERODYNE - 4 BAND
CHASSIS NO 1203
ZENITH RADIO CORP.
CHICAGO, ILL.

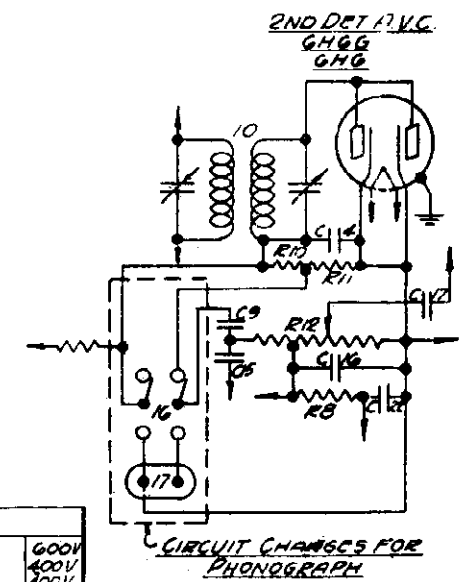
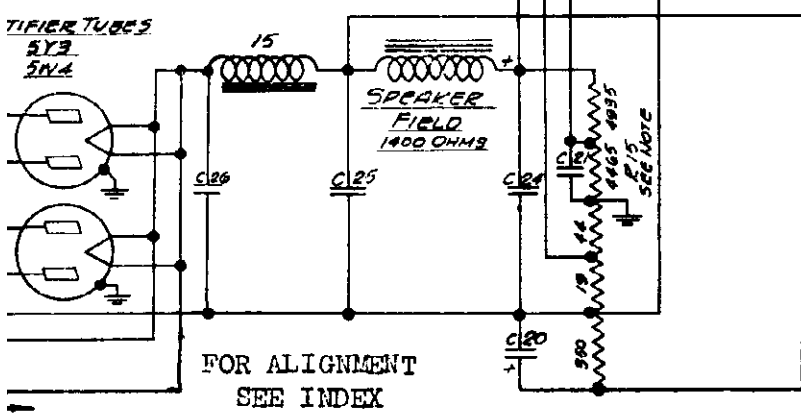
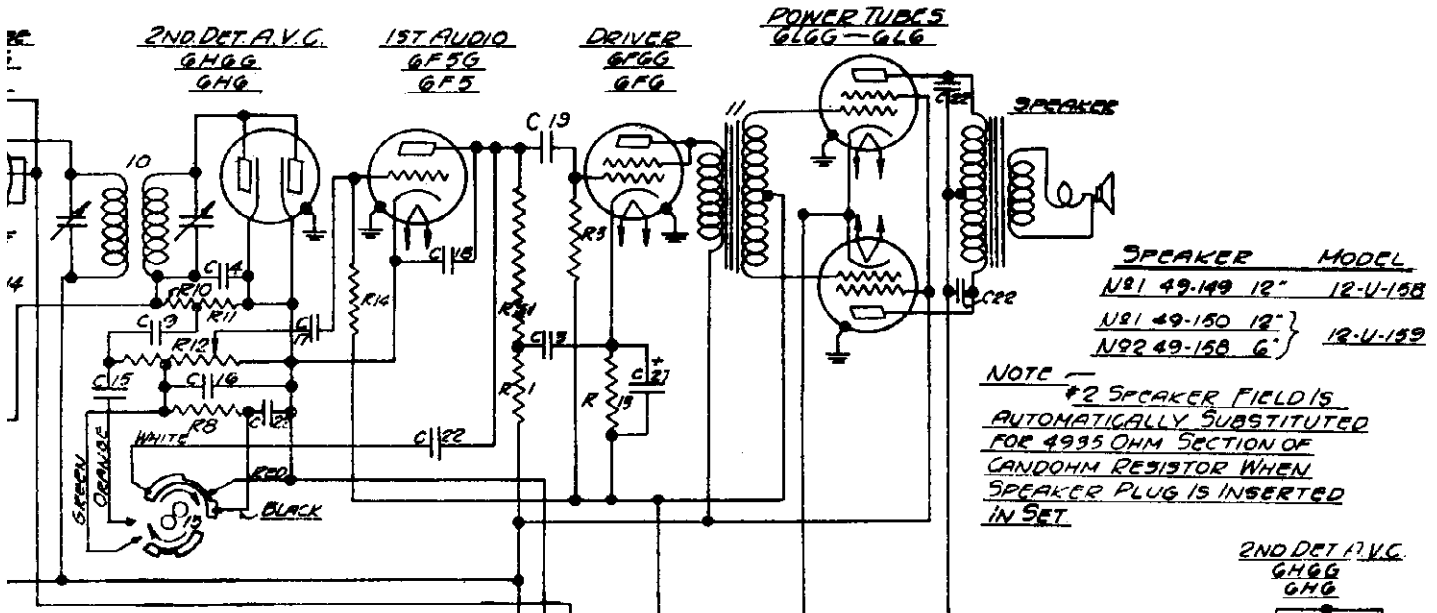
I.F. FREQUENCY 456 KC

SOCK



Tube	Position	
6K7	R. F.	0
6L7	1st Det.	0
6C5	Osc.	0
6K7	I. F.	0
6H6	2nd Det. A.V.C.	0
6F5	1st Audio	0
6F6	Driver	0
6L6	Power	0
6C5	Target Tuning Amp.	0
5Y3	Rectifier	0

RADIO CORP.



Line Voltage 112V.
Current Consumption 120 watts.
Power Output 17 watts.

VOLTAGES

	3	4	5	6	7	8	9
C	235	100	0	—	3AC	0	0
C	230	120	-.5	—	3AC	0	0
C	185	—	-8	—	3AC	0	—
C	235	100	0	—	3AC	9	0
C	-2.5	-2.5	-2.5	—	3AC	-2.5	—
C	—	90	—	—	3AC	-2.5	—
C	215	215	-.5	—	3AC	11	—
C	330	210	-3	—	3AC	14	—
C	230	—	0	—	3AC	0	—
0	—	AC	—	AC	—	340	—

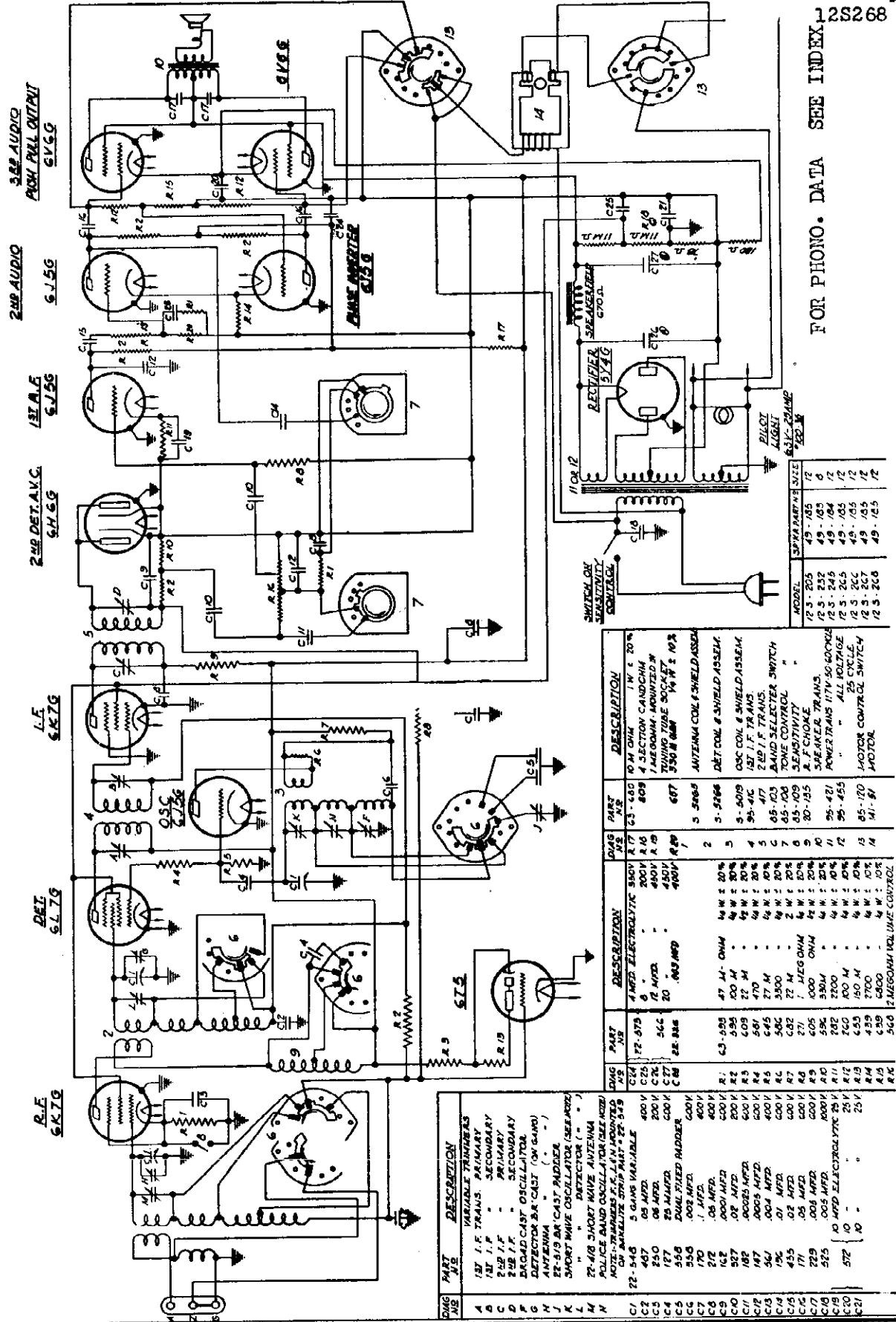
QTY	VAL	NO.	DESCRIPTION	PRICE
C1	20-303	5 MMFD	600V	
C2	487	.05 MFD	400V	
C3	170	.1	400V	
C4	289	50 MMFD	600V	
C5	187	25 MMFD	600V	
C6	212	.05 MFD	400V	
C7	486	.0012	600V	
C8	243	.01	400V	
C9	250	.05	300V	
C10	508	TRIMMER COND		
C11	285	10MMFD	600V	
C12	205	200-350 MFD PADDER		
C13	384	.0015 MFD	300V	
C14	499	3 GANG VARIABLE		
C15	182	.00025 MFD	600V	
C16	147	.0005	600V	
C17	188	.02	400V	
C18	162	.0001	600V	
C19	435	.02	600V	
C20	509	10 MFD DRY ELEC COND	50V	
C21	500	10 . W.T.	250V	
C22	229	.005 MFD (TUBULAR)	600V	
C23	485	.005	600V	
C24	125	8 MFD WET ELEC COND	450V	
C25	294	.10	450V	
C26	304	.10 (CHROM.)	450V	
C27	405	10 . DRY . COND.	50V	
R1	65278	99 M OHM	1/4W	
R2	357	500	1/4W	
R3	295	990 Ω	1/4W	
R4	208	12 M	1/4W	
R5	456	990	1/2W	
R6	532	5100	1/4W	
R7	530	5	1/4W	
R8	280	49 M	1/4W	
R9	303	700	1/4W	

QTY	VAL	NO.	DESCRIPTION	PRICE
R10	65260	100 M OHMS	1/4W	
R11	385	300 M	1/4W	
R12	522	2 MEG OHM VOL CONT 3 SW.	1/4W	
R13	581	650 OHM	1/4W	
R14	525	2 MEG OHM	1/4W	
R15	528	GANDOHM	1/4W	
R16	411	20 OHM	1/4W	
R17	261	990 OHM	1/4W	
1	20-71	ANTENNA CHOKE		
2	20-135	R.F. PLATE		
3	122-14	TUNING METER		
4	54545	ANTENNA COIL ASSEM		
5	54546	DETECTOR		
6	54547	OSCILLATOR		
7	54587	H.F. DETECTOR		
8	54388	H.F. OSCILLATOR		
9	95-368	1ST I.F. TRANS		
10	95-369	2ND I.F.		
11	95-570	AUDIO		
12	95-570	POWER	115V 50-60 CYCLE	
	95-373		25 CYCLE FULL VOL	
13	85-92	TRIMMER COND		
14	85-91	SENSITIVITY CONT SW		
15	95-366	POWER CHOKE		
16	85-39	PHONO SWITCH		
17	41-7	JACK		
18	85-94	BAND SELECTOR SWITCH		

Chassis 1204
Schematic, Parts

ZENITH RADIO CORP.

MODELS 12S205, 12S2
12S245, 12S2
12S266, 12S2
12S268



FOR PHONO. DATA SEE INDEX

MODEL	SPEAKER SIZE
12 S-205	4 1/2" x 4 1/2"
12 S-245	4 1/2" x 4 1/2"
12 S-266	4 1/2" x 4 1/2"
12 S-268	4 1/2" x 4 1/2"

DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
1	22-515	4 MED. ELECTROLYTIC 350V	17	C5-400	10 M OHM CARBOH.
2	C24	5 OHM VARIABLE	18	R10	1 MEG OHM VOLUME CONTROL
3	C25	10 MFD ELECTROLYTIC 75V	19	R11	100 OHM
4	C26	10 MFD ELECTROLYTIC 75V	20	R12	100 OHM
5	C27	10 MFD ELECTROLYTIC 75V	21	R13	100 OHM
6	C28	10 MFD ELECTROLYTIC 75V	22	R14	100 OHM
7	R1	100 OHM	23	R15	100 OHM
8	R2	100 OHM	24	R16	100 OHM
9	R3	100 OHM	25	R17	100 OHM
10	R4	100 OHM	26	R18	100 OHM
11	R5	100 OHM	27	R19	100 OHM
12	R6	100 OHM	28	R20	100 OHM
13	R7	100 OHM	29	R21	100 OHM
14	R8	100 OHM	30	R22	100 OHM
15	R9	100 OHM	31	R23	100 OHM
16	R10	100 OHM	32	R24	100 OHM
17	R11	100 OHM	33	R25	100 OHM
18	R12	100 OHM	34	R26	100 OHM
19	R13	100 OHM	35	R27	100 OHM
20	R14	100 OHM	36	R28	100 OHM
21	R15	100 OHM	37	R29	100 OHM
22	R16	100 OHM	38	R30	100 OHM
23	R17	100 OHM	39	R31	100 OHM
24	R18	100 OHM	40	R32	100 OHM
25	R19	100 OHM	41	R33	100 OHM
26	R20	100 OHM	42	R34	100 OHM
27	R21	100 OHM	43	R35	100 OHM
28	R22	100 OHM	44	R36	100 OHM
29	R23	100 OHM	45	R37	100 OHM
30	R24	100 OHM	46	R38	100 OHM
31	R25	100 OHM	47	R39	100 OHM
32	R26	100 OHM	48	R40	100 OHM
33	R27	100 OHM	49	R41	100 OHM
34	R28	100 OHM	50	R42	100 OHM
35	R29	100 OHM	51	R43	100 OHM
36	R30	100 OHM	52	R44	100 OHM
37	R31	100 OHM	53	R45	100 OHM
38	R32	100 OHM	54	R46	100 OHM
39	R33	100 OHM	55	R47	100 OHM
40	R34	100 OHM	56	R48	100 OHM
41	R35	100 OHM	57	R49	100 OHM
42	R36	100 OHM	58	R50	100 OHM
43	R37	100 OHM	59	R51	100 OHM
44	R38	100 OHM	60	R52	100 OHM
45	R39	100 OHM	61	R53	100 OHM
46	R40	100 OHM	62	R54	100 OHM
47	R41	100 OHM	63	R55	100 OHM
48	R42	100 OHM	64	R56	100 OHM
49	R43	100 OHM	65	R57	100 OHM
50	R44	100 OHM	66	R58	100 OHM
51	R45	100 OHM	67	R59	100 OHM
52	R46	100 OHM	68	R60	100 OHM
53	R47	100 OHM	69	R61	100 OHM
54	R48	100 OHM	70	R62	100 OHM
55	R49	100 OHM	71	R63	100 OHM
56	R50	100 OHM	72	R64	100 OHM
57	R51	100 OHM	73	R65	100 OHM
58	R52	100 OHM	74	R66	100 OHM
59	R53	100 OHM	75	R67	100 OHM
60	R54	100 OHM	76	R68	100 OHM
61	R55	100 OHM	77	R69	100 OHM
62	R56	100 OHM	78	R70	100 OHM
63	R57	100 OHM	79	R71	100 OHM
64	R58	100 OHM	80	R72	100 OHM
65	R59	100 OHM	81	R73	100 OHM
66	R60	100 OHM	82	R74	100 OHM
67	R61	100 OHM	83	R75	100 OHM
68	R62	100 OHM	84	R76	100 OHM
69	R63	100 OHM	85	R77	100 OHM
70	R64	100 OHM	86	R78	100 OHM
71	R65	100 OHM	87	R79	100 OHM
72	R66	100 OHM	88	R80	100 OHM
73	R67	100 OHM	89	R81	100 OHM
74	R68	100 OHM	90	R82	100 OHM
75	R69	100 OHM	91	R83	100 OHM
76	R70	100 OHM	92	R84	100 OHM
77	R71	100 OHM	93	R85	100 OHM
78	R72	100 OHM	94	R86	100 OHM
79	R73	100 OHM	95	R87	100 OHM
80	R74	100 OHM	96	R88	100 OHM
81	R75	100 OHM	97	R89	100 OHM
82	R76	100 OHM	98	R90	100 OHM
83	R77	100 OHM	99	R91	100 OHM
84	R78	100 OHM	100	R92	100 OHM

I.F. FREQUENCY 455 K.C.
12 TUBE SUPERHETERODYNE
5 BAND

ZENITH RADIO CORP.
CHICAGO, ILLINOIS

MODELS 9S203, 9S232, 9S242
 9S244, 9S262, 9S263
 9S264
 Chassis 5905

ZENITH RADIO CORP.

Voltage, Alignment
 Socket, Trimmers

MODELS 12S205, 12S232
 12S245, 12S265
 12S266, 12S267
 12S268
 Chassis 1204

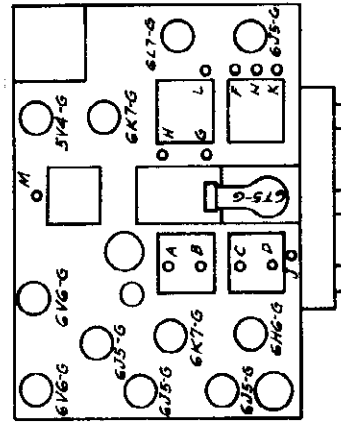
CHASSIS 1204
 Model 12S series
SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R. F.	0	3.2	246	83	0	0	—	3.2	0
6L7	Converter	0	3.2	243	83	-10	-10.5	—	3.2	0
6J5	Osc.	0	3.2	121	—	-10.5	—	—	3.2	0
6K7	I. F.	0	3.2	237	83	0	—	—	3.2	0
	2nd Det. A.V.C.	0	3.2	-2	-1.5	-2	—	—	3.2	-1.5
6J5	1st Audio	0	3.2	70	—	-5	—	—	3.2	-1.5
6J5	2nd Audio	0	3.2	74	—	-2	—	—	3.2	-5
6J5	Inverter	0	3.2	76	—	-2	—	—	3.2	-5
6V6	Power	0	3.2	231	240	-2.5	—	—	3.2	8
6V6	Power	0	3.2	231	240	-2.5	—	—	3.2	8
5Y4	Rect.	0	—	AC	—	AC	—	—	3.18	3.18
6T5	Target	H	Ep	Eg	Et	Ek	—	—	—	—
		3.2	13	-1.5	240	-1.5	3.2			

All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 110W. Power output 15W.

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br/dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	"	200 Mmfd.	1500	"	1500	GH	Align of Ant & Det
4	"	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5	"	"	"	"	"	FGH	Repeat 2 & 3
6	Rec. Ant. Post	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
7	"	400 Ohms	16500	S.W.	16500	LM	Rock gang & adj. for max. output
8	"	400 Ohms	5500	Police	5500	N	Rock gang & adj. for max. output



LOCATION OF TRIMMERS

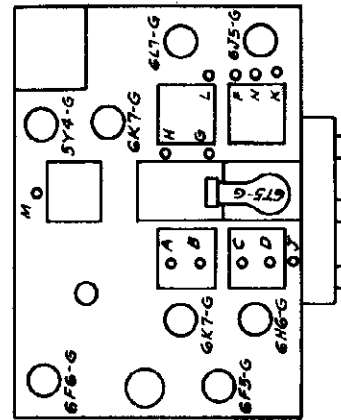
CHASSIS 5905
 Model 9S series
SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R. F.	0	0	240	80	0	—	6.2	0	-2
6L7	Converter	0	6.2	240	80	-7	—	0	0	-1
6J5	Osc.	0	6.2	130	—	-8	—	0	0	—
6K7	I. F.	0	6.2	237	80	0	—	0	0	-1
	2nd Det. A.V.C.	0	0	-2.5	-2	-2.5	—	6.2	-2	—
6F5	1st Audio	0	0	—	82	—	—	6.2	-2	-2.5
6F6	Power	0	0	225	240	-3.5	—	6.2	-4.5	—
5Y4	Rect.	0	—	AC	—	AC	—	—	298	298
		H	Ep	Eg	Et	Ek	H	—	—	—
6T5	Target	0	10	-2	240	-2	6.2			

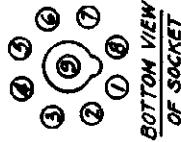
All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 75W. Power output 4.5W.

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br/dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	"	200 Mmfd.	1500	"	1500	GH	Align of Ant & Det
4	"	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5	"	"	"	"	"	FGH	Repeat 2 & 3
6	Rec. Ant. Post	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
7	"	400 Ohms	16500	S.W.	16500	LM	Rock gang & adj. for max. output
8	"	400 Ohms	5500	Police	5500	N	Rock gang & adj. for max. output



LOCATION OF TRIMMERS



BOTTOM VIEW OF SOCKET

BOTTOM VIEW OF SOCKET

ZENITH RADIO CORP.

I.F. FREQUENCY 456KC
15 TUBE SUPERHETRODYNE
4 BAND

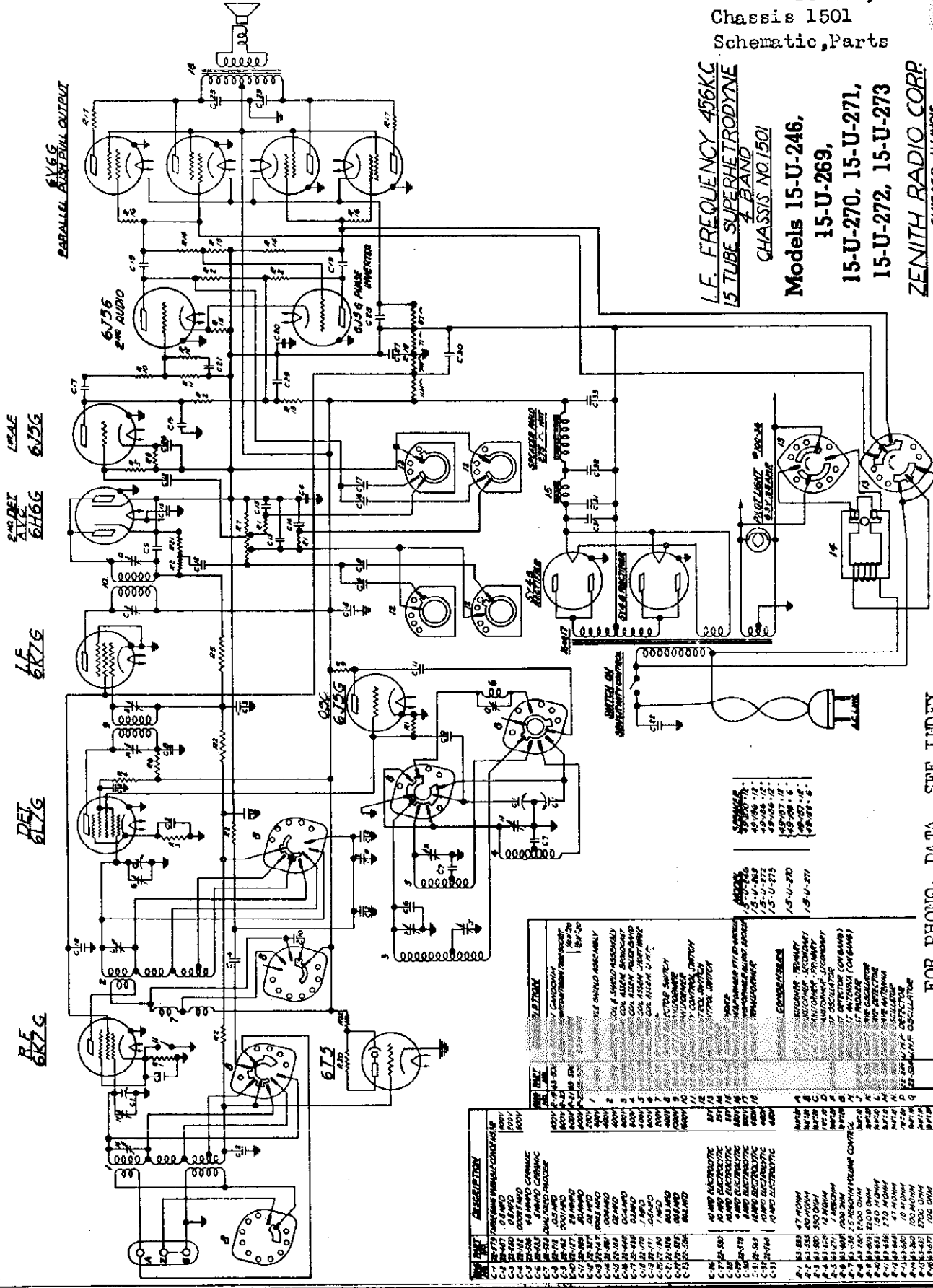
CHASSIS NO. 1501

Models 15-U-246,
15-U-269,

15-U-270, 15-U-271,

15-U-272, 15-U-273

ZENITH RADIO CORP.



6A76
6A76
DET 6V76
6B76
1ST AUDIO
6V76
2ND AUDIO
PARALLEL RESONANT OUTPUT

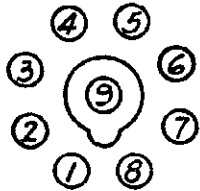
QTY	DESCRIPTION	REMARKS
1	15U246, 15U270, 15U272, 15U273	CHASSIS NO. 1501
1	6X75	5Y4
1	6A76	6X4
1	6V76	6X6
1	6B76	6X5
1	6B6G	6X3
1	6V76	6X2
1	6A76	6X1
1	6B76	6X0
1	6V76	6X4
1	6B76	6X5
1	6V76	6X6
1	6A76	6X7
1	6B76	6X8
1	6V76	6X9
1	6A76	6X0
1	6B76	6X1
1	6V76	6X2
1	6A76	6X3
1	6B76	6X4
1	6V76	6X5
1	6A76	6X6
1	6B76	6X7
1	6V76	6X8
1	6A76	6X9
1	6B76	6X0
1	6V76	6X1
1	6A76	6X2
1	6B76	6X3
1	6V76	6X4
1	6A76	6X5
1	6B76	6X6
1	6V76	6X7
1	6A76	6X8
1	6B76	6X9
1	6V76	6X0
1	6A76	6X1
1	6B76	6X2
1	6V76	6X3
1	6A76	6X4
1	6B76	6X5
1	6V76	6X6
1	6A76	6X7
1	6B76	6X8
1	6V76	6X9
1	6A76	6X0
1	6B76	6X1
1	6V76	6X2
1	6A76	6X3
1	6B76	6X4
1	6V76	6X5
1	6A76	6X6
1	6B76	6X7
1	6V76	6X8
1	6A76	6X9
1	6B76	6X0
1	6V76	6X1
1	6A76	6X2
1	6B76	6X3
1	6V76	6X4
1	6A76	6X5
1	6B76	6X6
1	6V76	6X7
1	6A76	6X8
1	6B76	6X9
1	6V76	6X0
1	6A76	6X1
1	6B76	6X2
1	6V76	6X3
1	6A76	6X4
1	6B76	6X5
1	6V76	6X6
1	6A76	6X7
1	6B76	6X8
1	6V76	6X9
1	6A76	6X0
1	6B76	6X1
1	6V76	6X2
1	6A76	6X3
1	6B76	6X4
1	6V76	6X5
1	6A76	6X6
1	6B76	6X7
1	6V76	6X8
1	6A76	6X9
1	6B76	6X0
1	6V76	6X1
1	6A76	6X2
1	6B76	6X3
1	6V76	6X4
1	6A76	6X5
1	6B76	6X6
1	6V76	6X7
1	6A76	6X8
1	6B76	6X9
1	6V76	6X0
1	6A76	6X1
1	6B76	6X2
1	6V76	6X3
1	6A76	6X4
1	6B76	6X5
1	6V76	6X6
1	6A76	6X7
1	6B76	6X8
1	6V76	6X9
1	6A76	6X0
1	6B76	6X1
1	6V76	6X2
1	6A76	6X3
1	6B76	6X4
1	6V76	6X5
1	6A76	6X6
1	6B76	6X7
1	6V76	6X8
1	6A76	6X9
1	6B76	6X0
1	6V76	6X1
1	6A76	6X2
1	6B76	6X3
1	6V76	6X4
1	6A76	6X5
1	6B76	6X6
1	6V76	6X7
1	6A76	6X8
1	6B76	6X9
1	6V76	6X0
1	6A76	6X1
1	6B76	6X2
1	6V76	6X3
1	6A76	6X4
1	6B76	6X5
1	6V76	6X6
1	6A76	6X7
1	6B76	6X8
1	6V76	6X9
1	6A76	6X0
1	6B76	6X1
1	6V76	6X2
1	6A76	6X3
1	6B76	6X4
1	6V76	6X5
1	6A76	6X6
1	6B76	6X7
1	6V76	6X8
1	6A76	6X9
1	6B76	6X0
1	6V76	6X1
1	6A76	6X2
1	6B76	6X3
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1	6B76	6X6
1	6V76	6X7
1	6A76	6X8
1	6B76	6X9
1	6V76	6X0
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1	6V76	6X6
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1	6B76	6X8
1	6V76	6X9
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1	6B76	6X1
1	6V76	6X2
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1	6B76	6X4
1	6V76	6X5
1	6A76	6X6
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1	6V76	6X8
1	6A76	6X9
1	6B76	6X0
1	6V76	6X1
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1	6V76	6X4
1	6A76	6X5
1	6B76	6X6
1	6V76	6X7
1	6A76	6X8
1	6B76	6X9
1	6V76	6X0
1	6A76	6X1
1	6B76	6X2
1	6V76	6X3
1	6A76	6X4
1	6B76	6X5
1	6V76	6X6
1	6A76	6X7
1	6B76	6X8
1	6V76	6X9
1	6A76	6X0
1	6B76	6X1
1	6V76	6X2
1	6A76	6X3
1	6B76	6X4
1	6V76	6X5
1	6A76	6X6
1	6B76	6X7
1	6V76	6X8
1	6A76	6X9
1	6B76	6X0
1	6V76	6X1
1	6A76	6X2
1	6B76	6X3
1	6V76	6X4
1	6A76	6X5
1	6B76	6X6
1	6V76	6X7
1	6A76	6X8
1	6B76	6X9
1	6V76	6X0
1	6A76	6X1
1	6B76	6X2
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1	6A76	6X4
1	6B76	6X5
1	6V76	6X6
1	6A76	6X7
1	6B76	6X8
1	6V76	6X9
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1	6B76	6X0
1	6V76	6X1
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1	6B76	6X9
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1	6A76	6X7
1	6B76	6X8
1	6V76	6X9
1	6A76	6X0
1	6B76	6X1
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1	6B76	6X4
1	6V76	6X5
1	6A76	6X6
1	6B76	6X7
1	6V76	6X8
1	6A76	6X9
1	6B76	6X0
1	6V76	6X1
1	6A76	6X2
1	6B76	6X3
1	6V76	6X4
1	6A76	6X5
1	6B76	6X6
1	6V76	6X7
1	6A76	6X8
1	6B76	6X9
1	6V76	6X0
1	6A76	6X1
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1	6V76	6X6
1	6A76	6X7
1	6B76	6X8
1	6V76	6X9
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1	6B76	6X4
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1	6V76	6X8
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1	6B76	6X6
1	6V76	6X7
1	6A76	6X8
1	6B76	6X9
1	6V76	6X0
1	6A76	6X1
1	6B76	6X2
1	6V76	6X3
1	6A76	6X4
1	6B76	6X5
1	6V76	6X6
1	6A76	6X7
1	6B76	6X8
1	6V76	6X9
1	6A76	6X0
1	6B76	6X1
1	6V76	6X2
1	6A76	6X3
1	6B76	6X4
1	6V76	6X5
1	6A76	6X6
1	6B76	6X7
1	6V76	6X8
1	6A76	6X9
1	6B76	6X0
1	6V76	6X1
1	6A76	6X2
1	6B76	6X3
1	6V76	6X4
1	6A76	6X5
1	6B76	6X6
1	6V76	6X7
1	6A76	6X8
1	6B76	6X9
1	6V76	6X0
1	6A76	6X1
1	6B76	6X2
1	6V76	6X3
1	6A76	6X4
1	6B76	6X5
1	6V76	6X6
1	6A76	6X7
1	6B76	6X

MODELS 15U246, 15U269
15U270, 15U271
15U272, 15U273

ZENITH RADIO CORP.

Chassis 1501
Voltage, Alignment
Socket, Trimmers

SOCKET
VOLTAGES



BOTTOM VIEW
OF SOCKET

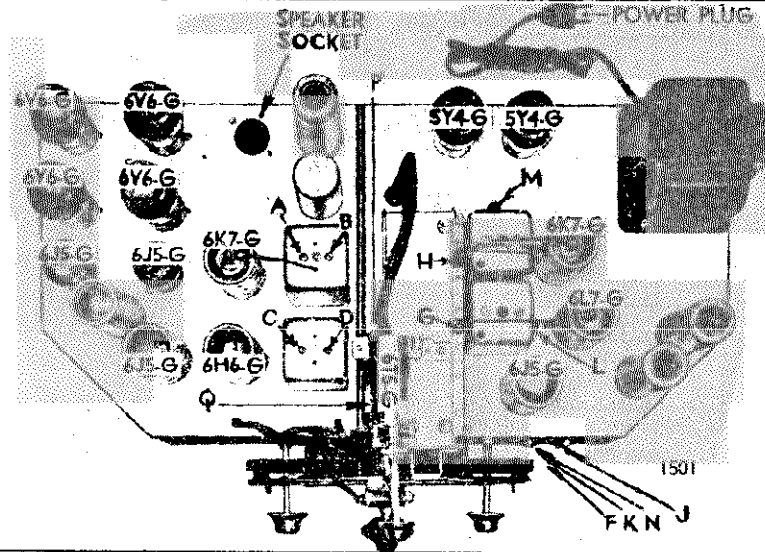
Tube	Position	1	2	3	4	5	6	7	8	9
6K7	R. F.	0	3	250	93	0	—	3	0	—3
6L7	Converter	0	3	250	153	—8	—	3	3	—2
6J5	Osc.	0	3	225	—	—8	—	3	0	—
6K7	I. F.	0	3	250	93	0	—	3	0	—1
6H6	2nd Det. AVC	0	3	—3	—3	—3	—	3	—3	—
6J5	1st Audio	0	3	53	—	—1	—	3	—1	—
6J5	2nd Audio	0	3	82	—	—5	—	3	1.5	—
6J5	Inverter	0	3	82	—	—2.5	—	3	1.5	—
6V6	Power	0	3	243	250	—1	—	3	8	—
6V6	Power	0	3	243	250	—1	—	3	8	—
6V6	Power	0	3	243	250	—1	—	3	8	—
6V6	Power	0	3	243	250	—1	—	3	8	—
5Y4	Rect.	0	—	AC	—	AC	—	320	320	—
5Y4	Rect.	0	—	AC	—	AC	—	320	320	—
			Eh	Ep	Eg	Et	Ek	Eh		
6T5	Target	3	11	—3	216	—3	3			

All voltages measured from point indicated to ground using a 1000 Ohm per Volt meter, antenna and ground disconnected. Line voltage 117V. Consumption 160W. Power output 30W.

ALIGNMENT PROCEDURE

Operation	Connect Test Oscillator to—	Dummy Antenna	Set Test Osc. to	Band	Set Dial At	Adjust Trimmers	Purpose
1	1st Det. Grid	1/2 Mfd.	456	Br'dc't	600	ABCD	I. F. Alignment
2	Rec. Ant. Post	200 Mmfd.	1500	"	1500	F	Set Osc. to Scale
3	" " "	200 Mmfd.	1500	"	1500	GH	Algmt. of Ant. & Det
4	" " "	200 Mmfd.	600	"	600	J	Rock gang & adj. for max. output
5	" " "	"	"	"	"	FGH	Repeat 2 & 3
6	Rec. Ant. Post	400 Ohms	18000	S.W.	18000	K	Set Osc. to Scale
7	" " "	400 Ohms	16500	S.W.	16500	LM	Rock gang & adj. for max. output
8	" " "	400 Ohms	5500	Police	5500	N	Rock gang & adj. for max. output
9	" " "	400 Ohms	40000	U.H.F.	40000	Q	Set Osc. to Scale
10	" " "	400 Ohms	40000	U.H.F.	40000	P	Rock gang & adj. for max. output

LOCATION OF TRIMMERS



MODELS	258, 268, 278, 280 281, 288, 289, 478	558, 568, 578, 589, 590	Chassis 2051, Early-Late	Parts List
22-82	.001 mfd	500 volt	(band switch).....	.25
22-113	.05 "	200 "	(1st detector cathode).....	.35
22-115	.01 "	400 "	(oscillator plate & 2nd detector grid)	.35
22-147	.0005 "	600 "	(band switch).....	.25
22-162	.0001 "	500 "	(band switch).....	.20
22-197	Variable	Condenser.....		2.75
22-203	10. mfd	25 volt	(power cathode).....	.60
22-204	Dual 8 "	500 "	(filter).....	2.00
22-205	Oscillator	Padder.....		.35
22-206	Dual .01 mfd	600 volt	(tone control).....	.25
22-207	Dual .1 "	200 "	(R.F., 1st det. I. F. grid & cathode)..	.25
22-208	Dual .01 & .0005 mfd	400 volt	(2nd det. grid & cathode)....	.20
22-209	Dual .01 mfd	400 volt	(2nd det. plate).....	.20
22-210	Dual .1 & .5 mfd	400 volt	(2nd I. F. screens & plate).....	.35
22-211	.1 mfd	300 volt	(2nd detector plate).....	.20
22-212	.05 "	400 "	(audio coupling).....	.20
63-136	50M ohm	$\frac{1}{2}$ watt	... (2nd detector plate).....	.20
63-146	2M "	" "	... (R. F. cathode).....	.20
63-180	1M "	" "	... (1st detector cathode).....	.20
63-240	1900 "	" "	... (1st detector grid & 2nd I.F. plate)..	.20
63-258	490M "	" "	... (2nd detector anode).....	.20
63-260	100M "	" "	... (power grid).....	.20
63-265	220 "	" "	... (I. F. Cathodes).....	.20
63-271	1 meg "	" "	... (2nd detector grid).....	.20
63-275	15500 "	" "	... (voltage divider).....	.70
63-278	99M "	$\frac{1}{4}$ "	... (R.F. & 1st detector grid return)....	.20
63-280	49M "	$\frac{1}{4}$ "	... (oscillator bias).....	.20
63-284	500M "	Volume	Control.....	1.00
63-285	50M "	Tone	Control.....	.75
63-286	50M "	Sensitivity	Control.....	.75
63-288	19M "	$\frac{1}{2}$ watt	... (R. F. & 1st detector screens).....	.20
63-289	29M "	1 "	... (oscillator plate).....	.20
63-307	40 "	1 "	... (2nd detector cathode).....metal.....	.15
20-32	Standard	Wave	Detector Coil.....	1.00
20-43	Antenna	Coil.....		.75
95-181	1st I. F.	Transformer.....	(485 kilocycle).....	1.25
95-182	2nd I. F.	Transformer.....	(485 kilocycle).....	1.25
95-184	3rd I. F.	Transformer.....	(485 kilocycle).....	1.25
S-2252	Plate	Choke and	Bracket Assembly.....	.50
S-2672	Short	Wave	Oscillator Coil.....	1.25
S-2673	Short	Wave	Detector Coil.....	1.25
4-118	Tube	Shield	Base.....	.05
8-25	Antenna	and	Ground Binding Post Assembly.....	.20
44-4	Phono	Connector	Jack.....	.15
46-59	Large	Control	Knob.....	.15
46-60	Small	Control	Knob.....	.15
49-44	Dynamic	Speaker.....		8.00
	Cone and	Voice	Coil for above #8304 (3 hole mounting spider).....	3.00
	Output	Transformer	for 49-44 Speaker.....	2.00
57-342	Escutcheon	Plate.....		.60
85-40	Two	Gang	Selector Switch.....	1.50
93-167	Rubber	Cushion	for Chassis Mounting (lower).....	.01
93-168	Rubber	Cushion	for Chassis Mounting (upper).....	.01
95-168	All	Voltage, All	Cycle Power Transformer.....	6.00
106-18	$2\frac{1}{2}$ volt	Dial	Lamp.....	.12
106-109	Tube	Shield.....		.10

ALL PRICES SUBJECT TO REGULAR DISCOUNT AND CHANGE WITHOUT NOTICE.

.10
.05
.01

per ft.
Dial Cord.....
Dial Lamp Bracket.....
Dial Bushing Set Screw.....

.80 11-2
1.00 12-297
1.25 73-19

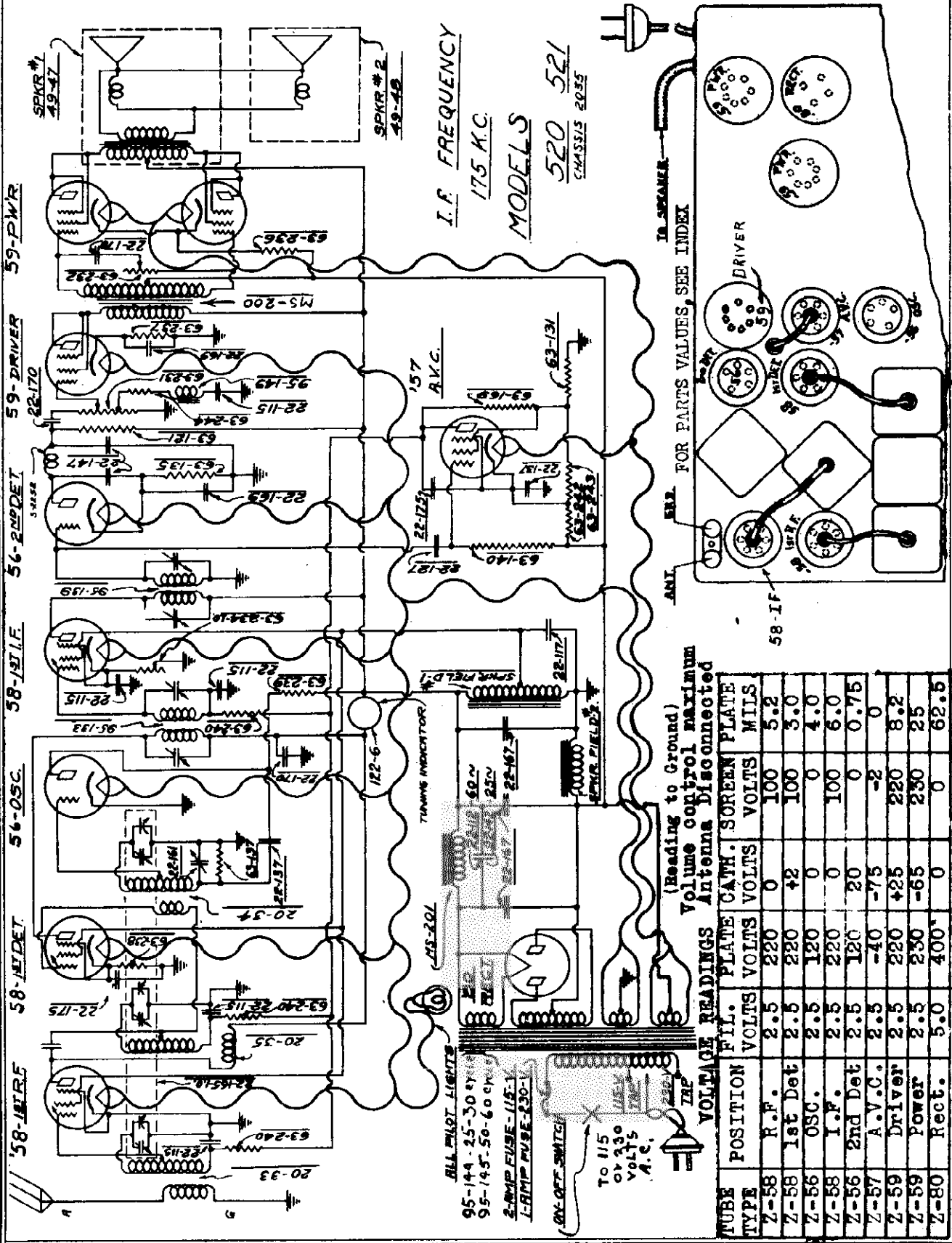
S-2678 Dial Tuning Shaft and Bracket Assembly....
S-2679 Dial Strip and Support Assembly (plain)....
S-2680 Dial Mask and Support Assembly.....

MODELS 520, 521, 602, 605
608, 611, 615
Chassis 2035

ZENITH RADIO CORP.

Schematic, Socket, Voltage
Trimmers, Alignment

BALANCE INTERMEDIATE FREQUENCY AT 175 KC. CONDENSER GANG
AT 1500 KC AND THE OSCILLATOR PADDER AT 600 KC.



I.F. FREQUENCY
175 K.C.
MODELS
520 521
CHASSIS 2035

ANT. FOR PARTS VALUES, SEE INDEX

(Reading to Ground)
Volume control maximum
Antenna Disconnected

TUBE TYPE	POSITION	FIL. VOLTS	PLATE VOLTS	CATH. VOLTS	SCREEN VOLTS	PLATE MILS.
Z-58	R.F.	2.5	220	0	100	5.2
Z-58	1st Det	2.5	220	+2	100	3.0
Z-56	OSC.	2.5	120	0	0	4.0
Z-58	I.F.	2.5	220	0	100	6.0
Z-56	2nd Det	2.5	120	20	0	0.75
Z-57	A.V.C.	2.5	-40	-75	-2	0
Z-59	Driver	2.5	220	+25	220	8.2
Z-59	Power	2.5	230	-65	230	25
Z-80	Rect.	5.0	400	0	0	62.5

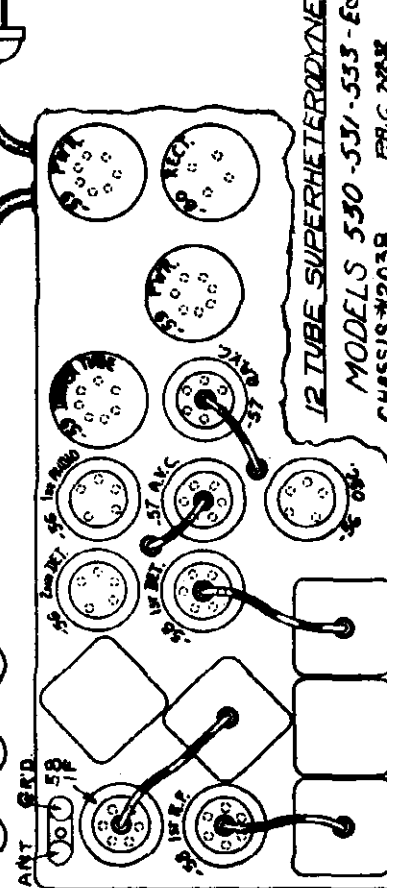
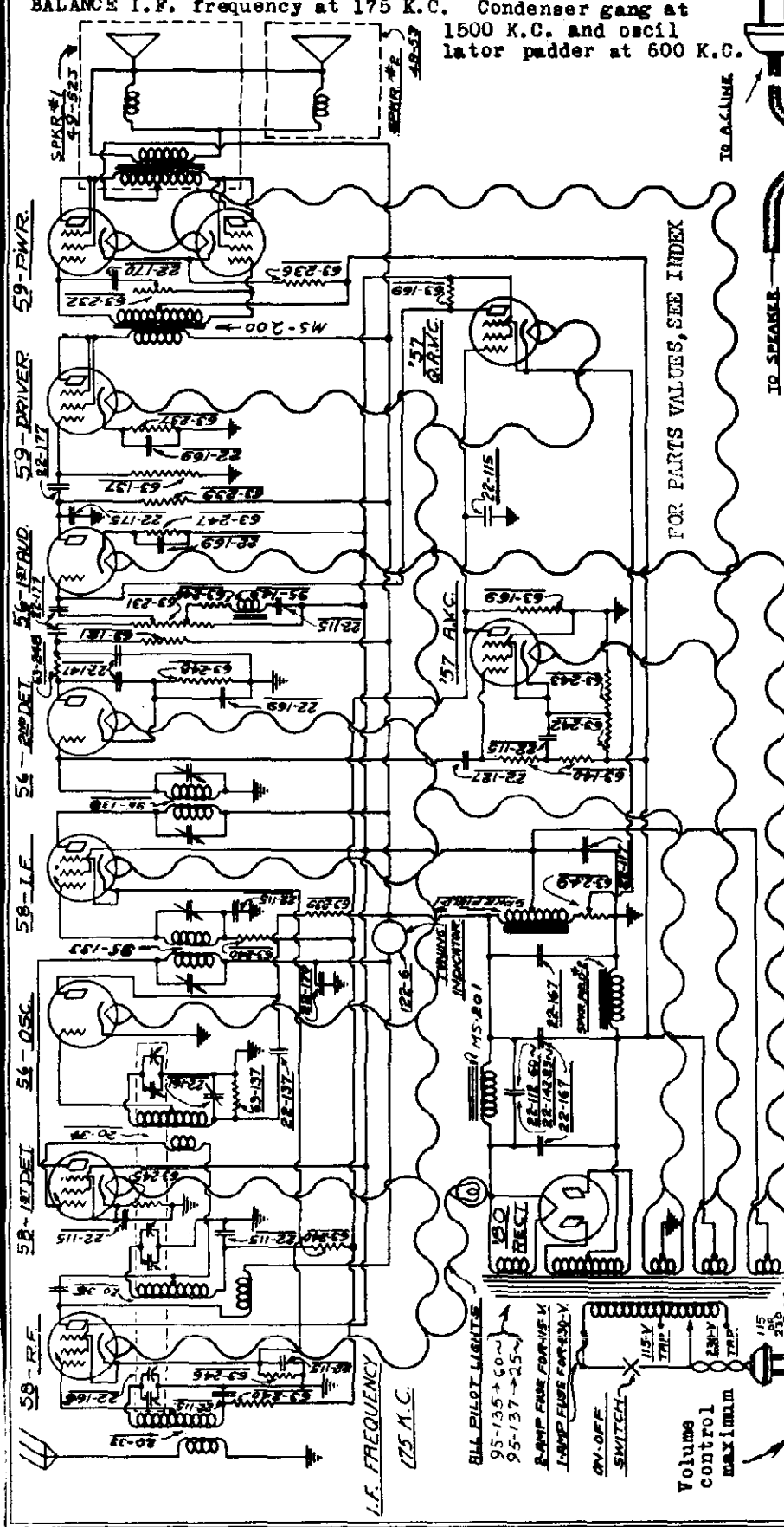
ALL PILOT LIGHTS
95-144 - 25-30 ohms
95-145 - 50-60 ohms
2-AMP FUSE - 115 V.
1-AMP FUSE - 230 V.
ON-OFF SWITCH
TO 115 OR 230 VOLTS A.C.

Chassis 2038
Schematic, Voltage, Socket
Trimmers, Alignment

ZENITH RADIO CORP.

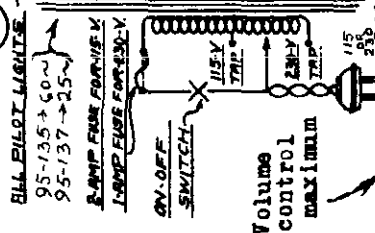
MODELS 530, 531, 532, 533
603, 612, 617, 623
623

BALANCE I.F. frequency at 175 K.C. Condenser gang at 1500 K.C. and oscillator padder at 600 K.C.



(Reading to Ground)

TUBE TYPE	POSITION	FIL. VOLTS	PLATE VOLTS	CATH. VOLTS	SCREEN VOLTS	SUPP. VOLTS	PLATE MILS
Z58	1st RF	2.5	175	2.2	75	2.2	5.7
Z58	1st Det	2.5	190	4.5	75	4.5	2.3
Z56	OBC	2.5	100	0	-	-	3.5
Z58	1st IF	2.5	200	2.2	75	2.2	5.5
Z56	2nd Det	2.5	110	10	-	-	.3
Z56	1st Aud	2.5	170	80	-	-	.8
Z57	A.V.C.	2.5	-	-85	-	-85	-
Z57	Q. AVC	2.5	30	13	75	13	-
Z59	Driver	2.5	190	20	190	190	13
Z59	Power	2.5	195	-70	195	195	22



Volume control maximum

FOR PARTS VALUES, SEE INDEX

12 TUBE SUPERHETERODYNE
MODELS 530-531-533-ECT.
PUB. C. 2038

MODELS 520, 521, 602, 605
608, 611
Chassis 2035

ZENITH RADIO CORP.

MODELS 530, 531, 532, 533
603, 612, 617, 620
623 Parts Lists
Chassis 2038

22-112	.1 mfd 300 volt	[Filter]	.....	.25
22-115	.1 " 200 "	[Blight Used, See Below]	.....	.35
22-117	.5 " 300 "	[Filter]	.....	.50
22-127	.00025 600 "	(A.V.C. Grid)	.....	.35
22-137	.05 mfd 400 "	[Oscillator Plate]	.....	.25
22-142	.4 " 300 "	[Filter 25 Cycle Only]	.....	.40
22-147	.0005 " 600 "	[2nd Detector Plate]	.....	.20
22-161	Padder	.....	.....	.45
22-165	Three Gang Variable	.....	.....	3.50
22-167	8. mfd 500 volt	[Filter]	.....	1.50
22-169	8. " 50 "	[2nd Det. Cathode, Driver Cathode & 1st Audio Cathode]	.....	.55
22-170	.1 " 400 "	[1st Det. Plate, Tone Control]	.....	.25
22-175	.002 " 500 "	[1st Audio Plate]	.....	.25
22-177	.2 " 400 "	[2nd Det. Plate, 1st Audio Grid, 1st Audio Plate]	.....	.25
63-121	100M ohm	1 watt [2nd Detector Plate]	.....	.25
63-137	250K "	[Driver Grid]	.....	.25
63-140	1 meg "	[A.V.C. Grid & Cathode]	.....	.25
63-169	400 "	[A.V.C. & 4-A.V.C. Plate]	.....	.25
63-231	Volume Control & Switch Assembly	.....	.....	1.40
63-232	Tone Control	.....	.....	.75
63-236	500 ohm	[Wide Metal] [Power Tube Bias]	.....	.25
63-237	1500 "	[Narrow Metal] [Driver Tube Bias]	.....	.25
63-239	24M "	1 watt [Osc. & 1st Audio Plate]	.....	.25
63-240	1900 "	[R.F. 1st Det. & I.F. Grids]	.....	.25
63-242	2500 "	[A.V.C. Cathode]	.....	.25
63-243	18M "	[A.V.C. Cathode]	.....	.25
63-244	500 "	[Acoustic Filter]	.....	.25
63-245	1500 "	[1st Detector Cathode]	.....	.25
63-246	150 "	[R.F. Cathode]	.....	.25
63-247	9M "	[1st Audio Cathode]	.....	.25
63-248	50M "	[2nd Det. Plate & Cathode]	.....	.25
63-249	Sensitivity & Quiet Control	.....	.....	.75
22-115	R.F. 1st Detector, I.F. Grid Return, A.V.C. Plate, A.V.C. Cathode, 1st Detector Cathode, R.F. Cathode, and Acoustic Filter, Antenna Coil	.....	.....	.75
20-33	Oscillator Coil	.....	.....	.85
20-34	Detector Coil	.....	.....	1.00
20-35	1st I.F. Transformer with Grid Lead	.....	.....	1.25
95-133	2nd I.F. Transformer without Grid Lead	.....	.....	1.25
46-61	Large Knobs	.....	.....	.20
46-62	Small Knobs	.....	.....	.10
49-52	Dynamic Speaker [With Transformer]	.....	.....	8.25
49-53	Dynamic Speaker [Without Transformer]	.....	.....	7.00
52-34	Speaker Multicord	.....	.....	.45
57-343	Exoncheon Filter Plate	.....	.....	.50
78-56	Type 59 Socket	.....	.....	.15
78-57	Type 56 Socket	.....	.....	.15
78-58	Type 58 Socket	.....	.....	.15
78-59	Type 57 Socket	.....	.....	.15
78-60	Type 80 Socket	.....	.....	.15
95-167	Upper Cushion Washer for Chassis Mounting	.....	.....	.01
95-168	Lower Cushion Washer for Chassis Mounting	.....	.....	.01
95-142	115 volt 25 cycle Power Transformer	.....	.....	7.25
95-143	115 volt 60 cycle Power Transformer	.....	.....	5.25
95-149	Acoustic Filter Choke	.....	.....	.30
106-129	Small Tube Shield	.....	.....	.10
MS-200	Push Pull Input Transformer	.....	.....	3.50
MS-201	Power Filter Choke	.....	.....	2.00
122-5	Shadowgraph Meter	.....	.....	2.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

PARTS LIST

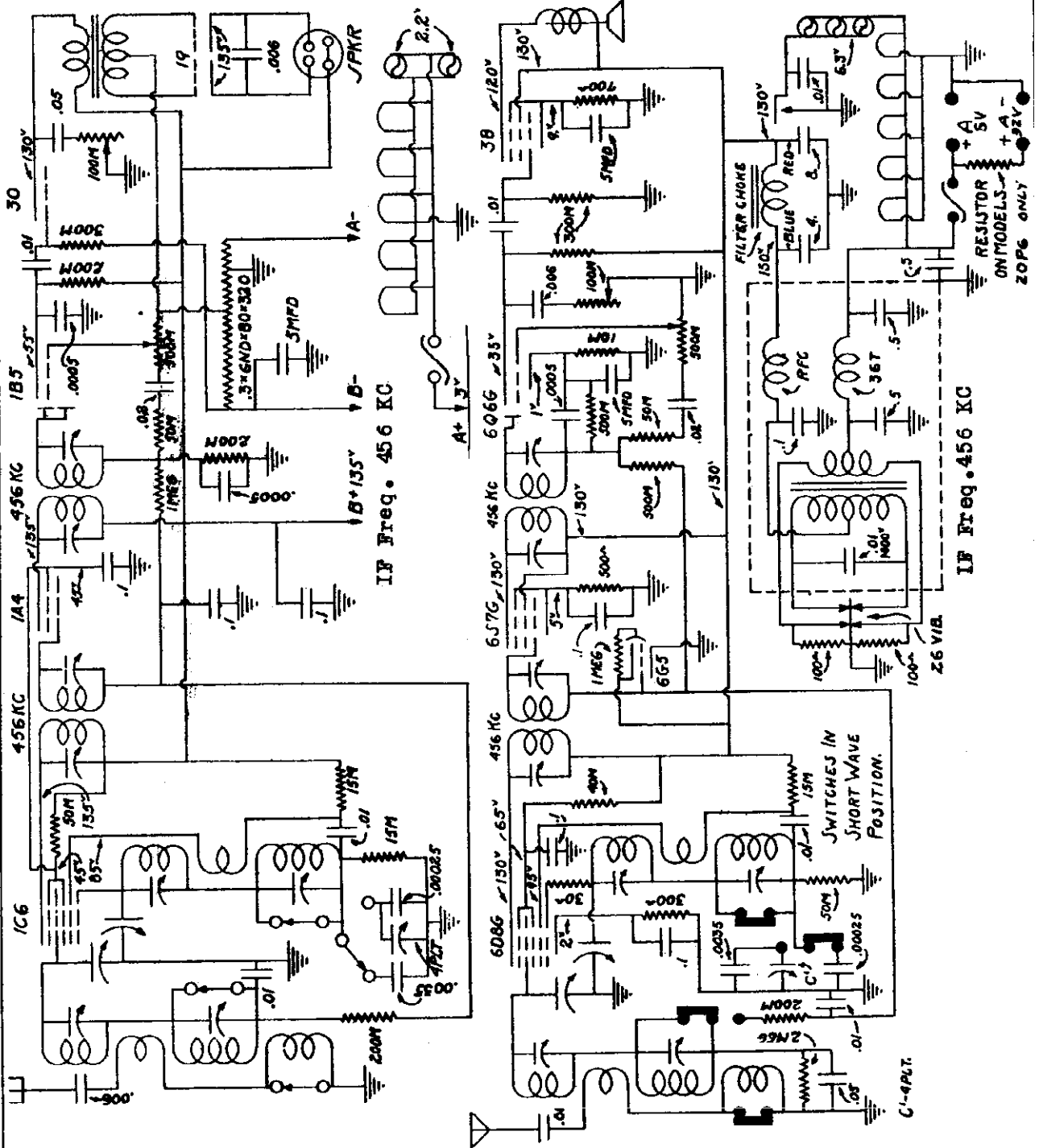
MODELS 520, 521, 602, 608, 611
Chassis 2035

11-5	Dial Pulley Strip	.....	.....	.25
26-36	Calibrated Dial Strip	.....	.....	.15
80-69	Dial Cord Tension Spring	.....	.....	.01
80-86	Volume and Tone Control Dial Tension Spring	.....	.....	.10
83-274	Volume Control Dial Strip	.....	.....	.10
83-275	Tone Control Dial Strip	.....	.....	.10
100-18	2.5 Volt Pilot Lamp	.....	.....	.12
122-6	Shadowgraph Meter	.....	.....	2.00
22-112	.1 mfd 300 Volt [Filter]	.....	.....	.25
22-115	.1 " 200 " [5 used, see footnote]	.....	.....	.35
22-137	.05 mfd 400 " [Filter]	.....	.....	.25
22-142	.4 " 300 " [Filter, 25 Cycle Only]	.....	.....	.40
22-147	.0005 " 600 " [2nd Detector Plate]	.....	.....	.20
22-161	Padder	.....	.....	.45
22-165	Three Gang Variable	.....	.....	3.50
22-167	8. mfd 500 Volt [Filter]	.....	.....	1.50
22-169	8. " 50 " [2nd Detector Cathode, Driver Cathode, and 1st Audio Cathode]	.....	.....	.55
22-170	.1 " 400 " [1st Detector Plate, Audio Coupling and Tone Control]	.....	.....	.25
63-121	100M Ohm 1 Watt [2nd Detector Plate]	.....	.....	.25
63-137	250K " 1 " [2nd Detector Cathode]	.....	.....	.25
63-140	1 Meg " 1 " [Oscillator Grid]	.....	.....	.25
63-169	400 " 1 " [A. V. C. Grid]	.....	.....	.25
63-231	Volume Control Assembly	.....	.....	1.25
63-232	Tone Control Assembly	.....	.....	.75
63-236	500 Ohm [Power Bias] [Wide Metal]	.....	.....	.25
63-237	1500 " [Driver Bias] [Narrow Metal]	.....	.....	.25
63-239	24M " 1 " [Oscillator Plate]	.....	.....	.25
63-240	1900 " 1 " [R.F. 1st Detector & I.F. Grids]	.....	.....	.25
63-242	2500 " 1 " [A. V. C. Cathode]	.....	.....	.25
63-243	18M " 1 " [A. V. C. Cathode]	.....	.....	.25
63-244	500 " 1 " [Acoustic Filter]	.....	.....	.25
63-245	1500 " 1 " [1st Detector Cathode]	.....	.....	.25
63-246	150 " 1 " [R.F. Cathode]	.....	.....	.25
63-247	9M " 1 " [1st Audio Cathode]	.....	.....	.25
63-248	50M " 1 " [2nd Det. Plate & Cathode]	.....	.....	.25
63-249	Sensitivity & Quiet Control	.....	.....	.75
22-115	R.F. 1st Detector, I.F. Grid Return, A.V.C. Plate, A.V.C. Cathode, 1st Detector Cathode, R.F. Cathode, and Acoustic Filter, Antenna Coil	.....	.....	.75
20-33	Oscillator Coil	.....	.....	.85
20-34	Detector Coil	.....	.....	1.00
20-35	1st I.F. Transformer with Grid Lead	.....	.....	1.25
95-133	2nd I.F. Transformer without Grid Lead	.....	.....	1.25
46-61	Large Knobs	.....	.....	.20
46-62	Small Knobs	.....	.....	.10
49-52	Dynamic Speaker [With Transformer]	.....	.....	8.25
49-53	Dynamic Speaker [Without Transformer]	.....	.....	7.00
52-34	Speaker Multicord	.....	.....	.45
57-343	Exoncheon Filter Plate	.....	.....	.50
78-56	Type 59 Socket	.....	.....	.15
78-57	Type 56 Socket	.....	.....	.15
78-58	Type 58 Socket	.....	.....	.15
78-59	Type 57 Socket	.....	.....	.15
78-60	Type 80 Socket	.....	.....	.15
95-167	Upper Cushion Washer for Chassis Mounting	.....	.....	.01
95-168	Lower Cushion Washer for Chassis Mounting	.....	.....	.01
95-142	115 volt 25 cycle Power Transformer	.....	.....	7.25
95-143	115 volt 60 cycle Power Transformer	.....	.....	5.25
95-149	Acoustic Filter Choke	.....	.....	.30
106-129	Small Tube Shield	.....	.....	.10
MS-200	Push Pull Input Transformer	.....	.....	3.50
MS-201	Power filter choke	.....	.....	2.00

PARTS LIST - MODELS 530, 531, 532, 533, 603, 612, 617, 620, 623
(Chassis 2038)

ZEPHYR RADIO CO.

MODELS 20A6, 21A6, 22A6
 MODELS 20B6, 21B6, 22B6
 20P6, 21P6, 22P6
 Schematics, Voltage



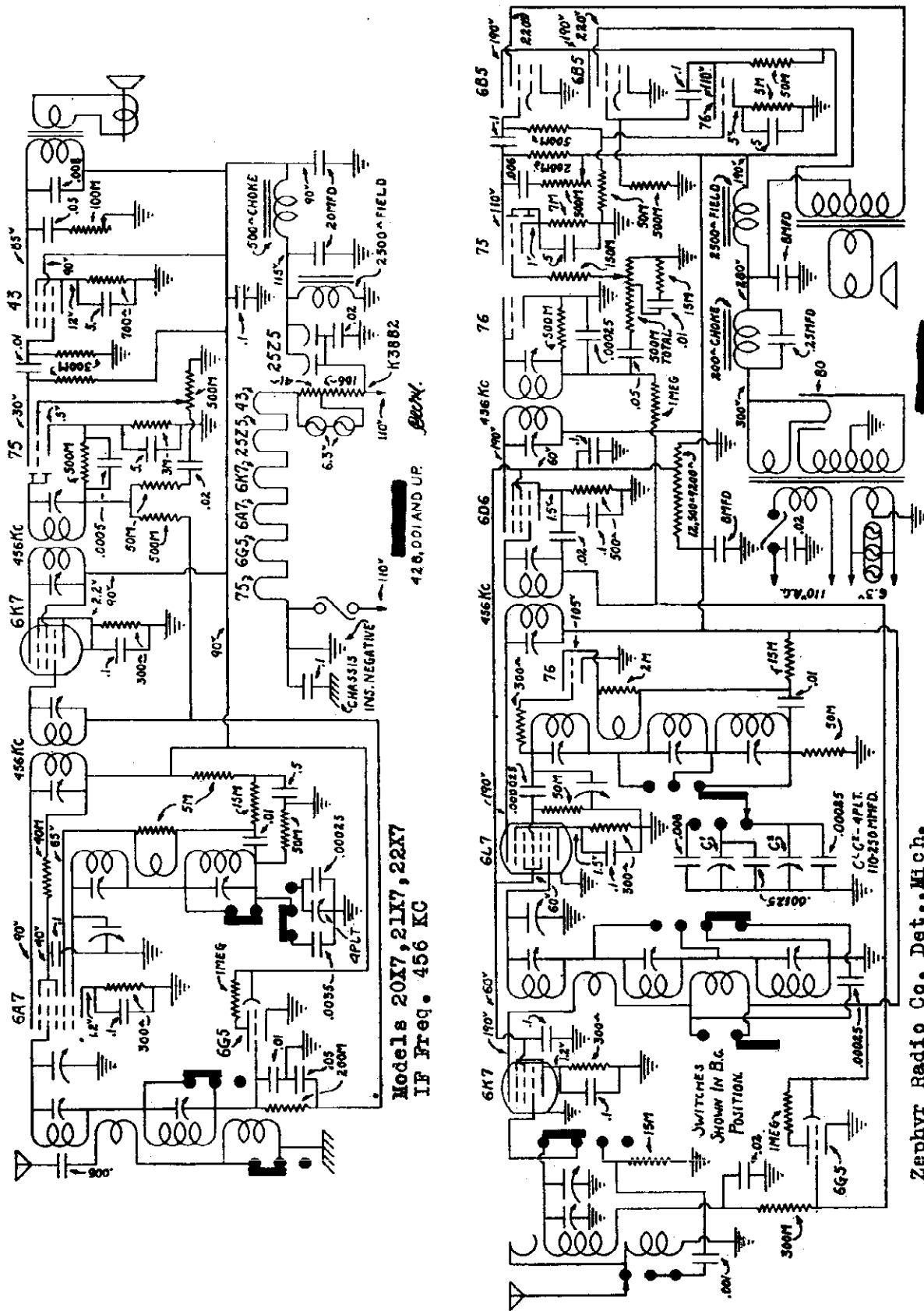
Models 20A6, 21A6, 22A6
 460,001 AND UP

500,001 AND UP. *ELUM*
 Models 20B6, 21B6, 22B6
 Models 20P6, 21P6, 22P6
 Zephyr Radio Co., Detroit, Michigan

MODELS 20X7, 21X7, 22X7
MODEL 25Y11

ZEPHYR RADIO CO.

Schematics, Voltage



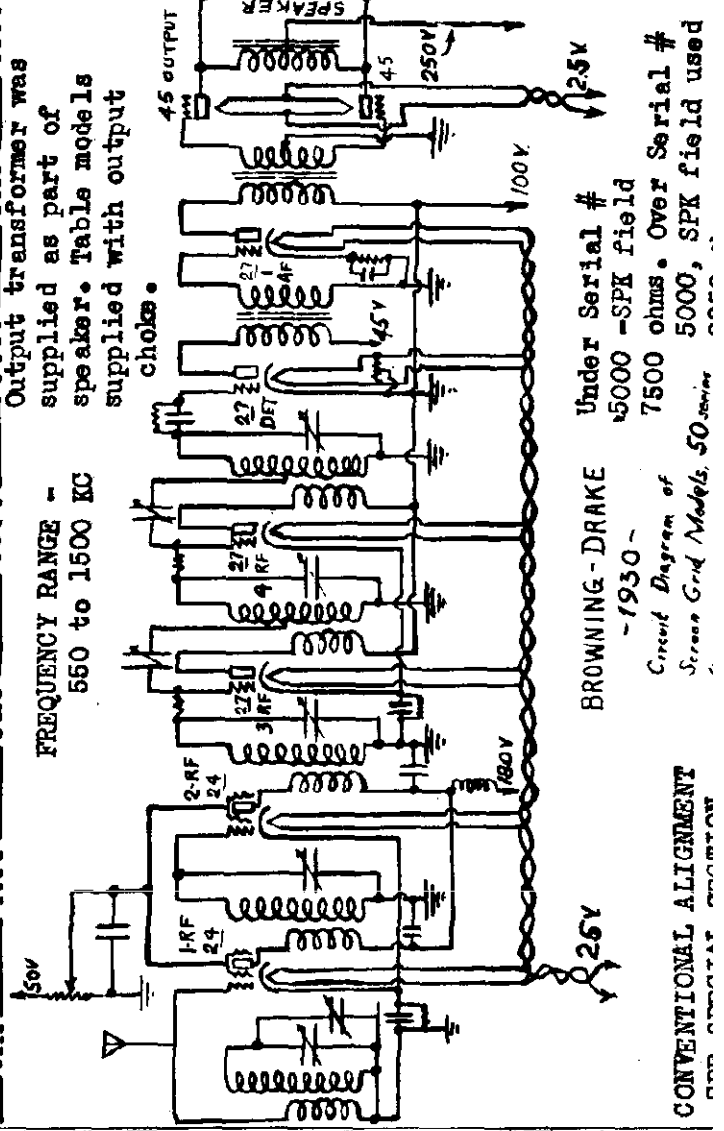
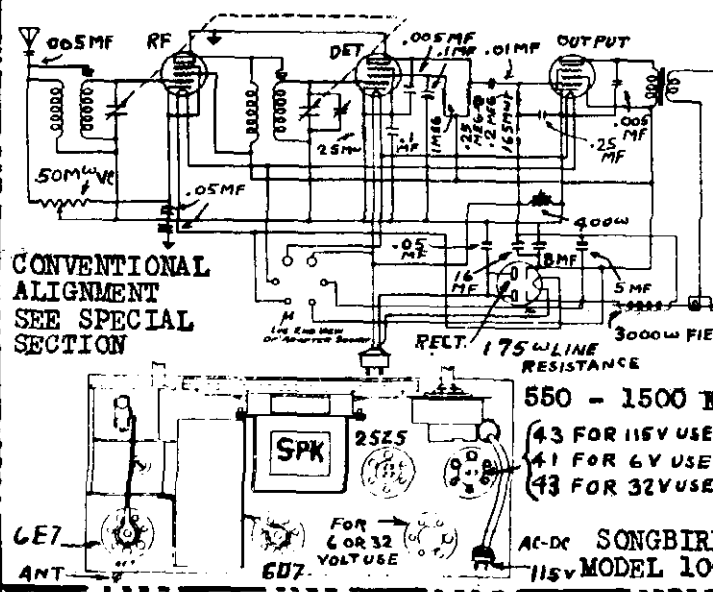
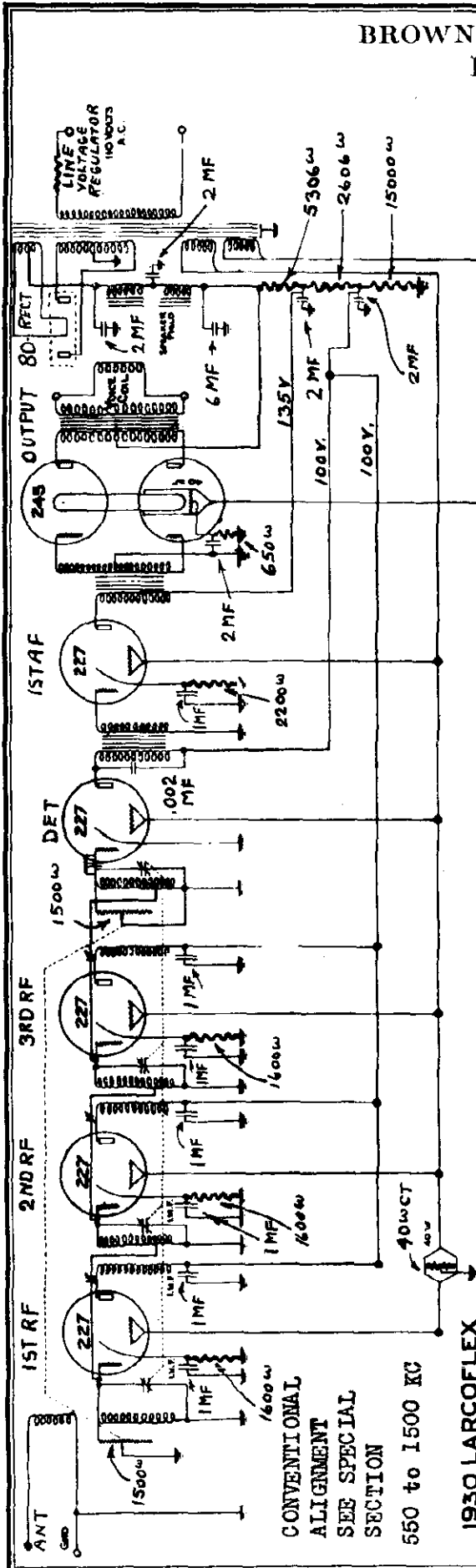
Models 20X7, 21X7, 22X7
IF Freq. 456 KC

Zephyr Radio Co. Det., Mich.
Model 25Y11
IF Frequency 456 KC

902.001 AND UP. *Beckm.*

BROWNING-DRAKE CORP.
LARCOfLEX
SONGBIRD

MODEL 50 Series
MODEL 1930 LarcOfL
MODEL 1000
Schematics, Alignme



Output transformer was supplied as part of speaker. Table models supplied with output chokes.

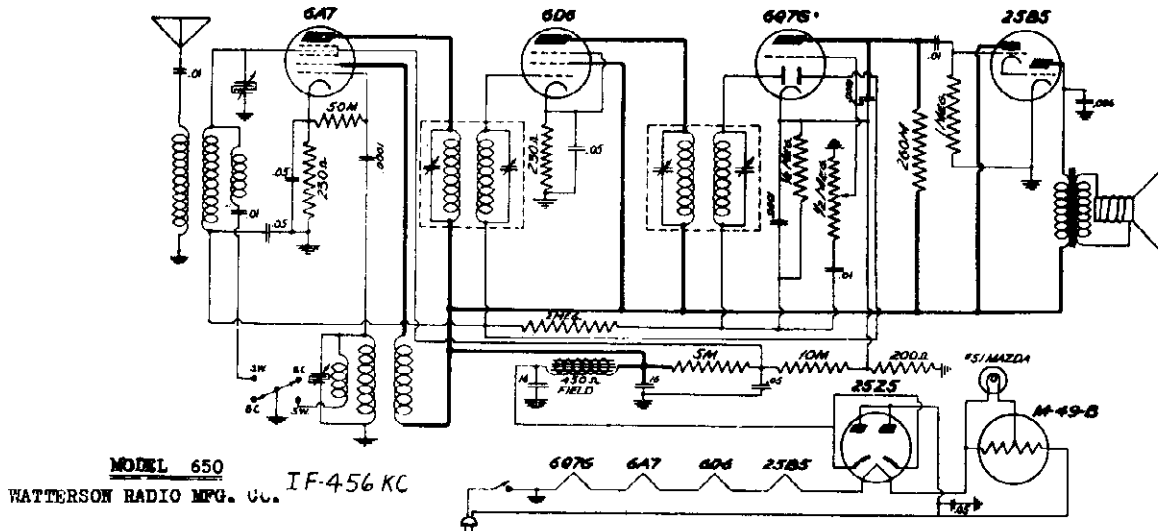
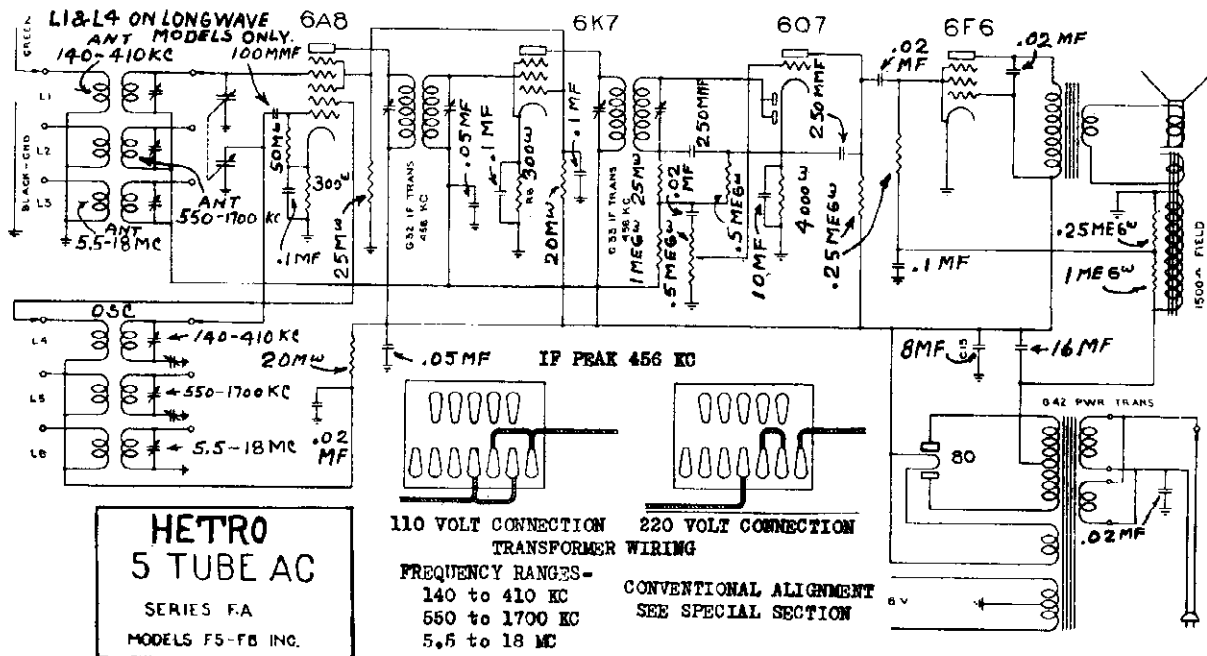
FREQUENCY RANGE - 550 to 1500 KC

BROWNING-DRAKE Under Serial #
-1930- 5000 -SPK field
Circuit Diagram of 7500 ohms. Over Serial #
Screen Grid Models, 50 ohms

CONVENTIONAL ALIGNMENT

MODELS F5, F6, F7, F8
 MODEL 650
 Schematics, Alignment

HETRO ELECTRICAL INDUSTRIES
 WATTERSON RADIO MFG. CO.



Set service oscillator to 456 KC and connect "HOT" lead to grid of 6A7. Ground the stator of rear (oscillator) section of variable condenser. Turn Volume Control for maximum output, and peak IF trimmers for maximum gain. Turn Volume Control for maximum gain. Remove variable condenser short and turn wave band switch knob towards right. Adjust service oscillator and receiver to 1500 KC, and peak variable condenser trimmers for maximum gain.

This is a dual wave superheterodyne with automatic volume control and a frequency range 1650-545 and 3700-1600 Kilocycles.

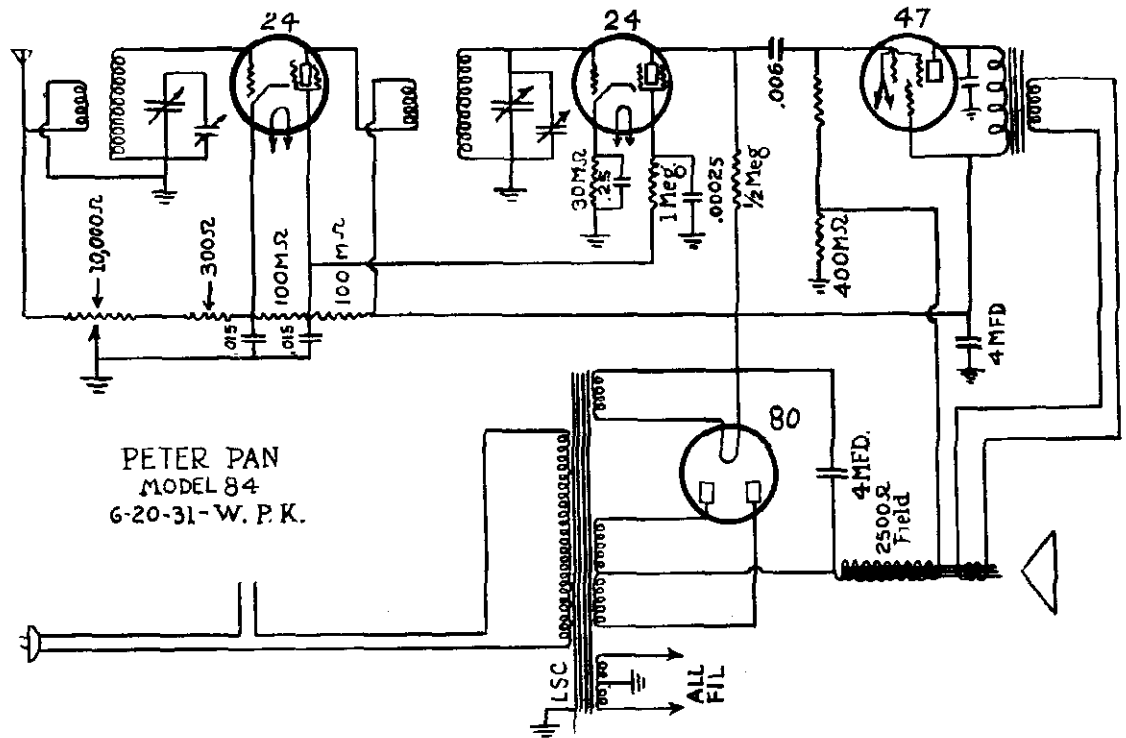
ANTENNA: No outside antenna is necessary unless used in a steel or shielded building, but it is necessary to unwind the reel of wire that is attached to the receiver chassis. For addition power the brown wire may be connected to an outside antenna.

TUBES: 6D6, 6A7, 6Q7G, 25B5, 25Z5, M49B

IMPORTANT: DO NOT GROUND THIS RECEIVER OR TOUCH GROUND WIRE TO CHASSIS IN ANY WAY.

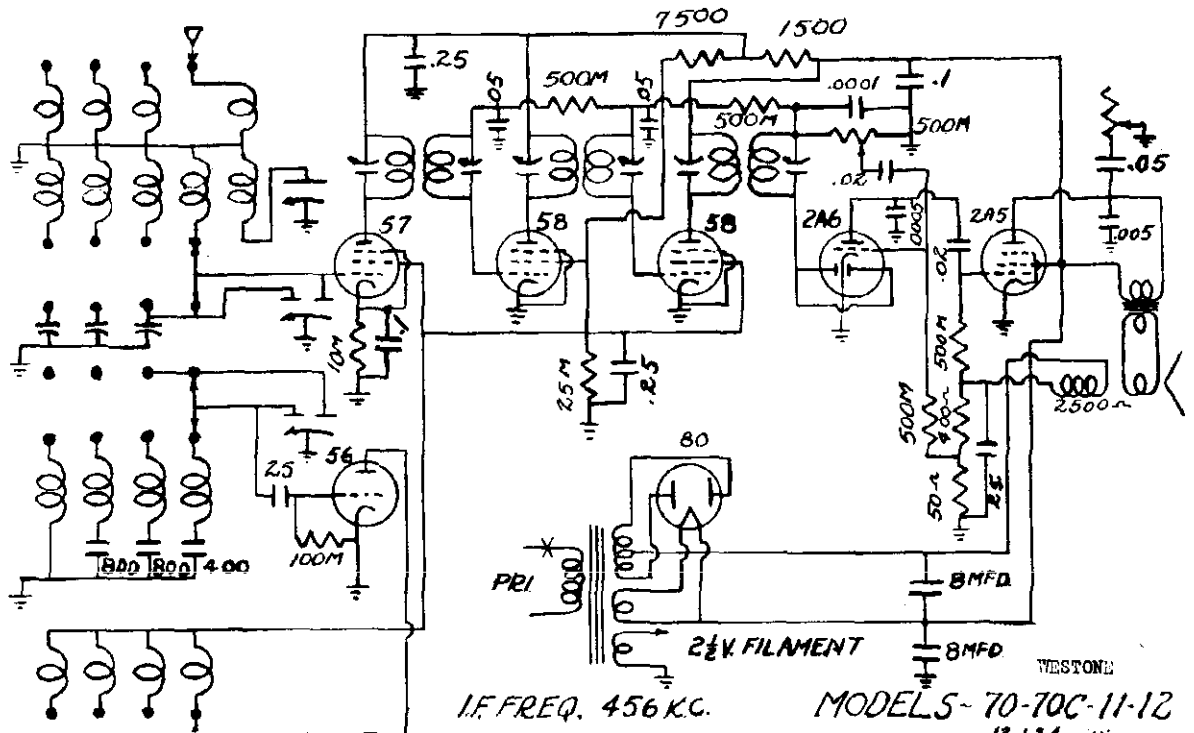
JACKSON-BELL CO., INC.
WESTONE RADIO CORP.

MODEL 84
MODELS 70, 70C, 11, 12
Schematics



PETER PAN
MODEL 84
6-20-31-W. P. K.

FREQUENCY RANGE - 550 to 1500 KC
CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION



IF FREQ. 456 KC.

MODELS-70-70C-11-12

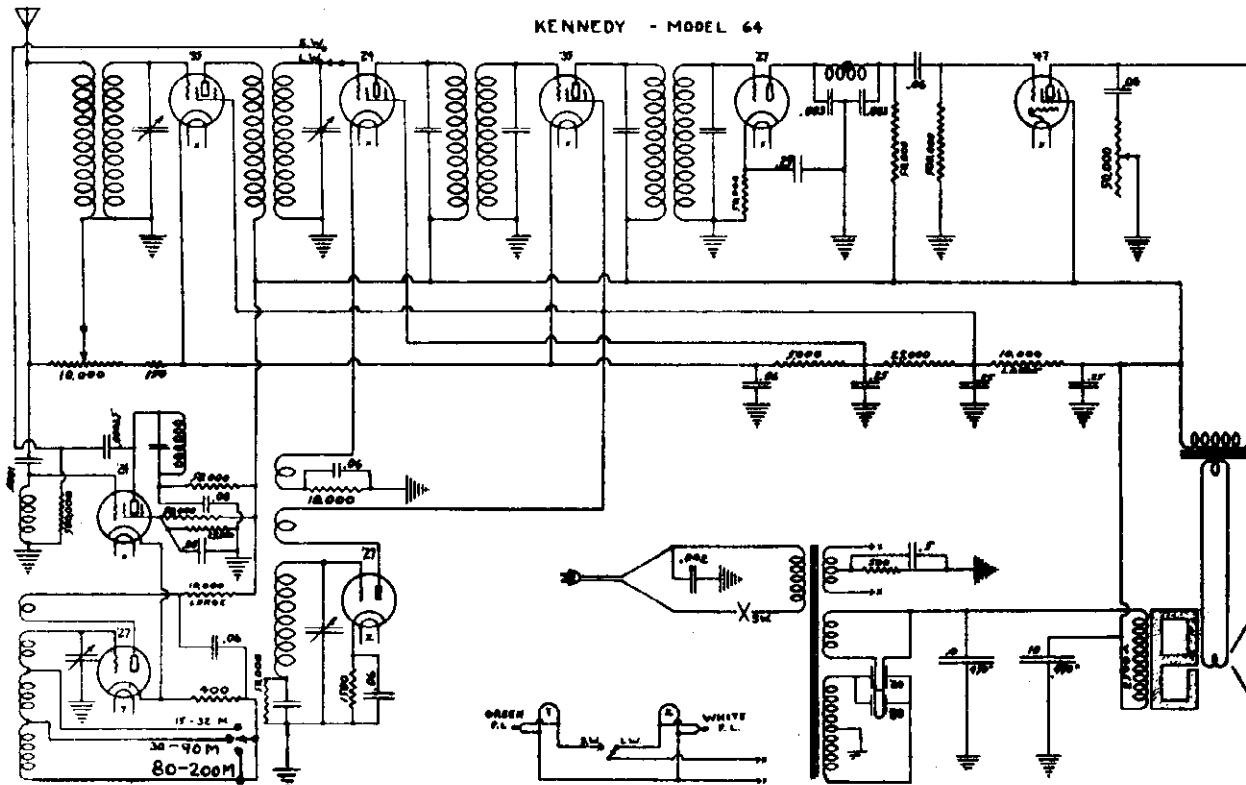
CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION

WESTONE

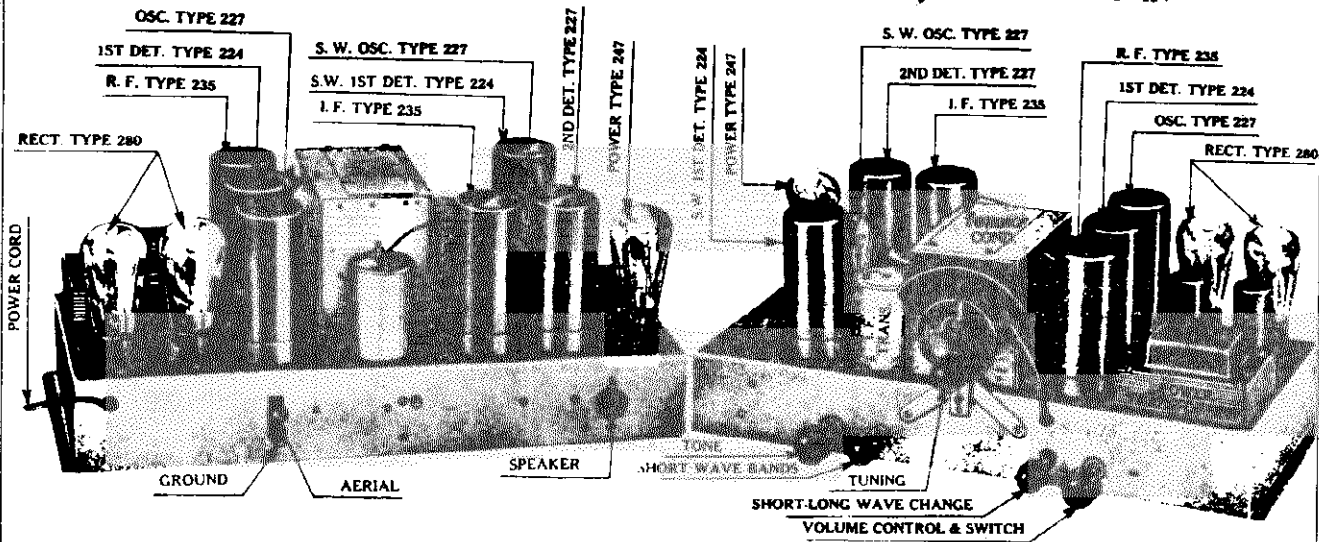
12-1-34

MODEL 64
Schematic, Socket
Alignment

COLIN B. KENNEDY



FREQUENCY RANGES -
20 to 9.5 MC, 10 to 3.3 MC, 3.75 to 1.5 MC, 1500 to 550 KC

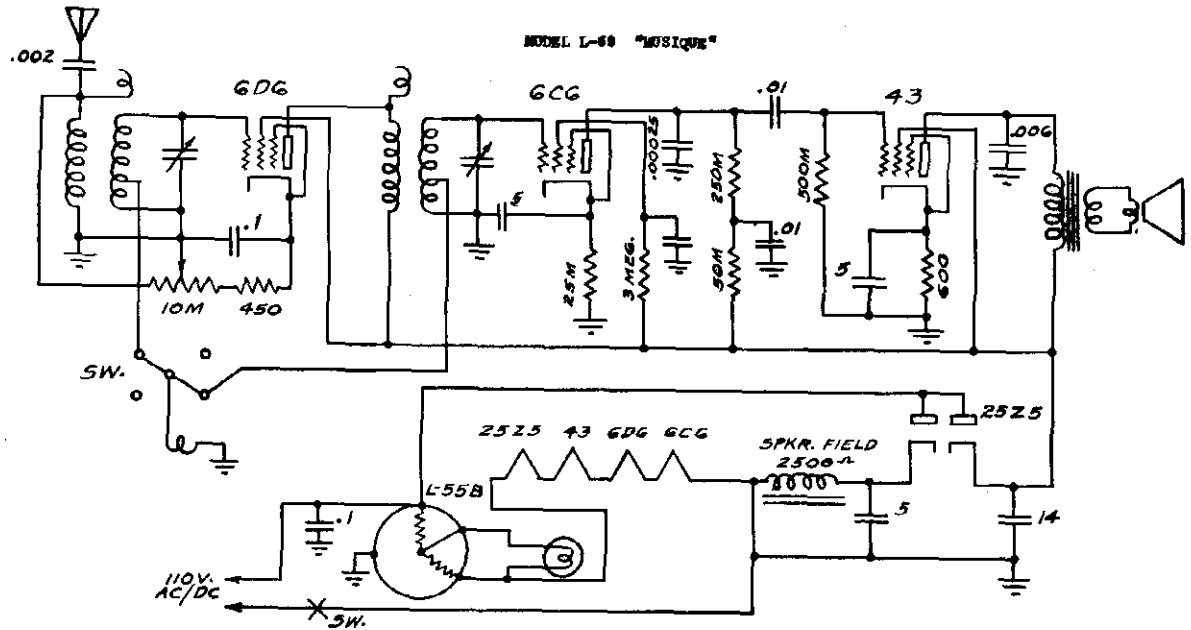


CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION

Align the I-F transformer trimmers at 175 KC. The generator and dial of the receiver are now set to 1500 KC. The Oscillator trimmer and then the R-F and Antenna trimmers are adjusted to maximum peak. Generator and dial next set to 600 KC, pad the oscillator circuit for maximum peak. Padding condenser is reached thru hole in rear center of chassis. Rock the variable condenser during the padding adjustment. The front section of the variable condenser is used for shortwave reception, and requires no adjustment other than above.

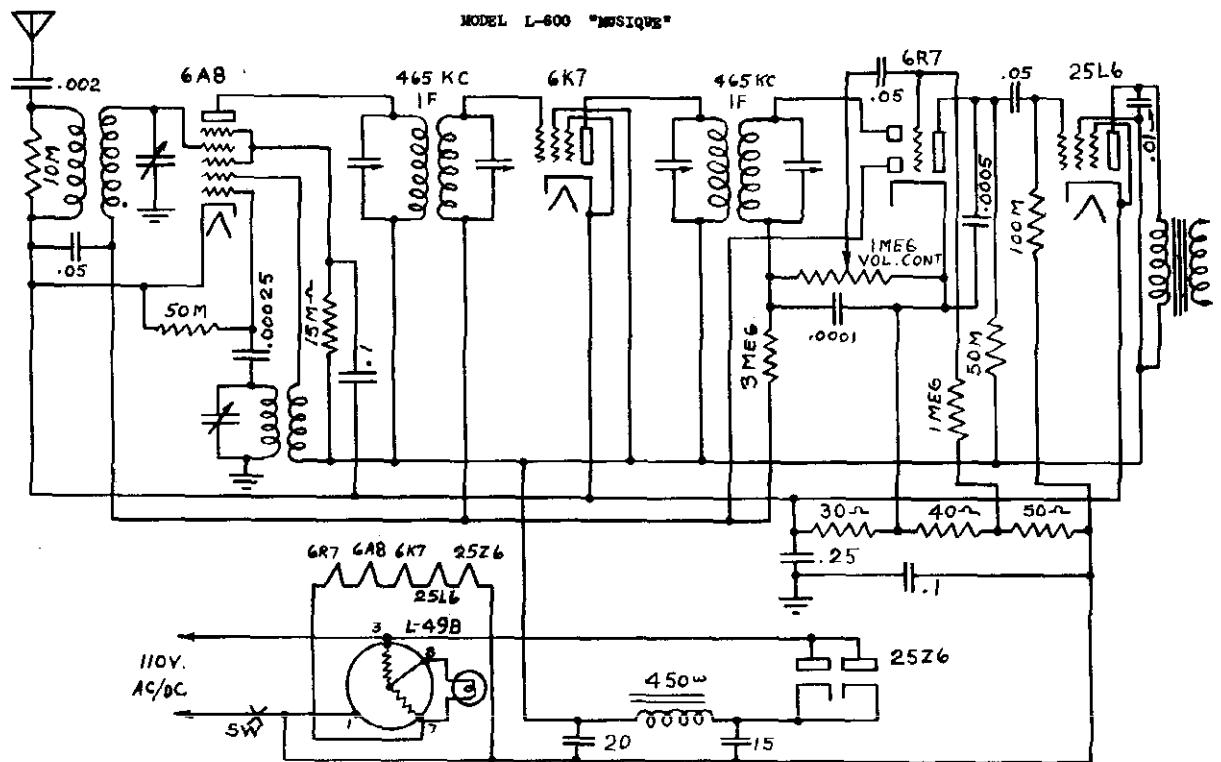
LAUREHK RADIO MFG. CO.

MODEL L-69 Musique
MODEL L-600 Musique
Schematics, Alignment



CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION
FREQUENCY RANGE - 550 to 1600 KC

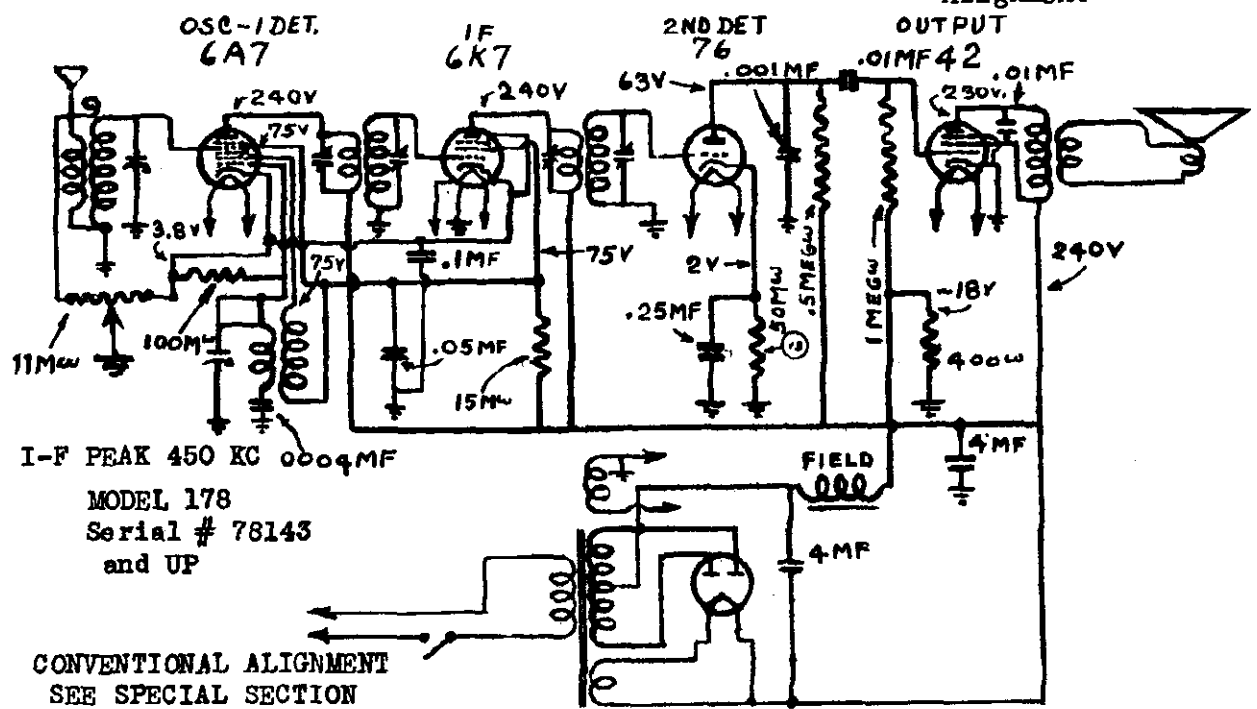
LAUREHK RADIO MFG CO



CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION
FREQUENCY RANGE - 550 to 1600 KC

LAUREHK RADIO MFG CO

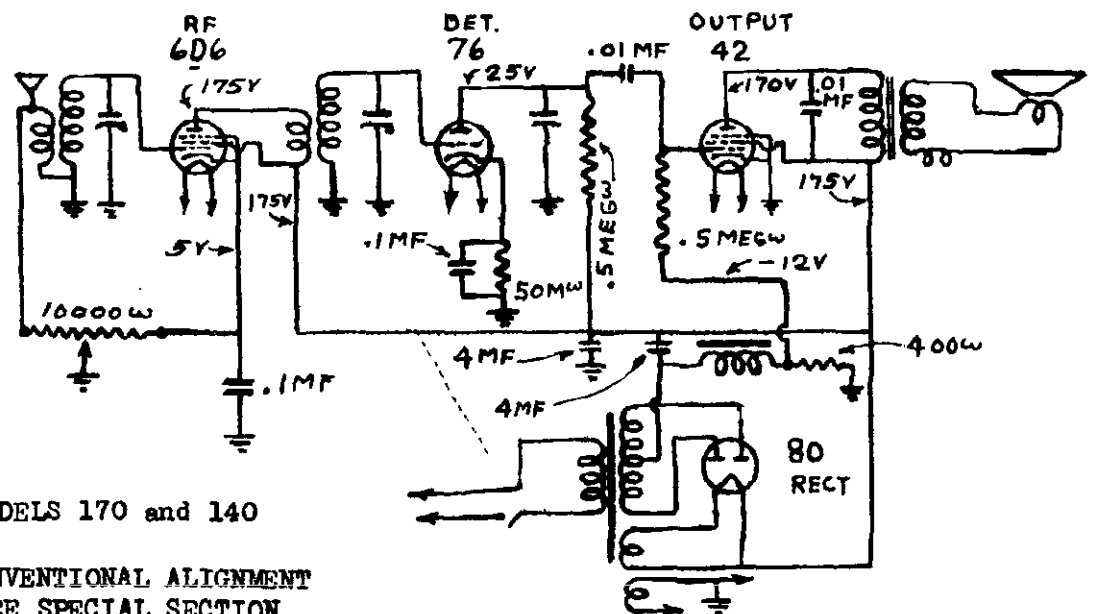
RADIO PRODUCTS SALES CO. MODEL 178 Clipper
Schematics, Voltage Alignment



I-F PEAK 450 KC 0004MF
MODEL 178
Serial # 78143
and UP

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION

Align the I-F transformer trimmers at 450 KC.
Generator set to 1400 KC, align the rear trimmer of the variable condenser to a maximum peak. (Oscillator section)
Generator at the same frequency, align the front trimmer of the variable condenser to maximum peak. (Antenna trimmer)
No padding is required for the Oscillator circuit.



MODELS 170 and 140

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION

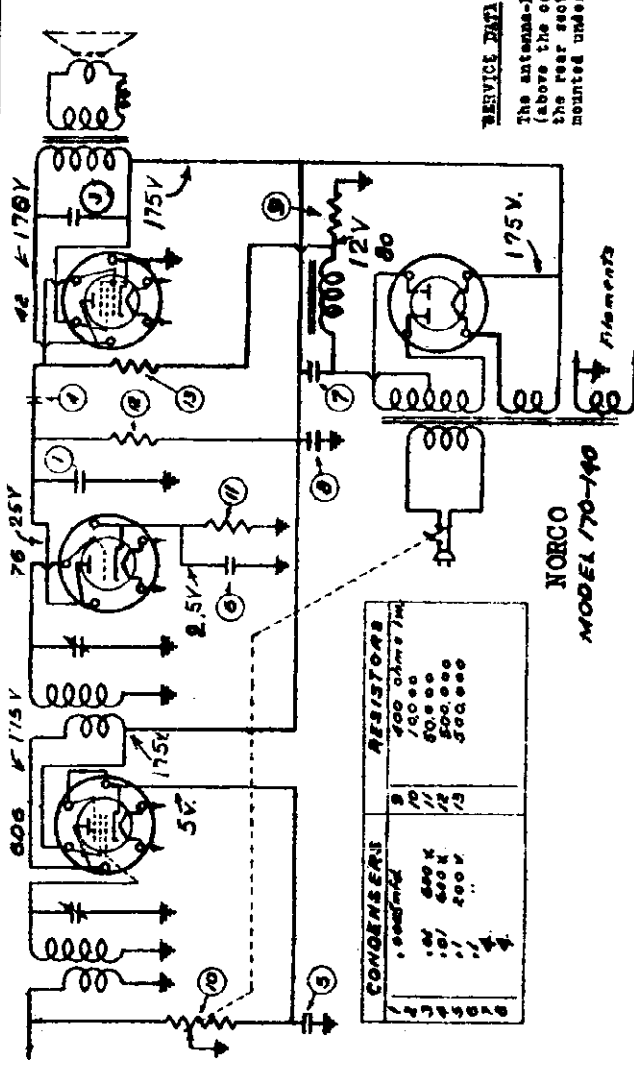
The generator is connected to the antenna of the receiver and set to 1400 KC. The trimmer of the front section of the variable condenser is then adjusted to maximum peak. The rear trimmer of the variable condenser (ANT) is next peaked to maximum.

MODELS 140,170 Norco
 MODEL 178 Norco
 Schematics, Voltage
 Alignment

REMLER COMPANY, LTD.

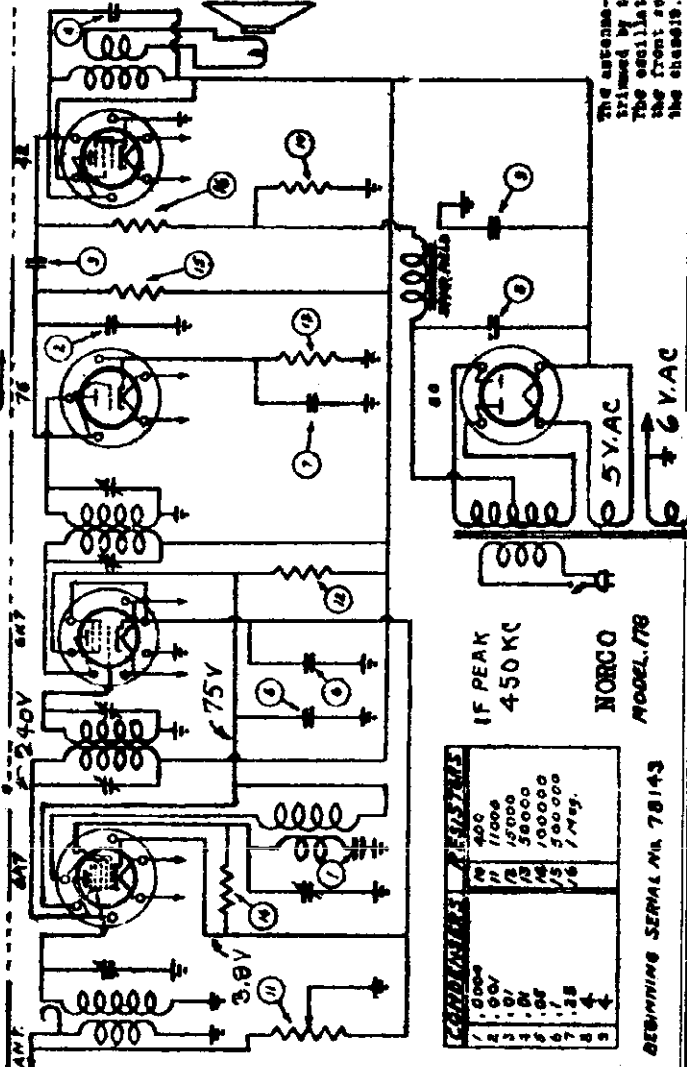
- TUBES:**
 Type 6X4 Triode grid mixer control amplifier
 " 7C Detector
 " 4Z Lower Amplifier
 " 80 Rectifier
 " 746 Pilot Lamp
- A.C. VOLTAGE:**
 Mains Filaments: 6X4, 7C, 4Z 100 Volts
 80 0-5
 746 0-5
- D.C. VOLTAGES:** Full volume no signal
- From chassis test:**
 80 Rectifier filament 100 Volts
 806 Plate 175
 806 Screen 175
 76 Cathode 2.5
 76 Plate 170
 4Z Plate 175
 4Z Screen 11
 4Z Grid bias supply

SERVICE DATA: Voltages read with 1000 ohm per volt meter.
 The antenna-R.F. coil is located in back of the variable condenser (above the condenser on Model 140) and is trimmed by the trimmer on the rear section of the variable condenser. The detector coil is mounted under the chassis and is trimmed by the front trimmer section.

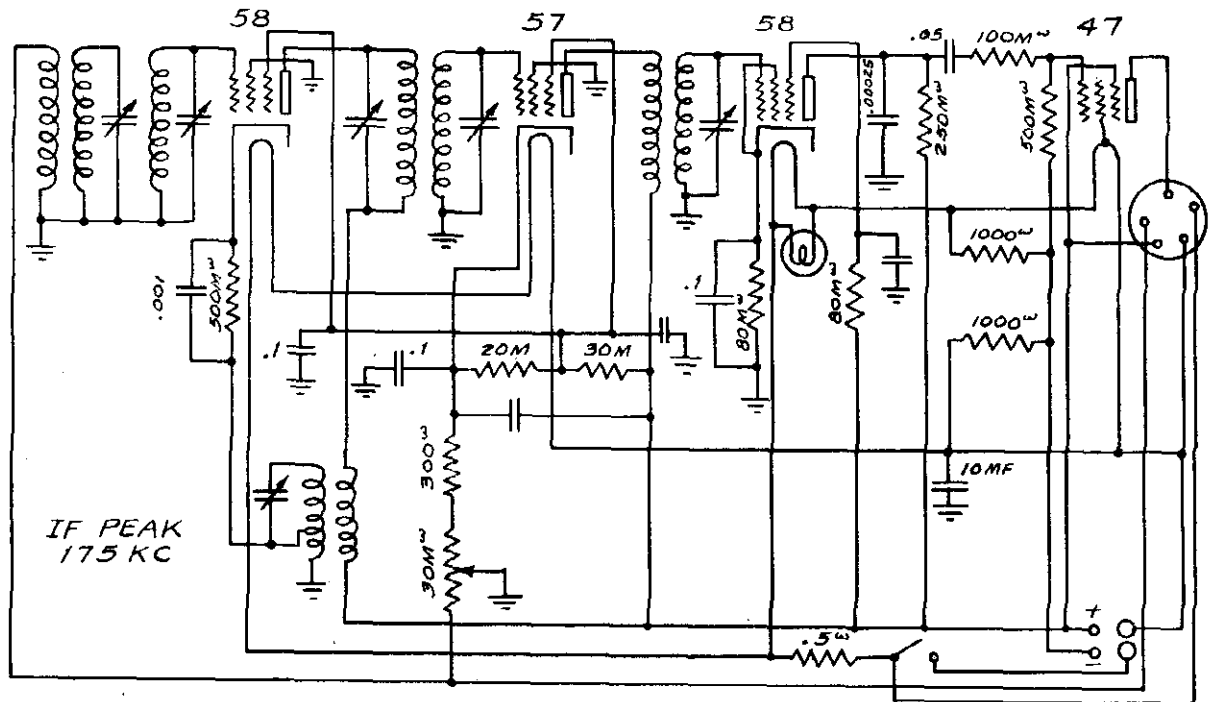


- TUBES:**
 Type 6A7 Converter
 " 6X7 I.F. Amplifier
 " 7C Detector
 " 4Z Lower Amplifier Pentode
 " 80 Rectifier
 " 746 Dial Lamp
- A.C. VOLTAGE:**
 Mains Filaments: 6A7, 6X7, 7C, 4Z 100 Volts
 80 6
 746 8
- D.C. VOLTAGE:** No signal, full volume
- From chassis test:**
 6A7 Plate 200 Volts
 6A7 Screen 75
 6A7 Cathode 2.5
 6X7 Plate 200
 6X7 Screen 75
 6X7 Cathode 2.5
 7C Plate 200
 7C Cathode 2
 4Z Plate 240
 4Z Screen 240
 4Z Grid -15

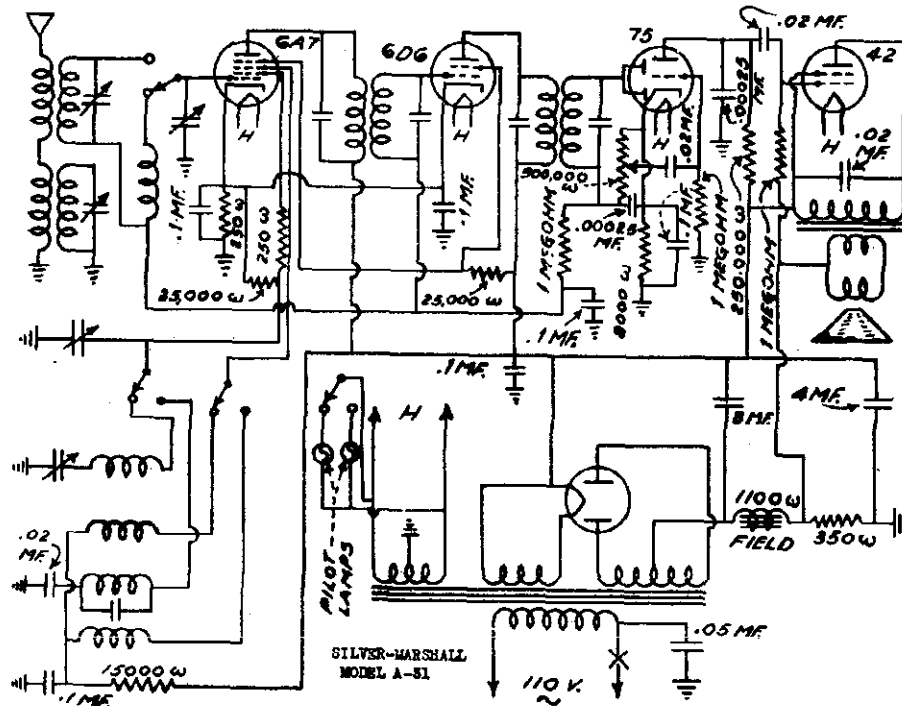
SERVICE DATA: Voltages read with 1000-ohm per volt meter.
 The antenna-R.F. coil is located over the variable condenser and is trimmed by the trimmer on the rear section of the variable condenser. The oscillator coil is mounted under the chassis and is trimmed by the front section. The I.F. transformers and trimmers are mounted under the chassis. The I.F. frequency is 450 K. C.



SILVER-MARSHALL MFG. CO. MODEL A-31
 MODEL Little Red Rooster
 Schematics



LITTLE RED ROOSTER



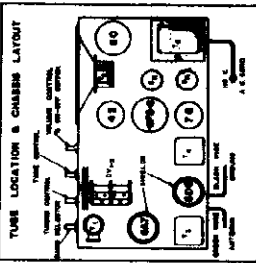
CONVENTIONAL ALIGNMENT - SEE SERIAL SECTION

MODEL A-31

MODEL AX
 MODELS HMS, HMT Teletalk
 MODEL ICS-1241
 MODEL MS
 Schematics

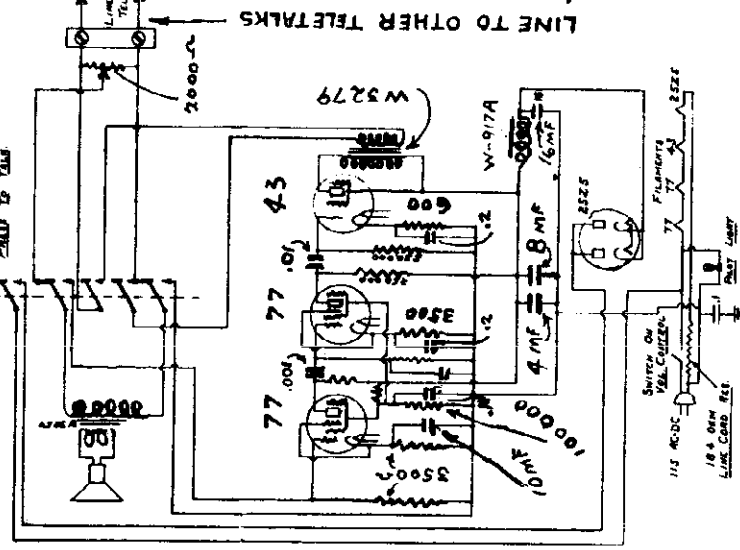
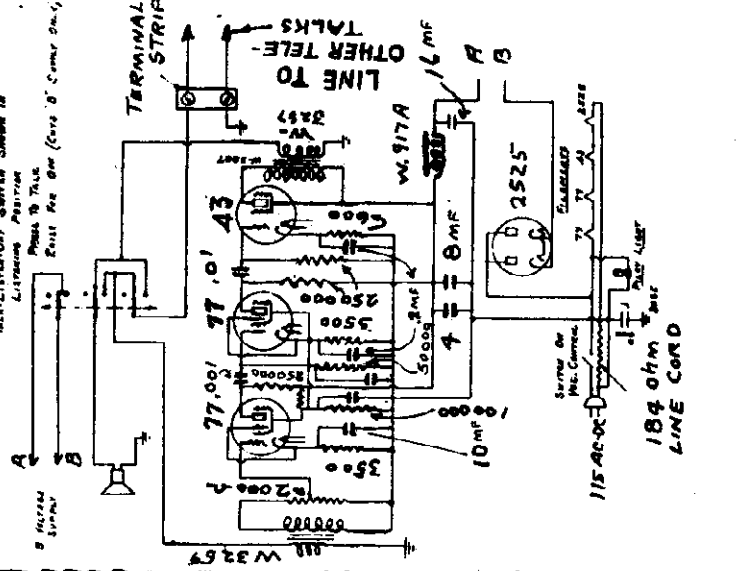
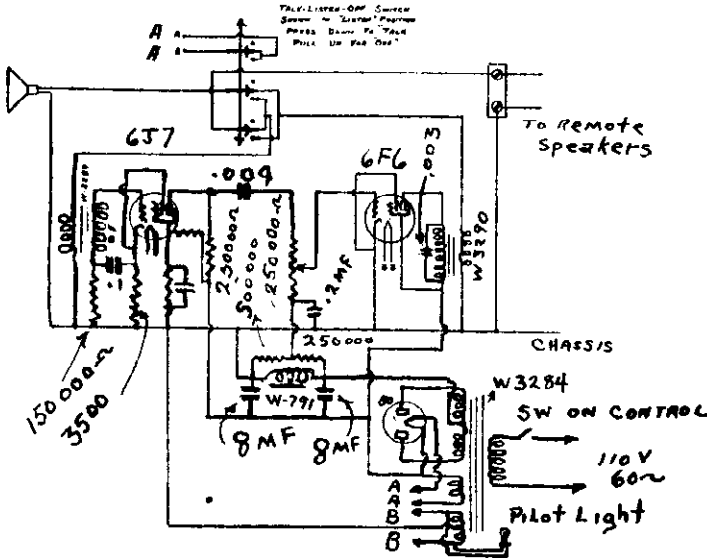
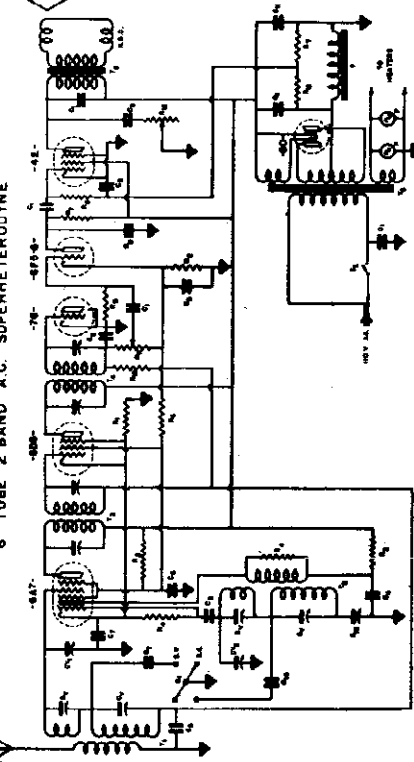
WEBSTER ELECTRIC CO.
 RADIO VISION CORP.

HMS and HMT Webster
 Electric "Teletalk" Unit



NO.	DESCRIPTION
1	6X500T
2	6X500T
3	6X500T
4	6X500T
5	6X500T
6	6X500T
7	6X500T
8	6X500T
9	6X500T
10	6X500T
11	6X500T
12	6X500T
13	6X500T
14	6X500T
15	6X500T
16	6X500T
17	6X500T
18	6X500T
19	6X500T
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22	6X500T
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29	6X500T
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88	6X500T
89	6X500T
90	6X500T
91	6X500T
92	6X500T
93	6X500T
94	6X500T
95	6X500T
96	6X500T
97	6X500T
98	6X500T
99	6X500T
100	6X500T

IF PEAK 456 KC
 CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION.
 RADIO VISION CORP.



Model "MS"

Model ICS-124-1

Emerson L117, L122, L133, L135, L141

The schematic on page 7-27 of *Rider's Volume VII* applies only to sets bearing serial numbers under 895,962. Since the publication of Volume VII we have been advised by the manufacturer that changes have been made in this chassis, Model L, and in order that you may have the latest data, we are showing herewith the schematic of the chassis that is used in those sets with serial numbers above 895,962. Also please note that a sixth model number has been added to the above list: L150.

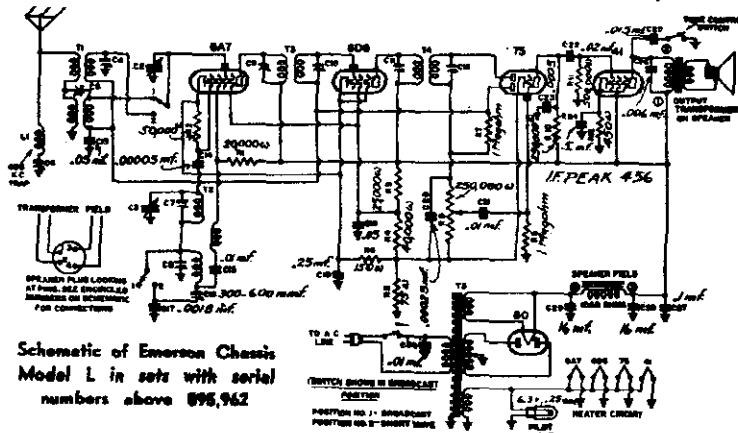
In this late chassis a 75 second detector has been substituted for the 85 tube. The voltage table, given with the rest of the servicing data on page 7-28 of *Rider's Volume VII*, is the same as that of the new chassis, except

for the readings of the 75 tube, which are:

Plate	120
Screen	—
Cathode	1.8
Filament	6.3

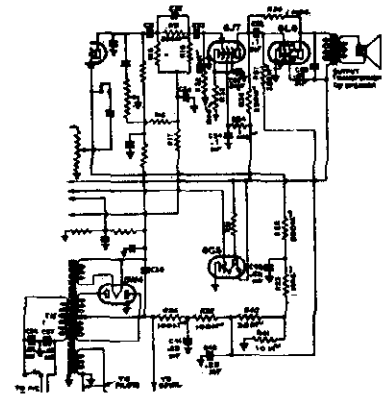
Note that in Model L150 the electrolytic condensers, C28 and C29, have values of 12 mf. and 8 mf. respectively, and have a voltage rating of 450. Also note that in sets having serial numbers below 961,900 the two primaries of the antenna coil, T1, were in parallel from antenna to ground, and a 0.00005-mf. mica condenser was in series with the antenna lead and the short-wave primary. Also, C17 was an 0.00135-mf. mica condenser.

The General Notes and Adjustments on Emerson page 7-28 apply to this new chassis, as well as the early.



Emerson Chassis C and CLW

The 6C5 and the 6F6 tubes of these chassis have been replaced by a 6J7 and 6L6 respectively. There have also been other changes in the audio



Changes in Emerson Chassis C and CLW

amplifier, which can be seen by comparing the partial schematic shown herewith and the original which will be found on page 7-36 of *Rider's Volume VII*. The values of parts on the accompanying schematic are the new values. These changes apply to sets carrying serial numbers above 880,050 of Chassis C and above 848,410 for Chassis CLW.

Also please make a note that Chassis CLW is the same as Chassis C, except that a long-wave coil has been substituted for that one covering the police range.

The voltage data that appears on page 7-35 applies to sets having the above changes incorporated with the exception of the readings for the 6J7 tube; these are: Plate—115; Screen—45, and Cathode—1.2. This means that the readings for the 6L6 are the same as those for the 6F6.

Emerson 35

The voltage readings for Chassis T6, used with the model 35, will be found below. The schematic of this receiver will be found on page 4-3 of *Rider's Volume IV*.

Tube	Plate	Screen	Cathode	Suppressor
78 1st R.F.	98	98	1-3.5	0
78 Det-Osc.	98	98	13	13
78 I.F.	98	98	1-3.5	0
75 2nd Det. AVC	50	..	1.0	..
43 O.P.	90	98	0	..

The bias for the 43 tube is measured across the filter choke and should be between 15 and 18 volts. The voltage across the speaker field should be approximately 115.

Emerson H-5

The schematic of this chassis appears on page 3-6 of *Rider's Volume III* and page 884 of the *Rider-Combination Manual*. The voltage data and socket layout appears on page 4-5 of *Rider's Volume IV*. Also on this latter page is the schematic diagram for the chassis No. H-5-L, which receiver has the same voltage and socket layout with the following exceptions:

A 6A7 tube is used as a 1st detector-oscillator and the "screen" voltage reading in the table should be 50 instead of 98. This tube in the socket layout is the top one on the right-hand side nearest the gang condenser and should be so marked on the above-mentioned page, bearing in mind, of course, that this layout also applies to the H-5 chassis, which uses a 78 tube as a 1st detector-oscillator.

Also please note that the model numbers of this chassis, H-5, are 30, 250, and 300.

Emerson 117

We are advised by the manufacturer that receivers having serial numbers above 761,440 of this model (Chassis C-5) have the following changes incorporated in the circuit:

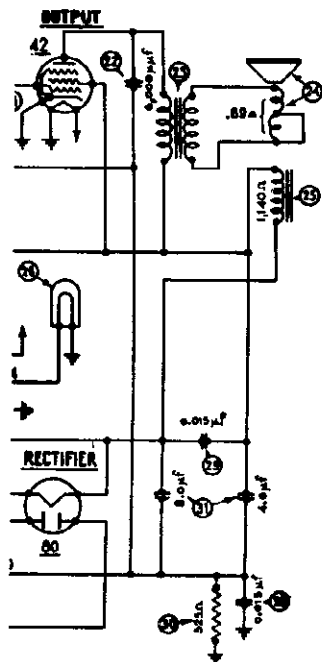
The compensator on the oscillator coil trimmer strip, which formerly went from the grid condenser to ground, now goes directly across the broadcast oscillator secondary. This change facilitates alignment.

The compensator on the antenna coil trimmer strip, which formerly went from the grid end of the broadcast antenna secondary to ground, now goes from the grid end of the broadcast antenna secondary directly to the antenna lead. This change introduces capacity coupling and increases the sensitivity at the high-frequency end of the broadcast band.

The schematic of this receiver will be found on page 7-21 of *Rider's Volume VII*.

Philco 59

The schematic, furnished by the manufacturer and shown on page 5-30 of *Rider's Volume V*, has an error in the field coil circuit, Part No. 25. Compare



Partial schematic of Philco 59, showing correct wiring of the field coil, Part No. 25.

the partial schematic shown here with the one mentioned above and you will see the difference in the connections to the field coil.

Philco 37-33

Starting with Run No. 3, the filament wiring of the 1D5G i-f. tube was reversed, thus improving operation of the set. In Fig. 1 on page 7-16 of *Rider's Volume VII*, the left-hand filament terminal of this tube is marked "2 volts." This terminal is now grounded to the chassis.

Referring to Fig. 3 on the same page, resistor No. 8 has been removed from the r-f. terminal panel and connected directly from the oscillator grid contact on the 1D7G socket to ground. This change improved the sensitivity in the center of the broadcast band.

Philco 630

The schematic of this receiver shown on page 6-31 of *Rider's Volume VI* indicates a 1d-coil resistance of 1140 ohms. This is incorrect and should be 640 ohms. Please make this change in your Volume VI.

Philco 65

The schematic of this receiver was published on the following pages of *Rider's Volume I*: page 1-16 of the revised edition and page #459 of the early edition; and on page 1638 of the *Rider-Combination Manual*. At the time of publication the values of the parts were unobtainable and these are now given in the list below. The first column is the identifying number used on the schematic; the second column is the part number; and the third column is the value.

Schematic Number	Part Number	Value
1	3524	10,000 ohms
5	3292A	.1 mf. — 250 ohms
6	3584A	.05 mf. — 250 ohms
13	3583	.5 mf.
14	3525	32,000 ohms
21	3422	200 "
22	3526	5,000 "
23	3518	4,000 "
24	3512	2700 ohms (700,2000)
25	3528	2,000 ohms
26	3628	6 "
27	3292B	.05 mf. 00 250 ohms
29	2850	3200 "

Philco 645

The schematic of this set will be found on page 7-109 of *Rider's Volume VII*. Several changes have been made, as follows:

Starting with Run No. 3, the 51,000-ohm resistor, No. 16, has been removed. A 32,000-ohm resistor, ½ watt, Part No. 33-332334, has been connected from the oscillator grid of the 6A7 to the suppressor grid of the 78 r-f. tube. The 0.05-mf. condenser, No. 61, has been removed. The 25,000-ohm resistor, No. 60, has been replaced with one having a value of 240,000 ohms, ¼ watt, Part No. 33-424143.

A 0.06-mf. condenser, Part No. 30-4114, has been connected from the —C end of the B.C. resistor, No. 64, to the junction of the 1-megohm and 490,000-ohm resistors, Nos. 66 and 67.

The filament voltage of the 80 rectifier is shown as 6.3 volts in Fig. 3 on page 7-108 of *Rider's Volume VII*. This should be 5.0 volts.

Beginning with Run No. 4, the green and yellow leads of the a-f input transformer, No. 52, were reversed to reduce hum.

Philco 651

The leads of the i-f. transformer should be separated as widely as possible from each other, in order to reduce the possibilities of i-f. oscillation.

This means, too, that the leads from one of these transformers should be as far as possible from the leads of the other.

The -B lead from the suppressor plate terminal of the 78 r-f. tube to the wiring panel mounted on the 0.05-mf. condenser, No. 72, should be run close to the baseboard and away from the wave trap coil. This should eliminate motor-boating at 540 kc.

For schematic, see page 7-111, *Rider's Volume VII*.

Philco 655

In the paragraph titled "Police" of the alignment instructions on page 7-116 of *Rider's Volume VII*, it reads that the detector trimmer No. 11 should be adjusted for maximum output. This should be trimmer No. 12 to conform with the layout of Fig. 4 at the top of the page.

In Fig. 1, the designations of the r-f. transformers on page 7-114 should be changed as follows: 15-A, oscillator, to 16; 9, antenna, to 3; and 14, detector, to 10. To correct the lead designations of the oscillator transformer, No. 16 on the schematic, change No. 3 to 7; 7 to 5; 5 to 4; and 4 to 3.

Another error in the manufacturer's data was in the tube layout shown on the top of page 7-115 of *Rider's Volume VII*. The second detector is a 75, not an 85. The designation on the schematic on this same page is correct. Please make these changes in your Volume VII.

Beginning with Run No. 4, the 51,000-ohm resistor, No. 14, was removed and a 32,000-ohm resistor, Part No. 33-332334, ½ watt, was connected from the oscillator grid of the 6A7 to the suppressor of the 78 r-f. tube.

Philco I-F. Peaks

In certain localities it has been found advisable to align certain two- and three-gang Philco sets at some other i-f. peak than the one for which they were designed, i.e., 470 kc. This change has been found necessary because of some interference that is peculiar to these localities: Portland, Maine; Miami, Fla.; New Haven, Conn.; San Diego, Cal.; about one third of northern Long Island; Newark and southern New Jersey.

Therefore, if you are operating in any of these places and are bothered by code interference, align either of the two type sets mentioned above at 456 kc., 465 kc., or 480 kc. The i-f. peaks just mentioned are to be used depending on the location and type of interference.

Philco 37-600

To prevent reduction in sensitivity at the low-frequency end of the band, the 200-ohm resistor, No. 7, has been changed to 300 ohms, starting with Run No. 3. This change has been noted in the Parts List on page 7-37 of *Rider's Volume VII*, but it still shows as 200 ohms on the schematic, which will be found on the same page.

The lead connecting the suppressor grid to the cathode of the 6J7G i-f tube has been changed. It now runs from the suppressor grid to the junction of the sensitivity control, No. 23, and the secondary of the i-f transformer, No. 19.

Philco 37-116

Up to Run No. 4, a condenser was connected between the heater contact and ground of the 6K7G r-f tube. This condenser was removed starting with Run No. 4 to prevent hum modulation on Range 5. It is not shown on the schematic appearing on page 7-31, 7-32 of *Rider's Volume VII*.

Electrolytic condensers, Nos. 126 and 127, 8 mf., have been changed to 4 mf. Part No. 30-2174, starting with Run No. 5.

Starting with Run No. 6, the two 25,000-ohm resistors, Nos. 110 and 111, have been removed from the audio unit and relocated in the power unit near the 6B4G sockets.

To obtain the proper selectivity curve in the expanded position of the i-f expanding unit and to avoid regeneration, dress the plate lead (white) of the 6L7G tube as follows: The plate lead should lay across the 6L7G socket, then pass into the oscillator section close to the base; from here the wire must pass through the second aperture from the front of the r-f unit into the i-f unit.

To prevent clicks when tuning the bass compensation control on a very strong carrier, a 2-megohm resistor, Part No. 33-520339, was connected from the lug on which the 70,000-ohm resistor, No. 103, and the .008-mf. condenser, No. 104, are connected in the audio unit, to ground.

It will be noticed in the schematic on page 7-31, 7-32 of *Rider's Volume VII*, that two parts carry the same number: No. 135. One is the pilot light and this is the correct number for this part; the second is a switch, located on the schematic just below and to the left of the 6J5G AVC tube. The number of this switch should be 137. This number does not appear in

the list of parts on page 7-36, but the switch is used on the automatic dial mechanism and appears in the parts list under "Code 122" as "Plunger Stop and Switch Assembly, Part No. 45-2330."

Another switch located between Nos. 100 and 103 on the schematic with the wording "used in code 122 only," is used to short the audio system when using the automatic dial. This switch is located on the vernier drive assembly. The part numbers of the removable sections which contain the riveted contacts, are 45-2350 and 28-4110.

The magnetic tuning transformer has been changed. Its old part number was 32-2217 and its new number is 32-2361.

Philco 37-38

Starting with Run No. 4, the filament wiring of the 1D5G i-f tube was reversed to improve the operation of the set. In Fig. 1 on page 7-18 of *Rider's Volume VII*, the "F+" of the 1D5G socket becomes "F—" and is grounded to the lug near the socket.

The 32,000-ohm resistor, No. 8 (see schematic on page 7-17 of *Rider's Volume VII*) has been replaced with one having a value of 51,000 ohms, Part No. 33-351339. The resistor is removed from the range switch assembly and is connected directly to the oscillator grid of the 1C7G tube and ground. This change was made to improve the sensitivity in the center of the broadcast band.

Philco 37-60

Run No. 2. The 1000-mf. condenser, No. 11, was changed to 250 mmf., Part No. 30-1032, and resistor No. 12 was changed from Part No. 33-351339 to No. 33-332339. This change was made to prevent relaxation oscillation.

Run No. 5. Refer to the Base View of the chassis on page 7-22 of *Rider's Volume VII*. The condenser No. 46 has been moved from the location shown—near the front—to the rear of the power unit. The tubular condenser No. 40 has been replaced with Part No. 8318-SU Bakelite condenser and mounted in the location from which No. 46 was removed.

Run No. 6. The suppressor grid of the 6K7G, i-f tube, is removed from ground and connected to the -2.5 negative tap of the bias resistor, No. 43. See schematic on page 7-19 of *Rider's Volume VII*.

Beginning with Run No. 9, the i-f transformers were changed. The first i-f transformer No. 15 now is Part No. 32-2274 and the second, No. 27, is Part No. 32-2276. The first i-f transformer has a stabilizing winding which is placed in series with the suppressor grid of the 6K7G i-f tube. The short or yellow lead is connected to the ground lug and the long lead to the suppressor grid.

Philco 37-61

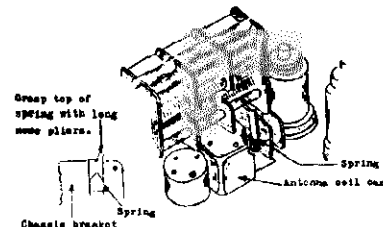
The changes applying to Philco Model 37-60 also apply to Model 37-61 with the exception of the first paragraph. The schematic diagram appears on page 7-23 in *Rider's Volume VII*.

Philco 90, 90A

Please make a note on page 84 of *Aligning Philco Receivers* that the i-f. peak of both chassis used in these models (with two 45s and one 47) is 175 kc. Note 1 on this page should read "175 kc. for both chassis." The correct i-f. peak is indicated on the schematics in *Rider's Manuals*.

Wells-Gardner 6K Series

If noise (not motor or vibrator) is encountered in this model, it may be due to the fact that the antenna transformer shield can is not grounding satisfactorily. The noise brought about by this condition is a popping or scratching, and will be heard only when the chassis is bumped or shaken.



By inserting a spring as shown above in the Wells-Gardner 6K series chassis, a good ground is assured for the antenna transformer shield.

This condition can easily be remedied without removing the chassis from the case by inserting a phosphor-bronze spring between the antenna coil can and the chassis bracket. This spring is inserted with a pair of long-nose pliers and the position after insertion is shown in the illustration.

For other data, see pages 7-20 and 7-21 in *Rider's Volume VII*.

RCA Automatic Record Changer

Data and notes on the automatic record changer will be found incorporated in the service data of model RE-73. These notes will be found on the following pages in *Rider's Volume II: revised edition, pages 2-79 to 2-83 inclusive; early edition, pages 504-Q to 504-U inclusive; and in the Rider Combination Manual, pages 1897 to 1901 inclusive.*

Please make a note in your Index where these data may be found.

RCA 690

We have been advised by the manufacturer that no service data on this model were issued, but that it contained a Radiola Model 82 chassis and a Capehart Model 1012-C automatic record changer.

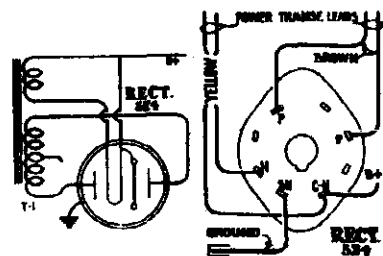
The schematic diagram of the 82 chassis will be found on page 1-45 of the revised *Volume I*; page *502 of the early edition; and on page 1929 of the *Rider-Combination Manual*. Other data will be found on the following pages: 2-92, 2-93, and 2-94 of the revised *Volume II*; 502-C, 502-D, and front of the early edition; and on pages 1930, 1931, and 1932 of the *Rider-Combination Manual*.

RCA T11-8

A 5Z4 metal rectifier has been substituted for the 5Z3 in this chassis, the schematic for which will be found on page 7-144 of *Rider's Volume VII*.

RCA T6-1 and C6-2

A metal rectifier tube, 5Z4, has been substituted in the chassis used in these models in place of the type 80 shown in the schematic on page 6-83 of *Rider's Volume VI*. The partial schematic and wiring diagrams, show how the 5Z4 is connected.



These diagrams show the connections for the 5Z4 rectifier in the RCA models T6-1 and C6-2.

The resistor, R3, in the cathode circuit of the 6A8 tube has been changed from 56,000 ohms to 100,000, the new Part No. 3118. The resistor, R4, in the screen grid circuit of the same tube, has been changed from 12,000 ohms to 33,000, the new Part No. 8072. New power transformers have also been substituted, depending on the voltage and frequency of the line; they are: 105-125 volts, 50-60 cycles, Part No. 11848; same voltage for 25-50 cycles, Part No. 11849; for 100 up to 250 volts, 40-60 cycles, Part No. 11850. The following parts are not used in the revised chassis: the .1-mf. condenser, C23; and the resistors, R8, 1200 ohms, and R9, 220,000 ohms.

RCA D11-2

Several changes have been incorporated in this model, the schematic of which may be found on page 7-137 of *Rider's Volume VII*.

A 5Z4 metal rectifier tube has been substituted for the 5Z3 formerly used. The phonograph motor has been changed and is now of the capacitor type. The motor is wired in this instrument as follows: One power supply lead connects to one terminal of switch S14, the main toggle switch. The other terminal of S14 connects to one terminal of the brake switch S15. The other terminal of S15 connects to the yellow motor lead. The green motor lead connects to one lead of the motor capacitor, Part No. 12051. The red motor lead connects to the other capacitor lead and also to the remaining power-supply lead. A new suspension spring is also used, Part No. 12050.

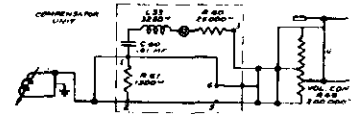
The 0.01-mf. condenser, C24, is no longer used. The following parts are added to the revised model D11-2: the motor, 105-125 volts, for 60 and 50 cycles, Part Nos. 9650 and 9651 respectively for the motor formerly employed; filter pack for phonograph that is used in some models, Part No. 12037; and a new reproducer, complete, Part No. 6952.

RCA R-14

For servicing information on this model, please refer to the data covering Radiola Model 42, which will be found on page 3-19 of *Rider's Volume III* and on page 1866 in the *Rider-Combination Manual*.

RCA 342

This combination radio-phonograph set is similar to the Model 341 with the exception of the pick-up coupling transformer. Instead of this unit, the



Change in the pick-up circuit of the RCA 342. Compare with Model 341.

apparatus shown in the schematic herewith, has been substituted in the 342. The schematic for Model 341 will be found on page 5-157 in *Rider's Volume V*.

RCA AR-4229

Certain changes were made in this police auto radio receiver, necessitating new components. Below will be found corrections for the parts list, which was run on page 5-206 in *Rider's Volume V*.

New Stock No.	Old Stock No.	Description
4049	3745	C-12, 1310 mmf.*
7701	7601	3-gang variable condenser
7702	6540	R-f coil assembly
7703	6731	Antenna coil
7704	6471	Oscillator coil
6570	6784	Dial scale
7698	G-7850	Control box cover
7705	G-7851	Control box complete
6161	G-5021	Station selector knob

*Was 745 mmf.

RCA 6K10, 6T10, 8T10, 9K10

These receivers are similar to models 6K2, 6T2, 8T, and 9K2 respectively, except for cabinet design. The servicing data, as published on the following pages in *Rider's Volume VII*, applies to these new model numbers: 6T10 and 6K10, page 7-41; 8T10, page 7-56; and 9K10, page 7-99.

RCA 10K11, 10T11

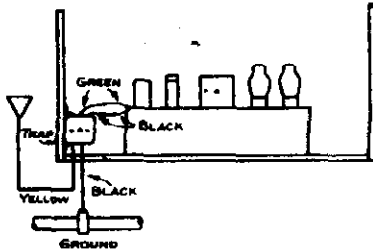
The chassis and speakers of these two models are identical to models 10K and 10T, which will be found in *Rider's Volume VII* on page 7-132. The service data starting on that page applies to these new model numbers with the exception of some minor replacement parts for the new cabinets in which these chassis are housed.

Silvertone Wave-Trap

A wave-trap has been designed for use with the following receivers when they are used near ship transmitters, airports, or air beacon stations, which cause code interference: 1989, 4408, 4420, 4520, 4409, 4413, 4442, 4443, 4522, 4523, 4542, 4543. The part number of this wave-trap is 101311-4256.

Installation:

The trap should be mounted, by means of two wood screws, at any convenient place on the chassis shelf or cabinet, where it will be near the an-



Installation of wave-trap in various Silvertone chassis

tenna terminal of the set. Connect the yellow lead of the wave-trap to the antenna downlead and splice the green wire of the wave-trap to the green antenna lead of the receiver. Cut off any excess wire from the trap and from the chassis antenna lead, so that the green lead from the wave-trap to the chassis is as short as possible. The yellow lead from the wave-trap should be run so that it is as far as possible from the green lead. Splice one of the black leads from the wave-trap to the black ground lead of the receiver. Connect the other black lead to the ground that is used for the installation. See accompanying illustration.

Adjustment:

The trap is pre-tuned to the intermediate frequency of the set, so that normally no further adjustment should be needed. However, if interference still be experienced, tune the receiver to approximately between 550 and 600

kc. Then adjust the wave-trap until the interference is eliminated, by means of the trimmer screw at the bottom of the container. The addition of the trap will reduce the sensitivity of the receiver around 600 kc. by about 50%. It would be wise to advise the set owner of this fact before installing this trap.

Silvertone 2- and 3-Volt Chassis

The model numbers in which these chassis are used are as follows: 4404, 4405, 4424, 4444, 4524, and 4544 for the 3-volt models; 4410, 4411, 4425, and 4445 for the 2-volt models. The schematic for both chassis will be found on page 7-55 of *Rider's Volume VII*.

In some localities where a 930-kc. station is operating, it may be desirable to shift the i-f. peak — 465 kc. — of these chassis to eliminate a whistle due to a beat between the second harmonic of the i-f. peak and the signal of 930 kc.

First determine at what point between 900 and 960 kc. the whistle will be least objectionable. Dividing this frequency in half will give the new i-f. peak at which the receiver should be aligned. For example: assume that the whistle at 915 kc. would be unobjectionable, then the new i-f. peak would be $915 \div 2$, or 457.5 kc. Align the i-f. transformers at this new frequency and then realign the rest of the receiver, as described on page 7-56 of *Rider's Volume VII*.

Silvertone 1802A, 1803A, 1807

Refer to the schematic page 5-31 of *Rider's Volume V*. The 0.001-mf. condenser in the plate circuit of the 2A6, second detector, is no longer grounded. One side is still connected to the plate, as it was in the schematic mentioned above, but the other side now is connected to the cathode of the 2A6.

Silvertone 1825, 1828

A change has been made in the antenna circuit of this chassis, the schematic of which appears on page 5-39 of *Rider's Volume V*. The switch, connected across the 100,000-ohm resistor in the antenna primary circuit, has been eliminated.

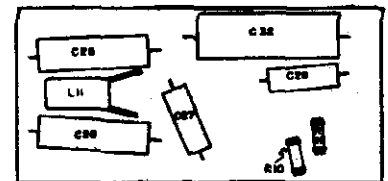
Silvertone 1945

The original production of this model was supplied with 1.5-ampere fuses. Sometimes trouble was experienced with these fuses blowing out, due to the initial charging current of the electrolytic condensers. This occurred only when the receiver had not been used for a considerable time, so that the electrolytic condensers momentarily drew large forming current when the set was first turned on.

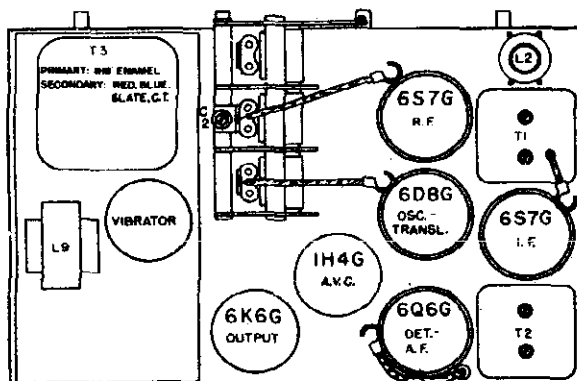
Later production of this model was supplied with a 2-ampere fuse and if you come across any of these models with the smaller fuse, substitute the 2-ampere type.

Silvertone 4428A, 4448A, 4528A, 4548A

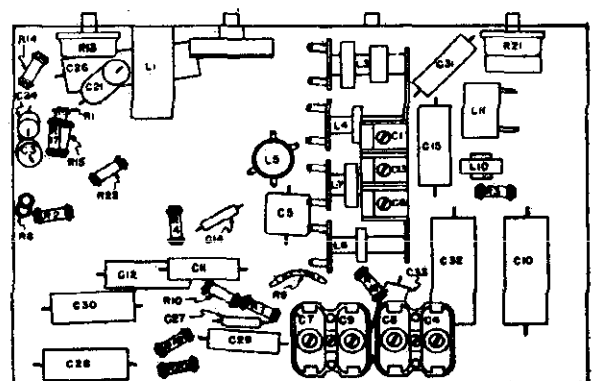
We have been advised by the manufacturer that the tube layout and the two chassis views that were supplied with the servicing instructions of the chassis used in the above models, were incorrect. We are reproducing here the three correct layouts that should appear on pages 7-61 and 7-62 of *Rider's Volume VII*. Please make proper notation on these pages in your Manual.



The locations of the parts under the power supply unit of the Silvertone 4428A and other models



LOCATIONS OF PARTS ON TOP OF CHASSIS

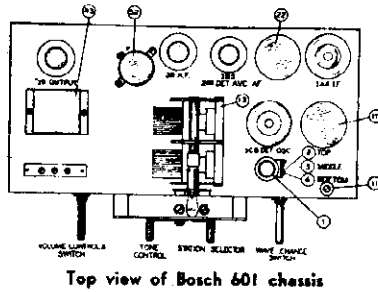


LOCATIONS OF PARTS UNDER CHASSIS

The correct chassis views of the Silvertone models 4428A, 4448A, 4528A, and 4548A.

Bosch 601

Several omissions of parts values were in the preliminary schematic diagram of this set which was published on page 7-20 of *Rider's Volume VII* and these missing values will be found below opposite the diagram number by which the various components are designated. The connections are the

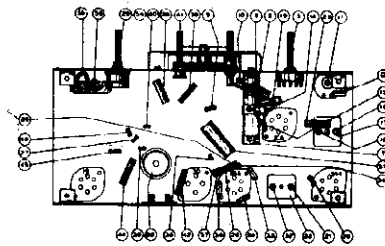


Top view of Bosch 601 chassis

same in the final schematic as they are shown on the above-mentioned page with the one exception: A 0.5-mf. condenser has been inserted between the high side of the filament supply and ground. Draw this in on your schematic just to the left of the dial lamp (No. 53) where the lead to the filament of the 1A4 tube is connected. The part number of this new condenser is CW 2-50 and its diagram number is 57.

Diagram No.	Part No.	Description
10, 28, 37	CW 4-02	0.02 mf., 400 v.
19, 23	CW 2-05	0.05 mf., 200 v.
29	VR 9538	0.5 megohm, vol. con.
38	CW 4-005	0.005 mf., 400 v.
42	CW 6-005	0.005 mf., 600 v.
44	CW 4-01	0.01 mf., 400 v.

Also check the values of diagram numbers 55 and 56; they should be 0.94 and 0.42 ohm respectively.



Bottom view of Bosch 601 chassis

Below will be found the alignment data for this receiver together with the layouts of the apparatus on both the top and bottom of the chassis. The numbers of the parts correspond with the diagram numbers on the schematic already published in *Rider's Volume VII*.

Wave Switch	Dial Position	Dummy Antenna	Quesney	Sig. Gen. 465 kc.	Sig. Gen. 1A4 grid 21, 22	Connec- tion	Trim- mers	Out- put Signal
.....	000 kc.	.5 mf.	.....	.....	1A4 grid 16, 18	.....	.....	Max.
.....	1000 kc.	.0002 mf.	1600 kc.	.....	Antenna	.....	.....	Min.
.....
.....	000 kc.	.....	800 kc.	.....	.....	.....	.....	11 1/2
.....	1000 kc.	.....	1600 kc.	.....	.....	.....	.....	8, 3
Sh. Wave	0000 kc.	.....	0000 kc.	.....	.....	.....	.....	7
.....	.....	.....	.....	.....	.....	.....	.....	3

1 Volume control to maximum and tone control to treble
2 While rocking condenser.

39. The new value is .005 mf., Part No. CW4-005.

Below will be found the resistance of the windings of the power transformer:

Winding	Primary	Sec. Total	6.3 Fil.	Rect. Fil.
TR 9555	15.5 ohms	600 ohms	.24 ohm	.17 ohm
TR 9564	16.5 ohms	570 ohms	.23 ohm	.14 ohm
TR 9565	61 ohms	580 ohms	.23 ohm	.15 ohm

Please add these data to the schematic.

Bosch 650

The final schematic of this model is the same as the preliminary, which will be found on page 7-33 of *Rider's Volume VII*, with the following exceptions:

Diagram No.	Old Value	New Value	Part No.
10	.0001 mf.	.000065 mf.	CM9511
18	.005 mf.	.005 mf.	CW4005
23	40,000 ohms	40,000 ohms	SA99957
38	.05 mf.	.25 mf.	CW2-25
51	30,000 ohms	50,000 ohms	RE95116
59	65 ohms	50 ohms	RE9537

Note that the part numbers only of items 18 and 23 are changed; the values remain the same.

Please make a correction on the schematic. The lower plate of condenser No. 10 should be connected to the junction of the tuning condenser and condenser No. 12. This was omitted from the drawing.

Bosch 605, 605C

The final schematic is the same as the preliminary, which will be found on page 7-25 of *Rider's Volume VII*, with the following change in the value of the .01-mf. condenser, Diagram No.

Bosch 640

The final schematic is the same as the preliminary, which will be found on page 7-31 of *Rider's Volume VII*, with the following exceptions:

Diagram No.	Old Value	New Value	Part No.
10	.0001 mf.	.000065 mf.	CS9511
23	40,000 ohms	25,000 ohms	SA99777
38	.05 mf.	.25 mf.	CW2-25
39	.05 mf.	.1 mf.	CW2-10
46	65 ohms	50 ohms	RE9537

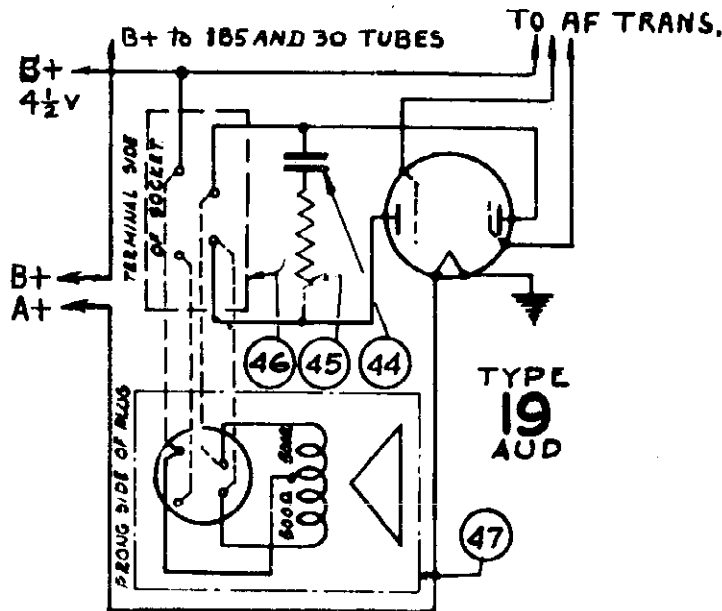
Please make these changes in the list of parts on Bosch page 7-32 in *Rider's Volume VII*.

Silvertone Wave-trap Change

Wave-trap, Part No. 1013114477, used for eliminating code interference in models 1986, 1987, 4403, 4463, 4464, 4484, 4563, and 4584 (see page 7-45 of *Rider's Volume VII*), is described as having three leads.

In later production of this trap only two leads were used, having the colors black and green. The green lead is to be connected to the green lead of the set's antenna lead or connected to the antenna terminal, if the receiver has a terminal board. The black lead of the trap is to be connected to ground.

This trap acts as a series resonant circuit connected across the antenna and ground terminals of the set.



CORRECTION OF SPEAKER CABLE CONNECTIONS TO THE SPEAKER PLUG OF MODEL 601.

